NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812
AC 205 453-0034

25th Anniversary
1958-1983

June 15

Tim Tyson
Marshall Space Flight Center, Ala.
(205/453-0034)

For Release:

IMMEDIATE
Also released in
Washington, D. C.

RELEASE NO: 83-44

SPACE TELESCOPE SCIENCE INSTITUTE DEDICATION JUNE 15

The $10 million Space Telescope Science Institute, designed to be the world center for astronomical research into the 21st century, is to be dedicated at 4 p.m. Wednesday, June 15 on the campus of Johns Hopkins University in Baltimore, Md.

The institute, established as part of NASA's Space Telescope Program, will house facilities for astronomers to analyze visual and computer data transmitted from the telescope.

The Space Telescope is an unmanned, multipurpose astronomical observatory to be carried into orbit aboard the Space Shuttle in 1986. Because it will be in orbit above Earth's hazy and turbulent atmosphere, the Space Telescope will see the heavens clearly. Scientists expect it to add significantly to mankind's ability to observe the universe.

The Marshall Space Flight Center in Huntsville, Ala., is NASA's lead center for management of the Space Telescope project.

The telescope itself, with its 2.4 meter-in-diameter (8 feet) optical telescope mirror, will be able to see objects 50 times fainter and seven times farther away with resolution 10 times better than Earth-based telescopes. The volume of the universe astronomers can study with the telescope may be increased 350-fold.

Speakers at the dedication will include Sen. Charles McC. Mathias (R-MD); George Keyworth, science adviser to President Reagan; and NASA Administrator James M. Beggs.

-more-

June 10, 1983

Marshall Center Director Dr. William R. Lucas and Space Telescope Project Manager James B. Odom have been invited to the dedication as the Center' representatives. Senior managers from NASA Headquarters and the Goddard Space Flight Center in Greenbelt, Md., have also been invited to attend.

The dedication will follow a special symposium entitled "The Space Telescope and the Frontiers of Science" and a panel discussion on "The Promise of the Space Telescope."

The panel includes the principal investigators (scientists) responsible for the telescope's scientific instruments: the high resolution spectograph, the faint object camera, the high speed photometer, the faint object spectograph, and the wide field/planetrary camera.

Operated for NASA by the Association of Universities for Research in Astronomy (AURA), a consortium of 17 major universities, the institute is an independent research center responsible for scientific activities associated with the Space Telescope project.
Its newly completed facility ultimately will house a staff of approximately 250, including some 30 astronomers from AURA and 10 from the European Space Agency. In the two years since its establishment, the institute has hired 30 astronomers.

The institute is expected to attract visiting scientists from the United States and abroad, who will conduct their observations and participate in scientific meetings and symposia.

Space Telescope, the largest astronomical observatory ever to be placed in Earth orbit, will operate around the clock, permitting long observations of the faintest and most distant celestial objects. During such observations, the fine guidance system will lock onto guide stars and hold the instrument steady for recording data with unprecedented accuracy.

Space Telescope's five instruments will cover portions of the ultraviolet and infrared, as well as the visible, regions of the electromagnetic spectrum. The instruments can be replaced during the anticipated 20-year life of the Space Telescope, which will be serviced by astronauts from the Space Shuttle or even returned to Earth for extensive repairs.

Communications to and from the Space Telescope will travel through the Tracking and Data Relay Satellite System to a ground station at White Sands, N.M., for retransmission to the Goddard Space Flight Center, where the Space Telescope ground operations center will be located. The data will then be transmitted to the Space Telescope Science Institute.

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Institute computers will process the data for analysis and convert it into visual images, giving astronomers the first clear pictures of many astronomical bodies, including some never before seen. In effect, scientists at the institute will study the universe in greater detail than ever before.

Construction of the 67,000-square-foot facility began in September 1981. It houses offices and an observation room for the institute's permanent staff and guest astronomers, as well as computing and other support facilities. Heat from the institute's computers will be recycled to provide heat for the building.

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1958-1983

July 29

For Release:

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JOINT NASA/ESA PRESS RELEASE

RELEASE NO: 83-49

NASA AND ESA ANNOUNCE RESCHEDULE OF SPACELAB 1 LAUNCH

The first Spacelab mission aboard the Space Shuttle has been rescheduled to Oct. 28, 1983. This decision was reached jointly by NASA and the European Space Agency (ESA) following a series of discussions. The joint NASA-ESA mission, STS-9, was originally scheduled for Sept. 30.

-more-

July 29, 1983

The rescheduling results from delays encountered with ground verification testing of the Tracking and Data Relay Satellite System (TDRSS).

Proper checkout and operations of the TDRSS is essential for the Spacelab mission due to the enormous amount of scientific data that must be transmitted through the satellite to ground stations from the European laboratory.

The Tracking and Data Relay Satellite was launched from the Shuttle during the STS-6 mission in April 1983 but failed to achieve its correct orbit because of an upper stage anomoly.

By using commands from its ground station, the satellite's thrusters were used to place the TDRS into its desired orbit which was obtained on June 29, 1983. On-orbit checkout of TDRS is in progress from the NASA-Spacecom ground station at White Sands, N.M. Complete checkout of the satellite is expected to be accomplished by the October 28 launch date.

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RELEASE NO: 83-50 / NASA 83-116

LAUNCH OF STS-8 SCHEDULED FOR AUG. 30

The eighth flight of the Space Shuttle (STS-8) is scheduled for launch from the Kennedy Space Center, Fla., on Aug. 30, 1983.

The launch date provides NASA and contractors extra time to continue ground verification testing of the Tracking and Data Relay Satellite System (TDRSS) prior to in-orbit testing during the STS-8 mission. Proper operation of the TDRSS is essential for the STS-9 Spacelab mission now scheduled for Oct. 28, 1983. If necessary, the scheduled five day mission may be extended an additional day to allow for more complete checkout of the TDRSS.

STS-8 will be commanded by Richard H. Truly, pilot of the second Shuttle mission conducted in November 1981. Other crew members include pilot Daniel C. Brandenstein and three mission specialists: Dale A. Gardner, Dr. Guion S. Bluford Jr., and Dr. William E. Thornton.

-more-

July 29, 1983

The Indian National Satellite (INSAT 1-B) will be deployed from Challenger's cargo bay on the second day of the mission. Flight days three and four involve operations with the Payload Deployment and Retrieval System test article using the Canadian-built remote manipulator arm. TDRSS testing will be interspersed throughout the mission.

The mission will culminate with a night landing at Edwards Air Force Base, Calif.

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1958-1983

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Jointly released with European Space Agency, Paris

RELEASE NO: 83-59

SPACELAB INSTALLED IN COLUMBIA'S CARGO BAY

Spacelab was moved a giant stride closer to its maiden mission when the reuseable orbital research laboratory was installed last week in the cargo bay of the Space Shuttle orbiter Columbia at the Kennedy Space Center, Fla.

Columbia is scheduled to carry Spacelab and its four-member NASA/ESA payload crew into orbit on Oct. 28 for a nine-day verification and science mission. More than 70 individual investigations in five research areas will be performed during the mission.

"Spacelab installation went very smoothly," said John Thomas, Spacelab Program Office manager at the Marshall Space Flight Center in Huntsville, Ala. The installation sequence began Monday, Aug. 15, when Spacelab was lifted by strongback from the Cargo Integration Test Equipment (CITE) stand in the Operations and Checkout Building, placed in the cargo cannister and moved to the Orbiter Processing Facility, where it was placed in Columbia's cargo bay.

Spacelab, designed, developed, and funded by the European Space Agency (ESA) as Europe's contribution to NASA's Space Transportation System, had been in the O&C building undergoing processing since its arrival in the United States from Europe in

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Aug. 26, 1983

December 1981. It had been undergoing testing in the CITE stand for approximately three months. The CITE stand duplicates mechanical and electronic systems of the orbiter and is used to verify that payloads such as Spacelab are compatible with the Shuttle.

The Marshall Space Flight Center monitors development work in Europe and is responsible for developing peripheral components such as the Spacelab Transfer Tunnel. Spacelab 1 is a joint NASA/ESA mission with each agency sponsoring approximately half the scientific payload. The Marshall Center is responsible for the U. S. portion of the payload and overall management of the first mission. ESA's SPICE (Spacelab Payload Integration and Coordination in Europe) team is responsible for the European part of the payload.

Two other NASA centers are also involved in the mission. The Kennedy Space Center is responsible for processing the Spacelab and launching it aboard the Shuttle, and the Johnson Space Center, Houston, is responsible for Shuttle Flight Operations.

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RELEASE NO: 83-60

LOCKHEED WINS SHUTTLE PROCESSING CONTRACT AT KENNEDY CENTER

The National Aeronautics and Space Administration has selected Lockheed Space Operations of Titusville, Fla., for final negotiation of a contract to perform Space Shuttle launch and landing activities at the Kennedy Space Center (KSC) and on behalf of the U. S. Air Force at Vandenberg Air Force Base (VAFB), including operation of related ground systems at both launch sites.

Fifteen contractors currently provide these services for NASA and the USAF. The Shuttle Processing Contract (SPC) will consolidate these services into a single contractual arrangement that will permit the Space Shuttle launch processing cycle to evolve from a research and development phase into an operational mode in which mission success and safety will continue to be achieved.

The initial transition phase of the contract will be on a cost-plus-award-fee basis. Once this transition is completed, the fee structure at both sites will become a cost-plus-incentive-fee with an award fee feature. The initial contract period is three years. The contract will contain one priced three-year option and three unpriced three-

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September 7, 1983

year options, for a total potential contract period of 15 years. Lockheed's proposed cost for the initial six-year period is approximately $2 billion.

Lockheed proposes to maintain stability and continuity by hiring a large percentage of employees currently performing the same or similar work at KSC. The contractor proposes a substantial goal for Small and Disadvantaged Business participation.

The SPC will be the second comprehensive contract award planned by NASA. The first, the KSC Base Operations Contract (BOC) was awarded to EG&G in December 1982.

The overall contract for Shuttle processing services will be administered by NASA and will contain separate statements of work for KSC and VAFB which will be managed by NASA/KSC and the USAF, respectively.

Requests for proposals were originally mailed to 71 companies and 20 additional companies received copies of the RFP. Informational copies were mailed to seven labor representives.

Two companies submitted proposals. Major subcontractors of Lockheed are Grumman Technical Services, Inc.; Morton-Thiokol, Inc.; and Pan-American World Services, Inc. Rockwell Shuttle Operations, Inc., also submitted a proposal supported by Boeing Services International, Martin Marietta Launch Services Corp., USBI Launch Services Corp. and United Airlines Aerospace Services Co.

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RELEASE NO: 83-65

SOLID ROCKET BOOSTER PARACHUTE DROP TEST CONDUCTED

The first in a series of three "drop tests" designed to evaluate larger parachutes proposed for the Space Shuttle's solid Rocket boosters was successfully conducted Friday in California, according to Larry Mulloy, manager of the Solid Rocket Booster Project at the Marshall Space Flight Center in Huntsville, Ala.

Larger parachutes will reduce the booster's water impact velocity and resulting damage at splashdown. The tests are being conducted to validate the design of the parachute.

Attempts earlier this year to begin the tests, which involve dropping a mock Shuttle booster with an attached parachute from NASA's B-52 aircraft, were canceled because of bad weather and mechanical difficulties. The series of test is expected to be completed early next year.

The boosters augment the Space Shutte's main engines during launch by providing the added thrust needed in the first phase of flight to orbit. The boosters are jettisoned about two minutes after launch, and the parachutes soften their descent into the ocean. The boosters are then recovered, refurbished and used on future missions.

Sept. 22, 1983

The B-52 flew the mock booster to the China Lake Naval Weapons Center, where it was dropped over a special test range. The parachutes were triggered to deploy at a designated speed and altitude, testing their performance and load-carrying capability.

In present Shuttle operations, a booster's standard parachute system consists of a small pilot parachute, a medium-sized drogue parachute, and three main parachutes, 115 feet in diameter. The new system will be made up of the standard parachutes but will utilize main parachutes which are 136 feet in diameter. Since the mock booster used for the drop tests is about one-third the weight of a real booster, the tests will simulate a Shuttle drop by using just one main parachute.

Investigators collected data during the tests by film and avionics recordings, and will examine the mock booster prior to its refurbishment for use in future tests.

The Dryden Flight Research Facility, Calif., is conducting the drop tests in coopertion with the Marshall Center, which is responsible for the parachute system. The parachutes are manufactured by Pioneer Parachute Company of Manchester, Conn.

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RELEASE NO: 83-70

SPACE TELESCOPE GETS NEW NAME

The Space Telescope, NASA's future orbiting optical astronomical observatory, was recently renamed the Edwin P. Hubble Space Telescope in honor of one of the America's foremost astronomers.

The Hubble Space Telescope Project, managed by the Marshall Space Flight Center in Huntsville, Ala., is scheduled for launch aboard the Space Shuttle in 1986.

Before Hubble's research, scientists held differing views on the extent and dimensions of the universe. It was understood that our solar system was part of a larger system which contained all the stars visible to the naked eye. Astronomers were uncertain whether the faint spiral nebulae were also part of our Milky Way system or themselves distant universes each composed of countless stars.

Working at the 100-inch telescope at Mount Wilson, Calif., Hubble succeeded in observing individual stars in the Andromeda nebula. By the end of 1924, he was able to show that Andromeda was many times more distant than any star within the Milky Way system. By means of similar observations of other nebulae, Hubble established that these nebulae were in fact galaxies far beyond our system.

Equally important was a later discovery by Hubble that the universe was expanding (evidence of the Big Bang theory). The observations showed that external galaxies were

-more-

Oct. 26, 1983

traveling away from Earth and, the more remote the galaxy, the faster it was moving. This phenomena is known as Hubble's Law and the coefficient relating the distance and the velocity of the galaxy is called the Hubble constant.

Hubble was an active research scientist until his death in 1953.

The Hubble Space Telescope will be operated much like a ground-based observatory. The 94.5-inch (2.4-meter) telescope and five scientific instruments will be housed in the space observatory during flight. However, the observatory's command, control and scientific operations will be ground-based. The observatory, which will not have any interference from Earth's atmosphere, will be able to look into space seven times farther than any ground-based observatory, and its imaging will have 10-20 times better resolution. Thus, the Hubble Space Telescope offers the potential of making new cosmological discoveries, in the spirit of its namesake.

NASA Headquarters in Washington, D.C., is responsible for the overall direction of the program; the Marshall Center has responsibility for overall project management, including development of the Optical Telescope Assembly and Support Systems Module; Goddard Space Flight Center in Greenbelt, Md., has responsibility for spacecraft operations and scientific instrumentation development; and the Space Telescope Science Institute in Baltimore, Md., has responsibility for managing the scientific investigations and the dissemination of scientific results.

The renaming of the Space Telescope was announced by Dr. Burton Edelson, NASA's associate administrator for Space Science and Applications.

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EDWIN P. HUBBLE

Edwin Powell Hubble, born Nov. 20, 1889 in Marshfield, Mo., revolutionized our knowledge of the size, structure and properties of the universe. He was an outstanding leader in the observational approach to cosmology, and his work made as great a change in mankind's concept of the universe as did the Copernican revolution 400 years before.

Hubble spent his early years in Kentucky and attended high school in Chicago. He won a scholarship to the University of Chicago, majoring in mathematics and astronomy, and received his bachelor's degree in 1910.

Hubble was a member of the 1909 University of Chicago championship basketball team and almost became a professional boxer. He spent the next three years as a Rhodes Scholar at Oxford, where he studied law . He was admitted to the bar in Kentucky, but after a year in private law he returned to astronomy at the Yerkes Observatory of the University of Chicago and earned his doctorate in 1917.

In his dissertation, "Photographic Investigations of Faint Nebulae," Hubble took note of a major issue then facing astronomers: Were the spiral "nebulae" seen by astronomers part of the Milky Way or were they external island universes.

While finishing his doctorate, Hubble was offered a staff position by George Ellery Hale, founder and director of The Carnegie Institution's Mount Wilson Observatory, near Pasadena, Calif. Before accepting, Hubble enlisted in the infantry and served with the American Expeditionary Force in France where he rose to the rank of major (at one time suffering a shrapnel wound received in the field).

Hubble returned to America in 1919, his arrival at Mount Wilson coinciding with the completion of the 100-inch Hooker Telescope, by far the world's largest and most powerful. Working with that telescope, Hubble made the discoveries that rank him as one of America's greatest astronomers.

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Oct. 26, 1983

At the onset of World War II, Hubble was appointed chief of exterior ballistics and director of the supersonic wind tunnel at the U.S. Army Ballistics Research Laboratory at Aberdeen Proving Ground, Md. After World War II, Hubble returned to astronomy and in 1949 he took the first photographs with the 200-inch Hale Telescope at Palomar Mountain, Calif. During the last years of his life he suffered from a heart condition. He died of a stroke in 1953 in San Marino, Calif.

Before Hubble, it was not known that our universe extended beyond the Milky Way. He was the first to introduce a significant classification system for galaxies, a system which is the basis of the classification still used. The velocity-distance relationship described by Hubble's Law and the concept of the expanding universe remain fundamental in modern cosmological investigation. The work of few other American scientists has so abruptly and so profoundly altered mankind's understanding of nature.

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LAUNCH DATE SET FOR SHUTTLE/SPACELAB 1 MISSION

National Aeronautics and Space Administration and European Space Agency officials have agreed to a November 28, 1983, launch date for the STS-9/Spacelab 1 mission.

NASA management has confirmed that the Shuttle system is ready to support the November date following the change of a solid rocket motor nozzle assembly.

During the past several weeks, two launch dates were considered by NASA and ESA; the November date and one in late February 1984. A majority of the scientific investigators have expressed a preference to proceed with the November launch date as most of the scientific functional objectives can be met with the replanned November timeline.

NASA and ESA have agreed to refly a few identified experiments that will be degraded by the November launch. Planning is underway for these experiments, in the space plasma physics, astronomy, Earth and atmospheric observations disciplines, to be reflown by mid-1985.

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November 2, 1983

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RELEASE NO: 83-80

NASA TO RECOMPETE BOOSTER REFURBISHMENT CONTRACT

The National Aeronautics and Space Administration has issued a request for proposal (RFP) to industry for recompetion of the Space Shuttle booster assembly and refurbishment contract.

The contract will encompass the refurbishment, assembly and checkout of 84 flight sets of the Shuttle solid rocket boosters. In addition, the successful bidder will be required to construct a Space Shuttle Solid Rocket Booster Assembly and Refurbishment Facility on the Kennedy Space Center, Fla., to facilitate increasing the booster production operations, now conducted in the low bay area of the Vehicle Assembly Building and other outlying facilities, to 24 deliveries per year.

Prospective bidders have been invited to send on-site assessment teams to the Kennedy Center to view current processing activities to aid in the preparations of their bids.

Proposals for the contract will be accepted no later than March 1984. The selection process should be completed and the successful bidder onboard by mid 1984.

Work under the current assembly contract is performed by United Space Boosters, Inc., Huntsville, Ala., under the direction of the Marshall Space Flight Center.

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RELEASE NO: 83-81

NEW ASTRONAUT SHUTTLE FLIGHT ASSIGNMENTS MADE

The National Aeronautics and Space Administration has selected astronaut crews for four additional Space Transportation System flights: missions 41-G, 51-A, 51-C and 51-F, and has named a launch-ready standby crew.

The attached schedule lists crew assignments and cargo manifests as now planned.

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Nov. 21, 1983

SPACE SHUTTLE FLIGHTS Calendar Year 1984

NOTE: Cargo manifests and crew scheduling are subject to change. MS - Mission Specialist; PS - Payload Specialist.

FLIGHT 41-B
Date: Jan. 29, 1984
Cargo: SPAS-01, Palapa B-2, Westar-VI
Crew: Vance D. Brand, commander
Robert L. Gibson, pilot
Bruce McCandless, MS
Robert L. Stewart, MS
Ronald E. McNair, MS

FLIGHT 41-C
Date: April 4, 1984
Cargo: LDEF, Solar Max Repair
Crew: Robert L. Crippen, commander
Francis R. Scobee, pilot
George D. Nelson, MS
James D. Van Hoften, MS
Terry J. Hart, MS

FLIGHT 41-D
Date: June 4, 1984
Cargo: Telesat-I, Syncom IV-1, Large Format Camera, OAST-1
Crew: Henry W. Hartsfield, commander
Michael L. Coats, pilot
Judith A. Resnik, MS
Steven A. Hawley, MS
Richard M. Mullane, MS
Charles D. Walker, PS

FLIGHT 41-E
DOD Mission

FLIGHT 41-F
Date: Aug. 9, 1984
Cargo: Telstar 3-C, SBS-D, Syncom IV-2, SPARTAN
Crew: Karol J. Bobko, commander
Donald E. Williams, pilot
Rhea Seddon, MS
Jeffrey A. Hoffman, MS
S. David Griggs, MS

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FLIGHT 41-G
Date: Aug. 30, 1984
Cargo: OSTA-3, ERBS
Crew: Robert L. Crippen, commander
Jon A. McBride, pilot
Kathryn D. Sullivan, MS
Sally K. Ride, MS
David D. Leestma, MS

FLIGHT 41-H
DOD Mission -or- TDRS-B
Date: Sept. 29, 1984
Crew: Frederick H. Hauck, commander
David M. Walker, pilot
Anna L. Fisher, MS
Dale A. Gardner, MS
Joseph P. Allen, MS

FLIGHT 51-A
Date: Oct. 24, 1984
Cargo: MSL-1, Telesat-H, GAS Bridge
Crew: Daniel C. Brandenstein, commander
John O. Creighton, pilot
Shannon W. Lucid, MS
John M. Fabian, MS
Steven R. Nagel, MS

FLIGHT 51-B
Date: Nov. 22, 1984
Cargo: Spacelab 3
Crew: Robert F. Overmeyer, commander
Frederick D. Gregory, pilot
Don L. Lind, MS
Norman E. Thagard, MS
William E. Thornton, MS

FLIGHT 51-C
Date: Dec. 20, 1984
Cargo: TDRS-B -or- TDRS-C
Crew: Joe H. Engle, commander
Richard O. Covey, pilot
James F. Buchli, MS
John M. Lounge, MS
William F. Fisher, MS

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Calendar Year 1985

FLIGHT 51-F
Date: March 29, 1985
Cargo: Spacelab 2
Crew: Charles G. Fullerton, commander
S. David Griggs, pilot
F. Story Musgrave, MS
Anthony W. England, MS
Karl G. Henize, MS

Standby Crew
Karol J. Bobko, commander
Ronald J. Grabe, pilot
Richard M. Mullane, MS
Robert L. Stewart, MS
David C. Hilmers, MS

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RELEASE NO: 84-1

NASA CENTER ISSUES "REQUEST FOR PROPOSAL"
ON ORBITAL MANEUVERING VEHICLE

A "request for proposal" has been issued by NASA's Marshall Space Flight Center in Huntsville, Ala., which invites aerospace companies to describe how they would define the concept of an Orbital Maneuvering Vehicle, a kind of "smart space tug" that would move satellites and other orbiting objects from place to place hundreds of miles above the Earth.

The companies have until Feb. 14, 1984, to respond to the request. From the proposals submitted, the Marshall Center will select three or more firms for twelve-month contracts for parallel definition studies. The contracts are expected to be in the range of $1.7 to 1.9 million for each company selected.

If the government ultimately decides to build an Orbital Maneuvering Vehicle, proposed for a first launch about 1990, one of the companies from those involved in the definition studies would be chosen to build the flight hardware.

The vehicle would supplement the present Space Transportation System, the heart of which is the Space Shuttle. Although the Shuttle has already proven to be an effective ferrying system in moving satellites and other equipment to space and back, its limited

- more -

Jan. 3, 1984

range of orbital altitude would make the maneuvering vehicle a valuable addition to the Space Transportation System. As presently envisioned by conceptual engineers, the maneuvering vehicle would be an unmanned spacecraft 15 feet in diameter and three feet in length. It could deliver payloads to orbits way beyond the practical reach of the Shuttle, and retrieve them as well. It would also serve as a means of reboosting satellites as their orbits gradually decayed, thus avoiding costly dedicated missions in using the Shuttle.

As currently conceptualized, the maneuvering vehicle would be deployed from the Shuttle in the early years for short duration missions; later it would remain in orbit for extended periods of time as a companion to both Shuttle-based and space station-based missions. Its role in support of a future space station program, in fact, is viewed by many in NASA as one of the maneuvering vehicle's most essential attributes. The vehicle would be operationally available for assembly and buildup of an initial station, proposed by the space agency to be built in the early 1990s, and would then become an essential element of station operations.

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RELEASE NO: 84-5

SPACE INDUSTRIALIZATION SYMPOSIUM
TO BE HELD FEB. 13-15 IN HUNTSVILLE

The opening of space to commercialization, as announced by President Reagan in his State of the Union address last week, will be the focus of a national symposium Feb. 13-15 in Huntsville, Ala.

Representatives from government, universities and industry will attend the Second Symposium on Space Industrialization to be held at the Huntsville Hilton Inn. Sponsored jointly by the Marshall Space Flight Center, the University of Alabama in Huntsville, and the American Institute of Aeronautics and Astronautics, the symposium will feature speakers who will assess where space industrialization stands and where it is heading.

Like the first symposium held in 1976, this gathering of distinguished speakers will again review commercial ventures in space. There will also be an evaluation of the technical disciplines compatible with space industrialization, and a discussion of the federal policies that affect commercial space activities. The ultimate role of a space station and other carrier options in space industrialization is another subject that will be addressed.

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Jan. 31, 1984

Among the approximately 30 speakers scheduled to address the symposium are Mr. Craig L. Fuller, assistant to the President for Cabinet Affairs; Dr. William R. Lucas, director of the Marshall Center; Dr. Bernard Morgan, chairman of the AIAA; Dr. John Wright, president of UAH; Dr. Gunther Seibert, head of the Microgravity Office, Directorate of Space Transportation Systems, European Space Agency; and Dr. John Vanderhoff, professor of chemistry at Lehigh University.

One of the lead-off speakers addressing the symposium will be NASA Associate Deputy Administrator Philip E. Culbertson, who for the past eight months headed a special NASA-wide task force on space commercialization. During his presentation, Culbertson will talk about the space agency's policies and plans in this area.

The symposium is intended to reach a broad cross section of industries, including aerospace firms, which have been involved in the space program from its beginning, as well as traditionally non-space-oriented companies. In the eyes of many experts, it will be the partnership of government, universities and industry that will bring about the successful commercialization of space.

- 30 -

NOTE TO EDITORS: News media are invited to attend this symposium. Registration is limited, so be sure to register in advance if you are interested in attending. The registration fee for meetings only ($60.00) will be waived for news media. Meals, including the banquet ($25.00) at which Mr. Fuller will speak, will be at your own expense. For further information on advance reservations, call Mrs. Rita Pugh at the University of Alabama in Huntsville, (205) 895-6010. For information about the symposium, call Terry Eddleman at the Marshall Space Flight Center, (205) 453-0034.

NASA News

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Carl Jones
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For Release:
IMMEDIATE

RELEASE NO: 84-7

RESEARCH GRANTS AWARDED TO ALABAMA A&M UNIVERSITY

Two research grants totaling $291,640 have been awarded by the Marshall Space Flight Center in Huntsville, Ala., to Alabama A & M University in Huntsville.

Center Director Dr. William R. Lucas presented the grants to Dr. Richard D. Morrison, president of Alabama A & M University, in a special ceremony Thursday. The total combined award is the largest ever made to that school by the Marshall Center.

The grants will enable the university to study an integrated computer based research program in robotic systems, and an interactive analytical integration and mission planning data base system to be used in a space station, according to Duron Crider of Marshall's Procurement Office.

The grants, amounting to $193,645 and $97,995, were made possible by funds from NASA Headquarters in support of an executive order signed by President Reagan in 1981. The order calls on government agencies to increase the participation in research by historically black colleges and universities.

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Feb. 15, 1984

Other attendees from Alabama A&M at the presentation included Dr. Bessie W. Jones, dean of the School of Arts and Sciences; Dawson I. Horn, director of the Development Office; Dr. H. Saha, chairman of the Computer and Information Sciences Department; Dr. Michael T. Borelli, associate professor of electronic engineering technology; Dr. Imao Chen, assistant professor of computer science; and Dr. J.R. Jenkins, dean of the School of Technology.

Marshall participants in the presentation included Jack Lee, deputy center director; Dr. F. A. Speer, associate director for science; J. N. Foster, director of Administration and Program Support; Clyde Foster, director of the Equal Opportunity Office; Dr. J. L. Randall, Information and Electronic Systems Laboratory; and Crider, Marshall grants officer.

The largest grant ever made to a college or university by the Marshall Center, $374,450, was presented in July 1983 to Tuskegee Institute. In August 1983, Tennessee State University was awarded a grant amounting to $235,632.

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For Release:
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RELEASE NO: 84-11

NASA SETS UP SPACE STATION DEVELOPMENT TEAMS

NASA has established seven inter-center teams to conduct advanced development activities for high potential technologies to be used in Space Station design and development.

The assignments are intended to identify emerging technologies for advanced development for Space Station design and to establish test beds into which prototype technology hardware could be integrated, tested, demonstrated and evaluated.

Three of the inter-center teams will be led by the Marshall Space Flight Center, Huntsville, Ala., and three by the Johnson Space Center, Houston. Lead center for the seventh team will be assigned later.

The center assignments are:

Attitude Control and Stabilization System -- Marshall is lead center of a team also including NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., and Johnson, with Langley Research Center, Hampton, Va., participating in a supporting role.

Data Management System -- Johnson is lead center in a team also consisting of the Goddard Space Flight Center, Greenbelt, Md. and Kennedy Space Center, Fla. Support will be provided by Ames Research Center, Mountain View, Calif.; National Space Technology Laboratories, Bay St. Louis, Miss.; JPL and Langley.

Auxiliary Propulsion System -- Marshall is lead center in a team including Lewis Research Center, Cleveland; Marshall, JPL and Johnson.

February 29, 1984

- more -

Environmental Control and Life Support System -- Johnson is lead center in a team that includes Ames.

Space Operations Mechanisms -- Marshall is lead center in a team that includes JPL, Johnson, Lewis and Marshall, with Langley in a supporting role.

Thermal Management System -- Johnson is lead center in a team including Goddard, Johnson, Lewis and Marshall.

Electric Power System -- Inter-center team is Johnson, Lewis and Marshall, with JPL in a supporting role as appropriate. Lead center will be designated later.

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For Release:
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RELEASE NO: 84-16

NASA CENTER ASKS FOR PROPOSALS ON COMMUNICATIONS PLATFORM IN SPACE

NASA's Marshall Space Flight Center in Huntsville, Ala., has invited aerospace firms to describe how they would envision 1990s space platforms orbiting 22,300 miles above the equator. These platforms would orbit above the equator at this "geostationary" altitude at which they would turn in synchronization with the Earth and appear to remain fixed in the sky.

Responses to this "request for proposals" are due to the Marshall Center by Mar. 16. From the proposals received, two firms will be chosen to perform parallel studies — that is, independent studies within the same area of concentration — on platform concepts. The two contracts, expected to be awarded in May, will run for 21 months and will cost a total of approximately $1.1 million, or $550 thousand for each firm selected.

Geostationary platforms could, however, serve a variety of uses besides communications, including Earth observation and data collection. At the geostationary altitude, a platform can continuously monitor almost an entire hemisphere at once for these services. The platform can also view wide areas of the Earth for weather patterns, ocean wave studies and crop observations. The dominant role of the early platforms, however, will be for communications.

- more -

Mar. 9, 1984

"Of course, we already have geostationary satellites doing these things," said Bob Durrett, study manager of the Geostationary Platform at the Marshall Center. "But the platform would allow us to aggregate all of these services, each of which would ordinarily require a separate satellite, into a single entity. Aggregation allows 'economy of scale' by using common utilities like power supply and attitude control. It's cheaper to build and operate one big platform than a lot of small, separate satellites."

The Marshall Center study will focus upon a geostationary platform "bus" — the platform minus its payloads. The bus, the foundation portion of the platform which supports payloads, would provide a common power supply and attitude control to the various payloads, station keeping (that is, keeping the platform in the right place), thermal control, structural support for the payloads and telemetry.

The NASA Lewis Research Center in Cleveland is performing an interrelated study which concentrates upon the payloads themselves — specifically, communications payloads. Together, the two studies will be coordinated to arrive at viable, realistic concepts of geostationary platforms in the next decade.

Although both studies concern communications platforms, both the bus and the payloads study contractors are to make allowances in their designs for non-communications payloads that would eventually be carried.

The objectives of the Marshall study will be to conceive buses appropriate for the late 1990s; determine standardizations for various interfaces; provide data to resolve such questions as methods of attitude stabilization, types of propulsion (whether it should be an integral part of the design, or external — a separate rocket), whether buses might be one-of-a-kind or of general applicability, and whether they should be serviceable. The studies will also determine how well future space systems could support large geostationary platforms; and examine possible ground and space experiments and demonstrations.

- more -

An "Experimental Geostationary Platform," now under consideration at Marshall for the early 1990s, would itself be one of a series of possible experiments and demonstrations to help pave the way for commercial operational platforms.

"These Marshall and Lewis studies initiate a four-phase program," said Durrett. "This beginning study opens the first phase, which is conceptual. After the first phase, we may continue through phase four, which would include the development, manufacturing and flight of whatever the earlier phases showed that was needed — like an experimental platform, or some flight experiments and demonstrations in low Earth orbit. As long as we're satisfied with our findings, we'll proceed with each new phase. But we're pushed for time. We're facing an ever-worsening arc/spectrum problem — the crowding of the geostationary arc as well as the crowding of the radio frequencies required for successful operation."

That invisible circle, or arc, around the Earth at the geostationary altitude is rapidly filling with individual satellites. Those which use the same frequency must be spaced at least two degrees apart to avoid interference with signals from each other.

"And then there's the crowding of the spectrum, as well as the arc," said Durrett. "There are only so many allocations of frequencies that can be assigned to each band, and those bands are filling up as rapidly as the arc itself."

The geostationary platform bus with large antennas and aggregated payloads could possibly relieve this problem. A large platform could replace perhaps dozens of individual satellites and would provide an aggregation of services to satellite users.

To relieve crowding of the communication spectrum, a possible answer may be found in "frequency reuse." With large amounts of power, huge antennas and an on-board switching capability, a geostationary platform could re-direct the same frequency to many highly specific points on the ground. Different messages could be sent simultaneously, through the same platform but transmitted from the platform on the same frequency, using many different narrow beams. Frequency "A," for example, could

simultaneously link Los Angeles and New York, Boston and Kansas City, and hundreds of other link-ups — all different in message but using the same frequency.

"Frequency reuse can't be accomplished today because it requires very narrow beams. Relatively small antennas of today can't broadcast these narrow beams. Only large antennas can, and they need support from a large structure like a platform."

Another objective of the study will be to examine "complexity inversion," in which the complexity of ground stations would be transferred to orbiting platforms. Today relatively simple antennas on satellites in orbit require huge antennas at ground stations to accept high data rates. With "complexity inversion," the reverse would be true, with large antennas on orbit communicating with small antennas of ground stations. Because of "complexity inversion," even wrist-worn telephone receivers may become a reality.

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For Release:
IMMEDIATE

RELEASE NO: 84-19

NASA AWARDS MARTIN MARIETTA $390 MILLION
CONTRACT FOR EXTERNAL TANK PRODUCTION

NASA's Marshall Space Flight Center in Huntsville, Ala., has awarded a $390 million contract to Martin Marietta Aerospace, Michoud Division for the production of 21 additional external tanks for the Space Shuttle.

The three-year contract includes manufacturing, assembly, test and delivery of each tank; program management and administration; and facility operations.

The external tank is the largest element of the Space Shuttle and holds the 528 thousand gallons of liquid propellants which fuel the Shuttle's three main engines.

Martin Marietta is currently under contract to provide 38 flight tanks. The first 15 flight tanks have been delivered to NASA. Ten of the giant tanks have already been flown on Shuttle missions.

-30-

March 19, 1984

NASA News

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For Release:
IMMEDIATE

RELEASE NO: 84-20

NASA REQUESTS PROPOSALS FOR ENGINE STUDIES

The Marshall Space Flight Center in Huntsville, Ala., has issued a Request for Proposal (RFP) to industry for studies that could result in redesign or modifying the Space Shuttle main engines.

The proposals will be accepted by NASA until April 16, 1984. One or two seven-month-long study contracts will be awarded in early summer.

According to Dr. Judson Lovingood, deputy manager for development in the Marshall Center's Shuttle Projects Office, the studies could lead to new engine component designs or new engine concepts to improve operating margins and increase the life of the Shuttle main engines.

The main engines are manufactured and tested by the Rocketdyne Division of Rockwell International, Canoga Park, Calif. "We are seeking new ideas taking advantage of the liquid rocket engine expertise in the U. S.," said Lovingood. "We want

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March 12, 1984

to assure ourselves that we will have the best designs to meet the requirements of the Space Shuttle main engine, especially the reuse and margin requirement."

Potential bidders may include derivations of their current engine such as the replacement of major components or a new engine concept that may be related more closely to current liquid rocket engine technology. The studies must include, as a minimum, replacing only the hot gas manifold on the existing engines and using the existing high-pressure pumps or replacing one or both of the pumps while retaining the hot gas manifold. Also, all proposed new hardware must be compatible with current engine designs.

The results of these design studies will be analyzed to determine whether they are valid. The study reports will be available to prospective bidders if further effort is justified.

NASA News

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RELEASE NO: 84-28

SPACE STATION APPOINTMENTS ANNOUNCED AT JOHNSON CENTER

Neil B. Hutchinson today was named manager of the Space Station Program office at NASA's Johnson Space Center in Houston.

Deputy manager is John W. Aaron. Both appointments are effective immediately, Gerald D. Griffin, Johnson Director, announced today.

NASA Administrator James M. Beggs announced in February that Johnson Space Center would be "lead center" for the agency's Space Station program.

Hutchinson has been serving in a staff assignment to the Johnson Director since his return in January 1984 from a one-year assignment at NASA Headquarters, where he was Director, Space Shuttle Operations Office in the Office of Space Flight.

-more-

April 9, 1984

Hutchinson joined NASA in 1962 and worked on the design and development of the Mission Control Center's Real Time Computer Complex. He served as a flight controller on Gemini and Apollo missions before becoming a Flight Director in 1972.

He served as Flight Director for the final Apollo lunar landing mission, Apollo 17; for all three manned Skylab missions in 1973-1974; for the Apollo-Soyuz Test Project in 1975; and for Shuttle developmental and orbital flight tests from 1978 to 1981.

In addition to his flight control and flight director responsibilities, Hutchinson served as head of the Systems Logic and Processing Section, assistant chief of the Apollo Command and Service Module Systems Branch, chief of the Guidance and Propulsion Systems Branch and deputy chief of the Flight Integration Office at Johnson.

Aaron has been chief of the Spacecraft Software Division at Johnson since 1981. He also served as Avionics Flight Software Project manager for the Shuttle Approach and Landing Test and Orbital Flight Test programs; as technical assistant to the chief, Spacecraft Software Division and as section head for the Electrical Power, Sequential and Instrumentation Systems for the Apollo Command and Service Module.

In addition to his organizational responsibilities, Aaron also served as a flight controller responsible for vehicle systems operation on Gemini, Apollo and Skylab programs.

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Hutchinson graduated from Wilamette University, Salem, Ore., in 1961 with a degree in mathematics and physics. He worked at the U. S. Naval Weapons Laboratory in Dahlgren, Va., as a mathematician until joining NASA in 1962. Married to the former Karen L. Zollman of Wichita, Kans., he and his wife make their home in Clear Lake City, Texas, with their two children.

Aaron received his degree in physics from Southwestern State College in Weatherford, Okla., and joined NASA in Houston in 1964. He is married to the former Cheryl Hart of Vinson, Okla., and they reside, with a son, in Houston and have a daughter attending Texas A & M University.

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For Release:
11 a.m. CDT
May 1, 1984
Also released in
Washington, D.C.

RELEASE NO: 84-33

EARTH OBSERVATION MISSION
PAYLOAD SPECIALISTS NAMED

The National Aeronautics and Space Administration today announced the selection of Dr. Michael Lampton of the University of California at Berkeley and Dr. Byron Lichtenberg of the Massachusetts Institute of Technology to fly as payload specialists on the first Earth Observation Mission, scheduled for launch aboard the Space Shuttle in 1985.

EOM 1, as the mission is officially designated, is the first in a series of NASA Spacelab missions primarily dedicated to measuring the makeup of the Earth's middle and upper atmosphere and variations in the sun's output during an 11-year solar cycle. To accomplish this, several of the instruments originally carried on the Spacelab 1 mission in Nov. 1983 will be reflown. The Earth Observation Mission series is being managed by the Marshall Space Flight Center in Huntsville, Ala.

Lichtenberg, who flew as a payload specialist on the historic first Spacelab mission late last year, and Lampton, who was an alternate payload specialist for that mission, were selected by the group of scientists who will have experiments aboard the

-more-

May 1, 1984

Earth Observation Mission. Selection occurred during the first meeting of the Investigator Working Group at the Marshall Center in March. The pilots and mission specialists will be assigned by NASA later.

"The selection of Lichtenberg and Lampton capitalizes on the prior training of each crewmember on each of the investigations and on the proven professional and operational qualifications of both men," said Mission Manager Gary Wicks of the Marshall Center. "This is important because of the considerable training required in the short time before flight."

The first Earth Observation Mission is currently scheduled to carry nine experiments in three major areas of research — space plasma physics, astronomy and solar physics, and atmospheric physics and Earth observations. NASA is sponsoring the Atmospheric Emission Photometric Imaging, Active Cavity Radiometer, Imaging Spectrometric Observatory, and Far Ultraviolet Astronomy using the FAUST telescope. The Belgium space agency is sponsoring the Measurement of the Solar Constant and, together with the French space agency, is sponsoring the Grille Spectrometer. The French space agency is also sponsoring the Solar Spectrum from 170-3200 Nanometers. The Japanese space agency is sponsoring Space Experiments with Particle Accelerators (SEPAC). The German space agency is sponsoring the Metric Camera. The European Space Agency is providing support to the European investigations.

This NASA Spacelab mission will use the short version of the laboratory module in which the scientists will work and a single pallet which will hold instruments that need to be exposed directly to the space environment. The crew will live in the Space Shuttle orbiter and travel to and from work in the laboratory module through a Spacelab transfer tunnel.

Payload Specialist biographies follow.

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Michael L. Lampton
Earth Observation Mission 1 Payload Specialist

PRESENT DUTIES: Dr. Lampton is a flight payload specialist for Earth Observation Mission 1, a NASA Spacelab mission scheduled to fly aboard the Space Shuttle in 1985. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission to operate their own experiments and those of their colleagues. EOM 1 is the first in a series of Spacelab missions designed to measure variations in the sun's output over an 11-year solar cycle and to study the makeup of the Earth's middle and upper atmosphere. The Marshall Space Flight Center is responsible for managing the Earth Observation Mission series and for coordinating training of the payload specialists.

BIRTHPLACE AND DATE: Born in Williamsport, Pa., March 1, 1941.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married to Susan Lea of Cardiff Wales, England. Her mother lives in England.

CHILDREN: Jennifer, Feb. 19, 1979.

PROFESSION: Physicist.

EDUCATION: Received a bachelor of science degree in physics from the California Institute of Technology in 1962, and a Ph.D. from the University of California at Berkeley in 1967.

EXPERIENCE: Dr. Lampton is a research physicist at the Space Sciences Laboratory, University of California at Berkeley. His main fields of research include X-ray astronomy, UV astronomy, space physics and optical and electronics engineering. He served as an alternate payload specialist for Spacelab 1, the first mission of a European Space Agency developed reusable, scientific research facility. During the mission, he worked as a member of the Marshall Center mission management team in the Payload Operations Control Center. From there he assisted in devising solutions to problems, trouble-shooting and changing crew precedures where necessary and communicating directly with the payload crew on orbit. Dr. Lampton was selected to train for the Spacelab 1 mission in June 1978 as one of two U. S. payload specialists and was named as an alternate payload specialist in September 1982.

ORGANIZATIONS: Dr. Lampton is a member of the American Astronomical Society, the Audio Engineering Society and the International Astronomical Union.

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Byron K. Lichtenberg (SC.D)
Earth Observation Mission 1 Payload Specialist

PRESENT DUTIES: Dr. Lichtenberg is a flight payload specialist for Earth Observation Mission 1, a NASA Spacelab mission scheduled to fly aboard the Space Shuttle in 1985. Spacelab payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission to operate their own experiments and those of their colleagues. EOM 1 is the first in a series of Spacelab missions designed to measure variations in the sun's output over an 11-year solar cycle and to study the makeup of the Earth's middle and upper atmosphere. The Marshall Space Flight Center is responsible for managing the Earth Observation Mission series and for coordinating training of the payload specialists.

BIRTHPLACE AND DATE: Born February 19, 1948, in Stroudsburg, Pa. His parents, Mr. and Mrs. Glenn Lichtenberg, reside in Wayne, Pa.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married to the former Lee Lombard of Farmington, Conn. Her parents live in Farmington.

CHILDREN: Kristin, August 12, 1973; Kimberly, October 1, 1976.

RECREATIONAL INTERESTS: His hobbies include golf, wind surfing, and skiing.

PROFESSION: Biomedical Engineer/Pilot.

EDUCATION: Graduated from Stroudsburg High School, received his bachelor of science degree in aerospace engineering from Brown University, Providence, R. I., in 1969. He did graduate work at the Massachusetts Institute of Technology, Cambridge, Mass., receiving his master's degree in mechanical engineering in 1975, and his SC.D. in biomedical engineering in 1979.

EXPERIENCE: Dr. Lichtenberg is a member of the research staff at the Massachusetts Institute of Technology. His primary area of research is biomedical engineering. In November/December 1983, he became the first American from outside NASA's career astronaut corps to fly in space when he served as a payload specialist aboard Spacelab 1, the first mission of a European Space Agency-developed reusable, scientific research facility. While in orbit, he conducted many of the more than 70 scientific investigations in five major research areas carried out during the 10-day mission. Dr. Lichtenberg was also actively involved as a co-investigator in the vestibular experiments flown on that mission. He was selected as one of two payload specialists to train for

-over-

that mission in June 1978 and was named to fly in September 1982. Between 1969 and 1973, he served in the U. S. Air Force. At present he is a fighter pilot in the Massachusetts Air National Guard, flying the A-10 close air support aircraft.

SPECIAL HONORS: Distinguished graduate, United States Air Force ROTC; National Merit finalist; graduated first in pilot training class, Williams Air Force Base, Arizona, 1970; Two Distinguished Flying Crosses, Vietnam, 1972; 11 Air Medals, Vietnam, 1972; Hertz Fellow; NASA Space Flight Medal, 1983.

ORGANIZATIONS: Lichtenberg is a member of Tau Beta Pi and Sigma Xi honor societies and the Aerospace Medical Association.

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For Release:
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RELEASE NO: 84-35

MARSHALL SPACE FLIGHT CENTER HOSTS PRODUCTIVITY CONFERENCE

Recommendations for improving productivity and quality in NASA's programs with American industry were presented and discussed recently during a NASA/contractor conference on impediments to productivity held at the Marshall Space Flight Center in Huntsville, Ala.

The conference, held April 26-27, was attended by representatives from approximately 35 agency contractors and all NASA centers.

Addressing the conference on the value of the NASA/contractor team effort, Marshall Center Director Dr. William R. Lucas said, "We have demonstrated a capability to go wherever in space we have a will to go, and to do whatever we commit ourselves to do."

Urging the agency and its contractor team to adopt a faster pace in the area of productivity improvement, Lucas said, "Doing much more with less is the challenge we face. Finding ways to accomplish this goal will enable us to continue to meet our obligations to the American taxpayer to prudently administer the public funds with which we have been entrusted, and it's also the principal way that we'll be able to fully utilize the capability that has been developed."

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May 2, 1984

NASA Administrator James M. Beggs strongly stated the need for greater productivity and higher quality in order to recoup from a steady decline in U.S. research and development allocations and a decline in the country's world-wide market position due to the impact of Japanese and German productivity improvements and quality enhancements over the last 10 to 20 years.

Beggs said a modest growth of one percent in the NASA budget over inflation is expected during the next five years. "It puts emphasis on our ability to do our job more efficiently, more productively and concomitantly with that productivity, with higher quality because it is quality to a large extent that drives our costs.

"It is, therefore, incumbent upon us to eliminate any 'impediment' at the NASA/contractor interface which would prevent us from being more productive," he said.

Ninety cents of every NASA dollar is spent with industry and universities, according to Beggs, "making it encumbent upon us to be more productive," he said. An estimated 85 percent of the agency's fiscal year 1984 annual budget of $7.2 billion was placed with contractors.

The NASA administrator created one of the first productivity offices in a government research and development agency when he established the Productivity Improvement and Quality Enhancement program, or PIQE, 18 months ago. One of the first goals of the program was to include the NASA hardware and service/support contractors in the productivity effort.

Representatives of approximately 20 hardware and service/support contractors participated in three workshop sessions in 1983 to identify areas of quality and productivity improvement. Contractors and NASA personnel were then organized into task teams to review the areas identified as possibilities for increasing productivity.

The workshop sessions and task team efforts culminated in the conference here, where working groups met to report progress toward resolving impediments and issues.

NASA News

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For Release:
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RELEASE NO: 84-36

MARSHALL CENTER MAKES MANAGEMENT APPOINTMENTS

A new deputy director and an associate director for engineering have been named for the Science and Engineering Directorate at the Marshall Space Flight Center in Huntsville, Ala., officials at the Marshall Center have announced.

Center Director Dr. William R. Lucas has appointed George B. Hardy as deputy director to replace Dr. Herman Thomason, who retired. Hardy has been associate director for engineering at the Center since 1983.

Dr. J. Wayne Littles, who has been deputy associate director for engineering since May 1983, succeeds Hardy as associate director.

Marshall is the NASA center responsible for managing the development of the Space Shuttle main engines, solid rocket boosters and external propellant tank, the Hubble Space Telescope, the Spacelab orbital research facility and for many other key space research and development projects. The Center is also playing a leading role in several programs involving the development of a Space Station.

-more-

May 7, 1984

Hardy has served in technical and management positions with progressively increasing responsibilities since joining the Marshall team in 1962. In addition to managerial positions with the Saturn I/IB, Apollo and Skylab programs, he was manager of the Solid Rocket Booster Project from 1974 to 1982 when he was appointed deputy manager for Development in the Shuttle Projects Office at Marshall.

"Throughout his career, Mr. Hardy had demonstrated outstanding technical management and leadership capabilities and is highly qualified to assume the responsibility of this new assignment," Dr. Lucas said.

Dr. Littles has served at Marshall since 1967. He has held increasingly responsible positions within elements of the Structures and Propulsion Laboratory, including branch chief and deputy division chief. Littles was chief of the laboratory's Engineering Analysis Division from 1980 to 1983.

"His engineering background and managerial capabilities, coupled with his experience as the deputy associate director for engineering, make him especially well qualified for this assignment," Lucas said in appointing Littles.

The Science and Engineering Directorate is one of three major organizations at Marshall and oversees seven laboratories which provide the technical support for the Center's research and devlopment activities.

NASA News

National Aeronautics and
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IMMEDIATE

RELEASE NO: 84-37

MARSHALL ENGINEER RECEIVES SECOND
EXCEPTIONAL SPACE ACT AWARD

Marshall Space Flight Center Director Dr. William R. Lucas Monday, May 14, presented Frank J. Nola, an engineer in the Information and Electronic Systems Laboratory, with his second $10,000 Exceptional Space Act Award for his Power Factor Control System for AC Induction Motors. Nola received his first $10,000 award for the system in May 1979.

The second award was granted by National Aeronautics and Space Administration (NASA) Administrator James M. Beggs upon the recommendation of NASA's Inventions and Contributions Board.

Nola's power factor controller senses the amount of power needed by an electric motor and varies the power according to the need, providing more power when the motor is "working" and less when it is idling.

-more-

May 15, 1984

"The power factor control system has demonstrated its capability to conserve impressive amounts of electrical power used by alternating current induction motors and to allow such motors to run both quieter and cooler," said L. D. Wofford, Jr., Marshall's chief patent counsel.

NASA has patented the system and granted licenses to more than 200 firms in the United States and several foreign countries for the manufacture of the system.

In addition to the cash award, Lucas also presented a certificate from Beggs citing Nola for his "creative development on a exceptional technical contribution determined to be of significant value in the advancement of the aerospace technology program of NASA...."

Nola was previously the first recipient of the Congressional Excalibur Award for his invention of the Power Factor Control System.

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National Aeronautics and
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For Release:

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No Date!

RELEASE NO: 84-38

DEERE & COMPANY DESIGNING METALLURGICAL
TESTS ABOARD SHUTTLE

NASA and Deere & Company of Moline, Ill., have signed a memorandum of understanding to cooperate on the design of metallurgical tests to be conducted aboard a future Space Shuttle flight.

In 1981 Deere became the first private company to sign a technical exchange agreement with NASA. That agreement permitted the company to perform cast iron solidification experiments on board conventional suborbital NASA aircraft, which simulate microgravity for 30 to 60 seconds.

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The design work on a series of additional metallurgical tests is already under way at Deere, where engineers are using data from the low gravity tests conducted earlier. Based on this work, Deere and NASA engineers have concluded that further experimentation would be productive.

The Shuttle tests would permit Deere to conduct experiments in space for longer periods of time than just seconds or minutes. This additional testing in near-zero gravity environment could yield new information to aid in the search for stronger irons. It also could provide new data about the process for forming iron molecules, leading to improved foundry efficiencies.

Signing of the memorandum of understanding is an interim step toward placing the Deere tests aboard a Shuttle in orbit.

The memorandum is expected to lead to a joint endeavor agreement between Deere and NASA under which the Shuttle tests would be carried out. It is estimated that several months work will be needed to design the tests before NASA and the company are ready to sign the agreement.

The Marshall Center will be responsible for managing the NASA portion of the joint endeavor agreement when the JEA is signed.

NASA News

National Aeronautics and
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For Release:
IMMEDIATE

Also Released in:
Washington, D.C.

RELEASE NO: 84-40

NASA DESIGNATES ACTING SPACE FLIGHT CHIEF

Jesse W. Moore will become Acting Associate Administrator for Space Flight on April 15, the National Aeronautics and Space Administration announced.

He will succeed Lt. Gen. James A. Abrahamson, USAF, who will become Director of Strategic Defense, a new position in the Department of Defense, reporting directly to the Secretary of Defense.

Abrahamson will direct the Space Flight program through the 41-C Space Shuttle mission, scheduled for launch April 6, and assume his new post April 15.

Both appointments were announced Tuesday, March 27.

Moore, who had been Abrahamson's Deputy, came to NASA Headquarters in 1978 as the Deputy Director of the Solar Terrestrial Division in the Office of Space Science. He was the

-more-

March 27, 1984

Director of the Spacelab Flight Division until December 1981, at which time he assumed the position of Director, Earth and Planetary Exploration Division in the Office of Space Science and Applications, where he remained until being appointed in February 1983 to the position of Deputy Associate Administrator for Space Flight.

Prior to these assignments, he was employed at the Jet Propulsion Laboratory (JPL) beginning in 1966 where he worked in a variety of areas, including guidance and control, advanced programs and flight projects. His last assignment at JPL was as the Science and Mission Design Manager for Project Galileo.

Moore received a bachelor's degree in engineering in 1961 and a master's degree in engineering in 1964, both from the University of South Carolina, Columbia. He joined General Dynamics immediately after graduation and worked in guidance systems development for naval missiles.

Moore is a member of the American Institute of Aeronautics and Astronautics and is a senior member of the American Astronautical Society.

He is married to the former Brenda Kay Polson and they are the parents of two children. Moore and his family reside in Vienna, Va.

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For Release:

IMMEDIATE

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RELEASE NO: 84-41

SHUTTLE MAIN ENGINE TESTING REACHES 20-MISSION MILESTONE

The Space Shuttle main engine testing program reached a major milestone recently when an engine completed a ground test demonstration, equivalent to 20 flight missions, by NASA's Marshall Space Flight Center in Huntsville, Ala.

The flight life of a Shuttle engine and its components are demonstrated through a ground test program called "certification." Of the series of engines being built for the Shuttle by the Rocketdyne Division of Rockwell International, Inc., some are intended for actual flight use, and some specifically for ground testing.

One of these "test only" engines -- serial no. 2010 -- has been put through rigorous paces since 1981 at NASA's National Space Technology Laboratories in Bay St. Louis, Miss. At this

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May 21, 1984

test site, where certification and flight testing occurs under Marshall Center management, engine 2010 has accumulated a run duration of 19,900 seconds from 65 tests. It has been in test longer than any other Shuttle main engine.

Since a Shuttle engine operates about 500 seconds during a mission, the 19,900 seconds accumulated by engine 2010 equates to about 40 flights. To provide a high degree of flight safety margin, however, NASA limits the flight life of Shuttle engines to half the lifetime demonstrated by ground testing. Thus engine 2010 has demonstrated a flight capability of 20 missions at the 104 percent thrust level.

The main engines of the orbiters now in service were originally designed to provide thrust of 470,000 pounds, usually referred to as 100 percent of rated thrust. NASA has demonstrated, however, that the engines are capable of higher thrust levels, and since 1980, much of the ground tests have been run at 104 percent of rated thrust or higher. Engine thrust in recent flights of the Shuttle have, in fact, been at the 104 percent level, which permits heavier payloads to be carried into orbit.

While the maximum thrust level needed through 1985 is 104 percent, the space agency is preparing the engines to perform at still higher levels. Much of the testing has been at 109 percent of rated thrust, and the Shuttle is expected to be routinely flying at that level by 1986.

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"The statistics from this 20-mission certification are very encouraging," said William Taylor, a manager of Marshall's Shuttle Engines Project. "Of the 19,900 seconds, more than 14,000 were above the rated power level with 8,400 at 109 percent. We even ran the engine 780 seconds at 111 percent of rated thrust to demonstrate design margin. That gives us confidence that if one engine were to fail in flight, the Shuttle could safely rely upon the remaining two at the 109 percent level to compensate for the lost engine."

Included in the accumulated time of nearly 20,000 seconds were 30 Shuttle mission simulations based on actual flight "profiles." "To say that we ran the test based on flight profiles means that engine 2010 was run at various thrust levels to simulate actual flight condition," said Taylor. "During an actual mission, the Shuttle engines aren't run at the same levels from liftoff to orbit. It's necessary that the levels change to accommodate Shuttle structual requirements that are affected by upper atmospheric wind shear conditions. These conditions could overstress some Shuttle parts if the engine power level is not reduced -- so you have to slow down, perhaps to 65 percent of rated power. After the Shuttle passes through this critical region, you can resume more powerful thrust levels."

Also among the 20-flight certification statistics are seven simulated abort tests. These tests simulated a failed-engine condition and the subsequent dependence on remaining engines to run at higher thrust levels up to 109 percent.

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NASA initiated the ground test program with Rocketdyne in 1975. The Marshall Center is responsible for the Shuttle's propulsion system, which includes the three main engines of the orbiter, the external tank, and the twin solid rocket boosters.

NASA News

National Aeronautics and
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For Release:

IMMEDIATE

RELEASE NO: 84-44

TEST FIRING OF DISCOVERY ENGINES SCHEDULED FOR JUNE 1

A 20-second on-the-pad test firing of Space Shuttle orbiter Discovery's powerful three main engines is scheduled for Friday, June 1, at Kennedy Space Center, Fla., according to Robert E. Lindstrom, manager of the Shuttle Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala.

The test will verify the flight readiness of the newest of America's fleet of reusable orbiter spacecraft and its main engines.

The Shuttle vehicle's main propulsion system and computer programs will be exercised during the flight readiness firing in a demanding, launch-day environment to demonstrate the proper integration of all elements prior to the 41-D mission, scheduled for flight June 19.

-more-

May 29, 1984

The test will mark only the fourth time that a primary propulsion system on a manned spacecraft has been static fired at the launch pad. A similar test of Columbia's three main engines was performed on Feb. 20, 1981, prior to the first launch of the Space Shuttle; Challenger's engines were also tested on Dec. 18, 1982, and again on Jan. 25, 1983, in preparation for the sixth flight of the Shuttle.

Discovery's engines, each capable of generating 390,000 pounds of thrust at sea level, were successfully test fired individually under direction of the Marshall Center at NASA's National Space Technology Laboratories, Bay St. Louis, Miss.

Countdown for the flight readiness firing is scheduled to start May 30, 1984, at 4:00 a.m. Huntsville time with the clock at the T-43 hour mark and will culminate with the 20-second engine firing.

Successful completion of the test will be a major step in clearing the way for the 41-D mission, the twelfth flight of the Shuttle.

Three days of flight readiness firing preparations, which will include purging the external tank with inert gases, installing special firing instrumentation and mounting a radiation shield on the deck of the Mobile Launcher Platform to protect the solid rocket boosters during the test firing, will precede the start of the firing countdown.

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The test, including pre- and post-test activities, will span six days. The test will involve personnel and operations from various NASA centers and support organizations including the Kennedy, Johnson and Marshall Centers.

A firing simulation on May 29, 1984, kicked off preparations for the test. This one-day test was primarily designed to check out critical flight and ground computer systems that will control the actual engine firing and re-review the test procedure with the Space Shuttle launch team. The last 12 hours of the firing countdown were simulated, leading to a mock firing of Discovery's engines.

Events leading up to the June 1 engine firing will be nearly identical to those that precede an actual Shuttle launch. Built-in holds will be distributed throughout the countdown at the same times they occur in an actual launch countdown.

The final nine minutes of the countdown will be controlled by the automated ground launch sequencer which performs the final series of events in a specific sequence. The sequencer also monitors various measurements for out-of-tolerance conditions and detects system malfunctions for which it will automatically stop the countdown.

At the conclusion of the test, technicians will begin an exhaustive external and internal inspection of the three main engines, followed by a functional re-test of the engines to verify their readiness for flight. The post-firing activities will take about three weeks to complete.

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RELEASE NO: 84-45

NASA CENTER AWARDS CONTRACTS TO LOCKHEED, TRW FOR DEFINITION STUDY OF X-RAY OBSERVATORY

An effort to place a highly advanced NASA X-ray observatory in orbit in the next decade is gathering momentum. Today the space agency's Marshall Space Flight Center in Huntsville, Ala., awarded contracts to Lockheed Missiles and Space Co. of Sunnyvale, Calif. and TRW, Inc. of Redondo Beach, Calif., to define a highly advanced X-ray telescope called "AXAF" — the Advanced X-Ray Astrophysics Facility.

Lockheed and TRW were selected by NASA for concurrent definition studies that will examine in more detail the basic concepts developed for the mission. Ultimately, one of the two firms would be chosen for building the telescope.

The contracts, 24 months in duration, will be in the range of $4 million for each company selected, with the total dollar value of the contracts to be approximately $8 million. Work performed under these firm fixed price contracts will be at the plants of the selected companies.

The advanced observatory would be the latest in a series of orbiting X-ray spacecraft that date back to the Uhuru (SAS-1) satellite launched in 1970.

- more -

June 4, 1984

Proposed for launch in the early 1990s, the observatory would be technologically superior to any X-ray facility previously sent into space. Weighing about 10 tons and measuring about 14 by 43 feet, it would be carried by the Space Shuttle and placed in an orbit 320 miles above the Earth for operation over a lifetime of about 15 years. It would contain a full complement of instruments for studying various properties of X-ray emissions.

The observatory is expected to see X-ray sources that are 100 times weaker and observe shorter wavelengths than those seen by its predecessor, the second High Energy Astronomy Observatory (HEAO-2) launched in 1978. NASA expects to gain much scientific knowledge from this more advanced observatory.

The observatory must orbit in space to be effective. The Earth's atmosphere absorbs most X-ray radiation and makes ground detection virtually impossible. Much can be learned from X-ray sources in the universe: because a tremendous amount of energy is required to create X-rays, scientists know that wherever these emissions are observed something violent has happened.

X-ray emissions carry detailed information about the temperature, density, age, and other physical conditions of the celestial objects that produce them. The study of these emissions provides insight into many of the fundamental physical processes that govern the universe.

The sources of copious X-rays are some of the oddest and most fascinating objects in the sky. They include quasars, the most powerful energy sources in the universe; spinning neutron stars, so dense that a drop of their material weighs more than all the people on Earth; and the theoretical invisible "black hole," a celestial object that has collapsed into a point so small and dense that nothing — not even light — escapes from its gravitational grasp. The AXAF could "see" this invisible object by the emission of X-

rays from matter being drawn into the hole. Thus far, four candidate black holes have been discovered by X-ray observations. The AXAF is expected to find many more.

Special concentric, cylindrical mirrors will be crucial to the capability of seeing such vast distances with such precise angular resolution. Considered the heart of the observatory, these nested pairs of mirrors will focus the X-rays 33 feet away on the imaging detectors of several science instruments mounted with the observatory. Coded pictures will then be transmitted back to Earth where the images will be decoded by computers.

The mirror design would be the "grazing incidence" type — meaning that the mirrors would be designed to be struck at a shallow angle by the X-rays. Otherwise, if the mirrors were faced more directly toward the stars, as with visible light telescopes, the X-rays would not be reflected — they would be absorbed by the mirrors themselves. With the mirrors lying almost flat in relation to the direction of the stars, however, the X-rays bounce off the surfaces, much like stones skipping on a pond.

The AXAF would be operated as a major national observatory in space, to be used by the scientific community as they would a ground observatory.

The Marshall Center's work on the X-ray telescope is sponsored by the Astrophysics Division of the Office of Space Science and Applications at NASA Headquarters in Washington.

- 30 -

NASA News

National Aeronautics and
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For Release:

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SUMMER FACULTY FELLOWSHIP PROGRAM UNDER WAY

The twentieth annual Summer Faculty Fellowship Program at the Marshall Space Flight Center began May 29 with the arrival of the first professors and researchers.

The 32 participants in this year's program represent 23 universities in 12 states.

Dr. L. Michael Freeman, assistant professor of aerospace engineering at the University of Alabama, is the university program director for the Marshall program this year. Dr. James B. Dozier, director of Marshall's Research and Technology Office, is the Marshall co-program director.

The program, sponsored jointly by NASA and the American Society for Engineering Education, places visiting academicians with scientists and engineers at a number of NASA centers.

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The fellowship recipients, representing various disciplines in the science and engineering fields, were selected from a group of applicants. They were matched as closely as possible with the Marshall Center employees engaged in research efforts in the same disciplines or areas of expertise. The fellows will work with their Center counterparts in completing an assigned research project during their 10 weeks at Marshall Center.

The basic objective of the program is to enrich the professional knowledge and research and teaching activities of the fellow at his or her university, as well as contribute to the research objectives of the Center, according to Leroy Osborn, Marshall Center assistant for university affairs.

The fellows benefit professionally from interacting one-on-one with experienced Marshall Center colleagues in a research laboratory setting while working on their projects. Also, the fellows are free to devote their time to meaningful research activities at the Center without the interruptions and distractions of the administrative duties they must perform while at their universities. The Marshall Center benefits from useful research that might not be conducted by regular staff members because of limited time and higher priority research tasks.

"Our experience over the years the program has been in operation indicates that it has been quite successful in meeting these objectives," Osborn said.

Of the 32 fellowship recipients at Marshall this year, 17 are participating for the first time.

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First year fellows and the schools they represent are: Kenneth C. Abernethy, Furman College; Paul S. Csonka and Thomas W. Koenig of the University of Oregon; Ben Lewis Currin, Calhoun Community College; T. Michael Davis, North Georgia College; Kenneth W. French Jr., John Brown University; Paul E. George III, University of Tennessee; John Howard Kitterman, South Dakota State University; Jae M. Hyun, Clarkson College; Wartan Jemian, Auburn University; Michael E. McAnulty, University of Alabama in Birmingham; Steven F. Nerney, San Juan College; Meckinley Scott, University of Alabama; Dallas G. Smith, Carl Ventrice, and Marie B. Ventrice of Tennessee Technical University; and Kenneth Yancy, Lambuth College.

Returning fellows and the schools they represent are: Raymond G. Clinton Jr., Georgia Institute of Technology; Libby W. Chou, James M. Thompson, and Jai-Ching Wang of Alabama A&M University; David J. Crouse and Robert N. Tolbert of Tennessee Technical University; William B. Day and Albert T. Fromhold Jr., Auburn University; William B. Hall, Mississippi State University; Prasad K. Kadaba, University of Kentucky; Franklin Curtis Mason, Middle Tennessee State University; Malcolm W. McDonald, Berry College; Fred R. Sias Jr., Clemson University; James E. Smith Jr., University of Alabama in Huntsville; and John L. Stensby, University of Kansas.

-30-

NASA News

National Aeronautics and
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For Release:

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June 7, 1984

RELEASE NO: 84-47

NASA ANNOUNCES CREW MEMBERS FOR FUTURE SPACE SHUTTLE FLIGHTS

The flight crew for Space Shuttle flight 51-H and mission specialist astronauts for mission 61-E were announced today at NASA Headquarters, Washington, D.C.

Veteran astronaut Vance D. Brand will command mission 51-H, scheduled for launch in November 1985, using the orbiter Atlantis. The flight will feature the Earth Observation Mission-1 (EOM-1) payload, managed by the Marshall Space Flight Center in Huntsville, Ala.

Brand was commander of STS-5, the first operational Shuttle flight in November 1982 and mission 41-B, the first use of the manned maneuvering unit in February 1984.

Other members of the 51-H crew are Michael J. Smith, pilot; Robert C. Springer, Dr. Owen K. Garriott and European Space

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Agency astronaut Dr. Claude Nicollier, mission specialists; and Dr. Michael L. Lampton and Dr. Byron K. Lichtenberg, payload specialists.

Dr. Garriott was a mission specialist on the Marshall-managed Spacelab-1 mission in 1983. Dr. Lichtenberg was a payload specialist on the inaugural Spacelab mission, and Dr. Lampton was an alternate payload specialist for the Spacelab flight. EOM-1 is a reflight of nine Spacelab-1 experiments in the areas of space plasma physics, solar physics, atmospheric physics, astronomy and Earth observations. A Spacelab habitable module and a pallet of experiment hardware will occupy the cargo bay.

Launch of 61-E is set for March 1986, with a crew of six on the orbiter Columbia. Mission specialists for this mission include Dr. Robert A. R. Parker, David C. Leestma and Dr. Jeffrey A. Hoffman.

The cargo includes the Marshall-managed ASTRO-1 payload, a Spacelab payload in the orbiter cargo bay. Astro-1 is made up of instruments to observe Halley's Comet. Dr. Parker was a mission specialist aboard Spacelab 1.

The other major 61-E payload is Intelsat VI-1, a large communications satellite for Intelsat, the multinational communications satellite network.

The 51-H commander, Brand, 53, a native of Longmont, Colo., came to NASA in 1966. His first space flight was as command module pilot on the July 1975 Apollo-Soyuz Test Project. Smith,

39, is a native of Beaufort, N. C. As a Navy pilot, he served on the aircraft carriers USS Kitty Hawk and USS Saratoga. He came to NASA in 1980 and this will be his first Shuttle mission.

The 51-H mission specialists include Springer, 42, who was born in St. Louis, Mo., and joined NASA in 1980 after serving as a pilot in the Marine Corps. Garriott, 53, is a veteran astronaut, having logged nearly 70 days in space, including the 59-day Skylab-3 mission in 1973 and the nine-day Spacelab-1 flight. Garriott has been with been with NASA since 1965. He was born in Enid, Okla.

Nicollier is a European astronaut flying as a mission specialist. A native of Vevey, Switzerland, he is 39 years old. His experience prior to assignment for astronaut training was in astronomy. He is a pilot in the Swiss air force reserve.

Lampton, 43, a physicist, is a native of Williamsport, Pa. Lichtenberg, 36, a biomedical engineer and pilot, is a native of Stroudsburg, Pa.

61-E mission specialist Parker is a native of New York City. The 47-year-old astronomer/astronaut joined NASA in 1967. This will be his second space flight.

Leestma, 35, was born in Muskegon, Mich. A Navy pilot, he was selected as an astronaut candidate in 1980. He also is a crew member on Shuttle flight 41-G, scheduled to fly in October 1984. Hoffman, 39, is a Brooklyn, N. Y., native. A member of the 1978 class of astronauts, he is scheduled to fly a Shuttle mission in August. Hoffman's experience prior to coming to NASA was in high energy astrophysics.

NASA News

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For Release:

2 p.m. CDT
June 8, 1984

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SPACELAB 3 AND 2 PAYLOAD SPECIALISTS NAMED

The National Aeronautics and Space Administration today announced the selection of four career scientists to fly as payload specialists on the next two missions of Spacelab, a reusable Space Shuttle-based research facility.

Dr. Lodewijk van den Berg of EG&G Corporation, Goleta, Calif., and Dr. Taylor G. Wang of the Jet Propulsion Laboratory, Pasadena, Calif., were named flight payload specialists for Spacelab 3, scheduled for launch in January 1985. NASA also announced the selection of Dr. Mary Helen Johnston of the Marshall Space Flight Center and Dr. Eugene H. Trinh of the Jet Propulsion Laboratory to serve as alternate payload specialists for Spacelab 3.

Dr. Loren W. Acton of Lockheed Palo Alto Research Laboratory, Palo Alto, Calif., and Dr. John-David Bartoe of The Naval Research Laboratory, Washington, D.C., were named as flight payload specialists for Spacelab 2, which is now slated for launch in April 1985. NASA also named Dr. Dianne K. Prinz of the Naval Research Laboratory and Dr. George W. Simon of the Air Force Geophysics Laboratory, with permanent duty station at Sacramento Peak Observatory, Sunspot, N. M., as alternate payload specialists for Spacelab 2.

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"These Spacelab flights continue NASA's evolutionary process of developing space science capabilities aboard the Shuttle," Dr. Burt Edelson, NASA's associate administrator for space science and applications said. "This process began in earnest with Spacelab 1 and will continue through the end of this decade. At the same time we are using the Spacelab experience to help us develop capabilities for science to be performed aboard the Space Station," Dr. Edelson added.

Spacelab 3 will be the first operational mission of the research facility. Conducting experiments requiring the low gravity environment of Earth orbit is the prime mission objective. The mission emphasis is materials processing in space, a field which offers great commercial promise. Other major planned experiments have been selected from the fields of life sciences, environmental observations, technology research, astronomy and space plasma physics. Spacelab 3 will use the long version of the laboratory module, in which the scientists will work, and a special cargo bay instrument support structure.

Spacelab 2, which follows Spacelab 3 due to development delays in some of the equipment, include experiments in the fields of solar physics, plasma physics, infrared astronomy, high energy physics, atmospheric physics, life sciences and technology. The configuration of Spacelab for this mission includes three pallets, which hold experiments requiring direct space exposure, an "igloo" which will contain Spacelab subsystems, and a special support fixture for a large cosmic ray experiment.

The mission will mark the first time the Spacelab will be flown without the habitable module. The crew will operate experiments remotely from the aft flight deck of the orbiter. It also marks the first flight of the Spacelab Instrument Pointing System. Both these missions are managed for NASA by the Marshall Space Flight Center, Huntsville, Ala.

The alternate payload specialists will act as flight backups and will play a major role in payload control operations from the ground throughout the mission.

In addition to the payload specialists, the Spacelab 3 flight crew will consist of Robert F. Overmyer; commander, Fredrick D. Gregory, pilot; Dr. Don L. Lind, Dr. Norman E. Thagard, and Dr. William E. Thornton, mission specialists, all named previously to the mission.

Other Spacelab 2 flight crew members identified earlier are Charles G. Fullerton, commander; S. David Griggs, pilot; and Dr. F. Storey Musgrave, Dr. Anthony W. England, and Dr. Karl G. Henize, mission specialists.

Payload specialist biographies follow.

NASA Biography

National Aeronautics and
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George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Lodewijk van den Berg
Spacelab 3 Payload Specialist

PRESENT DUTIES: Dr. van den Berg is a flight payload specialist in training to operate experiments aboard Spacelab 3, the second mission of a reusable, scientific research facility built by the European Space Agency (ESA) and scheduled to fly aboard the Space Shuttle in January 1984. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 3 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Sluiskil, the Netherlands, March 24, 1932.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married, with two children.

PROFESSION: Chemical engineer with EG&G Corporation in Goleta, Calif.

EDUCATION: Received a M.S. in chemical engineering from Technical University, Delft, the Netherlands, in 1961; a M.S. in applied science from the University of Delaware in 1972; and a Ph.D. in applied science from the University of Delaware in 1975.

EXPERIENCE: Dr. van den Berg has over 20 years of research and management experience in preparation of crystalline materials, in particular, growth of single crystals of chemical compounds and investigation of associated defect chemistry and electronic properties. After van den Berg completed his Ph.D., he joined EG&G as a senior scientist were he is responsible for the operation of a crystal growing facility. This facility produces various kinds of crystals via vapor transport methods. Van den Berg is a co-investigator on the Spacelab 3 mission Vapor Crystal Growth System (VCGS) experiment, and in that capacity, he is responsible for the crystal growth aspects of the VCGS experiment. Dr. van den Berg has intimate knowledge of VCGS and Fluid Experiment System (FES) hardware and has participated in all major design and science reviews of those systems. He has broad experience in crystal growth and characterization including vapor transport, solution and melt growth techniques. He is an international authority on vapor growth techniques with emphasis on mercuric iodide crystals and its application in the nuclear industry as gamma ray detectors.

ORGANIZATIONS: He is a member of the American Association of Crystal Growth and the American Institute of Aeronautics and Astronautics.

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Taylor G. Wang
Spacelab 3 Payload Specialist

PRESENT DUTIES: Dr. Wang is a flight payload specialist in training to operate experiments aboard Spacelab 3, the second mission of a reusable, scientific research facility built by the European Space Agency (ESA) and scheduled to fly aboard the Space Shuttle in January 1985. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 3 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Mainland China, Shanghai on June 16, 1940.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married, with two children.

PROFESSION: Physicist with Jet Propulsion Laboratory, Pasadena, Calif.

EDUCATION: Wang received a B.S. in physics in 1967, a M.S. in physics in 1968, and a Ph.D. in physics in 1971 from the University of California at Los Angeles.

EXPERIENCE: After completing his Ph.D., Wang joined the California Institute of Technology Jet Propulsion Laboratory (JPL) in 1972 as a senior scientist. He is currently Program Manager for Materials Processing in Space. At JPL he has been responsible for the inception and development of containerless processing technology and dynamics of liquid drops and bubbles research. Wang is the Principal Investigator (PI) on the Spacelab 3 mission NASA DDM Experiments, PI on the NASA SPAR Flight Experiment #77-18 "Dynamics of Liquid Bubble", PI on the NASA SPAR Flight Experiment #76-20 "Containerless Processing Technology," and PI on the Department of Energy Experiment "Spherical Shell Technology." Wang has been conducting precursor drop dynamics experiments for the DDM in ground-based laboratories employing acoustic levitation systems, neutral buoyancy systems and drop towers, and in the near weightless environment provided by JSC KC-135 airplane flights and SPAR rockets. These flights have helped to define the experimental parameters and procedures in the DDM experiments to be performed on Spacelab 3. He is the inventor of the acoustic levitation and manipulation chamber for the DDM and is the author of 10 patents.

ORGANIZATIONS: Dr. Wang is a member of the American Physical Society, Materials Research Society, American Institute of Aeronautics and Astronautics, Sigma Xi, and a Fellow in the Acoustical Society of America.

1984

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Mary Helen Johnston
Spacelab 3 Payload Specialist

PRESENT DUTIES: Dr. Johnston is an alternate payload specialist in training to operate experiments aboard Spacelab 3, the second mission of a reusable, scientific research facility built by the European Space Agency (ESA) and scheduled to fly aboard the Space Shuttle in January 1985. As alternate payload specialist, she will work as a member of the Spacelab mission management team in the Payload Operations Control Center at the Johnson Space Center in Houston. From there she will assist in devising solutions to problems, troubleshooting and changing crew procedures where necessary and communicating directly with the payload crew on orbit. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 3 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in West Palm Beach, Fla., on Sept. 17, 1945.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married.

PROFESSION: Dr. Mary Helen Johnston is a materials engineer in the Metallurgical and Failure Analysis Branch of the Materials and Processes Laboratory at the Marshall Space Flight Center.

EDUCATION: Graduated from Dan McCarty High School in Fort Pierce, Florida, in 1962 and entered Florida State University in Tallahassee where she studied engineering science. After earning bachelor's and master's degrees at Florida State, she entered the University of Florida at Gainesville where she was awarded a doctorate in metallurgical engineering in 1973.

EXPERIENCE: Dr. Johnston began working at the Marshall Center in 1963 as an engineering cooperative student and became a full-time employee in 1968. At the Marshall Center, she has had a variety of engineering assignments and has specialized in the fields of solidification of materials, crystal growth and X-ray diffraction. In 1974 she participated as one of an all-woman crew of scientific experimenters in a five-day simulated space mission. The exercise was conducted to test support hardware for materials science payloads which will be flown on future Space Shuttle/Spacelab Earth-orbital missions. In 1982 she received a NASA Exceptional Scientific Achievement Award for zero gravity research. Currently, Dr. Johnston is working on experiment equipment and experiments to be flown on the Space Processing Applications Rocket (SPAR) flights, proposals for materials processing experiments for Spacelab 3 and failure analysis in Space Shuttle materials testing.

ORGANIZATIONS: Dr. Johnston is a member of the American Institute of Aeronautics and Astronautics and the American Society for Metals.

NASA Biography

1984

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Eugene H. Trinh
Spacelab 3 Payload Specialist

PRESENT DUTIES: Dr. Trinh is an alternate payload specialist in training to operate experiments aboard Spacelab 3, the second mission of a reusable, scientific research facility built by the European Space Agency (ESA) and scheduled to fly aboard the Space Shuttle in January 1985. As alternate payload specialist, he will work as a member of the Spacelab mission management team in the Payload Operations Control Center at the Johnson Space Center in Houston. From there he will assist in devising solutions to problems, troubleshooting and changing crew procedures where necessary and communicating directly with the payload crew on orbit. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 3 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born on September 14, 1950, in Saigon, South Vietnam.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Married.

PROFESSION: Physicist at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

EDUCATION: Received a B.S. in engineering science from Columbia University in 1972; from Yale University, he received a M.S. in applied physics in 1974; an M.Ph. in applied physics in 1976; and a Ph.D. in applied physics in 1978.

EXPERIENCE: After receiving his Ph.D., Dr. Trinh served as a Post Doctoral Fellow for approximately one and one-half years at Yale University where he conducted research in the physics of liquids using acoustical levitation techniques for the measurement of the properties of free drops in metastable states. In 1979 he joined the Jet Propulsion Laboratory (JPL) as a member of the technical staff working in the area of fluid mechanics. He is a member of the Drop Dynamics Module (DDM) science team. His research at JPL involves experimental and theoretical studies in fluid mechanics and acoustics. He has performed extensive studies of the linear and nonlinear behavior of oscillating and rotating free drops. Trinh has made extensive use of acoustical levitation apparatus in his research on free drops in ground-based laboratories and in the weightless environment provided by the JSC KC-135 aircraft. He has authored three patents on levitation devices to assess the effects of temperature gradients on liquid materials, to study outgassing and bubble migration in liquid drops, and to monitor chemical reactions in liquid drops.

ORGANIZATIONS: He is a member of the American Acoustical Society, the American Physical Society, and the American Society of Mechanical Engineers. He is the recipient of Yale University and Columbia University Fellowships.

1984

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Loren W. Acton
Spacelab 2 Payload Specialist

PRESENT DUTIES: Dr. Acton is a flight payload specialist in training to operate experiments aboard Spacelab 2, the third mission of a reusable, scientific research facility built by the European Space agency (ESA) and scheduled to fly aboard the Space Shuttle in April 1985. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 2 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Lewistown, Mont., on March 7, 1936. He is the son of Wilber Acton of Worland, Wyo.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Married to the former Evelyn Oldenburger. They have two children, Cheryll Anne and Stanley Scott.

PROFESSION: Dr. Acton is the senior staff scientist with the Space Sciences Laboratory, Lockheed Palo Alto Research Laboratory, Palo Alto, Calif.

EDUCATION: Received a bachelor of science degree from Montana State University in 1959 and his Ph.D. from the University of Colorado in 1965.

EXPERIENCE: As a research scientist, Dr. Acton's principle duties include conducting scientific studies of the sun and other celestial objects using advanced space instruments and serving as a co-investigator on one of the Spacelab 2 solar experiments, the Solar Optical Universal Polarimeter.

ORGANIZATIONS: Dr. Acton is a member of the American Astronomical society, International Astronomical Union, Sigma Chi, Astronomical Society of the Pacific, the American Association for the Advancement of Science, and the Tau Beta Pi.

1984

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. John-David F. Bartoe
Spacelab 2 Payload Specialist

PRESENT DUTIES: Dr. Bartoe is a flight payload specialist in training to operate experiments aboard Spacelab 2, the third mission of a reusable, scientific research facility built by the European Space Agency (ESA) and scheduled to fly aboard the Space Shuttle in April 1985. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 2 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Abington, Pa., in 1944. He is the son of Mrs. Edith F. Bartoe, of Holmeville, Pa.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Married to the former Phylis Ann Thorpe. They have three children, David Alan, Kevin John and Joelle Elizabeth.

PROFESSION: Dr. Bartoe is an astro physicist at the Naval Research Laboratory in Washington, D. C.

EDUCATION: Received a bachelor of science degree from Lehigh University in 1966, a master of science degree from Georgetown University in 1974, and his Ph.D., also from Georgetown University, in 1976.

EXPERIENCE: As an astro physicist, Dr. Bartoe's primary duties are to serve as co-investigator of two Spacelab 2 experiments to study the ultraviolet radiation from the sun, the High Resolution Telescope and Spectrograph and the Solar Ultraviolet Spectral Irradiance Monitor.

ORGANIZATIONS: Dr. Bartoe is a member of the American Astronomical Society, the Optical Society of America, Sigma Xi, Phi Beta Kappa, and Tau Beta Pi.

1984

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Dianne K. Prinz
Spacelab 2 Payload Specialist

PRESENT DUTIES: Dr. Prinz is an alternate payload specialist in training to operate experiments aboard Spacelab 2, the third mission of a reusable, scientific research facility built by the European Space agency (ESA) and scheduled to fly aboard the Space Shuttle in April 1985. As alternate payload specialist, she will work as a member of the Spacelab mission management team in the Payload Operations Control Center at the Johnson Space Center in Houston. From there she will assist in devising solutions to problems, troubleshooting and changing crew procedures where necessary and communicating directly with the payload crew on orbit. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 2 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Economy, Pa., in 1938. She is the daughter of Joseph L. Kasnic of Conway, Pa.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married.

PROFESSION: Dr. Prinz is a research physicist with the U. S. Naval Research Laboratory in Washington, D. C.

EDUCATION: Received a bachelor of science degree from the University of Pittsburgh in 1960 and a Ph.D. from Johns Hopkins University in 1967.

EXPERIENCE: As a research physicist, Dr. Prinz specializes in solar-terrestrial relations and design of optical instrumentation. She is a co-investigator on one of the Spacelab 2 solar physics experiments, the Solar Ultraviolet Spectral Irradiance Monitor.

ORGANIZATIONS: Dr. Prinz is a member of Sigma Xi, the American Geophysical Union, Washington Academy of Sciences, the Society of Photo-Optical Instrumentation Engineers, and the National Capital Section of the Optical Society of America.

1984

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. George W. Simon
Spacelab 2 Payload Specialist

PRESENT DUTIES: Dr. Simon is an alternate payload specialist in training to operate experiments aboard Spacelab 2, the third mission of a reusable, scientific research facility built by the European Space agency (ESA) and scheduled to fly aboard the Space Shuttle in April 1985. As alternate payload specialist, he will work as a member of the Spacelab mission management team in the Payload Operations Control Center at the Johnson Space Center in Houston. From there he will assist in devising solutions to problems, troubleshooting and changing crew procedures where necessary and communicating directly with the payload crew on orbit. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Spacelab 2 payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Frankfurt, Germany on April 22, 1934.

NATIONALITY: U. S. citizen.

MARITAL STATUS: Married to the former Patricia Ann Young. They have three children, David, Karen and Susan.

PROFESSION: Dr. Simon is senior scientist of the Space Physics Division, Air Force Geophysics Laboratory, with permanent duty station at the National Solar Observatory in Sunspot, N.M.

EDUCATION: Received a bachelor of arts degree from Grinnell College in 1955, a master of science from California Institute of Technology in 1961, his Ph.D., also from California Institute of Technology, in 1963 and a master's in business administration from the University of Utah in 1976. He received an honorary doctor of science degree from Grinnell College in 1983.

EXPERIENCE: Dr. Simon's duties include conducting basic research in observational and theoretical solar physics, specializing in problems concerning velocity, magnetic and intensity fields in the solar convection zone, photosphere, chromosphere, transition zone, and corona. He is also a co-investigator on one of the Spacelab 2 solar experiments, the Solar Optical Universal Polarimeter.

ORGANIZATIONS: He is a member of the American Astronomical Society, International Astronomical Union, Phi Beta Kapa, Sigma Xi, Beta Gamma Sigma, the American Men and Women of Science, Who's Who in the West, the Unitarian-Universalist Association, the American Geophysical Union, and the American Physical Society.

NASA News

National Aeronautics and
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For Release
IMMEDIATE

RELEASE NO: 84-52

NASA PAVILION POPULAR AT WORLD'S FAIR

NASA's Louisiana World Exhibition Space Pavilion, featuring the Space Shuttle orbiter Enterprise, is proving to be one of the Fair's most popular attractions.

The Enterprise is located on the waterfront near the Department of Commerce's U. S. Pavilion. On the opposite side of Enterprise is the NASA Space Pavilion, an indoor area where visitors can learn about the latest in the Nation's activities in space.

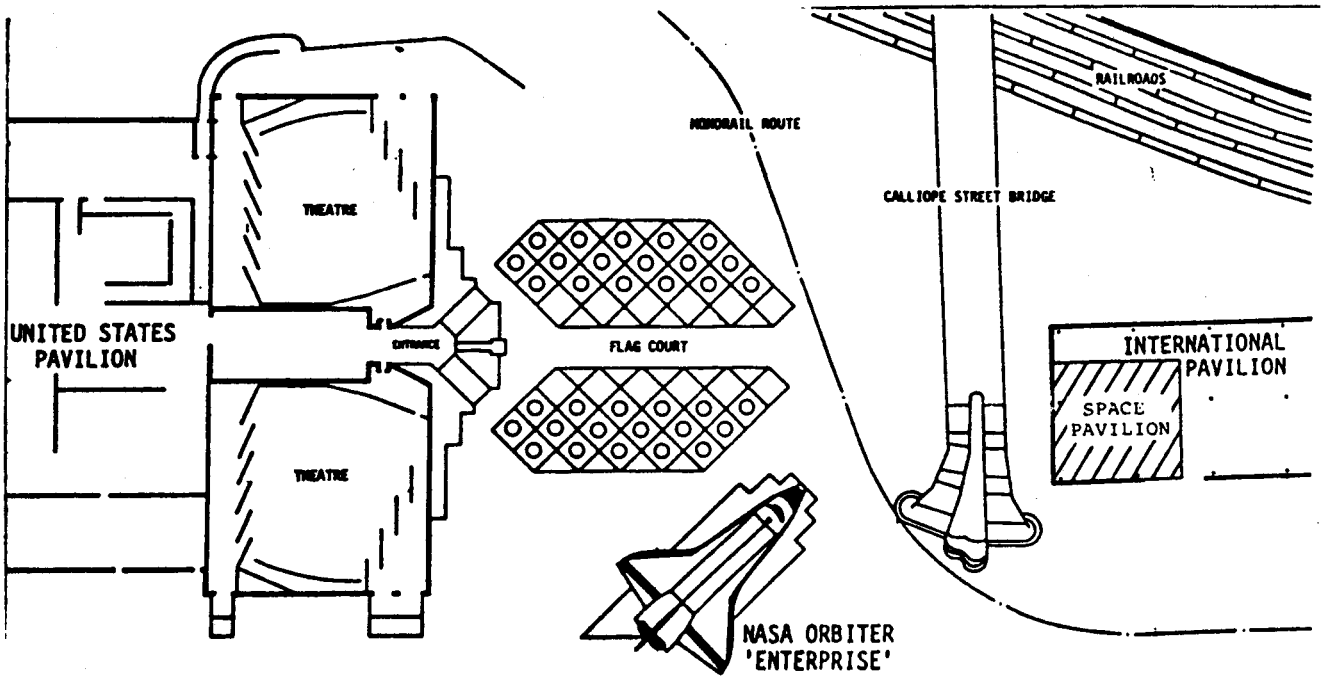
-more-

July 3, 1984

More than three quarters of a million Fair visitors have already entered the Space Pavilion to see exhibits on Space Station, Spacelab and Space Shuttle, including a full-scale mockup of Spacelab and a Shuttle orbiter flight deck, on display inside. Visitors also see a special video program on a Shuttle launch and mission presented on three large projection TV screens. Other video programs on aeronautics, commercial use of space and space sciences are featured.

The Space Shuttle orbiter Enterprise is probably the most photographed object at the World's Fair. Visitors are able to approach close enough to stand under the tips of the huge wings. Recorded information on the Space Shuttle is available nearby in six languages.

The NASA Space Pavilion at the World's Fair is open from 10:00 a.m. to 10:00 p.m. daily.



NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812
AC 205 453-0034

June 13

David B. Drachlis
Marshall Space Flight Center
Huntsville, Ala.
(205/453-0034)

For Release:

IMMEDIATE

Also released in
Washington, D. C.

RELEASE NO: 84-53

SCIENTISTS SELECTED TO OBSERVE HALLEY'S COMET

NASA has selected a team of scientists to observe Halley's Comet in 1986 using a Space Shuttle-based astronomy observatory called Astro. Astro consists of three specially designed ultraviolet telescopes and two wide-field cameras that will be carried as a Spacelab payload in the Shuttle cargo bay.

The observatory is designed to fly on a series of Shuttle missions to study stars and galaxies in ultraviolet light. Recognizing the opportunity to study Halley's Comet on the first of these flights, NASA added the pair of visible-light cameras to the instrument package.

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June 13, 1984

Scientists selected by NASA for observations of the comet include: Dr. Michael A'Hearn, University of Maryland, College Park, Md.; Drs. John Brandt, Bertram Donn and Malcolm Niedner, Goddard Space Flight Center, Greenbelt, Md.; Dr. Barry Lutz, Lowell Observatory, Flagstaff, Ariz.; Dr. Chet Opal, University of Texas, Austin, Texas, Dr. C. Robert O'Dell, Rice University, Houston, Texas; and Dr. Susan Wyckoff, Arizona State University, Tempe, Ariz.

These researchers, together with a scientist representing each of the three ultraviolet telescope teams, (Dr. Paul Feldman, Johns Hopkins University, Baltimore, Md.; Dr. Arthur Code, University of Wisconsin, Madison, Wis.; and Theodore Stecher, Goddard Space Flight Center) comprise the Astro Halley Science Team, which will plan the overall program for observing the comet.

The three telescopes are co-aligned for simultaneous ultraviolet imaging as well as spectroscopic and polarization measurements of the comet and other astronomical objects.

The Hopkins Ultraviolet Telescope is designed to record the far-ultraviolet spectra of very faint cosmic sources. These measurements will reveal the chemical composition of Halley, including the first attempts to measure helium abundance. The telescope is being developed by Johns Hopkins University.

The Wisconsin Ultraviolet Spectropolarimeter will make simultaneous observations of the spectrum and polarization of ultraviolet light coming from stars. Unlike the Hopkins instrument, this instrument will also investigate the formation and destruction of dust grains in the comet's tail. The spectropolarimeter is being developed by the University of Wisconsin.

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Goddard's Ultraviolet Imaging Telescope is designed to provide imaging of very faint objects in the ultraviolet. This instrument will be used to aid in determinations of the overall cometary structure and to observe effects of perihelion passage when the sun's energy boils off significant amounts of material from the comet nucleus. The telescope is being developed by the Goddard Space Flight Center.

The wide-field cameras will photograph the large-scale comet tail in visible light. The cameras are being developed by NASA's Marshall Space Flight Center in Huntsville, Ala.

Stecher, Niedner, Brandt and Opal will work on optical and ultraviolet imaging studies of the comet. Code will study polarization of the cometary gas and dust. Feldman, Donn, Wyckoff, O'Dell, A'Hearn, Opal and Lutz will concentrate on spectroscopic studies of the complex chemistry of the materials in the comet.

The Astro missions are being managed by the Marshall Space Flight Center. The missions will permit scientists to obtain ultraviolet-light observations which are impossible from beneath the Earth's atmosphere.

The observatory is scheduled for assembly and integration into the Space Shuttle for its maiden flight at the Kennedy Space Center, Fla., during 1985 and for launch in early March of 1986.

The first seven-day Astro mission, which is presently scheduled at a time when several comet probes will intercept Halley, should return outstanding scientific data and photography of the comet. The European Space Agency, Japan and the Soviet Union have each designed probes which will fly by the comet and through its tail in early March 1986.

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These observations and probe missions will enable the international research community to obtain measurements of large- and small-scale events occurring in the comet's nucleus and tail.

The last appearance of Halley was spectacular and widely viewed in 1910 when the comet appeared in the northern hemisphere's evening sky. The 1985 - 1986 appearance, however, is not expected to be as spectacular because the comet will appear in the southern hemisphere before dawn and will be farther from the Earth than during its last return. Astro photography may be the best way to view Halley.

The least understood members of the solar system family, comets, are thought to be primitive collections of ices and dust. An intensive study of their composition could offer valuable insights into not only the nature of comets themselves but also into the nature of the primordial mixture from which our solar system may have formed some 4.5 billion years ago.

Astro missions will use a pair of Spacelab pallets and the Spacelab instrument pointing system. Spacelab subsystems will be carried in a pressurized container called an igloo, and the crew will operate the instruments from the aft flight deck of the Shuttle orbiter. Spacelab is a modular, reusable Shuttle-based laboratory system developed for NASA by the European Space Agency.

NASA News

National Aeronautics and
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For Release:
Embargoed until
10:00 a.m. CDT
June 20, 1984

RELEASE NO: 84-54

ASTRO PAYLOAD SPECIALISTS SELECTED

NASA today announced the selection of three scientists to train as payload specialists for a series of astronomy missions scheduled for the Space Shuttle beginning in March 1986. The mission series, called Astro, will utilize major elements of Spacelab, a Shuttle-based research facility.

The scientists are Dr. Samuel T. Durrance of The Johns Hopkins University, Baltimore, Md.; Dr. Kenneth H. Nordsieck of the University of Wisconsin, Madison; and Dr. Ronald A. Parise of Computer Sciences Corporation, Silver Spring, Md. Dr. Durrance has considerable experience with ultraviolet studies of solar system objects both from satellites and with sounding rockets.

Dr. Nordsieck is an expert on polarimetry and has conducted ground based polarization studies of stars, the interstellar medium and extragalactic objects. Dr. Parise has been involved in flight instrument operations development and has research interests in the properties of binary star systems. Each payload specialist is a member of the three prime Astro instrument research teams.

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Astro consists of three specially designed ultraviolet telescopes that will be used to study stars and galaxies in ultraviolet light. A pair of visible-light cameras have been added to the payload to study study Halley's Comet during the first flight.

The astronaut mission specialists for the first flight of Astro (Astro 1) have been announced previously and are: Dr. Robert Parker, who flew on Spacelab 1, Dr. Jeff Hoffman, assigned to STS 41-F later this year, and Lt. Cmdr. David Leestma. Parker and Hoffman are astronomers and will be closely involved in the operations of the Astro payload. The commander and pilot have not yet been named.

The Astro program is being managed by the Marshall Space Flight Center in Huntsville, Ala., for NASA's Office of Space Science and Applications.

The Astro payload specialists were designated by the Astro Investigator Working Group, which is made up of members of the science instrument teams. "Each of the payload specialists should have the opportunity to fly on two of the three scheduled astro flights," mission manager Leon B. Allen of the Marshall Center said. "We are planning to fly two payload specialists on each mission." Recommendations for flight assignments will be made by the Investigator Working Group later, while the payload specialists are in training.

"They will be the on-orbit experts for the instruments they have helped develop these past several years. The astronomical observations will be a team effort on orbit between the payload specialists who know the instruments well and the astronaut mission specialists who know the shuttle operations. The payload specialists will also coordinate closely with the instrument teams on the ground at a payload operations control center," added Astro mission scientist Dr. Ted Gull of the Goddard Space Flight Center, Greenbelt, Md.

The Astro telescopes are being developed by Johns Hopkins University, the University of Wisconsin and the Goddard Center, respectively. The instruments are the Hopkins Ultraviolet Telescope, which is designed to record the far ultraviolet spectra from very faint

cosmic sources; the Wisconsin Ultraviolet Photopolarimetry Experiment, which will make simultaneous observations of the spectrum and polarization of ultraviolet light from stars; and the Ultraviolet Imaging Telescope, which is designed to provide imaging of very faint objects in the ultraviolet.

The Astro missions will use a pair of Spacelab pallets and the Spacelab Instrument Pointing System. Spacelab subsystems will be carried in a pressurized container called an igloo, and the crew will operate the instruments from the aft flight deck of the Shuttle orbiter. Spacelab is a modular, reusable Shuttle-based laboratory system developed for NASA by the European Space Agency.

Payload specialist biographies follow.

-30-

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Samuel T. Durrance
Astro Payload Specialist

PRESENT DUTIES: Dr. Durrance is a payload specialist in training to operate experiments aboard Astro, a series of Spacelab astronomy missions scheduled to begin in March 1986. Spacelab is a reusable, scientific research facility built by the European Space Agency (ESA) and carried in the cargo bay of the Space Shuttle orbiter. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Astro payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Tallahassee, Fla., on Sept. 17, 1943. He is the son of Rodney and Leone Durrance of Lakeland, Fla.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Married to the former Rebecca Tuggle. They have one child, Benjamin.

PROFESSION: Dr. Durrance is associate research scientist in the Department of Physics and Astronomy at Johns Hopkins University, Baltimore, Md., and assistant project scientist for the Hopkins Ultraviolet Telescope program. The telescope is one of the instruments scheduled to fly as part of the Astro payload.

EDUCATION: Received bachelor of science degree and a master of science degree in physics (with honors) from the California State University, Los Angeles in 1972 and 1974, respectively. He received his Ph.D. in astro-geophysics from the University of Colorado in 1980.

EXPERIENCE: Dr. Durrance has made International Ultraviolet Explorer satellite observations of Venus, Mars, Jupiter the Io Torus, Saturn and Uranus. He helped develop special pointing techniques needed to observe solar system objects with the satellite. He used the Pioneer Venus UV Spectrometer to observe airglow emissions from Venus. He used the OSO-8 UV spectrometer to study the terrestrial thermosphere and has flown three rocketborne telescope/UV spectrometer payloads to observe both planetary and steller objects. He also participated in the design, construction, calibration, integration and launch of telescope/UV spectrometer payloads. His main astronomical

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interests are in the origin and evolution of the solar system, the origin and propensity of other planetary systems and the origin and evolution of life in the universe.

ORGANIZATIONS: He is a member of the American Astronomical Society and the American Geophysical Union.

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Kenneth H. Nordsieck
Astro payload specialist

PRESENT DUTIES: Dr. Nordsieck is a payload specialist in training to operate experiments aboard Astro, a series of Spacelab astronomy missions scheduled to begin in March 1986. Spacelab is a reusable, scientific research facility built by the European Space Agency (ESA) and carried in the cargo bay of the Space Shuttle orbiter. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Astro payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in New York City, Feb. 19, 1946. He is the son of Arnold and Evelyn Nordsieck of Santa Barbara, Calif.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Single.

PROFESSION: Dr. Nordsieck is an associate professor at Washburn Observatory, University of Wisconsin in Madison. He is Co-Investigator for the Wisconsin Ultraviolet Photopolarimetry Experiment, one of the instruments scheduled to be flown as part of the Astro payload.

EDUCATION: Received a bachelor of science degree in astronomy (with honors) from the California Institute of Technology in 1967, and a Ph.D. in physics from the University of California, San Diego in 1972.

EXPERIENCE: Dr. Nordsieck has conducted research in angular momentum of spiral galaxies, polarization of extragalactic objects, intersteller grains, polarimetric systems, astronomical instrumentation and space astronomy.

ORGANIZATIONS: American Astronomical Society

NASA Biography

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NAME: Dr. Ronald A. Parise
Astro Payload Specialist

PRESENT DUTIES: Dr. Parise is a payload specialist in training to operate experiments aboard Astro, a series of Spacelab astronomy missions scheduled to begin in March 1986. Spacelab is a reusable, scientific research facility built by the European Space Agency (ESA) and carried in the cargo bay of the Space Shuttle orbiter. Payload specialists are normally career scientists selected to go into space aboard a particular Spacelab mission. Astro payload specialist training is coordinated by the Marshall Space Flight Center in Huntsville, Ala.

BIRTHPLACE AND DATE: Born in Warren, Ohio, May 24, 1951. He is the son of Mr. and Mrs. Henry Parise of Warren, Ohio.

NATIONALITY: U.S. citizen.

MARITAL STATUS: Married to the former Cecelia M. Sokol. They have a son, Nicholas, and are expecting another child in December.

PROFESSION: Dr. Parise is manager of the Advanced Astronomy Programs Section, Computer Sciences Corporation, in Silver Spring, Md. He is a member of the research team for the Ultraviolet Imaging Telescope, one of the instruments scheduled for flight as part of the Astro payload.

EDUCATION: Received his bachelor of science degree in physics, with minors in mathematics, astronomy and geology, in 1973 from Youngstown State University, Ohio. He was awarded a master of science degree and a Ph.D. in astronomy from the University of Florida, in 1977 and 1979, respectively.

EXPERIENCE: Dr. Parise has been involved in flight software development, electronic system design, and mission planning activities for the Ultraviolet Imaging Telescope project. He has studied the circumstellar material in binary star systems and the rotational excitation of chromospheres in stars. He is also pursuing his astronomical research interests with the International Ultraviolet Explorer satellite under a NASA grant.

ORGANIZATIONS: American Astronomical Society, Society of Photo-Optical Instrumentation Engineers, Astronomical Society of the Pacific.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812
AC 205 453-0034

For Release:
June 19, 1984

Newsroom
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

RELEASE NO: 84-56

NEW NASA EDUCATIONAL PROGRAM FOR SCIENCE AND MATH ANNOUNCED

Operation Liftoff, a new NASA Educational program, announced by President Reagan today, is designed to encourage pupils in the nation's 75,000 elementary schools to take greater interest in mathematics and science.

The new program will rely on the development and refinement of information and materials in the NASA system and the creation of an expanded and more efficient delivery system utilizing the latest computer science and laser disk technology.

The key to success will be NASA's ability to develop and test "pilot" or "prototype" materials and concepts, and then to obtain private and community involvement in expanding their distribution into classrooms.

The program will cost $3 to $5 million over three years.

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"For more than 25 years NASA has pioneered on the cutting edge of science and technology and has stimulted our young people to strive for excellence in all they do," the President said in a speech. His remarks were made at the dedication of the National Geographic Society's new building in Washington, D.C.

"Now NASA, in cooperation with the private sector, will expand its educational outreach program to our very young people in more than 75,000 elementary schools throughout the country. NASA will be able to share its engineering know-how and scientific discoveries and sow the seeds of future progress by stimulating our young people to study science and engineering.

"We call this new program Operation Liftoff, and it will incorporate such advanced instructional tools as computer softwear, laser disks, and audiovisual materials and other techniques. It will also involve private enterprise. I have asked NASA to reinforce its ties with the aerospace industry and with private citizen's groups to expand this effort to the fullest.

"In this connection I was particularly pleased to learn of the efforts of the National Space Institute to develop and support a new national Young Astronauts program to involve young Americans more directly in our space program. This new organization will expand their appreciation of space as a place in which people can live, work and learn. I've asked NASA to work directly with the N.S.I. to develop this project in the context of our Private Sector Initiative Program," the President said.

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Among the major new initiatives planned as part of Operation Liftoff are:

1. New written materials on aeronautics and space topics for the elementary level;

2. New and expanded audiovisual and computer products for classroom use;

3. Encouragement of student participation in--and private sector support for--such space and science-related extracurricular activities as the National Space Institute's new Young Astronauts youth organization;

4. Establishment of strong Teacher Resource Centers at all major NASA locations, at certain university sites and at NASA Industrial Applications Centers;

5. Development of prototype commercial, education and cable television programming on a pilot basis;

6. Conduct of opportunities conferences for educational publishers and representatives of other organizations who can effectively utilize the materials and information in new classroom materials;

7. Support for pilot programs offering one-day space camp-type experiences for elementary students;

8. Providing NASA space-related and live mission video coverage to school systems nationally;

9. Encouragement of the widest possible participation by the private sector, using NASA resources wherever possible as seed money to stimulate participation by local school systems, community organizations and private businesses.

According to the report of the National Commission on Excellence in Education, April 1983, the educational foundations of the United States are being eroded by a rising tide of mediocrity that threatens our future as a nation and as a people.

This erosion undergirds American prosperity and security and has permitted preeminence in commerce, industry, science and technological innovation to be overtaken by determined, well-educated and highly-motivated competing nations.

Learning is a priceless investment essential to a free, democratic society. President Reagan stated: "Certainly there are few areas of American life as important to our society, to our people and to our families as our schools and colleges."

In view of a national commitment to excellence in education, the President responded with a White House-designed national

-more-

program called "Partnerships in Education." He also developed the Presidential Awards for Excellence in Science and Mathematics Teaching. The first of the awards have been received by two teachers in each state.

NASA responded to the movement toward reform in education by undertaking a study of the agency's current education services to determine if services could be expanded and new directions initiated.

It was determined early in the process that if NASA's excellent educational programs were to have maximum impact on the national effort to attract more and better students into science, mathematics and engineering, it would be necessary to formulate an aggressive plan to capture their interest in their formative years, i.e., in the elementary grades. Such a program would utilize the 1,170,000 teachers and 76,302 schools currently in the elementary system, and would support and complement the widely acclaimed programs NASA now offers at university and secondary levels.

The result of this effort is Operation Liftoff.

The Young Astronauts Youth Organization, to be established by the National Space Institute, will be for boys and girls ages 6-12 and will be nationwide in scope. The program is designed to:

-more-

o Utilize the excitement and drama of space flight to initiate and stimulate interest on the part of young people in becoming involved, as adults, in space-related activities and careers.

o Increase student participation in technical studies such as science and math.

o Encourage appreciation of space as an environment to be explored, tamed and disciplined so that it can be used as a place in which to live, work and learn.

Young Astronauts will be an achievement-based program dedicated to developing an aspiration for excellence. Various levels of tasks will be built in which must be achieved for students to progress through the program. Rewards, including badges, astronaut-related memorabilia and visits to space centers, will be used as incentives. The program will be school- and community-related, NASA-assisted, supported by the private sector and in operation in all 50 states within 12-24 months.

The National Space Institute is a nonprofit public interest organization founded in 1974 by space pioneer and former NASA official Dr. Wernher von Braun. NSI is engaged in a variety of educational and informational programs designed to make the public aware of the U.S. space program. Its headquarters is at 600 Maryland Ave., S.W., Suite W-203, Washington, D.C. 20024. Glen P. Wilson, Ph.D., serves as Executive Director (Acting) phone: 202/ 484-1111.

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Members of the Board of Governors are: Dr. Isaac Asimov, Frank Borman, Arthur C. Clarke, Capt. Jacques Cousteau, John Denver, Dr. James C. Fletcher, U.S. Representative Don Fuqua (D-Calif.), U.S. Senator Barry Goldwater (R-Ariz.), Barry Goldwater, Bob Hope, Dr. Robert Jastrow, John Johnson, Robert McCall, Harold W. McGraw Jr., former U.S. Senator Frank E. Moss, Florence Nelson, Nichelle Nichols, Dr. Melvin M. Payne, Dr. Frederick Seitz, Adm. Alan B. Shepard, Dr. John B. Slaughter, Louis Szathmary, Ph.D., Dr. James A. Van Allen and James B. Wyeth.

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NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812
AC 205 453-0034

For Release:

Terry M. Eddleman
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(205/453-0034)

July 11, 1984

RELEASE NO: 84-57

MARSHALL AWARDS CONTRACT FOR STUDY OF ORBITAL TRANSFER VEHICLE

A space vehicle to move payloads from low Earth orbits to higher Earth orbits will be the subject of new study contracts awarded by NASA's Marshall Space Flight Center in Huntsville, Ala.

Both Martin Marietta Aerospace Co. in Denver and Boeing Aerospace Co. in Seattle have been awarded contracts to perform "parallel" studies -- that is, concurrent but independent studies in the same area of concentration -- for an Orbital Transfer Vehicle, or "OTV." The cost of each contract, which will run for 15 months, is about $1 million.

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The transfer vehicle would be initially an unmanned "upper stage," a rocket that would transfer payloads in space from one orbit to another. After moving the payload into its proper position in orbit, the vehicle would return on its own to either a ground base or a space base for reuse.

Martin Marietta and Boeing will conduct these new conceptual studies to examine the possibilities of both space-based and ground-based transfer vehicles. The space-based version would be maintained and refueled at the Space Station, whereas a ground-based vehicle would be carried into space by the Space Shuttle and deployed.

For ground-based considerations, both Shuttle payload bay-launched and aft cargo carrier-launched concepts will be studied. The aft cargo carrier, also under study at the Marshall Center, would be a payload compartment attached to the aft end of the Shuttle's external tank. The tank would be carried to orbit, and the transfer vehicle would be placed in this aft cargo compartment for deployment into space. Once in orbit the transfer vehicle would be separated from the external tank, and the payload that the vehicle would later ferry would be deployed from the cargo bay of the orbiter. The vehicle would then join with the payload and begin its job of moving the payload to higher orbit.

If the transfer vehicle were to be space-based, however, there would be certain advantages. The vehicle would remain permanently in orbit rather than be carried to orbit and returned

-more-

to Earth after each use. Initial delivery of this space-based vehicle could be either in the Shuttle cargo bay or in the aft cargo compartment of the external tank. "You could assemble the vehicle in orbit," said Don Saxton, Marshall's study manager of the Orbital Transfer Vehicle, "such that it would be a larger size than a ground-based unit and be capable of carrying more payload.

"Various alternatives for the transfer vehicle must be examined. Should it be ground-based or space-based, as has been noted? Reusable or expendable? Should it use cryogenic or storable propellants? These conceptual studies will help us to resolve these questions."

A possible compromise could be reached for the basing mode of the vehicle. "It may begin as a ground-based operation," said Saxton, "but then evolve to a space-based one."

The transfer vehicle as presently conceived by Marshall engineers would be an unmanned upper stage in the beginning. The ultimate goal, however, would be to develop a manned vehicle capable of ferrying a crew capsule to geosynchronous orbit -- that point 22,300 miles above the Earth where an orbiting object appears to remain stationary in the sky. The vehicle would then return the crew and capsule for other missions. "We have a long way to go before we reach that goal," said Saxton, "but these conceptual studies by Martin Marietta and Boeing will be a positive step in that direction."

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No, no.

For Release:

July 12, 1984

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(205/453-0034)

RELEASE NO: 84-61

HUBBLE SPACE TELESCOPE MIRROR CLEANED

Cleaning and remeasurement of reflectivity of the primary mirror of the Hubble Space Telescope, managed by the Marshall Space Flight Center, in Huntsville, Ala., have confirmed that the observatory will have the very best optical system possible.

The primary mirror is the principal optical element of the Optical Telescope Assembly of the orbiting observatory, scheduled to be launched into orbit by the Space Shuttle in 1986.

In a 16-hour operation recently, technicians at Perkin-Elmer Corp., Marshall's primary contractor for the telescope assembly, cleaned the 2.4-meter primary mirror. Part of the operation was a remeasurement of the mirror's reflectivity at ultraviolet wavelengths. It was found that there was no degradation in the reflectivity since the mirror was coated in December 1981. The mirror retained its reflectance performance at 10 percent above specification. A system employing jets of dry nitrogen in

conjunction with a special vacuum cleaner was used to remove and collect the mirror dust accumulations of the past two years.

Since the mirror was coated in 1981, telescope assembly operations have been conducted in a special clean room. Even so, a very fine deposit of dust particles had accumulated on the mirror, making cleaning a desirable operation.

Cleaning and reflective measurements were conducted at the latest date possible before the mirror became inaccessible. Final assembly operations during the next few months will incorporate the mirror into the Optical Telescope Assembly.

"This cleaning operation was an important step toward ultimately placing the observatory in space," said James B. Odom, manager of the Marshall Center's Space Telescope Project Office. "With the reflectance performance shown to be well above specification, we have increasing confidence that the launch date for the Hubble Telescope will be met in 1986."

NASA News

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George C. Marshall Space Flight Center
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July 19

For Release:

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(205/453-0034)

July 19, 1984

RELEASE NO: 84-64

MARSHALL AWARDS GEOSTATIONARY PLATFORM
STUDIES TO FORD, LOCKHEED

The Marshall Space Flight Center in Huntsville, Ala., has awarded contracts to two aerospace firms, Ford Aerospace and Communications Corp. of Palo Alto, Calif., and Lockheed Missiles and Space Co. of Sunnyvale, Calif., for the conceptual study of geostationary platforms.

According to the contracts, Ford and Lockheed are to envision platforms of the 1990s and to report their findings to the Marshall Center at the conclusion of the studies. These platforms would revolve above the equator at the "geostationary" altitude of 22,300 miles, where they would be in synchronization with the Earth's rotation and would appear to remain fixed in the sky.

The contracts, each of which costs approximately $550,000, will run for a period of 21 months. The studies will be

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"parallel" -- that is, concurrent but independent studies in the same area of concentration. These conceptual studies are sometimes referred to as the "Phase A" portion of a systematic approach for new space projects, such as geostationary platforms.

The platforms could serve a variety of uses, including communications, Earth observations and data collection. At the geostationary altitude, instruments aboard such a platform could continuously monitor almost an entire hemisphere at once. The instruments could also view wide areas of the Earth for weather patterns, ocean wave studies and crop observations. The dominant role of the early platforms, however, will be communications.

"We already have satellites at the geostationary orbit doing those things, of course," said Bob Durrett, study manager of the geostationary platform at Marshall, "but the platform would allow us to 'aggregate' all of these services, each of which would ordinarily require a separate satellite, into a single entity. Aggregation allows 'economy of scale' by using common utilities, attitude control, and so forth. It may be cheaper to build and operate on a big platform than a lot of small, separate satellites."

The Marshall Center's study will focus upon the geostationary platform "bus" -- the platform minus its payloads. The bus is the foundation portion of the platform which supports payloads like communications systems. In addition to providing a common power supply and attitude control to the various payloads, the platform bus would also provide such things as station keeping (that is, keeping the platform at the right place in orbit),

thermal control, structural support for the payloads and telemetry.

The Lewis Research Center in Ohio is performing an interrelated study which concentrates upon the payloads themselves -- specifically, communications payloads.

Together the studies from the two centers, along with inputs from the communications satellite industry, will provide the basis for arriving at realistic concepts of geostationary platforms in the next decade.

The objectives of the Marshall study focus on arriving at bus concepts appropriate for the late 1990s; determining standardizations for various interfaces; providing data to resolve such questions as methods of attitude stabilization, whether buses might be one-of-a-kind or of general applicability, and whether they should be serviceable. The studies will also determine how well future space systems could support large geostationary platforms and examine possible ground and space experiments and demonstrations.

According to Durrett, the Marshall study will also help define operational and physical interfaces between the Space Station and future large satellites and platforms. "This will help to establish requirements for the Space Station so that early definition activities for the station can take into account what is needed for the geostationary platform."

-30-

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For Release:

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July 24, 1984
Also released in
Washington, DC

RELEASE NO: 84-65

FIRST SPACE PRODUCT TO BE DEVELOPED FOR COMMERCIAL USE

Microscopic latex particles produced aboard the Space Shuttle should soon become the first space product to be offered commercially, NASA announced.

An experiment developed by the Marshall Space Flight Center in Huntsville, Ala., produced the particles in space.

A major step in the process to put the material on the market was taken July 17 when 15 grams of the 10-micrometer particles, were presented by NASA to the Commerce Department's National Bureau of Standards (NBS). NBS will certify the particles as a "standard reference material" and make them available for sale in early 1985.

The presentation was made by representatives from NASA Headquarters, the Marshall Center, and Lehigh University in Bethlehem, Pa.

The 10-micrometer particles were produced in space during 1983 in the Marshall-developed Monodisperse Latex Reactor

-more-

experiment apparatus. The experiment, conducted jointly by Marshall and Lehigh University, produced quantities of monodisperse (identical-sized) latex microspheres superior to those produced on Earth because of the influence of gravity during ground-based manufacturing process.

Because of their spherical uniformity and precision, the particles will be used by industry and medical research as a standard for calibrating sensitive scientific instruments as well as in industrial processes.

About 600 units of the latex material will be sold. Each unit, a 5-milliliter vial containing approximately 15 million identical-sized spheres suspended in water, will cost about $400. The proceeds will be shared equally by NASA and NBS to recover the costs of producing and certifying the spheres.

Preliminary samples of the particles have already undergone extensive testing by NBS to evaluate the material's use as a standard reference material at the 10-micrometer diameter range. The latex spheres will be the third small particle reference material available from NBS.

Such latex particles have been used in medical research in applications such as measuring the size of pores in the wall of the human intestine in cancer research; and measuring the size of pores in the human eye in glaucoma research.

The latex reactor experiment has been conducted in space on five Shuttle missions beginning in March 1982. It operates in the Shuttle crew cabin with minimum astronaut support. The maximum size of the latex particles that can be produced in

quantity on Earth, given required standards of quality and uniformity, is about five micrometers. In space, the experiment has produced particles in a variety of sizes ranging from 5 to 30 micrometers.

The experiment, which last flew on Shuttle mission 41-B in February, will continue operations on three subsequent flights to provide particles in larger sizes up to 100 micrometers.

The experiment package consists of four, 1-foot-tall chemical reactors, each containing 100 milliliters of a chemical latex forming recipe, housed in a 2-foot-high metal cylinder. The recipe consists of tiny latex beads suspended in water with other chemicals that cause the beads to "grow" larger. The experiment, which incorporated the first controlled heterogenous chemical reaction conducted in space, confirmed the theory that a chemical reaction takes place at the same rate in space as on Earth.

Working under the direction of Dr. John D. Vanderhoff of Lehigh University are co-investigators Drs. Fortunato J. Micale and Mohamed S. El-Aasser of Lehigh, and Dale M. Kornfeld of the Marshall Center.

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July 24 July 20

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(205/453-0034)

July 24, 1984

RELEASE NO: 84-66

SPACELAB 2 MISSION SEQUENCE TESTING COMPLETED

A week-long series of tests designed to verify the compatibility of Spacelab 2 experiments with each other and their simulated Spacelab support systems was successfully completed Friday, July 20, at the Kennedy Space Center, Fla.

The announcement was made by officials at the Marshall Space Flight Center in Huntsville, Ala. Marshall is managing the seven-day NASA mission, which is scheduled for launch next year.

The Mission Sequence Testing, as it is called, marked the first simulation of mission operations using the actual flight experiments, according to Spacelab 2 Mission Manager Roy Lester of Marshall's Spacelab Payload Project Office. "We operated all of the instruments simultaneously, just as they will be operated on orbit during the mission," Lester explained. "Both the flight and alternate payload specialists and two of the three mission specialists participated in the testing.

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"The testing went very smoothly, and no major technical problems were encountered," reported Lester.

The Mission Sequence Testing brought to a close Spacelab 2 Level IV integration activities. These activities also included installation of the experiments onto the U-shaped Spacelab support structures called pallets, hook-up of necessary wiring and plumbing, and the initial power up and checkout of the instruments.

Spacelab 2 will consist of 13 experiments to be conducted in solar physics, atmospheric physics, infrared astronomy, high energy physics, life sciences and technology. Most of the experiments will be carried on three Spacelab pallets in the Space Shuttle orbiter cargo bay. They will be operated by the crew from the aft flight deck of the orbiter.

NASA News

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RELEASE NO: 84-67

NASA SELECTS CONTRACTORS FOR ORBITAL MANEUVERING VEHICLE STUDY

An Orbital Maneuvering Vehicle (OMV) to ferry satellites about in space came closer to reality today when NASA selected LTV Aerospace and Defense Company, Dallas, Tex.; Martin Marietta Denver Aerospace, Denver, Colo.; and TRW Inc., Redondo Beach, Calif., for negotiations leading to contracts for System Definition Studies. The OMV would extend the reach of the Shuttle to about a thousand miles above the Earth.

The contracts, to be negotiated and managed by NASA's Marshall Space Flight Center, Huntsville, Ala., will be on a fixed-price basis, twelve months in duration, with the combined dollar value of the three contracts approximating $5 million.

Upon approval to proceed with the construction of an OMV, proposed for a first launch about 1990, NASA anticipates that one of the companies from those involved in the definition studies would be chosen to build the flight hardware.

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The vehicle would supplement the present Space Transportation System, the heart of which is the Space Shuttle. The OMV would have the ability to retrieve satellites from high orbits and bring them back to the Shuttle for maintenance and repair. The OMV would then place the repaired satellites back into their operational orbits. The OMV would also serve as a means of reboosting satellites as their orbits gradually decayed, thus avoiding costly, dedicated, Shuttle missions.

As presently envisioned, the OMV would be a remotely-piloted unmanned spacecraft approximately 15 feet (about 3 meters) diameter and 3 feet (about 1 meter) in length. The life of the vehicle would be approximately 10 years with refurbishment. On-orbit maintenance would be included in the design.

As currently conceptualized, the OMV initially would be deployed from the Shuttle for short duration missions; later it would remain in orbit for extended periods of time for use in both Shuttle-based and Space Station-based missions. Its role in support of a future Space Station program is viewed as one of the OMV's essential attributes. The vehicle is expected to be available for assembly and buildup of an initial Space Station, proposed by NASA to be built in the early 1990s. The OMV would then become an essential element of Space Station operations.

Proposals were also received from Boeing Aerospace Company, Seattle, Wash.; General Dynamics Corp., Convair Division, San Diego, Calif.; Lockheed Missiles and Space Company, Sunnyvale, Calif.; and Rockwell International, Downey, Calif.

NASA News

National Aeronautics and
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For Release:

August 1, 1984

RELEASE NO: 84-69

MARSHALL CENTER CREW AIDS TWO DIVERS

Members of the hyperbaric chamber crew at the Marshall Space Flight Center in Huntsville, Ala., were involved in two emergency treatment activities last week, according to Rick Richter of the Center's Test Laboratory.

"On Tuesday evening (July 24) about 6:30 p.m. crew members were called to assist in the treatment of a diver who was suffering from air embolism," according to Richter.

"We were informed the diver had been working under water in Kentucky Lake near Paris Landing, Tenn. He ascended rapidly from a depth of about 18 feet and, upon reaching the surface, was unable to pull himself into the boat. A companion pulled the diver into the boat and recognized he had some paralysis."

A dive shop operator placed a call to Fort Campbell, Ky., to arrange for a helicopter to transport the diver, and made arrangements for treatment of the diver in Marshall's chamber.

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While the patient was en route to Marshall, Test Laboratory personnel prepared the chamber for the recompression treatment.

The patient arrived at the Neutral Buoyancy Simulator, where the chamber is located, at approximately 8 p.m. July 24, and Dr. William B. Dye of Marshall's Medical Center evaluated the patient. According to Dye, the patient's right arm and both legs were totally useless, his vision was blurred, he had severe headache pain, and was suffering from air embolism, which is the presence of undissolved air bubbles in the blood stream.

The treatment began at 8:35 p.m. The patient emerged from the recompression chamber at 1:26 a.m. July 25, totally symptom free, walking unassisted, and hungry.

The second air embolism victim of the week was treated Saturday (July 28) afternoon. A graduate student from Murray State University on assignment to Oak Ridge National Laboratories was participating in an open water scuba certification dive in Cherokee Lake near Knoxville. He was making a free ascent from a depth of 30 feet when he blacked out some 10 feet below the surface. Upon surfacing he immediately experienced paralysis of the right side, crossed blurred vision, and dizziness.

After treatment at University of Tennessee Medical Center, the diver was flown to Huntsville from Knoxville, Tenn., in an Air National Guard KC-135. The patient arrived at Marshall's hyperbaric chamber at approximately 4 p.m. Saturday (July 28) and was evaluated by Dr. H. B. Elwell of Marshall's Medical Center.

He was placed in the chamber and emerged nearly five hours later walking unassisted. He was admitted to a local hospital for overnight observation.

Since the establishment of the large neutral buoyancy simulator at Marshall, the Center's hyperbaric chamber crew has participated in approximately 12 recompression treatments for divers from Alabama and surrounding states.

These two treatments were the first since Christmas Eve 1983. Prior to that, there had been none for approximately three years.

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For Release:

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(205/453-0034)

August 1, 1984

RELEASE NO: 84-70

SPACELAB 3 SIMULATION COMPLETED AT MARSHALL

Spacelab 3 investigators, engineers, support personnel and science crew members participated in the first integrated Spacelab 3 mission simulation last week at the Marshall Center.

The activity began at 8 p.m. Wednesday, August 25, and ended at 4 p.m. Thursday, August 26. Participants in the mission will take part in several such simulations in preparation for the scheduled January 1985 mission, according to Spacelab 3 mission manager Joe Cremin.

The payload and mission specialists, rather than being 190 nautical miles above the Earth as they will be during the actual mission, were located at the Marshall Center Payload Crew Training Complex. They were communicating and working with mission management and science team members in a simulated Payload Operations Control Center at the Huntsville Operations Support Center (HOSC).

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"The primary purpose of this simulation was to train the principal investigator operations teams in POCC (Payload Operations Control Center) procedures with the Marshall Center POCC cadre," said Cremin. The simulation also provided the participants with communications experience in an operational environment.

"Overall, the simulation went well," he said.

An additional simulation like the one conducted last week will take place at Marshall in September. In November the Marshall team will begin operations and simulations at the Payload Operations Control Center at the Johnson Space Center. "Even then, the flight crew will be at Marshall to use the Payload Crew Training Complex and the HOSC will be active in providing support for the simulation," said Cremin.

NASA News

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August 7, 1984

RELEASE NO: 84-71

SPACELAB 3 COMPLETES MISSION SEQUENCE TESTING

Spacelab 3 moved a giant step closer to its scheduled January 1985 launch aboard the Space Shuttle with the successful completion last week of a major test series at the Kennedy Space Center, Fla.

"The week of testing represents one of the most important series of tests leading to the mission," said mission manager Joe Cremin of the Marshall Space Flight Center in Huntsville, Ala. "Everything went extremely well, I am very pleased with the performance of both the laboratory and the experiments."

The Integrated Mission Sequence Test, as the series is called, was designed to verify compatibility of experiments with each other and with their actual Spacelab support subsystems, added John Thomas, manager of the Spacelab Program Office at

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Marshall. It is the final major integrated test of the payload and laboratory prior to installation in the orbiter. Installation is now scheduled for December.

During the tests, Spacelab 3 science crew members in the Spacelab module worked with researchers in a simulated ground control center to operate the experiments just as they will do during the mission. Members of the Marshall Center Spacelab 3 mission management team were present at Kennedy for the testing, and representatives from both the Spacelab Program and Spacelab Payload Projects offices were on hand in Marshall's Huntsville Operations Support Center to monitor the testing.

Spacelab 3 is the first operational mission of the European-developed Shuttle-based research center. Its primary objective is to conduct application, science and technology experiments requiring the low gravity environment of Earth orbit. The Marshall Center is responsible for managing this and several other Spacelab missions.

NASA News

National Aeronautics and
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August 7, 1984

RELEASE NO: 84-72

MARSHALL HOSTING TWO-WEEK WORKSHOP
FOR MATH, SCIENCE TEACHERS

The Marshall Space Flight Center in Huntsville, Ala., is hosting a workshop this month for 25 pre-college teachers of science and mathematics.

The two-week program, which began Monday (August 6), is one of the NASA Educational Workshops for Mathematics and Science Teachers (NEWMAST) being held this summer at NASA centers.

NEWMAST is sponsored by NASA, the National Science Teachers Association, the University of Toledo (Ohio), and the National Council of Teachers of Mathematics. The program is funded by the National Science Foundation.

The goal of this program is to recognize excellence in the teaching of mathematics and science and to provide a program for updating science and mathematics backgrounds.

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The candidates for the program were selected from recommendations submitted by a steering committee consisting of the National Science Supervisors Associations and the Council of State Science Supervisors, both affiliates of the National Science Teachers Association; and the National Council of Supervisors of Mathematics, an affiliate of the National Council of Teachers of Mathematics.

The workshop at Marshall will directly involve teachers with scientists and engineers at selected work areas within all of the laboratories in the Center's Science and Engineering Directorate. The teacher participants will be updated on the latest Center research activities and development programs.

During the workshop, opportunities will be provided for the teachers to participate in a variety of activities.

They will review and discuss educational resource materials available from NASA, including printed materials, video tapes, laser discs, computer programs, audio tapes, movies and slides; identify and recommend space topics for science and mathematics curricula; design laboratory activities for existing science and mathematics courses; organize and prepare materials for public awareness programs for presentation to school and community groups; recommend new educational resource materials for science and mathematics classrooms to be developed by NASA; and, recommend ways in which the Shuttle program activities can be integrated into science and mathematics classrooms at the pre-college level.

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Several NASA centers have reported good results in the workshops that have already been completed. Workshops were held at the Langley Research Center, July 9-19; at the Ames and Lewis Research Centers, July 9-20; and at the Goddard Space Flight Center, July 23 - August 3. In addition to Marshall, workshops are presently under way at the Johnson and Kennedy Space Centers. The Jet Propulsion Laboratory will hold a workshop August 13-24.

Teachers from six states are at Marshall for the workshop. The teachers, and the schools they represent, are: Danny Alexander of Meridian High School, Little Rock, Miss.; Randall Bradshaw of Carver Junior High School, Raymond, Miss.; Gary Brooks and Ken Fay of Greeneville (Tenn.) Middle School; Jacqueline Brown of Nelson Adams Middle School, Saraland, Ala.; Clara Colston of Tyler Junior High School, Chattanooga, Tenn.; Fred Cureau of Northside High School, Slidell, La.; Harold Dinsmore, Farragut (Iowa) Community School; Hannah Edwards of Semmes Middle School, Prichard, Ala.; Shirley Herndon of Fair High School, Little Rock, Ark.; Vernon Johnson of Humes Junior High School, Memphis; John Kounas of Westwood High School, Sloan, Iowa; Jane Nall of Escambia County High School, Atmore, Ala.; William Neblett of Richview Middle School, Cunningham, Tenn.; Janis Olson of Mountain Brook Junior High School, Birmingham; Robert Plunkett of Ida Grove (Iowa) Community School; Geraldine Richards of Westlawn Middle School, Huntsville; Robert Ricks of Whatley Middle School, Sylacauga, Ala.; Joe Ann Simmons of Humboldt High School, Tenton, Tenn.; Virginia St. Clair of Hixson (Tenn.) Junior High School; Bill Tuggle of Hernando Middle

School, Memphis; Carol Varvaro of Legion Elementary School, Thibodux, La.; Mark Windschitl of Sacred Heart Elementary School, West Des Moines, Iowa; and Patricia Zeringue of Henry Ford Middle School, Westwego, La.

NASA News

National Aeronautics and
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RELEASE NO: 84-73

NASA ANNOUNCES UPDATED FLIGHT CREW ASSIGNMENTS

The National Aeronautics and Space Administration has announced the assignment of the commander and mission specialist for a future Space Shuttle flight and the rescheduling of some other crews for upcoming missions.

Veteran astronaut Henry W. Hartsfield, commander of the next Space Shuttle flight 41-D, has been named to command flight 61-A, the dedicated German Spacelab mission planned for launch Oct. 14, 1985. James F. Buchli has been assigned as a mission specialist for that flight.

Previously named for that flight were pilot Steven R. Nagel, mission specialists Guion S. Bluford, Jr., and Bonnie J. Dunbar, and payload specialists Reinhard Furrer (German), Ernst Messerschmid (German) and Wubbo Ockels (Dutch).

The flight crew for mission 41-F, commanded by Karol J. Bobko, has been reassigned to mission 51-E, scheduled for launch Feb. 12, 1985. The crew's original flight was deleted and some of its cargo placed on flight 41-D after the launch abort of that flight in late June.

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The attached list is based on a plan to reschedule crews for the earliest possible date on flights for which the training is similar to their original mission.

FLIGHT 41-D

Projected date: Aug. 29, 1984
Orbiter: Discovery
Payload: OAST-1, SBS-D, Telstar-3C, Syncom IV-2
Flight crew:
Henry W. Hartsfield, CDR
Michael L. Coats, PLT
Richard A. Mullane, MS
Steven A. Hawley, MS
Judith A. Resnik, MS
Charles D. Walker, PS (McDonnell Douglas)

FLIGHT 41-G

Projected date: Oct. 1, 1984
Orbiter: Challenger
Payload: OSTA-3, ERBS, LFC
Flight crew:
Robert L. Crippen, CDR
Jon A. McBride, PLT
Kathryn D. Sullivan, MS
Sally K. Ride, MS
David D. Leestma, MS
Marc Garneau, PS (Canada)
Paul D. Scully-Power, PS (U.S. Navy civilian)

FLIGHT 51-A

Projected date: Nov. 2, 1984
Orbiter: Discovery
Payload: Dual option flight, Telesat-H, Syncom IV-1
Flight Crew:
Frederick H. Hauck, CDR
David M. Walker, PLT
Anna L. Fisher, MS
Dale A. Gardner, MS
Joseph P. Allen, MS

FLIGHT 51-C

DOD MISSION

FLIGHT 51-B

Projected date: Jan. 17, 1985
Orbiter: Discovery
Payload: Spacelab 3
Flight Crew:
Robert F. Overmyer, CDR
Frederick D. Gregory, PLT
Don L. Lind, MS
Norman E. Thagard, MS
William E. Thornton, MS
Lodewijk van den Berg, PS (EG&G Corp.)
Taylor G. Wang, PS (Jet Propulsion Laboratory)

FLIGHT 51-E

Projected date: Feb. 12, 1985
Orbiter: Challenger
Payload: Telesat-I, TDRS-B
Flight Crew:
Karol J. Bobko, CDR
Donald E. Williams, PLT
M. Rhea Seddon, MS
Jeffrey A. Hoffman, MS
S. David Griggs, MS
French payload specialist

FLIGHT 51-D

Projected date: March 18, 1985
Orbiter: Discovery
Payload: LDEF-1 Retrieval, Syncom IV-3
Flight crew:
Daniel C. Brandenstein, CDR
John O. Creighton, PLT
Shannon W. Lucid, MS
John M. Fabian, MS
Steven R. Nagel, MS
Hughes payload specialist

FLIGHT 51-F

Projected date: April 17, 1985
Orbiter: Challenger
Payload: Spacelab 2
Flight crew:
Charles G. Fullerton, CDR
S. David Griggs, PLT
F. Story Musgrave, MS
Anthony W. England, MS
Karl G. Henize, MS
Loren W. Acton, PS (Lockheed)
John-David Bartoe, PS (U.S. Navy civilian)

FLIGHT 51-G

Projected date: May 30, 1985
Orbiter: Columbia
Payload: Ease-Access, Telstar-3D, Arabsat-A, Morelos-A
Flight crew:
Joe H. Engle, CDR
Richard O. Covey, PLT
James van Hoften , MS
John M. Lounge, MS
William F. Fisher, MS

FLIGHT 51-L

Projected date: July 2, 1985
Orbiter: Challenger
Payload: EOS-1, TDRS-C, OASIS
Flight crew:
Brewster H. Shaw Jr., CDR
Bryan D. O'Connor, PLT
Mary L. Cleave, MS
Sherwood C. Spring
Jerry L. Ross (MS)

FLIGHT 61-A

Projected date: Oct. 14, 1985
Orbiter: Columbia
Payload: Spacelab D-1
Flight crew:
Henry W. Hartsfield, CDR
Steven R. Nagel, PLT
James F. Buchli, MS
Guion S. Bluford, Jr., MS
Bonnie J. Dunbar, MS

Payload specialists:
Reinhard Furrer (DFVLR) (German)
Ernst Messerschmid (DFVLR) (German)
Wubbo Ockels (DFVLR) (Dutch)

FLIGHT 51-H

Projected date: November 27, 1985
Orbiter: Atlantis
Payload: EOM-1
Flight crew:
Vance D. Brand, CDR
Michael J. Smith, PLT
Robert C. Springer, MS
Owen K. Garriott, MS
Claude Nicollier, MS

Payload specialists:
Michael L. Lampton (Univ. of Calif., Berkley)
Byron K. Lichtenberg (MIT)

FLIGHT 61-D

Projected date: Jan. 28, 1986
Orbiter: Columbia
Payload: Spacelab 4
Flight crew:
John M. Fabian, MS
James P. Bagian, MS
M. Rhea Seddon, MS
(commander, pilot and payload specialists to be assigned)

FLIGHT 61-E

Projected date: March 6, 1986
Orbiter: Columbia
Payload: Intelsat VI-1, Astro-1
Flight crew:
(commander and pilot to be assigned)
Robert A.R. Parker, MS
David C. Leestma, MS
Jeffrey A. Hoffman, MS

STANDBY CREW
Karol J. Bobko, CDR
Ronald J. Grabe, PLT
Richard M. Mullane, MS
Robert L. Stewart, MS

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
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AC 205 453-0034

For Release:

Charles Redmond
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Terry Eddleman
Marshall Space Flight Center, Ala.
(Phone: 205/453-0034

August 17, 1984
FOR RELEASE
AFTER 3:00 PM
CDT

RELEASE NO: 84-75

NASA SELECTS USBI FOR SRB ASSEMBLY AND REFURBISHMENT CONTRACT

NASA announced today the selection of United Space Boosters, Inc., Huntsville, Ala., for negotiations leading to the award of a contract to manufacture, assemble and refurbish solid rocket boosters for the Space Shuttle. USBI's proposal reflected a cost of approximately $274 million for this work. The contract will be managed by NASA's Marshall Space Flight Center, Huntsville, Ala.

The cost-plus-incentive-fee contract, which will cover an approximate five-year period, will require USBI to manufacture, assemble, check out and deliver 84 flight sets of solid rocket boosters, and to refurbish them when returned to earth after each use. Further, the contract will include two unpriced options, each for delivery of 60 flight sets, covering a total additional period of performance of about five years.

-more-

Under a separate contract, USBI will build a new facility at NASA's Kennedy Space Center, Florida, specifically for booster assembly and refurbishment. USBI's proposal reflected a cost of approximately $21 million, in addition to the cost of the solid rocket booster manufacture, assembly and refurbishment work, for the new facility. In the past, refurbishment has taken place at Kennedy's Vehicle Assembly Building -- used to assemble the entire configuration of orbiter, boosters, and external tank.

Other firms submitting proposals for the contract were:

Lockheed Corp., Burbank, Calif.;
McDonnell Douglas Booster Assembly Co., Cocoa Beach, Fla.

NASA News

National Aeronautics and
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September 14, 1984
Also released in
Washington, D. C.

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RELEASE NO: 84-79

SPACE STATION PROPOSALS SOUGHT

The National Aeronautics and Space Administration today issued a Request for Proposal (RFP) to U.S. industry for definition and preliminary design of a permanently manned Space Station to be operational in low earth orbit early in the 1990s. Proposals are due by November 15.

President Reagan, in his State of the Union Message in January, directed NASA to develop such a Space Station and to do it within a decade.

The Space Station will support scientific and commercial endeavors in space, stimulate new technologies, enhance space-based operational capabilities and maintain the United States' leadership in space. Because it will be a multipurpose facility serving many users, NASA's objective is that the Space Station be "customer friendly" and be dedicated to fulfilling customer requirements in its design and operation.

-more-

The Request for Proposal contains four "work packages" covering definition and preliminary design (Phase B) of Space Station elements. NASA plans to let competing contracts for each of the work packages and has scheduled April 1, 1985, as the effective date of the contracts.

In addition to the study of the permanently manned system, the Request for Proposal also requires contractors to study how those elements of the Space Station would change were the station initially man-tended rather than permanently manned. Contractors also will be expected to pay particular attention to recommendations of the NASA Advanced Technology Advisory Committee, which is identifying automation and robotic technologies which could be used in the Space Station.

Following completion of the 18-month definition and preliminary design contracts, NASA intends to move, in 1987, into final design and development of the Space Station. Proposers for the definition and preliminary design phase must have the capability to perform and manage the design, development and test phase (Phase C/D) of their appropriate work packages.

Because of the long lifetime of the Space Station and requirements for evolutionary growth and international participation, there will be no single prime contractor for the program. The overall system engineering and integration activities will be performed by NASA's Johnson Space Center, Houston.

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The work packages and the NASA centers responsible are:

Work Package One, Marshall Space Flight Center, Huntsville, Ala. -- definition and preliminary design of pressurized "common" modules with appropriate systems for use as laboratories, living areas and logistic transport; environmental control and propulsive systems; plan for equipping a module as a laboratory and additional ones as logistics modules; and plan accommodations for orbital maneuvering and orbital transfer vehicles.

Work Package Two, Johnson Space Center, Houston -- definition and preliminary design of the structural framework to which the various elements of the Space Station will be attached; interface between the Space Station and the Space Shuttle; mechanisms such as the Remote Manipulator Systems; attitude control, thermal control, communications and data management systems; plan for equipping a module with sleeping quarters, wardroom and galley; and plan for extravehicular activity (EVA).

Work Package Three, Goddard Space Flight Center, Greenbelt, Md. -- definition and preliminary design of the automated free-flying platforms and of provisions to service, maintain and repair the platforms and other free-flying spacecraft; provisions for instruments and payloads to be attached externally to the Space Station; and plan for equipping a module as a laboratory.

Work Package Four, Lewis Research Center, Cleveland -- definition and preliminary design of the electrical power generation, conditioning and storage systems.

Other NASA centers will support the definition and preliminary design activities.

The Kennedy Space Center, Fla., will be responsible for pre-flight and launch operations and will be involved in logistics support activities.

Launch of the Space Station elements and subsequent transportation between the station and earth will be provided by the Space Shuttle.

A major objective of the Space Station program is to bring about participation of international partners as builders and users as well as to assist in Space Station operations. Funding for such international participation will be provided by other governments who will let their own definition and preliminary design contracts in phase with the NASA activity.

As part of the overall program, two or more unmanned free-flying platforms will be developed for use with the Space Station. A maximum of common subsystems such as power, thermal, docking, data, etc., will be used on both the Space Station and the platforms. The platforms will be tended and serviced by the Space Station in orbit. The platforms also will have the capability of being launched and serviced by the Space Shuttle in high inclination or polar orbits.

NASA's plans call for an initial Space Station to be operational in the early 1990s. It will be capable of growth both in size and capability and is intended to operate for several decades, well into the 21st century. It is planned to be placed

in a low earth orbit about 300 miles high and at an inclination to the equator of 28.5 degrees. It will include a number of pressurized modules and a power supply of 75 kilowatts, support a crew of six to eight people and have two or more free-flying unmanned platforms.

For the purposes of the Request for Proposal, NASA has selected a Space Station reference configuration called the "power tower." The power tower is one of a family of configurations that uses similar elements or components. The power tower family is considered a starting point for definition studies but is expected to undergo significant modifications as studies progress. Contractors may offer modifications within the reference concept family or other preliminary designs.

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George C. Marshall Space Flight Center
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Oct. 24, 1984

RELEASE NO: 84-84

BAR CODES TO TRACK SHUTTLE PARTS INVENTORY

Bar codes, those tiny black-and-white strips of lines often seen printed on containers of food and other merchandise, will soon be applied almost universally to the thousands of parts which make up NASA's Space Shuttle.

"Bar codes have proven themselves in recent years to be an absolutely outstanding means of keeping track of inventory with merchandise," said Fred Schramm, an engineer in the Shuttle Projects Office of NASA's Marshall Space Flight Center in Huntsville, Ala. Schramm is bar-code coordinator, responsible for converting current methods of inventory tracking for Shuttle parts from a slower key-punch style to the fast and accurate bar-code approach.

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"The speed of inventory tracking which bar codes provide is evident whenever you go into the supermarket," said Schramm. "The checker simply runs a laser scanner over the bar code strip, and the main store computer records not only the price but the change in inventory status. When applied to our own needs in the Shuttle Projects Office, this time-saving system will save dollars by immensely improving data reliability and productivity."

The tiny lines of a typical bar code -- which are encodings of letters and numbers -- are "read" by a laser beam, which measures the lightness and darkness of the lines, interprets them and records the information in a computer.

Shuttle parts manufactured for NASA carry either a part number, serial number, or both. These numbers are typically 5 to 15 characters long. At present, both numbers must be keyed by a human operator into a computer whenever the part is transferred from one point to another. Under a bar-code system, chances for error are lessened when an operator merely runs a laser scanner over the code. And time is saved as well.

"To understand the magnitude of the situation," said Schramm, "you have to realize that a pair of solid rocket boosters alone contain more than 70,000 pieces and parts, one main engine has about 30,000, and an external tank over 200,000. Then you figure how many times each part is moved. A new or refurbished part may move as many as 20 times within one flight cycle. For an entire propulsion system for just one Shuttle, the number of parts is

staggering. And we have three operational Shuttles now, with one on the way."

Schramm is ensuring that the new system will be implemented at approximately the same time in a coordinated effort by all four major contractors of the Space Shuttle propulsion system (Rocketdyne, which produces the main engines; Martin Marietta, the external tank; USBI, the solid rocket boosters; and Morton-Thiokol, the booster motors). Each prime contractor did independent feasibility studies to determine if bar code use was cost-effective and, if so, the extent of its application. Results were conclusive that bar codes fulfill both objectives. "Our productivity will certainly be increased by the use of bar code technology in our manufacturing operations," said Willy Wilhelm of Rocketdyne. "This increase will be due to the reduced errors and the increased speed in processing records and other paperwork."

Each contractor has a bar code manager and coordinator, and workshops are held quarterly among the aerospace firms to exchange information and discuss the progress of the bar-code conversion. Schramm is central coordinator of all the activity, and is optimistic about the near future. "Our goal is to have full-scale implementation by mid-fiscal year 1987," he said.

One of the objectives of the conversion project is to enscribe a permanent bar code on each Shuttle recyclable part with a laser beam. This delicate etching -- not more than a one to two thousandths of an inch in depth -- would replace the older methods of identification, such as impact stamping. "Laser marking is really without equal in permanence," said Schramm.

"And best of all, the laser beam marks the surface so lightly that it's virtually harmless to the precision tolerances of machined parts."

"This program greatly demonstrates our commitment to ever-improving quality and productivity," said Shuttle Projects Office manager Robert E. Lindstrom. "We hope, in fact, that interest in using bar codes will go beyond the Shuttle Projects Office. We're working through productivity groups here at Marshall to see if bar code inventorying can be extended throughout the entire Center. Everyone would certainly benefit."

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Oct. 24, 1984

RELEASE NO: 84-85

FIRST SPACE SHUTTLE EXTERNAL TANK
ARRIVES AT WESTERN LAUNCH SITE

The first Space Shuttle external fuel tank for use at Vandenberg Air Force Base, Calif., arrived there Sunday, Oct. 21, after a 5,000-mile journey, marking a major milestone in activation of the West Coast space launch complex.

The 154-foot-long external tank, the largest element of the Shuttle and its structural backbone, began its journey on Sept. 25 at the Marshall Space Flight Center's Michoud Assembly Facility in New Orleans. Martin Marietta Aerospace manufactures the tank there for the Marshall Center.

With the arrival of the tank at Vandenberg, the U.S. Air Force program to construct a launch and landing complex for the Shuttle at that California base continued to progress on schedule. Plans call for the initial launch from the new complex in October 1985.

-more-

Most of the major facilities at Space Launch Complex-Six have been completed, including the facility for storage and preparation of the external tank. The U.S. Army Corps of Engineers has been responsible since 1979 for building and facility construction at Space Launch Complex-Six, while Martin Marietta Aerospace has had responsibility since 1975 for design, procurement, installation and checkout of Shuttle ground support systems.

The ground support systems consist of 13 new or modified groups of facilities. Major structures, besides the Shuttle Assembly Building, include a launch control center, payload preparation facility, a mobile tower to take payloads to the vertical mounted orbiter, an access tower for the mounted orbiter and a mobile service tower for access prior to liftoff.

Shuttle missions originating from Vandenberg will carry both Department of Defense and NASA payloads.

For its journey to Vandenberg, the external tank was mounted on a transporter at Michoud and shipped on a covered barge formerly used to tow Apollo segments to Kennedy Space Center, Fla.

The barge entered the harbor at the old Coast Guard boathouse area, south of Point Arguello, Calif., which had been dredged and prepared for the arrival. The tank on its transporter was unloaded and towed by a large tractor over a specially constructed 2.3-mile tow road to the external tank checkout and

-more-

storage facility, which is capable of storing up to five tanks at a time.

At the facility, the tank will undergo a thorough four-week inspection by the Air Force and its Shuttle processing contractors. Early next year, it will be mated with two inert solid rocket boosters and the Shuttle orbiter Enterprise for testing of compatibility between the Shuttle and ground facilities.

NASA News

National Aeronautics and
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Oct. 25, 1984

Ed Medal
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(205/453-0034)

RELEASE NO: 84-86

NEW SPACE SHUTTLE BOOSTER MOTOR
SUCCESSFULLY TEST FIRED

NASA's prime contractor for Space Shuttle solid rocket booster motors successfully static fired a new, lightweight version of that motor in northern Utah today. The test was conducted under the direction of NASA's Marshall Space Flight Center in Huntsville, Ala.

Preliminary results from the two-minute firing at Morton Thiokol's Wasatch Division near Brigham City, Utah, indicate that all objectives were met and the system operated as expected.

The case of the new motor is made from a composite material of plastic reinforced with graphite fibers wound into a cylinder. Each of these filament wound cases weighs about 30,000 pounds less than the current steel case that makes up most of the length

-more-

of the Shuttle's solid rocket booster. Use of the lighter cases will increase Shuttle payload carrying capacity about 4,600 pounds.

Larry Mulloy, manager of the solid rocket booster project in the Marshall Center's Shuttle Projects Office, was "elated" at the outcome of the test. He was on hand during the static firing along with a number of other NASA and contractor personnel from throughout the U.S.

Two more of the filament wound booster motors will be test fired by Morton Thiokol in the spring and summer of 1985. Also in the spring of 1985, flight motor segments containing filament wound cylinders will be shipped to Vandenberg Air Force Base, Calif., for use by NASA and the U.S. Air Force in the first Shuttle launch from Vandenberg planned for October 1985.

Following that launch, the boosters will be retrieved from the Pacific Ocean and the motor case components will be returned to Utah for inspection and analysis.

The filament wound motor cases are built for Morton Thiokol as a joint venture by Hercules, Inc., of Magna, Utah, and Votaw Precision Tool, Inc., of Santa Fe Springs, Calif.

NASA News

National Aeronautics and
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For Release:

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Nov. 2, 1984

Nov 1

RELEASE NO: 84-89

HUBBLE SPACE TELESCOPE OPTICS ARRIVE IN CALIFORNIA

The optics for a NASA telescope so powerful that it may enable scientists to see to the edge of the known universe arrived on the west coast yesterday, where it will be integrated with the other telescope components and prepared for launch aboard the Space Shuttle in 1986.

The Optical Telescope Assembly for NASA's Hubble Space Telescope was transported from its manufacturer, the Perkin-Elmer Corp., Danbury, Conn., to the Lockheed Missiles and Space Co., Sunnyvale, Calif. Much of the trip was by Super Guppy, a NASA aircraft specially modified to carry oversized cargo.

The 10-foot diameter, 30-foot long assembly, which consists of the primary and secondary telescope mirrors, associated electronics, and supporting structure for the telescope's instruments, left Perkin-Elmer by truck Monday morning, and was flown from Stewart Airport, Newburgh, N.Y., Wednesday morning.

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At Lockheed, the assembly will be integrated with sensitive scientific instruments shipped earlier and with other Lockheed supplied spacecraft components, then checked out, and prepared for shipment to the Kennedy Space Center, Fla., for launch.

"The move went flawlessly," said Jim Odom, Space Telescope Project manager at NASA's Marshall Space Flight Center, Huntsville, Ala. "Things went so smoothly, in fact, that we completed the move ahead of schedule."

The overall telescope, 43 feet long and weighing more than 25,000 pounds, will become the largest scientific payload ever placed in Earth orbit.

From its vantage point 320 nautical miles in altitude and above the Earth's distorting atmosphere, the telescope will enable scientists to see some 14 billion light years and to observe celestial objects some 50 times fainter than now possible. Some scientists have termed the telescope the greatest advance in astronomy since the invention of the simple telescope almost four centuries ago.

The Marshall Space Flight Center has overall management responsibility for the Hubble Space Telescope project. Science instrument development was led by NASA's Goddard Space Flight Center in Greenbelt, Md. Once in orbit around the Earth, the telescope's astronomical research work will be guided by Goddard and the Space Telescope Science Institute in Baltimore, Md.

NASA News

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Nov 8

For Release:

Ed Medal
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(205/453-0034)

Nov. 2, 1984

RELEASE NO: 84-90

51-A BOOSTERS EQUIPPED WITH LARGER PARACHUTES

Larger main parachutes will be a part of the Space Shuttle solid rocket booster's deceleration system during mission 51-A, set for launch Nov. 7 from Kennedy Space Center. The main chutes are designed to slow the boosters' final rate of descent prior to impact into the ocean.

The new parachutes are 136 feet in diameter compared to previously used chutes 115 feet in diameter. According to Keith Henson, booster recovery subsystem manager in the Shuttle Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala., the larger chutes will reduce the velocity of the boosters at water impact from 88 feet per second or 60 miles per hour to 75 feet per second or 51 miles per hour. The reduced velocity will relieve the structural loads on the boosters at impact by about 25 percent, thus reducing the amount of impact damage sustained by the boosters.

-more-

Three main parachutes are used on each of the Shuttle boosters. Following launch and separation from the Shuttle, the boosters are recovered from the ocean, refurbished and used on a later flight.

According to Henson, the larger chutes were tested during mission 41-D in August on the Shuttle's right booster. Beginning with mission 51-B, scheduled for January 1985, all future steel case boosters will have the larger chutes.

Smaller main chutes will continue to be used on some Shuttle missions, including the 51-C mission in December and on missions where lighter-weight filament wound booster motor segments are used. First use of those segments is planned for October 1985.

The booster's deceleration system, of which the parachute program is a part, was designed by Martin Marietta Corp., Denver, Colo., under the direction of the Marshall Space Flight Center. The parachutes are provided by Pioneer Parachute Co., Manchester, Conn.

NASA News

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November 5, 1984
Also released in
Washington, D.C.

RELEASE NO: 84-91

NASA ANNOUNCES DELAY OF 51-C SPACE SHUTTLE MISSION

NASA today announced the delay of the 51-C Space Shuttle mission originally scheduled for launch from the Kennedy Space Center, Fla., on Dec. 8, 1984.

A decision was made today to replace up to 2,800 thermal protection tiles on the underside of the orbiter Challenger due to the degradation of the bonding material.

NASA is in the process of determining the earliest new launch date.

When Challenger returned from space on its last mission, a black tile from the left wing chine area, just behind and below the crew door area, was missing. About 100 tiles were removed from Challenger and it was found that the adhesive substance known as "screed," used to smooth irregularities in the surface of the orbiter, had softened. This white, Room Temperature Vulcanizing (RTV) material is used in much the same way that body putty is used on a car. It hardens and can be sanded smooth after it dries.

The screed is used on areas of the body of the orbiter, such as the underside of the fuselage, body flap, elevons and the sides.

The screed is applied directly over the aluminum skin of the orbiter. All other areas are covered with a primer called red RTV-560 which is used as an adhesive for bonding the strain isolation pads (SIP) to the body and the tile to the SIP.

The 51-C mission is the first completely dedicated Department of Defense mission. One previous mission, STS-4, carried a DOD payload as part of its cargo, but was flown primarily as the final development mission for the orbiter Columbia.

The 51-A Space Shuttle mission continues on schedule for launch November 7 at 7:22 a.m. CST.

NASA News

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For Release:
November 8, 1984

RELEASE NO: 84-92

NASA SEEKS TEACHER FOR EARLY 1986 SHUTTLE MISSION

The National Aeronautics and Space Administration, in conjunction with the Council of Chief State School Officers, has released the Announcement of Opportunity (AO) specifying the eligibility requirements for selection of a teacher in NASA's Space Flight Participation Program.

Through the program, NASA will extend Shuttle flight opportunities to a wide segment of private citizens with the purpose of communicating the experience of space flight to the public through educational and information programs. NASA eventually intends to fly various categories of Space Flight Participants two to three times per year.

Teachers meeting the requirements may request an application packet, which will be available after December 1, 1984, from the NASA Teacher in Space Project, Council of Chief State School Officers, 400 North Capitol Street, N.W., Suite 379, Washington, D. C. 20001. The application period is from December 1, 1984, to February 1, 1985.

The AO is open to elementary and secondary level teachers in all public, private and parochial schools in the United States and U.S. territories and in Department of Defense overseas dependents schools and Department of State overseas schools and in the Bureau of Indian Affairs. The teacher must:

-more-

- Be a U.S. citizen;
- Be a full-time classroom teacher;
- Have been a full-time classroom teacher for the past five years;
- Provide verification of teacher eligibility and consent to participate which will be included in the application packet;
- Meet all medical requirements as defined;
- Not be a spouse of a current or former NASA employee.

The school in which the teacher teaches, if it is non-public, must advertise that it does not discriminate in admissions based on race.

Teachers applying for this flight opportunity will submit an application to illustrate their qualifications and excellence as an educator and to demonstrate how they would share the experience with the public.

All applications received will be screened to eliminate those not meeting the basic requirements. Remaining applications will be forwarded to State Review Panels which will evaluate the proposals and select two teachers per state as nominees. The 120 nominees (two per state, plus U.S. territories, Departments of Defense and State dependent schools and Bureau of Indian Affairs schools) will be forwarded to a National Review Panel for further evaluation. All state nominees will attend a teachers' workshop and recognition banquet in the summer of 1985 in Washington, D.C. The workshop will inform the participants of current developments in the space program, and applicants will undergo further evaluation and screening by the National Review Panel in the form of personal interviews.

From the state-level nominees, the National Review Panel will recommend ten teachers as semifinalists for consideration by the NASA Space Flight Participant Evaluation Committee. This Committee is comprised of seven senior NASA officials.

The semifinalists will go to NASA's Johnson Space Center, Houston, for thorough medical examinations, in-depth briefings and interviews by the NASA Evaluation Committee. Based on results of the physical examinations and the interviews, the Evaluation Committee will determine which applicants are qualified to undergo necessary training and will recommend five finalist candidates.

The names of the five finalists will be submitted to the NASA Administrator, who, along with the Evaluation Committee, will select the primary and back-up candidates to undergo training for space flight. The specific flight opportunity is under review; however, the goal is to fly the first teacher on a mission in early 1986.

NASA News

National Aeronautics and
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Terry Eddleman
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For Release:
November 14, 1984

RELEASE NO: 84-93

EMPLOYEES RECEIVE AWARDS IN CEREMONY TODAY AT NASA CENTER

Twelve individual medals, eight group awards, and 16 director's commendation certificates were presented at the Annual Honor Awards Ceremony at NASA's Marshall Space Flight Center in Huntsville, Ala., today.

The various awards were given for leadership, engineering and scientific achievements, and other contributions to the Marshall Center.

Guest speaker was Ann Bradley, NASA associate deputy administrator, who also assisted Center Director Dr. William R. Lucas and Deputy Center Director Thomas J. Lee in the presentation of the awards.

Following her remarks, Bradley, Lucas and Lee began the presentations by awarding the NASA Exceptional Engineering Achievement Medal to Jess H. Jones of the Environmental Analysis Branch in the Systems Dynamics Laboratory.

Jones was recognized for "exemplary technical achievement in development of innovative dynamic data analysis methodologies and systems. These methodologies and systems have substantially increased the state-of-the-art and the capability to perform dynamic evaluation of Shuttle, SSME [Space Shuttle main engines], SRB [solid rocket booster] and payload systems, providing greater technical understanding of hardware dynamic phenomena."

The NASA Exceptional Service Medal was awarded to Harry J. Bandgren Jr., chief of the Component Analysis Branch in the Systems Dynamics Laboratory; C. D. Bean, director of the Personnel Office; Robert M. Croft, chief of the Flight Mechanics Branch in the Preliminary Design Office, Program Development Directorate; Orville E. Driver of the Vehicle Systems Office in the Shuttle Projects Office; James H. Ehl, chief of the Tooling Applications Branch in the Materials and Processes Laboratory; Robert W. Hughes of the Propulsion Control Branch of the

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Structures and Propulsion Laboratory; Larry A. Kiefling of the Systems Analysis Branch of the Systems Dynamics Laboratory; Charles C. Rupp of the Tethered Satellite System Project in the Special Projects Office; Robert J. Schwinghamer, director of the Materials and Processes Laboratory; and Frank J. Swalley, chief of the Systems Engineering Division in the Preliminary Design Office, Program Development Directorate.

Bandgren was recognized for "exceptional technical contributions to and able leadership of the SSME [Space Shuttle main engine] Program through development of innovative, cost-effective, and timely data evaluation methods."

Bean was honored for "exceptional service and exemplary leadership in the planning and implementation of personnel management activities at the George C. Marshall Space Flight Center."

The medal was presented to Croft for "personal dedication, untiring enthusiasm, able leadership and exceptional engineering achievements in the evaluation and selection of configurations for the Shuttle Derived Vehicle, a potential new hardware development program."

Driver was cited for "exceptional contributions to the Space Shuttle Program and for extraordinary technical and management abilities demonstrated as manager of the Main Propulsion Test Program for the Shuttle Projects Office."

Ehl was honored for "distinguished service and exceptional management and technical contributions in the field of materials and manufacturing process technology development."

Hughes was recognized for "exemplary contributions to the success of the Space Shuttle mission by the dedicated application of technical expertise to developing and qualifying an APU [auxilliary power unit] for the Shuttle boosters."

Kiefling was cited for "exceptional technical contributions to and able leadership in the Space Shuttle Program through the development of unique and innovative math models critical to the solution of component and subsystem failures impeding the development of the SSME [Space Shuttle main engine]."

The medal was presented to Rupp for "technical innovation, excellence, and engineering leadership in definition efforts leading to the establishment of the Tethered Satellite System and for professional skill and enduring enthusiasm during the critical conceptual design phases."

Schwinghamer was honored for "superior leadership and extraordinary contributions toward the technology transfer of four major productivity improvements from the Materials and Processes Laboratory to Shuttle program prime contractors."

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Swalley was cited for "efficient and dedicated service in systems engineering during the preliminary design and definition phase of several advanced projects as well as technical managerial contributions to the upper stage alternatives analysis."

The NASA Equal Opportunity Medal was presented to John R. Nunnelley, chief of the Analytical and Physical Chemical Branch of the Materials and Processes Laboratory. Nunnelley was honored for "exemplary contributions toward achieving equal employment opportunity for all employees though aggressive leadership, professional skill and personal commitment."

NASA Group Achievement Awards were presented to eight Marshall Center teams.

The Advanced X-Ray Astrophysics Facility Study Team received the award for "noteworthy achievements in AXAF conceptional design and program planning activities leading to the selection of AXAF by the National Academy of Sciences as the highest priority astronomy and astrophysics program recommended for start during this decade, and to the approval by NASA to proceed into the preliminary design phase."

The Foam Reinforcement of the Solid Rocket Booster Aft Skirt Ring Development Team was honored for "exceptional team performance in the development of a highly successful process engineering contribution -- a foam fairing to the SRB Aft Skirt stiffener rings which eliminated water impact damage."

The Orbital Maneuvering Vehicle Concept Definition Team was recognized for "exemplary contributions which led to the concept definition of the Orbiter Maneuvering Vehicle project."

The Solid Rocket Booster Hydraulic Power Unit Hydrazine Team was cited for "exceptional performance and major contributions in support of the Hydraulic Power Unit (HPU) through professional skill, personal dedication, and chemical metallurgical evaluations and assessments of the HPU fuel and hardware."

The Shuttle Projects Office Configuration Management Team received the award for "efficient and dedicated team effort in the development, implementation, and management of the Space Shuttle change management system."

The Solid Rocket Motors STS-8 Nozzle Erosion Investigation Team was honored for "exceptional engineering support of the STS-8A throat erosion anomaly investigation leading to a timely recovery plan through professional skill, technical insight and personal dedication."

The Spacelab Payload Crew Training Complex Team was recognized for "technical excellence, exceptional performance, and exemplary

contributions to the development and implementation of the Spacelab Payload Crew Training Complex."

The Standardized Launch Vehicle-X Proposal Development Team was cited for "exceptional team performance, dedication, enthusiasm and exemplary contributions to the preparation of the NASA Proposal on the Standardized Launch Vehicle-X Program."

Five of the Director's Commendation Certificates were received by Center employees who conducted the top three research projects funded by the Marshall Center Director's Discretionary Fund. The five are James A. Carter of the Systems Dynamics Laboratory, Dr. Mona J. Hagyard and Edward A. West of the Space Science Laboratory, and Dr. Mary Helen Johnston and Richard A. Parr of the Materials and Processes Laboratory.

Others receiving the Director's Commendation Certificate were Margaret W. Brennecke of the Materials and Processes Laboratory; Daniel R. Clough of the Procurement Office in the Administration and Program Support Directorate; Carl E. Colley, Robert J. Davies, Thomas C. French, Edward C. Hamilton, Billy A. Neighbors, Robert F. Nixon, James L. Sanders, and Billy W. Shelton of the Preliminary Design Office in the Program Development Directorate; and John W. Gresham Jr. of the Facilities Office in the Administration and Program Support Directorate.

-30-

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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Nov. 20, 1984

RELEASE NO: 84-94

FOG DISPERSAL TESTS AT MARSHALL SPACE FLIGHT CENTER

A series of tests were conducted at the Marshall Space Flight Center in Huntsville, Ala., recently in an effort to develop a method to disperse warm fog at Space Shuttle landing facilities.

Lack of visibility due to fog is one of the conditions that can cause the delay of an orbiter landing, or cause the orbiter to be diverted to an alternate landing site. Warm fog accounts for more than 95 percent of all fog occurrences in the United States.

Dr. Vernon W. Keller of the Systems Dynamics Laboratory at the Marshall Center has proposed a solution to this problem that uses water to force the fog to collect into large droplets and fall rapidly to the ground. The tests at Marshall, supervised by Keller, were to verify his concept.

"The tests were designed to measure the size of water droplets and to identify water nozzles and operating conditions which would produce and project the correct size water drop to heights above 75 feet," said Keller.

To conduct the tests, water was pumped from a pond near a Marshall Center test stand using three mobile firefighting modules developed jointly by the Marshall Center and the U.S. Navy. The modules provided the ability to spray up to 10,000 gallons of water per minute to a height of up to 150 feet. Each module supported several high volume flow nozzles, which produced a variety of sizes and concentrations of drops. The drops were measured spectrally to determine their sizes, and the concentrations obtained during the tests.

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"We were very fortunate during the tests to experience heavy fog in the area of the test stand, which gave us an opportunity to see the concept at work," said Keller. "And, visually, we could see it worked well, despite the less than perfect conditions. Under perfect conditions, the water used and the air temperature would be identical in order to prevent the water droplets created from forming additional fog. When we performed our test in the heavy fog, the water temperature was approximately four degrees warmer than the air temperture. Even under these conditions, the visibility in the area of the fog was measurably improved.

"Preliminary results indicate the technique could be of substantial benefit in clearing fog along Shuttle and aircraft runways. Now, we plan to analyze all the data we gathered and develop a detailed plan on how to proceed from here."

Arrangements for the use of the firefighting modules participation in this test were made by Marshall's Technology Utilization Office. If the concept proves successful, the Technology Utilization Office will also be responsible for making the new concept available for use at commercial airports and on highways and bridges where fog creates a safety hazard.

Also participating in the tests were Ralph Burns of the Marshall Center's Structures and Propulsion Laboratory who was the project engineer for the module development, and James Manser of the U.S. Navy who was director of module operations.

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Nov. 29, 1984

RELEASE NO: 84-95

NASA EMPLOYEE HONORED FOR COURAGE IN BOATING DISASTER

A engineer at NASA's Marshall Space Flight Center in Huntsville, Ala., today received the state's highest honor, the Distinguished Service Award, for his part in the recovery of bodies after a boating disaster on the Tennessee River July 7.

The Alabama Department of Public Safety award was given to Homer Hickam, Jr., an engineer in the Spacelab Program Office at the Marshall Center, in a special ceremony today. Presenting the certificate, signed by Alabama Governor George C. Wallace, was Capt. John Henderson, commander of the department's Safety, Education and Public Relations Unit in Montgomery. He was assisted by Sgt. Larry Hardin and Cpl. Wendell Bagwell, Safety, Education and Public Relations Officers for the Huntsville and Decatur State Trooper Posts, respectively.

Also being honored at the same ceremony was Mick Roney, a local swimming coach and manager of a Huntsville swimming association, who joined Hickam in the rescue attempt.

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Hickam, an amateur scuba diver, volunteered to attempt to rescue any survivors following the sinking of the SCItanic, a private boat owned by a Huntsville corporation. High winds during a violent storm had turned the boat completely upside down and trapped 11 passengers inside.

Hickam happened on the scene of the capsizing only minutes afterward.

Both Hickam and Roney searched for survivors but found all 11 passengers drowned. After smashing through windows and doors under water and sustaining a number of cuts, they were able to recover the bodies.

The citation of the Distinguished Service Award read that each man "exposed himself to immediate danger, knowing of the probability of serious injury or death, in efforts to rescue eleven people who were trapped inside the SCItanic ... and in that so displayed those attributes so deeply admired of courage, tenacity, perseverance, and concern for his fellow man and beyond any doubts, his acts of bravery serve as a beacon by which all others may be guided."

Those attending the ceremony included Marshall Center Director Dr. William R. Lucas, other Marshall managers, and the families of the award recipients.

"I'm honored to be receiving this award," said Hickam, "but I'm also surprised. I just happened to be there (at the scene of the capsizing) that day. It was really tragic. Mick and I just did the best we could. We never lost hope that we might find somebody alive."

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RELEASE NO: 84-99

NASA SELECTS BOEING COMPUTER SERVICES FOR COMMUNICATIONS CONTRACT

The National Aeronautics and Space Administration has selected the Boeing Computer Services Co., Vienna, Va., for negotiations leading to the award of a contract to provide program support communications for the agency.

The contractor will provide hardware, software, documentation and transmission services required to deliver, install, operate and maintain a Program Support Communications Network and three Private Automatic Branch Exchanges (PABXs); and the communications mission services to support the network and PABXs.

The term of the contract, including priced and unpriced options, will be up to 10 years, with a proposed cost/price of approximately $205 million for the first five years. The contract will be a cost-plus-award-fee contract for the mission services, fixed-price lease with option to purchase the Program Support Communications Network, fixed-price lease to ownership for the PABX, and a fixed price requirements lease for the tariffed transmission service.

Boeing Computer Services Co. will have the Brown and Associates Management Services (BAMSI), Titusville, Fla.; RCA Service Co., Cherry Hill, N. J., and Teledyne Brown Engineering Corp., Huntsville, Ala., as subcontractors in the performance of the contract.

The Program Support Communications Network will interconnect NASA Headquarters, field installations, and major contractor locations for the transfer of programmatic and institutional data and voice. The Marshall Space Flight Center will manage the network for NASA.

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The Private Automatic Branch Exchanges will provide voice and data systems at the Marshall Space Flight Center in Huntsville, Ala., the Michoud Assembly Facility near New Orleans, La., and the Slidell Computer Complex in Slidell, La.

The engineering and operations services necessary to support the Program Support Communications Network, the three Private Automatic Branch Exchanges and Marshall Center intracenter communications will be provided under the communications mission services requirements of the contract.

Other firms submitting proposals for the contract were: AT & T Technologies Systems, Greensboro, N.C.; Bell South Systems Technology Inc. (withdrawn prior to selection), Birmingham, Ala.; Ford Aerospace and Communications Corp., Houston; GTE Business Communications Systems, Inc., Darien, Conn.

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January 24, 1985

RELEASE NO: 85-3

CONSTRUCTION-IN-SPACE TEST TO FLY ABOARD SHUTTLE THIS YEAR

The U.S. efforts toward homesteading in space will continue late this year when astronauts test a NASA experiment aimed at building large structures in orbit.

In December 1985, a structural assembly test called "EASE" -- for "Experimental Assembly of Structures in EVA (Extravehicular Activity)" -- will provide fresh insight into the ability of humans to work in space.

The experiment is managed by NASA's Marshall Space Flight Center in Huntsville, Ala.

Essentially the experiment involves six aluminum beams, each 12 feet in length and 4 inches in diameter. Located in the payload bay of the Space Shuttle, the beams will be carried into orbit and continually assembled and disassembled by a team of two Shuttle crew members dressed in extravehicular activity suits.

"In this experiment, astronauts will demonstrate the performance of human beings in orbit as they attempt to build strong, practical structures," said the Marshall Center's Ed Valentine, mission manager for the experiment.

When the team completes the assembly, its shape will always be a tetrahedron -- a four-sided pyramid. "This is a first step," said Valentine. "Our ultimate purpose with this experiment is to build structures in space. The ability to move about in space and put beams together into a unified, practical whole has applicability to a number of things under study, such as the Space Station."

The two crewmembers assigned to work with the experiment will be tethered to the payload bay and their movements recorded

-more-

with videotape and still photographs. The team will link the beams by special connectors at the tips, rather than with the more traditional Earth-bound method of beam-connecting by nuts and bolts.

"This building approach falls within the class of techniques within the Large Space Structures program called 'erectible' methods," said Valentine. "The other class is the 'deployable' method, but this isn't going to be demonstrated -- at least not until 1986 or '87 when we orbit the 'SADE,' or 'Structural Assembly Demonstration Experiment.' It'll be the follow-on experiment to the tetrahedron assembly, and will involve both erectible and deployable methods in constructing a metal truss."

For several years Earthly tests of similar experiments have been carried out in Marshall's Neutral Buoyancy Simulator, a million-gallon water tank that provides a sense of weightlessness to people submerged within it and working in space suits.

Historically, EASE has its ties with both the neutral buoyancy tank and the Massachusetts Institute of Technology. "In 1980 the school asked the Marshall Center for use of its tank to perform structural assembly experiments," said Valentine. "When the Shuttle later became operational and NASA began looking at possible flight experiments for it, the school proposed the tetrahedron experiment to NASA Headquarters as a preliminary study to the SADE."

In late 1982 the notions of a first structural assembly test in space coalesced into the experiment now known as EASE. The demonstration is currently scheduled for Shuttle flight 61-C.

After the videotape and still pictures of the test have been returned to Earth for study, the results will be correllated with those found in the neutral buoyancy tank. "Basically we'll time how long it takes to assemble the tetrahedron and how long it takes to take it apart," said Valentine. "Somehow, though, we'd like to be able to measure a human being's productivity in space scientifically. We're not really sure if time measurements are all that are needed to guage that, so we'll be examining other possible criteria to use in the future."

When the experiment is launched into space this year, it will be accompanied by a structural assembly project managed by the Langley Research Center in Langley, Va. The Marshall Center is responsible for integrating the two experiments, both of which will rest upon a special structure called "MPESS," for "Mission Peculiar Equipment Support Structure."

"We think the tetrahedron experiment this year is the beginning of a wide-ranging application of construction in space," said Valentine, "all starting with this relatively modest test called 'EASE'."

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Marshall Space Flight Center 1960-1985

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NASA SELECTS GRUMMAN FOR CLASS VI COMPUTER SYSTEM CONTRACT

NASA's Marshall Space Flight Center in Huntsville, Ala., announced today the selection of Grumman Data Systems Corportaion of Bethpage, N.Y., for negotiations leading to the award of a contract for a high speed (Class VI) computer system.

The firm-fixed price contract will require Grumman to provide hardware, software, documentation and services required to deliver, install, and maintain an engineering analysis and data system.

The system will be used for scientific and engineering computations in support of Marshall Space Flight Center programs with emphasis on analysis of thermal, electrical, loads and structural design characteristics that influence flight vehicle and payload performance.

Cost of a five-year contract is approximately $42 million. The contract provides for a total lease period, with renewal in periods of one to 12 months, not to exceed 60 months.

Other firms submitting proposals for the contract were: Falcon Systems, Inc., of Bethesda, Md., and Sperry Corporation of McLean, Va.

-30-

NASA News

National Aeronautics and
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Marshall Space Flight Center 1960-1985

David B. Drachlis
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For Release
February 1, 1985

RELEASE NO: 85-5

MARSHALL CENTER SPACELAB MISSION COUNTED AMONG NATION'S TOP ENGINEERING ACHIEVEMENTS

NASA's Marshall Space Flight Center in Huntsville, Ala., was recognized today by the National Society of Professional Engineers for its role in the historic first mission of Spacelab -- a reusable facility that transforms the Space Shuttle into a versatile on-orbit scientific research center.

The society announced the selection of the Marshall Center-managed Spacelab 1 mission, launched on November 28, 1983, as one of the nation's Ten Outstanding Engineering Achievements for 1984. Because the 10-day mission took place so late in 1983, the society determined that it could be considered for competition in 1984.

Another of the society's 10 awards for 1984 went to the Perkin-Elmer Corp. of Danbury, Conn., which was cited for its development of the Hubble Space Telescope's Optical Telescope Assembly, another technically sophisticated NASA project managed by the Marshall Center.

The announcements were made during a special awards ceremony at the society's Winter Professional Meeting in Albuquerque, N.M. Thomas J. Lee, the Marshall Center's Deputy Director, accepted the award for Spacelab at the meeting on behalf of center employees.

The Spacelab 1 mission was previously selected as the year's Outstanding Engineering Achievement in Alabama, and was entered by the Alabama Society of Professional Engineers in the national competition.

The Spacelab 1 mission was an international scientific research expedition during which more than 70 investigations sponsored by 14 nations were conducted in five scientific disciplines.

Throughout the mission, hundreds of scientists in a special ground-control facility at the Johnson Space Center in Houston worked directly with astronauts and scientists, called payload specialists, on orbit. Payload specialists, who work in the orbiting lab, are career scientists from outside NASA's astronaut corps who are selected by their peers to fly on a particular mission.

During the first Spacelab mission, they worked with their ground-based counterparts to study the stars and the sun and look at the Earth, its atmosphere, and the magnetic field that surrounds it. They conducted human and plant research, and they studied the processing of materials in space.

Carried in the cargo bay of the Space Shuttle orbiter, Spacelab consists of a pressurized module - or room - in which scientists work, and a series of unpressurized structures called pallets that contain instruments requiring direct exposure to space.

Spacelab was built by the European Space Agency in cooperation with NASA. In addition to its mission management role, the Marshall Center was cited by the society for its management of NASA's Spacelab development role, which included the transfer tunnel connecting the Shuttle orbiter cabin to the module and other components necessary for successful operation of the laboratory. The center was also recognized for providing technical and programmatic monitoring of the Spacelab design and development activities in Europe and for lending technical expertise and support to the European Space Agency.

Virtually every engineering discipline contributed to the successful flight of Spacelab, from design to crew training.

NASA News

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March 5, 1985

RELEASE NO: 85-11

Dessler Receives Commemorative Medal

Dr. Alexander J. Dessler, director of the Space Science Laboratory at NASA's Marshall Space Flight Center in Huntsville, Ala., has been presented a bronze medal by the Soviet Geophysical Committee of the Union of Soviet Socialist Republics Academy of Sciences.

The medal was one of 1,000 made to commemorate the 100th anniversary of the first international geophysical progam, the First International Polar Year, 1882-1883.

The medals were presented to scientists who have made important contributions to international geophysics involving solid Earth, oceans, atmospheres, solar-terrestrial relations, and the geophysical programs in Antarctica and space.

Dessler was one of approximately 100 American scientists who were selected by the Soviet Geophysicl Committee to receive one of the medals.

The certificate accompanying the medal cites Dessler for his "distinguished contributions to fulfillment of international geophysical programs."

Since beginning his scientific career in 1956, Dessler has specialized in research in the fields of low-temperature physics, atmospheric electricity, and space phycics. He is the author of more than one hundred technical papers on these subjects. He is a fellow of the American Geophysical Union, the American Association for the Advancement of Science, and he has served as an officer of the International Association of Geomagnetism and Aeronomy.

The Space Science Laboratory is responsible for conducting basic research in space science in support of the activities of the Marshall Space Flight Center and NASA. Areas of research in the laboratory include solar-terrestrial physics, astrophysics and low-gravity space processing.

-30-

NASA News

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March 20, 1985

RELEASE NO: 85-12

NASA SELECTS AXAF SCIENTIFIC INVESTIGATIONS

NASA has announced the selection of scientific investigations to be implemented on the proposed Advanced X-ray Astrophysics Facility (AXAF), managed by the AXAF Task Team in the Program Development Directorate at the Marshall Space flight Center in Huntsville, Ala.

The AXAF will be a long-lived X-ray observatory that will operate in low-Earth orbit for at least 15 years. The AXAF investigators fall into three categories: instrument principal investigators, with the responsibility for design and fabrication of scientific instrumentation to be placed in the telescope focal plane; interdisciplinary scientists, who provide scientific expertise from both X-ray astrophysics and other fields of astronomy; and a telescope scientist, who will provide the scientific and technical expertise essential to the fabrication of the X-ray telescope.

"We're pleased to see that the principal investigators and scientists have been chosen," said David Cramblit, deputy manager of the Marshall task team. "The selections place us nearer to our goal in making this advanced X-ray observatory a reality."

The basic observatory consists of a 1.2-meter diameter, 10-meter focal length X-ray telescope housed within a spacecraft carrying an array of selected instruments and providing power, precise pointing and data transmission. The AXAF will make detailed observations of X-ray emissions from cosmic sources ranging from nearby stars to distant quasars.

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Construction of the X-ray facility could begin as early as 1987-1988 with launch approximately five years later. In orbit, AXAF will join the Hubble Space Telescope, to be launch in 1986, and the Gamma Ray Obserrvatory, planned for launch in 1988. These three space observatories, together with the later launch of the planned Space Infrared Telescope Facility, will provide the capability for simultaneous observations of cosmic sources over infrared, visable, ultraviolet, X-ray and gamma ray wavelengths.

The instrument principal investigators selected and their investigations are Dr. Gordon Garmire of Pennsylvania State University, "Charged Coupled Device Imaging Spectroscopy"; Dr. Steven Murray of the Smithsonian Astrophysical Observatory, "High Resolution Camera"; Dr. Stephen Holt of the Goddard Space Flight Center, "X-Ray Spectroscopy Investigation for the AXAF"; Dr. Claude Canizares of the Massachusetts Institute of Technology, "High Resolution X-Ray Spectroscopy using AXAF"; and Dr. Albert Brinkman of the University of Utrecht in the Netherlands, "High Throughput Transmission Grating for Cosmic X-Ray Spectroscopy."

The interdisciplinary scientists selected are Dr. Riccardo Giacconi of the Space Telescope Science Institute, "Advanced X-Ray Astrophysics Facility Mission (AXAF)"; Dr. Jeffrey Linsky of the National Bureau of Standards, "The Coronal Structures of Selected Cool Stars and Close Binary Systems"; Dr. Richard Mushotzky of the Goddard Space Flight Center, "A Program to Measure the Mass of Galaxies and Clusters of Galaxies with AXAF"; Dr. Andrew Wilson of the University of Maryland, "Studies of Radio Jets and the Narrow Line Regions of Active Galaxies with AXAF"; and Dr. Andrew Fabian of Cambridge University in the United Kingdom, "Cooling Flows in Clusters and Galaxies."

The telescope scientist selected is Dr. Leon Van Speybroeck of the Smithsonian Astrophysical Observatory.

The selected investigators will be appointed members of the AXAF Science Working Group that will provide scientific and technical guidance to the project through all stages from initial design to on-orbit operation. Each will receive a specific amount of time to use the telescope during the first 30 months after the AXAF is declared operational. The majority of observing time will be made available to astronomers throughout the United States and around the world.

-30-

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NASA FactSheet

National Aeronautics and
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RELEASE NO: 85-13

NASA SELECTS 6 INDUSTRY TEAMS FOR SPACE STATION CONTRACTS

NASA has selected six industry teams for negotiations leading to definition and preliminary design contracts for Space Station. The contractors chosen to define the work package assigned to the Marshall Space Flight Center in Huntsville, Ala., are Boeing Aerospace Co., Seattle; and Martin Marietta Aerospace, Denver.

Four work packages in all have been divided among several NASA centers for the definition effort, sometimes called "Phase B." The Space Station is proposed to be operational in low-Earth orbit by the mid 1990s.

"We're very pleased that the final large step toward establishing the preliminary design of the Station has begun," said Luther Powell, manager of Marshall's Space Station Project Office. "All of us at Marshall and throughout NASA are anxious to get on with the work of this great project."

The contracts will begin April 15, extend for 21 months and cover Space Station elements assigned to Marshall; the Goddard Space Flight Center, Greenblet, Md.; the Johnson Space Center, Houston; and the Lewis Research Center, Cleveland.

Contractors assigned to the Goddard work package are RCA Astro Electronics, Princeton, N.J.; and General Electric Co., Space Systems Division, Philadelphia.

Assigned to the Lewis package are Rockwell International, Rocketdyne Division, Canoga Park, Calif.; and TRW Federal Systems Division, Redondo Beach, Calif.

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In addition, NASA will negotiate with Lockheed Missiles & Space Co., Sunnyvale, Calif.; McDonnell Douglas Astronautics Co., Huntington Beach, Calif.; and Rockwell International, Space Station Systems Division, Downey, Calif., the three proposers for work to be performed under the management of the Johnson Center. Following negotiations, a report will be presented to the NASA Administrator who will then award one or more contracts.

Although the value of each contract will be negotiated, the Request for Proposal issued Sept. 14, 1984, indicates that the approximate value of each contract to be managed by the Marshall Center could be $24 million, by Johnson $27 million, by Goddard $10 million and by Lewis $6 million.

In addition to the definition and preliminary design of the permanently manned Space Station, contractors are required to study how those elements of the Space Station would change were the station originally man-tended rather than permanently manned. Contractors also will pay particular attention to the recommendations of the NASA Advanced Technology Advisory Committee that is identifying automation and robotic technologies that could be used in the Space Station.

Following completion of the 21-month contracts, NASA plans to move, in 1987, into final design and development (Phase C/D) of the Space Station.

The work to be managed at each center covers:

Marshall -- Definition and preliminary design of pressurized "common modules" that can be equipped with appropriate systems for use as laboratories, living areas and logistic transport; environmental control and propulsive systems; a plan for equipping a module as a laboratory and additional ones for use as logistics modules; and accommodations for orbital maneuvering and orbital transfer vehicles.

Johnson -- Definition and preliminary design of the structural framework to which the various elements of the Space Station will be attached; interface between the Space Station and the Space Shuttle; mechanisms such as the Remote Manipulator Systems; attitude control, thermal control, communications and data management systems; plan for equipping a module with sleeping quarters, wardroom and galley; and plan for extra-vehicular activity.

Goddard -- Definition and preliminary design of the automated free-flying platforms and of provisions to service, maintain and repair the platforms and other free-flying space-craft; provisions for instruments and payloads to be attached externally to the Space Station; and plan for equipping a module as a laboratory.

Lewis -- Definition and preliminary design of the electrical power generation, conditioning and storage systems.

President Reagan, in his State of the Union Message of Jan. 25, 1984, directed NASA to develop a permanently manned Space Station and to do it within a decade. With the Space Shuttle approaching operational maturity, the agency believes the Space Station to be the next logical step in space for the United States.

NASA will retain the responsibility for overall program definition and plans to retain responsibility for systems engineering and integration throughout the program. This effort will be managed at the Johnson Space Center.

NASA's plans call for a Space Station to be operational by the mid 1990s. It will be capable of growth both in size and capability and is intended to operate well into the 21st century. It is planned to be placed in low Earth orbit, about 300 miles high, and at an inclination to the equator of 28.5 degrees. It will include a number of pressurized modules and a power supply of about 75 kilowatts, support a crew of six to eight people and have two or more free-flying platforms.

For the purpose of the definition and preliminary design activity, NASA has selected a Space Station reference configuration called the "power tower". This is one of a family of configurations that uses similar elements or components. The power tower family is considered a starting point for the definition studies and is expected to undergo significant modifications as the studies progress. Contractors may offer modifications within the reference concept family or other preliminary designs.

Launch of the Space Station elements and subsequent transportation between the Earth and station will be provided by the Space Shuttle.

A major objective of the Space Station Program is to bring about participation of international partners as builders and users as well as to assist in Space Station operations. The European Space Agency, Canada and Japan have indicated interest in participating in the Space Station program. Funding for such international participation will be provided by the other governments who will award their own definition and preliminary design contracts in phase and in coordination with the NASA activity.

- 30 -

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NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Marshall Space Flight Center 1960-1985

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RELEASE NO: 85-15

NASA INVENTORS OF THE YEAR ANNOUNCED

The National Aeronautics and Space Administration today presented its 1984 Inventor of the Year Award to Dale M. Kornfeld of Marshall Space Flight Center in Huntsville, Ala., and Drs. John W. Vanderhoff, Mohammed S. El-Aasser and Fortunato J. Micale, all of Lehigh University in Bethlehem, Pa. The inventors were honored for their "Process for Preparation of Large-Particle Size Monodisperse Latexes."

At a ceremony at NASA Headquarters in Washington, D.C., the inventors were presented an Inventor of the Year plaque and certificate, a Space Act Award certificate and a monetary award. Kornfeld and Vanderhoff each received $2,500; El-Aasser and Micale, $2,000. Edward Sudol, Chi-Ming Tseng and Anthony Silwanowicz, also of Lehigh, will each receive a $2,000 Space Act Award. These three were contributors but not considered as inventors.

The Monodisperse Latex Reactor, an experiment flown aboard the Space Shuttle, has produced microspheres in zero gravity in sizes ranging from 5 to 30 micrometers. The maximum size particles that can be produced on Earth, with the required standards of quality and uniformity, is about 2 to 3 micrometers.

Microspheres can be used in calibrating sensitive scientific instruments such as microscopes, filters and particle counters. Medical uses include identification of cancer and glaucoma and the study of the transport of materials inside living organisms. Industrial applications include the production of finely-ground products such as paint pigments, inks, toners, explosives and other powder materials.

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In July 1984, a major step was taken toward making the microspheres commercially available, when NASA presented 15 grams of 10-micrometer particles to the Commerce Department's National Bureau of Standards (NBS). NBS will certify the microspheres as "standard reference material" and make them available to purchasers.

NASA has submitted the names of the four inventors to the Intellectual Property Owners, Inc. (IPO) as nominees for national recognition. IPO, in cooperation with the U.S. Patent and Trademark Office, conducts National Inventor of the Year competition.

In 1978, Barbara Askins, also of the Marshall Center, was selected as the National Inventor of the Year for her invention of a practical autoradiographic image enhancement process.

Earlier this year, Philip A. Studer of Goddard Space Flight Center, Greenbelt, Md., was presented the NASA 1983 Inventor of the Year Award for his invention of a linear magnetic bearing.

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FIRST MAJOR SIMULATION OF SPACELAB 2 COMPLETED

The launch of Spacelab 2, a multi-discipline science experiment payload, moved a step closer to reality recently when the first major test series involving actual flight hardware was completed at the Kennedy Space Center, Fla.

Scheduled for launch aboard the Space Shuttle orbiter Challenger July 12, the Spacelab 2 experiments had undergone a series of three intensive tests over several months to verify their compatibility in space. Known collectively as the "mission sequence test," it was the first time that the actual experiment flight hardware for the mission was operated in tandem with the Spacelab flight systems.

"And we're pleased to say that the testing was overwhelmingly successful," said Spacelab 2 Mission Manager Roy Lester of NASA's Marshall Space Flight Center in Huntsville, Ala. "We learned we could operate this complex system with high efficiency within acceptable Spacelab resource allocations. We feel ready to fly."

Marshall has NASA responsibility for managing the first three Spacelab missions in a series of Spacelab flights extending over several years. The first mission flew in 1983; the next will be launched later this month.

"This third and last test was a simulated six-hour slice of the actual on-orbit timeline," explained Lester. "It simulated the commanding of experiments as if it were being done both from the Payload Operations Control Center (at the Johnson Space Center in Houston) and from the flight deck of the orbiter."

The six-hour period chosen was one that would put maximum stress on the computer, according to Lester. "It was a worst-case scenario," he said. "You have to choose a situation like that. Otherwise, the test wouldn't have given us the confidence we have now that we're ready to go."

Resting upon three pallets and a special support structure, the 13 Spacelab 2 experiments cover seven scientific disciplines.Unlike the other two Spacelab missions being managed by Marshall, no habitable laboratory module is involved; instead, the Spacelab 2 crew will operate the experiments from the aft deck of the orbiter interior.

The Payload Operations Control Center, consisting of a cadre of Marshall engineers and scientists, will have direct communication with the crew. Often called simply the "POCC," the control center will also have data monitoring capability and, coexistent with the crew, control of a number of experiments.

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SPACELAB 3 PRELIMINARY SCIENTIFIC RESULTS 'EXCELLENT'

Following the successful conclusion of the recent Spacelab 3 space mission, many of the experiment teams for the mission's scientific experiments have made a preliminary analysis of the volumes of data obtained during the mission.

"Investigators have made only a cursory look at the more than 250 billion bits of data and the preliminary results are excellent," said Dr. George Fichtl, Spacelab 3 mission scientist of the Systems Dynamics Laboratory at NASA's Marshall Space Flight Center in Huntsville, AL. Spacelab 3, managed by the Marshall Center, was launched April 29 and ended May 6.

Materials Science

In the area of materials science, two of the three experiment teams have already been able to closely examine the crystals grown during Spacelab 3, according to Fichtl.

A mercury iodide crystal about the size of a sugar cube was successfully grown from a seed crystal in the Vapor Crystal Growth System. Using a vapor transport technique, the crystal grew at a carefuly controlled rate over a 104-hour growth period. "The crystal is still contained in the glass ampoule," said experiment team member Nate Skinner of EG&G Energy Measurements, Inc. "It is expected to be removed from the ampoule within the next few weeks for analysis. The analysis will determine its quality and properties as an X-ray and gamma ray detector for applications in scientific research, medicine and industry."

Two triglycine sulfate crystals were successfully grown in the Fluid Experiment System. This was the first time crystals were grown in space using a fluid transport technique. The two crystals will undergo a thorough analysis to determine their quality and properties as sensitive infrared detectors. "The crystals look quite good," according to co-investigator Roger Kroes of Marshall's Space Science Laboratory.

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"The Vapor Crystal Growth and Fluid Experiment Systems combined with the capabilities of Spacelab provided scientists the first opportunity for scientists to see in detail the crystal growth process in the microgravity environment, and to determine differences between crystal growth on Earth and in microgravity," Fichtl said.

The French Mercury Iodide Crystal Growth experiment is believed to have yielded six cartridges of seed-type crystals though they have not yet been examined by investigators. The cartridges are being returned to France for postflight analysis. Each of the cartridges had slightly different properties and will provide data about the nucleation (beginning) of crystal growth.

Fluid Mechanics

Two fluid mechanics experiments were completed successfully during the mission.

The Geophysical Fluid Flow Cell experiment completed more than 102 hours of experiments designed to provide information on convective flows on rotating spherical bodies. "The films of one of the Jovian (Jupiter) scenarios have indicated the formation of a 'Red Spot' similar to that present on Jupiter," said co-investigator Dr. Fred Leslie of the Systems Dynamics Laboratory. "This indicates the data we have obtained will be useful to meteorologists and astrophysicists in modelling the large-scale circulations of fluids under the influence of rotation, gravity and convection." These experiments were the first to explore convection in spherical rotating shells with a radial gravity field.

The Drop Dynamics Module, after a successful inflight repair by payload specialist Dr Taylor Wang of NASA's Jet Propulsion Laboratory, provided the first experimental data on the behavior of a free-floating fluid in the microgravity environment. "This represents a significant technological step forward towards true containerless materials processing," according to Fichtl. "In addition to the technology development aspect, the experiment provided new data useful in understanding the fundamental behavior of fluids. This data will aid the fields of astrophysics and atmospheric science as well as the materials science field." Several unexpected results were observed during the experiments, and the photography obtained will allow scientists to determine the causes and principals involved in these results. "This experiment is an important example of the capability Spacelab provides for scientists to perform pioneering science," he said. "Wang, who is the principal investigator on this experiment, and his colleagues working in the Payload Operations Control Center were able to perform their experiments nearly as they would in an Earth-laboratory -- changing the procedures and adjusting the equipment in response to the results observed first hand. This opportunity to 'fine tune' the experiment in progress is one of Spacelab's most useful qualities."

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Atmospheric and Astronomical Observations

Three atmospheric and astronomical observations were completed.

The Atmospheric Trace Molecules Spectroscopy Experiment operated for 50 hours providing 19 sequences of more than 150 independent atmospheric spectra. Each spectra contains more than 100,000 individual spectrally resolved measurements which will be used to analyze the Earth's atmospheric composition chemically and physically for the stratosphere and mesosphere between 10 and 150 kilometers. This information will provide an extremely detailed measurement of the minor and trace components of the atmosphere which is crucial to understanding the evolution and climate of Earth, according to Fichtl. These studies also will aid in the analysis of pollution causes and effects. In addition to the pioneering Earth atmosphere data returned, the experiment also provided the first high resolution infrared spectrum of the sun. These observations were obtained during five calibration sequences and indicate some surprising evidence about molecular constituents on the sun. "This single experiment has provided more data than previously obtained in decades of balloon-based research with similar instruments," said Fichtl.

Eighteen Auroral Imaging Experiment observations were carried out with auroras clearly visible during each. This marked the first time since the early 1970s that an aurora experiment flew on a manned vehicle and was the first American experiment to pass through three separate aurora, possible because of the high-inclination orbit of the Shuttle. Video tape images from the experiment will be processed to yield three-dimensional images of auroral structure and motion. Among the finds will be the first substantial data set from low-Earth orbit which will allow the vertical extent and dimension of the auroral forms to be determined and measured. Preliminary measurements indicate the height of the aurora is more a function of local time than geomagnetic substorm time.

The Studies of the Ionization of Solar and Galactic Cosmic Ray Heavy Nuclei experiment, also called Ions, was mounted outside the pressurized module and successfully collected data on high energy particles streaming toward Earth from the sun and from more distant sources in the galaxy. Tracks in the detector will be analyzed to identify the trace of cosmic rays to determine their specific ionization state, intensity, energy spectrum, arrival time and direction.

Life Sciences

Six life sciences experiments were completed successfully during Spacelab 3.

Four of these were part of the Ames Research Center Life Sciences Payload. The new Research Animal Holding Facilities was demonstrated a suitable animal habitat. The two squirrel monkeys and 24 rats adjusted well to spaceflight and demonstrated their

suitability for research in orbit. One primate apparently developed symptoms of space adaptation syndrome but recovered in a manner analogous to human experience.

Four members of the Spacelab 3 crew participated in the Autogenic Feedback Training investigation. In general, the hardware performed nominally. Information obtained on this flight, yet to be analyzed, will be used to evaluate the autogenic feedback technique for controlling symptoms.

All planned calibration and dead volume measurements were performed for the engineering objectives of the Urine Monitoring System experiment. Urine samples collected during the mission are being analyzed.

"In addition to the successful results from each of these experiments, the overall success of the mission has proven the importance of the Spacelab concept," said Fichtl. "During this mission, we have proven that a microgravity environment is an important environment for the growth of crystals, the study of fluid mechanics and measurment of the effects man is having on his environment. We have also proven the need for man's presence in performing these tasks."

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June 27, 1985

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MARSHALL SPACE FLIGHT CENTER CELEBRATES 25TH ANNIVERSARY

Monday, July 1, marks the 25th Anniversary of one of the nation's pioneering space institutions, NASA's Marshall Space Flight Center in Huntsville, Ala.

During its first quarter century, the Center has evolved from its initial role as NASA's developer of launch vehicles and propulsion systems to a scientific and engineering organization responsible for spacecraft and scientific experiments as well.

Today, Marshall is responsible for a wide range of major NASA programs including the Space Shuttle's engines, propellant tank and booster rockets; the Hubble Space Telescope; Spacelab orbiting research laboratories; Shuttle upper stage systems; and a significant portion of Space Station.

The Center now manages a budget of about $2 billion annually. Currently some 3,300 people from Huntsville and the surrounding Alabama-Tennessee area are employed at Marshall, while thousands more work with numerous aerospace and other high-tech organizations in the area that support the Center's many space efforts.

The group which formed the nucleus of the Marshall Center when it was founded in 1960 had already developed early rockets, including the Redstone and Jupiter, which launched the free world's first satellite, Explorer I, in 1958. Headed by Dr. Wernher von Braun, Marshall's first director, the group's initial task for NASA was to modify the Redstone for manned space flight. Less than a year after its formation -- in May 1961 -- a Marshall Redstone rocket boosted America's first astronaut, Alan Shepard, on a successful suborbital flight and launched America into the manned space program.

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Marshall also had a charter to develop a launch vehicle of unprecedented size and power to propel man to the moon. The Center gained further world prominence with the accomplishment of that charter -- the Saturn series of rockets. The largest of that series was the giant Saturn V, a 36-story multistage rocket that successfully launched the series of Apollo spacecraft that carried 27 men around the moon. Twelve of those men landed on the lunar surface.

The Saturn program didn't end with the last Apollo mission in 1972. Marshall's Saturn rockets were subsequently used in 1973 to launch Skylab and the three crews that worked on board Skylab, and the Apollo-Soyuz mission in 1975. And long before the program ended, the Marshall Center had begun to diversify and prove it could do more than develop and build launch vehicles.

The Center moved from launch systems to manned systems with management responsibility for the Lunar Roving Vehicle, the "moon car" used to transport astronauts and materials on the lunar surface during the last three Apollo missions. It continued its manned systems role as NASA's lead center for Skylab, the world's first space station. The Marshall Center developed strong new capabilities for science payloads and mission support operations while managing the Skylab project. Those capabilities led to increased responsibility in more recent space endeavors.

In 1970, NASA initiated Space Shuttle development activity. Marshall was heavily involved in the definition phase leading to the current Shuttle configuration. When the final concept was selected, the Center became responsible for development of its propulsion systems. Of the four principal Shuttle elements--the orbiter, main engines, external tank and solid rocket boosters -- all but the orbiter were developed under Marshall management. And after several years of development and testing, it was at the Marshall Center where all Shuttle elements were assembled for the first time in 1978 for a series of vibration tests.

Beginning with the first Shuttle launch in 1981, Marshall's propulsion elements have performed brilliantly. But the Center's role in the program involves more than the propulsion systems. Nearly every Shuttle mission includes a payload or payloads developed or managed by the Marshall Center.

One of those payloads, the Monodisperse Latex Reactor, produced the first product to be labeled "manufactured in space," and offered for sale to industry. The payload produced latex beads of a few microns in diameter that were more uniform than can be produced on Earth.

Another of those payloads, Spacelab, is a reusable research laboratory carried in the payload bay of the Shuttle orbiter. Spacelab was built by the European Space Agency, but the Marshall Center manages Spacelab activities for NASA and controls many of the Spacelab missions dealing with a variety of research areas

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such as astronomy, Earth observations, space plasma physics and materials science. For the missions assigned to Marshall, the Center provides the mission manager, mission scientist and numerous operations personnel.

The Hubble Space Telescope, another Marshall payload, is scheduled for launch from the Shuttle in 1986. It will weigh 12 tons, be 43 feet long and 14 feet in diameter. Expected to revolutionize modern astronomy, the telescope's 94-inch primary mirror will enable astronomers to see seven times farther into space and observe objects that appear 50 times fainter than they can see from the best ground-based observatories. The space telescope will serve as the world's premier astronomical research facility for the rest of the century.

Beyond the series of Shuttle and Spacelab missions, and the launch of the space telescope, lies the Space Station. When President Reagan announced the Space Station initiative in early 1984, he referred specifically to the engineering and scientific achievement of Marshall's Spacelab 1 mission. The Space Station will be the largest manned system ever attempted, and because it is intended to be permanent, it must be designed for on orbit maintenance, repair and refurbishment. The Marshall Center will manage a major portion of the Space Station work -- about 40 percent. The work includes definition and preliminary design of pressurized common modules for use as laboratories, living areas and logistic transport; environmental control, life support systems and propulsion systems; a module equipped as a laboratory and others as logistics modules; and accommodations for auxiliary orbital maneuvering and transfer vehicles.

The Marshall Center boasts a glorious past. In just 25 years, Marshall scientists and engineers have been instrumental in providing answers to many of the mysteries of the universe. But even more questions have been raised. As the Center looks to the next 25 years, its scientists and engineers of today and tomorrow are challenged to find those answers.

-30-

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COMMERCIAL DEVELOPMENT CENTER CANDIDATES NAMED

NASA Administrator James M. Beggs announced today the 21 teams which have submitted proposals to establish Centers for the Commercial Development of Space. Among the teams making proposals were the University of Alabama in Huntsville, University of Alabama in Birmingham, University of Tennessee Space Institute in Tullahoma and Vanderbilt University.

The objective of these centers will be to stimulate high technology research in the microgravity environment of space. This research eventually will lead to the development of new products which either have commercial potential or contribute to possible commercial ventures.

The research areas proposed include semiconductor crystal growth, remote sensing, communication technology and biotechnology.

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NASA's Office of Commercial Programs received proposals from industry/university consortiums in response to a program solicitation. Proposals were received from:

* Battelle-Columbus Laboratories, Columbus, Ohio
* The Institute for Technology Development, Jackson, Miss.
* Colorado School of Mines, Golden, Colo.
* Vanderbilt University, Nashville, Tenn.
* MIT, Cambridge, Mass.
* Midwest Research Institute, Kansas City, Mo.
* University of Alabama, Birmingham, Ala.
* University of Tennessee Space Institute, Tullahoma, Tenn. (2 proposals)
* University of Alabama, Huntsville, Ala.
* Institute of Space Research, Houston, Tx.
* Polymer Research Institute, Amherst, Mass.
* Earth Data Corp., Stanford, Calif.
* Georgia Tech Research Corp., Atlanta, Ga.
* The National Technological University, Fort Collins, Colo.
* University City Science Center, Philadelphia, Penn.
* Center for Technology Development, Albuquerque, N. Mex.
* University of Virginia, Charlottesville, Va.
* Virginia Polytechnic Institute, Blacksburg, Va.
* Northeastern University, Boston, Mass.
* University of Florida, Gainesville, Fla.

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The proposals currently are being reviewed by a panel of technical, managerial and financial experts. The review is expected to take 45-60 days. NASA will fund between three and six of these proposals for up to $1 million per year each, for a period not to exceed 5 years. Funding is anticipated by mid-September 1985.

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July 3, 1985

RELEASE NO: 85-34

NASA AWARDS $35 MILLION CONTRACT TO ROCKWELL INTERNATIONAL FOR SPACE SHUTTLE WORK AT THE MARSHALL CENTER

NASA's Marshall Space Flight Center in Huntsville, Ala., has awarded a three-year, $35,181,700 contract to the Space Transportation Systems Division of Rockwell International, Downey, Calif., for Space Shuttle systems integration work. The period of performance is from July 1, 1985 to June 30, 1988.

Under the contract, Rockwell will provide management, personnel, equipment, materials and resources required to provide systems integration to the Space Shuttle program at the Marshall Center. Work will also be performed at the Kennedy Space Center, Fla., and Vandenberg Air Force Base and Downey, Calif.

The Marshall Center is responsible for the Space Shuttle's propulsion system, which includes the main engines, solid rocket boosters and external tank.

-30-

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July 17, 1985

RELEASE NO: 85-37

FIRST MADE-IN-SPACE PRODUCT SOLD

The National Aeronautics and Space Administration and the National Bureau of Standards (NBS) announced today the first sale of a product manufactured in space. The product -- tiny polystyrene spheres 10 micrometers (1/2500th of an inch) in diameter -- was developed by Lehigh University, Bethlehem, Pa.; and NASA's Marshall Space Flight Center in Huntsville, Ala.

"This material is the first of what we expect will be a long line of products to carry a made-in-space label," said James M. Beggs, NASA administrator.

Deputy Center Director Jack Lee; researcher Dale Kornfeld; and project scientist Dr. Vaughn Yost represented the Marshall Center in a special ceremony today in Washington, D.C., to mark the first sale.

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NBS Director Ernest Ambler said the spheres, made aboard the sixth Space Shuttle flight in April 1983, are being offered as an NBS standard reference material. "They will be used to improve microscopic measurements made throughout the economy in electronics, medicine and other high technology areas," Ambler said.

The space product is being purchased by producers of finely ground powder products such as paint pigments, inks, toners, chemicals, flour and cosmetics as well as by technologists who monitor environmental particulate pollution from industrial and chemical plants.

The spheres also will be used by medical researchers who calibrate instruments to count blood cells and measure their shape and to perform a wide variety of diagnostic measurements. Moreover, the product is available to manufacturers as a reference in producing and distributing secondary measurement standards.

Billions of spheres have been produced aboard several Space Shuttle flights over the past several years using a chemical process developed for NASA by Lehigh.

The Marshall Center was responsible for providing the experiment elements and hardware as well as for flight-testing

the experiment. Marshall was also responsible for experiment safety and ensuring that the experiment could be conducted properly on the Shuttle flights. The spheres were produced in space because earthbound processes have not yielded sufficiently uniform materials in usable quantities. When produced in a low-gravity environment, the polystyrene spheres grow uniformly in size and shape.

The space material has been packaged by NBS into approximately 600 Standard Reference Material (SRM) units. Each unit is a 5-milliliter vial that contains approximately 30 million spheres. They are in a 0.4 percent concentration by weight; the remainder is water.

The price of Standard Reference Material 1960 (30 million spheres) is $384 per unit. Proceeds from the sales are shared equally by NASA and NBS.

- 30 -

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RELEASE NO: 85-42

CENTERS FOR COMMERCIAL DEVELOPMENT OF SPACE NAMED

NASA announced today that the Universities of Alabama at Huntsville and Birmingham, and Vanderbilt University were three of five organizations selected to establish Centers for the Commercial Development of Space.

The Centers are joint undertakings of government, industry and academic research teams which will work closely with NASA field centers in various research areas. New team members may be added at the Centers as research activity progresses in a particular area.

The Marshall Space Flight Center in Huntsville will work directly with the Commercial Development of Space Centers at the University of Alabama Huntsville, University of Alabama Birmingham and Vanderbilt.

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The five Centers selected, their directors and research areas are:

Battelle Columbus Laboratories
Columbus, Ohio
Dr. Frank J. Jelinek, Director
Research Area: Multiphase Materials Processing

University of Alabama, Birmingham
Birmingham, Ala.
Dr. Charles E. Bugg, Director
Research Area: Macromolecular Crystallography in Space

University of Alabama, Huntsville
Huntsville, Ala.
Dr. Charles A. Lundquist, Director
Research Area: Materials Processing

Institute for Technology Development
National Space Technology Laboratories
Hancock County, Miss.
Dr. Stanley A. Morain, Director
Research Area: Space Remote Sensing

Vanderbilt University
Nashville, Tenn.
Dr. Robert J. Bayuzick, Director
Research Area: Metallurgical Processing in Space

In naming the teams, Isaac T. Gillam IV, Assistant Administrator for Commercial Programs, said, "The objective of these Centers will be to stimulate high technology research taking advantage of the characteristics of space. This research will eventually lead to the development of new products which either have commercial potential or contribute to possible new commercial ventures."

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The five teams were selected from 21 proposals submitted to NASA based on:

o New and unique research leading to commercial activity requiring the space environment.

o Management teams that are capable of selecting and directing research projects that are commercially oriented.

o Available non-NASA resources to help operate the Center, including the commitment of industrial resources.

NASA will initially fund the Centers for a period not to exceed five years at which time they are expected to be self-sustaining.

Funding for each Center will range from $750,000 to $1.1 million on a year to year basis. Futher funding will depend on a favorable annual review of progress in stimulating commercial ventures in space.

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September 6, 1985

RELEASE NO: 85-43

NASA - AIR FORCE ANNOUNCE JOINT SPACE TRANSPORTATION STUDIES

NASA and the U.S. Air Force today announced the award of joint space transportation study contracts to four aerospace firms.

Boeing, General Dynamics, Martin Marietta, and Rockwell have been selected to perform Space Transportation Architecture Studies. Space transportation architecture consists of a total transportation system, including flight elements, ground and orbital support systems, and their operational interactions. The contracts are valued at $5 million each and are expected to run for 26 months.

NASA's Marshall Space Flight Center in Huntsville, Ala., is awarding and managing the contracts with General Dynamics' Convair Division, San Diego, Calif.; and Martin Marietta's Denver

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Division, Denver, Colo. The Air Force Space Division in Los Angeles is awarding and managing contracts with Boeing's Aerospace Company in Seattle, Wash.; and Rockwell's Space Transportation Systems Division, Downey, Calif. Close coordination will be maintained between the two agencies and the four study contractors throughout the award period.

The objectives of the studies are to determine the nation's overall space transportation system architectures, including transportation and support systems needed to simultaneously meet mission and operational requirements while substantially reducing total life cycle cost; to identify the technologies required for the architectures; and to refine the resulting transportation and support system concept(s) for the mid-1990's if firm requirements are identified.

Each agency is analyzing and providing projected mission/payload/operational requirements from the mid-90's to the 2010 timeframe. The studies are very broad in scope and will analyze mission requirements, develop and analyze architecture approaches, define future transportation system concepts, and identify technologies applicable to transportation system options.

Transportation system architectures and concepts will include launch and upper stage flight systems, mission control concepts, ground support systems, logistics support systems, and on-orbit operations for both manned and unmanned systems. The resulting transportation architecture and vehicle concepts are expected to

outline and define the most promising concepts for major cost-effectiveness improvements and mission need accommodation for the mid-90's through the 2010 period.

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RELEASE NO: 85-44

ATLANTIS' FLIGHT READINESS FIRING SET FOR SEPTEMBER 12

A 20-second on-the-pad test firing of the Space Shuttle orbiter Atlantis' three main engines is scheduled to be conducted at 10 a.m. CDT Sept. 12 at the Kennedy Space Center, Fla., according to Stanley R. Reinartz, manager of the Shuttle Projects Office at the Marshall Space Flight Center in Huntsville, Ala.

The test will verify the flight readiness of Atlantis--the fourth and newest of America's fleet of reusable orbiter spacecraft--and its three main engines.

The Shuttle vehicle main propulsion system and computer programs will be exercised during the Flight Readiness Firing in a launch-day environment. The firing is expected to demonstrate the proper integration of all elements prior to the first launch of Atlantis on the next Shuttle mission, 51-J, scheduled for Oct. 3.

Atlantis' engines, each capable of generating 390,000

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pounds of thrust at sea level, were successfully test fired individually, under the direction of the Marshall Center, at NASA's National Space Technology Laboratories.

Countdown for the Flight Readiness Firing is scheduled to start at 4 a.m., Sept. 10, with the clock at the T-43 hour mark and will culminate with the 20-second static firing.

Successful completion of the firing is a major step in clearing the way for the 51-J mission, the 21st Shuttle flight.

Three days of Flight Readiness Firing preparations will provide the start of the firing countdown. They will include purging the external tank with inert gases, installing special firing instrumentation, and mounting a radiation shield on the deck of the mobile launcher platform to protect the solid rocket boosters and external tank structures during the test firing.

The Flight Readiness Firing, including pre- and post-test activities will span six days. The test will involve personnel and operations from various NASA centers and support organizations, including the Marshall, Kennedy and Johnson centers.

A firing simulation Sept. 9 will kick off preparations for the test. This one-day test is primarily designed to check out critical flight and ground computer systems that will control the actual engine firing, and provide the Space Shuttle launch team time to re-review the test procedure.

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The last 12 hours of the firing countdown are simulated, leading to a mock firing of Atlantis' engines.

Events leading to the Sept. 12 engine firing will be nearly identical to those that precede an actual Shuttle launch. Built-in holds will be distributed throughout the countdown at the same times they occur in an actual launch countdown.

The final nine minutes of the countdown will be controlled by the automated ground launch sequencer, which performs the final series of events in a specific order. The sequencer also monitors various measurements for out-of-tolerence conditions and detects system malfunctions for which it will automatically stop the countdown.

At the conclusion of the test, technicians will begin an external and internal inspection of the three main engines, followed by a functional retest of the engines to verify their readiness for flight. The post-firing activities will take about 11 days to complete.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812
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For Release:

Eldred C. Jones Jr.
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(205/453-0034)

September 17, 1985

RELEASE NO: 85-46

MARSHALL CENTER SYSTEM UTILIZED TO SPEED UP ANALYSIS OF ICE DATA

Scientists involved in analyzing data received from the International Cometary Explorer during its interception with comet Giacobini-Zinner recently have been able to look at their data much sooner thanks to a scientific computer network designed at the Marshall Space Flight Center in Huntsville, Ala.

"When the satellite was originally launched as the International Sun Earth Explorer there were no plans for real-time analysis of the data they received," according to Dennis Gallagher of the Marshall Center's Space Science Laboratory. "The data received from the spacecraft was recorded at the Goddard Space Flight Center in Greenbelt, Md., copied onto computer tapes and mailed to the investigators for analysis in their laboratories.

"When the decision was made to change the mission of the spacecraft, a means of obtaining a faster, low-cost method of distributing the data to the investigators was needed. SPAN

[Space Physics Analysis Network] was the best way to accomplish this task."

The network was established in 1981 to translate existing computer technology available at the Marshall Center into a useable form for the science community. Dr. James Green, formerly with Marshall's Space Science Laboratory and now with National Space Science Data Center at the Goddard Space Flight Center, developed with the network that has now enabled the science community to access satellite information minutes after it is transmitted from a spacecraft to the systems computers.

"The capabilities of this network made it possible for the ICE investigators to receive their data electronically within a matter of minutes, analyze their data in their own laboratories, and have the preliminary results back to Goddard within 24 hours," said Gallagher

The biggest suprise in the early data, according to Steve Maran of the Goddard Space Flight Center was that the plasma in the tail of the comet was "much more turbulent both in time and space" than expected. The data also indicated that the magnetic field around the comet was "much smaller than the magnetic field around the Earth."

The International Sun Earth Explorer was launched in 1978 and was placed in orbit at the Sun-Earth libration point -- that position in space where a satellite is suspended in equlibrium between the sun and the Earth-moon system. Its primary mission was to collect scientific data on the solar wind until its anticipated demise in 1981. However, it remained in good

operational condition and had approximately 75 percent of its total propellant reserves as late as 1981.

A plan was devised to use the spacecraft to intercept comets Giacobini-Zinner and Halley. On June 10, 1982, the spacecraft was diverted by controllers at the Goddard Center to perform a series of orbital gymnastics. The plan took the spacecraft past the moon five times and catapulted it out toward comet Giacobini-Zinner. The final trajectory will also bring the the spacecraft within range of an upstream intercept of Comet Halley in March 1986.

NASA News

National Aeronautics and
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AC 205 453-0034

For Release:

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October 1, 1985

Terry M. Eddleman
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RELEASE NO: 85-47

NASA SELECTS PAYLOAD SPECIALISTS FOR COMET HALLEY MISSION

NASA today announced the selection of payload specialists for Space Shuttle mission 61-E, an ultraviolet astronomy mission known as "Astro-1," which will include the study of Halley's Comet. Launch is scheduled for March 6, 1986.

Dr. Samuel T. Durrance, associate research scientist in the Department of Physics and Astronomy, Johns Hopkins University, Baltimore, and Dr. Ronald A. Parise, manager of Advanced Astronomy Programs, Computer Sciences Corp., Silver Spring, Md., were selected to fly the mission, which will perform Halley's Comet observations.

Dr. Kenneth H. Nordsieck, associate professor at Washburn Observatory, University of Wisconsin, Madison, will serve as backup in the event either Durrance or Parise cannot participate in the flight. As an alternate payload specialist, Nordsieck

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will occupy a principal position in the Payload Operations Control Center at the Marshall Space Flight Center, Huntsville, Ala., during the mission. The Marshall Center is managing the Astro-1 mission.

The payload specialists are experienced astronomers, which is considered crucial to the mission since they will be making decisions to ensure the best possible scientific data return.

The Astro-1 mission will study Halley's Comet and many other celestial objects through three ultraviolet astronomical instruments. In addition, a special visible-light wide field camera has been incorporated into the payload to augment the Halley's Comet studies.

Each payload specialist is a member of one of three science teams that developed the ultraviolet instruments. Payload specialists Durrance and Parise will operate the ultraviolet instruments, while astronaut mission specialists will operate the instrument pointing system (IPS), on which the three instruments are mounted. Designed for precise aiming at celestial targets, the IPS was developed by the European Space Agency and flew initially on the Spacelab 2 mission mission in early August.

The Astro-1 flight is scheduled to coincide with the Halley encounter missions by the European Space Agency, the Soviet Union and Japan. Dr. Burton I. Edelson, NASA Associate Administrator for Space Science and Applications, said: "The opportunities for science synergism between Astro-1 and the armada of Halley encounter spacecraft are significant. The scientific study of Halley's Comet will be an internationally coordinated effort."

The Astro-1 complement of scientific instruments is well suited for the study of a wide variety of other celestial objects in addition to Halley's Comet. The complement consists of the Hopkins Ultraviolet Telescope, which will study faint astronomical objects such as quasars, active galactic nuclei and normal galaxies in the far ultraviolet range; the Ultraviolet Imaging Telescope, which will record image-intensified photographs of faint objects such as hot stars and galaxies in broad ultraviolet wavelengths and with a wide field of view; and the Wisconsin Ultraviolet Photopolarimetry Experiment, which will study the polarization of hot stars, galactic nuclei, and quasars. Together, these instruments will make 200 to 300 observations during the Astro-1 mission, the first of three in a series scheduled for launch within the next 2 years.

NASA News

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October 24, 1985

Ed Medal
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Huntsville, Ala.
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RELEASE NO: 85-51

JOURNALIST TO FLY ON SPACE SHUTTLE

The National Aeronautics and Space Administration announced today that a U.S. journalist will fly on a Space Shuttle mission in late 1986 as the second in a series of communicators to be selected as part of the agency's Space Flight Participant Program.

The first candidate selected under this program was Christa McAuliffe, a classroom teacher, scheduled to fly next January. McAuliffe, with Barbara Morgan (her backup), was chosen after a nationwide competition in which more than 11,000 teachers participated. They are currently in training at the Johnson Space Center, Houston.

The Space Flight Participant Program was established by NASA in 1984 to provide flight opportunities for men and women not otherwise associated with the space program, who, because of their background and special skills, could communicate their experience to the general public in an effective manner.

In today's announcement, NASA said the journalist, like the teacher candidate, would be selected after a nationwide competition conducted by the Association of Schools of Journalism and Mass Communication (ASJMC), a journalism education organization, which will include in the selection process professionals representing the broad spectrum of journalism in the United States.

- more -

The competition will be limited to full-time working media representatives (U.S. citizens) with five or more years experience covering or commenting on the news for U.S.-based audio, video or print media. Applications will be evaluated on the basis of demonstrated ability to communicate clearly and effectively to mass audiences in both broadcast and print media, although it is not necessary to have worked professionally in both.

The selection process will be organized by ASJMC on a regional basis and eight candidates from each of five regions will be named. From the 40 regional nominees, a National Selection Panel will recommend five for final consideration by the NASA Space Flight Participant Evaluation Committee, composed of seven senior NASA officials.

The five finalists will undergo medical examinations and receive briefings on the space flight experience at the Johnson Space Center. Based on the results of these physicals and subsequent interviews, the evaluation committee will recommend a primary and a backup candidate to the NASA Administrator who will approve the final selection.

The journalist selection competition will be administered for NASA by the ASJMC in cooperation with the Association for Education in Journalism and Mass Communication and a Journalism Advisory Committee comprised of representatives from 16 professional journalism organizations, including: American Newspaper Publishers Association (ANPA); Radio Television News Directors Association (RTNDA); American Society of Newspaper Editors (ASNE); National Association of Broadcasters (NAB); Society of Professional Journalists/Sigma Delta Chi; and National Newspaper Association (NNA).

Application packets for the Journalist in Space Program will be available Dec. 1, 1985, and may be obtained by writing or calling:

Journalist in Space Program
Association of Schools of Journalism
and Mass Communication
University of South Carolina
School of Journalism
Columbia, SC 29208-0251
Phone: 803/777-5007

- 30 -

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Marshall Space Flight Center 1960-1985

Dave Drachlis
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For Release
October 30, 1985

RELEASE NO: 85-53

NASA AWARDS $98 MILLION CONTRACT EXTENSION TO
MCDONNELL DOUGLAS TECHNICAL SERVICES FOR SPACELAB INTEGRATION

NASA's Marshall Space Flight Center in Huntsville, Ala., has awarded a 33 month, $98,105,079 contract extension to the McDonnell Douglas Technical Services Co., Spacelab Integration Division, Huntsville, for continuing integration work.

Under the contract, the company will provide system integration, selected flight hardware, software, ground support equipment, and mission integration support for manifested Spacelab missions.

The extension, which runs through June 30, 1988, brings the total value of the Spacelab contract to $341,496,165.

The Marshall Space Flight Center is responsible for mission integration and sustaining engineering for the reusable international research laboratory. When carried in the cargo bay of the Space Shuttle orbiter, it converts the Shuttle into an orbiting scientific research center. The laboratory was developed for NASA under international agreement by the European Space Agency. The Marshall Space Flight Center was responsible for monitoring design and development activities and for management of U.S. development of selected Spacelab components.

NASA News

National Aeronautics and
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For Release:

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November 12, 1985

Terry Eddleman
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RELEASE: 85-55

NASA ISSUES REQUEST FOR PROPOSAL FOR ORBITAL MANEUVERING VEHICLE

A request for proposal has been issued by NASA's Marshall Space Flight Center, Huntsville, Ala., inviting the three aerospace companies involved in previous definition studies -- LTV, Dallas, Tex.; Martin Marietta, Denver, Colo.; and TRW, Redondo Beach, Calif. -- to compete for the design, development and manufacture of an Orbital Maneuvering Vehicle (OMV).

Often called a "space tug," the vehicle would be used to transfer satellites and other objects between Earth orbits. The maneuvering vehicle is expected to extend the reach of the Space Shuttle by about 1000 miles.

The companies have until Dec. 20, 1985 to respond to the request. From the proposals submitted, NASA will select one of the three companies to build the vehicle. The contract is expected to be awarded June 1986 with the first flight planned for early 1991.

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The contract includes provisions for testing and hardware flight testing prior to its actual operational missions. One maneuvering vehicle will be built with an option by NASA to build a second.

The vehicle would be an element of the present Space Transportation System, the heart of which is the Space Shuttle. Although the Shuttle already has proven to be an effective ferrying system in moving satellites and other equipment to space and back, the range-extending capabilities of the maneuvering vehicle make it a valuable addition to the Space Transportation System.

The OMV would have the ability to retrieve satellites from high orbits, bring them back to the Shuttle for maintenance and repair, then return the repaired satellites to their operational orbits. It also would serve as a means of reboosting satellites as their orbits gradually decayed.

The maneuvering vehicle will be an unmanned spacecraft, 15 feet in diameter and approximately 4 feet in length. Its life will be approximately 10 years with refurbishment and on-orbit maintenance included in the design.

Plans call for the maneuvering vehicle to be deployed from the Shuttle for short duration missions. Later it will remain in orbit for extended periods for use in both Shuttle-based and Space Station-based modes of operation. Its role in support of a future Space Station is viewed as one of the maneuvering vehicle's essential attributes. The OMV is expected to be available for assembly and buildup of an initial Space Station

proposed by NASA to be built in the early 1990s. The maneuvering vehicle then would become an essential element of Space Station operations.

-30-

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RELEASE NO: 85-59

STUDENT PROJECT TO FLY ON ASTRO-HALLEY MISSION

The National Aeronautics and Space Administration has announced that an educational experimental package has been added to the Astro-1 mission scheduled for launch aboard the Shuttle Orbiter Columbia on March 6, 1986.

The "Can Do" student experiment, sponsored by the Charleston County, S.C. school district, will be included in the Astro-1 payload package that will perform a wide variety of astronomical

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observations. The Astro-1 complement of three ultraviolet astronomical instruments and a special visible-light, wide-field camera system will study Halley's Comet and other celestial objects during its nine day flight in space. Astro-1 is managed by NASA's Marshall Space Flight Center, Huntsville, Ala.

The primary objective of the students' project is to photograph Halley's Comet. Middle school students, grades 6 through 8, will study and interpret astronomical photographs obtained from the flight.

The photographic equipment, consisting of four 35mm, still cameras equipped with differing lenses addressing a particular aspect of cometary science, will be contained in a canister normally used for Getaway Special experiments. In addition to the comet photography experiment, the canister will contain a separate package of passive student experiments, including biological samples, magnets and two kinds of accelerometers to study the effects of microgravity.

The camera package, developed with the participation of the National Geographic Society, Washington, D.C., will use a newly developed color film with unprecedented film speeds to photograph the dim tail of Halley's Comet. The color pictures will complement the black-and-white images obtained by Astro-1's own image-intensified, scientific wide-field camera.

According to Astro-1 mission Manager Leon Allen, "We believe that this kind of scientist-student cooperative effort will bring the benefits and excitement of space science research directly to the classroom and, in essence, will allow the students to

function as junior partners in the study of Halley's Comet."

The Charleston County Schools, in cooperation with NASA's Educational Affairs Division, has developed a broad-reaching program of astronomical science and related educational activities that will be offered to other students throughout the nation. These will include concurrent ground-based photography by student groups to be compared with results from the Shuttle-based photos; teaching packets for classroom use; and comparative studies of Comet Halley through interviews with persons who recall the comet's passage in 1910.

The Can Do project received active support from NASA's Langley Research Center, Hampton, Va.; Goddard Space Flight Center, Greenbelt, Md.; and the Marshall Center. The project also was assisted by the National Geographic Society, Washington, D.C.; the College of Charleston, S.C.; the Medical University of South Carolina; the West Ashley Optimist Club; and other organizations in the Charleston area. Several national manufacturers also supplied support for the project.

The Can Do project coordinator is Charles A. Traynor of the Charleston County school system.

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November 25, 1985

RELEASE NO: 85-60

EASE/ACCESS

Space Shuttle mission 61-B, scheduled for launch Tuesday, Nov. 26, will feature a construction-in-space payload for which the Marshall Space Flight Center in Huntsville, Ala., is the mission manager.

The payload includes two experiments -- EASE (Experimental Assembly of Structures in Extravehicular Activity) and ACCESS (Assembly Concept for Construction of Erectable Space Structures). Together they will comprise the "first flight demonstration of construction of large space structures," according to Ed Valentine of Marshall's Spacelab Payload Project Office.

Valentine, EASE/ACCESS mission manager, explained that in addition to providing valuable on-orbit construction experience, the experiments will serve several other purposes.

"We'll be able to compare assembly rates and techniques used in space to those used during simulations on the ground and in

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neutral buoyancy water tank tests," he said. "We also hope to evaluate potential Space Station assembly and maintenance concepts and techniques, and identify ways to improve erectable structures to ensure productivity, reliability and safety."

Valentine said the EASE and ACCESS structures will be assembled and disassembled several times during two six-hour EVAs (extravehicular activities). The first EVA is scheduled to begin Friday at 4:15 p.m. central time, with the second scheduled for Sunday beginning at 3 p.m.

"The first EVA will be devoted to studying the human performance of construction tasks in space," he said. "The second is dedicated to supplementary experiments that explore alternative construction techniques and practice potential Space Station maintenance scenarios."

Although both EASE and ACCESS are called "large space structures," Valentine explained that they are distinguished by different assembly methods and physical characteristics.

"ACCESS is a 45-foot 'high-rise' tower composed of 10 identical bays. It's assembled with crew members in fixed work stations using many small aluminum struts and nodes," he said. "EASE is a geometric structure, about 12-feet high, that looks like an inverted pyramid. The crew moves about during EASE assembly using a few large aluminum beams and nodes."

Nodes are clusters of three or four sockets into which the ends of struts or beams are placed and secured by sleeves.

For this first-ever space construction, no tools will be used, according to Valentine. "The crew members will 'snap' together the prefabricated components to form the EASE/ACCESS structures," he said.

The components are all located on a Mission Peculiar Equipment Support Structure (MPESS). Interface plates attached to the structure allow easy mounting of foot restraints and hand restraints where the EVA crewmembers can anchor themselves to make assembly procedures safer and easier.

EASE is a joint effort between the Marshall Center and the Massachusetts Institute of Technology. ACCESS was developed by NASA's Langley Research Center in Hampton, Va. Marshall, MIT and Langley have worked together assembling structures during simulations on the ground and in Marshall's Neutral Buoyancy Simulator.

"These simulations have been a tremendous help in preparing us for the mission," Valentine said. "They've helped us understand how humans work best in low gravity and they've provided us valuable information about the different kinds of structures that can be built."

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For Release

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December 10, 1985

RELEASE NO: 85-65

STATE RESOLUTION LAUDS MSFC ACHIEVEMENTS

A resolution passed by the Alabama House of Representatives commending the Marshall Space Flight Center in Huntsville on its 25 years of accomplishment was presented recently to Center Director Dr. William R. Lucas by Representative Steve Hettinger.

The resolution was sponsored by Representatives Hettinger, Robert E. Albright, Morris J. Brooks Jr., Tom Butler, George Grayson and Albert Hall. It was signed by Governor George Wallace and Secretary of State Don Siegelman.

The following is the text of the resolution:

NOTING WITH COMMENDATION THE 25 YEARS OF ACCOMPLISHMENT OF MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALABAMA

WHEREAS, July 1, 1985, was a milestone anniversary of the Marshall Space Flight Center (MSFC) in Huntsville, Alabama, marking 25 years of space-related achievement including the design and development of Saturn V, Skylab, Lunar Rover and the Shuttle propulsion system; and WHEREAS, further, as an essential

- more -

division of the National Aeronautics and Space Administration (NASA), Marshall Space Flight Center is, in consensus, world renowned for its vigorous research and technology programs, in addition to the center's broad capability relative to propulsion systems and the design and management of large space systems; and

WHEREAS, the Marshall Space Flight Center also is responsible for the Space Shuttle's main engines, solid rocket boosters and external propellant tank; the Spacelab orbital laboratory; and the development of the Space Telescope, as well as numerous other space experiments; and WHEREAS, the citizens of Huntsville, Madison County and the entire State of Alabama are indeed inordinately proud of the distinguished achievement and advances in space exploration of the Marshall Space Flight Center, a primary concentration of unparalleled contributions to the benefit of all mankind through its major role with NASA; now therefore, BE IT RESOLVED BY THE LEGISLATURE OF ALABAMA, BOTH HOUSES THEREOF CONCURRING, That we hereby extol the excellence of accomplishment of the Marshall Space Flight Center in its first 25 years of remarkable technical and scientific advancement.

BE IT FURTHER RESOLVED, That a copy of this resolution be fowarded to Dr. William R. Lucas on behalf of MSFC's distinguished scientists, engineers, technicians, management and support personnel, all of whom have achieved beyond measure for the past 25 years.

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George C. Marshall Space Flight Center
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Marshall Space Flight Center 1960-1985

For Release

Eldred C. Jones
Marshall Space Flight Center
Huntsville, Ala.
(205/453-0034)

December 27, 1985

RELEASE NO: 85-70

Space Transportation Study
Team Established at MSFC

In response to a request that NASA and the Department of Defense jointly study requirements for a second generation space transportation system, Dr. William R. Lucas, director of the Marshall Space Flight Center in Huntsville, Ala., has established a Space Transportation System Study Team within the Advanced Projects Office of the Center's Program Development Directorate.

As part of the joint study, NASA/Marshall "will be involved in the assessment of advanced vehicle systems, determination of space transportation architectures and support systems, and major related subsystems," said Lucas in announcing the formation of the study team.

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The Marshall Center team will provide the needed management and interfaces for the implementation of the study effort. The team will be responsible for the management of Space Transportation Architecture Study activities, related technology determinations, complementary vehicle systems studies and supporting systems studies.

Upon establishment of the team, Lucas appointed Charles R. Darwin, director of the Preliminary Design Office, to manage the study team as an additional assignment. Lucas also announced the assignment of Luther T. Spears to the Advanced Projects Office to become deputy manager of the study team.

"This Study Team assignment represents a major new thrust in the design and development of advanced launch vehicles that are of utmost important to NASA and Marshall," said Lucas.

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December 19, 1985

RELEASE NO: 85-72

MARSHALL CENTER SELECTS TELEDYNE BROWN
FOR FACILITIES CONTRACT

NASA's Marshall Space Flight Center in Huntsville, Ala., has selected Teledyne Brown Engineering for negotiation leading to the award of a new five-year contract to provide for the operation and maintenance of the propellants and pressurants facilities for the Center. Total price for the first three contract years is approximately $8.8 million.

The company, located in Huntsville, Ala., will furnish the necessary management, personnel, equipment and materials required to operate and maintain the gaseous pressurants equipment and distribution systems, liquid propellants storage and transfer systems, fluid transporter services, valve and component refurbishment, and retention of certification status of high pressure'systems including test stands, wind tunnels and DOT certification of fluid transporters.

Other firms which submitted proposals for the contract are Air Products Operating Co., Ala,; Wyle Laboratories, Huntsville, Ala,; and PRC-Kentron, Huntsville, Ala.

-30-

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(205/453-0034)

For Release
Dec. 24, 1985

RELEASE NO: 85-73

SIGNIFICANT SCIENTIFIC RESULTS PRODUCED
BY SPACELAB 3 MISSION

Research carried out during the Spacelab 3 mission this spring has produced some significant preliminary scientific results, according to mission scientist Dr. George H.Fichtl of the Marshall Space Flight Center in Huntsville, Ala. Researchers and participants in the seven-day Space Shuttle flight gathered at the Center this month to present their initial findings.

"The mission has made some major contributions in the physical and life sciences," said Fichtl of the Center's Systems Dynamics Laboratory. "We have gained a lot of insight for future Spacelab and Space Station research. And I think we can now say that space research is becoming routine."

"Initial results from the three Spacelab 3 crystal growth experiments are very promising," said Fichtl, lead scientist for the Marshall Center-managed research mission. The two triglycine sulfate crystals and the single mercuric iodide crystal grown

-more-

aboard the space laboratory were at least as good as the best crystals grown on Earth to date. And they may actually be better, but additional testing will be required to confirm this, according to Fichtl. "This is of major significance, because normally, we must grow between one and two thousand crystals on Earth to get just one crystal that is equal to the quality of those grown on Spacelab 3. Mercuric iodide crystals have application in X-ray detectors, and triglycine sulfate crystals are used in infrared detectors."

Additionally, the methods used to grow the crystals on orbit were proven during the flight. Triglycine sulfate crystals were grown from a solution, as part of an experiment provided by Alabama A&M University in Huntsville. The mercuric iodide crystal was grown using a vapor transport process in an experiment provided by EG&G Energy Measurements Inc. of Goleta, Calif.

The third crystal growth experiment, which also used mercuric iodide and was provided by France, performed as expected and added to scientists' knowledge about the process of crystal nucleation. This is a difficult process to study on the ground because of gravity-induced convection, according to Fichtl.

The fluid physics experiments also provided new information. The Drop Dynamics Module that was repaired during the flight by principal investigator and payload specialist Dr. Taylor Wang enabled researchers to do some experiments not possible on Earth. Results of the experimentation confirmed some of the theories on how drops behave when rotated. This was the first opportunity to

-more-

test some theories posed centuries ago by scholars, including Sir Isaac Newton.

The experiment also proved that the use of sound waves is a viable technique for manipulating liquids in a microgravity environment. This has direct appliciation to containerless materials processing in space. This technique allows the processing of materials without incurring the contaminating effects introduced by the container. From the flight, it was learned that the "accoustic bottle" or "crucible of sound" in which the droplet is contained, had much better characteristics than had been theorized. "And this is good news for the containerless processing," said Fichtl.

Drop dynamics experiments confirmed theories on how drops behave when rotated slowly. However, experiment data violated some basic theories relating to the behavior of drops being rotated at higher rates. It was found, for example, that drops tend to transition (change) to a new shape at rotation rates lower than had been predicted. "All this tends to indicate that some of our theories may need to be modified," said Fichtl. The Drop Dynamics Module experiment was developed by the Jet Propulsion Laboratory.

Researchers for the Geophysical Fluid Flow Cell Experiment reported that all 102 hours of their data looked good, and is expected to lead to a better understanding of the dynamics of stellar interiors and planetary atmosphere.

Many of the results confirmed existing theories of convection. It was noted by the research team, however, that at

-more-

higher heating rates -- such as those that may be found on the sun -- the date showed some interesting and significant departures from what had been anticipated. Since the mission, researchers have been able to successfully develop computer models of some of this news information.

"In the area of atmospheric research and astronomy, the Atmospheric Trace Molecules Spectroscopy (ATMOS) experiment, sponsored by the Jet Propulsion Laboratory, also produced some fantastic results," said Fichtl. For the first time, researchers were able to simultaneously measure the concentrations of chemical compounds associated with carbon, nitrogen, oxygen and other chemical cycles in the atmosphere. This will provide a better insight into the chemical processes that govern the distribution of minor and trace gases in the atmosphere between 10 and 100 kilometers.

The instrument worked so well that it was able to record concentrations of gases as low as parts per 100 billion. This is significant, because it is the first time we have been able to make such sensitive measurements, reported Fichtl. And, for the first time, researchers were also able to detect and measure traces of nitrogen pentoxide. This compound had heretofore been undetected in the atmosphere, but was predicted to be present.

The instrument also provided some data that will help researchers understand the gaseous regions above the surface of the sun.

The aurora experiment recorded data on every planned pass, and accumulated 274 color photographs and five hours of video

-more-

recordings. The spectacular pictures that are still being analyzed have already revealed some structures not previously observed.

The Studies of the Ionization of Solar and Galactic Cosmic Ray Heavy Nuclei (IONS) instrument reportedly worked well, and research teams in India, the sponsoring nation, are still processing their data.

Results from the Research Animal Holding Facility showed that the system worked well overall, and researchers learned a lot about how to operate the facility on future flights. Only minor modifications will be required to the facility.

Researchers concluded that the apparent case of space adaptation syndrome in one of the monkeys supports the contention that this species will be a good model for future studies of vestibular adaptation in microgravity. Researchers reported that both primates are alive and well and residing at the Ames Research Center, the organization responsible for the Research Animal Holding Facility experiments.

Results from studies of the largest group of rats flown aboard a single spacecraft showed their hind muscles were 11 to 36 percent smaller and the bones were less strong after their space flight.

Other researchers are still reviewing their intial data, according to Fichtl.

The one-day science conference was the first review of the results of the mission since its launch in April. The Spacelab 3 mission was the first operational mission of Spacelab. The mission carried 15 experiments in five areas of research.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Marshall Space Flight Center 1960-1985

For Release
December 27, 1985

Leon N. Perry
Headquarters, Washington, D.C.
(Phone: 202/453-1547)

Dave Drachlis
Marshall Space Flight Center
Huntsville, Ala.
(Phone: 205/453-0034

RELEASE NO: 85-74

ALTERNATE PAYLOAD SPECIALISTS NAMED FOR EARTH OBSERVATION MISSION

The National Aeronautics and Space Administration has announced the selection of Dr. Charles R. Chappell of the Marshall Space Flight Center in Huntsville, Ala., and Dr. Dirk D. Frimout of the European Space Agency (ESA), as alternate payload specialists for the first Earth Observation Mission (EOM). The mission, which will use NASA's modular research facility, Spacelab, is scheduled for launch on the Space Shuttle Orbiter Atlantis in the latter half of 1986.

Chappell is the chief of the Solar Terrestrial Division, Space Science Laboratory at the Marshall Space Flight Center and is responsible for directing a research group which studies the physics of the sun-Earth environment. He served as mission scientist for the 10-day Spacelab 1 mission in November and December 1983, during which 70 investigations were carried out. Chappell was born in Greenville, S.C., and graduated magna cum laude in 1965 from Vanderbilt University in Nashville. He has a bachelor's degree

-more-

in physics and received his Ph.D. in space science from Rice University, Houston, in 1968.

Frimout is the senior engineer supporting European researchers who will have experiments on this mission. He served as ESA crew coordinator and operations manager for Spacelab 1. The Poperinge, Belgium native received a Ph.D. in applied physics from the University of Gent, Belgium, in 1970, and did postgraduate work in ultraviolet astronomy at the University of Colorado.

As alternate payload specialists, Chappell and Frimout will serve as back-ups to flight payload specialists Dr. Byron Lichtenberg, who flew as a payload specialist on Spacelab 1, and Dr. Michael Lampton, who was his alternate. According to Mission Manager Gary Wicks of the Marshall Center, Chappell and Frimout will train with the flight crew and will serve as members of the mission management team in the Payload Operations Control Center during the flight. They will communicate directly with the crew on orbit, assist the payload operations team during normal operations; aid in trouble shooting problems and in changing crew procedures when necessary. Chappell and Frimout will also advise the mission scientist, Dr. Marsha Torr, of the potential impact of problems and mission timeline changes.

The Earth Observation Mission flight is the first in a series of Shuttle missions primarily dedicated to measuring solar irradiance (the sun's output) and the chemical composition of the Earth's stratosphere and mesosphere (the middle and upper atmosphere) over the period of an 11-year solar cycle. To

accomplish this, several instruments originally carried on the Spacelab 1 and 3 missions are being reflown.

A total of 15 experiments will be conducted in six disciplines: atmospheric science, solar physics, plasma physics, earth resources, astronomy and life sciences. The international mission will include experiments sponsored by Belgium, France, Japan, Federal Republic of Germany and the United States. ESA is providing operations support for the European investigations.

The mission will use the short version of the Spacelab module in which the scientists will work. A single Spacelab pallet and special support structure will hold instruments that require exposure to the environment of space.

The alternate payload specialists were selected by the NASA administrator from candidates submitted by the Investigators Working Group (IWG), which consists of the principal investigator (chief scientist) for each of the mission experiments. The Earth Observation Mission program is managed by the Marshall Center.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812
AC 205 453-0034

For Release:

Eldred C. Jones Jr
Marshall Space Flight Center
(205/453-0034)
(205/544-0034 - Effective March 31, 1986)

March 24, 1986

RELEASE NO: 86-6

NOTE TO EDITORS AND NEWS DIRECTORS -
PHONE NUMBERS TO CHANGE AT THE MARSHALL SPACE FLIGHT CENTER

Effective March 31, the Marshall Space Flight Center in Huntsville, Ala., will begin a 30-day changeover to a new state-of-the-art telecommunications system. This new system will involve both new telephone equipment and new telephone numbers. During the 30-day period, both the old phone numbers and new phone numbers will be operational.

Effective May 1, the old phone numbers are scheduled to be disconnected. Those calling the old numbers after that date will be referred to the Center's central operator, 544-2121. The central operator will provide the caller with the employee's new phone number.

The new telephone number for the Center's Media Services Office will be (205) 544-0034.

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NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Marshall Space Flight Center 1960-1985

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Ed Medal
Marshall Space Flight Center
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For Release

April 2, 1986

RELEASE: 86-8

DESTACKING OF 61-G ELEMENTS AND MODIFICATIONS TO ORBITERS PLANNED

Destacking of the solid rocket motors for use on Space Shuttle mission 61-G, launch of the Galileo spacecraft to Jupiter, is scheduled to begin early this month as a data-gathering activity in support of the Challenger accident investigation.

The principal objective of the destacking exercise is to gather information to assess the preflight conditions in and around the vicinity of solid rocket motor field joints. Of primary interest will be the condition of the field joint "O" rings.

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Inspections during destacking also will focus on examination of the putty used in the joints and on correlating rocket motor case ovality, or "roundness," with any assembly damage.

Assessments also will be made on the degree of clevis gap-opening resulting from stacking and assembly and the degree of propellant slumping that occurs as a result of vertical stacking.

Any relevant data from the destacking inspections that may be useful in the investigation of the Challenger accident will be assembled by the NASA 51-L Data and Design Analysis Task Force and provided to the Presidential Commission on the Space Shuttle Challenger Accident.

Operations to remove the external tank from the 61-G stack are underway this week. Orbiter Discovery will be temporarily moved out of the Vehicle Assembly Building storage bay while the 61-G external tank is placed in a storage cell.

In parallel with the 61-G destacking operations, the KSC shuttle processing team will proceed with approved modifications on the orbiters.

This work includes major modifications to the orbiter Discovery to equip the ship for missions that will use the Centaur upper-stage, structural reinforcement of the orbiter's wings, and installation of special instrumentation for future launches from the Vandenberg Air Force Base in California.

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Other modifications planned for the orbiters Discovery, Columbia and Atlantis, include previously approved modifications and equipment upgrades that were deferred until time was available.

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This release and other NASA information is available electronically through ITT Dialcom. For access to NASA NEWS, through this system, contact Jim Hawley, ITT Dialcom Inc. at 202/488-0550.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Eldred C. Jones
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

April 18, 1986

RELEASE NO: 86-11

New Communications Network To Connect NASA Locations

A new, common-user NASA communications network that will interconnect Headquarters, seven centers and various operating locations became operational this month.

The Marshall Space Flight Center in Huntsville, Ala., is responsible for the management, operation and maintenance of the network for NASA. George D. Cassimus of the Marshall Center Communications Office is network project manager.

"Called the Program Support Communications Network, the new integrated digital network combines into one system all of the Agency's program support communications services," said Cassimus.

"The network provides Federal Telephone System long distance telephone service among NASA facilities, packet and circuit switched data communications, facsimile, electronic mail, and voice teleconferencing. Video teleconferencing is a planned addition during 1987. It also provides a new computer network service to provide high volume data transfer among large Class VI computers at Office of Aeronautics and Space Techology centers."

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According to Cassimus, NASA is the first government agency to integrate all voice, data, message and video services into a single, fully digital network.

"NASA is now capitalizing on new communications industry technology, and continuing our tradition of timely and effective use of advanced technology," said Cassimus. "Once completed, the network will interconnect 16 locations and will handle agencywide communications traffic employing satellite and terrestrial, high-speed digital circuits."

The network uses a computer-controlled switching unit that combines the service elements into a network and removes the need for multiple transmission circuits.

"Among the benefits the network will provide to NASA are improved quality and variety of communications services; rapid response to new or changed user services; advanced information exchange capabilities to reduce or avoid other direct NASA costs; and data on service use for future planning and maintenance of the network configuration," said Dr. F. Max Croft, director of the Communications Office.

By Monday, six NASA locations were interconnected by the network. They include NASA Headquarters, Marshall, Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, and the Dryden Flight Research Facility.

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Nine more locations will be added to the network by the end of July. They include the Ames Research Center, the Langley Research Center, the Jet Propulsion Laboratory, Marshall's Slidell Computer Complex and Michoud Assembly Facility, the Wallops Flight Facility, the National Space Technology Laboratories, and the NASA facilities at White Sands and Vandenberg Air Force Base.

The final location -- Lewis Research Center -- will be brought on line later in the year.

Implementation of the network began during 1985. The project involved designing the network, installing and testing equipment at each center, coordination of transmission services and earth station installation.

A portion of the communications services, including facsimile equipment and voice teleconferencing equipment to be provided as part of the network, were installed by the end of 1985.

Satellite transmission was operational at Marshall, Johnson Space Center and the Dryden Flight Research Facility by the middle of March.

Boeing Computer Support Services, Inc., designed the network and is the network management contractor. Boeing is supported in this effort by over 70 subcontractors and suppliers. Major subcontractors include RCA of Cherry Hill, N.J.; and BAMSI of Titusville, Fla.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release:

Robert K. Ruhl
Marshall Space Flight Center
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(205/544-0034)

May 9, 1986

RELEASE NO: 86-15

MSFC'S MULLOY, SMITH APPOINTED TO NEW POSITIONS

Lawrence B. Mulloy has been appointed Assistant to the Director of the Science and Engineering Directorate at the Marshall Space Flight Center in Huntsville, Ala., Center Director Dr. William R. Lucas announced today.

At the same time, Dr. Lucas announced that Gerald W. Smith has been appointed Manager of the Solid Rocket Booster Project, the position formerly held by Mulloy.

Mulloy transferred from the Army Ballistic Missile Agency to the former Structures and Mechanics Division of the Marshall Center in July 1960. He served in progressively responsible positions within the Structures and Mechanics Division, the former Propulsion and Vehicle Engineering Laboratory, and the Shuttle Projects Office.

In March 1974 he was named chief engineer for the Systems/Products Office, Science and Engineering, and became chief engineer for the External Tank Project in June 1974. He was named chief engineer, Inertial Upper Stage Project, Office of

- more -

the Associate Director for Engineering, Science and Engineering, in November 1980. Since October 1982, he has served as manager of the Solid Rocket Booster Project.

Smith joined the Marshall Center in September 1961 as a member of the former Structures and Mechanics Division. From 1961-63, he served in the Army and was then reemployed at Marshall in the Propulsion Division of the former Propulsion and Vehicle Engineering Laboratory. In 1965 he was employed by a major industrial corporation associated with NASA programs but later returned to Marshall in 1969 as a member of the Astronautics Laboratory.

In 1974 he was assigned to the Office of the Associate Director for Engineering in the Science and Engineering Directorate. In 1983 he became deputy manager of the Space Shuttle Main Engine Project, currently the Flight Engine Project, within the Shuttle Projects Office. In September 1984 he was appointed Deputy Associate Director for Engineering in the Science and Engineering Directorate. In April 1985, he was detailed to NASA Headquarters, Office of Space Flight (OSF), as Acting Chief, Engine Programs Branch, Shuttle Propulsion Division, under the OSF Critical Assignment Development Program. He was named Deputy Manager of the Ad Hoc Solid Rocket Motor Design Team in March 1986. "His experience in project management as well as in structures and propulsion disciplines makes him well qualified for this new assignment," Dr. Lucas said.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Mike Wright
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

For Release:

June 17, 1986

RELEASE NO: 86-19

NEW CRAY SUPERCOMPUTER INSTALLED AT MARSHALL

The Marshall Space Flight Center will mark the completed installation Friday of a new Engineering and Data Analysis System (EADS) able to complete in less than 30 minutes some large and complex computer jobs that once took more than 20 hours.

The nerve center for EADS will be a CRAY supercomputer with a capacity of 32 megabytes, a 20 megabyte increase in capacity for the Center. Marshall will officially accept the CRAY, which is located in building 4663, from the contractor on Friday.

"EADS will provide Marshall with state-of-the-art engineering and design capabilities to perform simulation, modeling and analytical calculations much faster," said J.C. Lynn, director of the Center's Computer Services Office.

"For example, EADS is expected to reduce from 60 hours to approximately six minutes the amount of time it once took to run one particular program for the Space Shuttle main engine," said Lynn.

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The system will include 1,400 terminals and more than 20 processors networked for use by Marshall's engineers and scientists.

In addition to the CRAY high-speed vector processor, the system will include an IBM 3084Q front-end processor and a range of peripherals and communications equipment.

As part of a contract awarded to The Grumman Data Systems Corporation in May 1985, Grumman is responsible for providing the hardware and software for the system for the next four years.

The communications network and the IBM front-end processor were installed in August 1985, two months ahead of the original schedule.

The Center will accept the system Friday in a ceremony beginning at 9 a.m. in building 4200. Center Director Dr. William R. Lucas, along with other officials from Marshall and Grumman, will participate. The ceremony will be followed by a tour in building 4663.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Terry Eddleman
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

For Release:
June 27, 1986

RELEASE NO: 86-22

NOTE TO EDITORS:

The National Aeronautics and Space Administration will hold two press briefings on Wednesday, July 2, 1986.

Solid Rocket Motor Redesign

10:00 a.m. CDT at Marshall Space Flight Center, Huntsville, Ala. -- John W. Thomas, Manager of the Solid Rocket Motor Redesign Team, will present an update of the team's activities.

Delta 178 Investigation

12:30 p.m. CDT at NASA Headquarters, 6th Floor Auditorium, 400 Maryland Ave., SW, Washington, D.C. -- Lawrence J. Ross, Chairman of the Delta 178 Investigation Board, will conduct a briefing on the results of that investigation.

Both events will be carried live on NASA Select TV with two-way audio.

-30-

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Robert K. Ruhl
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

July 3, 1986

RELEASE NO: 86-24

LUCAS RETIRES AS DIRECTOR OF MARSHALL SPACE FLIGHT CENTER

Dr. William R. Lucas, NASA's senior center director, retired Monday from his position as director of the Marshall Space Flight Center in Huntsville, Alabama. Dr. Lucas' career spanned 34 years of leadership in Army rocketry and NASA space programs.

Commenting on Lucas' retirement, NASA Administrator Dr. James C. Fletcher said, "History will place Bill Lucas among that very small group of individuals who have made extraordinary personal contributions to the accomplishments of America's space exploration program."

Born in Newbern, Tenn., on March 1, 1922, Lucas was educated in Tennessee schools and served as a naval officer during World War II.

He moved to Huntsville in 1952 to join the Redstone Arsenal team of rocket pioneers headed by Dr. Wernher von Braun. At Redstone he became a staff member of the Guided Missile Development Division. A specialist in materials he eventually became chief of that organization's Materials Division. On

February 1, 1956, Lucas was transferred to the Development Operations Division of the Army Ballistic Missile Agency.

There he was responsible for designing the passive thermal control system for the free world's first satellite, Explorer I, which was launched by a Huntsville team and Jupiter rocket in 1958. And he selected the materials used in the Redstone that would carry the nation's first astronaut, Alan Shepard, into space in 1961.

On July 1, 1960, when the development division became the nucleus of the Marshall Center, Lucas transferred to the new organization.

For most of the decade of the '60s, while working on the Saturn family of rockets, he served in progressively responsible management positions within the Center's Propulsion and Vehicle Engineering Laboratory, becoming laboratory director in 1966.

In these positions, he directed the critical selection of major materials and welding techniques for future launch vehicles. He pioneered work with spray-on foams for cryogenic insulation and high-temperature materials. And, he led the development of the world's largest propulsion system used in the Saturn V launch vehicle.

Lucas was also involved in the design and development of the world's first space station, Skylab. Under his direction, one of the upper stages of the Saturn V was transformed into a laboratory and living area where three astronaut crews would eventually spend a total of six months probing the unknowns of long-duration space flight and conducting numerous other

scientific experiments.

In 1969, four years prior to the actual launch of Skylab, Lucas was named by Wernher von Braun to direct a new organization designed to look to the future. In that key position, then later as deputy director of the Center, and finally from 1974, as Center director, Lucas was instrumental in bringing to Marshall a significant share of the nation's major space programs.

Under Lucas' direction, Marshall was given responsibility for managing three of the four main Shuttle elements -- the Main Engines on the orbiter, the twin Solid Rocket Boosters and the huge External Tank. In addition, the Marshall Center has had responsibility for Spacelab, an international laboratory carried in the Shuttle where career scientists can travel into space to acquire new knowledge about the sun, the stars, the Earth and life itself. The Center also assumed responsibility for managing Spacelab missions on orbit.

Other Marshall Shuttle payloads include everything from erectable large space structures and deployable solar arrays and to the first commercially marketed space product, tiny beads used as reference material to make microscopic measurements.

Under Lucas' guidance, the Marshall Center has also led a NASA/industry team in the development of the Hubble Space Telescope which will enable astronomers to see seven times further into space.

Lucas has also led the Center into a major involvement in NASA's plans for the Space Station including the development of the modules where men and women will work and live in space.

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Lucas holds a B.S. degree in chemistry from Memphis State College, now Memphis State University, and M.S. and Ph.D. degrees in metallurgy from Vanderbilt University in Nashville.

In addition, he has been awarded honorary degrees by Mobile College (humane letters), Southeastern Institute of Technology (science), and The University of Alabama in Huntsville (science).

Lucas has garnered a number of professional, civic and educational awards throughout his distinguished career. These include the rank of Distinguished Executive conferred on him by President Carter in 1980 in recognition of sustained extraordinary accomplishment in the career Federal Service. Among other awards are the NASA Medal for Exceptional Scientific Achievement presented in 1964; two NASA Exceptional Service Medals presented in January and October 1969 for his contributions to the Apollo 8 lunar orbital mission and the Apollo 11 lunar landing mission, respectively and the NASA Distinguished Service Medal awarded in 1972 for excellence in directing the Center's technical programs and planning and formulating new programs for the Nation's future in space. On April 30, 1986, Lucas was one of six who were awarded the American Institute of Aeronautics and Astronautics Elmer A. Sperry Award for contributions to the Space Transportation System.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Ed Medal
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

July 16, 1986

RELEASE NO: 86-26

SHUTTLE ENGINE TEST IS SUCCESSFUL

A 250-second main stage test of a Space Shuttle main engine was successfully conducted today at NASA's National Space Technology Laboratories in Mississippi.

Although complete results of the test will not be known until later, initial reports indicate that the test "was extremely successful," according to Ron Weesner of the Marshall Space Flight Center's Shuttle Projects Office. The Marshall Center, located in Huntsville, Ala., manages the engine program for NASA.

Today's test was the first in a series to verify a modification designed to extend the operational service life of turbine blades on the engine's high pressure oxidizer turbopump. The modification consists of a two-piece damper system designed to significantly reduce blade vibration. According to Weesner, "vibrations were lower than predicted" during the test.

The Rocketdyne Division of Rockwell International, NASA's prime contractor for the Shuttle main engines, conducted the test.

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NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Ed Medal
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

July 16, 1986

RELEASE NO: 86-27

LAWRENCE B. MULLOY ANNOUNCES RETIREMENT

Lawrence B. Mulloy, assistant to the director of Science and Engineering at the Marshall Space Flight Center, plans to retire July 18, 1986.

He had recently been assigned to become Deputy Director of the Propulsion, Power and Energy Division, Office of Aeronautics and Space Technology at NASA headquarters in Washington. In lieu of accepting this position, considered an important post with responsibilities for the development of aeronautics and space technology, Mr. Mulloy decided to exercise his option to retire. He has had more than 30 years of government service.

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NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Terry Eddleman
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

July 30, 1986

RELEASE NO: 86-28

MARSHALL CENTER ESTABLISHES OMV IN SPECIAL PROJECTS OFFICE

The Orbital Maneuvering Vehicle Project, a fiscal year 1986 new start for the Marshall Space Flight Center in Huntsville, Ala., was established last week within the Marshall Center's Special Projects Office. Bill Huber was named by Acting Center Director T.J. Lee to continue as manager of the project.

During its conceptual and definition phases, the project had been under the Center's Program Development directorate as a task team organization. Huber had led that effort for nearly three years.

"It's great to see the Marshall Center moving ahead with the Orbital Maneuvering Vehicle," said Huber. "It is going to make a significant contribution to the United States space effort."

The Special Projects Office, headed by Stan Reinartz, is an organization comprised of a variety of projects now under development or in active flight status, such as the Inertial Upper Stage and Tethered Satellite System.

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The Orbital Maneuvering Vehicle, for which TRW Inc. was recently selected for negotiations leading to a contract award, will be an unmanned propulsive stage deployed from the Space Shuttle to deliver and retrieve satellites from orbits and inclinations beyond the practical reach of the Shuttle.

Expected to cost more than $200 million in hardware development, the vehicle will extend the reach of the Shuttle up to 1,500 miles and will play an important role in the Space Station program.

Planned for placement in orbit by 1991, the vehicle will be remotely controlled from Earth, and later will be attached to the Space Station and also remotely controlled from there.

Huber transferred from the Army Ballistic Missile Agency to the Marshall Center in July 1960 as chief, Program Analysis and Control Group, Future Projects Office. He served in progressively responsible positions within the Future Projects Office and the Advanced Systems Office of the former Research and Development Operations Directorate. He was named director, Advanced Systems Analysis Office in the Program Development directorate in March 1969. He served as deputy manager of the IUS/Tug Task Team, manager of the Power Module Task Team, deputy manager of the 25kW Power Module Project Office, and deputy manager of the Space Platform Project Office before being named manager of the OMV Task Team in January 1984.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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For Release:

Mike Wright
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

August 1, 1986

RELEASE NO: 86-29

NEW MARSHALL SRB FACILITY AT KENNEDY DEDICATED TODAY

Officials from the Marshall Space Flight Center in Huntsville, Alabama, will join others from NASA and from United Technologies' USBI Booster Production Company, Inc., today to dedicate Marshall's new 238,000-square foot Solid Rocket Booster Assembly and Refurbishment Facility at the Kennedy Space Center in Florida.

The $24.75 million facility is located on a 45-acre tract one mile south of the Vehicle Assembly Building at Kennedy. Within the new facility, the USBI Booster Production Company will perform most of the Space Shuttle solid rocket booster assembly and refurbishment activities now done by the company at various locations on the center and the adjacent Cape Canaveral Air Force Station.

Approximately 570 people will be employed in the complex that includes a separate administrative office and manufacturing building and several storage and support structures.

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Those expected to participate in today's ceremony include: NASA Deputy Administrator Dr. William R. Graham; T.J. Lee and Thomas Utsman, acting directors of the Marshall Center and Kennedy Space Center, respectively; Senator Lawton Chiles of Florida; Congressman Bill Nelson of Florida; Florida's Lt. Gov. Wayne Mixson; Robert Daniell, president and chief executive officer of United Technologies Corporation; and George Murphy, executive vice president and general manager of USBI Booster Production Company, Inc.

The facility has been designed with extensive use of robotics and computer-controlled production techniques, some developed and tested in Marshall's Productivity Enhancement Center.

Major facility features will include a two-story, 48,500 square foot Engineering and Administration Building; a three-level, 167,500 square foot Manufacturing Building; a Service Building and an Aft Skirt Test Facility where hot fire testing of the SRB's thrust vector control (steering) system will be performed.

Ground was broken for the facility in January 1985, six months after Marshall selected USBI Booster Production Company to design and build the facility. The complex was designed by USBI-BPC's architectural engineering firm of Reynolds, Smith and Hills of Jacksonville, Fla. Construction was managed by USBI-BPC and Federal Construction Company of St. Petersburg, Fla.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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Sarah Keegan
Headquarters, Washington, D.C.
(202/453-8536)

For Release:
August 5, 1986

Robert K. Ruhl
Marshall Space Flight Center
Huntsville, Ala.
(205/544-0034)

RELEASE No: 86-31

THOMPSON APPOINTED DIRECTOR, MARSHALL SPACE FLIGHT CENTER

Dr. James C. Fletcher, NASA Administrator, today announced the appointment of James R. Thompson as Director of the Marshall Space Flight Center, Huntsville, Ala., effective in late September.

Thompson, 50, has been the deputy director for technical operations at the Princeton Plasma Physics Laboratory since April 1983. From March to June of this year he served as the vice-chairman of the NASA task force inquiring into the cause of the Space Shuttle Challenger accident. In this capacity he headed the day-to-day operations of the 51-L Data and Design Analysis Task Force, which collected and analyzed accident-related information in support of the Presidential Commission on the Space Shuttle Challenger accident.

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Before assuming his position at Princeton University, Thompson spent 20 years with NASA at Marshall, where he managed development of the Space Shuttle's main engines for eight years. He also worked in the Skylab program and was Associate Director of Engineering for the center.

Upon announcing the appointment, Dr. Fletcher said, "We are very fortunate to have J.R. take on this assignment which is so critical to NASA's continuing position of leadership in space exploration. I view his appointment as another positive step in the process of safely returning the Space Shuttle to flight. His extensive and varied experience makes him eminently qualified to assume this post, and I know I speak for the entire Agency in welcoming him back to NASA."

Public Affairs Office
George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Marshall Space Flight Center, Ala. 35812 Current 8/86

JAMES R. THOMPSON JR.

James R. Thompson Jr. has been named director of the National Aeronautics and Space Administration's Marshall Space Flight Center in Huntsville, Ala., effective in late September.

He was named to that position Aug. 5, 1986 by NASA Administrator Dr. James C. Fletcher. Thompson has been deputy director for technical operations at the Princeton Applied Physics Laboratory since April 1983. From March to June of 1986, he served as the vice-chairman of the NASA task force inquiring into the cause of the Space Shuttle Challenger accident. In this capacity, he headed the day-to-day operations of the 51-L Data and Design Analysis Task Force, which collected and analyzed accident-related information in support of the Presidential Commission on the Space Shuttle Challenger Accident.

Before assuming his position at Princeton University, Thompson spent 20 years with NASA at the Marshall Space Flight Center in various positions, including associate director for engineering in the Science and Engineering Directorate and as manager of the Space Shuttle Main Engine Project in the Shuttle Projects Office.

Thompson joined the research and development team at the Marshall Center in 1963 as a liquid propulsion system engineer. In 1966 he was named lead engineer in the Space Engine Section of the former Propulsion and Vehicle Engineering Laboratory in Science and Engineering, and became chief of the section in 1968.

In 1969, Thompson transferred to the former Astronautics Laboratory in Science and Engineering where he served as chief of the Man/Systems Integration Branch from 1969 to 1974.

In September 1974, he was named manager of the Main Engine Project of the Shuttle Projects Office. In that position he was responsible for the development and operation of the most advanced liquid propulsion rocket engine ever developed. He served in that position almost from the inception of the Shuttle main engine through the initial flights.

In February 1982, Thompson was named associate director for engineering in the Science and Engineering Directorate. In this position, he was responsible for planning and executing the engineering overview, analysis, evaluation and support for all Marshall Center projects that were in the hardware development stage.

Born in Greenville, S.C., Thompson graduated from Druid Hills High School in Atlanta in 1954. He was awarded a bachelor of science degree in aeronautical engineering from the Georgia Institute of Technology in 1958 and a master of science degree in mechanical engineering from the University of Florida in 1963. He has completed all course work at the University of Alabama toward a Ph.D. in fluid mechanics.

Thompson is a member of the American Institute of Aeronautics and Astronautics, Sigma Nu social fraternity, and Sigma Xi professional society.

He was awarded the NASA Medal for Exceptional Service in 1973; and the NASA Medal for Distinquished Service in 1981. In 1982, President Reagan conferred on Thompson the rank of Meritorious Senior Government Executive.

The Marshall Center has a leading role in the space program. During the sixties and early seventies, the Center was best known for development of Saturn launch vehicles and lunar roving vehicles for the Apollo program, and for Skylab, the first U.S. space station. The Center also has developed satellite scientific experiments which have returned a wealth of data in astronomy, astrophysics, and other disciplines.

Currently, the Marshall Center is carrying out a large variety of projects ranging from development and production of the propulsion elements of the Space Shuttle to management of Spacelab Earth-orbital missions, development of the Edwin P. Hubble Space Telescope, and other payloads for the Space Shuttle. Also, the Marshall Center is playing a significant role in the Space Station Project with the assignment to define and design pressurized common modules for use as laboratories, living areas, and logistic transport; to design environmental systems; to design systems for equipping the laboratory and logistics modules; and to design accommodations for orbital maneuvering and orbital transfer vehicles which would operate from the Space Station. The Center also conducts basic research in many areas such as space and environmental sciences, chemical propulsion, structures, materials, and electronics.

NASA News

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For Release:

August 7, 1986

RELEASE: 86-32

AMATEUR ASTRONOMERS TO HAVE OBSERVING TIME ON SPACE TELESCOPE

NASA and the Space Telescope Science Institute, Baltimore, Md., announced today that U.S. amateur astronomers will be given the opportunity to make observations with the Hubble Space Telescope (HST).

The announcement was made by Dr. Riccardo Giacconi, director of the institute, which is under contract to NASA. He said that a small amount of observing time is being reserved for amateurs from the director's discretionary time, which is set aside for astronomical targets of opportunity.

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Dr. Giacconi said that amateur astronomers also could use Space Telescope data and picture archives and conduct cooperative observation projects, using their own telescopes for observations in concert with Space Telescope observations.

With a 94-1/2 inch mirror, the HST will be the largest astronomical telescope ever placed in space. Because it will be above the Earth's atmosphere, astronomers expect the telescope to detect celestial objects 50 times fainter and see them with 10 times the clarity of ground-based telescopes.

Amateur astronomers have made significant contributions to astronomy since the telescope was invented nearly 4 centuries ago. There are at least a quarter million amateur astronomers in the U.S.

In announcing this program, Dr. Giacconi said, "The professional astronomy community is deeply grateful to amateur astronomers for decades of valuable assistance in our observational programs and for helping to interpret our findings to the public at large. I look to amateur astronomers to ask refreshingly new questions and I expect that they will make a real contribution to the advancement of astronomy."

To explore and implement cooperative scientific efforts with the HST project on behalf of amateur astronomers, the following

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nationally recognized leaders of amateur astronomer activities have agreed to serve as the Hubble Space Telescope Amateur Astronomers Working Group:

Dr. David W. Dunham	President, International Occultation Timing Association
Stephen J. Edberg	President, Western Amateur Astronomers
Jesse B. Eichenlaub	President, Independent Space Research Group
George D. Ellis	President, Astronomical League
Dr. Janet A. Mattei	Director, American Association of Variable Star Observers
Gerald Persha	International Amateur-Professional Photoelectric Photometry
Dr. John E. Westfall	Acting Director, Association of Lunar and Planetary Observers

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Plans by the working group for soliciting and evaluating amateur astronomer proposals for use of the HST will be announced shortly. The working group has selected Stephen J. Edberg as its chairman. Mike Potter, research assistant at the Space Telescope Science Institute, is serving as project advisory officer.

On behalf of the Hubble Space Telescope Amateur Astronomers Working Group, Edberg responded, "We are grateful for the trust that NASA, the Space Telescope Science Institute and Dr. Giacconi have shown in amateur astronomers. We look forward to continuing our long tradition of amateur contributions to astronomy as we join our professional colleagues in taking the next great step in the study of the cosmos."

The HST is a project of international cooperation between NASA and the European Space Agency (ESA). NASA's Marshall Space Flight Center, Huntsville, Ala., is the lead center for the development of the Hubble Space Telescope. NASA's Goddard Space Flight Center, Greenbelt, Md., is responsible for development of American scientific instruments aboard the Hubble Space Telescope, for spacecraft operations and management of the Space Telescope Science Institute. ESA has furnished the Space Telescope with one of its instruments and its solar arrays for electrical power.

Prime contractor for the telescope optics was Perkin-Elmer Corporation, Danbury, Conn. Lockheed Missiles and Space

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Company, Inc., Sunnyvale, Calif., was prime contractor for the HST and support systems. The scientific instruments for Space Telescope were designed by teams of scientists and constructed by aerospace corporations, NASA centers and universities.

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For Release:

August 8, 1986

Release No: 86-33

HUBBLE SPACE TELESCOPE PASSES MAJOR PRE-LAUNCH TESTING

NASA's premier astronomical observatory, the Hubble Space Telescope, successfully completed two months of rigorous testing recently in preparation for launch aboard the Space Shuttle as soon as possible after the Shuttle resumes operations in 1988.

"Much of the testing involved actually operating the 45-foot, 25,000-pound telescope under temperature and pressure conditions similar to those the observatory will experience in orbit," explained James B. Odom, telescope project manager at the Marshall Space Flight Center in Huntsville, Ala.

Additionally, all telescope-related space and ground components were exercised in a simulation of on-orbit operations, called an end-to-end test.

"Telescope performance was excellent throughout the testing," reported Odom, whose Marshall Center organization has overall responsibility for management of the Hubble Space Telescope project. "Testing demonstrated the readiness of the observatory to perform as designed.

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"No problems of major significance were uncovered in telescope hardware, software, communications or control," he said. "However, we did see somewhat less than optimal performance of the thermal control system, and some water vapor remained in the Wide Field/Planetary Camera, one of the telescope's science instruments," explained Odom. "We are working on correcting both of these conditions and we anticipate no significant effect on the performance of the Hubble Space Telescope once it is launched."

Thermal-vacuum testing began on May 2, and ended June 30. For these tests, the assembled telescope was placed in a special vacuum chamber at the Lockheed Missiles and Space Co. facility in Sunnyvale, Calif. Lockheed is the spacecraft assembly contractor. The end-to-end test, which was conducted during this time, linked the telescope with the Space Telescope Operations Control Center at the Goddard Space Flight Center, Greenbelt, Md., from where the telescope will be commanded once launched, and the Space Telescope Science Institute in Baltimore, where research in space will be guided.

"The thermal vacuum phase of the assembly and verification of the Hubble Space Telescope was a very demanding and complex series of operations," said Odom. In addition to people from Marshall, Goddard, the Science Institute, and Lockheed, the tests involved members of the European Space Agency, which provided one

-more-

of the science instruments and the telescope solar arrays; the Perkin-Elmer Corp., Danbury, Conn., the contractor responsible for the telescope optics; and the organizations responsible for developing and providing the science instruments.

When launched, the telescope will become the largest scientific payload ever placed in Earth orbit. From its vantage point above the Earth's distorting atmosphere, the telescope will enable scientists to see some 14 billion light years into space and to observe celestial objects some 50 times fainter than now possible. Some scientists have termed the telescope the greatest advance in astronomy since the invention of the simple telescope almost four centuries ago.

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For Release:
August 13, 1986

RELEASE: 86-34

NASA SELECTS PRATT & WHITNEY FOR ALTERNATE TURBOPUMP DEVELOPMENT

The National Aeronautics and Space Administration today announced the selection of United Technologies, Pratt & Whitney Aircraft, Government Products Division, West Palm Beach, Fla., for negotiations leading to a contract award for the design, development, test, flight certification and production verification of alternate high-pressure fuel and oxydizer turbopumps. These turbopumps are intended to be interchangeable with the current Space Shuttle main engine turbopumps, provide extended life capability and enhance safety margins.

A cost-plus-award-fee contract is anticipated. Pratt & Whitney's proposal reflected a cost of approximately $182 million and a period of performance of 5 to 6 years.

One other firm submitted a proposal: Aerojet TechSystems Company, Sacramento, Calif.

The contract will be managed by NASA's Marshall Space Flight Center, Huntsville, Ala.

-30-

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For Release:
August 20, 1986

RELEASE NO: 86-36

NASA AWARDS CONTRACT TO STUDY EXTERNAL TANK CONVERSION

NASA's Marshall Space Flight Center in Huntsville, Ala., has awarded a 7-month, $93,000 contract to Martin Marietta Corp., New Orleans, to study the feasibility of converting a Space Shuttle external tank to an orbiting telescope.

According to Max Nein, advanced systems division at Marshall, the proposal to transform the external tank into a Gamma Ray Imaging Telescope to study gamma ray sources in the Universe appears possible. Studies have determined that the spent tanks, 154-feet long and 27.6 feet in diameter, could be carried into orbit rather than discarded just before the Shuttle achieves orbit. Components of the telescope would be carried in the Shuttle's cargo bay along with other payloads. Because the telescope would require periodic maintenance, it probably would orbit near the planned Space Station, 230 to 345 miles above

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Earth. The proposal was initiated by Dr. David Koch, Astrophysical Observatory, Smithsonian Institution, Cambridge, Mass.

"Once in space, residual propellents would be expelled from the tank and astronauts could assemble telescope components within the liquid hydrogen tank," Nein said. "They could enter the tank via an existing 36-inch aft manhole port or through tank modification. The tank then would be pressurized to provide the needed environment for the gamma ray detection technique."

In operation, gamma rays would be converted by a lead plate into positrons and electrons which travel the length of the telescope emitting light. The light would be imaged onto a detector by a large mirror spanning the diameter of the tank. Since gamma rays reflect the highest energy processes, gamma ray astronomy is essential to understanding the evolution of stars and the universe and to the physical processes occurring in pulsars, quasars and black holes.

Nein said NASA plans to conduct a separate gamma ray survey using the orbiting Gamma Ray Observatory. The Gamma Ray Imaging Telescope would follow up the work of the Gamma Ray Observatory by enabling NASA to conduct even more detailed gamma ray studies.

"We hope the feasibility study now in progress will help us learn more about meeting the scientific and engineering challenges related to turning the external tank into a valuable resource for the space-based study of gamma ray astronomy," Nein concluded.

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Martin Marietta manufactures the Shuttle external tank under contract to MSFC at NASA's Michoud Assembly Facility, New Orleans, where the study is being performed.

-30-

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For Release:

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August 22, 1986

Release No: 86-37

NASA ANNOUNCES FULL-SCALE SOLID ROCKET MOTOR TEST PROGRAM

NASA has begun a series of tests designed to verify the ignition pressure dynamics of the Space Shuttle solid rocket motor field joint. The series will be conducted over the next year at Morton Thiokol's Wasatch Division in Utah and NASA's Marshall Space Flight Center in Huntsville, Ala.

Morton Thiokol is NASA's prime contractor for the solid rocket motor, and the Marshall Center manages the motor program for NASA.

The tests, the first of which was conducted Aug. 14 in Utah, use full-sized field joint test articles which duplicate the ignition and pressurization characteristics of the motor.

The test articles incorporate three single motor segments linked by two extensively instrumented joints. Each joint can incorporate different configurations or test conditions, and may also be environmentally conditioned.

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The segments are loaded with only about 400 pounds of actual propellant, plus inert propellant and insulation which duplicate the physical properties of a fully-loaded motor but are not consumed during a test. At ignition, the charge of live propellant burns to duplicate the first few seconds of motor operation, the time during which joint sealing and rotation are most critical.

The test articles will be refurbished and used many times. Between tests, data taken from instrumentation will be analyzed, and physical inspections of the joint and seals will be performed.

Initial tests in the series, utilizing existing hardware, will be conducted only in Utah. The Aug. 14 test, for example, was conducted to gather baseline data on the original joint design. Tests using improved joint configurations being studied by NASA will be utilized beginning in early 1987 in Utah and about mid-1987 at the Marshall Center, when the first tests are conducted there.

The test article at Morton Thiokol is called a Joint Environment Simulator and the one at Marshall will be dubbed a Transient Pressure Test Article.

The series of transient pressure tests, in conjunction with full-scale motor firings and other tests, are expected to lead to qualification of an improved solid rocket motor joint design and delivery of the first flight motor set near the end of 1987.

NASA News

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For Release:
August 20, 1986

RELEASE: 86-38

FORT PAYNE NATIVE NAMED TO NASA POST

Lt. Gen. Forrest S. McCartney, Commander of the Space Division, Air Force Systems Command, Los Angeles, has been named Director of the Kennedy Space Center, Fla. On assignment from the Air Force, he is expected to report to NASA on approximately October 1.

"General McCartney's close association with our nation's space program and his outstanding management record make him an excellent choice to become director of the Kennedy Space Center. I am pleased that the Air Force has allowed him to take on this assignment with NASA," said NASA Administrator James C. Fletcher.

McCartney succeeds Richard G. Smith who retired from NASA on July 31, 1986.

Born March 23, 1931, in Ft. Payne, Ala., McCartney received a bachelor of science degree in electrical engineering from the

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Alabama Polytechnic Institute, Auburn, in 1952 and earned a master's degree in nuclear engineering from the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, in 1955. He also is a graduate of the Armed Forces Staff College, Norfolk, Va.

McCartney's Air Force assignments have included the Satellite Control Facility, Sunnyvale, Calif., as a satellite controller during early space operations; the Office of Space Activities, Headquarters Air Force Systems Command, Andrews Air Force Base, Md., as a project officer in the Titan III program and various Air Force communication satellite programs; the Directorate of Space at Headquarters U.S. Air Force, Washington, D.C., as the program element monitor for satellite communications programs and other selected space-related efforts; and the Air Force Eastern Test Range, Patrick Air Force Base, Fla., as director of range engineering.

In June 1974, McCartney was assigned to the Space and Missile Systems Organization at Los Angeles Air Force Station as the systems program director for Fleet Satellite Communications Systems. In August 1976, he was reassigned within the organization as deputy for space communications systems.

McCartney moved to Norton Air Force Base, Calif., in September 1979, as vice commander of the Ballistic Missile Office and was named commander of the Ballistic Missile Office and M-X program director in November 1980. He became vice commander of the Space Division in May 1982 and commander, Space Division and vice commander, Space Command in May 1983. Upon activation of

the U.S. Space Command, he was redesignated commander of the Space Division in October 1985.

His military decorations and awards include the Distinquished Service Medal, Legion of Merit with one oak leaf cluster, Meritorious Service Medal and Air Force Commendation Medal with three oak leaf clusters. He also wears the master missile badge and the master space badge.

McCartney and his wife, the former Ruth Griffis of Memphis, Tenn., have two daughters, Margaret and Worthy.

-30-

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August 22, 1986

Release No: 86-39

NASA ANNOUNCES PLAN FOR SPACE STATION REVIEW

NASA Associate Administrator for the Office of Space Station Andrew J. Stofan announced today the formation of two teams to review Space Station design and work package assignments and functions.

A Space Station Configuration Critical Evaluation Task Force, headed by W. Ray Hook, Manager, Space Station Office at NASA's Langley Research Center, Hampton, Va., will conduct a technical review of Space Station architecture and systems. The task force will conduct their activities at Langley. An Executive Technical Committee, headed by Stofan, will provide oversight and guidance to the task force and will assess the impact of any design modifications or changes on individual NASA center and contractor roles.

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Stofan's actions are in response to NASA Adminstrator James C. Fletcher's July 31 directive to conduct a thorough review of all aspects of Space Station design and to hold off the implementation of work package realignment for a period of up to 90 days.

Approximately 35 people will serve on the task force full time. Several hundred more will take part in the technical evaluation, including NASA personnel from the work package centers and from outside of the program, Phase B contractors, and representatives from user groups and the international partners.

Of those 35 full-time task force people, approximately six will be from the Marshall Space Flight Center in Huntsville, Ala., and will be geographically assigned to the Langley Center until the review of the task force is complete. The Marshall Center -- one of five prime NASA centers involved in the Space Station effort -- is responsible for designing and outfitting the modules provided by the United States. NASA will build the habitability module, a laboratory module, and the logistics module. Europe and Japan will provide additional laboratories, and Canada will provide a large robotic arm for Space Station assembly and maintenance support.

The Executive Technical Committee will include representatives from engineering organizations at the five prime Space Station centers, the flight crew office and the user

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community. The acting Space Station program manager and project managers from the five Space Station centers also will serve on this committee.

The task force will critically examine all aspects of the current Space Station baseline configuration. It will evaluate the configuration in terms of the amount of extravehicular activity required for assembly and maintenance of the station, launch capacity of the shuttle fleet when again operational, assembly sequence of the baseline configuration, any resultant impact to the utilization of the station, potential impact on international partners and overall technical performance and integrity of the station.

The Executive Technical Committee will approve the assumptions, engineering and technical constraints identified by the task force and will oversee their activities. The committee will examine work package assignments from the standpoint of changes required due to the impact of any design iterations, minimizing development costs and achieving simple, controllable interfaces.

Results of the overall evaluation will be factored into the request for proposals to be released to industry in the next fiscal year beginning Oct. 1, 1986. Selection of contractors to design, build and test Space Station hardware is scheduled to take place in 1987.

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President Reagan, in his 1984 State of the Union message, directed NASA to develop a permanently manned Space Station within a decade. The Space Station, comprised of a manned base and unmanned platforms, will provide a multi-purpose facility in low-Earth orbit for the conduct of science, technology and commercial activities.

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For Release:

September 5, 1986

Release No: 86-40

NASA AWARDS STUDY CONTRACTS FOR SHUTTLE SOLID ROCKET MOTORS

NASA's Marshall Space Flight Center in Huntsville, Ala., has awarded study contracts to five aerospace firms for conceptual designs of an alternative or Block II Space Shuttle solid rocket motor.

The 120-day contracts, not to exceed $500,000 each, were awarded Sept. 3 to Aerojet Strategic Propulsion Company of Sacremento, Calif.; Atlantic Research Corporation of Alexandria, Va.; United Technologies Chemical System Division of San Jose, Calif.; Hercules Aerospace Company's Aerospace Division of Salt Lake City, Utah; and Morton Thiokol, Inc., of Brigham City, Utah, NASA's contractor for current solid rocket motors.

The contracts call for each study to provide a conceptual design for a Block II motor, a preliminary development and verification plan for the motor defining how the proposed motor program would be conducted, a capability assessment report

-more-

defining the resources needed by the contractor to conduct the program, a cost estimate for the program, and production cost of a flight set of Block II motors.

In addition, the contractors will provide conceptual designs for any proposed motor case joints within 60 days. It was a field joint on the current solid rocket motor which caused the failure of the STS 51-L flight.

The design concepts for the motor must essentially duplicate the outside geometry of the current Shuttle solid rocket motor and its interfaces with other Shuttle elements. But, with few exceptions, the studies provide the five contractors a free hand to propose a new motor.

The studies will lead to a final product geared to helping determine NASA's long-term policy for Shuttle motors. When the studies are complete NASA will look at the benefits to be gained from the Block II studies, determine how the ongoing solid rocket motor redesign efforts are proceeding, and from that determine NASA's long-term strategy.

NASA News

National Aeronautics and
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For Release:

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September 10, 1986

Release No: 86-41

NOTE TO EDITORS/NEWS DIRECTORS

The attached fact sheet on a new solid rocket motor design is being provided for background information to you and your staff. As the fact sheet notes, this design was announced by John Thomas, manager of the Solid Rocket Motor Design Team, at an August 12 press briefing. Keep in mind that this is only a preliminary design and changes could be made as the team continues its assessment and testing programs. Periodic status briefings by Mr. Thomas will be conducted to keep the media apprised of team progress and any changes in the design. These briefings will be aired over NASA Select Television and announced in advance at all NASA Centers.

- 30 -

NASA FactSheet

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

NEW SOLID ROCKET MOTOR DESIGN

At an August 12 press conference John W. Thomas, manager of the Solid Rocket Motor Design Team at the Marshall Space Flight Center in Huntsville, Ala., announced the primary design for the Space Shuttle's booster. The design includes tighter-fitting joints, more flexible O-rings and heater bands to maintain acceptable temperatures in the joints on cold launch days.

The design will undergo an intensive preliminary design phase, culminating in a review at the end of September.

Thomas concentrated his briefing on the field joint, so called because it is linked in the "field" at Kennedy rather than at the factory; the case-nozzle joint, which attaches the nozzle to the motor case; and the nozzle.

The ignition system and "factory" joint -- made in the Morton Thiokol factory in Utah prior to shipment to the Kennedy Center for installation -- are also areas of consideration in the redesign effort.

The field joint calls for "probably the most significant design effort," said Thomas. The prominent change is the "capture feature" with an "interference fit" -- an extremely tight one -- that should stop hot gas "blow-by" altogether.

Something of a tongue-in-groove method in joining segments of the booster has always been used, and the capture feature is a modification of that approach for the field joint.

A cutaway, or "profile," view of the original joint design shows a single-legged tang (the "tongue" of the joint) which fits into a U-shaped segment called a clevis (the "groove"), located beneath the tang.

In the new design the tang has a secondary leg, giving it an upside-down U-shape (again when viewed as a cutaway) which fits over the inner leg of the clevis (see illustration). When the booster segment is actually viewed from above, the tang and clevis are circular in shape -- a ring within a ring -- and in the new design they form an extremely tight fit when joined together. The reason: the circle formed by the inner leg of the tang (the capture feature) is wider than the circle formed by the inner leg of the clevis, but the larger tang circle is forced inside the slightly smaller clevis circle for a tight fit. This difference in diameters causes the inner leg of the tang to exert pressure against the inner leg of the clevis, causing a metal-to-metal "interference fit" which the redesign team predicts will force the O-ring seals to maintain tight contact and stop any hot gas leakage.

The capture feature also includes a third O-ring -- a departure from the original design of two for the field joint -- which will assist technicians in making pre-launch pressure checks and will aid the "interference fit" in stopping gas leakage. If any "rotation"

occurs -- that is, if pressure from the burning propellant causes bulging of the sides of the segments and the further opening of gaps within the joints -- the capture feature moves with the inner clevis leg and prevents hot gas from escaping.

Thomas noted that an advantage of the new field joint design is that it allows the use of casings that have the original clevis configuration, since only new casings with upgraded tangs -- those having capture features -- will be required.

He further explained that the synthetic rubber used in past O-rings of the field joint will be replaced with another material, such as fluorosilicone or nitrile rubber, having greater resiliency for a better seal. Additionally, two-kilowatt heater bands about an inch wide and a few thousandths of an inch thick will be placed on the outside of the motor casings opposite the O-rings. Covered with insulation, the bands will maintain acceptable temperature levels within the joints even on very cold launch days. Power to the bands will be supplied by an external umbilical cord, which will separate from the boosters at the moment of launch.

For the case-nozzle joint, design changes include eliminating putty that fill the gap where insulation for the case and nozzle meet, narrowing the gap where metals meet, and eliminating the insulation gap altogether by reshaping it and applying an adhesive within it to bond it tightly together. More resilient O-rings, which form seals where the metals of case and nozzle meet, will replace the older ones; and special "radial bolts" will be inserted through the two metals to join the case and nozzle more tightly together and prevent hot gases from escaping. The old design utilized a large primary bolt that vertically fastened the two elements together as a joint; however, the joint was subject to "skip," -- small, quick slippage upon ignition of the booster. The skip caused the gap between the case and nozzle to open slightly before the O-rings could compensate by expanding from their normally compressed state and sealing off the hot gas leakage. The radial bolts, however, which will be inserted horizontally through the nozzle into the casing, will eliminate such slippage.

The nozzle redesign incorporates several changes as well. Principal among them is the addition of an extra O-ring at several critical points where metal and phenolic materials, which insulate the frame of the nozzle from the terrific heat of the flame during launch, come together to form joints. Furthermore, some of the phenolic parts themselves will be redesigned by changing the direction of their layers to provide greater resistance to erosion from heat.

In other changes, more insulation will be added to the factory joints in Utah. Because of their size, booster segments are shipped from Thiokol in units no longer than two center segments at a time. They are linked by a factory joint which, unlike field joints, is covered completely by insulation and poses no substantial leakage problem. The added insulation called for in the redesign is "to enhance our safety factor and the reliability of the joint, even though we have not experienced any problem there in the past," said Thomas.

Changes to the ignition system -- located in the top of the booster -- primarily address some of its threaded bolts, which have been reconfigured for additional safety. In the old design, bolts

on the surface of the case dome, immediately above the ignitor, connected the dome to a metal adaptor plate, then both to the ignitor. The bolts pointed downward, threads toward the propellant, leaving the bolt heads exposed on the surface of the case dome as a possible hot gas escape route from the ignitor into the space above the dome area. Seals were therefore required around the heads to block any potential leakage. In the new design, the bolts have been reversed -- threads toward the case dome and heads within the ignitor area. Now completely internal, they connect the ignitor to the adaptor plate but go no further. The ends of the bolts are now secure, the threads safely within the metal of the adaptor plate, without penetration to the case dome area. (Other bolts encircling the plate will continue to connect it to the case dome, as they did in the original design.)

Although the total redesign described by Thomas is the primary one selected for preliminary review, "we are carrying several contingency designs in parallel in the event our primary design turns into being something less than desired on everybody's part," he said.

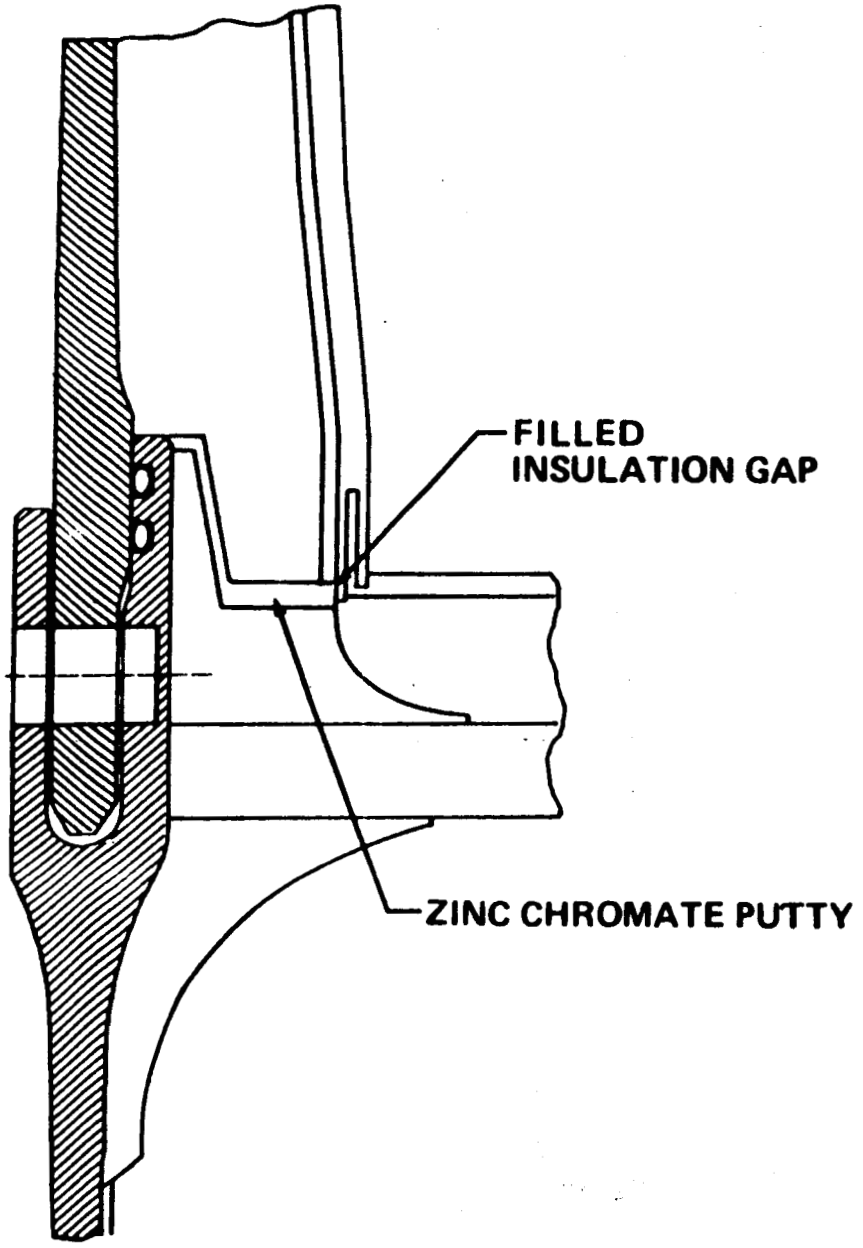
Private companies will be invited to participate in the redesign effort, according to Thomas. "We have taken the action already to invite the primary producers of solid propulsion in to review our design, critique that design, and provide to us any alternates they may have using the existing hardware that is in the inventory, and ... to provide us with a synopsis of their past history [experience with joint designs]," he said. Although such activity had occurred in the past, "we're going to focus [on] that ... over the next two to three weeks.

"There is an additional activity underway that calls for the solid rocket motor industry -- the same industry I just referred to -- to provide at the end of October a so-called 'clean sheet' design, meaning that we would not constrain the design to the use of existing hardware. We do that for contigency purposes, again in the event that something untoward happens to our preliminary design."

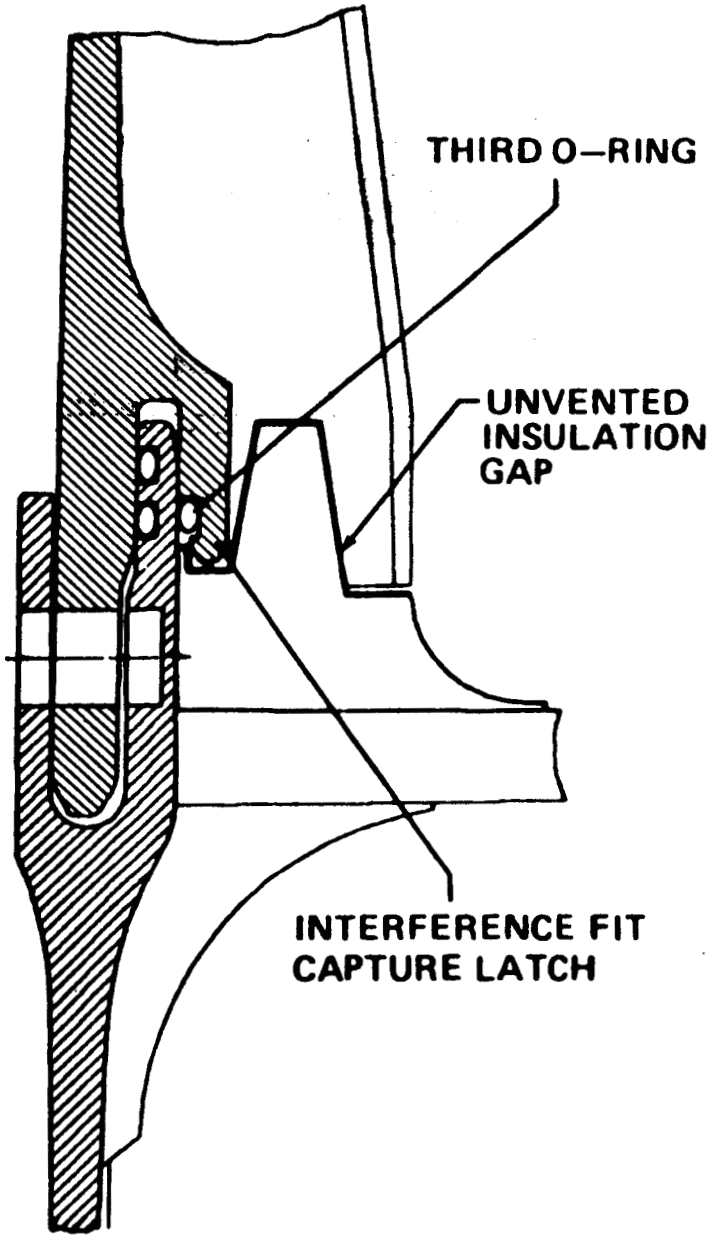
Thomas also noted that in addition to meeting with the National Research Council panel, which is overviewing his team's efforts, the design team had met with Titan rocket officials to discuss their own launch failure some months ago. While the cause of the Titan failure was different from that of the Challenger booster, he said, NASA's new design effort obligated his team to examine every kind of potential anomaly that could occur within the Shuttle system.

Full-scale tests are under way by Morton Thiokol, which will conduct 20 firings of two booster segments containing only enough propellant for firing long enough to pressurize the new joint -- about two seconds or less. With a separate set of dual segments, the Marshall Center will also conduct a similar series of 20 full-scale short-duration test firings beginning next April. At Thiokol an engineering test motor will be fired late this year, and in the fall of 1987 the company will test two development motors and a final qualification motor.

FIELD JOINT METAL AND INSULATION



ORIGINAL DESIGN



NEW DESIGN

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
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Ed Medal
Marshall Space Flight Center
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(205/544-0034)

For Release:
September 22, 1986

Release No: 86-42

MARSHALL CENTER CONSOLIDATES SAFETY, RELIABILITY AND QUALITY ASSURANCE FUNCTIONS

The Marshall Space Flight in Huntsville, Ala., has consolidated its safety, reliability and quality assurance functions into a single organization reporting directly to the center director.

Called the Safety, Reliability and Quality Assurance Office, the consolidation was announced Sept. 15 by Acting Center Director T.J. (Jack) Lee. He noted that the new organization "will provide for increased operational efficiency and will bring these functions into closer alignment with the Safety, Reliability and Quality Assurance organizations at NASA Headquarters and the other Office of Space Flight Centers."

Alexander A. McCool Jr., who has been with the Marshall Center since it was formed in 1960, will direct the newly formed office. Since 1974 he has served as director of the center's Structures and Propulsion Laboratory.

- more -

McCool explained that prior to the establishment of his new organization, the Safety Office was a staff function at Marshall and the Reliability and Quality Assurance Office was a part of the Science and Engineering Directorate. "We've had a marrying of the functions into one organization," he said.

According to McCool, his organization will be responsible for establishing and monitoring the safety and quality issues for all the programs the Marshall Center manages. "We're kind of like a police force," he said. "We set policy and establish procedures, and then work very closely with the projects to insure those policies and procedures are being followed."

There are currently about 100 civil service employees assigned to Marshall to carry out those tasks. But more people will be added in the coming months. When fully-staffed, McCool hopes to have about 175 civil service and a like number of contractors in his organization.

"We're going to find the best people possible to do the job and bring them into the organization," McCool said. "The center is committed to providing the necessary resources and I'm committed to getting the job done and done right."

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Ed Medal
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Huntsville, Ala.
(205/544-0034)

October 2, 1986

Release No: 86-45

NASA ANNOUNCES SECOND SOLID ROCKET MOTOR TEST

NASA has announced that the second in a series of short-duration vertical test firings using solid rocket motor Joint Environment Simulator test articles is scheduled to take place no sooner than Oct. 3 at Morton Thiokol's Wasatch Division in Utah.

Morton Thiokol is NASA's prime contractor for solid rocket motors. The motor program is managed for NASA by the Marshall Space Flight Center in Huntsville, Ala.

The test articles are configured from full-sized metal case hardware and consist of a forward dome, two cylindrical sections, an external tank attach section and an aft dome and port dome. The test assembly is 12.2 feet in diameter and stands 44.5 feet tall. The segments are loaded with inert propellant that simulates a Space Shuttle solid rocket motor internal grain geometry.

- more -

The configuration for the second test contains two typical field joints that are heavily instrumented to measure pressures, temperatures and deflections at the joints during initial motor pressurization. The test article is pressurized with hot gas from the igniter, a propellant cartridge, and propellant bonded in the field joint slots. Maximum pressure is achieved in about 0.6 seconds and the pressure decay to outside air conditions occurs in about 90 seconds.

The first Joint Environment Simulator test, on Aug. 14, successfully provided engineering data on the performance of joint sealing putty and of Viton(TM) O-rings at low environmental temperatures. The second test will further examine Mission 51-L failure modes and will also provide an engineering overtest of a new silicone O-ring material at low temperatures.

An additional eight tests of the Joint Environment Simulator are planned through the summer of 1987 to evaluate the performance of redesigned case joint and nozzle to case joint hardware, and the associated insulation joint. Design features evaluated in these short-duration test articles will be verified in full-scale static test motors.

NASA News

National Aeronautics and
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For Release:
October 2, 1986

Also released in
Washington, D.C.

RELEASE NO: 86-46

NASA SELECTS HORIZONTAL CONFIGURATION FOR JOINT TEST

After an intensive study, NASA has determined that the redesigned Space Shuttle Solid Rocket Motor (SRM) will be test fired in a horizontal attitude. This test attitude best simulates the critical conditions on the field joint which failed during the STS 51-L mission.

NASA also will conduct extensive component tests, full-segment joint environmental simulation tests (with loads applied) and full-scale motor static tests to verify and certify the redesigned motor for flight. Also being considered at this time is the construction of a second horizontal test stand with the capability of simulating launch and flight loads on the motor during static test. This second horizontal test facility, which should be ready for use in about 12 months at a location still to be determined, would provide additional test capability and redundancy in case of the loss of the only test facility now available to NASA. That facility is located in Utah at Morton Thiokol's Wasatch Division. Morton Thiokol is NASA's prime contractor for the Solid Rocket Motor.

-more-

The Presidential Commission investigating the STS 51-L accident recommended that NASA consider the vertical attitude for the motor firings and duplicate the actual flight conditions as closely as possible. It is NASA's belief that testing in the horizontal attitude is the most demanding test of the redesigned joint for pressure and flight-induced loads and thus best satisfies the Commission's intent.

These findings were reviewed within NASA's technical community, with the Shuttle management's formal review system, an SRM design overview committee composed of NASA amd industry experts, and the U.S. Air Force team which is responsible for returning the Titan launch vehicle to flight status. They also were presented to the independent SRM design review panel of experts established under the auspices of the National Research Council.

NASA believes that the test plan being implemented will provide the correct basis for flight verification of the redesigned SRM.

- end -

NASA News

National Aeronautics and
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For Release:
October 16, 1986

Release No: 86-49

NOTE TO EDITORS:

The final comprehensive scientific results of the NASA's Spacelab 2 mission, which flew in July 1985, will be presented during-a three day symposium in Annapolis, Md.

The Spacelab 2 science symposium will be held Oct. 20 - 22, at the Annapolis Hotel, 126 West St., Annapolis, Md. The presentations will highlight experiment results in the catagories of solar physics, plasma physics, infrared astronomy, high-energy astrophysics, life sciences and technology.

Members of the mission management team from NASA Headquarters and the Marshall Space Flight Center, Huntsville, Ala., are scheduled to participate in the presentations, along with many

- more -

Spacelab 2 scientific investigators. Media may attend any portion of the program. A special area in the conference room will be reserved for media desiring to attend any portions of the program.

At the conclusion of the Annapolis symposium, a news conference will be held on Wednesday, Oct. 22, at NASA Headquarters, 400 Md. Ave. S.W. Washington, D.C. at 2 p.m. Speakers will include Roy Lester, MSFC Spacelab 2 mission manager; Dr. Eugene Urban, MSFC mission scientist; and several Spacelab 2 principal investigators.

The Spacelab 2 news conference will be transmitted via NASA Select television on SATCOM F2R, transponder 13, 72 degrees west longitude, 3954.5 MHz. Media representatives may view and participate in the news conference from the Marshall Communications Center, building 4207.

NASA News

National Aeronautics and
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For Release:
October 16, 1986

RELEASE: 86-50

NASA TO CONSTRUCT SECOND SOLID ROCKET MOTOR TEST STAND

NASA today announced that it will proceed with the construction of a second horizontal test stand for redesign and recertification of the Space Shuttle solid rocket motor at the Morton Thiokol, Inc., Wasatch facility in Utah. The foundation of the test stand will be financed and owned by Morton Thiokol, Inc., but the removable test equipment completing the test stand will be owned by NASA and will be available for use at another site after the motor redesign and recertification process.

The new test stand will be designed to simulate, more closely than the existing solid rocket motor test stand, the stresses on the motor during an actual Shuttle launch and ascent. In addition, the second test stand will provide the capability for additional testing prior to resumption of Shuttle flight and redundancy in the event of a contingency with the existing stand.

- more -

The decision to construct a new test stand was made in conjunction with the selection of the horizontal attitude for solid rocket motor full-scale testing, and was supported by the National Research Council panel overseeing the motor redesign in its second interim report to the NASA Administrator.

This release and other NASA information is available electronically through ITT Dialcom. For access to NASA NEWS, through this system, contact Jim Hawley, ITT Dialcom, Inc. at 202/488-0550.

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National Aeronautics and
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For Release:

Ed Medal
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October 21, 1986

Release No: 86-51

MORE FULL-SCALE SOLID ROCKET MOTOR TESTS ANNOUNCED

A series of full-scale tests designed to study the dynamics of the Space Shuttle solid rocket motor nozzle-to-case joint will begin soon at Morton Thiokol's Wasatch Division in Utah. The first test is set to take place about the end of October.

Similar in concept to other tests of the shuttle motor case field joints conducted recently, the Nozzle Joint Environment Simulator test article is designed to investigate the motor case to rocket nozzle joint. The test setup utilizes a solid rocket motor forward dome mated to a motor aft dome. The aft dome contains the case to nozzle joint being investigated. Flight hardware domes and nozzle fixed housings are used in the test. Nozzles are replaced by a special piston and sleeve assembly for the purpose of the tests.

-more-

The tests are being conducted as part of the overall solid rocket motor redesign effort. The first two tests in the series involve pressurizing the test article with water to verify test article and test stand design as well as obtain measurements of joint deflections. Subsequent tests, set to begin early in 1987, will utilize live motor igniters and small amounts of propellant to obtain joint dynamics information.

Morton Thiokol is NASA's prime contractor for Space Shuttle solid rocket motors. The Marshall Space Flight Center in Huntsville, Ala., manages the motor program for NASA.

NASA News

National Aeronautics and
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For Release:

October 22, 1986

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RELEASE NO: 86-52

MOSER TO HEAD SPACE STATION PROGRAM OFFICE

NASA Administrator James C. Fletcher today named Thomas L. Moser to become director of the Space Station Program Office which will be located in the Washington, D.C., area.

The Space Station Program Office will be responsible for the overall technical direction and content of the Space Station program, including systems engineering and analysis, configuration management and the integration of all elements into an operating system that is responsive to customer needs. Moser will report directly to Andrew J. Stofan, Associate Administrator for Space Station.

Establishment of the program office in Washington was in response to a recommendation by a committee headed by former Apollo Program Director Gen. Samuel E. Phillips (USAF-Ret.) which is conducting a long-range assessment of overall NASA

- more -

capabilities and requirements. Dr. Fletcher announced this past summer that program management of the Space Station would be centralized in Washington to improve communications, program control and accountability.

Moser was appointed Deputy Associate Administrator for Space Flight at NASA Headquarters in February 1966. Prior to this position, he was director of Engineering at the Johnson Space Center, Houston.

Moser began his career with NASA in 1963 as a mechanical systems design and analysis engineer. From 1966 to 1971 he was the structural subsystem manager for the Apollo command module and subsequently became project manager for the Shuttle Structures and Mechanics Division. In 1972, Moser was named head of structural design and manager for Orbiter structure and thermal protection system.

He became technical assistant to the director in 1981 and was named deputy manager, Orbiter Project Office in 1982. He assumed the position of director of Engineering in 1983.

Born Aug. 12, 1938, in Houston, Moser received a B.S. degree in mechanical engineering from the University of Texas in 1961 and an M.S. degree in mechanical engineering from the University of Pennsylvania in 1963. He has completed candidacy requirements for a Ph.D. at Rice University.

Moser has received numerous NASA awards, including the Exceptional Engineering Medal and two Special Achievement Awards. He belongs to two professional engineering fraternities and is a member of the American Institute for Aeronautics and

Astronautics and the National Management Association. He is a registered engineer in the state of Texas.

Moser and his wife, the former Nelwyn DeLaney, reside in Arlington, Va. They have two children, Matthew and Meredith.

This release and other NASA information is available electronically through ITT Dialcom. For access to NASA NEWS, through this system, contact Jim Hawley, ITT Dialcom, Inc. at 202/488-0550.

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Nov. 4, 1986

RELEASE NO: 86-54

MARSHALL CENTER'S KINGSBURY RETIRES;
ODOM, RICHARDSON TAKE NEW POSITIONS

James E. Kingsbury, director of the Science and Engineering Directorate, has announced his plans to retire effective Nov. 30. James B. Odom has been named to succeed him.

Jerry W. Richardson has been named to replace Odom as manager of the Space Telescope Project Office. Richardson was deputy manager for Development in the Space Shuttle Projects Office.

Odom's appointment is effective Dec. 1. In the interim, he will be reassigned to the Science and Engineering Directorate to ensure a smooth transition upon Kingsbury's retirement. Richardson's appointment is effective immediately. Both appointments are pending formal approval of NASA Headquarters.

The Science and Engineering Directorate provides a capability for accomplishing scientific and engineering activities associated with the design, development, testing, and evaluation

of launch vehicles, space transportation systems, space stations, payloads and assigned projects.

Center Director J.R. Thompson noted that Kingsbury's "distinguished government service spans over three decades including the past 11 years as director of the Science and Engineering Directorate."

Thompson called Kingsbury a "recognized expert in rocketry and space flight" adding that he "has been directly involved in every major manned space flight program of NASA since the establishment of the agency."

Kingsbury joined the rocket research and development team at Redstone Arsenal in 1951 when he made significant contributions to the design and development of the nation's pioneering Redstone, Jupiter, and Juno rocket programs. He transferred to NASA in July 1960 when the Army Ballistic Missile Agency became the nucleus for the establishment of the Marshall Center.

At the Marshall Center, Kingsbury has served in various technical and management positions including chief of the Center's Materials Division at the time of the Apollo 11 lunar landing and chief engineer for mechanical systems in the development of Skylab. In June 1974, he became associate director for engineering in the Center's Science and Engineering Directorate. He assumed his present position in April 1975.

Kingsbury made important contributions to the Lunar Roving Vehicle, Apollo-Soyuz, and High Energy Astronomy Observatory Program. More recently, his involvement in the design and development of the Space Shuttle elements -- external tank, solid

rocket booster, and main engines --as well as the Spacelab and the Hubble Space Telescope was "marked by exceptional personal accomplishments and organizational leadership," Thompson said.

Odom began his government service in 1956 as an engineer with the U.S. Army and was assigned to the Development Operations Division of the U.S. Army Ballistic Missile Agency (ABMA). Following his release from active duty in 1958, he was assigned to the Systems Engineering Branch in the Development Operations Division at ABMA.

He transferred to the Marshall Center when it was established in 1960 as a senior engineer in the Light and Medium Vehicles Office and subsequently held increasingly responsible technical and managerial positions in the program and project offices of the Center. In 1972, he was named Manager of the External Tank Project in the Shuttle Projects Office, and "very capably led the design, development and production of this critical element of the Space Transportation System," Thompson said.

He had a substantial role in the effort to significantly reduce the weight of the external tank and, under his leadership, this "challenging task was completed within schedule, below projected cost, and with a weight reduction much greater than the target reduction," Thompson added.

In 1982, he became Deputy Manager for Production and Logistics in the Shuttle Projects Office where he was responsible for management and direction of all Marshall production and logistics efforts in support of Space Shuttle operations.

In April 1983, he was appointed Manager of the Space Telescope Project Office. "He has demonstrated exemplary leadership in managing the design, development, and production of the Hubble Space Telescope, the premiere space observatory for the next generation," Thompson said, adding that "Mr. Odom's technical expertise and broad project management experience make him well qualified for the position as director of the Science and Engineering Directorate."

Richardson joined the Marshall Center in 1961 as a production specialist in the former Quality Assurance Division. He served in progressively responsible supervisory positions within that division and its successor organization, the Quality and Reliability Laboratory, Science and Engineering Directorate. In 1972 he was promoted to chief of Technical Operations Office, in the Quality and Reliability Assurance Office, in the Science and Engineering Directorate, after serving for several years as deputy chief.

He was appointed manager of the Program Control Office for the Sortie Lab Task Team in the Program Development Directorate in 1973. He became manager of the Program Control Office in the Spacelab Program Office in 1974, and was named Deputy Manager of the Spacelab Program Office in October 1981.

In 1983, he was appointed manager of the Optical Telescope Assembly Project in the Space Telescope Project Office. In Sept. 1985, he was named Special Assistant to the Marshall Center director. He was appointed Deputy Manager of the Shuttle Projects Office in May 1986.

"Mr. Richardson's broad experience and managerial abilities make him well qualified for this key assignment," Thompson said.

-30-

NOTE TO EDITORS/NEWS DIRECTORS

Photos are available upon request.

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November 24, 1986

RELEASE NO: 86-56

SOLAR-A TELESCOPE

The Marshall Space Flight Center in Huntsville, Ala., has been selected by NASA Headquarters to manage the definition and development of a soft X-ray telescope slated to fly aboard a Japanese satellite to study the sun.

The telescope will be one of two major experiments on the satellite scheduled to be launched by the Japanese during the next period of maximum solar activity in August 1991.

The purpose of the Solar A mission, as the scientific effort is called, is to advance the understanding of the sun's high energy phenomena by studying its x-ray and gamma ray emissions.

"The U.S. telescope will investigate less energetic or "soft" x-rays emitted by the sun," explained Rein Ise, manager of science payload projects within Marshall's Spacelab Payload Project Office. "Our initial effort will be to perform a preliminary design of the instrument and complete an

- more -

accommodations study with the Japanese. This study will define interfaces between the telescope and the satellite."

The U.S. research team for this instrument is headed by Dr. Loren Acton, Lockheed Palo Alto Research Laboratory, Calif. Acton was a Payload Specialist on the Marshall Center-managed Spacelab 2 research mission which flew aboard the Space Shuttle in the summer of 1985.

Solar-A is expected to be in operation for three years, continuing the systematic study of high energy solar processes started by the NASA Solar Maximum mission and the Japanese Hinotori mission, both operated in the early 1980s during the height of the last epoch of maximum solar activity. These peaks, during which high energy events called solar flares most frequently occur, appear about every 11 years.

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November 26, 1986

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RELEASE NO: 86-57

NASA AWARDS UPPER STAGE CONTRACT FOR MARS OBSERVER

NASA has signed a contract with Orbital Sciences Corp., Fairfax, Va., for acquisition of the company's solid-fuel upper stage to place the agency's Mars Observer spacecraft, weighing approximately 4,700 pounds, into the proper interplanetary trajectory, so that the spacecraft can proceed on its mission to study Mars. The launch is expected in the early part of the next decade.

Called the Transfer Orbit Stage (TOS), the vehicle fits in the cargo bay of the Space Shuttle and has the potential for being integrated with a Titan launch vehicle. While the Mars Observer mission is baselined for the Shuttle, an option using an expendable launch vehicle is being kept open until early next year when a decision will be made.

- more -

The TOS will thrust NASA's Mars Observer spacecraft into its interplanetary trajectory and separate from the spacecraft. The Mars Observer will then continue on its planetary mission under its own propulsive power. After about a year of flight, the spacecraft will come to orbit Mars to begin a 2-year study with a variety of scientific instruments.

The 12-ton, 11-foot-long upper stage is being built for Orbital Sciences by Martin Marietta's Denver Aerospace Division.

NASA's Marshall Space Flight Center, Huntsville, Ala., has acted as technical monitor of the commercial development of the TOS effort. NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Mars Observer spacecraft and is responsible for its mission.

The TOS is a medium-capacity vehicle designed to economically carry payloads in the range between the Payload Assist Module PAM (built by McDonnell Douglas Astronautics Co.) and the Inertial Upper Stage (built by Boeing Aerospace Co.).

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For Release:
November 26, 1986

RELEASE NO: 86-58

UPPER STAGE SELECTED FOR PLANETARY MISSIONS

NASA has selected the Inertial Upper Stage (IUS), a launch vehicle which fits in the cargo bay of the Space Shuttle, as the baseline option to carry probes to Jupiter, Venus and the sun. However, an option is being kept open until early next year to fly one of these missions on a Titan IV.

NASA Administrator James C. Fletcher selected the upper stage, built by the Boeing Aerospace Co. under Air Force contract, for three planetary missions -- Galileo, Magellan and Ulysses -- to be launched in 1989 and 1990. These missions will be the first to employ an IUS to carry payloads to study other bodies in the solar system.

- more -

Each of the planetary payloads will use a standard two-stage IUS, with the exception of Ulysses -- a probe to study the poles of the sun -- which will require the addition of a Payload Assist Module, built by McDonnell Douglas Astronautics Co. The added module, a smaller "kick" stage, will be needed for additional energy to reach proper orbit around the sun.

Ulysses is a joint mission of NASA and the European Space Agency (ESA). ESA funded and built the Ulysses spacecraft which will have on board several American scientific instruments.

The IUS is a two-stage, 17-foot-long vehicle weighing more than 16 tons. It has already been employed to carry payloads to geostationary orbit -- where satellites match the turning of the Earth and appear unmoving in the sky -- although it has always been designed for both Earth-orbital and planetary missions.

The Magellan mission will orbit Venus and map its surface with radar, since the cloud cover of the planet obscures direct vision.

Galileo will orbit Jupiter for nearly 2 years to measure such things as electromagnetic fields and plasma particles. The orbiting spacecraft will also send down an atmospheric probe for on-site readings, although the probe is expected to last for no more than a few hours because of the intense atmospheric pressure. Galileo is a joint mission of NASA and Germany, which developed the retropropulsion system for the probe's descent into the Jovian atmosphere.

- more -

The study of the solar poles by Ulysses will be the first time in the history of the space program for such an area to be investigated.

The Magellan, Galileo and Ulysses missions are managed by NASA's Jet Propulsion Laboratory, Pasadena, Calif. The IUS and payload-to-IUS integration for the planetary missions will be managed for NASA missions by the agency's Marshall Space Flight Center, Huntsville, Ala.

In August a Commerce Business Daily announcement gave notice of a proposed NASA action to study alternative launch vehicles for planetary missions following cancellation of the Shuttle/ Centaur Upper Stage. Because of an urgent and compelling need to reestablish NASA's planetary program following the Challenger accident, the space agency concluded that IUS had the unique capability to meet the mission requirements.

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For Release:
November 26, 1986

RELEASE NO: 86-59

NASA'S REINARTZ ANNOUNCES RETIREMENT

Stanley R. Reinartz, manager of the Special Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala., and former manager of the Shuttle Projects Office at Marshall, has announced his plans to retire from federal service on Dec. 31, 1986.

Reinartz has completed nearly 30 years of federal service. In his current position, he manages such projects as the Orbital Maneuvering Vehicle, the NASA-configured Inertial Upper Stage, the Transfer Orbit Stage, the Tethered Satellite System, and the NASA portion of the Combined Release and Radiation Effects Satellite.

Reinartz began his employment at the Marshall Center in 1960. Since that time he has served in many key management positions within Marshall's program and project offices and within its Science and Engineering Directorate. These positions have included assignments as manager of the Saturn IB/Centaur Program Office, deputy manager of the Saturn I/IB Launch Vehicle and Skylab Program Offices, director of the Test Laboratory,

- more -

manager of the Inertial Upper Stage Project, and deputy manager of the Spacelab Payload Project Office. He was appointed manager of the Special Projects Office in June 1984 and was named manager of the Shuttle Projects Office in August 1985. He returned to the position of manager of Special Projects the following April.

He was awarded the NASA Medal for Exceptional Service in 1969 for his contributions to the success of the Apollo lunar landing program. In 1973 he received the NASA Medal for Outstanding Leadership for his services as deputy manager of the Skylab Program Office.

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For Release:
November 28, 1986

RELEASE NO: 86-60

PERSONNEL CHANGES ANNOUNCED AT MARSHALL SPACE FLIGHT CENTER

Four key appointments in the Science and Engineering Directorate have been announced by J.R. Thompson, director of NASA's Marshall Space Flight Center in Huntsville, Ala. The new positions are being created as part of a realignment of functions within the Science and Engineering Directorate. These changes become effective December 1.

Dr. Judson A. Lovingood is named associate director for Propulsion Systems and will be responsible for assuring engineering adequacy of the Center's propulsion projects including the Space Shuttle Main Engine, Solid Rocket Booster, External Tank, Orbital Maneuvering Vehicle, and upper stages. Dr. Lovingood has served as the associate director for Engineering,

-more-

Science and Engineering Directorate since May 1986. He previously served as manager, Main Engine Project and deputy manager, Shuttle Projects Office.

E. Ray Tanner is appointed associate director for Space Systems and will be responsible for assuring engineering adequacy of the Space Station, Hubble Space Telescope, Advanced X-Ray Astrophysics Facility, Marshall Center-assigned payloads and Spacelab payload integration. Tanner has served as deputy manager, Spacelab Program Office since August 1983 and was previously assigned to the Science and Engineering Directorate as chief engineer for the Spacelab Program.

John P. McCarty is named director, Propulsion Laboratory, and will have responsibility for research and development, engineering, and technical direction of propulsion systems design and analysis as related to launch and space vehicles. McCarty has served as director of the current Structures and Propulsion Laboratory, Science and Engineering Directorate, since October 1986. He previously served as deputy director of that laboratory as well as chief of its Propulsion Division.

Dr. George F. McDonough is named director, Structures and Dynamics Laboratory which will have responsibility for research and development in the areas of structural design and analysis of launch and space vehicles, analysis of the dynamics behavior, specification of dynamics-related design criteria, and analysis of atmospheric and environmental processes. Dr. McDonough has been

the director of the Systems Dynamics Laboratory, Science and Engineering Directorate, since March 1981 and previously served as deputy associate director for Engineering, Science and Engineering, and deputy director of the former Data Systems Laboratory.

According to Thompson, the planned organizational adjustments will strengthen the Center's position to meet the agency's goal of getting the Space Shuttle back in operation in 1988. "It will also prepare the Center for its substantial role in the Space Station program as well as other important projects both assigned and anticipated," he said.

With the realignment, the chief engineer functions will be divided between the associate director for Propulsion Systems and the associate director for Space Systems, as appropriate, to permit more focus on these important areas.

The Propulsion Laboratory will combine all dedicated propulsion activities, including the relocation of the Propulsion Test Division from the Test Laboratory.

The Structures and Dynamics Laboratory will focus these activities in one major organization.

According to Thompson, the Information and Electronics Systems, Materials and Processes, and the Space Science Laboratories are not affected. The Systems Analysis and Integration Laboratory structure will remain the same; however, there will be adjustments associated with the propulsion and thermal disciplines within the laboratory.

NASA News

National Aeronautics and
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George C. Marshall Space Flight Center
Huntsville, Alabama 35812

For Release:

Terry Eddelman
Marshall Space Flight Center
(205/544-0034)

November 28, 1986

RELEASE NO: 86-61

NASA AWARDS CONTRACT FOR PROBLEM AND SAFETY ASSESSMENT CENTERS

NASA's Marshall Space Flight Center in Huntsville, Ala., has selected Calspan Corp., Buffalo, N.Y., for award of a contract for operation of the Marshall Problem Assessment Center and Safety Issue Assessment Center.

Calspan will receive problem reports and safety issues from the prime contractors of Marshall's numerous projects, check the accuracy and completeness of the reports, and track the closeout of proposed corrective actions. The company will also perform trend analyses and special studies to identify generic causes of problems and safety issues, and it will apprise Marshall management on a daily basis about its findings. Marshall will make the final assessments and take appropriate corrective action from the data presented.

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Calspan will provide the necessary management, personnel, equipment and supplies to provide mission services for these assessment centers, both of which will be located at Marshall under its Safety, Reliability and Quality Assurance Office.

The contract, to run for a period of five years beginning Jan. 1, 1987, has a negotiated price of approximately $8.9 million.

Other firms who had submitted proposals were Rockwell International, Inc., Downey, Calif.; Lockheed Missiles and Space Co, Inc., Huntsville; Otha C. Jean and Associates, Huntsville; and USBI Booster Production Co., Inc., Huntsville.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

RELEASE NO. 86-62

For Release:
December 1, 1986

NOTE TO EDITORS

DEPUTY ADMINISTRATOR MYERS TO ATTEND MARSHALL AWARDS CEREMONY

Dale D. Myers, NASA's Deputy Administrator, will be at Marshall Space Flight Center on December 4 to attend Marshall's Annual Employee Honor Awards Ceremony. While here, Myers will also be available to meet with the press.

News media are invited to the awards presentation at 1:30 p.m. in building 4200. Media interested in speaking to Myers should come to the Public Affairs Office by 3:00 p.m. For further information, contact the Media Services Branch at Marshall, (205) 544-0034.

NASA News

National Aeronautics and
Space Administration

George C. Marshall Space Flight Center
Huntsville, Alabama 35812

RELEASE 86-63

For Release:

December 1, 1986

SAUCIER, COUNTS PROMOTED AT NASA CENTER

Sidney P. Saucier has been appointed deputy manager of the Special Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala. Saucier was formerly manager of the Inertial Upper Stage/Transfer Orbit Stage (IUS/TOS) Projects, which fall within the Special Projects Office. That position was filled by Parker V. Counts, formerly the deputy manager to Saucier. Both appointments were effective Nov. 30.

Saucier joined the Marshall Center in 1962 as a propulsion and power engineer in the former Propulsion and Vehicle Engineering Division. He subsequently held engineering and technical management positions of increasing responsibility. He was project engineer for the RL-10 hydrogen/oxygen engine in the former Propulsion and Vehicle Engineering Laboratory. He transferred to the Program Development Directorate when it was established in 1969 where he had overall responsibility for planning and developing engineering analyses and studies directed toward the definition of space transportation and exploration systems.

In 1977, Saucier became the NASA-MSFC representative for the Inertial Upper Stage at the Air Force Space Division and its predecessor organization in Los Angeles. In October 1980, he returned to Huntsville as deputy manager of the IUS Project and was appointed manager of the project in 1982. He assumed added responsibility as manager of the TOS Project in 1985.

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positions. In 1973, he was assigned to the former Mississippi Test Facility as the co-located laboratory representative for verification of the test facility modifications, development and acceptance testing of the Space Shuttle Main Engine. He subsequently served as the senior Reliability and Quality Assurance Office resident engineer at a major contractor's facility in Canoga Park, Calif. In 1977, he was named assistant to the director, Reliability and Quality Assurance Office of the Science and Engineering Directorate. He was detailed to the IUS Project in the Special Projects Office in 1980, and in 1981 was named manager of Systems Verification and Launch Operations for the project. Recently he was given the additional responsibility as deputy manager of the IUS/TOS Projects.

- 30 -

NASA News

National Aeronautics and
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For Release:

December 3, 1986

RELEASE NO: 86-65

MARSHALL CENTER'S KINGSBURY REFLECTS ON FOUR DECADES OF PROGRESS

The days are gone when vacuum tubes, instead of microcomputers, controlled the guidance systems for launch vehicles, and when engineers did their calculations on slide rules instead of computers.

But much more than that has changed in the nation's space program and at the Marshall Space Flight Center in Huntsville, Ala., since July 1951 when the U.S. Army sent then-Private James E. Kingsbury to Huntsville, a place he first saw as "a little cotton town" in North Alabama.

Over the last 34 years Kingsbury, who retired Nov. 30 as director of the Center's Science and Engineering Directorate, has done much more than witness those changes. He has been an active participant in virtually all of them.

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"I didn't have any idea what went on here (at Redstone Arsenal) in 1951. It was just a place the Army sent me and my unit to help support a group of scientists that were being transferred here from Fort Bliss, Texas," Kingsbury said referring to Dr. Wernher von Braun and his German team.

Now 26 years after he was transferred from the Army Ballistic Missile Agency to the Marshall Center, Kingsbury vividly recalls the contrast between then and now.

"In the early days of the space program we were presented with many opportunities to do things that as kids we had read about in science fiction books. There was no lack of dedication and enthusiasm on the part of anyone involved. Unfortunately there was a lack of knowledge on how to do things," Kingsbury recalls.

One of the difference in then and now was the testing program for spacecraft hardware and components. "Test programs in those days were conducted to find out what would happen, not to confirm what you expected to happen. That's a big change from today."

According to Kingsbury, "slide rules were the order of the day. We didn't have the tools for doing structural or dynamic analysis."

Despite such circumstances, Kingsbury and his associates pressed on. "The truth is we had some very dramatic successes that were caused by failures. For example, when we were working

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on the old Redstone engine, which was according to today's technology an extremely simple engine, we did not fully appreciate the hazards associated with working with liquid oxygen."

"We had not before encountered the problems of dealing with very low pressures in space. They were serious problems with lubricants that almost shut down the nation's guided missile program in the middle 50s. I also remember the days when guidance systems were filled with vacuum tubes. You worried yourself to death about something like that."

In addition to recalling how the methods, tools and resources associated with yesterday's space program differed from those of today, Kingsbury recalls how the role of the Marshall Center has changed. "Back in the 1950s and early 1960s there was really no aerospace industry in this country. There were airplane manufacturers. This meant we had to actually build and test our own hardware. Of course, the role we play today has changed from doing it all to making sure it is done right by our contractors."

"Of course, there is an advantage in designing something and seeing it built right here where you can kick the tires." However, the times required that the Marshall Center change from a center "doing a one of a kind program to a center responsible for a multiplicity of programs," Kingsbury added.

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That change occurred in the 1970s, a "very traumatic period" for the Marshall Center, according to Kingsbury. "There were rumors and conjectures that the Marshall Center might close. But because of the management acumen here we emerged from that period as one of NASA's strongest centers with a diversity of programs."

Kingsbury believes the Marshall Center retains that strength today because, despite all the other changes the Center has experienced, one thing has remained the same. "That's the quality of the people who work here. I guess I have spent my life surrounded by people whose enthusiasm for their job was foremost in their lives. In fact it is very encouraging and heartwarming to see the kind of people who are coming to work with us now in the space program. Today the people in the space program are mirror images of the kind of people we worked with in the early days. They show the same type of enthusiasm, the same type of dedication, and the same type of spirit."

"I think the space program is in great hands," Kingsbury said.

NASA News

National Aeronautics and
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December 10, 1986

RELEASE NO: 86-67

NOTE TO EDITORS:

NASA's Marshall Space Flight Center will hold a press/photo opportunity during the visit of 11 Young Cosmonauts from the Soviet Union on Monday, December 15, from 2:05 to 2:25 p.m.

The Young Cosmonauts visit is sponsored by the Young Astronaut Council, a privately sponsored, non-profit, educational organization launched by the White House in 1984. While in Huntsville, the Young Cosmonauts will tour the Marshall Space Flight Center, the Alabama Space and Rocket Center, and Space Camp.

News media representatives are requested to arrive at Building 4200 to obtain press badges prior to 1:45 p.m. The Young Cosmonaut delegation will be available for photo and press opportunities during their tour of the Shuttle mockup area in Building 4708.

- more -

For more information, news media representatives may contact the Marshall Space Flight Center Media Services Branch at (205) 544-0034.

NASA News

National Aeronautics and
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For Release:
December 19, 1986

RELEASE NO: 86-69

NEW APPOINTMENTS ANNOUNCED IN SAFETY AND QUALITY ASSURANCE OFFICE

At NASA's Marshall Space Flight Center in Huntsville, Ala., five new appointments in the Safety, Reliability and Quality Assurance Office have been announced. The new assignments were effective Dec. 18 and are part of NASA's overall plan to expand its safety, reliability and quality assurance efforts throughout the agency.

CHARLES R. MAULDIN of Huntsville has been named director of the Systems Safety and Reliability Office. As such, he will be responsible for focusing the safety and reliability roles for all Marshall-assigned projects.

WILEY C. BUNN of Huntsville has been appointed director of the Quality Assurance Office and will be responsible for all of Marshall's quality programs.

DONALD L. HARTLEY of Huntsville has been assigned as director of the Institutional Safety Office. In his new position, he will

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be responsible for Marshall's safety programs, including occupational safety, traffic safety, aviation safety and public safety.

ARTHUR M. CARR of Huntsville has been named director of the Project Assurance Office. His area of responsibility will be for all Marshall projects, with personnel co-located with the projects offices and in resident offices at all field sites.

DEWEY BOWES CHANNELL of Decatur, Ala., has been appointed chief of the Systems Safety Engineering Division within the Systems Safety and Reliability Office.

Mauldin joined the Marshall Center in 1963 as a project engineer in the former Test Division. He subsequently served in key technical positions within the Science and Engineering Directorate and its predecessor organization, the Research and Development Operations Directorate. In 1978 he was promoted to chief of the Solid Rocket Booster and Integration Branch in the Space Shuttle Systems Division of the Systems Analysis and Integration Laboratory. Since March of this year he has served in that laboratory as director of the Projects Systems Division.

Bunn began his employment at the Marshall Center in 1961 in the former Quality Division. He then served in progressively responsible positions within the quality and reliability functions, becoming deputy of the Quality Engineering Division in the former Quality and Reliability Assurance Laboratory in 1965. In 1973 he entered private industry and returned to Marshall in 1975 as the senior safety, reliability and quality assurance

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representative for the Solid Rocket Booster Project, Shuttle Projects Office, with duty station in Brigham City, Utah. In 1980 he became manager of Shuttle Reliability and Quality Assurance Support, Project Support Office, Reliability and Quality Assurance Office within the Science and Engineering Directorate. He was named director of the Reliability and Quality Assurance Office in 1984.

Hartley came to Marshall in 1963 as an aerospace engineer in the former Test Division. He served in several key technical positions within the former Research and Development Operations Directorate and the Industrial Operations Directorate. In 1971, he was reassigned to the Safety Office as a safety engineer and has been promoted to progressively responsible positions within that office. He has served as chief of Industrial Safety since 1981.

Carr joined the Marshall Center in 1962 and since that time has served in many important supervisory positions within the quality and reliability disciplines. In 1974 he was named chief of Shuttle Projects Safety, and subsequently served as chief of the Product Assurance Office, in the Reliability and Quality Assurance Office. In 1985 he was named chief of the Projects Support Office in the Reliability and Quality Assurance Office.

Channell began his employment with Marshall in 1963 in the Vehicle Systems Checkout Division of the former Reliability and Quality Assurance Laboratory. He served in key technical positions within that laboratory and subsequently in the Test

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Laboratory. In 1980 he was promoted to aerospace systems technician, Flight Missions Operations in the Systems Analysis and Integration Laboratory. In 1984 he was reassigned to the Tethered Satellite System Project in the Special Projects Office as a supervisory aerospace flight systems engineer.

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December 19, 1986

RELEASE NO: 86-70

NEW HIGH-PRESSURE TURBOPUMPS FOR SPACE SHUTTLE MAIN ENGINE
TO OFFER ENHANCED SAFETY AND OPERATING MARGINS

Alternate high-pressure turbopumps being developed for the Space Shuttle main engine will "not only be interchangeable with current main engine turbopumps but will also function for a longer period of time with enhanced safety and operating margins," according to Joe Lombardo, manager of the Space Shuttle Main Engine Projects Office at NASA's Marshall Space Flight Center in Huntsville, Ala.

The Marshall Center recently announced the selection of Pratt & Whitney to design, develop, test, verify, and certify alternate high-pressure fuel and oxidizer turbopumps. The cost-plus-award-fee contract, with a total value of approximately $198 million, was signed this week by officials of Pratt & Whitney and the Marshall Center, which will manage the contract.

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The contract is intended "to produce improved high-pressure turbopumps based on the past decade of Space Shuttle main engine operating experience," said Lombardo. "This gives us an opportunity to remove anomalies we've seen during these years."

Each of the three Space Shuttle main engines contains two high pressure turbopumps: one to pump liquid hydrogen and one to pump liquid oxygen from the external tank into the combustion chamber of the main engine. "From a mechanical standpoint, the turbopumps operate somewhat like a jet engine, but the operating environments are much more severe," said Lombardo.

"The new turbopumps are expected to significantly increase the useful life of the hardware without disassembly," Lombardo said. "This, in turn, could save millions of dollars over the life of the Shuttle program."

In addition to a more efficient design for the alternate high-pressure turbopumps, the materials used in the new pumps are expected to demonstrate increased strength, fatigue resistance, and hydrogen embrittlement resistance as compared to the complement of materials in the current pumps.

By 1991, Pratt & Whitney will deliver four sets of flight-ready turbopumps. Those pumps will be tested to verify that they will perform the same as the certification pumps. "These four pump sets could then be installed on Space Shuttle orbiters and flown, if we chose to do so," said Lombardo.

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National Aeronautics and
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For Release:
December 24, 1986

RELEASE: 86-73

SPACE STATION ORGANIZATION APPROVED

NASA Administrator Dr. James C. Fletcher has approved the organization for the Office of Space Station at NASA Headquarters.

In addition to the associate administrator and two deputies, the approved Space Station organization includes a chief scientist, a senior engineer and six division directors responsible for Resources and Administration, Policy, Utilization, Operations, Strategic Plans and Programs and Information Systems. There is also a position of special assistant to the associate administrator.

The associate administrator for the Office of Space Station is Andrew J. Stofan, former director of the Lewis Research Center. He was named to that position in June 1986. Franklin D.

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Martin is the deputy associate administrator for Space Station. Previously director of Space and Earth Sciences at the Goddard Space Flight Center, Martin was named to this post in September 1986.

Thomas L. Moser is the deputy associate administrator for development, a new position established by the reorganization. In this position, Moser also will serve as the program director for Space Station, directing the Washington-area office that will be responsible for overall technical direction and content of the Space Station program, including systems engineering and analysis, program planning and control, configuration management and the integration of all the elements into an operating system. Creation of the program director position was the central element of program restructuring in response to recommendations of the committee headed by former Apollo Program Director Gen. Samuel Phillips which conducted an extensive examination of the Space Station organization. Moser was named to this position in October 1986.

A major portion of the systems integration will be performed at the NASA centers through Space Station field offices to be established at the Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala. The Space Station project manager at each of the five centers will head the field office and will report

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directly to the program manager in Washington. The program office and field offices will be assisted in systems engineering, analysis and integration activities by a program support contractor who will be competitively selected next year. The organizational structure for the program office in Washington has not been developed, and the field office managers at the centers have not been named.

Daniel H. Herman has been named senior engineer, a new staff position created under the Space Station reorganization. The senior engineer will advise the associate administrator on the policy, schedule, cost and user implications of technical decisions. Previously, Herman was director of the engineering division whose functions and responsibilities have been absorbed by Moser's organization and was on the original Space Station Task Force which defined the basic architecture of the current Space Station system.

David C. Black will continue to serve as chief scientist for the Space Station until his appointment expires. Black, chief scientist of the Space Research Directorate at the Ames Research Center, Mountain View, Calif., has served as chief scientist for the Space Station since the post was created in 1984.

Paul G. Anderson will act as the director of the Resources and Administration Division, which is the combination of the former Business Management and Program Support organizations. Anderson previously served as comptroller at the Lewis Research Center.

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Margaret Finarelli is director of the Policy Division which has functional responsibility of the former Policy and Plans organization. This element of the reorganization reflects the strong policy coordination role required of the Space Station office in working with other elements of NASA, the international partners and other external organizations. Prior to this assignment, Finarelli was chief, International Planning and Programs Office in the International Affairs Division, NASA Headquarters.

Richard E. Halpern is the director of the Utilization Division which has responsibility for developing user requirements for the Space Station, including science and applications, technology development and commercial users, and ensuring that those requirements can be efficiently and economically accommodated on the Space Station. Halpern was the director of the Microgravity Science and Applications Division in the Office of Space Science and Applications prior to accepting this position.

The Operations Division has the responsibility for developing an overall philosophy and management approach for Space Station system operations, including user support, prelaunch and postlanding activities, logistics support and financial management. Granville Paules is currently serving as acting director of the Operations Division.

Under the new organization, two new divisions, Strategic Plans and Programs and Information Systems, were formed. Alphonso V. Diaz has assumed the position of director of Strategic Plans and Programs and has responsibility for ensuring that

the evolution of the Space Station infrastructure is well planned and coordinated with other NASA offices and external elements. As part of its responsibility, this division will manage and act as the single focus for Space Station automation and robotics activities and program-focused technology and advanced development work. Diaz has been at NASA Headquarters since 1979 and most recently served as deputy director of the Solar System Exploration Division within the Office of Space Science and Applications.

The Information Systems Division will provide a management focus for the total end-to-end information system complex for Space Station. A director for that division has not been named.

William P. Raney, who had served as director of the Utilization and Performance Requirements Division, is currently serving as special assistant to the associate administrator.

The Space Station, consisting of a manned base and unmanned free-flying platforms, will be a permanent research facility in low earth orbit for the conduct of science, technology and commercial activities in space. Operations aboard the Space Station are planned to begin in the mid 1990s.

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NASA News

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December 24, 1986

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RELEASE: 86-74

SPACE STATION ANALYSIS RESULTS

NASA Administrator Dr. James C. Fletcher today accepted the additional analysis conducted by the Office of Space Station and directed Andrew J. Stofan, associate administrator for the Space Station to implement the recommended technical and work package modifications to the Space Station configuration that resulted from the review conducted this past summer.

The additional analysis was in the areas of Space Station management, use of expendable launch vehicles (ELV), and cost impacts resulting from design changes.

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In September, Fletcher directed the Space Station office to provide additional detail in the three areas as a prerequisite to approving recommendations following a review of the Space Station program.

A detailed engineering review of the Space Station configuration was performed by the Critical Evaluation Task Force (CETF). The task force examined the Space Station baseline configuration, specifically with respect to issues of transportation capability, flight assembly and checkout, operations and safety.

An Executive Technical Committee, headed by Stofan, provided technical oversight to the task force and performed the review of the Space Station work package alignment.

Design changes recommended by the CETF included replacing the nodes and tunnels in the original Space Station design with larger "resource" nodes. The nodes are used to connect the pressurized modules.

The expanded nodes will house racks of command and control equipment, which in the baseline configuration had been located outside on the framework of the Station, thereby reducing significantly the amount of extravehicular activity required to maintain and replace equipment over the lifetime of the facility.

The CETF also recommended revising the assembly sequence to provide early scientific return and reduce extravehicular activity on early Station assembly flights. The design also

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incorporates an initial power level of 37.5 kilowatts of power, achieves a permanent manned capability with fewer Shuttle flights, places the fixed servicing capabilities closer to the modules, and makes room for early payloads. The design also reduces EVA requirements for assembly and maintenance of the Space Station, and features an improved safe haven capability.

The oversight committee recommended a realignment of certain work package responsibilities. Under that realignment, the Marshall Space Flight Center responsibilities included the laboratory, habitation and logistics modules, engine elements of the Space Station's propulsion system and the resource node structure. The Johnson Space Center responsibilities included the external truss, distributed subsystems, EVA systems, manned space systems, components and hardware in the habitat module, airlock and resource node outfitting. The Goddard Space Flight Center's responsibilities included the Space Station platforms, attached payload accommodations, robotic servicer and NASA's role in servicing. Finally the Lewis Research Center's responsibilities included the power system. Contractual arrangements for the development phase between the Johnson Space Center and the Marshall Space Flight Center were to be reflected in specific exhibits in the contracts for each center's work package and were further documented in memoranda of understanding signed by both center directors.

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The additional analysis requested by Fletcher focused on the functional and organizational dimension of the Space Station headquarters structure within the overall management of the program, the potential for using expendable launch vehicles, particularly with regard to Space Station launch and assembly, and the cost impacts of the task force recommended design modifications to the baseline configuration. A summary of the results follows:

MANAGEMENT

A detailed analysis of the management of the Space Station program, with emphasis on system engineering and integration, was conducted by a study team headed by Larry Ross, director, Space Flight Systems at the Lewis Research Center.

In June 1986, Fletcher announced that a Space Station program office would be established in the Washington, D.C., area, which would be responsible for overall technical direction and content of the Space Station program, including systems engineering and analysis, configuration management and the integration of all the elements into an operating system.

Ross' group examined the relationship between the program office in Washington, and the project offices at the NASA field centers. The resulting recommendation was consistent with NASA's earlier decision to establish a program office in the Washington, D.C., area. A major portion of the systems integration is to be performed at the NASA Centers through Space Station field offices

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which will be established at Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Flight Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala. The Space Station project manager at each of the five centers will head the field office and will report directly to the program director in Washington.

The study team concluded that this approach provided the most effective means to achieve the required level of program control and program accountability, coupled with an ability to utilize effectively the expertise that resides at the field centers.

EXPENDABLE LAUNCH VEHICLES

The potential use of existing or near-operational ELVs in the Space Station program was examined by a team headed by John Dunning of the Space Station Project Office at the Lewis Research Center.

The teams' analysis demonstrated that, under certain conditions, the schedule for achieving both the man-tended and permanently manned milestones in the assembly sequence could be accelerated by 4 to 9 months through the use of ELVs. However, ELVs would increase the amount of EVA required during the first four Station-dedicated Shuttle assembly flights by 10 to 40 percent, would require basing an Orbital Maneuvering Vehicle at the Station throughout the assembly phase to control, boost, and

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reboost passive structural elements, and could impact the weight and design of Space Station components because of the higher dynamic forces associated with ELVs.

The analysis also demonstrated that the accelerated assembly schedule was dependent upon retaining the current Shuttle flight rate to support assembly of the Station, and required the availability of as many as three Titan 4 launches during the first 2 years of Station assembly activity.

This analysis led the Space Station office to conclude that the substantial technical and programmatic uncertainties, the increased operational risks associated with the use of ELVs for the initial assembly phase and the increase in costs required to compensate for these uncertainties and risk far outweighed the marginal schedule benefits to the Space Station program and it recommended the Space Shuttle be retained as the baseline transportation system for assemblying the Station's manned base.

However, the program will continue to retain the option of using an expendable launch vehicle to launch the polar platform, one of two unmanned free-flyers that are components of the Space Station program. The study group concluded an ELV could be used to launch the high inclination platform in the event of a delayed reactivation of the Shuttle launch site at Vandenberg Air Force Base.

Also, recognizing that ELV's can be used for Space Station, and that the agency is continuing to reevaluate its STS utilization strategy in the context of overall national needs, Stofan

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has directed the program office to participate in the agency's mixed fleet studies and be prepared to discuss possible alternative strategies to the baseline for both assembly, maintenance and resupply of the Space Station.

COST IMPACT

The final item that was examined was the cost impact of the configuration changes recommended by the CETF. The analysis shows a net increase of approximately $49 million due primarily to replacing the nodes and tunnels, as defined in the original baseline configuration, with larger "resource" nodes and to increasing the power level of the photovoltaic solar arrays from 25 to 37.5 kilowatts. In addition, two cupolas were added to the configuration as was some support structure for the reaction control system.

A separate major review of Space Station cost estimates is currently underway. This review, which began in September, is being conducted by a team of approximately 35 technical and resource experts from the Space Station office and the NASA Comptroller's office. Results of this review will be presented to the NASA Administrator in mid-January.

Based upon these analyses, Fletcher has directed the Space Station Program to implement the technical and work package modifications to the Space Station configuration as outlined in the recommendations of the earlier review. The Administrator has

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also approved the memoranda of understanding between the Johnson Space Center and the Marshall Space Flight Center concerning work package responsibilities.

Completion of the analysis clears the way for final preparation of the requests for proposals (RFPs) for detailed design and development of the Space Station which are scheduled to be released to industry in February 1987.

- end -

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NASA News

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December 31, 1986

RELEASE: 86-75

NASA CENTER SELECTS CONTRACTOR TO OPERATE COMPUTER COMPLEX

NASA'S Marshall Space Flight Center in Huntsville, Ala., has selected Computer Sciences Corporation/Pan Am World Services, Falls Church, Va., for negotiations leading to the award of a 10-year contract to operate a space agency computer facility.

The contract will call for the management, operation, maintenance and protection of Marshall's Slidell Computer Complex in Slidell, La. The facility provides computer services support primarily to Marshall's Michoud Assembly Facility in New Orleans, which manufactures external tanks for the Space Shuttle.

The company will provide the necessary personnel, equipment and supplies to carry out its duties. The contract has an initial period of performance of one year, beginning in February 1987, and will contain nine one-year options. The approximate proposed value of the 10-year contract will be $99 million.

-30-