NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-01	Astronauts course in solar physics	1-15-71
Hqs	Col. Aldrin leaves NASA	1-19-71
71-02	Tektite	1-21-71
Hqs	Accreditation's for Apollo 14	1-21-71
71-03	Accident board established for Cernan's helicopter accident	1/25/71
Hqs	Lockheed Earth Resources Contract	1/28/71
Hqs	Reorganization of OMSF	1/22/71
71-04	Present accident	1/29/71
71-05	Present accident at Ellington	1/29/71
71-6	Mr. Whitbeck	2/8/71
71-07	Lockheed contract award	2/17/71
71-08	Awards ceremony	2/26/71
71-09	Announcement of Apollo 16 crew	3/3/71
Hqs	Earth-orbtial space station phase-B contract with McDonnell Douglas and North American contract extensions	3/5/71
71-10	Meeting in Dallas of Earth Observations Division	3/17/71
71-11	Rice process	3/24/71
71-12	Program for engineers in technical positions	3/24/71
71-13	Hometown release on Rich Wright	3/24/71
71-14	PET release	3/26/71
71-15	Meeting of clinical Society and Comm. Officers Association	4/2/71
71-16	Sample release to PI's	4/6/71
71-17	Fire resistant fabrics for aircraft	4/9/71
Hqs	Corn leaf blight	4/7/71
71-18	Grumman contract	4/14/71

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-19	Atomic clock	4/15/71
71-20	Microbial ~~xxxx~~ ecology evaluation release	4/15/71
71-21	Jamaica release	4/16/71
71-22	AMA meeting in Houston	4/19/71
71-23	Request for proposals on waste management system for Shuttle	4/19/71
71-24	Shuttle electronics conference	4/20/71
71-25	Contract with Martin Marietta	4/21/71
71-26	Contract for color monitor for Shuttle	4/22/71
71-27	Joe Allen speech at Am. Physical Soc.	4/26/71
71-28	10th Anniversary celebration at MSC	4/30/71
Hqs	Quarantine Discontinued	4/28/71
71-29	Safety techniques for Earth Orbiting	5/3/71
71-30	RFP - landing gear for Shuttle	5/4/71
71-31	Earth resources exploration of the flower garden	5/7/71
71-32	Skylab altitude test for medical data	5/13/71
71-33	Dynalectron release	5/13/71
71-34	Lovell going to S&AD	5/20/71
71-35	Auxiliary Propulsion System design study	5/14/71
71-36	RFP shuttle thermal protection system	5/17/71
71-37	~~XXXXX~~ Holmquist - leave of absence	5/21/71
Hqs	NR contract award	6/3/71
Hqs	Space Shuttle management announcement	6/10/71
Hqs --	~~XXXXXX~~ USSR/U.S. sharing lunar samples	6/10/71
71-38	RFP cryogenic supply system	6/11/71

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-39	Cunningham resignation	6/17/71
Hqs	Phased approach for shuttle	6/16/71
Hqs	U.S. - Soviet meetings at MSC June 21	6/17/71
Hqs	Apollox~~1~~6xxx 16 site selection	6/17/71
71-40	Apollo 14 soil results (COSPAR)	6/25/71
71-41	General Electric contract	6/22/71
Hqs	Corn Blight Watch experiment	6/18/71
~~1~~ 71-42	Stafford-Shepard position change	6/25/71
71-42b	Jamaican and U.S. review of ER data	6/21/71
71-43	-- Final report on U.S. Soviet meetings at MSC	6/25/71
71-44	Contract w/NR for study of safety techniques for c/c flying in earth orbit	~~7~~ 6/28/71
71-45	Brock (	7/1/71
71-46	Shuttle preliminary design contract extension	7/1/71
71-47	McDonnell Douglas contract	7/6/71
71-48	Lockheed contract computer support services at MSC]	7/8/71
71-48b	Medical ok for Apollo 15 by Dr. Berry	7/7/71
~~7~~ Hqs	Rocketdyne Space shuttle main engine contract	7/13/71
71-49	Soviet sample distribution	7/9/71
71-50	Wear suits ~~dix~~ during LM jettison	7/19/71
71-51	Attorneys for NASA's astronauts have reached agreement w/New York Times Special Feature	7/23/71
71-52	John F. Donnelly named ~~PAXXXXXX~~ PAO head	7/23/71
71-53	Slashing of flotation collars	7/24/71
71-53b	-- Study of flow & temp. in Trinity Bay	7/30/71
Hqs	"Life Scientist Program"	7/28/71
Hqs	Martin Marietta to assist JPL in Viking Orbiter	7/29/71

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-54	MSC & Clear Lake City Water Authority investigation	8/4/71
MSFC	Saturn V met all objectives for Apollo 15	8/3/71
71-55	R&QA and Flight Safety contract w/Boeing	8/10/71
71-56	Apollo 17 crew announemment	8/12/71
71-57	Textron & Rocketdyne contracts for APS on Shuttle	8/12/71
71-58	RIF release	8/13/71
71-59	Martin-Marietta contract: Shuttle cryo system	8/13/71
71-59b	Temp gradient below lunar surface is measured	8/23/71
71-60	Career Guidance Seminar, Outplacement center	8/25/71
—	71-~~0~~61 -- RFP atmospheric science facility	8/26/71
Hqs	Resignation of Neil Armstrong	8/25/71
Hqs	U.S.-Soviet docking discussions in Moscow	8/31/71
71-62	Workshop for a Prospective Owner of a New Business	9/1/71
~~XXXXX~~ HQS	Dr. Berry going to HQS	9/2/71
71-63	Dr. Simmons leaving MSC to go back to MIT	9/3/71
71-64	Lovell going to Harvard Business ~~Xxx~~ School	9/8/71
71-65	Contract w/Westheimer Rigging and Heavey Hauling Co.	9/8/71
71-66	Skylab's ATM arriving in Houston for testing	9/8/71
71-67	Supplemental agreement w/Grumman for Apollo Lunar Module contract	9/13/71
71-68	R+QA contract w/Boeing	9/13/71
71-69	Prelim. Biomedical Exam of Apollo 15 samples	9/17/71
[redacted]	Age dating of "Genesis rock"	9/17/71
—		
71-70	Cold weather environment tests on Skylab C M at Eglin AFB	9/17/71

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-71	Space-Science Programs for school groups	9/24
71-72	Apollo 15 Parachute Failure	9/28
71-73	Skylab Trainers Arrive at MSC	9/29
71-74	Skylab Food ~~Test~~ Taste Tests	10/1
71-75	Awards Ceremony	10/4
71-76	Hometown release for Awards Ceremony	10/5
71-79	LLTV Accident Report	10/18
H/S	Ceran Accident Report	10/18
71-80	Supplemental Agreement on Dynamics contract for LTV	10/20
71-81	Skylab Student Project	11/10/71
71-82	Propulsion Systems Study	11/15/71
Headquarters	USA/USSR Meeting on Docking	11/19/71
71-83	EVA/IVA Study	11/22/71
71-84	New Deputy Flight Directors Named	11/23/71
71-85	Glynn Lunney Goes to Moscow	11/29/71
71-86	Mr. Johnson Goes to Moscow (Caldwell C.)	11/29/71
71-87	Edgar Lineberry Goes to Moscow	11/29/71
71-88	Donald Cheatham Goes to Moscow	11/30/71
71-89	Robert Smylie Goes to Moscow	11/30/71
71-90	Donald Wade Goes to Moscow	12/3/71
71-91	Astronaut Richard F. Gordon, Jr. Retires	12/7/71
71-92	Test Bed Contracts Awarded	12/7/71
71-93	Dr. Christopher Kraft Goes to Moscow	12/7/71

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
71-94	Holiday Tour Schedule	12/13/71
71-95	MSC Awards Ceremonies	12/13/71
Headquarters	Apollo 16 Cosmic Ray Detector	12/19/71
71-96	NASA Leases Shuttle Simulator Study RFP	12/16/71
71-97	Apollo 15 Low Light Level Photography	12/19/71
71-98	Radnofsky Receives Commendation Certificate	12/20/71
71-99	Neshyba Earns Presidential Citation	12/21/71
71-100	ZEDEKAR Receives Commendation Certificate	12/22/71
71-101	NASA-Clear Lake Agreement	12/23/71
71-102	King named NASA-MSC Public Affairs Officer	12/23/71
71-103	NASA - Soviet Medical Agreement	12/27/71
71-104	MSC Welcomes One Millionth Visitor	12/29/71

NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 15, 1971
MSC-71-01

HOUSTON, TEXAS...While the majority of activity at NASA's Manned Spacecraft Center is directed toward the upcoming moon landing of Apollo 14, a group of astronauts and technicians are learning all they can about the sun.

The astronauts, potential Skylab crew members, about 50 support personnel at MSC are taking a special course in solar physics. The curriculum of the graduate level course includes a discussion of solar terrestial effects, problems to be resolved in solar physics and observational characteristics of a variety of solar phenomena.

The purpose of the course is to provide the potential Skylab crewmen with a background in solar physics and observing which will enable them to efficiently operate the Apollo Telescope Mount, one of the primary scientific objectives scheduled for Skylab. The astronauts are being trained to be solar observers with an intuitive feel for the physics behind the solar phenomena.

There are a number of transient events on the sun which emit radiation in the X-ray, ultraviolet and infrared wave lengths which can only be observed from above the earth's atmosphere. The Skylab manned telescope provides the capability of recording these events in high spatial and spectral resolution in the ultraviolet, X-ray, white light and hydrogen-alpha bands. The transient events are particularly prominent in and around active regions on the solar disk (or in the corona).

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Of the astronaut's role in the ATM, Scientist Astronaut Owen K. Garriott said, "the crewmen will provide the desired flexibility and reliability in selecting targets of scientific interest and pointing of the ATM."

"The solar physics course," Dr. Garriott said, "provides the crewmen with the background and training in recognizing, understanding, and responding to solar phenomena and events required to operate the ATM in an efficient manner."

The astronauts and support personnel have completed half of the 60-hour course started Oct. 19, 1970. When the classroom portion of the course is completed, sometime in late January, the astronauts are scheduled to gain real-time experience in use of solar telescopes and associated equipment at Sacramento Peak Observatory, Lockheed Solar Observatory, Aerospace Observatory, Kitt Peak National Observatory, and the High Altitude Observatory.

Dr. Frank Orrall of the University of Hawaii is the senior lecturer for the course. Dr. Orrall, who is on leave from the Department of Physics and Astronomy, will give a total of 38 hours of lectures on various topics in solar physics generally covering the entire field.

Other course lecturers are Dr. G. Richard White, senior scientist at the High Altitude Observatory (HAO), Boulder, Colo., Dr. R. Grant Athay, senior scientist HAO, Professor Adjoint in the Department of Physics and Astrophysics, University of Colorado, and Dr. John A. Eddy, senior scientist HAO, Professor in Astro-Geophysics Department of the University of Colorado.

The lectures are being video taped separately and will be available to other NASA personnel as well as principal investigators for the ATM experiments. Monthly update sessions will be held for the astronauts to review past solar activity, to discuss future trends, and review or obtain additional information on solar observation.

The course is divided into extensive reviews of the introduction to solar phenomena, the quiet sun (study of the solar interior, photosphere, chromosphere, and the corona), the active sun (sun spots, plages, prominences, active corona), and flares and explosive phenomena.

As part of the course, students study the sun in real time by means of closed circuit television. The TV picture is piped in from MSC's solar telescope, located about a half mile from the classroom.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
483-5111
January 19, 1971

RELEASED BY NASA HEADQUARTERS

Col. Edwin E. Aldrin, Jr., who as an Apollo 11 astronaut was on the first crew to put down on the Moon, returns to the Air Force in July 1971.

He will assume command of the Air Force System Command's Aerospace Research Pilot School, the only school in the free world that offers a formal course in space research pilot training. The school is located at Edwards Air Force Base, Calif.

In Col. Aldrin's present assignment with the National Aeronautics and Space Administration, he is working on design definition of the space shuttle.

Col. Aldrin was selected for duty with NASA as an astronaut-trainee in October 1963. Prior to his NASA assignment he had served with the 36th Tactical Fighter Wing in Germany and the 51st Fighter Interceptor Wing in Korea where he flew 66 combat missions in F-86's, downing two MIG-15 aircraft.

A graduate of the U. S. Military Academy at West Point, he has served as aide to the Dean of Faculty at the United States Air Force Academy. He holds a Bachelor of Science degree from West Point and a Doctor of Science Degree from the Massachusetts Institute of Technology, plus a number of honorary doctorate degrees.

Col. Aldrin has received many honors and awards. They include the Presidential Medal for Freedom, the NASA Distinguished Service Medal, the NASA Exceptional Service Medal, the Air Force Distinguished Service Medal, the Air Force Distinguished Flying Cross with one Oak Leaf Cluster, the Air Medal with two Oak Leaf Clusters, the Air Force Commendation Medal, the

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Air Force Command Pilot-Astronaut Wings and the NASA Group Achievement Award for the rendezvous operations and planning team.

He was the recipient of the Harmon International Trophy in 1967; the Kittyhawk Memorial Award in 1969; the Frank M. Hawks Memorial Award in 1969; the Robert J. Collier Trophy for 1969 and the AAAS Flight Achievement Award for 1969.

He also received the National Geographic Society's Hubbard Medal in 1970; the Robert H. Goddard Memorial Trophy in 1970; the Pierre Marquette Discovery Medal in 1969; the General Thomas D. White USAF Space Trophy for 1969; the William J. Donovan Award in 1970; the New Jersey Historical Society Award for 1970; the H. H. Arnold Trophy in 1970; the Ivan Kincheloe Award of the Society of Engineer Test Pilots in 1970; Honorary Life Membership in the International Association of Machinists and Aerospace Workers, and an Honorary Membership in the Aerospace Medical Association.

In addition, a number of other nations conferred their highest decorations upon him. They are: Brazil (Order of Cruzeiro do Sul), Spain (Traja de Luces), France (Legion of Honor), Belgium (Order of Leopold), Italy (Order of Merit of the Republic), Yugoslavia (Order of the Yugoslav Star), Congo (Order of the Leopard), Iran (Order of Taj), Thailand (Order of the White Elephant), Korea (Order of Rose Azalea), and Japan (Order of Culture).

Col. Aldrin is the son of the late Marian Moon Aldrin and of Col. (USAF Ret.) Edwin Aldrin who resides in Brielly, N. J., a native of Montclair, N. J. They have three children: J. Michael, 15; Janice R., 13; and Andrew J., 12.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

483-5111

January 21, 1971
MSC 71-02

HOUSTON, TEXAS...Two members of NASA have been invited to participate in the initial meetings of a study group planning a proposed Texas Tektite Program, an underwater living project which might be established in the Flower Garden coral reef of the Gulf of Mexico.

James L. Tomberlin, a special assistant in MSC's Engineering and Development Directorate, and Richard Sprince, from the Office of Manned Spaceflight, NASA Headquarters, have represented the space agency during the exploratory meetings.

The Texas Tektite feasibility meetings is sponsored by the Marine Biomedical Institute of Galveston. It is a joint project of the University of Texas and Texas A&M University systems.

Initial meetings investigated use and benefits which might come from such a project. Attending were representatives from other govermental agencies, industry and academic institutions.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 21, 1971

RELEASED BY NASA HEADQUARTERS

Fifteen hundred news media representatives have been accredited so far to cover the launch and flight of the National Aeronautics and Space Administration's Apollo 14.

Of this number, 225 represent foreign newspapers, magazines, radio and television stations in 23 countries.

The total Apollo 14 press accreditation is expected to exceed 1,700 by liftoff from Kennedy Space Center, Fla., on Jan. 31 at 3:23 p.m. EST.

The Apollo 13 mission in April 1970 attracted 1,795 newsmen, including 370 correspondents from aboard.

Record press accreditation for a United States manned flight was 3,497 on Apollo 11, the first manned lunar landing mission in July 1969.

The spacecraft commander for Apollo 14 is Alan B. Shepard, Jr. who was the first U. S. astronaut in space. By way of contrast, 440 newsmen covered his 15-minute sub-orbital flight from Cape Canaveral, Fla., on May 5, 1961.

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NEWS RELEASE

N..TIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 25, 1971
MSC 71-03

HOUSTON, TEXAS--A five-man board was named today by Manned Spacecraft Center Director Robert R. Gilruth to investigate the crash Jan. 23 of a NASA helicopter piloted by Astronaut Eugene A. Cernan.

Astronaut James A. Lovell, Jr., will be board chairman. Other members of the investigating team will be Conway H. Roberts, Aviation Safety Officer at MSC; Harold E. Ream,Senior MSC Pilot; Dick M. Lucas, Chief of MSC's Aircraft Maintenance and Quality Assurance Branch; and Astronaut Alan L. Bean.

Astronaut Cernan was flying the helicopter, a two-place Bell 47, on a training flight when the craft crashed in the Indian River near Cape Kennedy.

Cernan, who is Commander of the Apollo 14 backup crew,escaped from the crash with minor contusions and abrasions and some slight singeing of the eyebrows and eyelids.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 28, 1971

RELEASED AT NASA HEADQUARTERS

The National Aeronautics and Space Administration has selected Lockheed Electronics Co., Houston, for award of a contract to provide scientific and technical support services for the Earth Resources Laboratory at Mississippi Test Facility, Bay St. Louis, Miss.

The value of the cost-plus-fixed-fee contract is estimated at approximately $800,000 for the first year's period of performance which is to begin in February 1971. Provisions for two one-year extensions will be included in the contract.

Lockheed Electronics will support the Earth Resources Laboratory in research on the application of data acquired by remote sensing techniques to the Mississippi-Louisiana-Gulf area. The laboratory will use data generated by Earth resources experiments carried on aircraft, the Earth Resources Technology Satellites (ERTS), and on the manned orbiting Skylab, as well as data from Gemini and Apollo missions.

Ten firms had submitted proposals for the work.

Laboratory management is provided by NASA's Manned Spacecraft Center, Houston, with overall responsibility for program management under the Office of Space Science and Applications, NASA Headquarters, Washington.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

483-5111

January 22, 1971

RELEASED BY NASA HEADQUARTERS

The National Aeronautics and Space Administration has reorganized its Office of Manned Space Flight to reflect new management requirements for future manned flight programs.

Dale D. Myers, Associate Administrator for Manned Space Flight, said the new alignment will provide greater flexibility in use of manpower and will provide for uniformity of approach in manned flight technical efforts.

The five offices directing the ongoing programs of manned space flight Apollo, Skylab, Space Shuttle, Space Station Task Force and Advanced Missions remain essentially unchanged.

Two technical support offices are established. These are the Engineering and Operations Office under the direction of Robert N. Lindley and the Reliability, Quality and Safety Office under the direction of Haggai Cohen.

Also established are two functional offices: Administration Office under M. Keith Wible and Budget and Program Analysis Office under Harry Gorman, who assumes the direction of this office in an acting capacity in addition to his regular duties as Deputy Associate Administrator for Manned Space Flight (Management).

Four previous organizations are abolished. They are Mission Operations, Field Center Development, Institutional Operations and Space Medicine.

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John O. Stevenson (Maj. Gen., USAF-ret.), formerly Director of Mission Operations, becomes Deputy Director of Engineering and Operations. Robert F. Frietag (Capt. USN-ret.), formerly Director of Field Center Development, becomes Special Assistant to the Associate Administrator for Manned Space Flight.

The Space Medicine Office has been combined with other life science activities as announced December 3. Dr. James W. Humphreys, Jr., (Maj. Gen. USAF-ret.) is NASA Director for Life Sciences.

Other recent changes include the naming of Charles J. Donlan as acting director of the Space Shuttle Program in addition to his regular duties as Deputy Associate Administrator for Manned Space Flight (Technical) and Douglas R. Lord as Director of the Space Station Task Force.

NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 29, 1970
MSC 71-04

Houston, Texas--Stuart M. Present, a MSC staff pilot, ejected today from a lunar landing training vehicle at Ellington Air Force Base, Texas. He was not injured. Details of the accident, which occurred at 10:34 a.m., CST, are not yet available. They will be released as soon as possible.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

January 29, 1971
MSC 71-05

HOUSTON, TEXAS--Stuart M. Present, 40, a MSC staff pilot, ejected today from a lunar landing training vehicle at Ellington Air Force Base, Texas. He was not injured.

Preliminary investigation indicates that a loss of electrical power was the cause of the crash. Up to the time electrical power was lost, the attitude control system and the lunar module hand controller appeared to be functioning normally.

Christopher C. Kraft, Jr., MSC Deputy Director, said,"A complete investigation will be made of the accident. This accident should not affect Apollo 14. The only piece of hardware common to the LM and the LLTV is the hand controller, and that does not appear to have been the problem. The LLTV electrical system is totally different from the one in the lunar module."

Present was on a routine check flight when the accident occurred at 10:35 a.m., CST. He ejected moments before the vehicle crashed on a runway and burned. He had made 28 previous LLTV flights, beginning in April, 1970.

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Add 1
MSC 71-05

Three LLTV's were contracted for from Bell Aerosystems Company, Buffalo, New York, and delivered at a cost of $5.6 million in the latter part of 1967.

Today's crash was the second for a LLTV. The one remaining LLTV is based at Ellington AFB.

The first LLTV was destroyed in a crash December 8, 1968, at Ellington. The pilot, Joseph S. Algranti, Chief of MSC Aircraft Operations, parachuted to safety.

A Lunar Landing Research vehicle, forerunner to the LLTV, crashed at Ellington, May 6, 1968. The pilot, Astronaut Neil Armstrong, ejected safely.

The single-seat, wingless, free-flying vehicles are used to simulate the final 500 feet of the lunar landing. Primary support for the vehicle is supplied by a 4,200 pound thrust turbofan engine which has been modified for vertical flight and installed on a gimball mounting behind the cockpit.

The engine is automatically controlled and lifts five-sixths of the vehicles's weight, thus counteracting five-sixths of the earth's gravity and simulating the one-sixth gravity of the moon.

Lift for the remaining one-sixth of LLTV's weight is provided by two rocket engines with a maximum thrust of 500 pounds each.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

February 8, 1971
71-06

HOUSTON, TEXAS...The Manned Spacecraft Center announced today a reorganization of Center Administrative, procurement, and technical support activities.

The Administration Directorate and the Program Control and Contracts Directorate have been abolished. The Procurement Division and Program Budget Division formerly assigned to the Program Control and Contracts Directorate, together with the Institutional Resources and Procurement Division, the Personnel Division, the Financial Management Division, the Management Analysis Office, and university programs responsibility have been organized into a new Administration and Program Support Directorate. The Photographic Technology Division, Engineering Division, Technical Services Division, Logistics Division, and Management Services Division formerly a part of the Administration Directorate will form a new Center Operations Directorate.

Mr. Philip H. Whitbeck, formerly Director of Administration, was named as Director of the Administration and Program Support Directorate. Mr. Clinton L. Taylor, formerly Assistant Manager of the Skylab Program Office, was named Deputy Director of the new Directorate. Mr. Joseph V. Piland, formerly Deputy Director of Administration, was named as Director of the Center Operations Directorate.

Mr. Whitbeck, a native of Stillwater, Minnesota, has been with NASA since shortly after its establishment. He joined the Manned

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Spacecraft Center in March of 1961 serving as Deputy Director of Administration until 1968 when he became Director of Administration. Mr. Whitbeck is a graduate of the University of Minnesota where he received his undergraduate degree in Political Science in 1947 and completed graduate work in Public Administration in 1948. Prior to his service with NASA, Whitbeck served with the Atomic Energy Commission as a senior management analyst and a Personnel Officer. Whitbeck is married to the former Elizabeth Reed of Rahway, New Jersey. The Whitbecks have two children: Bill, 14, and Anne, 16, both students at LaPorte High School. The Whitbecks reside in Shoreacres, Texas.

Mr. Taylor, a native of Austin, Texas has been with NASA since 1962 when he joined the Manned Spacecraft Center. Prior to 1962, he was with General Dynamics - Convair and North American Rockwell in an engineering capacity. Mr. Taylor is a graduate of the University of Texas at Austin where he received his degree in Mechanical Engineering in 1961. He is married to the former Marion Nowotny of Austin, Texas. The Taylors have one child, Cynthia Lynn, 9 years old. The Taylors reside in Houston.

Mr. Piland, a native of Portsmouth, Virginia, has been with NASA since its establishment and prior to that with its predecessor agency, The National Advisory Committee on Aeronautics. From 1964 to 1969 he served as Manager of Technical and Engineering Services and in 1969 he was appointed Deputy Director of Administration. Mr. Piland is a graduate

of Virginia Polytechnic Institute where he received his degree in Mechanical Engineering. He is married to the former Ruth Beard of Portsmouth, Virginia. The Pilands have three children: Ellen, 22; Joseph Jr., 21; and John, 15. The Piland's reside in Dickinson, Texas.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

453-5111

February 26, 1971
MSC 71-08

HOUSTON, TEXAS...NASA Acting Administrator George M. Low will present awards Saturday, February 28 to NASA employees and to contractors and Department of Defense organizations for outstanding contributions to the Apollo 13 and 14 missions.

Apollo 14 astronauts Alan B. Shepard., Stuart A. Roosa and Edgar D. Mitchell and Apollo 13 Astronauts James A. Lovell, Jr., and Fred W. Haise will participate in the ceremonies, which will be held at the Manned Spacecraft Center in the main auditorium of building 1 begining at 10 a.m.

MSC Deputy Director Christopher C. Kraft, Jr., will be master of ceremonies and will assist in presentation of the awards.

Six NASA officials will receive the Agency's highest award, the NASA Distinguished Service Medal. Recipients of the award will be Dale D. Myers, Associate Administrator for Manned Space Flight, NASA Headquarters; James A. McDivitt, Manager, Apollo Spacecraft Program Office, Manned Spacecraft Center; Sigurd A. Sjoberg, Director of Flight Operations, Manned Spacecraft Center; Walter J. Kapryan, Director of Launch Operations, Kennedy Space Center; Eugene F. Kranz, Chief, Flight Control Division, Manned Spacecraft Center; and Glynn S. Lunney, Chief, Flight Directors Office, Manned Spacecraft Center.

The NASA Distinguished Public Service Medal will be awarded to the Grumman Aerospace Corporation "In recognition of the team's outstanding skill which made possible the successful use of the Lunar Module as a rescue vehicle for the safe return to earth of the Apollo 13 crew."

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The award will be accepted by Grumman Senior Vice President Joseph G. Cavin, Jr.

Twenty three NASA employees will receive NASA Exceptional Service Medals in recognition of "their outstanding contributions to this nation's manned space flight program."

NASA Group Achievement Awards will be presented to the Manned Flight support Network of NASA's Goddard Space Flight Center and to the Department of Defense Recovery Forces.

Donald E. Eyles, an employee of the Charles Stark Draper Laboratory at the Massachussetts Institute of Technology, will receive the NASA Public Service Award for his contribution in solving a problem with the Apollo 14 Lunar Module guidance system and circumventing an inadvertent abort of the lunar landing.

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NASA DISTINGUISHED SERVICE MEDALS

Walter J. Kapryan	Kennedy Space Center
Eugene F. Kranz	Manned Spacecraft Center
Glynn S. Lunney	Manned Spacecraft Center
James A. McDivitt	Manned Spacecraft Center
Dale D. Myers	NASA Headquarters
Sigurd A. Sjoberg	Manned Spacecraft Center

NASA DISTINGUISHED PUBLIC SERVICE MEDAL

Grumman Aerospace Corporation

NASA EXCEPTIONAL SERVICE MEDALS

Arnold D. Aldrich	Manned Spacecraft Center
Donald D. Arabian	Manned Spacecraft Center
Ronald L. Berry	Manned Spacecraft Center
Graydon F. Corn	Kennedy Space Center
M. P. Frank, III	Manned Spacecraft Center
John R. Garman	Manned Spacecraft Center
Charles D. Gay	Kennedy Space Center
James E. Hannigan	Manned Spacecraft Center
Onice M. Hardige, Jr.	Marshall Space Flight Center
Caldwell C. Johnson, Jr.	Manned Spacecraft Center
Sidney C. Jones, Jr.	Manned Spacecraft Center
H. Fletcher Kurtz, Jr.	Marshall Space Flight Center
Ellery B. May, Jr.	Marshall Space Flight Center
Riley D. McCafferty	Manned Spacecraft Center
Charles H. Meyers	Marshall Space Flight Center
Lawrence B. Mulloy	Marshall Space Flight Center
Shelby L. Owens	Manned Spacecraft Center
John W. O'Neill	Manned Spacecraft Center
Scott H. Simpkinson	Manned Spacecraft Center
Richard A. Thorson	Manned Spacecraft Center
Terry Williams	Kennedy Space Center
Milton L. Windler	Manned Spacecraft Center
Ralph A. Yoria	Kennedy Space Center

NASA PUBLIC SERVICE AWARD

Massachusetts Institute of Technology

NASA GROUP ACHIEVEMENT AWARDS

Manned Flight Support Network, Goddard Space Flight Center

DOD Recovery Forces

NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
NASA
Houston 1, Texas

483-5111

March 3, 1971
MSC 71-09

HOUSTON, TEXAS--The National Aeronautics and Space Administration today announced prime and backup crews for the Apollo 16 mission, scheduled for launch in March 1972.

Prime crewmen are John W. Young, Commander; Thomas K. Mattingly II, Command Module Pilot; and Charles M. Duke, Jr., Lunar Module Pilot. Backup crewmen, respectively are Fred W. Haise, Jr., Stuart A. Roosa, and Edgar D. Mitchell.

The lunar landing site for Apollo 16 has not yet been selected; however, it will not be in a mare area.

Mission duration will be approximately 12 days, including a lunar surface stay time of about 67 hours. Young and Duke will have three extra-vehicular activity periods on the lunar surface, totaling about 20 hours. They will use a Lunar Roving Vehicle (LRV).

An Apollo lunar surface experiment package (ALSEP) will be deployed and an extensive lunar orbital science program will be conducted. Mattingly will leave the Command Module during trans-earth coast to retrieve a lunar orbital science film package from the service module.

Young, 40, is a Navy Captain who will be making his fourth space flight. He has flown on Geminis 3 and 10 and Apollo 10. Apollo 16 will be his first lunar landing mission.

Mattingly, 34, a Navy Lieutenant Commander, has not yet flown in space. He was replaced as the prime command module pilot on Apollo 13 a few days before launch after being exposed to the German measles.

-more-

Duke, 35, an Air Force Lieutenant Colonel, also will be making his first space flight. He was backup lunar module pilot for Apollo 13.

Haise, 37, a civilian, was the lunar module pilot on the Apollo 13 mission. He served as backup lunar module pilot for Apollos 8 and 11.

Roosa, 37, is an Air Force Lieutenant Colonel. He was the command module pilot on the recently completed Apollo 14 mission.

Mitchell, 40, a Navy Captain, was the lunar module pilot on Apollo 14. He served as backup lunar module pilot on Apollo 10.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

483-5111

March 5, 1971

RELEASED AT NASA HEADQUARTERS

HOUSTON, TEXAS--The National Aeronautics and Space Administration has extended the Phase B contracts with McDonnell Douglas Corp., Huntington Beach, Calif., and the North American Rockwell Corp., Seal Beach, Calif., to continue studies of a manned Earth-orbital space station.

The ten-month, cost-plus-fixed-fee contract extensions were effective February 1, 1971.

In addition to the ten-month extension, each company will work on advanced technology in the design, development and fabrication of an Information Management System breadboard to validate specific subsystems applicable to a range of space station configurations proposed in the Phase B efforts.

Each contract is valued at approximately $3.4 million.

The basic configuration to be considered in this definition study extension is a modular space station constructed from individual modules delivered to Earth orbit by a space shuttle vehicle.

The initial station includes a general purpose laboratory, the capability to support two research modules, crew quarters and a command and control area. The growth version will include additional crew quarters and laboratories for experiments in life sciences, astronomy, Earth resources and physics.

-more-

Add 1

The station should be capable of accommodating a crew of six and be operational in the early 1980's. The station also should have the potential for growth up to 12 scientists and crew.

The McDonnell Douglas effort is directed by NASA's Marshall Space Flight Center, Huntsville, Ala., while the North American Rockwell work is under the direction of NASA's Manned Spacecraft Center, Houston.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

NASA

Houston 1, Texas

483-5111

March 17, 1971
MSC 71-10

HOUSTON, TEXAS--Representatives of the Earth Observations Division at the NASA Manned Spacecraft Center, Houston, Texas will discuss potential use of remote sensing techniques on March 23, 1971 in Dallas.

Mike Holter, Dr. John Dornbach, and Bryan Erb of NASA's Earth Observation Division will describe what NASA has accomplished in the earth observation area. NASA-MSC has several instrumented aircraft which overfly select test sites for government and university scientists in the disciplines of agriculture, forestry, geology, hydrology and oceanography.

Mr. Holter will discuss the work being planned in the Houston area and this work's potential application to the Dallas region.

Representatives of regional planning and local public agencies have been invited to attend the presentation which will be held in the auditorium of the Dallas Power and Light Company at Commerce and Browder Streets. The program,which is sponsored by the Dallas Area Office of the Housing and Urban Development,begins at 9:30 a.m. on March 23.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

March 24, 1971
MSC 71-11

HOUSTON, TEXAS--A new "quick and easy" rice preparation process which was developed for the nation's manned space flight program may soon find its way to the American dinner table or on camping and hunting trips.

NASA's Invention and Contributions board which has described the process as a "technical contribution having scientific value" awarded $300 to its inventor Dr. Clayton Huber of the NASA Manned Spacecraft Center's team of food scientists. Dr. Huber is employed by Technology, Inc. of San Antonio, Texas, which provides design and evaluation on space flight feeding systems at MSC.

The new process allows rice using "hot tap water" to rehydrate from the dry state to the "ready-to-eat" in several minutes, compatible to use in a spacecraft and the common household kitchen. The process modifies the physical properties of the rice starch by means of alternate cycles of freezing (2 hours at minus 14°F) and thawing and a final treatment of freeze-drying making it more readily digestible and easy to prepare.

An advantage of the process, according to its inventor Dr. Huber, is that it requires no boiling water or extended steaming. In the spacecraft, the water used to prepare food is about 155°F, Huber explained, and water from the hot faucet in the kitchen is about 155°F.

-more-

In addition to not requiring "boiling water", the "space-rice" is ready to eat in just a matter of minutes. In recent lab tests a special portion of lab-prepared chicken and rice soup, mixed with hot tap water was ready to eat in less than four minutes.

Dr. Norman D. Heidelbaugh, Chief of Food Science Services of the Preventive Medicine Division at MSC said the Aerospace Food Technologist and the housewife have similar problems. "Each is continually searching for food which is safe, nutritious, economical, and convenient to prepare and serve."

Heidelbaugh said the new rice process "falls into these categories -- its safe, nutritious, economical, and convenient to prepare.

Dr. Heidelbaugh reports that two major food companies have shown interest in this new rice process and it's possible that the process may find its way to the commercial market. The new processed rice would not only help the housewife, Dr. Heidelbaugh said, but it would be great for hunters and campers who want a quick and nutritious food item.

The Apollo 14 crew which completed a sucessful landing on the moon carried along some of the rice prepared by the new process. A chicken and rice soup, prepared in the Food and Nutrition laboratories at MSC, was eaten by the Apollo 14 astronauts Alan B. Shepard, Edgar Mitchell and Stuart Roosa.

"The rating from the crew was very good," Dr. Huber reported.

Huber and his team of food technologists are not stopping with chicken and rice soup. Research is currently under way to combine rice with other products such as shrimp, and ham, he stated.

The MSC research team, supported by Dr. Huber's team of food technologists from Technology, Inc., is conducting research in other areas of food science and nutrition. This includes work in instant fruit drinks, nutritional food sticks, nutritionally complete milk-based beverages, and freeze dehydrated foods.

Dr. Huber, 33, is a native of LaPoint, Utah and is a graduate of Utah State University where he received a B.S. and M.S. in Dairy Science. He received his Ph.D. in Food Science from Purdue. He is married to the former Beth Briggs of Syracuse, Utah and they have three children.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

March 24, 1971
MSC 71-12

HOUSTON, TEXAS---A retraining program for qualifying engineers to work in critical areas has been formed at the NASA Manned Spacecraft Center here. The program is aimed toward strengthening the Center's engineering capability in the thermal analysis and materials technology fields.

The Structures and Mechanics Division of the MSC Engineering and Development Directorate hopes to fill 18 engineer positions--12 in thermal analysis and six in materials specialties -- from within the ranks of engineers in the Directorate. New hiring of engineers is sharply curtailed under present NASA personnel ceilings.

The retraining in the two technical specialties will be done through intensive refresher courses conducted by university engineering faculty, MSC staff and by on-the-job training at the Center. The program is scheduled to begin by the end of March.

Engineers applying for retraining in thermal analysis should have degrees and experience in math analysis, thermodynamics, heat transfer or systems engineering. A degree and experience in mechanical, civil, industrial, chemical or metallurgical engineering is required for retraining in the materials technology specialty.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

483-5111

MSC 71-12

HOMETOWN RELEASE

Houston, Texas--Richard A. Wright formerly of San Antonio, Texas, has been appointed Executive Assistant to the Director of Science and Applications at the NASA Manned Spacecraft Center in Houston.

Anthony J. Calio, Director of Science and Applications, said Mr. Wright, formerly a civilian employee at Kelly Air Force Base in San Antonio, will assume his post immediately.

The Science and Applications Directorate at the Manned Spacecraft Center is responsible for developing scientific experiments for the Apollo lunar landing program and for the follow-on Skylab earth orbital program. The organization is also responsible for conducting the preliminary examination of the returned lunar samples and for distributing samples to the world-wide scientific community for detailed investigation. In addition, the Science Directorate manages programs for surveying earth resources from space. It develops and tests techniques which may be used in space to assess the health and status of crops, rangeland and forests; to locate mineral reserves and productive fishing grounds; to survey air and water pollution; and to improve geological and geographical mapping. The organization also conducts basic research in geology, geophysics, space radiation, astronomy, geochemistry and high-energy physics; and it provides science training for astronaut crews.

-more-

Add 1
71-12

In his position as Executive Assistant, Mr. Wright will assist the Director of Science and Applications in management and administrative activities.

Mr. Wright has been with NASA since 1963 and has 21 years of Government Civil Service. Prior to his present appointment he was assistant to the Chief of the Planetary and Earth Sciences Division at the Manned Spacecraft Center.

Mr. Wright is the son of the late C. Burton Wright and of Lydia K. Wright, who resides in San Antonio. He is married to the former Betty Jean Bess of Cherryville, North Carolina. They have two children, Deborah S., 13 and Ricky A., 11.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

483-5111

March 26, 1971
MSC 71-14

HOUSTON, TEXAS--A twenty-three man team of scientists has nearly completed preliminary examination of 94 pounds (42.64 kilograms) of lunar material from the Apollo 14 mission, including 63 pounds (28.5 kilograms) of rocks described as the most complicated yet returned from the moon.

Dr. Robin Brett, Chief of the Geochemistry Branch at NASA's Manned Spacecraft Center and Vice Chairman of the Lunar Sample Preliminary Examination Team, said the complexity of the rocks arises from the large number of minerals they contain, from their fragmental makeup, and from the numerous and often superimposed geologic histories they reflect.

The Apollo 14 rocks contain some 23 different minerals -- as many as were found in the Apollo 11 and 12 samples combined -- and only about half of these minerals have as yet been positively identified.

The individual rocks from the Apollo 14 sample are frequently composed of several different rock types; and they often contain large numbers of fragmental clusters or breccias which in turn are composed of smaller clusters which are themselves made up of still smaller fragmental clusters. Each of the superimposed groups of breccias may represent a different phase of the rock's history. Some of these fragments may date back to the original 4.6 billion year old crust of the moon.

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Dr. Brett said it should not be surprising that the Apollo 14 material shows a complex and varied history. The site at Fra Mauro was selected, he said, because it offered an excellent chance to recover material that may have formed part of the ancient lunar crust and subsurface material before it was scattered over a large area of the moon's surface by the impact of the meteorite or asteroid which formed the Imbrium basin early in the moon's history.

Our experience with large meteorite impacts and volcanic explosions on earth, said Dr. Brett, would lead us to expect the kinds of complicated fragmental rocks we have in such abundance in the Apollo 14 sample.

Although it is not possible from a preliminary examination to say conclusively that Imbrium crustal material was returned from the landing site at Fra Mauro, Dr. Brett said initial chemistry data shows the sample to be enriched in some of the same elements that formed earth's crust. They are elements, he said, which do not fit easily into most minerals, so if melting of a rock occurs these elements tend to separate out first, forming a scum which on earth cooled to form the planet's crust.

In comparing the Apollo 14 rocks with rocks returned from the Apollo 11 and Apollo 12 missions, the material from previous missions that is closest in chemical composition to many of the Apollo 14 rocks is the norite or "KREEP" component of rock 13 and others from the Apollo 12 sample.

-more-

The Apollo 14 rocks also possess low concentrations of solar wind implanted particles compared with similar rocks from the Apollo 11 and 12 sites. This implies either that the Apollo 14 fragmental rocks were formed in a different manner or that they had a different post-formational history from fragmental rocks returned previously from the mare regions of the moon.

The Apollo 14 sample contains far fewer igneous rocks than either the Apollo 11 or the Apollo 12 sample. Whereas large portions of the Apollo 11 and 12 rocks were igneous, only two of the rocks 50 grams (1.75 oz) or larger returned on the Apollo 14 mission are igneous, and only one of these is chemically similar to the basalts of either Apollo 11 or 12.

Nearly all the Apollo 14 rocks are composed of various sizes and types of fragments bound together with differing degrees of cohesion. At one extreme these fragmental rocks are little more than loosely cohering clods resembling clumps of dirt in a freshly plowed field or globs of wet beach sand. When placed in aluminum foil the crinkles of the foil will leave imprints on the rocks, and they must be handled with care to assure they do not disintegrate.

Other samples are much tougher and progress in uniform gradations to extremely tough fragmental rocks with physical properties resembling building stone or masonry.

The Apollo 14 rocks exhibit various degrees of crystallinity, with the tougher, more cohesive samples tending to be more crystalline. The tougher rocks also generally appear to be impregnated with a smaller quantity of particles associated with the solar wind such as carbon and rare gasses, with the lowest carbon content (28 parts per million) to be found in the largest rock -- a tough, 20 pound (9 kilogram) fragmental boulder, and the highest carbon content (225 parts per million) to be found in one of the crumbly, fine-grained rocks.

The soil at the Apollo 14 site appears physically similar to the soil seen at the Apollo 11 and 12 locations, although there are some marked differences, particularly in chemistry.

The chemistry of the Apollo 14 soil closely resembles the chemistry of many of the rocks from that site. This contrasts with the Apollo 11 and 12 soils, which differed in chemistry from most of the rocks collected at these sites.

The extent and quantity of dust adhering to surfaces was less than on previous missions. The Modularized Equipment Transporter, for example, which was reported by the astronauts as occasionally "spraying" dust around, did not collect thick layers of dust.

A large solar flare, which occurred on January 25, just prior to the Apollo 14 mission, presented a unique opportunity to study solar flare products in the sample material and to determine the recent orientation on the lunar surface of the rocks. The orientation of one of the two igneous rocks has been determined using a radioactive isotope produced on the side of the rock facing the sun during the flare.

Add 4
MSC 71-14

The Apollo 14 astronauts collected the lunar material at Fra Mauro on February 5 and 6, and the first shipment of Apollo 14 rocks and soil arrived at the Manned Spacecraft Center's Lunar Receiving Laboratory on February 11. The total return had arrived by February 17.

The Preliminary Examination Team has conducted its studies in the Lunar Receiving Laboratory, where the lunar material has been held in quarantine since its arrival in Houston. All samples were processed in pure nitrogen in glass and stainless steel glove cabinetry designed to protect the earth environment from the lunar material until it has been established that the sample contains no harmful organisms. At the same time the glass-walled cabinets protect the sample from being contaminated by earth's environment.

Results from the preliminary examination of the Apollo 14 sample will be used in dividing part of the sample for distribution to more than 175 scientific teams in the U. S. and in foreign nations shortly after quarantine release of the samples.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas
483-5111
MSC 71-15
April 2, 1971

HOUSTON, TEXAS--Man in space and man-in-the-sea will be topics discussed at the annual meeting Wednesday, April 7, of the Clinical Society and Commissioned Officers Association of the U. S Public Health Service, to be held at the NASA Manned Spacecraft Center.

The morning portion of the program will be devoted to an overview of medical support of man in space, and the afternoon portion will be a discussion of the man-in-the-sea.

Dr. Charles A. Berry, Director of Medical Research and Operations at MSC will discuss an overview of medical support to man in space. Other man in space speakers will be Dr. Lawrence F. Dietlein - "Future Concerns of Biomedical Engineering," Dr. Malcom Smith - "Space Food Systems," Dr. Edward Moseley - " Medical Information Systems," and Dr. Sam Pool - "Medical Applications of Space Technology."

The man-in-the-sea program will include presentations by Dr. Stewart Wolf - "Plans and Purposes of the Marine Biomedical Institute," Dr. Richard Masson - "Preview of Medical Observations of Saturation Diving of Tektite II," Dr. Edward Beckman - "Potentials of Texas Tektite on Flower Gardens," and Dr. William Willis - "Lessons for Neurobiology."

The Public Health Service conference is being held at the Moody Hall, Galveston, on April 5 and 6, and the final day's program is

-more-

scheduled for MSC on April 7. Surgeon General of the U. S., Dr. Jesse Steinfeld, is scheduled to head up the approximately 200 conferees who will attend the MSC program, starting at 11:00 a.m. in the Building 1 auditorium.

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NEWS RELEASE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston 1, Texas

483-5111

MSC 71-16
April 6, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration today began distributing 15 pounds (7.02 kilograms) of the 94 pounds (42.64 kilograms) of sample returned from the moon's Fra Mauro formation by the Apollo 14 astronauts.

One hundred eighty seven scientific teams in the United States and 14 foreign countries are scheduled to receive portions of rock and soil from the third U. S. lunar landing. In all, more than 700 scientists will be directly involved in analyzing the samples,believed to include material formed at the same time as the original lunar crust.

Investigating teams in the United States are located at 65 different institutions in 30 states and the Virgin Islands. Fifty-six foreign teams are at 41 institutions; following are the number of teams by country:

Country	No. of Principle Investigators
United Kingdom	15
France	7
Canada	6
West Germany	6
Switzerland	5
Australia	4
Japan	4
India	2
South Africa	2
Brazil	1
Finland	1
Holland	1
Italy	1
Norway	1
	56

-more-

Each of the investigating teams will analyze the sample for one or more of the following: mineralogy and petrology, chemical and isotopic composition, physical properties and organic characteristics.

Mineralogy and petrology studies are expected to identify rock types and their mode of origin, temperature and pressure conditions of igneous rock formation, and types and origins of particles in fragmental erosional processes such as meteoroid impact and particle bombardment.

Isotopic analysis will be used to age-date the lunar material and will be of particular importance in determining the age of formation of igneous rock particles in the fragmental rocks -- ages which may coincide with the age of the original lunar crust. The age of formation of the fragmental rocks may coincide with the age of the impact that gouged the Imbrium basin out of the ancient lunar crust.

Chemical studies of the trace elements give essential clues to early mineral forming processes in the evolution of the moon; measurements of rare gasses give a record of millions of years of the sun's activity.

Studies of the physical properties of the Fra Mauro material should yield new information on the radiation history of the earth, moon and sun and will aid in determining processes which formed lunar surface materials. Studies of the basic physical characteristics of lunar materials will also assist in interpreting earth-based observations of the moon.

Preliminary organic studies of the returned sample at the Manned Spacecraft Center in Houston showed the Apollo 14 material to have very low carbon content, similar to carbon levels observed in Apollo 11 and 12 rocks. There was no evidence of any lunar organisms. Detailed organic analysis is expected to determine the origin of indigenous carbon compounds seen in lunar material and will determine the structure and relative abundance of organic compounds native to and deposited on the lunar surface.

Only fine material (grain size less than 1 mm) will be distributed on April 6. The first distribution of rocks and chips will be made April 16, at the earliest.

One hundred twenty four scientists, including 31 from foreign countries will receive small quantities of fines in the initial release, which will total about one pound (440.7 grams).

Principal Investigators in the United States may either accept samples personally, have them delivered by courier or receive them by registered mail.

Investigators in foreign countries must either pick up their sample personally at Houston or have it delivered by State Department courier to the U. S. Embassy in his country.

The first shipment of Apollo 14 rocks and soil arrived at the Manned Spacecraft Center February 11, and the entire sample return had arrived by February 17. The lunar material was held in quarantine in the MSC Lunar Receiving Laboratory until April 4.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASED AT NASA HEADQUARTERS

April 7, 1971

Advanced plans are underway to conduct an experiment for cooperative ground and air study of possible southern corn leaf blight during the 1971 growing season.

The research project, to be conducted jointly by the U. S. Dept. of Agriculture, the National Aeronautics and Space Administration and selected corn belt states, is designed to utilize remote aerial sensing techniques in coordination with special ground observations.

These observations would be conducted by USDA, eight corn belt states and NASA in cooperation with Purdue University's Laboratory for Applications of Remote Sensing and the University of Michigan Institute for Science and Technology.

In 1970, southern corn leaf blight -- combined with severe drought in some areas -- resulted in a decrease of about 15 per cent in the nation's corn crop.

Major production losses occurred in the Midwest corn belt states. For that reason, the proposed "Corn Blight Watch" experiment would include 210 selected sites located in the States of Ohio, Illinois, Indiana, Missouri, Iowa, Minnesota, Michigan, and Nebraska. Each site would be about a mile wide by eight miles long.

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Under the proposed plan, farms producing corn in each selected area would be surveyed in terms of previous cropping history, acreage planted to corn, varieties of seed corn planted, denisty of plant population, and general cultural practices being applied.

Based upon this preliminary survey information, a group of sample fields would eventually be selected for detailed study and observation. USDA personnel responsible for the ground watch phase of the program would carry out plant-by-plant inspections of corn plants on these sites at about two-week intervals.

Simultaneously with ground studies, NASA high-altitude aircraft would repetitively photograph about 45,000 square miles of the corn belt area including the selected sites using special infrared and natural color film. These photographs, along with ground study data, would be sent regularly to a special photo-interpretation team stationed at Purdue University for analysis.

USDA and NASA said major long-range goals of the project are to (1) monitor development and spread of corn blight during the growing season across the corn belt region; (2) evaluate the technique as a means of assessing the levels of infection in the corn belt; (3) evaluate the capability of remote sensing to assess the status and probable impact on crop production by corn blight and other foliar stresses; and (4) evaluate results for feasibility of application to similar situations occurring in the future.

Because of the experimental nature of the project, no formal statistical conclusions would be drawn or forecasts made concerning virulence, rate of spread, or ultimate effect on total corn production during the ground-air study June through September. Should the disease occur, however, information obtained from the experiment will be made available only through Department of Agriculture's Corn Blight Information Center.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-17 - RTW

April 9, 1971

HOUSTON, TEXAS...Four turboprop aircraft used by the National Aeronautics and Space Administration for commuting between field centers will be refurbished with the latest nonflammable and fire resistant fabrics and coatings.

The new materials were developed by NASA Manned Spacecraft Center engineers working with private industry for use in manned spacecraft.

Curtains, seat upholstery, carpets and headliner panels will be replaced with such materials as Fluorel-coated durette, fiberglass, and Proban-treated fabrics, and Fluorel-coated Nomex. The twin-engine Grumman Gulfstreams will be flown to Houston for the refurbishment work from their home bases at NASA Langley Research Center, Hampton, Va.; Marshall Space Flight Center, Huntsville, Ala.; and Kennedy Space Center, Fla. The fourth Gulfstream is based at the Manned Spacecraft Center in Houston.

The nonflammable and fire-resistant materials were developed for use in manned spacecraft interiors where a 100-percent oxygen atmosphere increases the hazard of fire. Potential applications in non-space fields for the new fabrics and coatings are under development at the Manned Spacecraft Center, including aircraft interiors, residential and commercial building interiors and special-purpose garments such as firefighters' clothing and hospital patient gowns.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-18

April 14, 1971

HOUSTON, TEXAS...The National Aeronautics and Space Administration has signed a Supplemental Agreement with the Grumman Aerospace Corp., valued at about $11,577,561 for changes in the Apollo Lunar Module contract.

The agreement formally incorporates into the Grumman contract 178 changes previously authorized by NASA for modification to the contractor's requirements to: Restrain Systems Stowage on the Lunar Surface, Modification to the Lunar Equipment Conveyor Assembly, Replacement of Standard Hasselbald Camera with Second Lunar Surface Hasselbald and 60 mm Lens, Addition of Lunar Geology Exploration Camera, Changes to the Environmental Control Systems, Changes to the LM Documentation Requirements, and Modifications to the Lunar Tools. The modifications bring the estimated value of the Grumman Contract since January, 1963 to approximately $1,617,510,000.

Grumman performs the majority of work on the Lunar Module contract at its Bethpage, NY facility with support from its field offices in Houston and at the Kennedy Space Center.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-19-tw

April 15, 1971

HOUSTON, TEXAS--The Mad Hatter would never be late to his tea party if he had a clock like the one under development in the Manned Spacecraft Center's Information Systems Division laboratory here. The timing device, a technology development in support of future long-duration space flight missions, is so accurate that it would only be off by one second after running 50 years.

Lacking a mainspring or a pendulum, the experimental clock uses the resonant frequency characteristics of the rubidium 87 atom to generate the basic timing pulse. The technique of exciting electrons of the rubidium atom is called "optical pumping." The electrons are induced to resonate at a known frequency, and thus form the basis for keeping extremely accurate time.

For the technically minded, the process works as follows: rubidium 87 gas in a glass cell is illuminated by a lamp filled with rubidium 87, and the light in turn passes through a filter cell containing rubidium 85. The filter cell passes only a selected bandwidth of light to raise the rubidium atoms in the gas cell to a higher energy level, and therby extract light energy from the beam. Microwave energy from a quartz crystal oscillator-multiplier drives the outer electron of the rubidium atom to a lower energy level. Variations in microwave frequency affect the

-more-

net amount of light reaching a photocell and the rubidium atoms are "pumped" to a corresponding energy level. The detected modulated microwave signal, from the photocell, drives a synchronous detector which keeps the crystal oscillator at the atomic resonance frequency. The crystal oscillator in turn drives a frequency synthesizer and time code generators for feeding timing pulses to spacecraft systems and timekeeping displays.

The prototype space clock's accuracy has been measured against two laboratory hydrogen maser frequency standards at the Center in a test that ran for 340 days. Additionally, the clock was tested in simulated space conditions of temperature and launch vibrations. Weighing about 19 pounds, the prototype timing device is packaged in a box 5 x 5 x 18 inches. The clock operates on 28 volts DC and draws 18 watts.

General Radio Corporation of West Concord, Mass., has completed a development contract with the Center's Information Systems Division.

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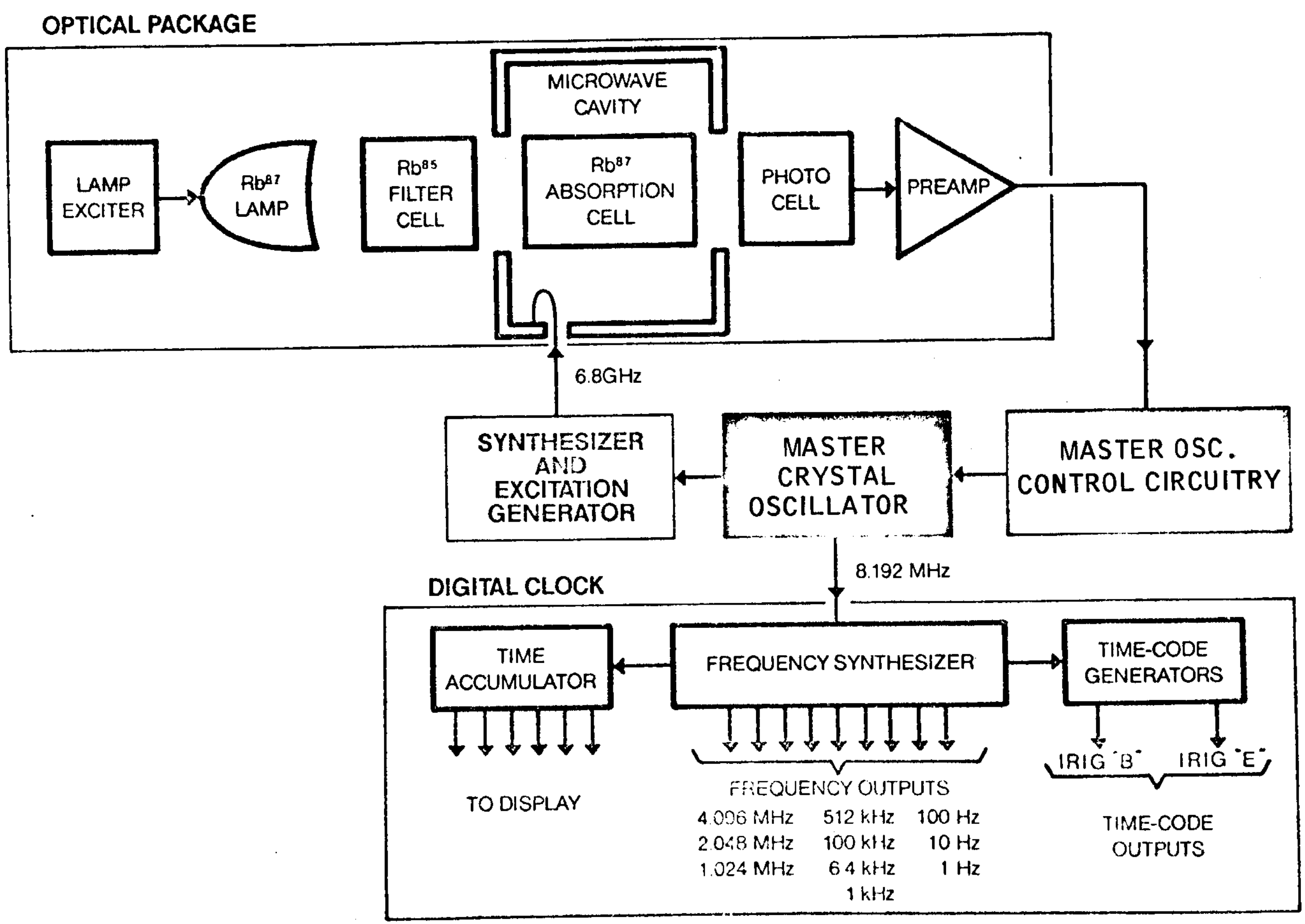
SPACECRAFT ATOMIC TIMING STANDARD BLOCK DIAGRAM



11-19 tw

PRESENT "SATS" CHARACTERISTICS

SIZE: ..... **444 cu. in. (5" x 5" x 17-3/4").**

WEIGHT: ..... **18.5 lb.**

POWER: ..... **19.6 W (@ 70°F).**

FREQUENCY STABILITY

LONG-TERM: ..... **5×10^{-11}** rms/ year

SHORT-TERM: ..... **1.6×10^{-11} rms (one-second averaging time).**

OPERATIONAL ENVIRONMENT

TEMPERATURE RANGE: ..... **−31°F to + 142°F.**

VIBRATION: ..... **12.3 g rms (random).**

SHOCK: ..... **30 g (11 ms).**

PRESSURE (ALTITUDE): ..... **760 to 1×10^{-6} mm Hg.**

EMI: ..... **MSC-IESD-19-3A.**

ACOUSTIC: ..... **165 dB (random).**

HUMIDITY: ..... **100% RH.**

O_2 : ..... **100%.**

MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-20-rvg (FOR RELEASE FRIDAY A.M.) April 16, 1971

HOUSTON, TEXAS--An experiment to determine the response of selected microorganisms to the space environment is planned during the trans-earth coast phase of Apollo 16 scheduled in March 1972.

The experiment, Microbial Response in Space Environment, calls for the Apollo 16 crew to place a small container outside the command module during the extra-vehicular activity planned during the homeward journey from the moon. The container, the Microbial Ecology Evaluation Device (MEED), which measures $4\frac{1}{2}$ x $4\frac{1}{2}$ x 9 3/4 inches, will house a selection of microbial systems, and will be retrieved by the crew after 10 minutes of exposure.

Dr. Gerald Taylor, microbiologist at the NASA Manned Spacecraft Center, Houston, Texas said the purpose of the experiment is to quantitatively measure the effects of certain space environmental parameters (alterations in oxygen pressure, vacuum, weightlessness, and solar ultraviolet irradition), on the microbial test systems. The microbial test systems will include bacteria, fungi, and viruses.

Microbial experiments conducted on the Russian Vostok series, Geminis 9 and 12, and Biosatellite 2, suggest the possibility that weightlessness and/or changes in the partial pressure of oxygen may alter the growth rate and mutation rate of microorganisms. Objective of the experiment is to evaluate the effects of these factors and

-more-

of genetic and responsive alterations stimulated by the UV irradiation.

Five strains of microorganisms will be used in the test, Dr. Taylor said. The candidate systems being considered are: Rhodotorula glutinis, Streptococcus mitis, Escherichia coli, Bacillus subtilis, Aeromanas proteolytica, and Pseudomonas boreopolis, Chaetomium globosum.

The inflight MEED package contains three separate trays. Each tray contains 280 chambers into which temperature sensors, UV measuring solutions and the microorganisms will be placed. A smaller MEED unit, with only one tray, will be maintained in the Lunar Receiving Laboratory (LRL) at the Manned Spacecraft Center and will serve as a ground based control unit.

Dr. Taylor estimates a total of approximately 60 million microorganisms will be used in the spacecraft unit and another 20 million in the unit in the LRL. Two-thirds of the microorganisms will be maintained in a dry state inside the chamber and the remainder will be in water suspension.

Principal Investigators for the experiment are Dr. Paul Volz, Eastern Michigan University, Ypsilanti, Michigan; Dr. Bill G. Foster, and Dr. James M. Prescott of Texas A&M, College Station, Texas; and Dr. John Spizizen, Scripps Clinic and Research Foundation, La Jolla, California.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-21

April 16, 1971

HOUSTON, TEXAS--The government of Jamaica has asked the United Nations to assist in surveying Jamaica's natural resources by using aircraft especially equipped for this purpose.

The UN Food and Agriculture Organization (FAO) invited NASA to provide one of its especially instrumented aircraft for flights over the island and its surrounding waters at various altitudes.

An instrumented aircraft of NASA's Manned Spacecraft Center, Houston, Texas is scheduled to gather high altitude and low altitude photography and thermal imagery data of Jamaica and its surrounding coastal waters, beginning April 19. The Food and Agriculture Organization of the UN, the Geological Survey of Jamaica, and the U. S. Geological Survey of the Department of Interior are cooperating in the mission which is being managed by MSC's Science and Applications Directorate.

The purpose of the mission is to provide experimental sets of photographic and imagery data which will be helpful in planning and developing the islands natural resources including forestry and timber assessment, land use analysis, mineralogic resources development, plant disease detection, and with particular emphasis on water resources management.

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Objects and areas on land and sea emit visible light, heat and other radiations which can be measured by sensitive instruments carried by aircraft and spacecraft. The amount and kind of this radiation is different for each type of object and area and is called its signature.

Earth resources surveying consists of obtaining data on the land and water resources of an area from overflights by instrumented aircraft or spacecraft which can be compared with test measurements of the same areas made on the ground. From such surveys extensive information can be obtained about the conditions of crops, forests, mineral deposits, water resources, and fisheries which can be helpful in planning the development of natural resources.

The NASA program of research in earth resources surveying includes the development of techniques and instruments for aircraft and spacecraft remote sensing and the analysis and interpretation of the data obtained.

The NASA four engine aircraft, a modified C-130, is scheduled to fly nine separate flights at varying altitudes, ranging from 5,000 to 25,000 feet. The specific objectives of the mission are: to provide experimental photographic coverage and thermal imagery of the entire island and adjacent coastal waters from 25,000 feet, conduct a thermal infrared survey of selected coastal waters at 5,000 feet, conduct a low altitude photo and thermal survey of the Rio Minho, the island's water shed, and Rio Minho River Basin from 8,000 feet, and a thermal survey of the Southern Island shelf at 3,000 and 15,000 feet.

Add 2
MSC 71-21

The Jamaican Geological Survey assisted by a team from the United States Geological Survey, Department of Interior, will provide personnel and equipment for gathering ground data on land and water.

NASA will provide all data obtained to the government of Jamaica and the FAO.

The aircraft and scientific and technical team will leave the NASA Manned Spacecraft Center, Houston, Texas on April 18.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-22-rvg

April 19, 1971

HOUSTON, TEXAS--Twenty aerospace doctors, engineers and scientists from five National Aeronautics and Space Administration field centers are scheduled to present papers at the 42nd annual scientific meeting of the Aerospace Medical Association which will be held at the Shamrock Hilton Hotel, Houston, Texas April 26-29, 1971.

Approximately 5,000 aerospace doctors from the United States and numerous foreign countries are scheduled to attend the four day session. Scientific and technical exhibits, which reflect current aerospace medical programs and research will also be on display.

Dr. Charles A. Berry, Director of Medical Research and Operations at the NASA Manned Spacecraft Center, is out-going president of the organization. Capt. Ralph L. Christy, MC, USN, is the incoming president.

NASA personnel from the following NASA centers are scheduled to present papers - Ames Research Center, Moffett Field, Calif.; Langley Research Center, Langley Field, Virginia; Lewis Research Center, Cleveland, Ohio; Manned Spacecraft Center, Houston, Texas; and Marshall Space Flight Center, Huntsville, Alabama. Several NASA Headquarters papers are also scheduled to be presented.

The NASA papers discuss various findings from Apollo manned space flight as well as man's role in future programs of Skylab and Shuttle.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

71-23-dg

April 19, 1971

HOUSTON, TEXAS--The NASA Manned Spacecraft Center requested proposals from the aerospace industry for development of a human waste collecting and storage system for the orbiter stage of the Shuttle.

In its instructions to industry, MSC noted that previous waste management concepts have placed emphasis on reclamation of materials in a zero "G" environment. With the onset of a reusable space transportation system, the management of waste requires refinement and accommodations for both male and female crew members.

The proposal calls for a system which will:

a. Be as earthlike as possible in human operation.

b. Have long duration operating capacity.

c. Be of high reliability.

d. And be readily maintainable during ground servicing.

The contractor will fabricate for testing a fully functional unit that can be used individually during a week-long test by a team comprised of three men and one woman.

The proposal calls for a cost-plus-a-fixed-fee contract. MSC has allotted approximately $90,000 for use in the study and development.

Proposals are to be submitted by May 12. The effort is to be completed approximately 13 months after contract award. It will be conducted under direction of the Crew Systems Division.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

71-24-rtw

April 20, 1971

HOUSTON, TEXAS--A three-day conference to examine electronics technology having space shuttle applications will be held May 11-13 at the National Aeronautics and Space Administration Manned Spacecraft Center here. Called the Space Shuttle Technology Conference on Integrated Electronics, the meeting will be in the Center's main auditorium.

The May 11 morning session will be devoted to a general overview of subjects related to electronics development, and the afternoon session will cover instrumentation and power distribution and communications. The final day's sessions will be on data systems.

MSC Assistant Director for Electronics Systems, Robert A. Gardiner, conference chairman, said the conference will "contribute significantly toward establishing the hard technology base necessary for initiation of the space shuttle design and development." Electronics and avionics specialists from NASA, Department of Defense and industry are expected to attend the conference.

Conference registration is being handled by Rexford Talbert, Code EG9, NASA Manned Spacecraft Center, Houston, Texas 77058.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-25

April 21, 1971

HOUSTON, TEXAS...NASA's Manned Spacecraft Center has signed a $10,699,404 contract modification with Martin Marietta Corp. for equipment in support of the Skylab Earth Resources Experiment Package (EREP).

The Skylab EREP consists of a package of five scientific experiments for the first Skylab Earth-orbital mission to be flown in early 1973.

The modifications formally incorporated into the Martin Marietta contract the EREP support equipment and includes the electrical-electronic system, tape recorder system, control and display panel and equipment racks.

This brings the total value of the contract since February 1970 to about $60 million.

Martin Marietta performs most of the work on the contract at its Denver, Colo. facility with support from other divisions at Baltimore, Md. and Orlando, Fl.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-26 DG

April 22, 1971

HOUSTON, TEXAS...The NASA Manned Spacecraft Center requested proposals from the aerospace industry for design, development and construction of a color monitor suitable for use on the Shuttle or a space station.

MSC calls for a prototype article whose general performance will provide:

a. Resolution of at least 400 lines.

b. A useful operating lifetime of 5,000 hours.

c. High quality reproduction from a standard color video signal.

d. And be capable of operating in a laboratory environment.

The monitor might be used in the experiment bay of a Shuttle-transported module, or in support of experiments on an Earth orbiting space station. The model initially will be used for breadboard testing. Later it will become a part of a complete telecommunications system.

The proposal calls for a firm-fixed price research and development contract. Proposals are to be submitted by May 10 and the work is to be completed approximately nine months after contract award.

It will be conducted under MSC's Telemetry and Communications Systems Division.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASED AT NASA HEADQUARTERS

April 23, 1971

APOLLO 15 TIMELINE

The planned launching in July of the Apollo 15 lunar mission opens the final, three-flight series of manned lunar exploration missions.

The Apollo space vehicle for these missions will be capable of delivering to the lunar surface twice as much equipment and scientific payload as any previous vehicle. This payload will include additional life support consummables to double the time the astronauts can work on the lunar surface.

Exploration periods on the Moon will be increased to three with two of these periods lasting up to seven hours and one to six hours. A lunar roving vehicle will provide transportation for the astronauts, experiments, tools, new communications equipment, and lunar samples collected during the three traverses.

The lunar roving vehicle and improved astronaut space suit and life support systems will increase the range and efficiency of these surface operations.

The service module of the Apollo spacecraft has been modified to include a scientific instrument module which houses experiments to be conducted from the lunar orbiting Apollo spacecraft.

-more-

Add 1

On the Apollo 15 and 16 missions, a subsatellite will be ejected into lunar orbit from the spacecraft scientific instrument module. The satellite includes three experiments that will continue to operate in lunar orbit for about a year.

A television camera mounted on the lunar roving vehicle will provide coverage of astronaut surface exploration events while the vehicle is not actually in motion. The television system includes a ground command capability which could permit the first television coverage of lunar module liftoff from the lunar surface.

For the first time on an Apollo return flight from the Moon, the spacecraft command module pilot will leave the cabin, move along the outside of the spacecraft to retrieve films from the scientific instrument module, for return to Earth. Television coverage of this activity is being planned.

This series of three Apollo missions will complete the manned lunar exploration program. Apollo 15 is scheduled for launching July 15 at 8:34 am CDT from the Kennedy Space Center, Florida.

Apollo 15 will be commanded by David R. Scott, a USAF colonel; with Alfred M. Worden, a USAF major, as command module pilot; and James B. Irwin, a USAF lieutenant colonel, as lunar module pilot.

The landing site for the 12-day mission is the Hadley-Apennine area of the Moon between the Apennine Mountains to the east which peak to 13,000 feet above the landing site and the mandering Hadley Rille, about a mile wide and 1,200 feet deep.

-more-

Add 2

A tentative timeline of Apollo 15 mission events follows:

Event	Time from Liftoff (Hr/Min)	CDT/Date
Launch		8:34 am July 26
Earth Orbit Insertion	00:12	8:46 am
Trans Lunar Injection	2:50	11:24 am
Lunar Orbit Insertion	78:31	3:05 pm July 29
Descent Orbit Insertion	82:40	7:14 pm
Spacecraft Separation	100:14	12:48 pm July 30
Lunar Landing	104:42	5:15 pm
Lunar Exploration I	119:50	8:24 am July 31
Lunar Exploration 2	141:10	5:44 am August 1
Lunar Exploration 3	161:50	2:24 am August 2
Lunar Liftoff	171:38	12:12 pm
Spacecraft Docking	173:30	2:04 pm
Trans Earth Injection	223:44	4:18 pm August 4
Trans Earth EVA	242:00	10:34 am August 5
Pacific Ocean Splashdown (26° N. Lat./158° Long.)	295:12	3:46 pm August 7

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-27-dkw

April 26, 1971

HOUSTON, TEXAS--Astronaut Joseph P. Allen, speaking at the spring meeting of the American Physical Society, today described the first of a new generation of manned lunar landing missions that will begin with the Apollo 15 expedition to the Hadley-Apennine region of the Moon this July.

Dr. Allen said the upcoming Apollo 15 mission, with its more sophisticated hardware and its spectacular landing site in a northern lunar plain cut by a deep gorge and near some of the Moon's highest mountains, should add greatly to the swell of scientific excitement being generated as the secrets of our Earth-Moon system and of our solar system are revealed by the data from returned lunar samples and from lunar science stations placed in operation by astronauts on and around the Moon.

Dr. Allen said the lunar module will touch down on a narrow mare region between Rima Hadley, a meandering V-shaped erosional rille of mysterious origin, and the towering Apennine Mountains which ring Mare Imbrium, the largest circular basin on the Moon. The lunar module will land with a scientific payload of twice the weight carried on previous missions and will remain on the lunar surface some 66 hours, or about twice as long as the stay time of previous missions.

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During their extended stay Astronauts David R. Scott and James B. Irwin will carry out three geological traverses: (1) southwest across the mare to investigate and sample the intersection of the Apennine mountain front and the 1,000 foot-deep rille; (2) southeast around a cluster of craters to sample widely spaced portions of the mountain front; and (3) north along the rille to examine and sample a complex of domes, craters and scarps.

The lunar roving vehicle, a four-wheel drive, electrically powered device, will be used for the first time on the Apollo 15 mission to carry the astronauts, their geological equipment, and a ground-controlled color TV camera along the many miles of traverse routes.

In addition to the geological explorations, Dr. Allen said the astronauts will deploy a fourth lunar science package as part of a growing network of self-sustained stations transmitting continuous data on the Moon back to Earth. From its northern location, the Apollo 15 science station will provide a valuable addition to the operating network which presently includes the Apollo 12 and 14 stations located near the lunar equator.

The Apollo 15 package will include a seismometer, a magnetometer, a suprathermal ion detector, a cold-cathode ion gauge, a solar wind spectrometer, a solar wind composition experiment, and a greatly improved laser reflector. A hand-held drilling unit will be used to

emplace heat-flow probes deep into the surface and to extract cores of lunar soil from 10 feet below the surface.

Dr. Allen said the increased complexity of the scientific instruments and objectives of the Apollo 15 mission applies to the orbiting spacecraft as well. While Astronauts Scott and Irwin are on the lunar surface, Astronaut Alfred M. Worden will be busily involved aboard the orbiting spacecraft with the operation of four remote-sensing spectrometers which provide information on the chemical make-up of the Moon's surface and the composition of its tenuous atmosphere; a panoramic camera providing high resolution stereo photography, a mapping camera and laser altimeter for selenodetic studies; and a three-experiment subsatellite which will be jettisoned from the service module into lunar orbit.

Noting that many of the physicists attending the Washington conference are teachers, Dr. Allen said Apollo missions to the Moon are the best pedagogical example of physics yet devised.

Physics students, he said, will recognize fundamental formulas for force used in launching the spacecraft, classic two body problems inherent in orbital mechanics, vector analysis used in determining direction and magnitude of mid-course maneuvers and doppler shift techniques used to determine position and velocity among the classroom theories given practical application in Apollo missions.

Dr. Allen, a 33 year old physicist, became a NASA astronaut in 1967. He is presently serving as Apollo 15 mission scientist.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-28-tw

April 30, 1971

HOUSTON, TEXAS--The tenth anniversary of the flight of the first American into space will be observed at the NASA Manned Spacecraft Center here with special exhibits and tours for the public.

Wednesday marks the anniversary of Alan B. Shepard's 15-minute suborbital flight aboard Mercury spacecraft Freedom 7. A Redstone launch vehicle and Mercury spacecraft will be on exhibit next to the Center's main auditorium, and items carried on the flight will be on display.

A motion picture on Freedom 7 will alternate with "A Visit to Fra Mauro"--a film on Apollo 14 lunar landing commanded by Shepard--in the auditorium starting at 9:00 a.m., May 5, 7, 8 and 9.

The anniversary program Wednesday includes guided tours of the Mission Control Center, Space Environmental Simulation Laboratory (vacuum chambers), and the Lunar Receiving Laboratory. Additionally, self-guided tours may be made of the Exhibit Hall, the Flight Crew Training Facility and the Flight Acceleration Facility (manned centrifuge).

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MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASED AT NASA HEADQUARTERS

April 28, 1971

On the basis of tests of lunar rocks and soil brought to Earth by three U. S. manned Moon landing missions, the National Aeronautics and Space Administration has decided to discontinue quarantine of the returned astronauts, spacecraft and lunar materials for the remaining three Apollo flights.

Dr. George M. Low, NASA Acting Administrator, stated: "The analysis of quarantine information from Apollo 14 has now been completed. On the basis of this analysis, as well as the results from the Apollo 11 and Apollo 12 flights, we have concluded that there is no hazard to man, animal, or plants in the lunar material.

"These results have been reviewed by the Interagency Committee on Back Contamination, and that committee has recommended that further lunar missions need not be subject to quarantine."

The committee was established in 1966 to assist NASA in developing a program to prevent possible contamination of the Earth by lunar materials. The committee membership includes representatives of the Public Health Service of the Department of Health, Education and Welfare; the Department of Agriculture; the Department of the Interior; NASA and the National Academy of Sciences.

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Add 1

The crews of Apollos 11, 12 and 14 were transported from the recovery ship in a sealed Mobile Quarantine Facility and kept in quarantine with the spacecraft, lunar-exposed material and lunar samples in the Lunar Receiving Laboratory at the Manned Spacecraft Center, Houston, for a period of 21 days from the last closing of the hatch of the Lunar Module on the lunar surface. During this period intensive analyses of the lunar material were performed, to determine if there were any harmful effects on the life on Earth; none were found.

There was no quarantine for Apollo 13, since the flight was terminated without landing on the Moon.

Discontinuing the quarantine will not significantly affect procedures for protecting the Apollo 15, 16 and 17 lunar samples from contamination on the return journey and during transport to the Lunar Receiving Laboratory. Accountability and allocation procedures similar to those used in the past also will continue to be employed.

Apollo 15 is scheduled for launch next July and Apollos 16 and 17 are in 1972.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-29 dg

May 3, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration today asked aerospace firms for proposals to study safety techniques for spacecraft flying in Earth orbit.

The request was issued by NASA's Manned Spacecraft Center.

In its instructions to industry, MSC identified the study objectives as the analysis of hazards on specific programs which will "enhance the safety of future manned spaceflight operating in Earth orbit."

The proposal calls for studies involving the Space Shuttle--planned for operations in the late 1970's--and the Modular Space Station, which is planned for the 1980's.

Five specific tasks are called for during the period of the study.

Analysis of escape, rescue and survivability is task number one. Previous studies generally were confined to rescue of small numbers of personnel. In this proposal, the contractor is requested to adapt to concepts incorporating larger groups--specifically, sizes up to 12 personnel.

Task number two calls for analysis of escape routes and traffic patterns. Examples include the study of dual escape routes, whether dual access to safety areas is essential, if interior hatches should be left open during normal operations and the pros and cons of outside (extravehicular) versus inside (intravehicular) methods for escape.

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In the third task, industry is requested to analyze the potential problems resulting from the delivery of payloads that are hazardous. The transfer of propellants and live pyrotechnics fall into this group.

Studies have disclosed that direct docking of a Space Plane (Orbiter) with a Space Station could be difficult to accomplish. A portion of the study will address itself to three docking options:

1. Direct "hard" docking with cargo extended.

2. Docking via a free-flying module that was delivered earlier by the Space Plane.

3. Soft docking using flexible ports.

The fifth task calls for an analysis of recovery techniques when the craft is out-of-control, disabled, or tumbling. How can the tumbling craft be arrested, the proposal asks? If the tumbling cannot be stopped, the contractor is requested to devise rescue procedures.

The kind and nature of space emergencies in this study are assumed to be explosions, fire, meteoroid puncture, collision with another body, the failure of critical systems or toxic atmosphere buildup.

A resuable Shuttle will be used to transport personnel and cargo into low Earth orbit. Concepts call for an airplane-like Booster and Orbiter which will be launched vertically in a piggy-back arrangement. They will separate at approximately 200,000 feet (60,960 meters) altitude with the workhorse Booster returning immediately to Earth and the sleek Orbiter continuing onward into space. Each will land horizontally like present-day jet aircraft.

Add 2

One of the tasks of the versatile Shuttle is to transport habitable cylindrical volumes into space. These modules will be assembled and will provide living accommodations--initially for six scientific and technical personnel--and later for 12.

The safety calls for a fixed price research and development contract. MSC has alloted approximately $125,000 for performance of the study.

Proposals are to be submitted by May 24 and the study effort is to be concluded 12 months after contract award. It will be conducted under direction of the Safety Office.

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MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058
713/483-5111

news

MSC 71-30 dg

May 4, 1971

HOUSTON, TEXAS--The Manned Spacecraft Center requested proposals from industry for the development and testing of a lightweight landing gear for the Orbiter portion of the Space Shuttle.

In its instructions to industry, MSC has advised the contractors that the Orbiter will experience long periods in space when temperatures are in the minus range followed immediately by exposure to temperatures of plus 300 degrees F.

The tire-wheel-brake system, as it is called, must survive without leaking; therefore, a study of better sealing techniques also is required.

Like other space hardware, Orbiter is weight sensitive, and the use of materials of lightweight is desirable.

The tire will have an outside diameter of up to four feet, four inches; be inflated to more than 300 pounds per square inch and be capable of withstanding touchdown speeds of 180 knots.

Industry is requested to fabricate two systems for testing.

The proposal calls for a firm fixed-price research and development contract. Proposals are to be submitted by May 17 and the work is to be completed approximately one year after contract award.

It will be conducted under MSC's Structures and Mechanics Division.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-31 fg

May 7, 1971

HOUSTON, TEXAS--An instrumented Earth Resources four-engine C-130B of NASA's Manned Spacecraft Center, Houston, Texas is scheduled to fly over the Gulf of Mexico's Flower Gardens Coral Reef during the week of May 10 as a team of medical scientists and oceanographers explore the Flower Gardens.

A 20-man team of professional divers and scientists from the Marine Biomedical Institute, a joint project of the University of Texas Medical Branch and Texas A & M University will begin underwater exploration of the garden area, 110 miles south of Galveston on May 10.

The Flower Gardens, the northern most living coral reefs in the Gulf of Mexico, are being considered as a site for a platform and underwater habitat and above-water laboratory.

Two metric and four multiband cameras, a dual-channel radiometer scanner which measures energy reflected or emitted by earth features and a precision radiation thermometer (PRT-5) to record water temperatures will be used during the flight.

The MSC aircraft will fly at an altitude of 5,000 feet.

The Flower Garden mission is the start of 10-day long Mission 165 which includes flights over Texas coastal waters May 10. Oceanography, Louisiana coastal waters on May 11 - oceanography, Mississippi Delta and Barataria Bay, La. May 14 - hydrology, Trinity Bay, Texas May 17 oceanography and Garden City, Kansas, May 19 agriculture.

-more-

Add 1

The aircraft earth resources flights are managed by MSC's Science and Applications Directorate.

Manager for Mission 165 is Frank Newman of the Earth Resources Aircraft Project Office.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

71-32

HOLD FOR RELEASE FRIDAY, May 14, 1971

HOUSTON, TEXAS--Three men will spend up to 56 days in an altitude test chamber early next year at the NASA Manned Spacecraft Center, Houston, to obtain medical data and evaluate medical experiment equipment for the Skylab Program, scheduled for flight in 1973.

The test will closely simulate Skylab mission conditions so that differences observed later during actual flight may be attributed to causes such as weightlessness, which cannot be simulated in the chamber. An altitude chamber is required to provide a low-pressure breathing atmosphere such as the astronauts will have in space.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which reflect the effects of the Skylab environment. There are 16 medical experiments scheduled for Skylab involving, among others, studies of the cardiovascular system, the expenditure of energy to do measured work, and food and nutritional investigations. Secondary objectives of the test include the evaluation of selected items of experiment equipment, medical experiment operating procedures and means of handling experiment data. In addition, this test will aid in training the ground-based medical operations team for their participation during the space flight.

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Although the test team members have not yet been selected, members of the astronaut team are being considered for the test. While the primary emphasis of this study is directed at obtaining medical data, the test crew will also engage in a full schedule of activities involving work, eating, leisure, recreation and sleep. During the work portion of the day, the crew will conduct experiments, monitor the environment, evaluate the operation of experiment equipment and perform allied test functions. During off-duty hours, the crew can select from onboard recreational activities such as television, tape recorders, chess, checkers, playing cards, sketching materials, exercise devices, books, writing materials or other personally-determined items. Safety precautions include the presence of a Medical Safety Officer with the authority to remove test team members from the chamber or to abort the test for medical emergency reasons.

The test will be conducted in a 20-foot diameter altitude chamber located in Building 7 at the Manned Spacecraft Center, which was used previously in the Gemini and Apollo programs. This chamber is being modified to resemble the crew quarters area of the Skylab Workshop. Simulating the flight environmental conditions, the cabin atmosphere will be 70% oxygen and 30% nitrogen at a total pressure of 5 psia. Carbon dioxide levels will be maintained within a 4.0 to 5.5 mm Hg range, and temperature will remain within 67 to 78 degrees Fahrenheit.

Humidity will range from 45 to 60 percent. Skylab type food and water will be consumed by the crew. Communications between the crew and the ground control will be similar to Skylab mission type communications which will be augmented by closed circuit TV during the conduct of the medical experiments.

The Skylab Program objectives are to extend the duration of manned space flight and to carry out a broad spectrum of experimental investigations. Of particular importance are a series of experiments aimed at research, earth survey, solar astronomy, and selected scientific and manufacturing experiments. Skylab is an earth orbital program scheduled for flight in 1973. The launch of an unmanned workshop will be followed by three separate manned launches of 3-man crews using Apollo spacecraft. After docking with the previously launched workshop, the crews will inhabit the assembly for up to 28 days on the first visit and up to 56 days on each of the other two visits.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-

May 13, 1971

HOUSTON, TEXAS--The NASA Manned Spacecraft Center has selected Dynalectron Corporation, Land-Air Division, Holloman AFB, New Mexico to negotiate a contract for support services at NASA's White Sands Test Facility near Las Cruces, New Mexico.

Estimated value of the one year cost-plus-award-fee contract is $1,805,000.

Under terms of the contract Dynalectron will provide support services for technical and administrative operations, maintenance, security and fire protection at the New Mexico facility. These services were previously handled under three separate support contracts.

The combined support services contract at White Sands is part of a program begun last year by the Manned Spacecraft Center to restructure and consolidate support contracts, reducing overhead costs and making better use of personnel.

Following negotiation of a contract, Dynalectron is scheduled to begin work at the White Sands Test Facility July 1, 1971.

Dynalectron was selected for the contract award from among six firms responding to a NASA request for proposals.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-34

May 20, 1971

HOUSTON, TEXAS---Astronaut James A. Lovell, Jr., today was named Deputy Director of Science and Applications at the NASA Manned Spacecraft Center in Houston.

Lovell, a Navy Captain and veteran of four space missions, will assist Anthony J. Calio, Director of Science and Applications in over-all management of the organization.

The Science and Applications Directorate at MSC is responsible for developing scientific experiments for the Apollo lunar landing program and for the follow-on Skylab earth orbital program. The organization is also responsible for conducting the preliminary examination of returned lunar samples and for distributing samples to the world-wide scientific community for detailed investigation. In addition, the Science Directorate manages programs for surveying earth resources from space. It develops and tests techniques to verify the utility of remote sensing for potential application in agriculture, geology and hydrology, forestry, oceanography and environmental control. The organization also conducts basic research in geology, geophysics, geochemistry, astro-physics, and high-energy physics, and it provides science training for astronaut crews.

"Jim Lovell's background in hardware development, flight test and mission operations will be of great value to us as we near the peak of our activities in both the Apollo and Skylab programs," Calio said.

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"We are especially interested in applying his abilities to the remaining three Apollo missions, where we hope to obtain maximum scientific return."

Lovell was commander of the Apollo 13 mission which was aborted in April 1970 with great hazard to the crew after an explosion disabled oxygen and electrical supplies in the command and service module. He was a member of the Apollo 8 crew which first circled the moon at Christmas 1968. And he flew on the 14-day Gemini 7 mission in December 1965 and was commander of the Gemini 12 mission which concluded the Gemini program in November 1966.

Lovell was selected as a NASA astronaut in September 1962 and has spent more time in space than any other human being -- a total of nearly 30 days.

Following graduation from the U. S. Naval Academy in 1952, Captain Lovell received his flight training and was later assigned as a test pilot at the Naval Air Test Center, Patuxent River, Maryland. A graduate of the Aviation Safety School of the University of Southern California, he also served as a flight instructor and safety engineer with Fighter Squardon 101 at the Naval Air Station, Oceana, Virginia.

He is married to the former Marilyn Gerlach of Milwaukee, Wisconsin. They have four children, Barbara, James, Susan and Jeffrey.

Captain Lovell was born March 25, 1928 in Cleveland, Ohio. His mother, Mrs. Blanche Lovell, resides in Edgewater Beach, Florida.

Add 2
MSC 71-34

In addition to his regular duties as an astronaut, Captain Lovell has continued to serve as Special Consultant to the President's Council on Physical Fitness and Sports -- an assignment he has held since June 1967.

Among his special honors Captain Lovell holds the Presidential Medal for Freedom awarded in 1970, the NASA Distinguished Service Medal, two NASA Exceptional Service Medals, the Navy Astronaut Wings, the Navy Distinguished Service Medal, and two Navy Distinguished Flying Crosses.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

71-35

May 14, 1971

HOUSTON, TEXAS--A $400,000 design study of the Auxiliary Propulsion System (APS) for the Space Shuttle has been requested from the aerospace industry by the National Aeronautics and Space Administration.

The request was issued at the Manned Spacecraft Center, Houston, Texas.

Objective of the study is to define a oxygen-hydrogen system which is compatible for use in both the Booster and the Orbiter vehicles.

Auxiliary propulsion consists of a space-qualified Orbital Maneuvering System (OMS) and a Reaction Control System (RCS) on the Orbiter, and the RCS only on the Booster.

The winning contractor will carry out a five-phase study including:

1. Definition of requirements

2. Candidate RCS comparisons

3. Integration of RCS and OMS

4. Special studies designed to eliminate either turbopumps or heat exchanges in the RCS.

5. And, finally, a detailed study of the most promising APS concept.

The systems must be cost effective, simple to manufacture, lightweight and have high reliability.

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MSC 71-35
Add 1

The Space Shuttle represents a new version of NASA exploration -- one that significantly reduces costs of operation. It is a reusable vehicle which provides an economical means of performing most space missions. This includes industrial and scientific experiments, defense missions, the placement of weather and communications satellites and the servicing of orbiting space stations.

Unmanned satellites also can be inspected and serviced in space or be retrieved for return to Earth. Additional savings result in the design development and checkout of satellites themselves.

A firm fixed price contract is planned for this study. Proposals are to be submitted by May 21 and the study is to be concluded ten months after contract award.

It will be conducted under the direction of the Propulsion and Power Division.

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MANNED SPACECRAFT CENTER

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news

MSC 71-36

May 17, 1971

The Manned Spacecraft Center requested proposals from industry for technological development of new surface materials that can stand the environmental extremes expected to be experienced by the Space Shuttle.

In its instructions to industry, the space agency notes that previous Thermal Protection Systems (TPS) for manned space vehicles were designed for single missions. The requirement now exists for developing new materials that can be reused up to 100 times with minimum refurbishment.

NASA is requesting industries to design, develop and test a ceramic insulatro class of materials. This type of material appears to meet the requirements of lightweight, reusability and lower costs; all desired traits for the Shuttle.

Sample tiles sized to 12 x 12 inches x 2 inches thick will be delivered to MSC for specialized testing. The agency plans to expose the panels to hard vacuum, infrared transmissions, radiation, micrometeriod bombardment, freeze/thaw cycles, dust, rain and chemical contaminants.

The proposal calls for a firm fixed price contract. Proposals are to be submitted by May 24 and the work is to be completed about seven months after contract award.

It will be conducted under MSC's Structures and Mechanics Division.

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news

MSC 71-37

May 21, 1971

Dr. Donald L. Holmquest, 32, a scientist-astronaut, has been granted a one-year leave from NASA to pursue teaching and medical research at the Baylor University School of Medicine in Houston.

He has been named Assistant Professor of Radiology and Physiology at Baylor and Associate Director of the Nuclear Medicine section of the Department of Radiology, with staff appointments at St. Luke's, Texas Childrens and Ben Taub Hospitals.

"I plan to pursue sub-specialty studies in the field of nuclear medicine in addition to general medical research and research related to NASA programs, such as a more convenient method of measuring changes in body calcium," Dr. Holmquest said.

The scientist-astronaut's leave without pay will extend to May 14, 1972. Dr. Holmquest was selected for the astronaut program in August, 1967. He has doctorates in medicine and physiology from Baylor and a Bachelor of Science degree in Electrical Engineering from Southern Methodist University.

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news

RELEASED AT NASA HEADQUARTERS

June 3, 1971

North American Rockwell Corp., Space Division, Downey, California has earned incentive awards fees in the amounts of $234,600 and $307,350, respectively, under National Aeronautics and Space Administration contracts for the Apollo Command and Service Module (CSM) and the second stage (S-II) of the Saturn V launch vehicle.

The awards were determined by a Performance Evaluation Board, designated in January 1968 by the NASA Administrator, on the basis of NAR's achievement of management objectives specified in the contracts.

The awards cover the contractor's management performance under the CSM and S-II contracts during calendar year 1970. This period represents the last of three time increments designated in the contracts for award fee consideration.

The total amounts of fee available for award through contract completion were in addition to the basic fees provided for in the contracts, limited to one-half of one per cent of the estimated costs remaining at the time the incentive provisions were negotiated. The award fee pools were fixed and were not subject to adjustment.

The total amount of the incentive awards fees for the three-year period, 1968 through 1970, amounts to $3,561,230.

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news

RELEASED AT NASA HEADQUARTERS

June 10, 1971

The National Aeronautics and Space Administration has announced its management plans for the Space Shuttle Program of its Office of Manned Space Flight.

Overall management of the Space Shuttle Program will be in the Headquarters Office of Manned Space Flight which will be responsible for detailed assignment of responsibilities, basic performance requirements, control of major milestones and funding allocations to the various NASA field centers.

Dale D. Myers, Associate Administrator for Manned Space Flight, has assigned responsibilities to the three Manned Space Flight centers for the Space Shuttle Program as follows:

--Manned Spacecraft Center, Houston, will have program management responsibility for program control, overall systems engineering and system integration, and overall responsibility and authority for definition of those elements of the total system which interact with other elements, such as total configuration and combined aerodynamic loads. MSC also will be responsible for the orbiter stage of the Space Shuttle.

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--Marshall Space Flight Center, Huntsville, Ala., will be responsible for the booster stage and the main engines for the Shuttle.

--Kennedy Space Center, Fla., will be responsible for design of launch and recovery facilities.

All three centers will have personnel located at MSC as part of the overall systems engineering and systems integration activity.

The Space Shuttle is planned as a reusable space vehicle designed to carry payloads between Earth and near-Earth orbit. Missions for the Shuttle include deployment of unmanned spacecraft, satellite repair and retrieval, space rescue, and short-duration orbital science and applications.

The NASA FY 1972 Budget now before Congress includes $100 million for proceeding with shuttle main engine development and for initiating development or for continuing design studies of the shuttle airframe depending on the results of studies now underway.

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news

RELEASED AT NASA HEADQUARTERS

June 10, 1971

The following is the text of a statement released by the American Embassy in Moscow:

"An exchange of lunar samples between the Academy of Sciences of the USSR and the U. S. National Aeronautics and Space Administration took place today, the American Embassy announced.

"Under the Soviet/U. S. agreement of January 21, 1971, it was agreed that about 3 grams of lunar material returned by Luna 16 would be exchanged for about 3 grams of lunar samples returned by Apollo 11 and the same amount returned by Apollo 12.

"The exchange provides an opportunity for scientists in both countries to benefit from the study of material from areas of the Moon to which they would not otherwise have access."

"The United States group which came to Moscow to accept the Soviet sample and to present the American samples was headed by Mr. Lee R. Scherer, Director, Apollo Lunar Exploration Office, NASA. Academician A. P. Vinogradov presided for the Academy of Sciences."

"The exchange of lunar samples is the first of the provisions of the agreement to be undertaken. Working groups for carrying out the other provisions of the agreement are being established.

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"The exchange of lunar samples exemplifies the desire of NASA, as stated in the agreement of January 21, to expand cooperation in space research and exploration. The U. S. Government looks forward to the broadening and deepening of this cooperation."

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MANNED SPACECRAFT CENTER

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news

MSC-71-38

June 11, 1971

HOUSTON, TEXAS---The National Aeronautics and Space Administration today asked aerospace firms for proposals to develop, construct and test a model cryogenic supply system for use in the Space Shuttle.

The request was issued by NASA's Manned Spacecraft Center.

In its instructions to industry, MSC calls for a two-phase effort using cryogens such as liquid oxygen and liquid hydrogen. In phase one the contractor will design and ground test a prototype system. Phase two will provide a subscale model system and a flight test plan.

MSC notes that cryogenic propellants require thermal conditioning prior to use. One of the major problems is boil-off including vaporization in feedlines. As the propellants vaporize, the liquids are forced from the outlets cutting fuel supply to the engines.

The Shuttle Orbiter requires numerous starts in space during the extended missions planned for it; consequently, a low-risk, efficient cryogen system must be designed.

The reusable Shuttle will be used to transport personnel and cargo into low earth orbit. Concepts call for an airplane-like Booster and Orbiter which will be launched vertically in a piggy-back arrangement. They will separate at approximately 200,000 feet (60,960 meters) altitude with the workhorse Booster returning immediately to earth and the sleek Orbiter continuing onward into space. Each will land horizontally like present-day jet aircraft.

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Add 1

The proposal calls for a cost-plus-fixed-fee research and development contract. Proposals are to be submitted by July 2 and the two phases of work will be concluded approximately 17 months after contract award.

It will be conducted under the direction of MSC's Power and Propulsion Division.

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news

RELEASED AT NASA HEADQUARTERS

June 16, 1971

The National Aeronautics and Space Administration is examining the advantages and disadvantages of a "phased approach" to the development of a reusable space shuttle system in which the orbiter vehicle would be developed first and initially tested with an interim expendable booster.

In a "phased approach," full scale hardware development of a reusable booster would be started later, but some design and preliminary development work for it would proceed concurrently with development and test of the orbiter.

For the interim booster NASA and its industrial contractors will study the use of a modified Saturn IC (first stage of the Saturn V that launches Apollo flights to the Moon), a booster based on the Titan III, and a booster system using solid rockets.

The contractor studies now nearing completion are confirming the feasibility and desirability of a reusable Space Shuttle as the key element of a space transportation system which will meet the continuing needs and long-term objectives of the United States in space.

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Add 1

"The preferred configuration which is emerging from these studies," NASA Administrator James C. Fletcher said today, "is a two-stage delta-wing reusable system in which the orbiter has external propellant tanks that can be jettisoned.

"Although our studies to date have mostly been based on a 'concurrent approach' in which development and testing of both the orbiter and the booster stages would proceed at the same time, we have been studying, in parallel, the idea of sequencing the development, test, and verification of critical new technology features of the system. We now believe that a 'phased approach' is feasible and may offer significant advantages.

"We believe that the additional studies we are now undertaking, together with those previously undertaken and now being completed, will put us in a position to make a decision this fall on the technical and programmatic approach to be followed in the Space Shuttle program."

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news

RELEASED AT NASA HEADQUARTERS

June 17, 1971

A mountainous highland region of the Moon has been selected as the exploration site for the Apollo 16 mission, presently scheduled to carry out the fifth U. S. manned lunar landing in March 1972.

The landing point selected by the National Aeronautics and Space Administration is Descartes, named for a crater lying to the south, and is about nine degrees east and 16 degrees south of the center of the Moon as viewed from Earth.

Descartes is a key site in the lunar exploration program, complementing the 1969 Apollo 11 and 12 missions to maria, the Apollo 14 landing in the Fra Mauro uplands last February, and the planned Apollo 15 landing next month at Hadley-Apennine, a northern plain flanked by a deep gorge and high mountains.

Descartes lies in the central lunar highlands across one of the topographically highest regions on the Earth-side hemisphere. The site provides two distinct primary sampling objectives which are expected to provide material from which scientists can obtain data to fill gaps in the lunar models so far developed.

The first sampling objective, on which the astronauts will land, is the highlands basin fill. This is a volcanic-appearing material, flooding many of the large old highlands craters. The geologic evidence indicates that this material is older than the old mare sampled on Apollo 11 and 12 (about three and one-half billion years old) but younger than the Imbrium basin ejecta sampled on Apollo 14. When

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combined with the expected very old rocks from Apollo 15 at the Hadley-Apennine site, these samples should help scientists develop the story of lunar evolution. Near the landing site are two young large craters (about one-half mile across), which have thrown out large blocks of the basin fill where the astronauts plan to obtain fresh samples.

The second sampling objective is topographically hilly, grooved and furrowed, terrain again thought to be volcanic. Called uplands volcanics, the area is thought to be of similar age but of a different composition than the basin fill.

Much as the mare basalts are giving clues to the lunar interior composition in mare regions, it is thought that the upland volcanics will yield data on the interior composition of the thick highlands crust.

It is also expected that information will be obtained bearing on the processes that created the highlands which cover more than three quarters of the lunar surface. These processes are thought to have had their beginning soon after the origin of the solar system four and one-half billion years ago.

The astronauts will again use the Lunar Roving Vehicle, currently planned to be carried for the first time on Apollo 15, to transport them to prospective important locations determined prior to the mission and to other points they might select during their exploration. Contingency walking traverses will also be planned to accomplish as many of the scientific objectives as possible.

The astronauts will deploy a science station, the Apollo Lunar Surface Experiments Package (ALSEP), containing a passive seismometer, a magnetometer, a heat flow detector, and an active seismic experiment. In addition, other surface instruments will be a far UV camera/spectroscope, a cosmic ray detector and a portable magnetometer.

The passive seismometer will be looking primarily at two things. First, the scientists expect to find differences between the seismic activity or number and size of moonquakes beneath the highlands as compared with the maria. Second, analysis of the time that moonquake seismic waves take to travel will enable scientists to determine the density of the highlands crust and thus to see if they are analogous to the Earth's continents, which are relatively light and "floating" on a denser mantle.

The active seismic experiment will be used to help determine the thickness of the lunar soil layer, formed by meteoroid impact, and the depth of the upland basin fill in the old crater. The magnetometer experiments are designed to establish the levels of magnetism in the highlands to compare with that seen in the mare regions. The Descartes measurement will be a key one in trying to decipher the origin of lunar magnetism.

The magnetometer will also collect data pertaining to the electrical conductivity of the lunar interior. In turn this data can be used to derive the interior temperature and will thus complement the heat flow and seismic data.

The Apollo 16 mission will provide an opportunity to obtain heat

flow measurements on a highlands mass. Such data bears on the interpretation of the thermal history of the Moon and, when compared with data obtained at the mare sites, can lead to better knowledge of the origin of the very diverse maria and highlands.

The far UV camera/spectrograph is designed to obtain photographs of celestial objects or areas that are either emitting energy or are absorbing it from atomic hydrogen. The data obtained from this experiment will provide information on the composition, density, distribution, and motion of interstellar, interplanetary, and intergalactic gas clouds which will in turn enhance our understanding of the structure and evolution of the galaxy. The data will also provide information on the Earth's plasma environment.

The cosmic ray detector is designed to acquire data on the origin and source mechanism of high velocity cosmic rays. More specifically, it will lead to information on the elemental abundances, energy, and flux of primary cosmic ray nuclei. By flying the detector on an Apollo mission, the cosmic rays are detected beyond the disturbing effects of the Earth's atmosphere and magnetic field.

Apollo 16 will be the second mission to carry a large set of orbital sensors in the Service Module. The instruments are identical to those to be carried on Apollo 15 and include cameras, geochemical indicators, and a subsatellite with particles and fields detectors. The set of instruments will be used to extend our knowledge of the Moon and to extrapolate ground truth data to lunar areas which cannot be visited.

The subsatellite is a small satellite that will be ejected from the

Service Module during the mission and remain in lunar orbit after the astronauts return to Earth. It will contain particle detectors and a magnetometer, thus providing data to correlate with the surface magnetometer and particle detectors left on the surface by this and the Apollo 15 mission. Additionally, it will carry an S-band transponder to aid in the determination of gravity anomlies.

Apollo 16 will be commanded by John W. Young, a Navy Captain, with Thomas K. Mattingly II, a Navy Lieutenant Commander, as Command Module Pilot and Charles M. Duke, an Air Force Lieutenant Colonel, as Lunar Module Pilot. The backup crewmen are Fred W. Haise, Jr., a civilian; Stuart A. Roosa, an Air Force Lieutenant Colonel; and Edgar D. Mitchell, a Navy Captain.

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news

RELEASED AT NASA HEADQUARTERS

June 17, 1971

Space negotiations between U. S. and Soviet agencies on compatible docking systems resume June 21 at the Manned Spacecraft Center, Houston. Three joint working groups will meet to work out a single set of technical requirements for such systems.

Some 20 Soviet space scientists and engineers, including a cosmonaut, will attend the meetings called for under the agreement reached in Moscow October 28, 1970. The agreement sets forth procedures and a schedule for joint efforts to design compatible rendezvous and docking arrangements for the manned spacecraft of the two nations.

The agreement provides for three working groups:

Working Group 1 is to assure the compatibility of over-all methods and means for rendezvous and docking. Working Group 2 is to insure compatibility of radio guidance systems, optical and other guidance systems and communications. Working Group 3 is to assure compatibility of docking assembly and tunnel.

Dr. Robert R. Gilruth, Director, MSC, will head the NASA group participating in the meetings which are expected to last five days. In addition to Dr. Gilruth, NASA personnel participating will be Arnold W. Frutkin, Assistant Administrator for International Affairs; Leroy Roberts, OMSF; Caldwell Johnson, Glynn Lunney, Rene Berglund,

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Add 1

Jack Waite, Leonard Nicholson, Ed Smylie, Richard Reid, Ed Lineberry, Clark Covington, Don Cheatham, Charles Manry, R. H. Dietz, Don Wade, Jim Jones and Robert White of MSC, George Hardy, Melvin Brooks, Glynn Eudy, and Joseph Cremin, MSFC.

Head of the Soviet delegation will be Igor P. Rumyantsev, Council on International Cooperation in Space Research and the Use of Space (Intercosmos) of the Academy of Sciences. Boris N. Petrov, Intercosmos, the principal Soviet representative at the Moscow meeting which drew up the agreements, will also attend. Other participants are Oleg I. Babkov, Valentin N. Bobkov, Konstantin D. Bushuyev, Vladislav K. Dobroseliskiy, Oleg G. Ispolatov, Igor K. Kupriyanov, Illya V. Lavrov, Viktor P. Legostayev, Alexsandr S. Morgulev, Aleksandr V. Nikiforov, Igor G. Pochitalin, Vladimir A. Podelyakin, Viktor A. Raspletin, Cosmonaut Vitaliy I. Sevastinanov, Igor P. Shmyglevskiy, Vladimir S. Syromyatnikov, Georgiy R. Uspenskiy, and Vsevolod N. Zhivoglotov.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-39

June 17, 1971

Astronaut Walter Cunningham, 39, today announced his resignation from NASA effective on or about August 1.

A veteran of 260 hours in space aboard Apollo 7, Cunningham will become Vice President of Operations for Century Development Corporation, developers of Greenway Plaza in Houston.

Cunningham, a civilian, has been assigned to the Skylab Program since his Apollo flight. His resignation will reduce the number of astronauts on space flight status to 45.

He is one of the third group of astronauts selected in October 1963. Prior to joining NASA he was a research scientist for Rand Corporation. He served on active duty as a Marine Corps pilot and is a Marine reservist with the rank of major.

With Astronauts Walter M. Schirra, Jr. and Donn F. Eisele, Cunningham participated in the first manned flight test of the Apollo spacecraft--the 11-day earth orbital flight of Apollo 7 in October 1968.

Cunningham has Bachelor and Master of Arts degrees in physics from the University of California at Los Angeles and has completed work at UCLA on a doctorate in physics with exception of thesis. He

is an Associate Fellow of the American Institute of Aeronautics and Astronautics and member of the Society of Experimental Test Pilots, American Geophysical Union, Explorers Club, Sigma Pi Sigma, and Sigma Xi.

Cunningham has been awarded the NASA Exceptional Service Medal and Navy Astronaut Wings. He is co-recipient of the AIAA 1969 Haley Astronautics Award and was presented the UCLA Alumni Professional Achievement Award for 1969 and the National Academy of Television Arts and Sciences Special Trustees Award in 1969.

He and his wife, the former Lo Ella Irby of Norwalk, California, have two children, Brian, 10, and Kimberly, 8. Mrs. Cunningham is a member of the Nassau Bay City Council.

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June 17, 1971

STATEMENT BY WALTER CUNNINGHAM

After being fortunate enough to spend the last eight years with the most exciting program in history, I am leaving NASA to accept a new challenge. The excitement of the sixties was certainly "man in space," culminated by a successful lunar landing in 1969. I was pleased to fly on Apollo 7, but my most satisfying contribution to manned space flight was heading up the Skylab Branch of the Astronaut Office for twenty months following that mission. Sharing in our nation's thrust at technological pre-eminence for the last eight years has been the most educational, challenging, exciting, demanding, frustrating and satisfying experience imaginable.

For me, the challenge of the seventies will be bringing into successful operation a new concept of living and working at Greenway Plaza in Houston, Texas.

Greenway Plaza is 127 acres of the most exciting new commercial development under construction in this country today. It has offices, high-rise apartments, underground shops and parking, with half the acreage devoted to green open areas.

This project is being carried out by Century Development Corporation. My new position, commencing on or about August 1, 1971, will be Vice President of Operations for Century Development Corporation.

The short-sighted, low level of support of the space program and the future best interests of my family have convinced me this is the right move for us at this time. I am looking forward to it with enthusiasm.

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MANNED SPACECRAFT CENTER

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news

RELEASED AT NASA HEADQUARTERS

June 18, 1971

From as high as 60,000 feet, a four-engined aircraft has been repetitively photographing about 45,000 square miles in seven states of the Corn Belt in part of Phase III of the "Corn Blight Watch Experiment."

The watch is being conducted by the U. S. Department of Agriculture, the National Aeronautics and Space Administration, and Agricultural Experiment Stations and Extension Services of the seven states, in cooperation with Purdue University's Laboratory for Applications of Remote Sensing (LARS), LaFayette, Ind., and the University of Michigan's Institute for Science and Technology (IST), Ann Arbor.

The high-altitude infrared and natural color photography will be done every other week through September in Phase III of the Watch. This phase also includes ground observations of 223 selected fields in sampling sites--in coordination with the photography--by personnel of the State Cooperative Extension Services and State Agricultural Experiment Stations. Each site is about a mile wide and eight miles long.

The seven states are Ohio, Illinois, Indiana, Missouri, Iowa, Minnesota, and Nebraska. The state of Michigan is participating in the Watch independently through Michigan State University, East Lansing, by monitoring selected areas in that state.

The four-engined aircraft is a U.S. Air Force RB-57F flown for NASA by the USAF Air Weather Service.

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Add 1

In addition, the University of Michigan under contract to NASA's Manned Spacecraft Center (MSC), Houston, is providing a C-47 aircraft carrying a multispectral scanner. It will fly over an intensive study area in Indiana at about 5,000 feet.

The C-47 will fly 30 segments in the intensive test area to provide multispectral data for computer processing and analysis at LARS (Purdue University) and IST (University of Michigan).

In 1970, Southern Corn Leaf Blight--plus drought in some states--cut the nation's expected corn crop about 15 per cent. Major losses occurred in some Midwest states. For that reason, and because NASA and Purdue concluded that the technique offered promise for detecting blight from highflying aircraft, the Watch was set up to scan the Midwest.

Farms producing corn in each selected area were surveyed for previous cropping history, acreage planted to corn, varieties of corn planted, density of plant population, and general cultural practices. Using this survey information, sample fields were selected for detailed study and observation.

Major long-range goals of the project are to (1) evaluate the capability of remote sensing to monitor development and spread of corn blight during the growing season across the Corn Belt; (2) evaluate the technique as a means of assessing infection in the Corn Belt; (3) evaluate the techniques for assessing the status and probable impact on crop production by corn blight and other foliar stresses; and (4) evaluate results for feasibility of application to similar situations occurring in the future.

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The first phase flights of the Watch during April obtained black and white photographs of selected areas of the nation's corn belt region for use in orienting photo-interpreters and field personnel.

The second phase, obtaining color infrared photography, was completed during the month of May and was used by USDA to provide a background for an analysis of soil conditions before emergence of this year's corn crop.

Because of the experimental nature of the project, no formal statistical conclusions will be drawn or forecasts made concerning virulence, rate of spread, or ultimate effect on total corn production during the ground-air study from June 15 through September.

Information on the disease and corn production aspects of this experiment will be made available through the National Federal-State Information Center on Corn Blight in USDA. The Center reported June 16 that corn blight had been detected in 18 states and 124 counties (USDA 1915-71).

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PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-40 HOLD FOR RELEASE -- June 26, 1971

June 25, 1971

HOUSTON, TEXAS--Soil returned from the Fra Mauro region of the moon where Apollo 14 landed appears distinctly different from soil collected at mare sites visited by previous Apollo missions according to studies of the material by scientists at the NASA Manned Spacecraft Center in Houston. Apparently at least two types of rock developed early in the moon's history.

Dr. Arch Reid of the Geochemistry Branch of MSC today told scientists attending the annual meeting of the Committee on Space Research (COSPAR) in Seattle that in contrast to the Apollo 11 and 12 rocks, which are called mare basalts, the Fra Mauro material is significantly lower in the ratios of calcium to aluminum and iron to magnesium and is higher in several minor and trace elements such as potassium, barium, and the rare earth elements.

Dr. Reid said chemical and mechanical mixing of mare basalts and Fra Mauro material has occurred in the formation of the loose soil or regolith that covers the lunar surface. Scientists at MSC had earlier discovered a non-mare component in the mare soil. At the Apollo 14 site this non-mare material predominates, and material from the mare areas is a minor component, comprising only about ten percent of the Fra Mauro soil.

Detailed studies of soil returned from Apollo 14 reveal that the Fra Mauro formation contains a series of similar basaltic materials

-more-

which are quite different from the iron and titanium-rich mare basalts. The Fra Mauro materials are probably all genetically related and may be derived by partial melting and crystallization processes from a parent rock type at shallow depth.

Dr. Reid said one of the rock samples returned by the Apollo 14 astronauts, an eleven and a half pound igneous rock designated sample 14310, has essentially the composition predicted for the parent of the Fra Mauro material. The texture of rock 14310, he said, implies that liquids of this composition once existed at the lunar surface.

Coupling the information from the Apollo 14 samples with the earlier studies of mare samples from 11 and 12, Dr. Reid said, we now have sampled two distinct types of lunar material. The mare samples are iron-rich basalts derived about a billion years after the formation of the moon by partial melting of the lunar interiro. The Fra Mauro samples provide evidence of development presumably early in lunar history of a comples crust, enriched in trace elements. While quite distinct, said Dr. Reid, both systems have chemical compositions that are unlike any suggested primitive material from which the moon may have originally formed. Thus evidence to date, he said, suggests that the moon is a complex, heterogeneous body with marked differences in composition between the interior and the outer portions.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

MSC71-41

June 22, 1971

HOUSTON, TEXAS...The National Aeronautics and Space Administration, Manned Spacecraft Center, has selected General Electric Company, Houston Operations, Houston, Texas, to provide Flight Garments and Crew Provisions for use in the Skylab Program.

The $576,730 cost-plus-fixed-fee contract encompasses a program that will provide design, development, fabrication, test, cleaning, storing, and shipping functions for certain flight garments and crew provisions, as well as related documentation. Items falling within the consideration of the proposed contract are: inflight coverall garments, constant wear garments, shirts, rucksacks, brushes, tote bags, survival equipment and ground support equipment such as penlight batteries and radio beacon testers.

Centralized and coordinated activity in the area of flight garments and crew provisions will be achieved through this multitalent capability which will operate for a period of 31 months extending to early 1974.

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news

MSC 71-42

June 21, 1971

HOUSTON, TEXAS--Jamaican and United Nations officials today began a five day visit to the NASA Manned Spacecraft Center, Houston, to review earth resources data collected in April.

The island survey was a cooperative effort between the government of Jamaica and the United Nations Food and Agriculture Organization to gather information needed in assessing the island's natural resources and, in particular, its water resources. Assistance was also provided by consultants from the U. S. Geological Survey.

The seven-member group of geologists and hydrologists is headed by John Williams, Director of the Jamaican Geologic Survey and by David Wozab, Project Manager of the United Nations Development Programs (FAO), Jamaican Water Resource Development and Management Project.

During the week the group will be shown data collected over Jamaica and will receive briefings from MSC officials on techniques which may be used in interpreting the data. They will also receive background briefings on NASA earth observations programs.

Anthony J. Calio, Director of Science and Applications at the Manned Spacecraft Center said data collected during the Jamaican aircraft mission will be used as a basis for weeklong discussions and working sessions in principles of photogrammetry and photointerpretation, the physics of remote sensing and its applications to hydrology, agriculture and forestry, and health problems.

-more-

Add 1
MSC 71-42

The purpose of the Jamaican group's visit to MSC is to participate in a review of the data acquired and to train with analysis equipment prior to return to Jamaica with the data. NASA C130B aircraft flights were conducted at the joint request of Jamaica and the U.N. primarily to learn more about the tropical island's water supply. Although Jamaica has an average annual rainfall of 200 inches, much of the water in the mountain rivers never reaches the reservoirs of Jamaica's cities. It is believed that submarine springs carry a portion of the water off-shore into the Caribbean.

Allen H. Watkins, Manager of the Earth Observations Aircraft Program at MSC said excellent data was gathered on the flights, which he said was supplemented by the most complete "ground truth" operation yet attempted by the MSC aircraft program. Jamaican and U.N. field teams moved about the island on an hourly basis in order to be in position when the MSC aircraft flew over. At the same time scuba divers gathered information on water temperatures which will be used to spot check results obtained on a large scale by the aircraft.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

71-42

June 25, 1971

HOUSTON, TEXAS--Two veteran astronauts have received key assignments within the Manned Spacecraft Center's Flight Crew Operations Directorate.

Col. Thomas P. Stafford has been named Deputy Director, and Capt. Alan B. Shepard will resume his previous duties as Chief of the Astronaut Office.

In addition to taking part in overall management of the directorate, Colonel Stafford will assist the Director of Flight Crew Operations, Donald K. Slayton, with a broad range of technical matters relating to flight crew activities. The Deputy Director's position has been vacant.

Colonel Stafford has been an astronaut since 1962. He was pilot of Gemini VI in December 1965, command pilot of Gemini IX in June 1966, and commander of Apollo 10, which orbited the moon in May 1969. He succeeded Captain Shepard as Chief of the Astronaut Office in August 1969.

Captain Shepard returns to an assignment he held for several years prior to commanding the recent Apollo 14 lunar landing mission. One of the original astronauts selected in 1959, he flew the United State's first manned space flight in May 1961. The Navy has selected Captain Shepard for promotion to Rear Admiral.

The Flight Crew Operations Directorate is responsible for providing flight crews, crew procedures and training, and support aircraft for all manned space flight missions. The directorate also operates the 36 aircraft and the Lunar Landing Training Vehicle assigned to MSC.

-more-

Add 1
71-42

More than 1,100 civil service, military and contractor personnel are assigned to the directorate, including the 45 astronauts on space flight status.

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MANNED SPACECRAFT CENTER

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news

MSC 71-43

June 25, 1971

HOUSTON, TEXAS---The five-day meeting of representatives and specialist working groups of the USSR Academy of Sciences and the U. S. National Aeronautics and Space Administration was concluded here today.

The heads of the USSR and U.S. delegations, Academician Boris N. Petrov, Chairman of the Intercosmos Council of the USSR Academy of Sciences, and Dr. Robert R. Gilruth, Director of the NASA Manned Spacecraft Center, initialled a "Summary of Results" which is subject to confirmation by the President of the USSR Academy of Sciences and the Administrator of the National Aeronautics and Space Administration.

The delegations from both nations considered and discussed questions of principle and drafts of technical requirements for compatible rendezvous and docking systems of manned spacecraft and stations. Agreement was reached on a number of questions. A number of other questions require further discussion.

The current summary contains detailed lists of technical requirements for coordinate systems, optical and radio references, communications, atmospheres, docking hardware and other factors in rendezvous and docking operations where the two sides were in specific accord. Provision was also made for the exchange of additional information or for further discussion where required. The bulk of the requirements fall into the category of agreed items.

A compatible rendezvous and docking system would make it possible for spacecraft and stations to jointly carry out docking missions in outer space and, for humane purposes, would provide for a rescue capability in emergency manned flight situations.

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Delegates from both nations discussed the possibility of future experiments that might be used for the purpose of testing the technical requirements and solutions for compatible rendezvous and docking systems of Soviet and American manned spacecraft and stations.

The study of such experiments would be based on the premise that a first such experiment might be the docking of an Apollo spacecraft with a manned orbital scientific station of the Salyut-type and a subsequent experiment might be docking of a manned spacecraft of the Soyuz-type with an orbital scientific station of the Skylab-type.

Academician Petrov and Dr. Gilruth said that the meetings were conducted in a business-like atmosphere. Both expressed considerable gratification at the very rapid and substantive progress of their specialist working groups toward a comprehensive set of agreed requirements. The next meeting is planned for the end of the year in Moscow.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

MSC 71-44

June 28, 1971

HOUSTON, TEXAS--The NASA Manned Spacecraft Center has signed a contract with the North American Rockwell Corporation, Downey, California to study safety techniques for spacecraft flying in Earth orbit.

Amount of the fixed price research and development contract is $125, 000 and its period of performance is 12 months.

The agreement formally incorporates five specific study tasks relating to the Space Shuttle and the Modular Space Station. They are:

Analysis of escape, rescue and survivability is task number one. Previous studies generally were confined to rescue of small numbers of personnel. In this proposal, the contractor is requested to study concepts incorporating larger groups -- specifically, up to 12 personnel.

Task number two calls for analysis of escape routes and traffic patterns, particularly in space stations. Examples include the study of dual escape routes, whether dual access to safety areas is essential, if interior hatches should be left open during normal operations and the pros and cons of outside (extravehicular) versus inside (intravehicular) methods of escape.

In the third task, North American will analyze the potential problems resulting from the delivery of payloads that are hazardous. The transfer

-more-

of propellants and live pyrotechnics fall into this group.

Studies have disclosed that direct docking of a Shuttle Orbiter with a Space Station could be difficult to accomplish. A portion of the study will address itself to three docking options:

1. Direct "hard" docking with cargo extended.

2. Docking via a free-flying module that was delivered earlier by the Space Plane.

3. Soft docking using flexible ports.

The fifth task calls for an analysis of recovery techniques when the craft is out-of-control, disabled, or tumbling; and assuming the tumbling cannot be stopped, the contractor is requested to devise rescue procedures.

The kind and nature of space emergencies in this study are assumed to be explosions, fire, meteoroid puncture, collision with another body, the failure of critical systems or toxic atmosphere buildup.

MSC's Safety Office will monitor the contract.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC-71-45

July 1, 1971

HOUSTON, TEXAS...Eugene H. Brock, Deputy Assistant Director for computation and flight support at the NASA Manned Spacecraft Center has accepted a position as director of computing activities at the University of Virginia and of the Region II computing center for the State of Virginia. He will also hold an appointment as professor of electrical engineering in the University of Virginia School of Engineering and Applied Science.

Brock will assume his new duties at the University of Virginia about the middle of August.

He received his bachelors degree in Mathematics from Texas Technological College and bachelors and masters in engineering from Texas A & M University where he served as assistant dean of the school of engineering. Before joining NASA in 1962, he managed the computer center for General Electric Company at the NASA Marshall Space Flight Center in Huntsville, Ala.

In his new position Brock will have prime responsibility for the University of Virginia's three main computer centers---administrative data processing, computer-science and medical---and for arranging and coordinating computer services required by the 20 colleges and universities served by Region II of Virginia.

Brock is married to the former Virginia Dare Wood of Childress, Texas and they have two grown children.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

MSC 71-46

July 1, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has extended its space shuttle preliminary design contracts with four industry teams.

The companies are: McDonnell-Douglas Corp., St. Louis, Mo., with Martin-Marietta as a major subcontractor; North American Rockwell Corp., Downey, Calif., with General Dynamics as a major subcontractor; Grumman Aerospace Corp., Bethpage, N.Y., with the Boeing Co. as a major subcontractor; and Lockheed Aircraft Corp., Burbank, Calif.

The fixed price contracts are extended for four months effective July 1, 1971.

Each company has been requested to study the advantages and disadvantages of a "phased approach" to the development of the space shuttle in which the orbiter vehicle would be built first and initially tested with an interim expendable booster. Based on data from these studies, NASA expects to decide this fall if a "phased development" of the shuttle will be undertaken instead of concurrent development of both the orbiter and booster.

Three of the contracts are valued at approximately $2,800,000 each; the contract with Lockheed, at approximately $1,400,000.

Candidate interim expendable launch vehicles include a modification of the S-IC (first) stage of the Saturn V launch vehicle; an outgrowth of the Titan III rocket; a single 260-inch-engine solid booster; and multiple 120-inch or 156-inch solid rockets.

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The team headed by McDonnell-Douglas will study solids and the Titan type; Grumman, the S-IC and solids; Lockheed and North American Rockwell solid booster variations.

The extended studies also will look at orbiter configurations having external, expendable hydrogen and oxygen propellant tanks and smaller payload bays.

The McDonnell-Douglas and Lockheed studies are managed by the Marshall Space Flight Center, Huntsville, Ala., and the North American Rockwell and Grumman studies by the Manned Spacecraft Center, Houston.

The shuttle will reduce both launch and payload costs of Earth orbital missions. Among the user-services will be the deployment of unmanned spacecraft, satellite repair and retrieval for refurbishment and reuse, space rescue, short-duration science and applications, and ultimately space station supply.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

MSC 71-47

July 6, 1971

HOUSTON, TEXAS...The NASA Manned Spacecraft Center has selected the McDonnell-Douglas Corporation, St. Louis, Missouri for extension of a design study of the Auxiliary Propulsion System (APS) for the Space Shuttle.

Amount of the firm price contract is $380,000 and its period of performance is 10 months.

Object of the work is to define a oxygen-hydrogen system which is compatible for use in both the Booster and the Orbiter vehicles.

Auxiliary propulsion consists of a space-qualified Orbital Maneuvering System (OMS) and a Reaction Control System (RCS) on the Orbiter, and the RCS only on the Booster.

McDonnell-Douglas will carry out the five-phase study as follows:

1. Definition of requirements

2. Candidate RCS comparisons

3. Integration of RCS and OMS

4. Special studies designed to eliminate either turbopumps or heat exchanger in the RCS.

5. And, finally, a detailed study of the most promisiong APS concept.

The systems must be cost effective, simple to manufacture, light-weight and have high reliability.

-More-

MSC 71-47

Add 1

The Space Shuttle is a reusable vehicle which provides an economical means of performing Earth orbital space missions. This includes industrial and scientific experiments, defense missions, the placement of weather and communications satellites and the servicing orbiting space stations.

Unmanned satellites also can be inspected and serviced in space or be retrieved for return to Earth. Additional savings result in the design development and checkout of satellites themselves.

MSC's Propulsion and Power Division, will monitor the study.

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MANNED SPACECRAFT CENTER

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news

MSC 71-48

July 7, 1971

HOUSTON, TEXAS...The Apollo 15 crew, now in final training and pre-launch preparations Wednesday received a "medical go" from Dr. Charles A. Berry, Director of Medical Research and Operations following the first in a series of medical examinations.

Dr. Berry said that laboratory tests of the crew's F-minus 30-day physicals confirm that the prime crew and backup crews have no abnormalities and at this time are cleared for launch. The prime crew - mission commander David R. Scott, command module pilot A. M. Worden and lunar module pilot James B. Irwin - received their preliminary physicals on June 29. The backup crew of astronauts Richard F. Gordon, Jr., Vance D. Brand and Harrison A. Schmitt - underwent their physicals the previous day.

Dr. Berry said the laboratory tests of last week's physicals were completed Tuesday at the NASA Manned Spacecraft Center and the lab workup confirms the health of the crew members.

The crews will undergo additional physical examinations on July 12, at F-5 days on July 21, and on launch morning.

In order to reduce to possible exposure of the crews to disease or illness, a program of close medical surveillance was instituted this week at Cape Kennedy and the Manned Spacecraft Center. In addition to medical surveillance, the program similar to that initiated prior to Apollo 14, calls for close control of the numbers of people having contact with the crew.

The Flight Crew Health Stabilization Program generally provides clinical medicine, and immunology programs, and limitation of the number of outside contacts with the flight crew.

- Crew members (prime and backup) will reside solely in the Crew Quarters while at the Kennedy Space Center for a period of 21 days prior to launch.

- Access to primary training areas utilized by crew members will be controlled by the KSC security forces while occupied by flight crews.

- Access to areas during crew occupancy will be limited to properly badged primary contacts, or by waiver from the Director of Flight Crew Operations and subject to medical clearance from the Director of Medical Research and Operations.

- The major scope of crew activities will be limited to the primary areas of the Manned Space Operations Building (MSOB) and Flight Crew Training Building (FCTB), the flight line, and launch pad white room during the 21 day prelaunch period. Primary areas of the MSOB and FCTB are those areas with special air conditioning. Crew access to other than these areas requires special approval.

- Crew members will use personal vehicles when traveling from one primary area to another. The transfer van will be used when crew members travel from MSOB to the launch pad.

In the event crew members are required to be at MSC for training purposes they will reside in their own residence or the crew reception area of the Lunar Receiving Laboratory. Appropriate security controls will be implemented if crew members choose to stay in their homes while at MSC and children and everyone but the wife who is primary contact will be excluded.

MSC 71-48
Add 2

Starting 60 days prior to launch all illnesses occuring in family members of prime, backup, and support crews, as well as close contacts of these families are being reported to medical officials. A group of KSC employees will be similarly followed.

Primary contacts (wives, backup crew members, mission essential personnel) have been given physical examinations as early as 90 days prior to launch.

The follow-on medical surveillance is expected to maximize the possibility that those who come in contact with the crew prior to launch are healthy.

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news

MSC 71-48

July 8, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has selected Lockheed Electronics Co., Inc., Houston, for negotiation leading to the award of a contract to provide general electronic, scientific, and computing center support services at the Manned Spacecraft Center, Houston. Four companies submitted proposals for this work.

Lockheed's cost proposal for the one year, cost-plus-award fee contract is approximately $20 million. The contract will contain provisions for four additional one-year periods.

The contractor will support the Engineering and Development, Science and Applications and Flight Operations Directorates in a wide variety of support functions associated with the computer operations and maintenance, general electronic, instrumentation, engineering, and Earth observation activities at MSC.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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news

MSC 71-49

July 9, 1971

HOUSTON, TEXAS--Twenty-four U. S. scientists today began receiving samples of soil returned from the moon by the Soviet Union's Luna 16 spacecraft.

Three grams of the Soviet sample, returned from the moon's Sea of Fertility by the unmanned Luna on September 24, were provided the U. S. in exchange for three grams each of Apollo 11 and 12 lunar sample.

The exchange was based on an agreement reached January 21, 1971 between the U. S. and the Soviet Union.

Dr. Larry A. Haskin, Vice Chairman of the Lunar Sample Analysis Planning Team said "Acquisition of part of the Luna 16 material obtained by the Russians makes possible important measurements on an area of the moon that will not be sampled in the Apollo program."

Dr. Haskin, Professor of Chemistry at the University of Wisconsin, Madison, and Dr. Paul Gast, Chief of the Planetary and Earth Sciences Division at the NASA Manned Spacecraft Center, Houston, were members of a group headed by Lee R. Scherer, Director, Apollo Lunar Exploration Office, NASA Headquarters, Washington, which delivered the U. S. sample and picked up the Soviet sample in Moscow June 10.

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Dr. Gast said conversations with Soviet scientists and reports published by the Russians imply that the loose material or regolith covering the Sea of Fertility where Luna 16 landed contains significant differences from such material sampled on three U.S. Apollo missions.

Dr. Gast said Soviet scientists feel the Sea of Fertility regolith is much thinner and therefore closer to underlying strata than the soil of other lunar mare areas.

He also noted that the Soviet sample, which was collected in a hollow core tube similar to core tubes which have been used in Apollo, contained a much wider gradation of individual grain sizes than was seen in core samples returned by U. S. astronauts.

The three grams of sample provided NASA for distribution to U. S. scientists includes 1.5 grams from near the top of the 35 centimeter core tube and 1.5 grams from near the bottom of the tube. The sample is mostly fines and coarse fines with several small pebble size fragments interspersed. The largest of the pebbles in the U. S. sample weighs 62 milligrams and is described by the Russians as a coarse grained basaltic rock fragment.

Only about 600 milligrams of fine materials (about 20% of the total sample) will be distributed in the initial allocation of the Soviet sample. In describing the sample distribution plan, Dr. Haskin said, "Although we feel that one-half or more of the available Luna 16 material can reasonably be distributed to principal investigators over the next few months, we beileve that it is best to do this in at least two stages."

These initial studies, he said, should provide the information needed to develop a more complete plan for distribution and study of about 50% of the total sample during the next twelve months.

Dr. Gast said a major challenge to scientists studying the Luna 16 material will be to learn from tiny fragments no more than one-eighth inch in diameter many of the same things we learned from large rocks from Apollo missions.

Results of exchange sample studies by U. S. and Soviet scientists will be shared by the two groups and will be compared with similar studies being conducted by French scientists on Luna 16 samples provided in a separate agreement between France and the Soviet Union.

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news

RELEASED AT NASA HEADQUARTERS

July 13, 1971

The National Aeronautics and Space Administration has selected the Rocketdyne Division of North American Rockwell Corp., Canoga Park, Calif., for negotiations leading to the award of a cost-plus-award-fee contract for the Space Shuttle main engine.

The contractor's proposed cost for the design, development, and delivery of 36 engines by 1978 is approximately $500 million.

This program will be managed by the George C. Marshall Space Flight Center, Huntsville, Ala., and will support Space Shuttle orbital flights beginning in 1978.

The selection follows a 12-month Phase B competition during which three contractors conducted preliminary design studies and produced program definition documents for this ensuing phase. Proposals for this program were received by NASA from the three firms on April 21, 1971.

The Space Shuttle main engine is a hydrogen-oxygen engine employing a high-pressure staged combustion cycle in which all of the fuel is used in the main combustion process to produce the highest possible impulse.

The engine, producing 550,000 lbs. of thrust at sea level, is to be used as the primary propulsion for both the booster and orbiter of the reusable Space Shuttle. The engine and the shuttle vehicle itself will be designed for multiple reuse as in airline operations.

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Add 1

The engine, in addition to being reusable for 100 missions, will be easily maintained and supported by ground operations. It will be throttleable to accommodate vehicle flight requirements, including emergencies.

The reusable Space Shuttle will transport payloads between Earth and low Earth orbit. Airplane-like booster and orbiter stages will be launched vertically and land separately like airliners.

Rocketdyne will do this work at its Canoga Park, Calif., plant. In addition, engine system development testing is planned at NASA's Mississippi Test Facility near Bay St. Louis, Miss., and at the Air Force's Arnold Engineering Development Center, Tullahoma, Tenn.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-50

July 14, 1971

HOUSTON, TEXAS--Three contracts valued at nearly $1 million for development of new surface materials for the Orbiter stage of the Space Shuttle have been awarded to the aerospace industry by the NASA Manned Spacecraft Center.

The companies are: McDonnell-Douglas Corporation, St. Louis, Missouri, $325,000; General Electric Company, Aerospace Group, Philadelphia, Pennsylvania, $319,200, and the Lockheed Aircraft Corporation, Missiles and Space Company, Sunnyvale, California, $322,500. The different dollar amounts are influenced by the slightly different development tasks allotted to each firm.

NASA is requesting the companies to design, develop and test a ceramic insulator class of materials. This type of material appears to best meet the requirements of lightweight, reusability and low costs--all desired traits for the Shuttle.

The companies have been requested to deliver sample tiles sized to 12 x 12 inches x 2 inches thick to MSC for specialized testing. The agency plans to expose these panels to hard vacuum, infrared transmissions, radiation, micrometeroid bombardment, freeze/thaw cycles, dust, rain and chemical contaminants.

The firm fixed price contracts are to be completed seven months from signature date. They will be monitored by MSC's Structures and Mechanics Division.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-50

July 19, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration, following an evaluation of operational procedures for Apollo 15, has decided that the astronauts will wear their pressure suits during jettison of the lunar module.

This maneuver is scheduled for 6:55 p.m., EDT, August 2, shortly after the lunar landing crew has returned to the command module following their expedition to the surface of the moon.

The decision to have astronauts David R. Scott, Alfred M. Worden, and James B. Irwin fully suited at that time was based on a reevaluation of the requirements for crew members to wear pressure suits during different phases of the Apollo 15 mission.

The evaluation was conducted following the Soyuz 11 spacecraft accident which resulted in the deaths of three Soviet cosmonauts.

The Apollo 15 flight plan had called for the crew to be in "shirt sleeves" (wearing the inflight cover garments) during jettisoning of the lunar module ascent stage from the command module.

The evaluation included a review of the design, test and flight data of the windows, hatches, valves, and tubing and wiring that penetrate the cabins of both the lunar module and command module.

-more-

In addition, studies were performed on reentry effects on crew and cabin with a completely failed window, structural loading during lunar module jettison, cabin pressure decay caused by various sized holes, suit donning times, and postlanding emergencies.

The results of this review reconfirmed high confidence in the hardware and that operational procedures reduce to a minimum the possibility of damage to critical hardware through incorrect use.

The Command Module has the capability to maintain 3.5 psi for leak rates equivalent to a 1/4-inch hole for approximately 29 minutes and the Lunar Module even longer for an equivalent leak. Suit donning times for an emergency average about 11 minutes for the two crewmen in the Lunar Module to suit-up and approximately 19 minutes for the three crewmen in the Command Module to suit-up.

As a result of the review, NASA concluded that:

--The Lunar Module jettison event will be added to those events already requiring the crew to be fully suited.

--No change would be made in plans for the crew to be unsuited during reentry and splashdown. Although wearing suits would increase safety during reentry down to approximately 50,000 feet, the time from that altitude to the water is insufficient for removal of suits before splashdown. Since the more probable malfunction would occur at water impact, when wearing suits would decrease crew safety, the overall level of crew risk is lower on a nominal mission, by conducting reentry with the crew unsuited.

Add 2
MSC 71-50

The reentry event, except for the splashdown phase, is fairly predictable, and stress loads are well within the safety factor of the hardware. The stress loads imposed by the water impact are not so predictable and vary, for example, with wind velocity and direction, wave heights, wave velocity, wave rising or falling and direction.

Therefore, although the probability of a malfunction occurring at splashdown is still low, it is higher than a malfunction occurring during reentry into the earth's atmosphere. In the event that such a malfunction did occur on splashdown and emergency egress were necessary, a suited crew would be handicapped.

Furthermore, should the command module remain upside down, egress through the upper hatch under water would be required. It would be difficult and time consuming to attempt to remove suits in this condition, and if an emergency condition should exist, the crew would be severly handicapped.

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MANNED SPACECRAFT CENTER

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news

MSC 71-51

July 23, 1971

HOUSTON, TEXAS--Attorneys representing NASA's astronauts have reached an agreement with the New York Times Special Features, the syndicate division of The Times, for world-wide syndication of byline articles by the three Apollo 15 crew members and Scientist-Astronaut Harrison Schmitt.

The agreement in no way infringes on NASA's policies for the timely, free-flow of information to all media on the agency's space flight and other activities. Also, the contract in no way changes rules which apply to the conduct of government employees.

The Times on its part emphasizes that the arrangement is solely with the syndicate division and will in no way limit the enterprise of The New York Times coverage of all aspects of the program and persons involved in it.

Terms of the agreement call for one byline article each by Apollo 15 Astronauts David R. Scott, James B. Irwin and Alfred M. Worden for publication after the post-mission press conference and three byline articles by Astronaut Schmitt while the crew is on the lunar surface.

The New York Times Special Features also has rights of taking still photographs in the homes of Apollo 15 crew members at the time of their first return from the mission and rights to interviews with family members.

The agreement covers a period extending to 30 days after the end of the mission and provides for payment by The Times Special Features of 50 per cent of the gross proceeds from the syndication of the articles.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-52

July 23, 1971

HOUSTON, TEXAS--John T. Donnelly, Vice President for Corporate Communications, Whittaker Corporation, has been appointed Assistant Administrator for Public Affairs, National Aeronautics and Space Administration, effective about August 15, 1971.

Donnelly will be responsible for the development and direction of NASA's public affairs activities including Public Information, Public Services, and Educational Programs. These functions are carried out by the Office of Public Affairs at NASA Headquarters and by Public Affairs personnel at the NASA field centers, in accordance with the provisions of the NASA Space Act of 1958, requiring NASA to "Provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

Donnelly has been in charge of the Public Relations and Advertising Policies at the Whittaker Corporation since early 1970. Whittaker Corporation is a large diversified Los Angeles based company. Prior to that he had been Director of Corporate Communications for A-T-O Incorporated, a diversified Cleveland based company.

His previous experience in public relations includes a year with F. W. Dodge Corporation, New York City (now a division of McGraw Hill) and eight years in the Public Relations Division of Texaco Incorporated.

Donnelly was graduated from Long Island University with a BA in journalism in 1958, after military service in the U.S. Navy. A native of New York City, he now resides in Los Angeles. He is married and has five children.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-53

July 24, 1971

HOUSTON, TEXAS---Five flotation collars scheduled for deployment in USAF Aerospace Rescue and Recovery Service aircraft from Eglin AFB, Florida for the July 26 launch of Apollo 15, were slashed with a knife sometime between July 13-19 while in storage at Eglin.

The damaged flotation collars were discovered during a routine inspection and inflation of the collars prior to loading them on the aircraft. The collars have been replaced by the Naval Rework Facility at the Pensacola Naval Air Station in Florida, where the units are manufactured. The incident will have no impact on the Apollo 15 mission.

An investigation is being made by the USAF Office of Special Investigation and all the information will be turned over to the Federal Bureau of Investigation.

Two of the flotation collars were scheduled for use on an ARRS aircraft deploying out of Eglin on July 26 to cover Station A in the North Atlantic in case of an abort. Of the other three collars, two were scheduled for the backup aircraft with one for a spare.

Value of the flotation collars is about $5,000 each. The slashed collars will be repaired and used for training purposes only.

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MANNED SPACECRAFT CENTER

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news

RELEASED AT NASA HEADQUARTERS

July 28, 1971

LIFE SCIENTIST RESEARCH PROGRAM

The National Aeronautics and Space Administration is initiating a "Life Scientist Program" in which university faculty and their graduate students from the nation's universities and medical schools will receive appointments to do relevant research at NASA's Centers.

The program, recommended by the National Academy of Sciences, is designed to increase participation between university life scientists and their counterparts within NASA in contributing to the advancements of life sciences disciplines related to the NASA mission.

Also, it is designed to stimulate university life sciences departments to use the unique space-related ground research facilities of NASA. These are principally at the Manned Spacecraft Center, Houston; Ames Research Center, Mountain View, Calif., and Langley Research Center, Hampton, Va. NASA Life Science Programs include research and technology development associated with medical, biological, behavioral, bioengineering and life support engineering sciences as they relate to the support of living systems in aeronautic and space operations. They also include exobiology, the inquiry into the existence of life elsewhere in the universe and scientific explanation of the origin of life, and planetary ecology, the detection and characterization from space of ecological phenomena on Earth or other planets.

Announcements of the program have been mailed to universities and medical schools. Interested institutions must submit proposals to NASA by October 31, 1971.

Initially, the program will support five scientists. Selections will be made at different universities on the basis of scientific evaluation of the proposed investigations and their relevance to NASA's interest and needs.

The principal scientists selected will spend approximately one-third of their time with their graduate students at one of the three named Centers. Each will be awarded a grant for a three-year period on a step-funded basis.

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713/483-5111

news

MSC 71-53

July 30, 1971

The National Aeronautics and Space Administration, beginning the week of August 2, will undertake a cooperative program with state, local and federal agencies to determine how the cooling water of an area power company affects the flow and temperature characteristics of Trinity Bay.

The Trinity Bay study is part of an on-going cooperative program with numerous other agencies and is also designed to determine how well mathe-mathical models can predict changes in water temperatures. Participants in the study include NASA-MSC, Environmental Protection Agency, Texas Water Quality Board, U.S. Naval Research Laboratory, Houston Lighting and Power Company, Texas Department of Parks and Wildlife, U.S. Coast Guard, U.S. Army Corp of Engineers, and Texas A&M University. Participants are aided in the study by Tracor and Lockheed Electronics Company. A team from Michigan State University will aid in the August observation program.

NASA aircraft of MSC's earth observations program beginning Monday will fly over the area of Cedar Bayou near the cooling water outlet of the Houston Lighting and Power Company's Cedar Bayou plant.

Due to a shutdown of the Cedar Bayou plant during this period the August observational program will provide perhaps the last opportunity to observe the bay in its unaffected state. This will provide a data base for comparison to observations taken later during plant operation. These

observations will also provide data to be used in tests of hydrodynamic models of the bay in its unaffected state.

The pace of the observational program will gradually build from the use of a single vessel and ground transit team on Monday to the use of eight surface vessels, a ground meteorological station, a ground transit team, a helicopter, and a remote sensing equipped aircraft on Thursday. Temperature, salinity, turbidity and water velocity will be measured. In addition to using drogues and current meters to measure water velocity a non-toxic fluorescent dye (Rhodemine WT) will be used in the determination of both currents and the diffusion properties of the bay. This red-orange dye is harmless to aquatic life and is expected to diffuse to the extent it is no longer visible within 30 minutes of release. The dye will be detectable in minute quantities by fluoroscopes aboard two of the surface vessels for up to 2 hours after release.

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MANNED SPACECRAFT CENTER

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news

RELEASED AT NASA HEADQUARTERS

July 29, 1971

Martin Marietta Corp., Denver Division, has been selected by the National Aeronautics and Space Administration to support the Jet Propulsion Laboratory in the design and development of major subsystems of the Viking Orbiter.

Two Viking spacecraft will be launched in 1975, each consisting of an Orbiter and a Lander to investigate Mars in mid-1976.

NASA's Office of Space Science and Applications has assigned overall Viking project management to the Langley Research Center, Hampton, Va., and JPL is responsible for the Viking Orbiter.

Four companies submitted proposals for the work.

Martin Marietta proposed an estimated cost of about $12 million with an award fee to be based on performance.

Under the contract, Martin Marietta will assign engineers and technicians to JPL to support design, development and testing of the engineering mechanics subsystems, the propulsion sybsystem, and project engineering functions for the Orbiter. At its Denver Division, Martin Marietta will provide major subassemblies for the propulsion subsystem.

-more-

Add 1

Upon arrival at Mars, the Orbiters' first assignment will be to confirm optimum landing sites for the Landers. With the Landers on the surface, the Orbiters will continue to observe the planet so that local measurements made by the Landers can be correlated with overall surface phenomena. The Orbiters also will provide a radio relay link from the Landers to Earth to increase the data return from the Lander experiments.

Mounted on the Orbiter will be instruments to conduct scientific experiments from orbit: two high-resolution television cameras; an infrared spectrometer to map water vapor in the atmosphere; and an infrared radiometer to map temperatures on the planet's surface and in the atmosphere. In addition, study of changes of the Orbiter's radio signal as it enters and departs from behind the planet will provide additional information on the atmosphere.

Each Orbiter will weigh about 5,280 pounds (2,400 kilograms) including a little more than 100 pounds (47.6 kilograms) of scientific instruments.

END

MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-54

August 4, 1971

The National Aeronautics and Space Administration - Manned Spacecraft Center and the Clear Lake City Water Authority jointly announced today that they are entering into detailed discussions leading to a long term contract whereby the Clear Lake City Water Authority would provide treatment of MSC's wastewater. The Clear Lake City Water Authority's treatment facility is located approximately 300 feet from the MSC boundary, and a pipeline would be built between the two facilities. MSC has initiated a contract to provide for its connecting pipeline plans and specifications.

In August 1970, the Texas Water Quality Board issued Order No. 69-9A which will require all Clear Lake waste dischargers to either divert effluent from Clear Lake, or to upgrade treatment of effluent by August 1972. In addition, the President, through Executive Order 11507 dated February 5, 1970, notified federal installations of a requirement to meet more stringent effluent standards. As a result, MSC had initiated plans to upgrade its sewage treatment facilities. However, in March 1971, the Clear Lake City Water Authority proposed that it provide the advanced treatment of MSC wastewater as required by the Texas Water Quality Board and the Environmental Protection Agency.

Add 1
MSC 71-54

Both federal and state pollution regulatory agencies have endorsed the Clear Lake City Water Authority proposal and recommend the expanded use of municipal or regional facilities for the purpose of reducing water pollution. A stated long range goal of the Texas Water Quality Board is to ultimately divert all effluent from Clear Lake and the proposed contract between MSC and the Clear Lake City Water Authority will facilitate the accomplishment of this goal.

Even though MSC must install a connecting pipeline, there will be a considerable cost savings by not having to improve the existing MSC treatment facilities. It is also anticipated, because of a higher processing volume, that the operating costs to jointly process MSC and Clear Lake City wastewater will be significantly less than if each proceeded on an independent basis.

The Clear Lake City Water Authority has initiated a plan to meet the more stringent effluent standards by upgrading its treatment facility. The new treatment process will be operational by the deadline of August 1972. Matching federal and state funds have been requested to finance this project.

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MANNED SPACECRAFT CENTER
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news

RELEASED AT MARSHALL SPACE FLIGHT CENTER August 3, 1971

The early assessment report shows that Saturn V launch vehicle SA-510 met all mandatory and desirable objectives and performed satisfactorily in the Apollo 15 mission. The third stage impacted in the lunar target area.

The preliminary evaluation of data indicated that SA-510 was the most powerful Saturn V launched to date. Thrust at liftoff was pegged at 7,840,000 pounds. The nearest any other booster came to this level was SA-503 that launched Apollo 8 with a thrust of 7,726,936 pounds. All others have been in the 7.5 million pound range.

One minor deviation was defined, a navigation error during Earth parking orbit. The error was established by Canary Island tracking and confirmed at Carnarvon. The navigztion update was accomplished at Bermuda, and no appreciable navigation error was evident after translunar injection burn.

S-IC and S-II propellant tanks pressurization systems performance was satisfactory and the ullage pressure remained within the predicted band.

First motion of the vehicle was recorded on the exact predicted moment. Separation of S-IC was one-half a second later than planned. S-II separation occurred 0.7 seconds early.

-more-

Add 1

Parking orbit insertion came 4.4 seconds early because of a slightly higher performance than expected of the third stage. Translunar injection came 1.2 seconds ahead of the planned moment.

The first stage cut off at an altitude of 37.1 nautical miles, 0.06 mile higher than predicted. Velocity was 30.6 feet per second faster than predicted and range was 0.6 nautical mile farther.

The S-II cut off at 95.76 miles altitude, or 0.85 mile higher than anticipated, and 874.7 miles downrange, 1.3 miles short of the predicted point. Velocity was 23 feet per second faster than planned.

Parking orbit had an apogee of 91.685 nautical miles, or 1. 675 miles higher than expected, and a perigee of 90.659 miles, or 0.648 mile higher. Orbit period was 87.87 minutes, or 0.07 second longer than anticipated. Velocity was 2.6 feet per second slower than planned.

Translunar injection came at 10,563.7 seconds, or 0.97 second late, at an altitude of 173.36 nautical miles, 2.01 miles below that planned. Velocity was 35,575.4 feet per second, 3.42 fps fast.

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MANNED SPACECRAFT CENTER

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news

RELEASED AT NASA HEADQUARTERS

August 3, 1971

SCIENTISTS TO HAVE NEW LOOK AT MARS

When the planet Mars makes its close orbital approach to Earth in early August, scientists aboard a high altitude astronomical laboratory have a rare opportunity to investigate the Red Planet's invisible infrared light radiations while flying above 99 percent of Earth's occluding atmospheric water vapor.

The laboratory is a specially equipped Convair 990 jet aircraft operated by the National Aeronautics and Space Administration's Ames Research Center, Mountain View, Calif. Called the "Galileo" after the pioneer astronomer and inventor of the telescope, the aircraft will carry scientists and 10,000 pounds of instruments on at least three midnight research flights near Hawaii to seek new information on Mars' atmosphere, surface water content and temperature.

The flights originate at Hickam Air Force Base in Honolulu and begin Aug. 4. The flight path is about 540 miles south of Hawaii along the 13 degree north latitude meridian.

During the close Mars approach to Earth, the planet will be about 35 million miles away and will be the fourth brightest object in the sky. Only the Sun, Moon and Venus will be brighter. The last time Mars was this near Earth was in 1671.

radiation by the Earth's surface and by clouds. From the University of Wisconsin, Dr. James Weinman will use a pulsed ruby laser to measure small particles in the stratosphere. Dr. Ira Joli and Dr. James Radostitz of the University of Oregon will investigate patterns of infrared emissions from the Earth's atmosphere. Ernest Iufer of the NASA Ames Research Center will use a vector magnetometer to aid investigations of continental drift and sea floor spreading.

Forty-five people from NASA, universities, and other organizations are participating in the operation.

The Mars Expedition is sponsored by the Airborne Science Office at the NASA Ames Research Center under the direction of Donald R. Mulholland. Project Manager for Ames is Robert Cameron. Dr. William E. Brunk, Chief of Planetary Astronomy of the Office of Space Science and Applications at NASA Headquarters, is the program manager. Dr. Nancy Roman, Chief of Astronomy Programs at NASA Headquarters, is also participating in the research flights.

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news

MSC 71-55

August 10, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has selected Boeing Co. (Space Division) Houston and G.E. (Apollo Systems) Houston for competitive negotiations leading to final selection for the award of a contract which will provide reliability, quality assurance and flight safety engineering at the Manned Spacecraft Center, Houston.

The contract will be for one year and will contain provisions for two additional one-year extensions.

Reliability and quality assurance engineering include quality assessments of spacecraft systems, reliability program support for equipment, providing a parts and materials data system for equipment, and assessment of flight readiness of spacecraft and related equipment.

Flight safety engineering includes analyses of operational procedures, plans and activities, evaluations of test requirements and test operations, and performance of flight readiness assessments.

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Add 1

A University of Hawaii team, headed by Dr. W. M. Sinton, is conducting an experiment to determine the relationship between electromagnetic radiation from Mars and its infrared emissions. A group from the University of Arizona under Dr. G. P. Kuiper will use telescope-computer system to identify spectral features of the Martian atmosphere. A Cornell University experiment directed by Dr. J. R. Houck will measure water present in crystalline materials on the planet's surface. In addition to the airborne expedition, ground based observatories around the world will take advantage of the Mars position to make a variety of observations and measurements.

The new investigations, together with the results of NASA's successful Mariner Mars probes in 1969, will greatly enhance man's store of knowledge about its neighbor planet.

Water vapor in the Earth's atmosphere prevents most ground-based measurements of infrared light originating from objects in space. Scientists using the Ames' airborne laboratory can fly above most of this atmosphere filter and can obtain data on the infrared spectrum which is otherwise unobtainable. By calculating the amount of water vapor which lies between the aircraft and the airless Moon, a correction is applied to the airborne measurements of Mars infrared emissions so that even the small amount of water vapor above the aircraft is subtracted out. On the Mars mission, Dr. P. M. Kuhn of the National Oceanic and Atmospheric Administration (NOAA) is in charge of the experiment which will provide the correction data.

Several on-board experiments are utilizing the "Galileo" for purposes not connected with Mars. Dr. W. L. Smith of NOAA will be testing a new instrument to be flown on NASA Nimbus Emission which measures infrared

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news

MSC 71-56

August 13, 1971

The National Aeronautics and Space Administration today named Astronauts Eugene A. Cernan, Ronald E. Evans, and Harrison H. (Jack) Schmitt as the prime crew for Apollo 17, the last scheduled lunar landing mission.

Backup crewmen are Astronauts David R. Scott, Alfred M. Worden, and James B. Irwin, who recently completed the Apollo 15 mission.

Cernan, commander, and Schmitt, lunar module pilot, will explore the lunar surface, while Evans, command module pilot, conducts extensive scientific experiments in lunar orbit.

Schmitt, who has a Ph. D. degree in geology, will be the third holder of a doctorate to land on the moon. Astronauts Edwin E. Aldrin, Jr. and Edgar D. Mitchell, lunar module pilots of Apollos 11 and 14, respectively, have Doctor of Science degrees.

Apollo 17 is scheduled for launch in December 1972. Final choice of the landing site has not yet been made. The 12-day mission will continue the emphasis on both lunar surface and lunar orbital science.

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MSC 71-56
Add 1

Lunar surface stay time will be up to 68 hours, and three exploration periods of up to 7 hours each are planned. A Lunar Roving Vehicle will be used, and an Apollo Lunar Surface Experiments Package will be deployed. Mapping of the moon and several scientific experiments will be continued from lunar orbit. Evans will leave the spacecraft to retrieve film from cameras in the service module during the trip back to earth.

Cernan, 39, a Navy Captain, has accumulated 264 1/2 hours in space aboard Gemini 9 and Apollo 10. On his Gemini 9 extravehicular activity, he became the first man to stay outside a spacecraft for a full revolution of the earth. During Apollo 10, he and Colonel Thomas P. Stafford descended to within 8 miles of the lunar surface for the final checkout of the Apollo spacecraft before the first manned lunar landing. Cernan is married and has one daughter.

Evans, 37, a Navy Commander, has not yet flown in space. He was backup command module pilot for Apollo 14 and served on support crews for Apollos 7 and 11. Evans is married and has a daughter and a son.

Schmitt, 36, is a civilian. Apollo 17 will be his first space flight. He was backup lunar module pilot for Apollo 15 and has been involved in geology training for all lunar landing mission crews. Schmitt is single.

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news

MSC 71-57

August 12, 1971

HOUSTON, TEXAS--Two aerospace companies have been awarded technology contracts by the NASA Manned Spacecraft Center to study, design, develop and test demonstration hardware for thermally controlling propellants for Auxiliary Propulsion Systems (APS) on the Space Shuttle.

The contracts are with Textron Incorporated, Bell Aerospace Division, Buffalo, New York in the amount of $484,400 and Rocketdyne Division of North American Rockwell Corporation, Canoga Park, California in the amount of $460,445.

The awards are part of a continuing allocation of technology funds to study the most effective systems to use for Shuttle development once the program is fully underway.

A variety of propellant feed systems are being studied. While the systems differ greatly in configuration, one characteristic is common: all hydrogen and oxygen is delivered to thrusters in gaseous form. A gaseous mixture is preferred because of the greater difficulty in delivering cryogenic liquids to the many engines.

Some type of thermal conditioning is necessary to convert the stored liquids into gases and then to hold adequate quantities at proper temperatures in some type of accumulator or holding tank.

Each of the contractors will build a number of pre-prototype thermal conditioning units. Initial tests will be conducted at contractor plants. Later tests will be performed at MSC.

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Add 1
MSC 71-57

The cost reimbursable research and development contracts are to be completed approximately 14 months from signature date.

They will be monitored by MSC's Power and Propulsion Division.

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713/483-5111

news

MSC 71-58

August 13, 1971

HOUSTON, TEXAS--The Manned Spacecraft Center today notified 132 Civil Service employees they will be released as a result of manpower reductions of the National Aeronautics and Space Administration.

The total includes several employees who had already planned to resign or retire. An additional 69 employees were informed they will be reassigned or placed in jobs at a lower grade.

The move is to be concluded by October 3, and it will reduce the MSC work force to approximately 4,000 Civil Service personnel. By June 30, 1972, the work force will be further reduced by attrition to 3,935.

While some 212 positions are to be eliminated by next June, the number of employees being separated now is smaller because of resignations and retirements, a spokesman in the Personnel Division said.

A year ago during MSC's first forced reduction of Civil Service employees, 175 persons were released and an additional 185 workers were reassigned or placed in jobs at a lower grade.

Among the 132 employees scheduled to leave are 70 engineers and scientists and technicians. Most of them are stationed at the Center, although 34 have jobs in field operations of the Center at Downey, California, Bethpage, New York, and Kennedy Space Center, Florida.

The engineers and technicians have backgrounds in electronics, quality assurance, electrical and mechanical engineering and mechanical equipment.

-more-

Administrative professionals in the fields of contract administration, logistics, audio visual aids, and general administration also are affected.

MSC has set up an Outplacement Center for the affected workers and has invited other Government agencies and business concerns to interview them.

MSC Director Robert R. Gilruth told the RIFed employees, "I have directed the Personnel Officer to place the highest priority on assisting you and others who are adversely affected. Everything possible will be done to help you secure other employment."

Working closely with the Houston Chamber of Commerce and the Texas Employment Commission, 350 firms in the Houston area have been contacted and invited to interview the employees who would like to remain in the area.

Organizations wishing to review employee resumes or desiring to interview MSC employees for job openings are urged to contact Stan Goldstein, NASA Manned Spacecraft Center, Houston, Texas, telephone (713) 483-3486.

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713/483-5111

news

MSC 71-59

August 13, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has signed a $316,000 contract with Martin Marietta Corporation, Aerospace Group, Denver, Colorado to develop, construct and test a demonstration model cryogenic supply system for use in the Space Shuttle.

The program will be managed by the Power and Propulsion Division at the Manned Spacecraft Center.

Martin will undertake a two-phase effort using cryogens such as liquid oxygen and liquid hydrogen in developing the system. In phase one, the contractor will design and ground test a prototype system. In phase two, Martin will provide a subscale model system and a flight test plan.

Cryogenic systems are planned for use on both the Orbiter vehicle and the Booster. The two combine to make up the Shuttle.

Orbiter requires numerous starts in space during the extended missions planned for it; consequently, low-risk, efficient cryogen systems must be designed.

The Shuttle will be used to transport personnel and cargo into low Earth orbit. Various concepts are under study including a "phased approach" in which the Orbiter vehicle will be built first and initially tested with an interim expendable booster.

NASA expects to decide this fall if a "phased development" of the Shuttle will be undertaken.

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news

MSC 71-59

August 23, 1971

HOUSTON, TEXAS--Scientists from Columbia University's Lamont-Doherty Geological Observatory, using thermometers implanted in the lunar surface by the Apollo 15 astronauts, have successfully measured the temperature gradient beneath the lunar surface -- a first step in understanding how the moon produces and gives up its heat.

Dr. Marcus G. Langseth, Jr., Principal Investigator for the Apollo 15 heat flow experiment, and Dr. John L. Chute, Jr., co-investigator, reported measurements from the experiment show the temperature of material near the lunar surface increases at the rate of about nine degrees Fahrenheit for each ten feet of depth.

This increase of temperature with depth is believed related to the outward flow of heat from a warmer lunar interior.

Tonight, at midnight, scientists at the NASA Manned Spacecraft Center, Houston, will send radio commands to the experiment on the moon, turning on heaters which will determine the conductivity of material in which the thermometers are emplaced. Once the thermal conductivity (the efficiency with which a material conducts heat) of the moon has been established it becomes possible to combine this information with the temperature gradient and to calculate the rate at which heat is flowing from the moon. This in turn indicates the total heat produced by the moon and is related to the moon's interior temperature. From information on the total heat production of the

-more-

moon, conclusions can be drawn on the abundance of long-lived radioactive isotopes which usually are a major source of heat energy and which are related to the bulk composition of the moon.

Astronauts David R. Scott and James B. Irwin emplaced the temperature sensors, part of the Apollo Lunar Surface Experiments Package (ALSEP) during the first and second of three periods of exploration which they conducted at the moon's Apennine mountain front at Hadley Rille.

The sensors were placed in two holes which the astronauts drilled about five-and-a-half feet into the lunar surface and were encased in the hollow drill stems.

The bottom-most thermometer, 57 inches below the surface, has stabilized at a temperature of four degrees below zero Fahrenheit. Temperature differences between four thermometers in the bottom 20 inches of the hole were used to calculate a temperature gradient for the lunar surface material.

Active measurements of the surface material's conductivity will be made up until lunar sunset September 12.

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713/483-5111

news

MSC 71-60

August 25, 1971

HOUSTON, TEXAS--A Career Guidance Seminar, sponsored by the Manned Spacecraft Center's Outplacement Center, is being held today for employees affected by the reduction in force.

Participants will be given information concerning the state of the job market, jobs available, typical salary levels and current economic trends.

Included in the agenda is a panel discussion, small group discussions to answer specific questions, registration for scientific and engineering job leads, and an explanation of how to file for unemployment insurance.

Techniques for preparing a resume also will be covered.

Conducting the seminar are the Texas Employment Commission and the University of Houston Center for Human Resources.

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713/483-5111

news

MSC 71-61

August 26, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has asked aerospace firms for proposals to study an Atmospheric Science Facility which could be placed in Earth orbit by a Space Shuttle.

The request was issued by NASA's Manned Spacecraft Center.

In its instructions to industry, MSC calls out four study tasks. They are:

1. Scientific study
2. Spectrometer design study
3. Design study of telescope and pointing controls
4. Presentation of findings

The objectives of the study are to define the preliminary requirements for a general purpose Ultra-Violet (UV) to Infrared (IR) Laboratory which could study Earth's atmosphere, comets, other planets and the phenomena caused by the Sun.

Wooden mockups of UV and IR spectrometers and of a telescope mirror also are called for in the proposal.

The proposal calls for a firm fixed price contract. Bidders are to submit plans by August 30 and the work will be concluded approximately 12 months after contract award.

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news

RELEASED AT NASA HEADQUARTERS

August 31, 1971

The USSR Academy of Sciences and the National Aeronautics and Space Administration have confirmed the results of Joint Working Group meetings held at the Manned Spacecraft Center, Houston, Texas, on June 21-25, 1971 on the development of compatible space rendezvous and docking systems.

The Working Groups considered the technical requirements for compatible systems including the general methods and means for rendezvous and docking, radio and optical reference systems, communications systems, life support and crew transfer systems and docking assemblies.

The Working Groups agreed in principle or in detail on a number of technical solutions and requirements. A number of other problems require additional development and discussion.

Studies will be made of the technical and economic implications of experiments that might be conducted to test the technical solutions for compatible systems. A first such experiment might be the docking of an Apollo-type spacecraft with a manned orbital scientific station of the Salyut type. A subsequent experiment might be the docking of a manned spacecraft of the Soyuz type with an orbital scientific station of the Skylab type. Skylab is an Earth orbiting workshop to be launched in May 1973. It will be inhabited by three different crews of three

-more-

astronauts for periods up to 28 days on the first mission and for up to 56 days on the second and third missions later in the year.

The Working Groups agreed that further development of mission models should be undertaken to test the suitability of the agreed technical requirements and solutions.

The Soviets provided data on the manned orbital scientific station Salyut and the Americans provided data on Skylab.

The next meeting of the Working Groups is expected to be held in Moscow in late November, hopefully to complete agreement on technical requirements for compatible systems. Professor K. D. Bushuyev and Dr. Glynn S. Lunney were designated respectively to facilitate technical communications between the two sets of Working Groups.

The summary of results of the Working Group meetings was subject to confirmation within two months by the Academy of Sciences and NASA. Dr. George M. Low, Deputy Administrator, has approved the summary of results for NASA and Academician M. V. Keldysh has approved for the Academy of Sciences.

Texts of the Working Group minutes are available at NASA Headquarters, Room 6043, 400 Maryland Ave., S.W., Washington, D. C., 20546.

The bilateral Working Groups responsible for this work were established under an agreement signed in Moscow on Oct. 28, 1970 by representatives of the USSR Academy of Sciences and NASA.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-62

September 1, 1971

HOUSTON, TEXAS--A "Workshop for a Prospective Owner of a New Business," is to be conducted September 2 for all civil service employees affected by the recent reduction in force.

Sponsoring the session is the Manned Spacecraft Center's Outplacement Office. The day-long meeting will be held at Ellington Air Force Base.

The program is designed to acquaint people who may wish to begin a new business with certain techniques necessary to enhance their chances for success.

Speakers during the day will include the Management Assistance Officer and the Houston District Director of the Small Business Administration and members of the Service Corps of Retired Executives.

No admission will be charged, but a reservation is required.

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MANNED SPACECRAFT CENTER

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713/483-5111

news

RELEASED AT NASA HEADQUARTERS

September 2, 1971

Charles A. Berry, M.D., has been named National Aeronautics and Space Administration Director for Life Sciences at NASA Headquarters, Washington.

Berry, presently Director of Medical Research and Operations at the NASA Manned Spacecraft Center, Houston, succeeds James W. Humphreys, Jr., M.D., who left NASA to become secretary-treasurer of the American Board of Surgery in Philadelphia.

Berry will retain his responsibilities at MSC until his successor there has been appointed.

As NASA Director for Life Sciences, Berry will be responsible for the management of all life science activities in the Office of Manned Space Flight, including biomedical and bioscience research, associated flight experiment definition, advanced life support and protective systems, man-machine integration and advanced bioinstrumentation. He also will have overall responsibility for integration of the total NASA life sciences program, which includes activities in other NASA offices.

Berry joined NASA in July 1962 as Chief of the Manned Spacecraft Center's Medical Operations Office and he became Director of Medical Research and Operations in May 1966. Prior to joining NASA he was Chief of Flight Medicine in the Office of the United States Air Force

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Surgeon General from 1959 to 1962. From 1956 to 1959 he was assistant chief and chief of the Department of Aviation Medicine at the School of Aviation Medicine, Randolph Air Force Base, Texas. During this period he also was Project Mercury aeromedical monitor.

Berry received his doctor of medicine degree at the University of California Medical School, San Francisco in 1947 and a master of public health degree from the Harvard School of Public Health in 1956. For three years he was in general practice in Indio and Coachella, California.

Humphreys was Director of Space Medicine, NASA Office of Manned Space Flight, from June 1, 1967 to December 3, 1971, when he was named to the newly created position of NASA Director for Life Sciences, which he held until he left NASA on May 29, 1971.

Walton L. Jones, M.D., continues as NASA Deputy Director for Life Sciences, a position he has held since the office was created. Previously he was Director of Biotechnology and Human Research in the NASA Office of Advanced Research and Technology.

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MANNED SPACECRAFT CENTER

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713/483-5111

news

MSC 71-63

September 3, 1971

HOUSTON, TEXAS--Dr. Gene Simmons, Chief Scientist at NASA's Manned Spacecraft Center, Houston is returning to the Massachusetts Institute of Technology, Cambridge, where he will resume his position as Professor of Geophysics.

Dr. Simmons has served as Chief Scientist at the Houston Center since October 1969. He was named to the post by MSC Director Robert R. Gilruth.

In accepting the appointment at MSC, Dr. Simmons said he intended to maintain his ties with MIT and, because of academic commitments, would spend only a portion of his time here.

Dr. Gilruth said he was sorry to see Dr. Simmons leave the Manned Spacecraft Center even though it was understood at the time he accepted the appointment that his stay would be limited.

"I am sure Dr. Simmons' background in lunar studies and his knowledge of the Apollo lunar sample program will continue to be of benefit to us," Dr. Gilruth said.

Dr. Simmons, a native of Carrollton, Texas was Professor of Geophysics at MIT for four years prior to joining NASA. He is a graduate of Texas A&M, and received his masters degree at Southern Methodist University and his doctorate at Harvard University.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
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713/483-5111

news

MSC 71-64

September 8, 1971

HOUSTON, TEXAS--Captain James A. Lovell, Jr., Deputy Director of Science and Applications at the NASA Manned Spacecraft Center, will participate in a three-month advanced management program at the Harvard Business School, Cambridge, Massachusetts, September 12 through December 13.

The program provides intensive classroom study in such subjects as financial management, computer applications, organization, marketing, labor relations, and control and planning.

Captain Lovell will be on a temporary duty assignment from the National Aeronautics and Space Administration while participating in the study program.

He said he felt the training would broaden the engineering and management experience he gained as an astronaut in the Gemini and Apollo programs and as Deputy Director of Science and Applications leading up and through the Apollo 15 mission.

Captain Lovell said completion of the study program will allow him to take on broader responsibilities in assisting with the management of science and applications activities at MSC and the preparation of

-more-

experiments for the remaining Apollo missions and for future space flights such as Skylab.

Lovell was named Deputy Director of Science and Applications at MSC May 20, 1971.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-65

September 8, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has signed a contract with the Westheimer Rigging and Heavy Hauling Company, Inc., Houston, Texas for support services for hauling, rigging and assembling heavy equipment.

The work will be performed at the Manned Spacecraft Center's Clear Lake site and at MSC facilities located at Ellington Air Force Base.

Work includes the loading or off-loading of space-related equipment from aircraft; handling of heavy articles and equipment, rigging of tanks, test articles, mockups, and equipment used in connection with Apollo and other flight programs.

The contract runs for one year commencing September 1, 1971 and is valued at approximately $629,000.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-66

September 8, 1971

HOUSTON, TEXAS--Skylab's Apollo Telescope Mount (ATM) prototype arrived at the NASA Manned Spacecraft Center today where it will undergo extensive thermal vacuum testing.

The 22,000 pound ATM was flown from Marshall Space Flight Center, Huntsville, Alabama to Ellington Air Force Base aboard the Super Guppy aircraft. The ATM was transferred to MSC where it will undergo alignment verification in Building 36 clean room prior to the vacuum chamber tests which will simulate the harsh environment of space.

The Skylab ATM is a solar observatory which will operate from earth orbit and will give scientists views of the Sun undistorted by the earth's atmosphere. The Skylab cluster consisting of the ATM, airlock module, docking adapter and workshop is scheduled for launch during the second quarter of 1973 and will be visited by three separate three-man crews for durations of 28 to 56 days.

The ATM, following alignment verification, will be transported to Chamber A of the Space Environmental Simulation Laboratory, Building 32, where thermal vacuum tests are scheduled to begin on October 11.

Prior to the start of the thermal tests, an abbreviated systems test will be performed to verify the operation of all ATM systems.

-more-

These operations will be controlled from the Control and Display panels, identical to the actual controls which the Skylab astronauts will operate during flight.

The control and display panels will be located in a man-lock on the third level of Chamber A. Test crews will operate the controls and ATM system functions will be monitored by the automatic checkout equipment (ACE) in Building 32. This test, which is set to start on September 30, will be conducted while the man-lock is maintained at Skylab cabin pressure.

Two major thermal vacuum tests are scheduled. The first which begins October 11 will last five days and the second, scheduled to start on November 4, will last about 18 days. All tests will be operated around-the-clock.

Upon conclusion of the tests, the ATM prototype will be transferred to the Building 36 clean room for post-test alignment verification and then returned to Marshall.

The ATM tests at MSC follow quality and reliability assurance checkouts which were concluded late in August at the Marshall center. A Marshall checkout team will work with MSC personnel in the chamber tests.

The ATM flight unit, which is being fabricated at the Marshall Center, will undergo similar thermal vacuum chamber tests at MSC in May 1972. The ATM prototype is the backup flight item for Skylab.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-67

September 13, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has signed a supplemental agreement with the Grumman Aerospace Corp., valued at about $4,364,849 for changes in the Apollo Lunar Module Contract NAS 9-1100.

The agreement formally incorporated into the Grumman contract four changes previously authorized by NASA for modification to the Contractor's procedures for: LM Ascent Engine Recontoured Thrust Chamber; Extension of Simulation Effort (FMES/FCI); Modifications to the Exterior Tracking Light; and the Use of LM-8 for Testing in Support of LM-5. The modifications bring the estimated value of the Grumman contract since January 1963 to approximately $1,778,034,399.

Grumman performs the majority of work on the Lunar Module Contract at its Bethpage, New York facility with support from its field offices in Houston, White Sands, and at the Kennedy Space Center.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-68

September 13, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has selected the Boeing Company (Space Division), Houston, for award of a contract to provide reliability, quality assurance, and flight safety engineering at the Manned Spacecraft Center, Houston. Boeing was selected following completion of competitive negotiations.

Estimated cost of the one year, cost-plus-fixed-fee contract is approximately $4.3 million. The contract will be effective November 1.

Reliability and quality assurance engineering includes quality assessments of spacecraft systems, reliability program support for equipment, providing a parts and materials data system for equipment, and assessment of flight readiness of spacecraft and related equipment.

Flight safety engineering includes analyses of operational procedures, plans and activities, evaluations of test requirements and test operations, and performance of flight readiness assessments.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-69

September 17, 1971

Preliminary biomedical evaluation of lunar material collected on Apollo 15 began this week with the exposure of lunar fines to a series of animals, plants and tissue cultures at the NASA Manned Spacecraft Center Lunar Receiving Laboratory.

Three samples, totalling 125 grams, of lunar materials collected by Astronauts David R. Scott and James B. Irwin, were distributed to the biological, botanical and virology laboratories of the LRL where sample studies are currently underway. The samples collected from Spur Crater (40 grams), Hadley Rille (40 grams), and station 6 near the Apennine front (45 grams), are part of the 80 kilograms of lunar material returned by Apollo 15.

Biotest studies on samples collected during Apollo 11, 12 and 14 have revealed that there are no indications that lunar material contains microbial life forms that are capable of replicating and posing as a threat to any part of the terrestial biosphere. As a result, the Apollo 15 biomedical evaluation of lunar material is smaller in scope than previous lunar landing missions.

Add One
MSC 71-69

The type of investigation and host materials are:

Virology and Tissue Culture - exposure of selected lunar material to tissue cultures, mycoplasma media and embryonated eggs.

Botanical - exposure of lunar material to four algae species (blue-green, green, red and diatom), eight seed species (celery, cabbage, brussel sprouts, pepper, carrot, lettuce, radish, spinach), five lower plant species (club moss, liverwort and three types of fern), eight tissue cultures (carrot, soybean, sunflower, tobacco, rice, slash pine, sugar pine and corn), and seedling species (lime, cotton and longleaf pine).

Mammalian studies - approximately 310 laboratory mice and rats will be exposed to lunar material.

Results from previous Apollo biotest studies on plants have shown that lunar material is active to plant cells and the nature of this reaction is still not fully understood.

For this reason those species which exhibited marked improvement or initial shock reaction to lunar sample exposure have been included in the botanical studies. For instance, all the algae species exhibited initial shock reaction when exposed to samples from Apollo 11 and 12, but the blue-green algae appears to have grown better in contact with the lunar material from Apollo 14.

Add Two
MSC 71-69

The eight seed species and lower plant species selected for Apollo 15 study exhibited beneficial effect when in contact with lunar material. The eight tissue cultures species exhibited different sensitivities--the two pine species and soybean appeared to show initial shock reaction while the others displayed increased cell growth.

Later in the test program select samples from the Apollo 15 deep drill tubes will be distributed to the LRL biotest laboratories where microbial analysis, including controlled chemical analysis, will be conducted.

Birds, fish and insects which were used in the lunar material test program following previous missions are not included in Apollo 15 preliminary biomedical evaluation.

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Released Friday, September 17, 1971 by
State University of New York at Stony Brook
Phone: 516/246-5000

STONY BROOK--The "Genesis Rock," which brought cries of excitement from the Apollo 15 astronauts when they found it on the moon, has proved indeed to be the oldest lunar crystalline rock yet recovered. Scientists at the State University of New York at Stony Brook today reported the rock's age to be four billion one hundred fifty million years, one hundred fifty million years older than the previously recovered oldest moon rock.

Meteorite evidence suggests the solar system to be four billion five hundred fifty million years old plus or minus fifty million years. Since the Stony Brook data allows for a two hundred million year error, the "Genesis Rock's" maximum age could be four billion three hundred fifty million years; a further test scheduled for September 23 may be able to narrow the two hundred million year margin of error.

The Stony Brook team was led by Dr. Liaquat Husain, a 29-year old nuclear chemist from Pakistan who is a research scientist at the University. Dr. Husain's colleague in the work was Dr. John F. Sutter, a research geologist at Stony Brook. The only other group analyzing the "Genesis rock" for age is that led by Dr. Grenville Turner at the University of Sheffield in England.

-more-

Add 1

The Stony Brook group uses the highly accurate Argon 40/39 dating method. The key to age is the relationship between potassium and argon content. The group uses an ultra-sensitive rare-gas mass spectrometer and the high-flux beam reactor at nearby Brookhaven National Laboratories. The method allows dating of materials with very low abundance of naturally radioactive chemical elements. Even so, Dr. Husain noted, the "Genesis Rock's" dating was an exceptionally delicate challenge because its potassium content -- one hundred parts per million -- was about one-twentieth of the content of most moon rocks.

The Stony Brook group, at a press conference in the Earth and Space Sciences Building, also announced that it had dated an Apollo 15 basalt rock sample which proved to be three billion three hundred million years old. This was a piece of the football sized "Great Scott" rock, so called because it was found by Astronaut David Scott.

The scientists withheld speculation as to whether a moon rock dating to four billion five hundred fifty million years might ever be found. They did, however, express great satisfaction at the age of the "Genesis Rock." Dr. Husain called the rock's retrieval, "a step nearer getting the ultimate Genesis Rock." And said: "The findings are truly exciting. The younger a rock, the more its been reworked by nature. As they get older we get closer to the original composition of the moon, earth and solar system."

-more-

The "Genesis Rock" elicited cries of excitement from Astronauts Scott and James Irwin because it was anorthosite - a predominantly white rock with large crystals of the mineral group called plagioclase. Scientists had anticipated that anorthosite would prove very old. Most of the moon rocks had a salt and pepper appearance.

The Stony Brook team's sample was a half inch cube weighing 500 milligrams. It was hand delivered to the University from Houston. The age measurements were done on a two hundred milligram sample, the size of which required the scientists to handle the rock with dental tools.

From September 8 to 12, when analysis was underway in the University's Earth and Space Sciences Laboratory, either Dr. Husain or Dr. Sutter was on duty around the clock.

Before coming to Stony Brook, Dr. Husain was a research associate at Brookhaven. He earned his PhD at the University of Arkansas, where he worked with Professor Paul Kuroda, internationally known for his plutonium-244 series dealing with dating events in the pre-history of the solar system.

Dr. Sutter received his PhD from Rice University and before coming to Stony Brook was a National Research Council resident research associate in the Lunar and Earth Sciences Division at NASA's Manned Spacecraft Center in Houston.

Both scientists have worked for the past year with Dr. Oliver A. Schaeffer, Chairman of Stony Brook's Earth and Space Sciences Department and Principal Investigator for the project, who has examined moon rocks from all four manned lunar landing missions. Dr. Schaeffer is on sabbatical leave this year at the Max Planck Institute for Nuclear Physics in Heidelberg where he was to make simultaneous announcement of the "Genesis Rock's" dating.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-70

September 17, 1971

HOUSTON, TEXAS--A series of cold weather environment tests on the performance of the Skylab command module (CM) postlanding and recovery systems got underway this week at the Climatic Laboratory, Eglin AFB, Florida.

Skylab flights scheduled to begin in early 1973 will cover a much greater percentage of the Earth's surface than previous programs since the missions will be launched on a 50-degree inclination.

The ground track will cover an area as far north as Winnipeg, Canada and the southern tip of England and will cover all the southern hemisphere land masses except the southernmost tip of South America.

In several months of the year the area over which the spacecraft passes includes conditions considerably colder than heretofore experienced. There is a remote possibility that an emergency or major system malfunction during launch or orbit phases could force the spacecraft to land in these areas.

To prepare for the possibility of a contingency recovery in a cold region, it was considered necessary to determine the cold weather limitations of the combined crew and command module. The purpose of the tests at Eglin is to determine these limits.

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The current series of tests at Eglin AFB will be in a chamber/water tank environment with a water temperature of 33 degrees and an air temperature of 25 degrees.

Objectives of the tests series will be to determine the performance characteristics and limitations of Skylab CM postlanding systems in a cold weather environment, determine the CM test crew response to the cold as well as the interior environmental conditions of the CM. The extent of ice buildup on the CM exterior and effect of ice on the systems performance will also be determined.

The test vehicle to be used in the Skylab cold weather test program is CM-007A which has been used for qualifying Apollo postlanding systems and equipment for flight since 1966. The postlanding and recovery systems on CM-007A are completely representative of the actual Skylab CM systems. The interior configuration is very similar to Skylab in a postlanding condition.

The test program is in two phases. A minimum of three 12-hour manned tests with each successive test conducted in slightly more severe conditions. Each test will begin with Stable II (apex down) and end with a Stable I (CM upright) egress by the test subjects. The manned portion will be concluded with a 24-hour test to examine manned CM performance under conditions derived from the results of the 12-hour tests.

-more-

Add 2
MSC 71-70

The second and concluding phase of the program at Eglin will be completed by the end of this month with an unmanned open-end test not to exceed 72 hours conducted under environmental conditions derived from results of the manned tests. The CM systems will be Skylab battery powered and cycled remotely simulating a 72-hour postlanding period.

Engineers from the Manned Spacecraft Center Recovery Operations Branch will conduct and monitor the tests at Eglin. The MSC Medical Operations Division and Technical Services Division will support the test program at Eglin. The Aerospace Rescue and Recovery Service at Eglin AFB will supply pararescue personnel for the tests.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-71

September 24, 1971

HOUSTON, TEXAS--October 6 marks the beginning of the Manned Spacecraft Center's second year of special space-science programs for school groups.

Lecture demonstrations and question and answer sessions will be presented at the Center throughout the school year to acquaint students with space-science concepts, applications, major accomplishments, and future objectives.

The programs begin at 10:00 a.m. and last for two hours on the following schedule:

Grades 1-3	1st Tuesday of each month
Grades 4-6	1st and 3rd Wednesdays of each month
Grades 7-12	2nd and 4th Wednesdays of each month

After the presentation, students may view exhibits and artifacts of manned space flight which are on display in the Visitor Orientation Center. An optional self-guided tour through several operational facilities is also available.

Last year over 19,000 students participated in the program, including a group of deaf children who came with their own interpreter. School groups traveled to the Center from all over Texas and from as far away as Oklahoma, Louisiana, and Arkansas.

-more-

Add 1
MSC 71-71

For reservations, write to the Manned Spacecraft Center, Special Events Office, Code AP5, Houston, Texas 77058, or call 713/483-4321.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-72

September 28, 1971

HOUSTON, TEXAS--Tests to determine the cause of the Apollo 15 parachute failure have been concluded with two items still listed as candidates.

They are the fuel dump, which expelled approximately six pounds of monomethyl hydrazine (MMH) from the command module reaction control system, and the links which connect the suspension lines to the risers.

Apollo Spacecraft Program officials doubt that the exact cause can be determined, but corrective action will be taken on both effective with Apollo 16.

Tests have shown that MMH being dumped through a hot engine can result in tongues of flame from the thrusters which could affect parachute lines. Remaining fuel or oxidizer (nitrogen tetroxide) has been dumped shortly after main chute deployment. The dump will be eliminated in future missions, and the spacecraft will land with residual propellants aboard.

Flaws were detected in links on the one Apollo 15 parachute recovered. The parachute which failed was not recovered, but the possibility exists that enough of the links could have failed on it to permit collapse. The origin or cause of these flaws is not understood at this time. For this reason, the material for the links

will be changed. The links have been constructed of 4130 steel. Future links will be of Inconel, a nickel/steel alloy.

Tests eliminated the apex cover, or forward heat shield, as a reason for the collapse of one of the three parachutes during the Apollo 15 landing.

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MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-73

September 29, 1971

HOUSTON, TEXAS--Four Skylab trainers are scheduled to arrive at the NASA Manned Spacecraft Center between October 6 and October 15 for use in the Skylab astronaut training program.

Two trainers--the Orbital Workshop and the Apollo Telescope Mount--will leave the Marshall Space Flight Center, Huntsville, Alabama, on October 1 aboard the NASA barge Orion.

A Multiple Docking Adapter trainer is scheduled to be flown from Martin Marietta Corporation, Denver, Colorado, on October 6 aboard the Super Guppy aircraft.

The Super Guppy is also scheduled to fly the Airlock trainer from McDonnell Douglas Astronautics Co., St. Louis, Missouri, to MSC on October 15.

The Workshop trainer is an engineering mockup which has been converted by the Marshall Center for its training role. It is a replica of the flight model and contains training versions of experiments and equipment. The Apollo

-more-

Telescope Mount model was previously used in extensive thermal vacuum tests. This ATM has also been modified at the Marshall Center.

The four Skylab trainers will be used at MSC for training prospective Skylab crewmen. While Skylab crews have not yet been named, the training program is expected to begin later this year.

The trainers will be installed in the Mission Simulation Training Facility (Building 5). The west wall of Building 5 has been removed and special sliding steel doors have been installed to accept the more than 45-foot tall Orbital Workshop trainer.

The Skylab missions are scheduled to begin early in 1973.

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NEWS RELEASE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MANNED SPACECRAFT CENTER

Houston 1, Texas

483-5111

October 1, 1970

RELEASED AT NASA HEADQUARTERS

A northern lunar plain cut by a large gorge that runs along the base of some of the Moon's highest mountains has been chosen by the National Aeronautics and Space Administration as the landing site for Apollo 15, presently scheduled for launch on July 25, 1971.

Called Hadley-Apennine, the site for the fourth U. S. manned lunar landing is named for the nearby Apennine Mountains and the meandering Hadley Rille, half a mile wide, 600 feet deep, and 60 miles long.

The site is about three degrees east of the center of the Moon as viewed from Earth and 25 degrees -- about 465 miles -- north of the lunar equator on the edge of the massive Mare Imbrium (Sea of Rains). In contrast, the sites where Apollos 11 and 12 landed, last year, and the Fra Mauro site for Apollo 14, scheduled to be launched on Jan. 31, 1971, are all within 70 miles of the equator.

A mission to the Hadley-Apennine region presents a unique scientific opportunity in the Apollo program. On the lunar surface the astronauts will obtain samples and make observations relating to three key problems.

First, they will collect materials from the base of the Apennine Mountains, which rise over 8,000 feet from the mare surface near the landing point. Such samples are expected to contain a mix of the old lunar crust existing before the formation, probably by impact, of the

-more-

Imbrium basin, perhaps more than four billion years ago, and of rocks from deep within the Moon which were ejected during the impact.

Besides extending the time-scale back beyond the 3.7-billion-year average age of Apollo 11 samples, these rocks are expected to be significantly different in composition from either the Apollo 11 or 12 basalts.

Second, the astronauts will make trips to the rille area in an attempt to obtain evidence bearing on the origin of those strange lunar features, resembling dry river beds on Earth. Samples from near the rille may indicate whether or not water was a factor in its formation. Visual observations and photography of the layering in the rille walls may indicate whether the structures are a result of collapse of lava tubes or erosion by, for example, volcanic ash flows or surface materials made to behave like fluids by degassing from the lunar interior.

Third, sampling of the fresh-looking mare and volcanic-looking features at this location is expected to extend the age scale established on Apollo 11 and 12 to younger ages.

The astronauts will use the Lunar Roving Vehicle, planned currently to be carried for the first time on Apollo 15, to transport them to prospective important locations determined prior to the mission and to new points they might select during the exploration. Contingency walking traverses will also be planned to accomplish as many of the scientific objectives as possible.

The astronauts will deploy a science station, the Apollo Lunar Surface Experiments Package (ALSEP), containing a seismometer, magnetometer, heat flow experiment, and atmosphere and ion detectors.

The seismometer should be able to pick up seismic signals which originate in both highlands, east of the site, and in the mare basin, west of the site, which is the location of a major mascon -- a large positive gravity anomaly detected by the unmanned Lunar Orbiter spacecraft.

Many scientists believe that the mascon is caused by dense rocks deep in the Imbrium basin. If so, seismic waves traveling through such rocks should have high velocities relative to the velocities already measured in lunar material.

The Apollo 15 mission will provide an opportunity to obtain a heat flow measurement near a highlands mass. Such data bears on the interpretation of the thermal history of the Moon and, when compared to data to be obtained at other sites, can lead to better knowledge of the very diverse maria and highlands.

The rille at Hadley-Apennine is thought to be associated with volcanic activity. If, in fact, there are lunar transient events around the edges of circular maria, it is possible that gases still escape from the lunar interior. The atmospheric and ion detectors on the Apollo 15 ALSEP, being near the head of Hadley Rille, will be in an excellent position to detect such events.

Add 3

Apollo 15 will be the first mission to carry a new set of orbital sensors in the Service Module, including cameras, geochemical indicators, and a sub-satellite. Hadley-Apennine is particularly well suited for this payload because its high latitude results in far greater ground-track coverage than previous Apollo missions. The cameras and geochemical sensors will also be able to "map" a significant part of the lunar backside.

The sub-satellite is a small satellite that will be ejected from the Service Module early in the mission and remain in lunar orbit after the astronauts return to Earth. It will contain particle detectors and a magnetometer, thus providing data to correlate with the surface magnetometer and particle detectors and a S-band transponder.

The high inclination will allow the sub-satellite to fly over several mascons many times in its expected one-year life. The tracking experiment should then yield more refined data than available from Lunar Orbiter spacecraft from which scientists can construct better gravity profiles for mascons and may obtain a better understanding of what those structures really are.

Apollo 15 will be commanded by David R. Scott, a USAF colonel; with Alfred M. Worden, a USAF major, as Command Module Pilot and James B. Irwin, a USAF lieutenant colonel, as Lunar Module Pilot. The backup crewmen are U. S. Navy Captain Richard F. Gordon, Jr., Civilian Vance D. Brand, and Civilian scientist/astronaut Harrison H. Schmitt.

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NASA
S-71-26442

MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-74

October 1, 1971

HOUSTON, TEXAS--NASA astronauts are today taste-testing the food scheduled to be aboard for the 28 and 56-day long Skylab missions in 1973.

More than 15 astronauts are taking part in the food compatibility test which began last week at the NASA Manned Spacecraft Center. The food test calls for the astronauts to eat three specially prepared meals a day for five days and then record on a score sheet his comments--good, bad or indifferent on each food item.

Purpose of the test, according to Dr. Malcolm Smith, Chief of the Food and Nutrition at the Manned Spacecraft Center, is to evaluate proposed Skylab food items, determine astronauts' preference and most importantly determine individual astronaut energy requirements. In addition to evaluating many of the items already selected for Skylab, the astronauts are being asked to evaluate and comment on new food items being considered for use aboard Skylab. The test is being conducted in the MSC Life Systems Laboratory where the meals are planned and prepared by dieticians and food technologists in the food laboratory and served to the astronauts.

Technology, Inc., a contractor at MSC, is coordinating the food and compatibility tests and other food related programs.

"It is important that we know each man's energy requirements," said Dr. Smith. "These tests will provide the data necessary in the selection of not only the food the astronaut prefers but the items which will furnish the requirements for Skylab crew members."

"Energy (food) is weight and weight is critical on the spacecraft," Dr. Smith explained. He estimates approximately 2,000 pounds of food

-more-

and packaging and about 6,000 pounds of water will be required for the three manned Skylab missions. "If we over estimate the energy requirements (food) the weight would be excessive," he stated.

"Success of Skylab medical experiments is influenced by the nature and amount of food the astronauts consume," Dr. Smith said. One of the experiments, Nutrition and Musculoskeltal Function, demands on the precise knowledge of nutrient and mineral intake.

The food compatibility tests start with breakfast at 7:45 a.m. A recent breakfast menu consisted of orange juice, scrambled eggs, coffee and peach ambrosia. A sampling of the astronaut evaluations showed comments ranging from "like very much" or "like slightly" and "dislike moderately."

A luncheon meal consisted of tomato soup, cheese crackers, chicken and rice, ham salad spread, biscuits, pineapple tidbits and grape drink. The evening meal is packaged for the astronauts who take it home where it is eaten in a family atmosphere. All uneaten food must be returned to the food laboratory.

Each astronaut taking part in the food test is weighed prior to serving and all uneaten food is weighed.

During the food test meals are served in a mockup of the Skylab food tray. In flight the Skylab tray which is $13\frac{1}{2}$ inches by 15 inches by $4\frac{1}{2}$ inches thick has individual recessed compartments into which the canned food items are placed for heating. A flip of a switch and built in heating elements will heat the canned food.

Astronauts taking part in the test are: Vance Brand, Karol Bobko, Gerald Carr, Robert Crippen, Owen Garriott, Edward Gibson, Joe Kerwin, Don Lind, Jack Lousma, Bruce McCandless, Story Musgrave and Bill Pogue. Other astronauts will be scheduled for the final week of the test.

Add 2

MSC 71-74

Donald K. (Deke) Slayton, Director of Flight Crew Operations; Thomas P. Stafford, Deputy Director of Flight Crew Operations; Kenneth S. Kleinknecht, Manager, Skylab Program Office and Clifford E. Charlesworth, Deputy Manager, Skylab Program Office are also taking part in the test.

When the test is concluded within the next week, researchers at the Manned Spacecraft Center will have the information necessary to prepare the most palatable menu ever taken into space. The data gathered from the tests will be also used in determining the food which will be available for the 56-day three man altitude chamber test scheduled for June 1972. The chamber test, designed to obtain medical data and medical experiment equipment evaluation for Skylab, will be conducted in the 20-foot altitude chamber in the Life Systems Laboratory.

A sample menu used during the test:

Breakfast	Lunch	Dinner
Grapefruit Juice	Turkey Rice Soup	Shrimp Cocktail
Scrambled Eggs	Spaghetti and Meat	Filet Mignon
Rice Krispies	Tuna Salad Spread	Sweet Potatoes
Biscuit and Jam	White Bread	Creamed Peas
Coffee	Strawberries	Peach Ambrosia
	Tea	Orange Drink, Coffee

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(Photos available: S-71-50755 and S-71-50756)

MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-75

October 4, 1971

HOUSTON, TEXAS...NASA Administrator James C. Fletcher will present awards Tuesday, October 5, to NASA employees and contractors for outstanding contributions to the Apollo 15 mission.

The ceremony will honor those people whose contributions were so important to the success of the Apollo flight. It will be held in the Main Auditorium of the Manned Spacecraft Center beginning at 1:30 p.m.

Assisting Dr. Fletcher will be George M. Low, Deputy Administrator. MSC Deputy Director Christopher C. Kraft, Jr., will be master of ceremonies and will read the citation. The Apollo 15 crew also will participate.

Five scientists will receive the agency's NASA Exceptional Scientific Achievement Medal "for scientific accomplishments" in the Apollo 15 mission. Recipients of the award will be Dr. Larry A. Haskin, University of Wisconsin; Dr. Leon T. Silver, California Institute of Technology; Dr. Gordon A. Swann; United States Geological Survey; Dr. Robert O. Pepin, University of Minnesota, and Dr. Gene Simmons, formerly the Chief Scientist at the Manned Spacecraft Center now with the Massachusetts institute of Technology.

Twenty two NASA employees will receive NASA Exceptional Service Medals in recognition of "their outstanding contributions to this nation's manned space flight program."

-more-

NASA Group Achievement Awards will be presented to the Lunar Traverse Planning Team; the Lunar Orbit Experiments Team; the Extravehicular Mobility Unit Team; the Television and Lunar Communications Relay Unit Team--all of MSC, the Lunar Roving Vehicle Team, composed of members assigned to the Marshall Space Flight Center, Huntsville, Alabama and MSC, and to the Space flight Meteorology Group of the National Oceanic and Atmospheric Administration assigned to the Kennedy Space Center, Florida.

NASA Public Service Awards will go to four aerospace industry contractors for their contributions to the flight. Recipients are Earl R. Houtz, The Boeing Company, Samuel Ramano, Delco Electronics; Edward P. Smith, North American Rockwell Corporation, and Donald J. Markarian, Grumman Aerospace Corporation.

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MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

72-76

October 5, 1971

HOUSTON, TEXAS--Gerald D. Griffin, formerly of Athens, Texas, but now employed by the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded the NASA Exceptional Service Medal for his contributions to the successful Apollo 15 mission.

His gold imprinted certificate reads:

"To Gerald D. Griffin, in recognition of his outstanding contributions to the success of the Apollo 15 mission: the long list of accomplishments of this scientific expedition included the first use of the improved spacecraft, the lunar roving vehicle, remote control television, expanded communications, enhanced crew mobility, and the first deep space extravehicular activity.

"This extraordinary lunar exploration produced vast and unqiue additions to our store of scientific data from inflight observations as well as from the lunar surface, and accomplished all of the planned scientific and engineering objectives."

Along with his certificate, he received a medal with wreath, rosette and NASA insignia imprinted across its face.

-more-

The awards were made in Houston on October 5, by NASA Administrator James C. Fletcher. Assisting Dr. Fletcher were George M. Low, Deputy Administrator; Christopher C. Kraft, Jr., Deputy Director of the Manned Spacecraft Center; and the crew of Apollo 15.

Twenty-two other NASA employees, ten scientists, four aerospace industry contractors, and six organizations were also honored.

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Releases typed for:
Donald M Corcoran
George C. Franklin
Jesse F. Goree, Jr.
Olin L. Graham
Gerald D. Griffin
Enoch M Jones
Ronald W Kubicki
Charles C. Lutz
Chris D. Perner
Richard L. Sinderson, Jr
Harley L. Stutesman, Jr.
Donald G. Wiseman

MANNED SPACECRAFT CENTER
PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 72-77

October 7, 1971

Conferences on space biology, solar particles and on geophysics of the moon are expected to attract leading scientists from the United States and a number of foreign countries to the Lunar Science Institute, adjacent to the NASA Manned Spacecraft Center, Houston during the weeks of October 11 and October 18.

Scientists will discuss the chemical evolution of life, extra terrestrial life detection, and the response of living organisms to extra terrestrial conditions at a two day conference October 11 and 12 at the LSI. The conference will be headed by Dr. John Weete, Assistant Scientist at the Lunar Science Institute.

October 13-15, Dr. Robert M. Walker, Director of the Laboratory for Space Physics at Washington University, St. Louis, Missouri, will chair a conference on "Modern and Ancient Energetic Particles from the Sun." Scientists who have measured the properties of energetic particles in space probes and those who have studied their effects in returned lunar samples are being invited to participate.

A third conference at the LSI is scheduled for October 18-21 to discuss lunar geophysics, including some preliminary results from Apollo 15. The four day meeting will be chaired by Dr. David W Strangway, Chief of the Geophysics Branch at the NASA Manned Spacecraft Center.

Dr. Joseph W. Chamberlain, Director of the LSI, said between 45 and 85 scientists are expected to attend each of the conferences.

-more-

The Lunar Science Institute was established in 1969 by NASA and the National Academy of Sciences as a research center for scientists conducting lunar studies.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASES BY NASA HEADQUARTERS October 7, 1971

The National Aeronautics and Space Administration is extending by six months its study contracts on the Space Shuttle with four industrial teams in order to explore in detail various alternatives resulting from the current studies.

Present study contracts with teams headed by North American Rockwell Corp., McDonnell Douglas Corp., Lockheed Missiles and Space Co., and the Grumman Aerospace Corp. will be extended until April 30, 1972.

Selection of sites for Shuttle development and operational flights will be deferred until overall systems characteristics are defined.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-78

October 13, 1971

HOUSTON, TEXAS--A joint experiment conducted by the National Aeronautics and Space Administration (NASA) and the U. S. Department of Agriculture (USDA) to gather information on southern corn leaf blight from aircraft has been completed and the data are being analyzed.

Preliminary results show the blight can be detected and its progress monitored by sensor bearing aircraft. Although southern corn leaf blight was not as severe as projected, the presence of such a widespread infestation provided a unique opportunity to assess remote sensing as a tool for large-scale crop surveys. The technique offers promise in providing quick and accurate surveys of large areas of farmland from aircraft or spacecraft.

Color infra-red photography taken by a U. S. Air Force RB-57F aircraft and multi-spectral electronic data recorded by a University of Michigan C-47 aircraft, both under contract to MSC, were used in the experiment to determine how well crop diseases such as corn leaf blight can be detected from high-flying aircraft or spacecraft.

-more-

Add 2
MSC 71-78

The Air Force RB-57 collected color infra-red photography of more than 72,000 square kilometers (45,000 square miles) of America's richest corn country in the states of Ohic, Illinois, Iowa, Indiana, Missouri, Michigan and Nebraska during the corn growing season June through September. This photography was supplemented by electronic data collected by the C-47 covering about 6,720 square kilometers (4,200 square miles) in an intensive study area in Indiana.

During the four month study, information collected by the aircraft was compared periodically with data collected on the ground in a group of sample fields which were selected in advance for detailed study and observation. Personnel from federal and state agricultural agencies responsible for the ground watch phase of the program made plant-by-plant inspections of corn on these sites at about two-week intervals.

Simultaneously with ground studies, the same areas were photographed from the RB-57 flying at an altitude of about 60,000 feet. These photographs, along with ground study data were then sent to a photo-interpretation team at Purdue University's Laboratory for Application of Remote Sensing, Lafayette, Indiana. This team, headed by R. B MacDonald, analyzed the photography and compared results with those obtained by state and federal field personnel to determine the effectiveness of using remote sensing from high altitude aircraft to monitor the development and spread of corn blight, assess the levels of infection, and determine the probable impact of the blight on crop production.

-more-

MacDonald said the study, involving close cooperation among three government agencies and two universities, showed that corn blight could be detected and its progress tracked from high-flying aircraft. He said analysis of infrared photography taken by the RB-57 showed three levels of infestation beginning with the early to middle phase of infection.

The USDA and NASA are analyzing results of the experiment in detail not only to determine the usefulness of crop infestation surveys, but for many other agricultural applications such surveys promise. It is expected results of the analysis will be announced within the next few months.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-79

October 18, 1971

HOUSTON, TEXAS--A NASA Investigation Board cited electrical system malfunction as the principal cause of the Lunar Landing Training Vehicle crash at Ellington AFB, Houston, Texas, on January 29, 1971.

NASA Research Pilot Stuart Present, the sole occupant, ejected safely and received superficial cuts and bruises of the legs.

A five-man investigating board headed by Astronaut John Young concluded that the LTV Electrical Flight Control System lost its primary power source, the generator, and switching malfunctions prevented the battery from supplying emergency power. The LLTV, without its stabilizing control system, went out of control and crashed.

Before flight operations are resumed, the board recommended that the electrical system be modified to prevent these malfunctions, and ensure that backup power is available to the flight control system.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASED AT NASA HEADQUARTERS

October 18, 1971

Misjudgment in estimating altitude has been named as the primary cause of the January 23 helicopter crash in the Indian River south of Cape Kennedy in which Astronaut Eugene Cernan escaped injured. The five-man board investigating the accident has submitted its report to NASA Administrator Dr. James C. Fletcher.

The board listed possible mitigating factors which may have contributed to Cernan's failure to realize that he was flying into the water. These included a lack of familiar objects on the river surface to help him judge altitude, possible visual focusing on a false water surface because of the water's millpond smoothness and a change in sun reflection on the water cause by the change in course just prior to the accident.

The board also conjectures that Cernan's extensive experience with high-speed aircraft may have contributed to his altitude misjudgment --the lower a pilot flies in a jet aircraft, the faster the surface appears to pass by. The effect is not as pronounced in a slower aircraft such as a helicopter.

-more-

Cernan took off from Patrick AFB shortly after 9 a.m., January 23 for a one-hour practice flight in a Bell 47G helicopter. He flew south from Patrick AFB along the Banana River and offshore of the Atlantic coastline before turning west toward Malabar. As he crossed the middle of the Indian River, he altered course to the northwest while at about 300 feet altitude. Cernan continued a gradual descent until he hit the water between a small island and the west shore of the Indian River.

The main rotor, tail boom and plastic canopy separated from the aircraft on impact, and the ruptured right fuel tank ignited. The helicopter settled to the bottom in an upright position in six feet of water. Cernan released his straps, surfaced, and swam upwind from the fuel fire. He was picked up by perople in boats less than ten minutes after the crash. Cernan's only injuries were singed eyebrows and minor contusions on the face.

Cernan's extensive water survival training as an astronaut and naval aviator was cited by the board as a major factor in his ability to escape the submerged wreckage and swim through the burning fuel.

Add 2

Examination of the salvaged helicopter wreckage and Cernan's statement yielded no evidence of aircraft mechanical malfunction.

The board of investigation for the Cernan accident was appointed January 25 by Manned Spacecraft Center Director Robert R. Gilruth, and is chaired by Astronaut James A. Lovell. Board members are Astronaut Alan L. Bean, Harold E. Ream of the MSC Aircraft Operations Office, Conway H. Roberts of the MSC Aviation Safety Office, and Dick M. Lucas of Aircraft Quality Assurance Office.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

MSC 71-80

October 20, 1971

HOUSTON, TEXAS--The National Aeronautics and Space Administration has signed a Supplemental Agreement with the Grumman Aerospace Corporation valued at about $195,400,000 for changes in the Apollo Lunar Module contract.

The agreement formally incorporates into the Grumman contract changes previously authorized by NASA for modifications to the Lunar Module vehicles which includes: increased lunar staytime, increased Lunar Module surface payload, increased extravehicular activity support, increased lunar sample return capability, increased Lunar Module hover time and associated delivery schedule adjustment for the lunar landing missions through Apollo 17.

The modifications bring the total estimated value of the Grumman contract since January 1963 to approximately $1,973,475,391. Grumman performs the majority of work on the Lunar Module contract at its Bethpage, New York facility with support from its field offices in Houston, White Sands and at the Kennedy Space Center.

The contract is managed by the NASA Manned Spacecraft Center, Houston.

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MANNED SPACECRAFT CENTER

PUBLIC INFORMATION OFFICE
HOUSTON, TEXAS 77058

713/483-5111

news

RELEASED AT NASA HEADQUARTERS

October 24, 1971

The Apollo 16 astronauts are tentatively scheduled to begin the first of their three scientific expeditions on the Moon at about 9:18 p.m. EST, March 21, four hours after touching down at the Descartes landing site.

Astronauts John W. Young, Thomas K. Mattingly II, and Charles M. Duke are set for liftoff from NASA's Kennedy Space Center, Fla., at 1:03 p.m. EST March 17, 1972, with the objective of increasing man's knowledge of his solar system by studying the evolutionary records preserved on the Moon. Such records on Earth were long ago destroyed by natural events.

Exploration of the Descartes area will complement data gathered from earlier Apollo missions by sampling from two distinctive lunar formations, by emplacement of another scientific experiment station on the lunar surface, and by conducting a series of experiments from lunar orbit and during translunar and transearth flight. This will be the fifth U.S. manned lunar landing.

The second and third lunar surface expeditions are tentatively planned to begin at about 7:48 p.m. and 7:13 p.m. EST on March 22 and 23, respectively. Astronauts Young and Duke will ride the lunar roving vehicle on all three of the seven-hour trips. The lunar module is scheduled for lunar liftoff at 6:23 p.m. EST, March 24, after 73 hours on the Moon.

-more-

Scientific experiments in the Apollo command-service modules will be operated by Astronaut Mattingly during much of the 147 and one-half hours of lunar orbital flight.

Mattingly will maneuver outside the Apollo spacecraft to retrieve films from the service module experiment bay at about 4:33 p.m. EST, March 27, some 20 hours after beginning the return flight to Earth.

The planned splashdown point is about 9° South Latitude and 169.5° West Longitude in the Pacific Ocean at 4:14 p.m. EST, March 29. Total mission duration is 291 hours and 11 minutes.

The Descartes landing site is about nine degrees south and 15.5 degrees east of the center of the Moon as viewed from Earth.

Spacecraft Commander is Navy Captain Young, who completed two Gemini and the Apollo 10 missions prior to this assignment. Command Module Pilot is Lieutenant Commander Mattingly and Lunar Module Pilot is Air Force Lieutenant Colonel Duke. Neither Mattingly nor Duke have flown in space before.

The following is the preliminary timeline of Apollo 16 events:

Apollo 16 Preliminary Timeline

EVENT	March Date	EST
Launch	17	1:03 p.m.
Translunar Injection	17	3:40 p.m.
Lunar Orbit Insertion	20	5:10 p.m.
Descent Orbit Insertion	20	9:14 p.m.
Lunar Landing	21	5:25 p.m.
Start EVA 1	21	9:18 p.m.
Start EVA 2	22	7:48 p.m.
Start EVA 3	23	7:13 p.m.
Lunar Launch	24	6:23 p.m.
Transearth Injection	26	8:56 p.m.
Transearth Coast EVA (film retrieval)	27	4:33 p.m.
Earth Landing	29	4:14 p.m.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Robert V. Gordon
(713/483-5111)

RELEASE NO: 71-81

SKYLAB STUDENT PROJECT

High school students throughout Oklahoma have been invited to propose experiments for use aboard Skylab, the U. S. manned space laboratory scheduled for flight early in 1973.

Oklahoma students, as well as high school students from any U. S. public, private, parochial or U. S. overseas schools are eligible to enter the Skylab Student Project which is being co-sponsored by the National Science Teachers Association and the National Aeronautics and Space Administration. The project, designed to stimulate interest in science and technology by directly involving students in space research, calls for student experiment proposals to be submitted no later than February 4, 1972.

Oklahoma students interested in entering the project should ask their teacher to request an official entry form, rules, booklet, and sample proposal from the National Science Teachers Association, 1201 Sixteenth Street, N. W., Washington, D. C. 20036. Student proposals

- more -

must not exceed 1000 words and should describe the proposed space experiment in accordance with the Skylab Student Project Rules Booklet.

The NSTA has divided the nation into 12 regions for this project, each with its own chairman. Oklahoma is in region 10 along with Arkansas, Kansas, Louisiana, New Mexico, and Texas. Dr. Paul J. Cowman, Associate Professor of Science Education of North Texas State University, Denton, Texas, is chairman of region 10.

Students are invited to submit experiment proposals, within the guidelines established by NSTA and the NASA, in the areas of crew recreation and other aspects of living in weightlessness as well as scientific areas of interest.

Activities proposed by students will be judged on a regional basis and up to 10 percent of entrants in each region will be selected as regional winners by local committees. All regional winners will be judged by a national committee and 25 will be chosen from these as suitable for flight.

NASA will make the final selection of those experiments to be flown from the 25 national winners. The names of the winning students will be announced in April of 1972.

The 25 national winners and their teachers will be invited to attend, with expenses paid, the Skylab Educational Conference and the presentation of awards to be held at the Kennedy Space Center in Florida. The

Skylab Educational Conference will be held at the time of the launch of Skylab.

The 25 winners and their teacher/sponsors will receive special medallions, and plaques will be given to their schools. All entrants will receive certificates of participation and regional winners will receive a certificate and an official Skylab pin and certificates for their schools and teacher.

Skylab is an Earth orbital space laboratory which is designed to conduct scientific, technological, and biomedical investigations from the vantage point of space. The program will test Earth resources remote sensing equipment and techniques to gather information on Earth's ecology, oceanography, water management, agriculture, forestry, and geography.

Skylab astronomy experiments will substantially increase knowledge of the Sun and its effects on man's existence on Earth and the habitability, biomedical, behavioral and work effectiveness experiments scheduled for Skylab will further evaluate man's capabilities in space flight.

The first manned mission will last up to 28 days or twice the duration of any previous U. S. mission and the second and third three-man missions are planned to last up to 56 days.

NASA — MSC

- end -

71-81 SKYLAB STUDENT NEWS RELEASE

SAME RELEASED TO:

Kansas
Texas
Colorado
New Mexico
North Dakota
South Dakota

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 11/15/71

Don J. Green
(713/483-5111)

RELEASE NO: 71-82

PROPULSION SYSTEMS STUDY

The National Aeronautics and Space Administration today asked aerospace firms for proposals to develop and test polymer seal materials for application in Space Shuttle propulsion's systems.

The request was issued by NASA's Manned Spacecraft Center.

In its instructions to industry, MSC notes that although strides have been made in improving seals and seal materials, leakage continues to be one of the primary problems where liquid rocket propulsion systems are used.

Four materials are candidates for additional evaluation. They are HYSTL and Viton A, for use with liquid hydrogen, and polymers identified as AFE-124D and Teflon TFE, for use with liquid oxygen as well as liquid hydrogen.

The Shuttle will be used to transport personnel and cargo into low Earth orbit. Concepts call for an airplane-like Orbiter to be launched vertically on a Booster in a piggy-back arrangement. They will seperate at approximately 60,900 meters (200,000 feet) altitude.

Studies call for the Booster to be recovered, refurbished and used again. The sleek Orbiter continues on into space where it will conduct scientific studies for up to seven days. Upon returning to Earth, it will land horizontally like present-day jet aircraft.

The proposal calls for a fixed-price research and development contract. Proposals are to be submitted by December 3 and the work will be concluded approximately 12 months after contract award.

- more -

MSC has allotted approximately $100,000 for the performance of the contemplated contract.

The work will be conducted under direction of Propulsion and Power Division.

- end -

November 15, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 11/19/71
3:45 p.m.

RELEASED AT NASA HEADQUARTERS

A meeting of the Joint Working Groups of the USSR Academy of Sciences and the National Aeronautics and Space Administration on the development of compatible space rendezvous and docking systems will be held in Moscow from November 29 - December 7.

NASA representatives headed by Dr. Robert R. Gilruth, Director, Manned Spacecraft Center, Houston, will meet with a Soviet group under the leadership of Academician B. N. Petrov to continue joint efforts called for by the NASA/Academy of Sciences agreement of October 28, 1970.

At a previous meeting in Houston, June 21-25, 1971, the Working Groups considered general methods and means for rendezvous and docking, radio and optical reference systems, communications systems, life support and crew transfer systems, and docking assemblies. They also agreed to study the technical and economic implications of experimental space flights which might test the technical requirements being developed.

At the forthcoming Moscow meeting the Working Groups are expected to dispose of many of the remaining technical problems and make recommendations to NASA and the Academy of Sciences regarding a single set of requirements for compatible rendezvous and docking.

Progress is expected also on the definition of a possible joint flight mission which might test compatible systems.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713-483-5111)

RELEASE NO: 71-83

EVA/IVA STUDY

Ten aerospace-associated firms have been invited by the NASA Manned Spacecraft Center to submit proposals to study space walking requirements as they might pertain to the Space Shuttle.

The proposal calls for the contractor to investigate emergency, contingency and normal Extra Vehicular and Intra Vehicular Activities (EVA/IVA) -- synonyms for traverses by astronauts while outside Earth's atmosphere.

MSC told contractors that EVA's and IVA's probably will be necessary to support Shuttle operations. The contractors also are asked to study protective equipment needed to perform EVA/IVA tasks.

The proposal calls for a firm fixed-price research and development contract. Approximately $150,000 of research funds have been set aside for the contemplated work.

Proposals are to be submitted by December 6, and the study will be concluded approximately 10 months after contract award.

- end -

November 22, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 11/23/71

Milton Reim
(713-483-5111)

RELEASE NO: 71-84

NEW DEPUTY FLIGHT DIRECTORS NAMED

Four deputy flight directors have been named and additional assignments given to the present flight directors, by the Flight Operations Directorate at the NASA Manned Spacecraft Center to provide the support needed for the extended missions that will be flown in the Skylab Program.

The four deputy flight directors are Neil B. Hutchinson, Charles R. Lewis, Donald R. Puddy, and Philip Shaffer, all currently members of the Flight Control Division. They will continue in their present organizational position and assume the additional responsibility of deputy flight director.

Eugene Kranz, Chief of the Flight Control Division, said, "In order to bring these four men up to speed as quickly as possible, our plan is to use two of them on each of the remaining Apollo flights, and to assign them specific responsibilities for Skylab."

Puddy and Shaffer will be assigned flight director responsibilities on the upcoming Apollo 16 flight and Hutchinson and Lewis will be assigned to similar duties for the Apollo 17 mission.

The Skylab Program objectives are to extend the duration of manned space flight and to carry out a broad spectrum of experimental investigations. Of particular importance are a series of experiments aimed aimed at medical research, earth survey, solar astronomy, and selected scientific and manufacturing experiments. Skylab is an earth orbital program scheduled for flight in 1973. The launch of an unmanned workshop will be followed by three separate manned launches of 3-man crews using Apollo spacecraft. After docking with the previously launched workshop,

the crews will inhabit the assembly for up to 28 days on the first visit and up to 56 days on each of the other two visits.

Flight directors in the Apollo program are Kranz, M. P. (Pete) Frank, Gerald Griffin, Glynn Lunney, and Milton Windler. Lunney has been relieved of active flight director tasks for the present, in order to further concentrate on his activities with the United States - USSR compatable rendezvous and docking systems of manned spacecraft. Windler will assume a new assignment representing the Flight Control Division in the areas of Skylab Earth Resources Experiments Package (EREP) mission planning and preparation.

The flight directors for Apollo 16 and 17 will be Kranz, Griffin, and Frank. Lead flight director on 16 will be Frank and lead flight director on 17 will be Griffin.

Specific skylab speciality areas to be assigned to the flight directors and deputy flight directors are as follows: Puddy--Skylab 1 activation and console procedures; Shaffer--manned activation, deactivation and data priority; Lewis--Launch/rendezvous/entry, pad tests/schedules/training, flight plan/crew procedures, ground systems and mission rules; Hutchinson--corollary experiments; Griffin--biomed experiments; and Frank--Apollo Telescope Mount (ATM) experiments.

Hutchinson, 31, assistant chief of the CSM Systems Branch, was born in Portland, Oregon and received a BA degree in math and physics from the Willamette University in Salem, Oregon. He is married to the former Karen Zollman of Wichita, Kansas.

Lewis, 33, assistant chief of the Flight Control Operations Branch, was born in Lawton, Oklahoma, and received a BS degree in electrical engineering from New Mexico State University. He is married to the former Carolyn Cross of Lawton, Oklahoma, and they have two children, Anita, 11, and Keith, 9.

Puddy, 34, assistant Chief of the LM Systems Branch was born in Ponca City, Oklahoma, and received a BS degree in mechanical engineering from the University of Oklahoma. He is married to the former Dana Carol Timberlake of Ponca City, Oklahoma, and they have three children, Mike 12, Doug 8, and Glenn 6.

Shaffer, 35, assistant chief of the Flight Dynamics Branch was born in Beaver, Oklahoma, and received a BS degree in math from Panhandle State College in Goodwell, Oklahoma, He is single.

- end -

November 22, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713-483-5111)

FOR RELEASE: UPON RECEIPT

RELEASE NO: 71-85

GLYNN LUNNEY GOES TO MOSCOW

Glynn S. Lunney, an official of the Manned Spacecraft Center, formerly of Old Forge, Pennsylvania, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Lunney is the Chief of the Flight Director's Office and has been with NASA since 1958. Prior to his present appointment, he was a Chief of the Flight Dynamics Branch and had several assignments as a Flight Director during Apollo missions.

Among his achievements are a NASA Outstanding Performance Award; the Lawrence Sperry Award from the American Institute of Aeronautics and Astronautics and several NASA Exceptional Service Medals.

Lunney has a Bachelor of Science degree in Aeronautical Engineering from the University of Detroit. He is married to the former Marilyn Jean Kurtz. They have four children and currently reside in Friendswood, Texas.

- end -

November 29, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-86

MR. JOHNSON GOES TO MOSCOW

Caldwell C. Johnson, an official of the Manned Spacecraft Center, formerly of Hampton, Virginia, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Johnson is Chief of the Spacecraft Design Office and has been with NASA and its predecessor, the National Advisory Committee for Aeronautics since 1939. As Chief of the Spacecraft Design Office, he has responsibility for study and design of future spacecraft and their systems.

Among his achievements are US patents for the Mercury Spacecraft; a patent for a One-Man Orbital Escape System, and a Manned Spacecraft Center Certificate of Commendation.

Johnson attended the University of Virginia. He is married and has two children.

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November 29, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RELEASE

Don J. Green
(713/483-5111)

RELEASE NO: 71-87

EDGAR LINEBERRY GOES TO MOSCOW

Edgar C. Lineberry, an official of the Manned Spacecraft Center, formerly of Jacksonville, North Carolina, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Lineberry is the Chief of the Orbital Mission Analysis Branch and has been with NASA since 1959. His NASA career has been devoted exclusively to the development of guidance techniques for spacecraft. As Chief of the Orbital Branch, he is responsible for the detailed planning for the orbit phases of all manned missions. This includes planning for rendezvous phases, for abort, rescue and other contingency plans.

Among his achievements are the publication of more than a half dozen technical documents on spacecraft rendezvous, guidance and control.

Lineberry has a Bachelor of Science Degree in Mechanical Engineering and Aerospace Operations. He graduated from North Carolina State at Raleigh.

- end -

November 29, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-88

DONALD CHEATHAM GOES TO MOSCOW

Donald C. Cheatham, an official of the Manned Spacecraft Center, formerly of Birmingham, Alabama, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Cheatham is the Assistant Chief of the MSC Guidance and Control Division and has been with NASA and its predecessor since 1947. Prior to his present appointment, he had several assignments in the spacecraft guidance field.

Among his achievements is honorary membership as an Associate Fellow in the American Institute of Aeronautics and Astronautics. He has also written numerous technical papers on guidance.

Cheatham has a Bachelor of Science degree in Aeronautical Engineering from Auburn University.

He is married to the former Frances Duncan. They have five children and currently reside in Seabrook, Texas.

- end -

November 30, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-89

ROBERT SMYLIE GOES TO MOSCOW

Robert E. Smylie, an official of the Manned Spacecraft Center, formerly of Lincoln County, Mississippi, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Smylie is the Chief of the Crew Systems Division and has been with NASA since 1962. Prior to his present appointment, he held assignments in the Project Mercury (one-man) space program.

Smylie has a Bachelor of Science degree; and a Master of Science degree in Mechanical Engineering. Both were earned at Mississippi State University. In addition, he has a Master of Science degree in Management from the Massachusetts Institute of Technology.

He has been awarded the NASA Exceptional Service Medal; attended MIT on a Sloan Fellowship, and in 1970, was elected Councilman to the City of El Lago, Texas.

As Chief of the MSC Crew Systems Division, Smylie is responsible for development of equipment that is vital in keeping astronauts alive.

Smylie is married to the former June Reeves of Carthage, Texas.

- end -

December 1, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713-483/5111)

RELEASE NO: 71-90

DONALD WADE GOES TO MOSCOW

Donald C. Wade, an official of the Manned Spacecraft Center, formerly of San Antonio, Texas, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Wade is Chief of the Flight Loads Section, an office which is responsible for the peculiar problems associated with the transportation of goods and gear while in the gravity-free environment of space.

He is author of several technical papers and is a member of the American Institute of Aeronautics and Astronautics.

Wade has a Bachelor of Science degree in Aeronautical Engineering from the University of Texas, and has a Master's degree in the subject from Southern Methodist University.

He is married to the former Janet Wallrath, also of San Antonio. They have three children.

- end -

December 3, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 12/7/71
10 a.m.

Jack Riley
(713/483-5111)

RELEASE NO: 71-91

ASTRONAUT RICHARD F. GORDON, JR. RETIRES

Astronaut Richard F. Gordon, Jr., 42, a Navy captain and veteran of two space missions, will retire from the Navy and NASA on January 1, 1972.

Captain Gordon will join the John W. Mecom, Jr., organization in New Orleans, Louisiana. Details of the position will be announced later, he said.

The retirement will reduce the number of astronauts to 46.

A native of Seattle, Washington, Captain Gordon entered the Navy following his graduation from the University of Washington in 1951. He was one of the third group of NASA astronauts selected in October 1963.

In September 1966, he served as pilot of the Gemini 11 mission, in which he and Command Pilot Charles Conrad, Jr., rendezvoused and docked with an Agena vehicle during their first revolution of the earth. The crew established a new altitude record of 850 miles, and Captain Gordon left the spacecraft twice for extravehicular activity totaling 2 hours and 44 minutes.

Captain Gordon was command module pilot in the all-Navy crew for Apollo 12, the second lunar landing mission, flown November 14-24, 1969. He remained in lunar orbit during the 31-hour lunar surface stay of his fellow crewmen, Capts. Charles Conrad, Jr. and Alan L. Bean, and obtained mapping photographs of landing sites for future missions.

- more -

He has logged 315 hours and 53 minutes in space and has served as backup pilot for Gemini 8, backup command module pilot for Apollo 9 and backup spacecraft commander for Apollo 15.

In May 1961, Captain Gordon won the Bendix Trophy Race, establishing a new speed record of 869.74 miles per hour and a transcontinental speed record of two hours and 47 minutes.

He is a fellow of the American Astronautical Society and a member of the Society of Experimental Test Pilots. His awards include the NASA Distinguished Service Medal, NASA Exceptional Service Medal, two Navy Distinguished Flying Crosses, Navy Astronaut Wings, Navy Distinguished Service Medal, Institute of Navigation Award for 1969, Godfrey L. Cabot Award in 1970, and the Rear Admiral William S. Parsons Award for Scientific and Technical Progress in 1970.

Captain Gordon is married to the former Barbara J. Field of Seattle. They have six children.

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December 7, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

TEST BED CONTRACTS AWARDED

The National Aeronautics and Space Administration has signed development contracts valued at nearly $200,000, with two aerospace industries for preliminary design of a test bed to study thermal materials that might be used on the Orbiter vehicle of the Space Shuttle.

Industries winning the awards are the North American Rockwell Corporation, Space Division, Downey, California, in the amount of $99,000, and the Grumman Aerospace Corporation, Bethpage, Long Island, New York, in the amount of $92,000.

The awards are part of a continuing allocation of technology funds to study the most effective systems to use for Shuttle development once the program is full underway.

In this study of a test bed design, the contractors are requested to develop test objectives, design requirements, prepare preliminary design, study alternate concepts and -- finally -- recommend a test program.

The contract will run for approximately five months. It was awarded by the Structures and Mechanics Division of the Manned Spacecraft Center.

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December 7, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-93

DR. CHRISTOPHER C. KRAFT, JR. GOES TO MOSCOW

Dr. Christopher C. Kraft, Jr., Deputy Director of the Manned Spacecraft Center, formerly of Phoebus, Virginia, has been named to the official party which meets with Soviet counterparts in Moscow, November 29 through December 7. The meeting is a continuation of technical discussions on the compatibility of rendezvous and docking of manned spacecraft.

These discussions are the third between the two countries on this subject. In late October 1970, five National Aeronautics and Space Administration representatives went to the USSR for preliminary talks, and a Soviet delegation visited the Houston space center this year from June 21 to 25.

Dr. Kraft has had an illustrious career in the US space program. Prior to his November 26, 1969, appointment to the position of Deputy Director, he was the Director of Flight Operations at MSC; having held that position since November 1963.

In the course of his career, Dr. Kraft has been accorded numerous honors. He was selected as one of the 100 outstanding young leaders in the nation by the editors of Life Magazine in September 1962. He received the Arthur S. Fleming Award in 1963 as one of the ten outstanding young men in government career service. In May of the same year, Dr. Kraft received the NASA Outstanding Leadership Award. Making the award was John F. Kennedy, president of the United States.

The NASA Distinguished Service Medal has been presented to Dr. Kraft twice -- in January and again in October, 1969.

- more -

He has been elected a Fellow of the American Institute of Aeronautics and Astronautics, and also of the American Astronautical Society. In June 1967, Dr. Kraft was voted the "Virginian of the Year" by the Virginia Press Association.

He holds honorary Doctor of Engineering degrees from the Indiana Institute of Technology, Fort Wayne, Indiana, and from St. Louis University, East St. Louis, Illinois. In addition, he was awarded the Distinguished Alumnus Citation from Virginia Polytechnic Institute in 1965 -- the highest award granted by that institution.

Dr. Kraft entered the federal service in 1945 as a member of the National Advisory Committee for Aeronautics. In October 1958, he was selected as one of the original members of the Space Task Group -- the organization was established to manage Project Mercury, this nation's first space program.

Dr. Kraft is married to the former Elizabeth Turnbull of Hampton, Virginia. They have two children and currently reside in Friendswood, Texas.

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December 8, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 12/13/71

Terry White
(713/483-5111)

Release No: 71-94

HOLIDAY TOUR SCHEDULE

The NASA Manned Spacecraft Center will be closed Christmas and New Years' days to visitors.

Self-guided tours for the general public will be on the normal schedule the days before and after each holiday -- December 24 and 26, and December 31 and January 2 -- from 9 a.m. to 4 p.m.

- end -

December 13, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-95

MSC AWARDS CEREMONIES

Dr. Robert R. Gilruth, Director of the NASA Manned Spacecraft Center, on December 14, will present awards to 80 MSC employees, to contractors and to 11 Center organizations for outstanding space contributions during 1971.

Superior Achievement Awards will go to 57 NASA personnel, while another 23 will receive Certificates of Commendation. The General Electric Company, Houston operations, and Kelsey-Seybold Clinic, also Houston, will be awarded Certificates of Appreciation.

The 11 MSC organizations who will receive NASA Group Achievement Awards are: the Crew Training and Simulation Team, J Mission Spacecraft Development Team, Mapping Sciences Team, Lunar Surface Experiments Team, Thermochemical Team, Thermal Vacuum Team, Lunar Quarantine Operations Team, White Sands Test Facility, MSC Fire Prevention Group, Modular Equipment Transporter Team, and the Apollo group located at Bethpage, Long Island, New York.

MSC Deputy Director Christopher C. Kraft, Jr., will assist in the presentation of awards. The Master of Ceremonies is Frank Bogart, Associate Director of MSC.

- end -

December 13, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
SUNDAY,
December 19, 1971

RELEASED AT NASA HEADQUARTERS

APOLLO 16 COSMIC RAY DETECTOR

Information on the origin and chemical nature of cosmic rays is expected to be provided by a new experiment to be flown to the Moon aboard the Apollo 16 spacecraft in March, 1972.

Cosmic rays are atomic nuclei that travel through space at nearly the speed of light and continuously bombard Earth's atmosphere from every direction. The experiment cannot be performed on Earth since the Earth's magnetic field and gaseous atmosphere combine to absorb most of these potentially harmful particles before they reach the ground.

Analysis of the Apollo 16 cosmic ray experiment results is expected to provide data on the nature of low-energy, heavy cosmic ray particles (the nuclei of elements ranging from fluorine to zinc in the periodic table). Scientists believe that the chemical nature of many of these particles is changed little -- if at all -- during their journey through space. Thus, the study of the charge, mass, energy, and abundance of these particles should provide new information about the origin of the elements in the universe and the processes by which these elements are created within distant stars.

The Apollo 16 experiment also may answer a most important and puzzling question about cosmic rays: how old are they? If radioactive isotopes can be positively identified among the elements in the flux of primary cosmic rays, it will be possible to determine the age of these isotopes. For example, if the detectors can resolve Aluminum^{27} -- and if an appreciable number of aluminum nuclei are recorded -- then these cosmic ray nuclei must be less than a few million years old and must have originated within our own Milky Way galaxy.

- more -

The Apollo 16 array of detectors includes various materials such as plastics, glasses, and minerals to record the tracks of these cosmic rays. Each element in the cosmic radiation leaves its own distinctive "fingerprint" in its track. As a cosmic ray passes through thin layers of plastic, for example, it will create a trail of damage less than a millionth of an inch wide. This track can be enlarged for study by chemically etching the plastic sheets. The etching solution dissolves the radiation damage and produces cone-shaped holes. The shape of the track tells what kind of particle made it.

The experiment's glass samples are specially suited to the identification of rare, ultraheavy, low-energy nuclei. Included in the glass samples will be a thin section sliced from a tektite, a glassy rock found in large numbers in certain limited areas of the Earth. The origin of tektites is unknown. By subjecting the tektite samples to cosmic rays, calibration data may enable scientists to determine whether tektites experienced a cosmic ray exposure of seconds to minutes (implying an origin on Earth) or a few days (implying an origin on the Moon).

The detector array will be fabricated mainly of thin sheets of plastic, particularly Lexan polycarbonate resin, a high-impact strength material that is particularly sensitive to cosmic rays.

Other plastics used include cellulose triacetate for studying low-energy, medium and heavy cosmic ray particles and cellulose acetate butyrate for measuring thermal neutrons created by the impact of galactic cosmic rays against the Moon's surface.

The detectors also will contain mineral samples and strips of metal foil and metal-coated film to measure low-energy, heavy cosmic ray particles and light solar wind particles.

The detector array consists of four panels, each of which is fastened to its neighbor by a hinge. During the voyage to the Moon, the array will be attached to the exterior of the lunar module. At the end of the final "Moon walk" by the Apollo 16

astronauts, the detector array will be detached from the lunar module and returned to Earth.

Principal investogators for the experiment are Dr. Robert L. Fleischer, General Electric Research and Development Center, Schenectady; Dr. P. Buford Price, Professor of Physics, University of California at Berkeley; and Dr. Robert M. Walker, Professor of Physics at Washington University.

- end -

December 14, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-96

NASA RELEASES SHUTTLE SIMULATOR STUDY RFP

The National Aeronautics and Space Administration today asked aerospace firms for proposals to conduct a design study leading to the development of mission simulators for the Space Shuttle.

The request was issued by NASA's Manned Spacecraft Center.

In its instructions to industry, MSC calls for an effort which will result in three definitive summary reports.

The first report will acquire information on techniques, systems, and equipment which might be applied in the development of mission simulators.

Report number two will include analysis of visual systems and techniques, and the third report is to be a design study for the recommended systems. Specifications and cost figures also are required, according to the Request for Proposal (RFP).

The contractor is requested to study development simulators capable of ten different mission phases including:

1. Simulation of a vertical launch of mated Booster and Orbiter.
2. Capability of Orbiter insertion through a range of 50 to 500 nautical miles (92.6 to 926.0 kilometers).
3. Booster re-entry from 300,000 feet (91,440 meters).

- more -

4. Orbiter re-entry from 300,000 feet (91,440 meters).
5. Booster approach and landing capability under all conceivable flight conditions.
6. Simulation of Orbiter approach and landing capability under all flight conditions.
7. Orbiter rendezvous and dock with Space Station.
8. Horizontal take-off and ferry capability by Orbiter.
9. Simulation of Booster abort conditions, and
10. Simulation of Orbiter abort conditions.

For study purposes, two cockpit cabins will be developed. One is for the Booster; the other for Orbiter. Each cockpit will be mounted upon a moving base to aid in motion simulation and each cabin will accomodate two crewmen.

The Space Shuttle is planned for use in the late 70's to transport personnel and cargo to and from low Earth orbit. Concepts call for a Booster and Orbiter which will be launched vertically in a piggy-back arrangement.

They will separate at approximately 200,000 feet (60,960 meters) altitude with the workhorse Booster returning immediately to Earth and the sleek Orbiter continuing onward into space.

The study will be accomplished under a firm-fixed price contract. Proposals are to be submitted by January 10, 1972, and the work will be concluded approximately 12 months after contract award.

It will be conducted under the direction of MSC's Crew Training and Simulation Division.

- end -

December 17, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
Sunday, December 19, 1971

Robert V. Gordon
(713/483-5111)

RELEASE NO: 71-97

APOLLO 15 LOW LIGHT LEVEL PHOTOGRAPHY

Scientists have described a series of Apollo 15 photographs of the sun and of interplanetary dust showing features of the solar corona and zodiacal light never before observed by man.

The pictures were taken by Apollo 15 Command Module Pilot Alfred M. Worden and include views obtained in the darkest region of the solar system yet reached by man -- the so-called double umbra region where the Moon shadows the spacecraft from both direct sunlight and from light reflected from earth.

Robert D. Mercer of the Dudley Observatory in Albany, New York, and Lawrence Dunkelman of NASA's Goddard Space Flight Center, Greenbelt, Maryland, members of the Apollo Photo Science Team, described the photographs in a paper presented at an Apollo 15 investigator's symposium, recently held at the Lunar Science Institute near Houston, Texas.

They said, "Preliminary examination of the Apollo 15 photographs shows we are seeing light levels less than can be seen by the best telescopes on earth." Analysis of the photographs will permit scientists to make direct, comparative measurements of the relative brightness of solar phenomena, providing information on the mechanisms by which energy leaves the sun and on the distribution of particles outward from the sun.

- more -

The pictures were taken as part of low light level astronomy studies on Apollo 15, which produced photographs of the sun's corona and related zodiacal light, of a lunar eclipse, and of interesting regions of interplanetary dust.

-end-

December 16, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

Don J. Green
(713-483-5111)

RELEASE NO: 71-98

RADNOFSKY RECEIVES COMMENDATION CERTIFICATE

Matthew I. Radnofsky, formerly of Boston, Massachusetts, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Certificate of Commendation for his work during 1971 on fire resistant materials.

Radnofsky's certificate reads:

"For his outstanding contributions and personal dedication to the application of fire resistant, nonmetallic materials technology within the space program and to other aerospace and commercial activities."

"Largely through his efforts many fire resistant materials applications have been identified and implemented for spacecraft, aircraft, protective clothing, structures, and facilities. His efforts in this field promise to yield one of the more significant contributions of NASA technology to other areas of our society."

Dr. Radnofsky is Chief of MSC's Crew Equipment Branch and in that office has supported many of the Apollo moon flights.

He has a Bachelor of Arts degree in Physical and Biological Sciences and a Master of Arts degree in Physiology, both from Boston University. In addition, in 1967, he was awarded an Honorary PhD from the University of Taiwan.

He is married to the former Eunice Eisenberg. They have four children and currently reside in Seabrook, Texas.

- end -

December 20, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-99

NESHYBA EARNS PRESIDENTIAL CITATION

Victor P. Neshyba of the National Aeronautics and Space Administration's Manned Spacecraft Center has received a 1971 Presidential Management Improvement Certificate, accompanied by a letter from President Richard M. Nixon.

Neshyba is the only individual in NASA to win such an award this year. He was honored for his development of a new procedure for data redundancy removal that will save the government over $3 million.

The certificate, signed by President Nixon, reads "for excellence in improvement in government operations. The noteworthy efforts and intense dedication required for this achievement exemplify the high performance needed to keep our country strong."

Earlier in 1971, he received an MSC Cost Reduction Award for his work in devising more efficient methods for transmitting, storing, and reducing data which comes from spacecraft during missions.

Mr. Neshyba is assigned to MSC's Space Shuttle Program Office. He joined NASA in 1962.

He and his wife Mary, residents of Dickinson, Texas, have nine children.

- end -

December 21, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 71-100

ZEDEKAR RECEIVES COMMENDATION CERTIFICATE

Raymond G. Zedekar, formerly of South Haven, Michigan, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Certificate of Commendation for his work during 1971 on the Apollo lunar missions.

Zedekar's certificate reads: "In recognition of his outstanding contributions to the success of the Apollo 15 lunar landing mission. His skill in developing lunar surface procedures and crew training in deployment and activation of scientific instruments, geology sampling, and use of the lunar roving vehicle led to maximum scientific return from the three lengthy traverses on the lunar surface."

"As lunar surface activities officer, he provided real-time guidance to the crew in resolving problems encountered during their lunar surface excursions, and his efforts contributed significantly to the successful accomplishment of the first truly scientific expedition to the moon."

Mr. Zedekar is a training assistant working with spacemen assigned to fly missions to the Moon. He has been with NASA since 1959.

He has a Bachelor of Science Degree in Mechanical Engineering from the University of Virginia.

Zedekar is married to the former Shelby Ann Woodson of Charlottesville, Virginia. They have two children and are residents of Houston.

- end -

December 22, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 12/23/71

Robert V. Gordon
(713/483-5111)

RELEASE NO: 71-101

NASA-CLEAR LAKE AGREEMENT

The National Aeronautics and Space Administration - Manned Spacecraft Center and the Clear Lake City Water Authority jointly announced today that they have entered into a long term contract whereby the Clear Lake City Water Authority would provide treatment of MSC's wastewater. The Clear Lake City Water Authority's treatment facility is located approximately 300 feet from the MSC boundary, and a pipeline is to be built between the two facilities.

In August 1970, the Texas Water Quality Board issued Order No. 69-9A which will require all Clear Lake waste dischargers to either divert effluent from Clear Lake, or to upgrade treatment of effluent by August 1972. In addition, the President, through Executive Order 11507 dated February 5, 1970, notified federal installations of a requirement to meet more stringent effluent standards. As a result, MSC had initiated plans to upgrade its sewage treatment facilities. However, in March 1971, the Clear Lake City Water Authority proposed that it provide the advanced treatment of MSC wastewater as required by the Texas Water Quality Board and the Environmental Protection Agency.

Both federal and state pollution regulatory agencies have endorsed the Clear Lake City Water Authority proposal and recommend the expanded use of municipal or regional facilities for the purpose of reducing water pollution. A stated long range goal of the Texas Water Quality Board is to ultimately divert all effluent from Clear Lake and the contract between MSC and the Clear Lake City Water Authority will facilitate the accomplishment of this goal.

- more -

Even though MSC must install a connecting pipeline, there will be a considerable cost savings by not having to improve the existing MSC treatment facilities. It is also anticipated, because of a higher processing volume, that the operating costs to jointly process MSC and Clear Lake City wastewater will be significantly less than if each proceeded on an independent basis.

The Clear Lake City Water Authority has initiated a plan to meet the more stringent effluent standards by upgrading its treatment facility. The new treatment process will be operational by the deadline of August 1972. Matching federal and state funds have been requested to finance this project.

- end -

December 23, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 12/23/71
10:30 a.m.

Robert V. Gordon
(713/483-5111)

RELEASE NO: 71-102

KING NAMED MSC-PUBLIC AFFAIRS OFFICER

John W. (Jack) King has been appointed Public Affairs Officer at the National Aeronautics and Space Administration's Manned Spacecraft Center, Houston, Director Dr. Robert R. Gilruth announced today.

King, who has been Chief of Public Information at the NASA Kennedy Space Center, Florida, for the past 11 years, will assume the position effective late January, 1972.

At KSC, King has been responsible for news media activities concerning launch operations conducted by NASA at the Kennedy Space Center and Cape Kennedy Air Force Station.

During the period he has participated in more than 200 launches, including all the manned space flight programs in Projects Mercury, Gemini and Apollo.

King, 40, is a native of Boston, Mass. He is a 1953 graduate of Boston College, where he received a Bachelor of Arts degree in English. He served as an Army artillery officer in Korea and Japan.

Following his military tour of duty, King joined the Associated Press wire service in Boston in 1955. Prior to his assignment with NASA, he had served as the first Associated Press bureau chief at the then Cape Canaveral in 1958.

- more -

He was awarded the NASA Exceptional Service Medal in 1969, for his participation in the Apollo program and was named recipient of the Lawrence Award by the Aviation/Space Writers Association as the outstanding government civilian public information officer in 1968.

King and his wife Evelyn have three children, Chip 13, Elizabeth 4 1/2 and William 2.

- end -

December 23, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

RELEASED AT NASA HEADQUARTERS

FOR RELEASE:
December 27, 1971

Richard Friedman
(202/755-3897)

RELEASE NO: 71-103

NASA AND SOVIET MEDICAL AGREEMENT

The National Aeronautics and Space Administration and the Soviet Academy of Sciences have agreed on the substance and mechanics of future exchanges of medical and biological data on their experience in manned space flight.

The details of the recently approved agreement are contained in recommendations of a joint working group on space biology and medicine which met in Moscow October 9-13, pursuant to the agreement of January 21, 1971, between NASA and the Academy of Sciences of the USSR on space cooperation.

The Joint Working Group began an examination of selected biomedical data and the results of manned flight programs and exchanged reports on the Soyuz and Apollo programs. Special consideration was focused on the following aspects of the biomedical results of manned flight: the cardiovascular system, metabolism, water-electrolyte exchange, statokinetic apparatus performance, vestibular apparatus and biological research.

In the interest of expanded and more regular exchange of space biomedical data, the working group recommended that meetings be held at least once a year or more frequently should the need arise. These meetings will include the exchange of pre-, post- and inflight data in sufficient detail to assure a full understanding of the flight experience of each country from a physiological and medical viewpoint. Directly related research will also be discussed when it is pertinent.

The working group also recommended that working sessions be held at which experts would consider such topics as:

-- Methods of predicting the state of the human organism during and after space flights with a view to developing common predictions.

-- Response of the following systems to the space flight environment: cardiovascular, endocrine, fluid and electrolyte balance and central nervous.

-- Techniques of dysbarism prevention in crew members applicable to various decompression condition.

-- Methods of pre- and postflight medical observations of flight crew members with a view to proposing common usage.

-- Objectives, methods, and results of biological experiments, including developmental and genetic research, with a view to coordinating US and Soviet programs.

The joint working group recommended that the next meeting be held in May 1972, in the US to consider, in addition to flight data, methods of predicting the state of the human organism during and after space flights, methods of pre- and postflight medical observations of flight crew members and recommendations to achieve the consistent use of terminology. It also recommended that the co-chairmen explore the possibility of an exchange of one or two appropriate specialists to work in laboratories doing similar biomedical research in space programs of the US and the USSR.

Co-chairmen of the Working Group are Dr. Charles A. Berry, NASA Director for Life Sciences, and Dr. N. N. Gurovskiy of the USSR Ministry of Health and the Academy of Sciences.

- end -

December 27, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE: 12/29/71

Robert V. Gordon
(713/483-5111)

RELEASE NO: 71-104

MSC WELCOMES ONE MILLIONTH VISITOR

Mr. and Mrs. Willard Andrews and their family were the one millionth visitors to the Manned Spacecraft Center in 1971. They visited MSC on December 29, during their first trip to Houston.

The Andrews family is from Oskaloosa, Iowa. Included in the group besides Mr. and Mrs. Andrews were their daughter Judy, a second grade teacher; daughter Barbara (Mrs. Don Messer), a fifth grade teacher; and son-in-law, Reverend Don Messer. The Messer's live in Oleda, Illinois. Mr. Andrews is a salesman.

The family was escorted on a special tour of the Center and given information packages including pictures and brochures.

This is the second year in a row MSC has recorded in excess of one million visitors.

- end -

December 29, 1971

Picture

From Left to Right
Mr. Andrews, Mrs. Andrews, Judy Andrews, Barbara and Don Messer, and Bill Wicklund of Visitor Services.

The group is pictured at the base of a full size lunar landing module on display in the visitor center at the Manned Spacecraft Center.