NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-01	Gurley Receives Achievement Award	1/4/72
72-02	LM Pilot Charles M. Duke Hospitalized	1/4/72
72-03	MSC Awards Custodial Contract	1/5/72
72-04	Dorland Receives Achievement Award	1/6/72
72-05	Nixon/Fletcher Shuttle Statements	1/5/72
72-06	Third Lunar Science Conference	1/7/72
72-07	MSC Awards Two Center Support Contracts	1/10/72
Released at NASA Hdqts.	Apollo 16 Mission Rescheduled	1/7/72
	Note to Editors - Code-a-phone in operation	1/10/72
72-08	RFP ON IMBLMS	1/11/72
	Apollo 16 Preliminary Mission Profile a/o 1/10/72	1/11/72
72-09	Wade Receives Achievement Award	1/12/72
72-10	NASA Extends Photo Contract at MSC	1/13/72
72-11	Earth Resources Review at MSC	1/12/72
72-12	NASA Awards Television Support Contract	1/13/72
72-13	Smith Receives Achievement Award	1/13/72
72-14	Alldredge Receives Achievement Award	1/13/72
Released at NASA Hdqs. 72-15	Dr. Gilruth Appointed to New Position - Kraft MSC Director	1/14/72
72-16	Sjoberg Named Deputy Director of MSC	1/18/72
72-17	Skylab Flight Crews Named	1/18/72
72-18	Bogart to Retire	1/21/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-19	Moseley Receives Achievement Award	1/19/72
72-20	T-38 Crash Fatal to Two	1/20/72
72-22	Fra Mauro Samples Provided [illegible] Academy	1/26/72
72-21	NASA Awards [illegible] Systems [illegible]	1/25/72
Released at NASA Hdqs.	Skylab High-School Project	1/26/72
72-23	Kelly Receives Achievement Award	1/27/72
Released at NASA Hdqs.	Leak Develops in Apollo 16 Fuel System	1/25/72
Note to Editors	Apollo 16 Launch Remains April 16	1/27/72
72-24	MSC Calls for Shuttle Heat Protection Study	1/28/72
72-25	MSC Calls for Bids on Unit to Test Shuttle Materials	1/28/72
72-26	McAllister Receives Commendation Certificate	2/1/72
72-27	Ballard Receives Commendation	2/1/72
72-28	Irvin Receives Commendation Certificate	2/1/72
72-29	NASA Awards Study Contract to Loewy/Snaith	2/1/72
72-30	MSC Releases Request for Shuttle Maneuvering System Study	2/1/72
	Preliminary Apollo 16 Mission Timeline a/o 1/28/72	2/1/72
72-31	MSC Awards Shuttle Landing Simulation Contract	2/4/72
72-32	Skylab Simulations Begin	2/3/72
72-33	MSC RELEASES SHUTTLE THRUST CHAMBER RFP	2/3/72
72-34	Regellbrugge Receives Commendation Certificate	2/7/72
72-35	Smothermon Receives Commendation Certificate	2/7/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-36	Johnston, Acting Director of Medical Research Directorate	2/9/72
72-37	Subsatellite Data Problem	2/10/72
72-38	Guillory Earns Achievement Award	2/10/72
72-39	Post Apollo 15 Bed Rest Study	2/11/72
72-40	Hood Receives Achievement award	2/10/72
72-41	Stabilization of First Lunar Core Sample	2/16/72
72-42	VAN BOckel Receives Achievement Certificate	2/14/72
72-43	NASA Requests Seal Materials Study for Shuttle	2/16/72
Released at Hdqts. 72-44	Apollo 17 Site Selection	2/16/72
72-45	Minority Business Contract	2/18/72
72-46	MSC Scientist Addresses Map Makers	typed 2/25/72 3/13/72
72-47	Life Scientists Selected	2/28/72
72-48	MSC Awards Contract to Test Seal Materials	2/28/72
72-49	Dupree Fatality - Scott Injury	2/29/72
72-50	Gilbreath Appointed Deputy Director of Center Operations	3/1/72
72-51	Hoffler Receives Achievement Award	3/2/72
72-52	MSC Announces Reduction in Force	3/3/72
72-53	MSC Releases Request for Shuttle Payload Study	3/7/72
72-54	NASA to Study Orbiter Thruster Program	3/7/72
72-55	MSC Awards $299,250 Weld Bond Contract	3/8/72
72-56	Fittman Receives Achievement Award	3/9/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-57	NASA Space Science Program at - James D. Poindexter	
72-58	" " " " " John Scott West	
72-59	" " " " " Thomas J. Hill	
72-60	" " " " " Nelson J. Ehrlich	
72-61	Heating Array Contract Awarded	3/10/72
72-62	Space Shuttle Decisions	3/15/72
72-63	Space Shuttle Fact Sheet	3/15/72
72-64	NASA Releases Space Shuttle RFP	3/17/72
72-65	NASA Calls for Shuttle Simulation Study	3/21/72
72-66	MSC Issues Call for Shuttle RCS Engine Study	3/23/72
72-67	Rummel Earns Achievement Award	3/23/72
72-68	Gillen earns achievement award	3/23/72
72-69	USSR/NASA Meeting in Houston	3/24/72
72-70	RFP Issued for Shuttle OMS Study	3/27/72
72-71	HAFPTS: TV for Shuttle Use	3/30/72
72-72	NASA Requests Shuttle Training Aircraft Study	3/30/72
72-73	NASA HANDICAPPED EMPLOYEE WINS FED. AWARD	4/6/72
Released at Hqs. 72-74	NASA Negotiates Shuttle Engine Contract	4/4/72
72-75	Urban Systems Project Office	4/6/72
72-76	Life Sciences Directorate	4/7/72
72-77	Finalists for Skylab Student Project	4/6/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-78	MSC Negotiates for Shuttle Space Walking Studies	4/7/72
72-80	NASA REPS TO MOSCOW FOR LUNAR SAMPLE	4/1/72
72-79	MSC to Build Shuttle TV Test Unit	4/11/72
72-81	MSC Requests Space Shuttle Test Engine	4/12/72
72-82	Hinners Joins NASA	4/13/72
72-83	Space Shuttle Operational Site Selected	4/14/72
72-84	NASA extends STC Support Contract	4/19/72
Headquarters Release (72-88)	US/USSR REPORTS ON DOCKING	4/24/72 12 N - CST
72-85	MORRIS NAMED ASPO MANAGER	5/1/72
72-86	Temple Earns Achievement Award	5/1/72
72-87	Heidelbaugh Awarded Air Force Comm, Medal	5/2/72
72=88	Tindall named Director of Flight Oper.	5/2/72
72-89	MSC Participants at ASMA	5/3/72
72-90	Space Shuttle Thermal Test Article RFP Issued by MSC	5/4/72
72-91	MSC Releases Geosynchronous Programs Study RFP	5/4/72
72-92	NASA Awards Shuttle Simulator Study Contract to McD-Doug	5/5/72
72-93	MSC Issues Call for Medicine & Health Support Services	5/5/72
72-94	Charlesworth Manager Earth Resources Office (ERPO)	5/4/72
72-95	MSC Issues Bid for Space Shuttle Food Study	5/8/72
72-96	NASA Extends Transporation Support Service Contract	5/10/72
72-97	Shuttle Passenger Couch Request Goes to Industry	5/11/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-98	Conrad Ejects Safely From T-38	5/10/72
72-99	US/USSR Joint Working Group on Space Biology and Medicine to Meet at MSC	5/12/72
72-100	Board named to investigate T-38 Accident	5/11/72
72-101	MSC Extends APS Design Study Contract	5/12/72
72-102	Four Companies Submit Proposals for Space Shuttle Prog.	5/12/72
72-103	MSC Asks for Shuttle APU Hardware	5/12/72
72-104	AMS-Cargo Handling in Space	5/15/72
72-105	Large Meteorite Hits Moon	5/15/72
72-106	US/USSR Medical Working Group	5/18/72
72-107	MSC Announces Civil Service Reduction	5/19/72
72-108	Shuttle Consumable Study	5/22/72
72-109	MSC Awards RCS Test Prog. to Bell Aerospace	5/22/72
72-110	Apollo 16 Active Seismic Experiment Firing	5/22/72
72-111	MSC Calls for Shuttle Thermal Study	5/23/72
72-112	Apollo 16 Active Seismic Experiment Fired	5/23/72
72-113	Astronauts Mitchell and Irwin to Retire	5/23/72
72-114	Skylab Student Award - Nebraska	5/24/72
72-115	MSC Memorial Weekend Visitor Hours	5/25/72
72-116	Huntoon Moves to New Job under Intergovernmental Personnel Act	5/26/72
72-117	Low Density Ablator Study Contract Award	5/26/72
72-117A Hdq. 72-113	VON BRAUN TO RETIRE FROM NASA	5/26/72
72-118	Apollo 16 Subsatellite Apparently Crashes	5/30/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-119	Apollo 15 Crew Gets Collier Trophy	5/31/72
72-121	MSC Extends RPP Thermal Contract with LTV	6/1/72
72-120	Board Reports Cause of T-38 Crash	6/1/72
72-122	Major Skylab Test Completed	6/2/72
72-123	Zarcaro Named Deputy Earth Resources Program Office	6/2/72
72-124	TRW Wins Shuttle Payload Study Contracts	6/6/72
72-125	Grumman Awarded Shuttle CPI Thermal Contract	6/6/72
72-126	Scientists Report Evidence of Lunar Crust, Mantle & Core	6/6/72
72-127	Brig. Gen. James A. McDivitt Retires	6/7/72
72-128	MSC Issues Shuttle OMS Valve Deployment RFP	6/7/72
72-129	MSC Calls for bid on Shuttle Thermal Test Unit	6/8/72
72-130	ITEK AMPS Contract	6/9/72
72-131	MSC Extends Protective Services Contract	6/12/72
72-132	Honeywell Awarded IMU Study Contract	6/20/72
72-133	Battery Accident Board Findings	6/20/72
72-134	MSC Employees Get Apollo 16 Awards at MSFC	6/21/72
72-135	Skylab SMEAT Test	6/21/72
~~72-136~~	VOID ~~MSC aircraft assist ERTS~~	
72-137	Dunseith, New Deputy Dir. Flight Operations	7/3/72
72-138	Apollo-Soyuz Test Project Meeting	7/3/72
72-139	Shuttle Aircraft Contract	7/5/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-140	MSC AWARDS SHUTTLE THRUST CHAMBER CONTRACTS	7/10/72
72-141	Geosynchronous Programs Study Contract goes to California Firm	7/10/72
72-142	MSC Awards $540,000 Shuttle RCS Contract To Bell Aerospace	7/10/72
72-143	Apollo 15 Stamps	7/11/72
72-144	Skylab CSM 116 Delivered	7/17/72
72-145	MSC Extends RSI Thermal Contract	7/17/72
72-146	Helium Regulator Study Contract Goes to Marquardt	7/17/72
72-147	Shuttle Training Aircraft Study Contracts Awarded	7/17/72
72-148	Martin-Marietta, Denver, to Build Shuttle Passenger Couch	7/17/72
72-149	Astronauts Chapman and England Resign	7/14/72
72-150	Preliminary Results from Apollo 16 Sample Analysis	7/17/72
72-151	Apollo 11 Third Anniversary	7/17/72
72-152	Shuttle Space Suit	7/17/72
72-153	ATM Flight Vehicle Test	7/17/72
72-154	Educators At MSC	7/18/72
72-155	Skylab Menu	7/18/72
72-156	Student experiments selected for Skylab	7/18/72
	Communique on Results of Apollo-Soyuz Test Project Meetings - 7/6-18/72	7/17/72
72-157	OMS Study COntract Awarded	7/20/72
72-158	Grumman to build heat pipe control system	7/20/72
72-159	Singer Company Wins Shuttle Simulator Study Contract	7/20/72
72-160	TRW Awarded Contract to Study Propellant Seals	7/20/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-161	Martin-Marietta Designs Shuttle Crew Area Mockup	7/25/72
72-162	Scott Assigned to ASPO	7/25/72
ALSO RELEASED AT NASA HEADQUARTERS 72-163	Shuttle Contractor Selection	7/26/72
72-164	Trombly Supports Skylab Test	7/31/72
72-165	Hess Supports Skylab Test	7/31/72
72-166	Mays Supports Skylab Test	7/31/72
72-167	Mandell Supports Skylab Test	8/1/72
72-168	NASA Awards Waste Management Contract for Shuttle	7/31/72
ALSO RELEASED AT NASA HEADQUARTERS 72-169	US-USSR Space Biology Report	8/1/72
72-170	Report on First Week of SMEAT	8/2/72
72-171	MSC Adds $365,500 to LTV Thermal Contract	8/2/72
72-172	Lockheed to Develop IMBLMS Ground Test Unit	8/3/72
72-173	General Dynamics Awarded Shuttle RCS Study Contract	8/4/72
72-174	Motion Picture Contract Awarded	8/7/72
72-175	MSC Aircraft Maintenance & Modification RFP	8/7/72
72-176	Skylab Crew Completes Chamber Test	8/7/72
72-177	Homick Supports Skylab Test	8/7/72
72-178	Graves Supports Skylab Test	8/7/72
72-179	Smith Supports Skylab Test	8/7/72
72-180	NASA Extends Dynatech Contract at Cape Kennedy	8/8/72
72-181	Skylab Training	8/9/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-182	NASA/NR Sign Shuttle Letter Contract	8/10/72
72-183	Taylor Receives Service Award	8/16/72
72-184	NASA extends contract with Murdock, Inc.	8/21/72
72-185	Released at NASA Headquarters Petrone Named ASTP Project Officer	8/21/72
NASA Hqs. 72-186	NASA Revises FY 73 Operating Plan	8/22/72
72-187	Support Contractor Manpower Reductions	8/22/72
72-188	Apollo 17 Preliminary Timeline	8/22/72
72-189	Martin Awarded Shuttle Cargo Handling Study Contract	8/28/72
72-190	Guillory Supports Skylab Test	8/29/72
72-191	Leech Supports Skylab Test	8/29/72
72-192	Jack Q. Dunaway Support Skylab Test	8/30/72
72-193	Sevier Supports Skylab Test	8/30/72
72-194	Burgett Supports Skylab Test	8/31/72
72-195	McPherson Receives Service Award	9/1/72
72-196	Stokes Receives Service Award	9/1/72
72-197	Worden Assigned to Ames Research Center	8/31/72
72-198	Skylab Simulation	9/8/72
72-199	ASTP Fourth Meeting Results Approved	9/19/72
72-200	Apollo 17 Mission Patch	9/21/72
72-201	ATM Shipment	9/21/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-202	Rockett Research Awarded Shuttle Propulsion System Co.	9/26/72
72-203	Hogg, Builds Lunar Exhibit	9/27/72
72-204	Roach Receives Service Award	10/2/72
72-205	Research Producedures Have Potential Application	10/15/72
72-206	Astronaut Mitchell Retires	10/5/72
72-207	ALSO RELEASED AT NASA HEADQUARTERS ASTP Meeting in Moscow	10/5/82
72-208	Space Shuttle Food Study Contract Awarded	10/5/72
72-209	North American Selects American Airlines for Ground Operations for Space Shuttle	10/18/72
72-210	NASA Extends Computer Contract at MSC	10/24/72
72-211	North American Selects Mass. Firm for Space Shuttle Computer Contract	11/2/72
C		
72-212	Apollo/Soyuz Meetings	11/3/72
72-213	Holloway Receives Service Award	11/3/72
72-214	Servier Receives Service Award	11/3/72
72-215	Initial Space Shuttle Hardware Procurement Action Initiated by NR	11/1/72
72-216	Contract for ASTP Hardware	11/8/72
72-217	MSC Employees Honored at NASA Ceremonies	11/10/72
72-218	Phinney Receives Scientific Achievement Medal	11/13/72
72-219	Houston chamber of Commerce Tour	11/14/72
72-220	Assignment of RAF Medical Officer	11/16/72

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
72-221	4QF Loaned to USAF	11/21/72
72-222	Shuttle Simulation Flights Planned AT FRC.	11/22/72
72-223	MSC Annual Awards Ceremony	11/27/72
72-224	Westheimer Awarded Heavy Hauling Contract	11/29/72
72-225	Gilbert Receives NASA Exceptional Service Medal	11/28/72
72-226	NR Releases OMS RFP for Space Shuttle	11/30/72
Also Released at NASA Headquarters 72-227	ALSEP - Lunar Experiments to Continue Beyond A17	11/30/72
72-228	MSC Calls for Bid on Closed Circuit Color TV System	11/30/72
72-229	Astronaut Stafford Promoted	12/1/72
Pomeroy 72-230	First ALSEP station begins 4th year	12/8/72
Alibrando 72-231	International Youth Science Tour	12/9/72
~~72-232~~	~~Astronaut Lovellto Leave NASA~~ Dave	
72-233 m	NASA Earth Observations Aircraft Surveys Nicaraguan Disaster Area	12/29/72

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
UPON RECEIPT

RELEASE NO: 72-01

GURLEY RECEIVES ACHIEVEMENT AWARD

John R. Gurley, Jr., formerly of Forest City, North Carolina, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Gurley's certificate reads:

"For effectively establishing, supervising and participating in the mission planning coordination and data management for the Apollo flights. The establishment of these activities and their support of preflight and real-time flight planning and control have contributed immeasurably to the success of the Apollo program by providing an efficient central point of contact for these activities, and an expertise in the real-time management of spacecraft operational data."

This is the third award he has received during his NASA tenure. In 1966, John received an incremental salary increase called Quality Step Award, and in 1969, he received the Sustained Superior Performance Award; also for his work on the Apollo program.

Gurley is a Supervisory Aerospace Engineer who does spacecraft trajectory planning for flights to the Moon. He joined NASA in 1958, working at the Langley Research Center, Hampton, Virginia, as a wind tunnel test engineer.

- more -

Release No: 72-01

He has a Bachelor of Science degree in Aeronautical Engineering from North Carolina State University, Raleigh, North Carolina. The degree was awarded in 1958. He has also done graduate study at the University of Virginia, Charlottesville, Virginia, and William and Mary College, Williamsburg, Virginia.

Gurley is married to the former Lucia Hart of Charlotte, North Carolina. They have two children and are residents of Dickinson, a suburban community near Houston.

- end -

January 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

January 4, 1972
4:30 p.m.

John E. McLeaish
(713/483-5111)

RELEASE NO: 72-02

LM PILOT CHARLES M. DUKE HOSPITALIZED

Apollo 16 Lunar Module Pilot Charles M. Duke was admitted to Patrick Air Force Base Hospital today for treatment for bacterial pneumonia.

NASA physician Dr. John T. Teegen said that Duke's condition is not serious and he is resting comfortably, but that hospitalization is required.

Duke, who flew to KSC from Houston last night with fellow Apollo 16 crew member John Young, complained of a cold and bad cough today. He was admitted to Patrick Air Force Base Hospital at about 4:30 p.m. EST.

The recuperative period for Duke's illness is currently estimated to be 10 days to two weeks, doctors said.

Donald K. Slayton, Manned Spacecraft Center's Director of Flight Crew Operations, said Duke's illness is not expected to have any serious impact on the crew's training preparations for the Apollo 16 mission, which is scheduled for launch on March 17.

Neither Apollo 16 Commander Young nor Command Module Pilot Thomas K. Mattingly has shown any sign of illness, NASA physicians said.

- end -

January 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 5, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-03

MSC AWARDS CUSTODIAL CONTRACT

The National Aeronautics and Space Administration has awarded a contract to the Klate Holt Company, Webster, Texas, for custodial support services to be performed at the Manned Spacecraft Center.

Value of the cost-plus-fixed-fee contract is $1,102,312, for the first year's period of performance which began January 1, 1972. Provisions for three one-year extensions are included in the contract.

Custodial services will be performed at the Clear Lake site and at the MSC facilities located at Ellington Air Force Base.

Approximately 170 persons will be employed under terms of the contract.

Bids for the work performed under this contract were reserved for concerns that are independently owned and operated; identified by the Government as "small business firms." Seven companies submitted proposals for the work to the selection board.

- end -

January 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

Don J. Green
(713/483-5111)

RELEASE NO: 72-04

DORLAND RECEIVES ACHIEVEMENT AWARD

Wade D. Dorland, formerly of Humboldt, Nebraska, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 in connection with Skylab, NASA's space flight program that follows the Moon flights.

Dorland's certificate reads:

"In recognition of his outstanding achievement while managing and directing the vibro-acoustic testing of the Skylab vehicle for the flight dynamic environment. In accomplishing these tests, he successfully developed large-scale vibration and acoustic testing improvements to the state-of-the-art."

This is the fourth award he has received during his NASA tenture. He received a Sustained Superior Performance Award (SSP) in 1961 and again in 1964 and 1966. An incremental salary increase

-more-

accompanied each SSP.

Dorland is Chief of Experimental Dynamics Section, an organization responsible for component parts and systems to determine their ability to withstand strain brought on by vibration.

He has published numerous technical documents on the characteristics of vibration and shock on aircraft and spacecraft.

From 1957 through 1964, Dorland was assigned to the NASA Marshall Space Flight Center, Huntsville, Alabama, as an Aerospace Engineer investigating the environmental impact of noise produced by the firing of large rockets.

Dorland graduated from the University of Nebraska, Lincoln, with a Bachelor of Science degree in Electrical Engineering. The degree was awarded in 1957.

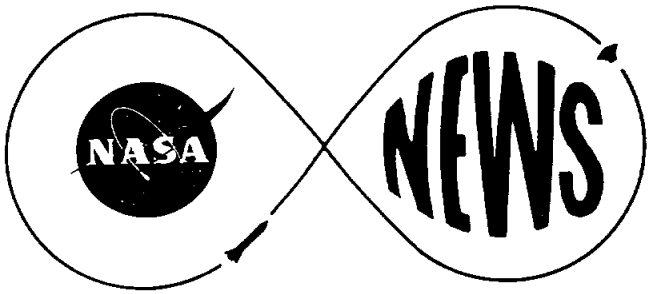
He is a member of the Institute of Environmental Sciences; the Institute of Electrical and Electronic Engineers, the Instument Society of America, and the Acoustical Society of America.

Release No: 72-04

Dorland is married to the former Corrine Demaree. They have two children and are residents of Houston.

-end-

January 6, 1972



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 5, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-05

NIXON/FLETCHER SHUTTLE STATEMENTS

Attached are the statements made by President Richard Nixon and NASA Administrator James Fletcher on the decision to proceed with a new type of space transportation system. The system is popularly called Space Shuttle.

A Shuttle Fact Sheet also is enclosed.

The statements were made January 5, 1972, at the Western White House, San Clemente, California.

- end -

January 5, 1972

THE WHITE HOUSE

STATEMENT BY THE PRESIDENT

I have decided today that the United States should proceed at once with the development of an entirely new type of space transportation system designed to help transform the space frontier of the 1970s into familiar territory, easily accessible for human endeavor in the 1980s and '90s.

This system will center on a space vehicle that can shuttle repeatedly from earth to orbit and back. It will revolutionize transportation into near space, by routinizing it. It will take the astronomical costs out of astronautics. In short, it will go a long way toward delivering the rich benefits of practical space utilization and the valuable spinoffs from space efforts into the daily lives of Americans and all people.

The new year 1972 is a year of conclusion for America's current series of manned flights to the moon. Much is expected from the two remaining Apollo missions -- in fact, their scientific results should exceed the return from all the earlier flights together. Thus they will place a fitting capstone on this vastly successful undertaking. But they also bring us to an important decision point -- a point of assessing what our space horizons are as Apollo ends, and of determining where we go from here.

In the scientific arena, the past decade of experience has taught us that spacecraft are an irreplaceable tool for learning about our near-earth space environment, the moon, and the planets, besides being an important aid to our studies of the sun and stars. In utilizing space to meet needs on earth, we have seen the tremendous potential of satellites for intercontinental communications and world-wide weather forecasting. We are gaining the capability to use satellites as tools in global monitoring and management of natural resources, in agricultural applications, and in pollution control. We can foresee their use in guiding airliners across the oceans and in bringing televised education to wide areas of the world.

- more -

However, all these possibilities, and countless others with direct and dramatic bearing on human betterment, can never be more than fractionally realized so long as every single trip from earth to orbit remains a matter of special effort and staggering expense. This is why commitment to the space shuttle program is the right next step for America to take, in moving out from our present beachhead in the sky to achieve a real working presence in space -- because the space shuttle will give us routine access to space by sharply reducing costs in dollars and preparation time.

The new system will differ radically from all existing booster systems, in that most of this new system will be recovered and used again and again -- up to 100 times. The resulting economics may bring operating costs down as low as one-tenth of those for present launch vehicles.

The resulting changes in modes of flight and re-entry will make the ride safer and less demanding for the passengers, so that men and women with work to do in space can "commute" aloft, without having to spend years in training for the skills and rigors of old-style space flight. As scientists and technicians are actually able to accompany their instruments into space, limiting boundaries between our manned and unmanned space programs will disappear. Development of new space applications will be able to proceed much faster. Repair or servicing of satellites in space will become possible, as will delivery of valuable payloads from orbit back to earth.

The general reliability and versatility which the shuttle system offers seems likely to establish it quickly as the workhorse of our whole space effort, taking the place of all present launch vehicles except the very smallest and very largest.

NASA and many aerospace companies have carried out extensive design studies for the shuttle. Congress has reviewed and approved this effort. Preparation is now sufficient for us to commence the actual work of construction with full confidence of success. In order to minimize technical and economic risks, the space agency will continue to take a cautious evolutionary approach in the development of this new system. Even so, by moving ahead at this time, we can have the shuttle in manned flight by 1978, and operational a short time later.

It is also significant that this major new national enterprise will engage the best efforts of thousands of highly skilled workers and hundreds of contractor firms over the next several years. The amazing "technology explosion" that has swept this country in the years since we ventured into space should remind us that robust activity in the aerospace industry is healthy for everyone -- not just in jobs and income, but in the extension of our capabilities in every direction. The continued preeminence of America and American industry in the aerospace field will be an important part of the shuttle's "payload."

Views of the earth from space have shown us how small and fragile our home planet truly is. We are learning the imperatives of universal brotherhood and global ecology -- learning to think and act as guardians of one tiny blue and green island in the trackless oceans of the universe. This new program will give more people more access to the liberating perspectives of space, even as it extends our ability to cope with physical challenges of earth and broadens our opportunities for international cooperation in low-cost, multi-purpose space missions.

"We must sail sometimes with the wind and sometimes against it, " said Oliver Wendell Holmes, "but we must sail, and not drift, nor lie at anchor." So with man's epic voyage into space -- a voyage the United States of America has led and still shall lead.

- end -

STATEMENT BY DR. FLETCHER

As indicated in the President's statement, the studies by NASA and the aerospace industry of the space shuttle have now reached the point where the decision can be made to proceed into actual development of the space shuttle vehicle. The decision to proceed, which the President has now approved, is consistent with the plans presented to and approved by the Congress in NASA's FY 1972 budget.

This decision by the President is a historic step in the nation's space program -- it will change the nature of what man can do in space. By the end of this decade the nation will have the means of getting men and equipment to and from space routinely, on a moment's notice if necessary, and at a small fraction of today's cost. This will be done within the framework of a useful total space program of science, exploration, and applications at approximately the present overall level of the space budget.

The space shuttle will consist of an airplane-like orbiter, about the size of a DC-9. It will be capable of carrying into orbit and back again to earth useful payloads up to 15 feet in diameter by 60 feet long, and weighing up to 65,000 lbs. Fuel for the orbiter's liquid-hydrogen liquid-oxygen engines will be carried in an external tank that will be jettisoned in orbit.

The orbiter will be launched by an unmanned booster.

The orbiter can operate in space for about a week. The men on board will be able to launch, service, or recover unmanned spacecraft; perform experiments and other useful operations in earth orbit; and farther in the future resupply with men and equipment space modules which themselves have been brought to space by the space shuttle. When each mission has been completed, the space shuttle will return to earth and land on a runway like an airplane.

There are four main reasons why the space shuttle is important and is the right step in manned space flight and the U.S. space program. Very briefly:

First, the shuttle is the only meaningful new manned space program which can be accomplished on a modest budget.

Second, the space shuttle is needed to make space operations less complex and less costly.

Third, the space shuttle is needed to do useful things.

Fourth, the shuttle will encourage greater international participation in space flight.

On the basis of today's decision, NASA will proceed as follows:

This spring we will issue a request for prospective contractors. This summer we will place the space shuttle under contract and development work will start. Between now and about the end of February, NASA and our contractors will focus their study efforts on technical areas where further detailed information is required before the requests for contractor proposals can be issued. These areas include comparisons of pressure-fed liquid and solid rocket motor options for the booster stage.

SPACE SHUTTLE FACT SHEET

What is the space shuttle?

The space shuttle will be the first reusable space vehicle. It will consist of two stages: a booster and an orbiter. It will take off like a rocket, fly in orbit like a spaceship, and land like an airplane.

What will the shuttle look like?

The orbiter will have a delta-wing and will look very much like a modern airplane. It will be powered by three high-pressure oxygen-hydrogen engines. Propellants for these engines will be carried in an external jettisonable tank. Two different kinds of boosters are still under consideration. The first uses liquid propellants, pressure-fed engines, and is recoverable. The second uses solid rocket motors. One of these two booster options will be selected within the next several weeks.

What are the dimensions of the orbiter and booster?

The overall length of the booster is approximately 175 feet or about 17 stories high. The orbiter is about

the size of a DC-9. It measures more than 120 feet in length and has a wing span of 75 feet. Fully fueled and ready for launch, the shuttle will weigh approximately 4.7 million pounds on the launch pad. (The dimensions described above are subject to modification upon completion of contractor studies and analysis of their recommendation.)

What are the dimensions of the orbiter's passenger compartment/cargo area?

The orbiter will have a large payload, 14 to 15 feet in diameter and 45 to 60 in length. Hatches on top of the compartment will open wide in orbit to facilitate unloading and deployment of large spacecraft.

How will the shuttle operate?

The booster and orbiter stages will be joined for launch, with the orbiter in piggyback position. At altitude, the two stages will separate and the orbiter's engines will fire to carry it into orbit around the earth.

What functions will the shuttle perform?

The multipurpose shuttle will replace almost all

present expendable launch vehicles. It will be used to carry into space virtually all of this nation's payloads, scientific and applications, manned and unmanned, civilian and military. It will also accommodate the future needs of commercial users, other government agencies, and foreign governments. In the future it will be used to ferry passengers and freight between earth and orbiting space laboratories. If necessary, the shuttle will also be available for rescue missions in space.

How long will the orbiter be able to remain in orbit?

Anywhere from a week to a maximum of 30 days, depending on mission requirements. When its mission is completed, its two-man crew will pilot the orbiter back to earth for an airplane type landing at the take-off point or another landing field.

When will the shuttle be operational?

The system is expected to take six years to develop. It should be operational by the end of this decade.

What is the first mission planned for the shuttle?

There will be many mission requirements waiting for the shuttle when it is built, ranging from deployment of weather and communications satellites to the retrieval of automated spacecraft now in orbit.

What NASA centers will be involved with shuttle work?

The Manned Spacecraft Center has been designated the lead center with program management responsibility, overall engineering and systems integration, and basic performance requirements for the shuttle. Houston will also be responsible for the orbiter stage of the shuttle. Marshall Space Flight Center has been given responsibility for the booster stage and the space shuttle main engine. Kennedy Space Center will be responsible for design of launch and recovery facilities. As in the Apollo program, all other NASA centers will contribute by providing technical know-how and support.

How much will it cost to develop the shuttle?

Development costs are estimated at $5.5 billion (in current dollars) over a six-year period; this is about one-fourth the cost of the Apollo program.

Will there be cost overruns or growths above this?

The refined cost-estimating techniques used in detailed design studies indicate that the job will be completed within the estimated cost figure. But because of the highly complex technical nature of the project, a contingency of 20 percent above the $5.5 billion figure was included for future planning purposes.

Are there any other fixed costs?

Yes. Development costs include all research, development and test, and evaluation expenses as well as two flight test vehicles. In addition, development and initial operational facilities will cost about $300 million; each added orbiter $250 million; and each added booster $50 million.

How much will it cost to fly the shuttle?

Less than $10 million per flight--far less than any other space vehicle with an equivalent payload capacity.

By how much will the shuttle reduce space costs?

It is estimated that the reusable space shuttle will reduce the cost per pound of putting a payload into space

from between $600 and $700 at present to $100. By comparison, the first U.S. satellite, Explorer I, which weighed only 30 pounds, represented a payload delivery cost of $100,000 per pound. In addition to the direct savings available with the reusable shuttle, significant additional economies will be achieved through reduction of the number and types of launch vehicles needed to support the nation's space effort, and in the cost of the satellites themselves. With the shuttle, automated satellites can be repaired or serviced in space or returned to earth for refurbishment and reuse. Moreover the size and weight-carrying capacity of the orbiter will free designers from constraints which make design more difficult and costly. This will make it possible to use relatively inexpensive standard laboratory equipment in place of specially constructed, highly miniaturized equipment which is expensive to develop and test. In the final analysis, total savings made possible by the shuttle will depend on its frequency of use.

How will availability of the space shuttle affect future use of space?

With the savings in launch costs, payload costs, and payload development time, it is expected that the space shuttle will greatly increase the use of space by government agencies and commercial users, and lead to the discovery of new uses for space. One of the primary reasons for development of the shuttle is to open the use of space for the practical benefit of mankind. With it we will be better able to survey the earth's resources, monitor and predict weather, improve worldwide communications, develop improved manufacturing processes, enlarge our knowledge of the earth and our solar system, and perhaps even harness the sun's energy as a source of pollution-free energy.

What is the complement of the space shuttle crew?

The orbiter will be piloted by a crew of two.

How many passengers will the shuttle be able to carry?

The orbiter will carry two passengers in addition to the crew. Provision can also be made to carry six to twelve more (or even more if required) in special modules carried in the payload bay.

Who will be able to fly in the shuttle?

The interior of the shuttle will be pressurized so that passengers and crew can travel in shirtsleeve comfort without spacesuits. No special flight training would be required for passengers, making it possible to send scientists, doctors, artists, photographers--both men and women--into space.

When will NASA issue an RFP for building the vehicle?

A Source Evaluation Board will be selected this month and it is planned to issue requests for proposals in the Spring.

How long after the RFP is issued will it be before a definitive contract is awarded for Phase C/D?

NASA's present timetable calls for awarding a definitive contract for Phase C/D in the Summer of this year.

What kind of support has Congress given to the space shuttle?

The Congress strongly supported and approved the shuttle proposal presented in NASA's budget for Fiscal Year 1972, with the clear understanding that development would proceed at completion of the studies then underway.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Douglas K. Ward
(713/483-5111)

FOR RELEASE:
January 7, 1972
1:30 p.m.

RELEASE NO: 72-06

THIRD LUNAR SCIENCE CONFERENCE

The Third Annual Lunar Science Conference, co-hosted by the NASA Manned Spacecraft Center and the Lunar Science Institute, will begin Monday in the Building 1 Auditorium at MSC.

Between 700 and 800 scientists are expected to register on Sunday and Monday for the four days of sessions, which, though not restricted to the science results of any one mission, will tend to center on Apollos 14 and 15.

Researchers from the United States and 17 foreign nations, including at least three scientists from the Soviet Union, are expected to attend the conference.

The first general session will begin Monday morning with a welcome by MSC Deputy Director Christopher C. Kraft, Jr.

Colonel James A. McDivitt, Apollo Spacecraft Program Manager at MSC, will lead off the conference with a discussion of the "Science Capability of the last three Apollo Missions."

At a session on Wednesday, Apollo 15 crewmen David R. Scott, James B. Irwin, and Alfred M. Worden will discuss observations made on the lunar surface and from lunar orbit.

A wide variety of papers on lunar science topics will be presented during the four days. In addition to those dealing with science results from the four Apollo lunar landing missions, there will also be papers which discuss analysis of Luna 16 samples and results of study of the moon's surface by Lunokhod-1.

- more -

Both Luna 16 and Lunokhod-1 were Soviet unmanned missions. Last June, the U.S. and Russia exchanged three grams of lunar material returned by Luna 16 for three grams returned by Apollo 11 and a like amount from Apollo 12.

The conference will close on Thursday with a summary session and discussion of Apollo 16, with particular emphasis on the geologic setting of Apollo 16's Descartes landing site and the plans for periods of extravehicular activity.

- end -

January 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 7, 1972
5:30 p.m.

RELEASED AT NASA HEADQUARTERS

NASA announced today that the Apollo 16 mission scheduled to be launched no earlier than March 17, 1972, for a landing in the Descartes highlands of the Moon is being rescheduled for no earlier than April 16, 1972.

This decision was based on a number of factors. The Apollo 16 astronauts' mode of operation in bending to pick up lunar samples disclosed a requirement to strengthen the swage fitting of a suit restraint cable and reinforcement of a taping layer on the suit boot. New cable terminations are being designed to overcome this problem and testing should begin shortly. However, the testing is not scheduled to be complete until late February.

The recent failure during a Skylab test of the docking ring jettison device has caused a significant amount of investigative testing to be undertaken. Preliminary results indicate that the cause of the failure was a very small empty volume in potting in the region of the pyrotechnic devices. Preliminary tests have shown that a repotting to eliminate these voids will eliminate this problem. Extensive testing, including a number of full-scale tests, will be done to verify this fix and to assure that this change does not have any detrimental effects. These tests will take some time to complete.

During reverification tests of LM descent battery capacity, some variation in the capacity was discovered. Both designs and process changes have been made to eliminate this variation and early indications are that these changes have resulted in achieving consistency in the battery capacity. Because of the long lead time in battery manufacture, a large amount of test data on complete batteries would not

- more -

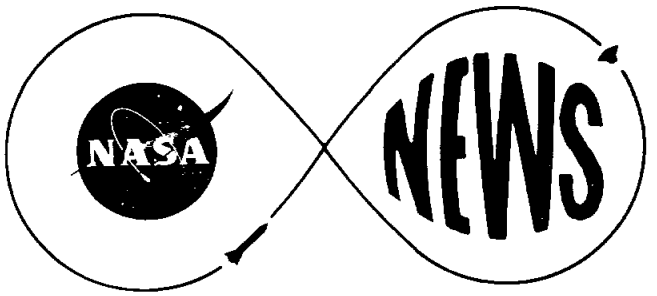
have been available at the time of a March launch. Although all indications are that the batteries will perform satisfactorily, more test data are deemed desirable.

The change in launch date at this time provides the operational teams adequate lead time to optimize the plans and procedures for an April 16 launch date.

Lt. Colonel Charles M. Duke's current illness is not expected to impact the crew's requisite training for a March launch. However, the delay will ensure more than adequate time for Lt. Colonel Duke to fully recover before reinitiating his training schedule.

- end -

January 9, 1972



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 10, 1972

Don J. Green
(713/483-5111)

NOTE TO EDITORS

The News Center code-a-phone now is in operation at the Manned Spacecraft Center. Press may receive up-to-date information on Apollo 16, future programs and other space-related activities by calling AC 713/483-6111.

- end -

APOLLO 16 PRELIMINARY MISSION PROFILE

As of January 10, 1972

C.S.T. of 72 Deg Launch Azimuth	4/16/72	11:54
Launch Window Duration for 72 to 100 Deg Launch Azimuth, Hr:Min		3:48
Translunar Flight Time, Hr:Min		71:23
Landing Azimuth, Deg		-90
Sun Elevation Angle, Deg		11.5
Lunar Surface Stay Time, Hr:Min		72:58
Time in Lunar Parking Orbit, Hr:Min		147:40
Transearth Flight Time, Hr:Min		69:54
Total Mission Duration, Day/Hr		12/3

EVENT	G.E.T., HR:MIN	DAY	C.S.T., HR:MIN
Lift-Off	0:00	4/16	11:54
EOI	0:12	4/16	12:06
TLI	2:35	4/16	14:41
LOI	74:03	4/19	13:57
DOI	78:01	4/19	17:55
Circularization	97:06	4/20	13:00
LM Landing	98:12	4/20	14:06
Start EVA 1	102:05	4/20	17:59
End EVA 1	109:05	4/21	00:59
Start EVA 2	124:05	4/21	15:59
End EVA 2	131:05	4/21	22:59
Start EVA 3	148:05	4/22	15:59
LOPC-1	151:54	4/22	19:48
End EVA 3	155:05	4/22	22:59
LM Ascent	171:10	4/23	15:04
LOPC-2	192:39	4/24	12:33
Shaping Burn	214:44	4/25	10:38
TEI	221:44	4/25	17:38
CSM EVA	241:20	4/26	13:14
Reentry	291:23	4/28	15:17
Earth Landing	291:36	4/28	15:30

Mission Planning and Analysis Division

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 10, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-07

MSC AWARDS TWO CENTER SUPPORT CONTRACTS

The National Aeronautics and Space Administration has awarded two contracts for support services for the Manned Spacecraft Center in Houston.

Contracts have been awarded to Bernhard-Knust Company for precision machine manufacturing, and to Esco Incorporated for sheet metal and welding. Both firms are located in Houston.

The Bernhard-Knust contract totals $478,499 and Esco Incorporated received an award of $178,630. Both contracts are cost-plus-fixed fee and will end December 31, 1972. Provisions for two one-year extension are included in each award.

The machine manufacturing contract includes the construction of small items of spacecraft test and flight hardware, tool

RELEASE NO: 72-07

and ground support equipment, models where precise tooling is needed, and other precision items.

Approximately 20 persons will be employed under terms of the precision contract and six persons will be employed under the welding contract.

Bids for the work were reserved for concerns that are independently owned and operated. These companies are identified as "small business firms."

Five "small businesses" competed for the welding contract and three firms bids on the precision contract.

The MSC Technical Services Division will monitor both contracts.

-end-

January 10, 1971

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
(713/483-5111)

FOR RELEASE:
January 11, 1972
1:00 p.m.

RELEASE NO: 72-08

RFP ON IMBLMS

The National Aeronautics and Space Administration will ask eight aerospace firms for proposals to design, develop and test the ground-based unit of the Integrated Medical and Behavioral Laboratory Measurement System (IMBLMS) for use in future manned space programs.

IMBLMS is a system for providing medical and health care for crews of space expeditions or possibly groups living in remote areas on Earth. Such assistance would be remotely monitored and controlled by doctors supervising the work of medically-trained members of such space crews, or isolated groups on Earth.

In this instance NASA is limiting its request to proposals developing only the earth-bound field unit as a portion of the overall IMBLMS project.

The request for proposals (RFP) was issued by NASA's Manned Spacecraft Center at Houston and is part of the program design phase of the IMBLMS project which began in 1967. Contractors are requested to submit their proposals by March 1, 1972. A preproposal bidders conference will be held 10 days after RFP's are received.

Firms invited to submit proposals include: General Dynamics Corporation, General-Electric Company, Grumman Aerospace Corporation, Honeywell, Inc.,

- more -

International Business Machines Corporation, Lockheed Aircraft Corporation, McDonnell Douglas Corporation, RCA Corporation and Spacecraft, Inc. Personnel from the Department of Health, Education and Welfare and the Veterans Administration will participate in evaluating the proposals.

Although NASA has experience in providing health care for crewmen on the ground as well as in space, full definition and design of a system which satisfies the requirements of a health service system for long duration missions is still needed. A long mission requires some member of the crew to be specially trained -- such as a physician's assistant, hospital corpsman, nurse, or perhaps a physician. In any case, the individual responsible for health services must be able to consult with the ground and obtain special assistance to assure comprehensive quality care.

Longer space missions now planned differ from earlier efforts in that crew size will increase, the nature of the crew will change and the environment aboard the spacecraft will be much more like Earth's.

Proposals requested will relate to building a field test unit to evaluate requirements for remote health care applicable to future NASA space operations. With proper applications this field unit could hopefully be used to evaluate delivery of health services to similarly remote or isolated communities on Earth.

In its instruction to industry, MSC calls for the IMBLMS test bed to be installed and operationally tested in a remote area to identify and validate the techniques, procedures and equipment requirements for ultimate use in the IMBLMS space system.

The period estimated for completion of the required tasks is 48 months, including a design phase and a build-and-test phase. The design phase will require about 10 months and the build-and-test phase about 38 months.

The most critical portion of the proposed test program will be the measurement of the effectiveness of the IMBLMS test bed in actual operation. The site will be selected at a later date. All work will be accomplished under a cost-plus-fixed-fee contract.

- end -

January 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 12, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-09

WADE RECEIVES ACHIEVEMENT AWARD

Lewis C. Wade, formerly of Cincinnati, Ohio, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Wade's certificate reads:

"For his outstanding achievements in photographic interpretation and analysis leading to the selection of the Apollo 15 lunar landing site, the successful accomplishment of the lunar landing, and the extensive surface exploration conducted during this mission."

He is responsible for photographic interpretation and analysis of lunar photography.

He has been employed with NASA since 1967. Prior to that he

-more-

RELEASE NO: 72-09

worked with industry and from 1958 through 1965 he was employed as a geophysicist with the United State Naval Oceanographic Office and as a physical scientist with the Central Intelligence Agency respectively.

Wade graduated from Pennsylvania State University, State College, Pennsylvania in 1955 with a Bachelor of Science degree. He is a member of the American Geophysical Union.

He is married to the former Joan Gatlin, Pikesville, Kentucky. They have two children and reside in Houston.

-end-

January 12, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
January 13, 1972
2:00 p.m.

RELEASE NO: 72-10

NASA EXTENDS PHOTO CONTRACT AT MSC

The National Aeronautics and Space Administration has extended for one year its contract with Technicolor Incorporated, Hollywood, California, for photographic support services.

The work is to be performed at NASA's Manned Spacecraft Center in Houston. The cost-plus-award fee contract totals $2,346,800, and will end December 31, 1972.

In the performance of his work, the contractor will operate the following functions: science photography, still and motion picture laboratory, precision laboratory service of Earth resources and lunar photography, and audiovisual support for the Public Affairs Office.

Approximately 140 persons will be employed under terms of the photographic support contract.

-more-

RELEASE NO: 72-10

The initial level-of-effort contract was signed January 1, 1971, for a period of one year. Provisions for four one-year extensions were included.

-end-

January 13, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

January 12, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-11

EARTH RESOURCES REVIEW AT MSC

Some 400 scientists from government, universities and private institutions are expected to attend NASA's Fourth Annual Earth Resources Program Review at the Manned Spacecraft Center, Houston, Texas, on January 17-21.

During the five day conference, reports will be presented on results of the past year's research and analysis of aircraft and spacecraft remote sensing data with applications in geology, mineral and land resources, cartography, oceanography, human and cultural resources, hydrology and water resources, agriculture, forestry and range. There will also be discussions of field and laboratory measurements and of recent advances in supporting research and technology.

Earth resources and remote sensing programs make use of the fact that every object on earth, subsurface strata, the atmosphere and oceans exhibit distinctive electromagnetic characteristics which may be detected at a distance by specialized sensors. Vegetation has a different and recognizable electromagnetic "signature" from water or bare earth, and a diseased crop will appear different from a healthy crop to a remote sensing instrument.

Remote sensing instruments are being flown and evaluated on both aircraft and spacecraft to provide economical synoptic coverage of large areas of Earth's surface.

- more -

Approximately 100 scientists are expected to discuss results of their studies of NASA earth resources data in such diverse fields as census land studies and surveys of southern corn leaf blight. Many of the scientists attending the conference will be discussing analysis and use of data to be gathered by the Earth Resources Technology Satellite (ERTS) to be launched in May 1972, and by the Skylab program (Earth Resources Experiments Package) scheduled for initial launch in the spring of 1973.

Scientists from a number of foreign nations and organizations which have conducted earth resources studies are expected to participate in the meeting. They include Brazil, Canada, Federal Republic of Germany, France, India, Mexico, United Kingdom, United Nations Food and Agriculture Organization and the European Space Research Organization.

- end -

January 12, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 13, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-12

NASA AWARDS TELEVISION SUPPORT CONTRACT

A support services contract for closed circuit television at the Manned Spacecraft Center has been awarded to Taft Broadcasting Company, Houston, Texas, by the National Aeronautics and Space Administration.

The cost-plus-fixed fee contract totals $851,675 and will end December 31, 1972. Provisions for two one-year extensions are included.

The contract is for equipment maintenance and other support TV services at the Clear Lake site. Approximately 40 persons will be employed under terms of the agreement.

Bids for the work performed under this contract were reserved for concerns that are independently owned and operated; identified by the Government as "small business firms."

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 13, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-13

SMITH RECEIVES ACHIEVEMENT AWARD

Dr. Malcolm C. Smith, Jr., formerly of Kingsville, Texas, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo moon flights.

Dr. Smith's certificate reads:

"For his outstanding leadership and technical achievement in the development of a space food program which has been essential to the success of the Apollo lunar missions."

Dr. Smith is manager of the Food and Nutrition Program at MSC. He joined NASA in 1969, although prior to that he had been working at the Houston space center as a member of the United States Air Force.

He has a degree of Doctor of Veterinary Medicine from Texas A&M University, College Station, and a Master of Science degree from Purdue University, Lafayette, Indiana. His DVM was awarded in 1959 and the Masters degree in 1966.

From 1959 on, Dr. Smith held various assignments with the USAF including tours of duty in Morocco, Europe, New Mexico, and Indiana.

As Manager of NASA's food program, Dr. Smith's group develops packaging requirements for space food, evaluates menus, establishes standards for microbiological safety, and supervises the procurement and stowage of food for the moon flights.

Dr. Smith is a member of the American Veterinary Medical Association, Institute of Food Technologists, Aerospace Medical Association, American Society for the Advancement of Science, and the American Clinical Society.

He is married to the former Mary A. Jones, Pottsville, Pennsylvania. They have two children and are residents of LaPorte, Texas, a small community near MSC.

- end -

January 13, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 13, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-14

ALLDREDGE RECEIVES ACHIEVEMENT AWARD

J. Brooks Alldredge, formerly of Cullman, Alabama, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo moon flights.

Alldredge's certificate reads:

> "In recognition of his outstanding performance and contributions to the planning, procurement, and administration of contracts for the Apollo Command and Service Module program."

Alldredge is Chief of the Spacecraft Contract Branch at MSC. His group has responsibility for the administration of Apollo contracts that over the years reached an approximate value of $3.7 billion. This includes contracts for development, production, testing and flight of Apollo spacecraft.

- more -

He has been employed with NASA since 1963. Prior to that he worked with the Fort Worth Division of General Dynamics for 13 years. He was responsible for procurement of major subsystems on the B-58 military aircraft.

Alldredge graduated from the University of California, Berkeley, with a Bachelor of Arts degree. He was awarded a law degree from the university's College of Law, San Francisco, in 1950.

He is a member of the American Bar Association and the Texas Bar Association.

Alldredge married the former Nancy Kimbrough of LaPorte, Texas. They have two children and are residents of Houston.

- end -

January 13, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 14, 1972

John E. McLeaish
(713/483-5111)

RELEASE NO: 72-15

RELEASED AT NASA HEADQUARTERS

Dr. Robert R. Gilruth, Director of the Manned Spacecraft Center and "father" of the United States manned space flight program, today was appointed to the newly created position of Director of Key Personnel Development for the National Aeronautics and Space Administration.

Dr. Christopher C. Kraft, Jr., Deputy Director of MSC, will succeed Dr. Gilruth as Center Director.

The appointments were announced by Dr. James C. Fletcher, NASA Administrator.

"Development of key personnel is one of the most essential functions of top management," Dr. Fletcher said. "As the man largely responsible for developing the team at MSC whose outstanding performance over the last decade is without parallel, Dr. Gilruth is especially well qualified for this important assignment."

- more -

In his new position Dr. Gilruth will be responsible for integrating NASA management's work in planning for the filling of key positions, identifying actual and potential candidates, and guiding them through appropriate work experience.

The intention to emphasize the internal development of executive talent and to assign principal responsibility for this function to a member of agency management was announced in a policy statement issued January 6, 1972.

In this newly established position, Dr. Gilruth will report to NASA Deputy Administrator, Dr. George M. Low, and his principal office will be located at Houston.

Dr. Gilruth has served as Director of the Manned Spacecraft Center since its inception in November 1961. Prior to this, he was Director of the Space Task Group at Langley Field, Virginia, the organization responsible for Project Mercury. Dr. Gilruth began his distinguished career in flight research in 1937 at the Langley Aeronautical Laboratory. He received his B. S. degree from the University of Minnesota in June 1935 and his M. S. degree in the same field in December the following year. He was awarded honorary Doctor of Science degrees by the University of Minnesota in 1962 and by the Indiana Institute of Technology and George Washington University, and a Doctor of

Engineering degree from the Michigan Technological University in 1963.

Dr. Kraft was appointed Deputy Director of the Manned Spacecraft Center, November 26, 1969. Prior to this, he was Director of Flight Operations at MSC, having held that position since November 1963.

Dr. Kraft entered the Federal Service in January 1945 as a member of the Langley Aeronautical Laboratory, National Advisory Committee for Aeronautics, and was one of the original members of the Space Task Group established to manage Project Mercury.

Dr. Kraft graduated from the Virginia Polytechnic Institute in December 1944 with a B. S. degree in Aeronautical Engineering. He was awarded honorary Doctor of Engineering degrees from the Indiana Institute of Technology, May 1966, and from St. Louis University, July 1967.

-end-

January 14, 1972

STATEMENT BY DR. CHRISTOPHER C. KRAFT, JR.

"I have been fortunate to work with and learn from Bob Gilruth for a number of years, so I feel especially honored to be named his successor as Director of the Manned Spacecraft Center. The wisdom that he has imparted to the accomplishments in space are without parallel. I am pleased that he will continue to make important contributions to our nation and its space program in his new position.

"I have inherited a great responsibility, but also an excellent organization with which to meet that responsibility. I am confident that MSC will continue the high standards of performance reached under Dr. Gilruth's leadership, and I look forward to the challenges of the new programs which will maintain the United States' leadership in space and provide benefits to people everywhere."

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 18, 1972

John E. Riley
(713/483-5111)

RELEASE NO: 72-16

SJOBERG NAMED DEPUTY DIRECTOR OF MSC

Sigurd A. Sjoberg today was named Deputy Director of the Manned Spacecraft Center. The appointment was announced by Dr. James E. Fletcher, Administrator of the National Aeronautics and Space Administration.

Sjoberg succeeds Dr. Christopher C. Kraft, Jr., who was promoted to Director of MSC on January 17. Sjoberg has been Director of Flight Operations since December 28, 1969, when he succeeded Kraft also.

Sjoberg also will act as Director of Flight Operations until a successor is selected.

In his new position, Sjoberg will assist the Director in planning and leading all phases of MSC operations. He will act for the Director on administrative and technical matters and will represent the Center in all phases of activity.

- more -

"Mr. Sjoberg's accomplishments have been outstanding in every job he has undertaken," Dr. Kraft said. "He was a most able deputy to me in the Flight Operations Directorate for seven years, and he has since served with distinction as director of that activity. I am extremely pleased that he has been appointed Deputy Director of this center."

Sjoberg joined the National Advisory Committee for Aeronautics, NASA's predecessor, in 1942, as an aeronautical engineer. He joined the Space Task Group, forerunner to MSC in October 1959, and has held successively responsible positions.

Sjoberg was born in Minneapolis, Minnesota, on September 2, 1919. He received a B. S. degree in aeronautical engineering from the University of Minnesota in 1942.

He accepted the Presidential Medal of Freedom as the representative of the flight control team which enabled the Apollo 13 crew to return safely to earth after their spacecraft was disabled enroute to the moon. He is the recipient of the MSC Superior Achievement Award, two NASA Exceptional Service Medals, and the NASA Distinguished Service Medal.

Sjoberg is a member of the American Institute of Aeronautics and Astronautics and is the United States representative to the Committee for Astronautics of the Federation Aeronautique Internationale (FAI), Paris, France.

He is married to the former Elizabeth Jane Ludwig, and they are the parents of three sons, Eric, Stephen, and Robert.

- end -

January 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

Terry White
(713/483-5111)

January 18, 1972
3:00 p.m.

RELEASE NO: 72-17

SKYLAB FLIGHT CREWS NAMED

Flight crews for Skylab--the United States' first Earth-orbiting space station--were announced today by the National Aeronautics and Space Administration.

The Skylab orbital workshop will be launched unmanned in the spring of 1973 and will be visited three times by three-man crews over an eight-month period.

Each Skylab crew will consist of a commander, a science pilot, and a pilot.

The prime crews, listed in that order, are:

--- first mission: Charles Conrad, Jr., Dr. Joseph P. Kerwin and Paul J. Weitz.

--- second mission: Alan L. Bean, Dr. Owen K. Garriott and Jack R. Lousma.

--- third mission: Gerald P. Carr, Dr. Edward G. Gibson and William R. Pogue.

- more -

Backup crewmen for the first mission are Russell L. Schweickart, Dr. Story Musgrave and Bruce McCandless II. Serving as backup crew for both the second and third missions are Vance D. Brand, Dr. William E. Lenoir and Dr. Don L. Lind.

Astronauts Kerwin, Garriott, Gibson, Musgrave and Lenoir are scientist astronauts; the remaining Skylab crew members are pilot astronauts.

The first manned visit will last 28 days, while the second and third will last 56 days each.

The Skylab program will test earth resources remote sensing equipment and techniques to gather information on Earth's ecology, oceanography, water management, agriculture, forestry, geology, and geography. Astronomy experiments will substantially increase knowledge of the Sun and its effects on man's existence on Earth. Habitability, biomedical, behavioral, and work effectiveness experiments will further evaluate man's capabilities in space flight.

Conrad, 41, has flown on Gemini 5 and 11 and Apollo 12--the second manned lunar landing--for a total of 506 hours of space flight. Holding the rank of captain in the U.S. Navy, Conrad is a native of Philadelphia, Pennsylvania.

Kerwin, 39, is a native of Oak Park, Illinois, and holds a doctor of medicine degree from Northwestern University Medical School. He is a commander in the U. S. Navy Medical Corps. This will be his first space flight.

Weitz, 39, is also a commander in the U. S. Navy and holds a master's degree in aeronautical engineering from the U. S. Naval Postgraduate School. Born in Erie, Pennsylvania, Weitz has not flown in space.

Bean, 39, was born in Wheeler, Texas, and was lunar module pilot on Apollo 12. He holds a bachelor's degree in aeronautical engineering from the University of Texas and is a U. S. Navy captain.

Garriott, 41, was born in Enid, Oklahoma, and holds a doctorate in electrical engineering from Stanford University. Garriott has not flown in space. He is a civilian scientist-astronaut.

Lousma, 35, is a major in the U. S. Marine Corps and is a native of Grand Rapids, Michigan. He holds aeronautical engineering degrees from the University of Michigan and from the U. S. Naval Postgraduate School. He has not flown in space.

Carr, 39, a U. S. Marine Corps Lieutenant Colonel, was born in Denver, Colorado. He has a master's degree in aeronautical engineering from Princeton University. Carr has not flown in space.

Gibson, 35, holds a doctorate in engineering with a minor in physics from the California Institute of Technology. A civilian scientist-astronaut, Gibson was born in Buffalo, New York. He has not flown in space.

Pogue, 42, was born in Okemah, Oklahoma. He is a U. S. Air Force Lieutenant Colonel and holds a master's degree in mathematics from Oklahoma State University. Pogue has not flown in space.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Sydni C. Shollenberger
(713/483-5111)

FOR RELEASE:
January 21, 1972
8:30 a.m.

RELEASE NO: 72-18

BOGART TO RETIRE

Associate Director of the Manned Spacecraft Center, Lieutenant General Frank A. Bogart, USAF (Ret.), will retire from government service on January 22, 1972.

A native of Warren, Pennsylvania, Bogart was graduated from the U.S. Military Academy in 1931. He served in the Army until September 1947, when he transferred to the Air Force as Executive Officer for the Deputy Chief of Staff, Materiel, Hq. USAF.

At the time of his retirement from the Air Force in 1964, he was Comptroller of the Air Force.

He joined the National Aeronautics and Space Administration in December 1964, as a special assistant to the Associate Administrator for Manned Space Flight. He remained with NASA Headquarters until November 1969, when he accepted the post of Associate Director at MSC.

He has received numerous high military honors and awards, and in 1969, NASA awarded him the Distinguished Service Medal in recognition of his distinguished contributions to the success of the Apollo lunar landing program.

General Bogart is married to the former Mary Maher of Fort Barrancas, Florida.

- end -

January 19, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 19, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-19

MOSELEY RECEIVES ACHIEVEMENT AWARD

Dr. Edward C. Moseley, formerly of Newport News, Virginia, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Dr. Moseley's certificate reads:

"For his outstanding achievements in the development of a medical data system which contributed to medical support for the Apollo lunar landing program."

Dr. Moseley is Chief of the Information Systems Branch at MSC. His group has responsibility for the planning and management of systems related to medical aspects of the lunar flights. This includes design, development and testing of medical-related items.

He has been employed with NASA since 1966. Prior to that he worked as a research psychologist for the Veterans Administration and also for the John Hopkins University Medical School, Baltimore, Maryland.

Dr. Moseley graduated from Lynchburg College, Lynchburg, Virginia, in 1950 with a Bachelor of Science degree in Psychology. He was awarded a Master of Arts degree in Psychology from George Washington University, Washington, D.C., in 1952 and earned a PhD again in Psychology in 1961 from the University of Texas at Austin.

- more -

He is a member of the American Psychological Association, the American Association for Advancement of Science and the Society of Sigma Chi.

Dr. Moseley is married and has a teenage daughter.

- end -

January 19, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 20, 1972

John E. Riley
(713/483-5111)

RELEASE NO: 72-20

T-38 CRASH FATAL TO TWO

Two NASA pilots were killed today when their T-38 jet aircraft crashed on Matagorda Island, Texas.

They were Stuart M. Present, 41, of 4135 Shady Springs Drive, Seabrook, and Mark C. Heath, 37, of 607 N. Clear Creek Drive, Friendswood, both civilians assigned to the Aircraft Operations Division of the Manned Spacecraft Center. Both were married.

Present and Heath were flying their third instrument approach of the afternoon at an Air Force field on Matagorda when radar contact with the plane was lost at 3:23 p.m. The plane's position at that time was reported as 3,000 feet south of the south end of the runway.

A fog bank was moving in from the Gulf of Mexico at the time, and zero visibility hampered aerial and ground searches for the plane. An airborne searcher spotted the wreckage on the beach approximately 2,000 feet south of the runway shortly after 5 p.m. when visibility improved temporarily.

Dr. Christopher C. Kraft, Jr., MSC Director, will appoint an accident investigation board to attempt to determine the cause of the crash.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
January 25, 1972
2:00 p.m.

RELEASE NO: 72-21

NASA AWARDS SOFTWARE SYSTEM STUDY CONTRACT

A contract for the development of a checkout system for Space Shuttle software has been awarded to the General Electric Company, Space Division, Houston, Texas, by the National Aeronautics and Space Administration.

The cost-plus-fixed fee contracts totals $407,630, and will end in May 1973. The work will be performed for NASA's Manned Spacecraft Center.

Six tasks are called for during the period of the contract. These are:

1. Development of systems specifications;
2. A report documenting the results of the design effort;
3. Development of a computer program compatible with the MSC Integrated Breadboard Flight Computer System;
4. Development of procedural documents;
5. Will develop a demonstration plan, and finally,
6. Demonstrate the system at the MSC computer complex.

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 Booster being parachuted to a water landing and the sleek Orbiter continuing into space.

- more -

Upon completion of the Orbiter space mission, it returns to Earth landing like a conventional jet aircraft.

The contract will be monitored by MSC's Information System Division.

- end -

January 24, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

January 26 1972

Doug Ward
(713/483-5111)

RELEASE NO: 72-22

FRA MAURO SAMPLES PROVIDED TO SOVIET ACADEMY

Samples of rock and soil collected by U.S. astronauts from the Moon's Fra Mauro formation have been provided to the Academy of Sciences of the U.S.S.R. for study by Soviet scientists.

The samples were delivered to scientists Y.I. Belyayev, M.S. Chupankhin and K.P. Florenskiy, who returned to the Soviet Union Sunday (January 23) after participating in the Third Annual Lunar Science Conference, January 10-13, at the NASA Manned Spacecraft Center in Houston, Texas.

Three grams (one-tenth of an ounce) of material from Apollo 14, were provided by the National Aeronautics and Space Administration for study by Soviet Scientists as part of U.S. - Soviet agreements for exchange of lunar samples.

-more-

The NASA has previously provided Soviet scientists with samples from the Apollo 11 and 12 missions and has received samples collected by the Soviet Union's unmanned Luna 16 spacecraft.

During their stay in Houston, the three Soviet scientists consulted with U.S. scientists and viewed a wide range of lunar rocks and soils stored at the Manned Spacecraft Center, while participating in the selection of samples to return to their colleagues in the USSR.

The Russian samples include a small chip from an unusual crystalline rock designated sample 14310, one of the most widely studied of the Apollo 14 rocks. They also received a small piece of a 9 kilogram (20 pound) boulder designated sample 14321, which was collected on the Apollo 14 mission as well as a variety of core samples, soils and polished thin sections.

Before receiving the Apollo 14 samples, the delegation of Soviet scientists joined with more than 600 scientists from the United States and 13 foreign countries in reporting on results of their analyses of U.S. and Soviet lunar samples at the annual lunar science conference in Houston.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 25, 1972

RELEASED AT NASA HEADQUARTERS

During a test of the Apollo 16 command module reaction control system today a leak developed in the fuel system. It appears that this leak was caused by an overpressurization of the bladder by ground support equipment. The bladder is made of Teflon and holds the monomethyl hydrazine propellant in the tank. The bladder separates the propellant from high pressure helium used to pressurize the tanks to assure flow under zero gravity conditions of the propellant to the RCS engines.

A change out of the fuel tank is required. In order to replace the tank it will be necessary to demate the spacecraft.

The Apollo 16 vehicle will be moved from the launch pad to the Vehicle Assembly Building where the spacecraft will be removed and returned to the Manned Spacecraft Operations Building where the tank will be replaced.

NASA is assessing the impact of this problem on the April 16 launch date. This assessment is expected to be completed in one to two days.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

January 26, 1972

RELEASED AT NASA HEADQUARTERS

More than 80,000 sets of entry materials and applications have been requested for participation by U.S. secondary school students in the Skylab Project, sponsored by the National Science Teachers Association and the National Aeronautics and Space Administration. The deadline for proposals by students is Friday, February 4, 1972.

A limited number of experiments proposed by students will be selected for performance by astronauts aboard the 1973 Skylab Earth orbital space laboratory.

Announcement of regional and national selectees will be made in April 1972. Selection of the flight experiments from the 25 national selectees will be made by the National Aeronautics and Space Administration.

Skylab is a manned earth orbital space laboratory scheduled to be launched in the Spring of 1973 for scientific, technological

-more-

and biomedical research from the vantage point of space. First manned mission is scheduled for up to 28 days with second and third missions up to 56 days.

Official entry forms, rules and sample proposals may be obtained from: Mrs. Dorothy K. Culbert, National Science Teachers Association, 1201 16th Street, N.W., Washington, DC 20036.

More than 3,400 Texas high school students requested applications for the Skylab Student Project. In New York approximately 10,200 students applied to the NSTA, while more than 5,000 California students indicated their plans to enter the contest.

-end-

NOTE TO EDITORS

APOLLO 16 LAUNCH REMAINS APRIL 16

NASA determined today that the time required to effect repairs to the Apollo spacecraft command module reaction control system fuel tank system and complete all retest requirements will not delay the scheduled April launch of Apollo 16.

Preparations of the space vehicle will be back on the original schedule by the first week of March 1972.

January 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 27, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-23

KELLY RECEIVES ACHIEVEMENT AWARD

William R. Kelly, formerly of Atlanta, Georgia, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 in managing the Center's resources.

Kelly's certificate reads:

"For his outstanding efforts and contributions in developing and effectively managing the Center's resource plan."

Kelly is the Chief of the Institutional Resources and Procurement Division. His group has responsibility for budgets and for the procurement of supplies needed to maintain operations at MSC.

This is the sixth award he has earned during his NASA tenure. He received a similar award in 1969, and Quality Salary Increases (QSI) in 1963 and 1970.

Kelly also was given a certificate for his suggestion in 1969 to reduce Center operating costs, and in the same year his supervisors rated his work for the year Outstanding -- for which a certificate is awarded.

He has been with NASA since 1962 and has had assignments in all of the agency's spaceflight programs -- Projects Mercury, Gemini and Apollo. Prior to that he was employed with industry and spent several years as a pilot with the United States Navy.

- more -

Kelly graduated from Georgia Tech, Atlanta, in 1953 with a Bachelor of Science degree in Engineering. He has a Master of Business Administration degree from Xavier University, New Orleans, Louisiana. The degree was awarded in 1964.

He is married and is the father of three children. The Kellys' are residents of Friendswood, Texas -- a suburban community near Houston.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 28, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-24

MSC CALLS FOR SHUTTLE HEAT PROTECTION STUDY

The National Aeronautics and Space Administration has asked aerospace firms for proposals to conduct a design study of ablative materials with qualitities of low density. The materials could be used in heat protection of the Space Shuttle Orbiter.

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

During this design study, NASA calls for reports and drawings describing a Thermal Protection System (TPS) using low density ablator materials.

Among the several options the contract will consider is the direct bonding of the material to the Orbiter, the investigation of mechanical attachment techniques and the application of roughly formed materials which later could be machined to the shape of the vehicle.

The contractor also will study methods of refurbishing the vehicle in as little as ten days. Sample tiles sized 12 x 12 inches with thickness from two inches down to one inch will be delivered to MSC for specialized testing.

There has been progress in the development of other kinds of thermal materials called Reusable External Insulation (REI). NASA may be ready to commit these for Orbiter use; however, tests indicate that there probably still will be areas on the vehicle (called "hot spots") which require ablative substances. So the basic system, as now conceived, calls for both REI and ablative materials.

- more -

The Space Shuttle is planned for use in the late 1970's. It will transport personnel and cargo to and from low Earth orbit. Concepts call for a Booster and an Orbiter which will be launched vertically in a piggy-back arrangement.

They will separate at approximately 200,000 feet (60,960 meters) altitude. The Orbiter continues into space and upon completion of its missions, returns to Earth. It will land like a conventional jet aircraft.

Meanwhile, the Booster will be recovered from the ocean, refurbished and used again. NASA is looking at the possibility of using parachutes to sufficiently slow the Booster's return to water to insure recovery.

The space agency also has investigated the possible use of retrorockets to slow the spent Booster when it gets close to a landing. While the final answers are not all in, OMSF Associate Administrator Dale Myers says, "Right at the moment, parachutes look like they are being favored as far as the final letdown into the ocean."

The MSC proposal calls for a firm-fixed-price contract. Proposals are to be submitted by February 7, and the contract will be monitored by the Structures and Mechanics Division in Houston.

- end -

January 28, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
January 28, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-25

MSC CALLS FOR BIDS ON UNIT TO TEST SHUTTLE MATERIALS

A request to design and then build a heating unit capable of producing high temperatures for testing materials used externally on the Space Shuttle vehicle has been issued by the National Aeronautics and Space Administration.

The Request for Proposals (RFP) was released recently by NASA's Manned Spacecraft Center in Houston.

The space agency desires to have a unit--technically called a Heating Array--built to size approximately three feet by three feet. It must be capable of generating heat up to 2500 degrees Fahrenheit and maintaining that rate for a quarter of an hour. The unit also must be built to operate in a vacuum chamber at atmospheres equivalent to approximately 200,000 feet altitude down to sea level.

Test materials--generally sized 12 inches square--will be placed near the unit and subjected to thermal investigation.

-more-

It is anticipated that the external surfaces on a returning Orbiter will heat up to approximately 2000 degrees F when the delta-wing vehicle returns from space.

Surface materials under consideration at this time are the ablative ones where excessive heat is dispersed by charring or melting and Reusable External Insulation (REI) which heats up but re-radiates much like coils on an electric burner.

The signal to go-ahead in the development of a Space Shuttle was flashed by President Nixon on January 5, when he said, "It will revolutionize transportation into near space by routinizing it. It will take the astronomical costs out of astronautics."

Ultimately it will usher in an era of routine travel by laymen.

Contractor bids on the heating unit are due at MSC by February 2. A fixed-price-research and development contract is called for by NASA. The period of performance is approximately one year from contract award, and the work will be monitored by the Structures and Mechanics Division.

-end-

January 28, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-26

McALLISTER RECEIVES COMMENDATION CERTIFICATE

Fred A. McAllister, formerly of Shawnee, Oklahoma, 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 Moon missions.

McAllister's certificate reads: "For his significant contributions to the design and development of the Apollo 15 command and service module extravehicular activity (EVA) umbilical and control panel. Through his outstanding technical and management ability, hardware and procedures were developed which permitted the Command Module Pilot to safety retrieve invaluable scientific information from the spacecraft scientific instrument module bay during an EVA conducted in deep space."

McAllister is a manager in MSC's Crew Equipment Section.

-more-

His group works on items used by astronauts as they conduct their lunar explorations.

McAllister graduated from the University of Texas, Austin, in 1958 with a Bachelor of Science degree in Aeronautics Engineering.

He is married to the former Patricia Gibson of San Antonio, Texas. The McAllister's have two children and are residents of Nassau Bay, a suburban community which is part of Houston, but located directly across from MSC.

-end-

February 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

February 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-27

BALLARD RECEIVES COMMENDATION

David A. Ballard, formerly of Ware, 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 the Apollo Moon flights.

Ballard's certificate reads:

"In recognition of his outstanding contributions to the Apollo 14 lunar landing mission as leader of the Apollo Flight Crew Support Team. His technical leadership, initiative, and innovative skill in directing the activities of the Apollo 14 Flight Crew Support Team contributed significantly to the success of the Apollo 14 mission."

This is the second award Ballard has earned during his NASA tenure. He received a Sustained Superior Performance

-more-

award in 1967, and with that award went an incremental salary increase.

He has been with NASA since 1966. All of his assignments have been in support of flight crews during Apollo missions.

Ballard graduated from the University of Florida, Gainesville, in 1961 with a Bachelor of Science degree in Electrical Engineering. He also attended St. Petersburg Junior College, also in Florida.

He married the former Nancy Johnson of Springfield, Massachusetts. They have two children and are residents of Seabrook, Texas--a suburban community near Houston.

-end-

February 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-28

IRVIN RECEIVES COMMENDATION CERTIFICATE

Richard G. Irvin, formerly of Paris, Arkansas, 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 Moon flights.

Irvin's certificate reads:

"For his outstanding accomplishments as Test Director for the Apollo 15 electromagnetic test program involving the lunar roving vehicle, lunar communications relay unit, ground commanded television assembly, and extravehicular communications system. Within severe schedule constraints, this excellently-managed program tested the electromagnetic compatibility of the combined systems for use in the lunar environment, and its effectiveness was demonstrated by the quality of television images, voice, and data transmissions received during the

-more-

lunar surface extravehicular activity."

Irvin is the Chief of the Apollo Communication Office at MSC. His group has responsibility for the telemetry and other communications from the spacecraft during flights to the Moon. His office also is working on communications for the coming Skylab, now scheduled to fly in 1973.

Irvin has been employed with NASA since 1960. He was assigned to the Goddard Space Flight Center, Greenbelt, Maryland for two years. In 1962, he transferred to MSC where he has worked in offices with responsibility for spacecraft communications.

This is the fifth award made to Irvin since coming to NASA. He has received two Outstanding Performance Certificates, each are made annually; and a Sustained Superior Performance (SSP) award. An incremental salary increase accompanies the SSP.

In addition he has also received a Superior Achievement Award, for which certificates are presented.

Irvin graduated from the University of Missouri, Columbia,

in 1950 with a Bachelor of Science degree in Electrical Engineering.

He married the former Mary Lou Ruff of Tulsa, Oklahoma. They have three children and are residents of Friendswood, Texas--a suburban community near Houston.

-end-

February 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

February 1, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-29

NASA AWARDS STUDY CONTRACT TO LOEWY/SNAITH

A contract to study methods for making the interior of a Space Shuttle Orbiter a more pleasant place in which to live and work has been awarded to Loewy/Snaith, Incorporated, New York, by the National Aeronautics and Space Administration.

In the jargon of space, this study is technically called "habitability design." Loewy/Snaith will be asked to develop conceptual designs, drawings, and to build small models and mockups. The final product will be the recommendation of a variety of concepts from which a selection may be made by NASA.

The firm-fixed-price contract totals $99,985 and will end January 31, 1973. The work is to be performed for NASA's Manned Spacecraft Center.

When MSC solicited proposals for the design work, it

-more-

advised prospective contractors that, "The efficient and comfortable integration of crewmember's within a small confined system is a subtle problem, and support from a talented industrial design firm is deemed appropriate."

-end-

February 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
February 1, 1972
2:00 p.m.

RELEASE NO: 72-30

MSC RELEASES REQUEST FOR SHUTTLE MANEUVERING SYSTEM STUDY

A $250,000 design study of a system for maneuvering the Shuttle Orbiter vehicle while in space has been issued by the National Aeronautics and Space Administration.

The request was made by NASA's Manned Spacecraft Center in Houston.

The system, which will be studied, bears the space-age name of an Orbital Maneuvering System (OMS). According to the proposal, the system for propelling the Orbiter must be light-weight, have high performance, high reliability, long life and low cost.

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

1. Define OMS requirements;
2. Design an OMS baseline system;
3. Study alternate concepts; and
4. Update the baseline system.

The propellants for the system will consist of nitrogen tetroxide and aerozine (50% hydrazine and 50% unsymmetrical dimethyl hydrazine), hypergolics which will be carried in liquid form. Hypergolic fuels ignite spontaneously upon contact, thereby eliminating the need for an ignition system. These propellants have provided thrust for several engines on the Apollo spacecraft during its many missions to the Moon.

- more -

Additional propellant combinations such as liquid oxygen with either liquid hydrogen or hydrocarbon as a fuel will be included in the study.

The Space Shuttle represents a new version of NASA exploration -- one that significantly reduces costs of operation. Forecasts for Shuttle include the launching into Earth orbit of unmanned scientific and industrial experiments, defense missions, and the placement of communications and other satellites.

A firm-fixed-price type of contract is planned for this study. Proposals are to be submitted by February 22, and the study is to be concluded one year after contract award.

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

- end -

February 1, 1972

JANUARY 28, 1972

PRELIMINARY APOLLO 16 MISSION EVENTS TIMELINE

Mission launched April 16, 1972, 17:54 G.m.t., 11:54 c.s.t.
(72° launch azimuth, 1st opportunity)

Events	Day	G.e.t.	C.s.t.	Rev.
Lift-Off	4/16	00:00	11:54	
EOI	4/16	00:12	12:06	
TLI	4/16	02:33	14:27	
LOI	4/19	74:29	14:23	
DOI	4/19	78:36	18:30	2
Circularization	4/20	97:42	13:36	12
LM Landing	4/20	98:47 (11.9° SEA)	14:41	13
Start EVA 1	4/20	102:40	18:34	
End EVA 1	4/21	109:40	1:34	
Start EVA 2	4/21	124:40	16:34	
End EVA 2	4/21	131:40	23:34	
Start EVA 3	4/22	148:40	16:34	
LCPC-1	4/22	152:29	20:23	40
End EVA 3	4/22	155:40	23:23	
LM Ascent	4/23	171:45	15:39	50
LOPC-2	4/24	193:14	13:08	61
Shaping Burn	4/25	216:49	12:43	72
TEI	4/25	222:21	18:15	76
CSM EVA	4/26	241:57	13:51	
Reentry	4/28	290:23	14:17	
Earth Landing	4/28	290:36	14:30	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

February 4, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-31

MSC AWARDS SHUTTLE LANDING SIMULATION CONTRACT

A contract to conduct simulations of an Orbiter approach and landing has been awarded to the Cornell Aeronautical Laboratory, Incorporated, Buffalo, New York.

The award in the amount of $175,183 was made by the National Aeronautics and Space Administration's Manned Spacecraft Center.

The purpose of the study is to more accurately establish the aft location of the Orbiter's center-of-gravity and systems for vehicle aerodynamic control.

The simulations will involve flying a power-off approach starting at altitudes of 5,000 feet to touchdown. It is anticipated that approach speeds might reach approximately 240 knots on the maximum leg of the glide; however, actual touchdown and landing will be at considerably less speed.

Three pilots assigned to MSC and one assigned by Cornell

-more-

Laboratory will do the landing simulations. The tests will be conducted in Buffalo using Cornell's Total Inflight Simulator.

The cost-plus-fixed fee contract is to run through July 31, 1972. The work will be performed for the Crew Training and Simulation Division.

-end-

February 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 3, 1972

Milton E. Reim
(713/483-5111)

RELEASE NO: 72-32

SKYLAB SIMULATIONS BEGIN

The faces are familiar, the consoles look much the same, but the chatter on the loops sounds new and strange. And rightly so, because a new mission for Mission Control Center (MCC) is in the offing.

This past week a team of flight controllers, flight planners, and "backroom" experts assembled in Mission Control Center's third floor rooms for a series of preliminary Skylab experiment planning simulations.

These initial simulations are aimed at exercising the basic plans and procedures necessary before the more detailed sims can begin later that will involve other elements of the Skylab team.

An initial look is being taken at procedures involved in integrating the four areas of experiment planning in Skylab, particularly the Apollo Telescope Mount (ATM), and

-more-

Earth Resources Experiments Package (EREP) areas, and to evaluate the effects of solar and earth weather on Skylab's operation.

Taking part in these preliminary planning simulations are members of Flight Control Division, the Space Flight Meteorology Office, Crew Procedures Division, and Mission Planning and Analysis Division.

No real-time computer support is involved in these simulations, no data from the spacecraft and no spacecraft problems are injected into the simulations.

The main variables in these initial sims are weather in the target areas resulting in flight plan updating to work around predicted cloud cover along the groundtrack, and unexpected solar activity necessitating changes in the ATM plan.

The period covered in the simulations is that between Command & Service Module (CSM) rendezvous with the Skylab and undocking for the return to Earth.

Included in the Data Pack for the sims are the Skylab ground tracks with beta angle and sun angle indicators

with listings of the targets intersected by the ground track while within sun angle and beta angle constraints.

A list of the Skylab instrument ON/OFF times for each instrument as it passes over the target (based on the fields of view) for each revolution is provided to the teams in Mission Control.

Graphical display of the ground tracks superimposed on the targets is projected on the TV displays in the front of the Mission Operations Control Room and on the consoles.

To provide the weather for realism in these initial simulations, the Space Flight Meteorology Office in MCC began in December recording daily realtime data from areas that Skylab will cover around the world and making weather forecasts for that day and also projected five-day forecasts.

These weather forecasts are now being applied to the Skylab groundtracks for the simulations. The meteorologists in MCC provide the cloud cover forecast for the countries covered by Skylab and give the flight controller teams the probabilities of cloud cover in the areas under the groundtrack of Skylab.

This series of simulations on Skylab, in addition to

exercising the basic plans and procedures, provides an excellent opportunity for familiarizing the flight control team with the new terminology and call signs used between the various console positions throughout the MCC.

Preplanning for these initial simulation exercises and there execution has been under the direction of Milton Windler, FCD.

Simulations involving the other elements connected with Skylab will begin sometime late in the fall.

-end-

February 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 8, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-33

MSC RELEASES SHUTTLE THRUST CHAMBER RFP

A request for proposals to develop concepts, build hardware and then test a thrust chamber for engines used in maneuvering the Shuttle Orbiter while in space has been issued to the aerospace industry by the Manned Spacecraft Center.

MSC has set aside approximately $550,000 in technology funds for the chamber contract, and the Government plans to make the awards in the form of two parallel contracts ($275,000 each.)

The purpose of the contract is to gather conceptual information on thrust chambers that are a part of the Orbit Maneuver Engine (OME). This would be followed by the actual construction of an experimental thrust chamber and the associated equipment and then testing.

MSC expects the bell-shaped chamber to be about three feet in diameter and approximately six feet long.

For purposes of this study, the propulsion-energy that flows through the chamber will come from a mixture of nitrogen tetroxide and aerozine 50 (that is, 50% hydrazine and 50% unsymmetrical dimethyl hydrazine.) Alternate combinations of propellants also will be studied.

The thrust chamber study is one of several efforts for which the National Aeronautics and Space Administration has allocated technology funds. Much of this work, especially on the Orbiter, is done under the control of the Houston center.

- more -

Contractor bids are due by February 23, and a firm-fixed-price type of contract is planned. The period of performance is for one year after contract signature.

The work will be done for the Propulsion and Power Division.

- end -

February 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 7, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-34

REGELBRUGGE RECEIVES COMMENDATION CERTIFICATE

Robert P. Regelbrugge, formerly of Geneva, Illinois, 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 Moon flights.

Regelbrugge's certificate reads:

"In recognition of his outstanding achievements while directing and participating in the development of the mathematical formulation and computer programs representing the rendezvous of Apollo spacecraft in earth and lunar orbits. The perfection with which the Apollo mission rendezvous were achieved was due, in a large degree, to the successful application of this theory and software to preflight and real-time rendezvous design and planning."

Reggelbrugge serves as Chief of a computer/organization which has developed flight information in the Gemini two-man

-more-

program and also the Apollo Moon flights. He has been employed at the Manned Spacecraft Center, Houston, since 1963.

This is the third award made to Regelbrugge since coming to NASA. He received an Outstanding Performance Certificate in 1969, and a Sustained Superior Performance (SSP) award in 1968. An incremental salary increase accompanied the SSP.

Regelbrugge graduated from Aurora College in Illinois in 1960 with a Bachelor of Arts degree with a major in mathematics.

He married the former Marcia J. Fowler of Grapevine, Texas. They have three children and are residents of Houston.

-end-

February 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 7, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-35

SMOTHERMON RECEIVES COMMENDATION CERTIFICATE

James L. Smothermon, formerly of Denton, Texas, 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 Moon flights.

Smothermon's certificate reads:

"In recognition of his outstanding contributions to the success of the Apollo 15 lunar landing mission as Flight Crew Support Team Leader for the mission. Under his leadership, the team recognized and resolved problems which the flight crew might encounter with equipment unique to this mission. His effective liaison between the flight crew and all other organizations assured that equipment was available for necessary training in the operations of the lunar roving vehicle, lunar surface scientific equipment, and the scientific instrument module bay experiments."

-more-

Smothermon has been working in an area supporting the astronauts who have been assigned to fly the lunar missions. Recently, he switched to the Skylab Program and is working with the teams that are assigned to those flights.

Skylab is a NASA Earth investigation program. Teams will remain aloft for nearly two months. The first such flight is scheduled for early 1973.

The Certificate of Commendation is the third award Smothermon has earned during his NASA tenure. He received a Sustained Superior Performance award in 1967 and again in 1970. An incremental salary increase accompanied both awards.

Smothermon has been with NASA since 1966. All of his assignments have been in support of flight crews during Apollo missions.

He graduated from Texas A&M University, College Station, in 1959 with a Bachelor of Science degree in Mechanical Engineering.

Smothermon is married to the former Nancy Collinsworth, of McKinney, Texas. They have two children and are residents of Friendswood, Texas--a suburban community near Houston.

-end-

February 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 9, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-36

JOHNSTON, ACTING DIRECTOR OF MEDICAL RESEARCH DIRECTORATE

Richard S. Johnston has been appointed Acting Director of the Medical Research and Operations Directorate at the NASA Manned Spacecraft Center.

Johnston, 45, who has served as Deputy Director for Biomedical Engineering for the medical organization since October 1970, assumes the responsibility formerly held by Dr. Charles A. Berry, recently appointed Director of Life Sciences for NASA Headquarters.

In his new post, Johnston will be responsible for the planning, implementation, and continual evaluation of the center's medical programs. This includes conducting biomedical research programs related to human tolerance and performance limitations, providing center management and research support for inflight medical experiments, providing comprehensive biomedical support to program offices (Apollo, Skylab and Shuttle), providing medical support for testing activities utilizing human subjects, providing comprehensive occupational medicine program of medical services, environmental hygiene, health physics, radiation control and public health ecology, supporting astronaut selection program, providing medical care for the astronauts, participating in mission planning and providing mission control operational support for manned space flights and establishing medical requirements for preflight, inflight, and postflight activities.

- more -

The Medical Research and Operations Directorate consists of the Biomedical Laboratories Division, Preventive Medicine Division, Medical Operations Division and the Project Support Division.

Johnston has held numerous top management positions since he joined NASA at Langley Field, Virginia in 1959. His previous assignments have included manager of the Experiments Office of the Apollo Spacecraft Program Office, Special Assistant to the Director and Chief of the Crew Systems Division.

In 1969, Johnston served as Special Assistant to the Director and was responsible for preparing the Lunar Receiving Laboratory for the Apollo 11 crew and the more than 45 pounds of rocks returned from the moon on the initial lunar landing.

Prior to joining the NASA in 1959, Johnston served as a research chemist with the Naval Research Laboratory (1946-55), and with the U. S. Naval Bureau of Aeronautics (1955-59), where he was responsible for the integration of crew equipment into high speed/low altitude aircraft systems.

A native of Keyser, West Virginia, he is a graduate of the University of Maryland, where he received a BS degree in chemistry in 1946. He is married to the former Jean Ambruster and they have two children, Susan, 18, and Richard, 16. The Johnston's reside in Timber Cove, Texas.

- end -

February 9, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Doug K. Ward
(713/483-5111)

FOR RELEASE:
February 10, 1972
9:00 a.m.

RELEASE NO: 72-37

SUBSATELLITE DATA PROBLEM

An apparent failure of an electronic component has caused the loss of major portions of data from two of three scientific experiments aboard the Apollo 15 Particles and Fields Subsatellite.

The mailbox-size subsatellite with three, five-foot booms protruding from it, was ejected into orbit around the moon from the Apollo 15 service module August 4, 1971, shortly before the astronauts fired their spacecraft engine to break out of lunar orbit for the return journey to earth. Its design life was one year.

Though all the data cannot be received from the two affected experiments -- the magnetometer and the particles experiment -- the experiments themselves appear to be functioning normally. The subsatellite's lunar gravity experiment, is not affected by the failure and is performing normally, and all of the subsatellite's command functions remain unaffected.

For the past six months the subsatellite has supplied scientists information on the moon's gravitational field, the interaction of the solar wind and the moon, and on the magnetic properties of the moon.

Data controlled by two of twelve gates which release the science data in the proper sequence in the subsatellite were lost February 3, and engineers have not been able to restore the two critical data paths, which handle orientation information necessary for analyzing magnetometer results; synchronizing pulses which allow

- more -

ground-based computers to decipher the telemetry data; and also handle portions of the scientific data collected by the magnetometer and particles experiments.

Personnel at NASA's Manned Spacecraft Center have been manually analyzing thousands of bits of data from the subsatellite in a tedious process to determine the extent of the problem and to work out possible alternative procedures for obtaining the missing data. Their analysis has shown that the failure was probably due to a breakdown of some electronic part.

A second subsatellite is to be placed in orbit around the moon on Apollo 16, scheduled for launch April 16, 1972. The problem in the Apollo 15 subsatellite is not expected to affect plans to fly a similar instrument on Apollo 16. However, extensive reviews and tests will be conducted at the Manned Spacecraft Center and at Systems Group of TRW, Inc., Redondo Beach, California, where the subsatellite was built, to better understand the failure and to assure that there is no fundamental design problem.

- end -

February 9, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 10, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-38

GUILLORY EARNS ACHIEVEMENT AWARD

Ted A. Guillory, formerly of Alexandria, Louisiana, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement Award for his work during 1971 on the Apollo Moon flights.

Guillory's certificate reads:

"In recognition of his exceptional efforts in developing and providing the Apollo onboard data that has significantly contributed to the success of the Apollo lunar program."

He is Chief, of MSC's Flight Data Section; a group that supports the astronauts who make the flights to the Moon.

The Superior Achievement Award is the third commendation Guillory has earned during his NASA tenure. He received Sustained Superior Performance (SSP) awards in 1966 and 1969. These commendations are different than the recent achievement

-more-

award. An incremental salary increase accompanies each SSP.

Guillory graduated from Louisiana Polythenic Institute, Ruston, in 1958 with a Bachelor of Science degree in Civil Engineering.

He is married to the former Julia Brown of LeCompte, Louisiana. They have two children and are residents of Pasadena, Texas--a suburban community near Houston.

-end-

February 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
(713/483-5111)

FOR RELEASE:
February 11, 1972
A. M.

RELEASE NO: 72-39

POST APOLLO 15 BED REST STUDY

A program of exercise, prolonged bed rest and diet control, all designed to duplicate the fatigue problem experienced by the Apollo 15 crew, will be undertaken later this month by the U. S. Public Health Service Hospital at San Francisco, California.

After the 12-day Apollo 15 flight, the crew took longer to return to physiological norm when compared to prior flights. The individual crew members -- David R. Scott, James B. Irwin, and Alfred M. Worden -- took varying degrees of time in returning to their normal pre-flight condition.

Two volunteers will serve as test subjects for the program which is being conducted for NASA's Manned Spacecraft Center, Houston, Texas. The pilot investigation, which commences February 22, and includes set periods of vigorous physical exercise, bed rest and post test analysis will closely simulate the conditions of Apollo 15 in terms of weightlessness and lunar surface activity.

The exercise program which will utilize a treadmill, bicycle ergometer and several physical therapy facilities at the Public Health Service Hospital, will duplicate the prolonged extravehicular activity performed by astronauts Scott and Irwin and the bed rest portion of the test is considered an analogue of weightlessness.

The test also subjects the volunteers to a high normal potassium intake during one bedrest period and moderately low and markedly low potassium intakes during other bedrest periods. Post-flight examinations of the Apollo 15 crew led NASA

- more -

scientists to postulate that crew members consumed inadequate potassium for their vigorous workload and the adjustments to weightlessness during their 295 hour mission.

Purpose of the test is to retrace the Apollo 15 mission profile under simulated conditions to determine the principal cause of the postflight observations.

Dr. Kenneth H. Hyatt of the San Francisco Public Health Service Hospital, is the principal investigator and supervisor of this potassium depletion pilot study. Co-investigators at NASA's Manned Spacecraft Center are Drs. L. F. Dietlein, Paul Rambaut, George W. Hoffler, Carter Alexander, Carolyn Huntoon, and John Rummel. Dr. P. C. Johnson of the Baylor University School of Medicine also is a co-investigator.

The test program is composed of the following phases:

A 9-day equilibration during which the subjects are placed on a special diet. This begins February 22, 1972.

The 7-day control phase has the subjects still on the special diet during which time they are observed daily.

The 12-day bedrest phase starting on March 9, duplicates the Apollo 15 time frame and calls for the subjects to perform exercises in time frames and energy expenditures corresponding to that of Astronauts Scott and Irwin. Sleep periods during this 12-day period will follow those actually recorded by Scott and Irwin.

The 14-day recovery period schedule calls for the two subjects to continue on the special diet with normal sleep and exercise schedules permitted.

- end -

February 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 10, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-40

HOOD RECEIVES ACHIEVEMENT AWARD

Robert C. Hood, formerly of Kingsport, Tennessee, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Hood's certificate reads:

"In recognition of his outstanding achievements in directing the program control activities in support of the Apollo Command and Service Modules program."

Hood is Chief of an MSC group identified as the Program Support Division in the Apollo Spacecraft Program Office.

Hood graduated from the University of Tennessee in 1956 with a Bachelor of Science degree.

He married the former Mary Bolden, also of Kingsport. They have two children and are residents of Pasadena, Texas--a suburban community near Houston.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 16, 1972

Robert V. Gordon
(713) 483-5111

RELEASE NO: 72-41

STABILIZATION OF FIRST LUNAR CORE SAMPLE

A 10,000-year-old prehistoric American - the celebrated "Marmes Man" - inadvertently contributed to the Apollo Program, it was disclosed today by the National Aeronautics and Space Administration.

Techniques developed originally to preserve sediments surrounding the bones of the earliest well-documented human remains in the Western Hemisphere have been applied to the delicate core samples returned to earth by Apollo astronauts. The result is the first permanent record of layering in dust which covers the surface of the moon.

Formal announcement of action to preserve a lunar core intact came this week in NASA technical memorandum entitled "Description, Dissection and Subsampling of Apollo 14 Core Sample 14230" by Drs. Roald Fryxell, Laboratory of Anthropology, Washington State University, and Grant Heiken, Manned Spacecraft Center.

Core 14230 was collected by Astronauts Alan B. Shepard, Jr., and Edgar D. Mitchell at Triplet Crater near the Fra Mauro landing site, and is 7.5 centimeters -- about 3 inches -- long. Using what Fryxell described as "micro-archaeological techniques," the scientists first removed 55 tiny subsamples, millimeter by millimeter, from the length of the core, using tiny stainless steel spatulas and forceps, working through rubber gloves in sealed cabinets of nitrogen to protect the samples from earth atmosphere. Next, three successive thin strips of the lunar core, with all layers intact and grains undisturbed, were gently impregnated with resin to bind them together.

The stabilized deposits then were mounted on Plexiglas as the first permanent

- more -

record of deposits beneath the surface of the moon. The small subsamples have since been distributed throughout the world for study by other scientists, but the stabilized sections will remain for analysis requiring grains of moon dust in their original positions.

In Washington, D. C., Senator Warren G. Magnuson (D-Wash.) of the Space and Aeronautics Committee greeted news of the preservation with delight, but saw nothing unusual in the combination of archaeological and space sciences. "The bones of our predecessors in North America are enclosed in the dust of thousands of years." Magnuson said, "The history of the moon and solar system are recorded in the accumulated lunar dust of millions or even billions of years. Preservation of either is, quite simply, dependent on the same important basic principle: preservation of the historical heritage of this country and of the entire world."

Magnuson has a unique interest in the historic step of preserving the moon dust intact. The Washington senior senator authored pioneering legislation to preserve United States antiquities, arranged funding for emergency rescue of the Marmes discoveries, and led a nation-wide campaign which culminated at the White House with President Lyndon B. Johnson to preserve and protect the unique cultural record at Marmes. Five major Government agencies - the National Park Service, National Science Foundation, U. S. Geological Survey, Corps of Engineers, and the Smithsonian Institution - eventually assisted in the effort.

The Marmes discovery was made by Fryxell in April 1968 at a tiny cave or rockshelter in the remote Palouse River Canyon country of southeastern Washington. The president of the American Society for Archaeology hailed the discovery of the ancient human remains and artifacts as "the most significant single development in American archaeology in the past 25 years."

When the project was terminated in early summer of 1969, Fryxell flew to Houston to join NASA's Lunar Sample Preliminary Examination Team for participation in analysis of the first Apollo samples. The transition from archaeology to lunar study included use of volcanic ash of a type found at Marmes Rockshelter to simulate lunar materials in preparation for handling samples to be collected by the Apollo 11 crew.

Fryxell and Heiken since have been responsible for preliminary dissection and description of all lunar cores opened thus far, and their continuing research is expected to provide guidelines for handling cores throughout the remainder of the Apollo program.

Magnuson noted that similar profitable but unexpected results of cooperation in basic research by scientists of greatly different backgrounds have typified the "spin-off benefits" of both NASA's Apollo Program and of the National Science Foundation, which originally supported geological research leading to the Marmes archaeological discovery.

- end -

February 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 14, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-42

VAN BOCKEL RECEIVES ACHIEVEMENT CERTIFICATE

John J. Van Bockel, formerly of Pipestone, Minnesota, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Van Bockel's certificate reads:

"In recognition of his outstanding leadership in defining and implementing the crew training plan and activities in support of the Apollo 14 and 15 missions."

Van Bockel is Chief of MSC's Training Office. His group plans the training programs for the astronauts who are selected to make the lunar flights. Recently, they have been working with the teams that are assigned to fly in the Skylab Program.

Skylab is a NASA Earth investigation program. Teams of astronauts will remain aloft for nearly two months. The first such flight is scheduled for early 1973.

-more-

Prior to joining NASA, Van Brockel served with the United States Air Force as a jet pilot. He also spent a tour with the Minnesota Air National Guard.

He graduated from the University of Minnesota, Minneapolis, in 1960 with a Bachelor of Arts degree.

Van Bockel is married to the former Marilyn Sinclair, of Mankato, Minnesota. They have three children and are residents of Friendswood, Texas--a suburban community near Houston.

-end-

February 14, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 16, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-43

NASA REQUESTS SEAL MATERIALS STUDY FOR SHUTTLE

Thirteen aerospace firms have been invited by the National Aeronautics and Space Administration to submit proposals to study, design and test polymer seal materials for storing propellants planned for use by the Space Shuttle.

NASA has set aside approximately $100,000 in technology funds for this study. The work will be done for the Manned Spacecraft Center in Houston.

Purpose of the contract is to gather information on the manner which propellants such as nitrogen tetroxide and hydrazine combinations affect seals during periods of storage.

In its instruction to industry, MSC notes that, "A significant portion of propulsion system development cost is commonly attributed to seal problems, and leakage control accounts for much of the redundancy design into systems to achieve high reliability. Seal technology remains in some areas very much an art characterized by cut and try development techniques."

"This cut and try technique....has resulted in seals and seal materials proceeding far into valve development programs before failures are detected," MSC continues. "This results in significant schedule and cost impact."

"In order to minimize development costs and schedule impacts, it is imperative that (the ultimate) Space Shuttle contractors be provided sufficient material data and

- more -

design tools to continue developing low risk solutions to these problems," according to NASA.

The contractor also is requested to develop specific models for testing at MSC.

The Space Shuttle represents a new version of NASA exploration -- one that significantly reduces costs of operation. Forecasts for Shuttle include the launching into Earth orbit of unmanned scientific and industrial experiments, defense missions, and the placement of communications and other satellites.

A firm-fixed-price type of contract is planned. Bids are to be submitted by March 6, and the study is to be concluded one year after contract award.

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

- end -

February 15, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
Upon Receipt

RELEASED AT NASA HEADQUARTERS
William W. Pomeroy

RELEASE NO: 72-44

APOLLO 17 SITE SELECTION

A combination mountainous highlands and lowlands valley region of the Moon designated Taurus-Littrow has been selected as the exploration site for the Apollo 17 mission, presently scheduled to carry out the sixth and final U.S. manned Apollo lunar landing in December 1972.

Apollo 17 is scheduled to be launched no earlier than December 6. The launch window, about 4 hours long, will open at approximately 9:38 p.m. EST. The landing point selected by the National Aeronautics and Space Administration is about 20^{o} north and 30^{o} east of the center of the Moon as viewed from Earth. The site is named for the Taurus Mountains and for the crater Littrow, both of which lie to the north of the site. This site was selected for consideration after a thorough search through the large amount of high resolution photography from Apollo 15.

Taurus-Littrow is a keystone site in the Apollo Program, having been selected to help fill in the major gaps in the developing model of the Moon as based upon Apollo 11, 12, 14, 15 and expected Apollo 16 data. The current model shows a complex Moon which formed about 4-1/2 billion years ago and which was subjected to intense cratering. Apollo 14 and 15 data show that one of the last large basins, Imbrium, was formed by an impact 3.9 billion years ago. It was not until the period from 3.2 to 3.7 billion years ago, however, that the great basins, formed during the intense cratering phase, became flooded by molten lavas originating in the lunar interior. One of the key questions remaining is to understand what happened in the period between 3.7 and 4.5 billion years.

- more -

Similarly, it is important to understand whether or not the Moon has been thermally inactive for the last 3.2 billion years.

The Taurus-Littrow site is situated just beyond the southeast edge of Mare Serenitatis. Mare Serenitatis is one of the largest lunar mascons. Large, steep-sided mountains of light-colored highlands dominate the terrain and are expected to provide samples older in age and different in composition from those returned from the Mare Imbrium basin on Apollo 14 and 15. Nature has already helped in the sampling as one of the sample sites is a rock slide which contains the debris which has fallen into the valley from high up on a 7000-foot mountain.

The targeted landing point itself will be on the other prime sampling objective which is the very dark non-mare material filling the valleys between the mountains. On occasion the dark material is found in small troughs on the mountainsides, indicating that it once thinly covered the mountains but has eroded off the steep slopes. This observation, plus the presence of volcanic-looking cinder cones, first reported by the Apollo 15 Command Module Pilot Al Worden, indicates to lunar-scientists that the dark material is an explosively produced volcanic ash. The apparently low crater density in the area covered by the dark material also leads geologists to believe it to be among the youngest lunar volcanics. The explosive nature of the volcanism indicates a relatively high content of volatiles or gases, both of which have been exceedingly rare in all lunar samples seen thus far. If the Moon, as the preferred models indicate, has indeed cooled from the outside in, these youngest lunar volcanics should be derived from the greatest depths and may give the first good samples of the deep lunar interior.

The astronauts will use the Lunar Rover Vehicle 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 an advanced version science station, the Apollo Lunar Surface Experiments Package (ALSEP), containing a Heat Flow Experiment similar to that deployed on Apollo 14 and planned for Apollo 17 as well as four new experiments.

In addition, two new surface traverse experiments, not powered by the ALSEP Central Station, will be deployed. These new experiments represent second generation scientific approaches to difficult lunar problems.

Three of the six new experiments represent new or improved geophysical techniques of exploring the hidden subsurface properties of the Moon. These experiments are: (1) Traverse Gravimeter, (2) Seismic Profiling, and (3) Surface Electrical Properties. The Traverse Gravimeter will measure variations in subsurface structure and furnish data on such problems as whether the mountains have deep roots or are merely deposits on a uniform subsurface. The Seismic Profiling and Surface Electrical Properties Investigations will measure the physical properties of the lunar interior down to about a kilometer in depth, and will indicate subsurface electrical and mechanical properties, the extent of subsurface layering and the degree of energy scattering at the landing site. Underground water, should it exist, will also be detectable.

A new ALSEP experiment, the Tidal Gravimeter, to study both the response of the moon to the earth's tidal pull and its response to gravity waves, should they exist in space, will be a fundamental contribution to astrophysics. Two other new experiments will also be part of the ALSEP. A mass spectrometer will measure the constituents of the lunar atmosphere -- the findings of which may be correlated with the mass spectrometers carried previously in lunar orbit; a lunar ejecta and meteorites experiment will determine the frequency and energy of the small meteorites and their ejecta which constantly impact and modify the Moon.

Three new experiments are added to the Apollo 17 orbital science payload. These replace the geochemical investigations and the mass spectrometer. Apollo 17 will be the third mission to carry a large set of orbital sensors in the Service Module. However, three new experiments are under development and production to replace the mass spectrometer, Alpha, x-ray and gamma experiments as well as the subsatellite carried on Apollo 15 and planned for Apollo 16. The first of these, a Lunar Sounder, is a pulsed radar sounder and has the potential for identifying electrical properties and layering of the lunar crust overflown by the spacecraft.

The Lunar Sounder will provide the opportunity to study detailed physical properties of the Moon up to depths of one and a half kilometers and if it exists, to aid in the location of subsurface water. The second, the infrared Scanning Radiometer will provide, for the first time, a high resolution thermal map of portions of the Moon. Thirdly, a Far Ultraviolet Spectrometer will measure the compositional and density variation of the lunar atmosphere. Since this experiment has the capability of measuring these variations as a function of atmosphere height, it will greatly extend the knowledge of the lunar atmosphere that was gained through the use of the original mass spectrometers on Apollo 15 and 16.

The SIM (Scientific Instrument Module) camera system flown successfully on Apollo 15, and planned for flight on Apollo 16, will also be carried on Apollo 17. This system contains the 24" Panoramic Camera, a 3" Mapping Camera and a Laser Altimeter. The Apollo 17 ground track will permit some new areas of the Moon to be investigated and photographed. In addition, where Apollo 17 overflies areas covered by previous missions, the difference in sun angle will provide the photo-geologists with photographs of lunar features at new illuminations. This will greatly aid them in their scientific investigations.

Apollo 17 will be commanded by Navy Capt. Eugene A. Cernan with Navy Cmdr. Ronald E. Evans, Command Module Pilot, and Dr. Harrison H. Schmitt, civilian scientist-astronaut, Lunar Module Pilot.

- end -

February 16, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 18, 1972

Sydni C. Shollenberger
(713/483-5111)

RELEASE NO: 72-45

MINORITY BUSINESS CONTRACT

The National Aeronautics and Space Administration, Manned Spacecraft Center, has awarded a $199,000 construction contract under the Minority Business Enterprise Program to RO&AS Joint Venture. The contract was awarded through the Small Business Administration.

RO&AS is a partnership formed by Roy Owens Interests, Inc., a Black-owned construction firm, and Advance Systems Construction, Inc., a Mexican-American owned company. Both are Houston-based firms.

The 150-day contract provides for construction of a trainer hardware support facilities building, to be completed by August 2, 1972.

The RO&AS Joint Venture marks the first time in NASA history that two minority businesses have pooled their resources for a joint contract effort.

-more-

Roy Owens Interests is owned by Roy L. Owens, Sr., and Advance Systems Construction is owned by Jose I. Huacuja.

MSC's Contractor Equal Opportunity Programs office played a key role in bringing the two firms together for the joint venture. For the duration of the contract and under the partnership agreement, the companies will pool their financial, administrative, and technical resources.

Construction of the trainer hardware support facilitiy was requested by the Flight Crew Operations Directorate. The Engineering Division, Center Operations Directorate will supervise the project.

-end-

February 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 13, 1972

Doug Ward
(713/483-5111)

RELEASE NO: 72-46

MSC SCIENTIST ADDRESSES MAP MAKERS

Have you ever had the feeling, when following a road map, that you were in a maze rather than on the most direct route from point A to point B?

Dr. John E. Dornbach, who has helped develop maps of the moon for U.S. astronauts, said we all tend to look at a map and then reconstruct it in our mind, absorbing those things which are pertinent to us. He said maps may be more confusing than helpful if they are not designed with some thought to how they will be reconstructed in the mind of the user.

When once formed, he said, these mental images are very hard to change, as anyone can attest who has ever entered a strange city, mistakenly assumed a river or road to run in a certain direction, and then been confused ever since when finding directions in this locale.

-more-

Dr. Dornbach, Deputy Manager of the Applications Office at NASA's Manned Spacecraft Center, said experiences with cockpit displays and aeronautical charts used by pilots have shown that the most effective maps and charts contain only the information that is used in producing a mental image. Whether producing maps for pilots or for use in the classroom, he said, mapmakers should give more attention to the mental impression the map makes on its user rather than its esthetic appearance or geometric precision.

For many years, he said, geographers criticized railroad timetable maps because geographic relationships were supposedly distorted to make the railroad route appear straight. They assumed that most of the motivation came from a desire to make the route of the particular railroad appear short and direct, even in rugged terrain. Dr. Dornbach said, research has now shown that the gross distortion of geographic fact may actually serve a real purpose for the traveller since the railroad map conforms more closely to the way he visualizes his route in his own mind. The railroad map and the mental map do not confuse him with geographical information which is of little immediate concern to him.

Dr. Dornbach delivered his remarks Monday March 13 at the joint annual meeting of the American Congress on Surveying and Mapping and the American Society of Photogrammetry in Washington, D.C.

-end-

February 24, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert Gordon
(713/483-5111)

FOR RELEASE:
February 28, 1972

RELEASE NO: 72-47

LIFE SCIENTISTS SELECTED

Dr. Roger P. Maikel of Indiana University will study with the NASA Manned Spacecraft Center the effects of a stressful or otherwise abnormal environment, such as space travel, on the action of selected therapeutic drugs.

Dr. Maickel's research will be devoted to the class of drugs selected and tested for use in the manned space flight program. Dr. Maickel who is Professor of Pharmacology at Indiana University is among three life scientists today selected by the NASA to receive initial grants under the NASA Life Scientist Program.

Others selected are Dr. Walter Stoeckenius of the Cardiovascular Research Institute of the San Francisco Medical Center of the University of California at San Francisco and Dr. William A. Bonner, Professor of Chemistry at Stanford University.

- more -

The Life Scientist Program was established in July 1971. It is designed to increase participation between university life scientists and their counterparts within NASA in contributing to the advancement of life sciences disciplines related to the NASA mission. The scientists and their graduate students will spend approximately one-third of their time at a NASA Center.

Dr. Stoeckenius of the San Francisco Medical Center will conduct research in the area of exobiology (exobiology is the inquiry into the existence of life elsewhere in the universe and scientific explanation of the origin of life). His project is designed to establish the physiologic role of a bacterial membrane that is dependent on high salt concentration in its environment. This membrane, because of its similarity to the visual pigments in the retina of the eye of higher animals, is a photoreceptor and functions as a collector and converter of light energy to chemical energy. The research is most relevant to the search for life on other planets, especially Mars. It also holds the potential for serving as a bacterial biochemical model for the further study of vision processes in higher animals, including man. The research will be conducted

in close collaboration with NASA Ames Research Center, Mountain View, California.

Dr. Bonner of Stanford University will also conduct research in the area of exobiology in cooperation with the NASA Ames Research Center. His research is aimed at developing a means for detecting measurable optically active molecules in remote regions of space. Living matter is intimately associated with optically active molecules such as amino acids (protein) and carbohydrates (sugars). One of the questions asked in regard to the origin of life is whether such optically active molecules preceded life on the primitive Earth and thereby permitted the subsequent emergence of life on Earth as we recognize it. Measurable optical activity is thought to provide a potential probe, perhaps the most valid probe, for the recognition of life or the biochemical constitutents of life in the remote regions of time or space, in ancient geologic samples, meteorites and on distant planets.

A total of 26 applications were received. Subject to final negotiations, each scientist will work under a 3 year step funded grant.

The program is under the direction of the NASA Office of Life Sciences, which is headed by Dr. Charles A. Berry.

-end-

February 28, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 28, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-48

MSC AWARDS CONTRACT TO TEST SEAL MATERIALS

A contract to develop and test polymer seal materials for applications in Space Shuttle propulsion systems has been awarded to TRW Systems, Redondo Beach, California.

The award in the amount of $97,800, was made by the National Aeronautics and Space Administration's Manned Spacecraft Center in Houston.

TRW will evaluate four different materials. 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.

A fixed price research and development contract was signed and the work will be concluded by February 15, 1973. MSC's Propulsion and Power Division will monitor the contract.

- end -

February 28, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
February 29, 1972

Terry White
(713-483-5111)

RELEASE NO: 72-49

DUPREE FATALITY - SCOTT INJURY

One man was killed at the Manned Spacecraft Center and another seriously injured about 2 p.m. Tuesday, when a 12-volt storage battery used to power underwater lighting exploded in a training building.

Dead is Kirby C. Dupree, 31, laboratory group supervisor with Brown & Root-Northrop, of 4747 First Street, Bacliff, Texas. The injured man, also a Brown & Root-Northrop employee, is James E. Scott, 26, reduced gravity technician, of 11211 Sage Park Lane, Houston. Scott is under treatment at Pasadena Bayshore Hospital.

The battery is used to power floodlighting in a 64,000-gallon water tank, the Water Immersion Facility, used to simulate zero gravity for Apollo and Skylab flight crew training. The battery was not in the tank at the time of the explosion, nor was any crew training under way at the time.

-end-

February 29, 1972

ACCIDENT INVESTIGATION BOARD
APPOINTED BY DR. C. C. KRAFT
FOR THE DUPREE/SCOTT ACCI DENT

Chairman	Clarence E. Propp
	Dr. Charles K. LaPinta
Alternate	Dr. M. Keith Baird
	James B. Trout
	Louie G. Richard
	Harley F. Erickson
	Edwin J. Burke

Consultant to Board -- Douglas L. Campbell

March 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
(713/483-5111)

FOR RELEASE:
March 1, 1972

RELEASE NO: 72-50

GILBREATH APPOINTED DEPUTY DIRECTOR OF CENTER OPERATIONS

Kenneth B. Gilbreath, manager of the NASA White Sands, New Mexico Test Facility, has been appointed Deputy Director of Center Operations at the Manned Spacecraft Center.

Jesse C. Jones, Chief of MSC's Laboratory Operations for MSC's Engineering and Development Directorate has been named to succeed Gilbreath as manager of the White Sands facility.

Gilbreath, 42, who will be Deputy to Center Operations Director Joseph V. Piland, has been with the NASA since 1964. He became manager of the NASA operations at White Sands in 1969.

Prior to joining the NASA, Mr. Gilbreath was employed by Westinghouse Corporation and Martin Marietta Corporation. He graduated from New Mexico State University where he received a Bachelor of Science degree in Electrical Engineering in 1956. Gilbreath, who is a native of Portales, N. M., is a veteran of the U. S. Navy.

Gilbreath is married to the former Doris J. Funk of Deming, N. M. The couple has three children, Trudi, 15, Judith, 10, and Brad, 8.

These appointments are effective April 1, 1972.

Jones, 43, was born in Perryton, Texas, and holds a master's degree in mechanical engineering from the University of Houston. Prior to joining NASA in

- more -

May 1962, Jones was employed by Douglas Aircraft Company, Bechtel Corporation and was on the civil engineering faculty at Texas Technological College, Lubbock, Texas. He served four years in the U. S. Navy. Jones is married and has two children.

- end -

March 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 2, 1972

Don J. Green
(713-483-5111)

RELEASE NO: 72-51

HOFFLER RECEIVES ACHIEVEMENT AWARD

Dr. George W. Hoffler, formerly of Sunbury, North Carolina, but now employed at the National Aeronautics and Space Administration's Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Dr. Hoffler's certificate reads:

"For his outstanding leadership and technical direction of research programs which have contributed to an understanding of the physiological effects of spaceflight."

Dr. Hoffler is Chief of MSC's Cardiovascular Laboratory in the Medical Office. His group have been engaged in heart research as relates to the spaceflight since 1968.

Dr. Hoffler graduated from the University of North Carolina, Chapel Hill, in 1956 with a Bachelor of Arts degree; and he was awarded a Doctorate of Medicine from the same university

-more-

in 1960. In 1968, he was awarded a Master of Science degree specializing in cardiovascular diseases. The degree was earned from Ohio State University, Columbus.

Dr. Hoffler is a member of the Aerospace Medical Association.

He is married to the former Anita C. Whitener, of Lenior, North Carolina. They have three children and are residents of Seabrook, Texas--a suburban community near Houston.

-end-

March 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 3, 1972

John E. Riley
(713/483-5111)

RELEASE NO: 72-52

MSC ANNOUNCES REDUCTION IN FORCE

The Manned Spacecraft Center will have a reduction in force of approximately 75 to 100 Civil Service positions by June 30, 1972, as part of a NASA-wide personnel reduction.

MSC is authorized 3,817 positions on that date. Total number of Civil Service employees at MSC now is 3,944. Attrition is expected to make up the difference between the number involved in the reduction in force and the authorized strength figure for the end of the fiscal year.

The exact number of reductions and the work areas to be affected have not yet been determined. MSC Director Dr. Christopher C. Kraft, Jr. said a plan will be developed to accomplish the reduction with the least impact on the center's mission and with the utmost consideration for individuals affected.

- end -

March 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 7, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-53

MSC RELEASES REQUEST FOR SHUTTLE PAYLOAD STUDY

A request for proposal to study and develop concepts for containerized payloads that might be used on the Space Shuttle has been issued to the aerospace industry by the National Aeronautics and Space Administration.

The work will be done for the NASA Manned Spacecraft Center. MSC has set aside approximately $95,000 in technology funds for the performance of the study.

In the jargon of aerospace engineering, the study technically is called, "A Sortie Payload Systems Compatibility Criteria Study."

MSC notes that, "It is generally considered that the criteria and specifications applied by NASA to the payloads flown on past space programs have resulted in high costs compared to military and commercial air freight....," and "The characteristics of the Shuttle are expected to allow selectively easing many of the costs.....now required of payloads placed in orbit by expendable launch systems."

The product of this study, "...will result in the definition of criteria which will form the basis of specifications to be developed later when quantitative Shuttle data is available."

The winning contractor will be required to concentrate on sortie mission payloads which will be mounted on pallets, and operated from a vehicle orbiting above Earth from seven to 30 days.

- more -

A fixed-price-research-and-development type of contract is planned for this study. Proposals are to be submitted by March 17, and the study is to be concluded one year after contract award.

It will be conducted under direction of the Engineering Analysis Division.

- end -

March 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 7, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-54

NASA TO STUDY ORBITER THRUSTER PROGRAM

Six aerospace firms have been invited by NASA to submit proposals to study the effect that jet thrusters will have on a Shuttle Orbiter's aerodynamics as it reenters from space.

NASA has set aside approximately $100,000 in technology funds for this study. The work will be performed for the Manned Spacecraft Center in Houston.

The purpose of the contract is to determine the best configuration for the Reaction Control System (RCS) for the Orbiter.

MSC has told industry that, "...experience has shown that the interaction of the RCS jet with the vehicle flow field can have a significant effect on the performance of the RCS. This effect can increase the thrust by as much as a factor of two, or it can degrade the thrust by perhaps 50 per cent..."

This degredation depends upon the location of the nozzle on the vehicle, according to MSC. Present Orbiter concepts show thrusters mounted in pods on each wing tip and the tip of the vertical stabilizer.

This study will determine the best location, as well as the best pod configuration.

The Space Shuttle is planned for use in the late 1970's. It will transport personnel and cargo to and from low Earth orbit. Concepts call for a Booster and an Orbiter which will be launched vertically in a piggy-back arrangement.

- more -

They will separate at approximately 200,000 feet (60,960 meters) altitude. The Orbiter continues into space and upon completion of its mission, returns to Earth. It will land like a conventional jet aircraft.

Shuttle is a new version of NASA exploration -- one that significantly reduces costs of operation. Forecasts include the launching into Earth orbit of unmanned scientific and industrial experiments, defense missions and the placement of communications and other satellites.

A firm-fixed-price type of contract is planned for this study. Proposals are to be submitted by April 3, and the study is to be concluded nine months after contract award.

It will be conducted under the direction of the Engineering Analysis Division.

- end -

March 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 8, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-55

MSC AWARDS $299,250 WELD BOND CONTRACT

A contract to study and develop a program for weld bonding materials used by a Space Shuttle has been awarded to Lockheed Missiles and Space Company, Inc., Sunnyvale, California.

The award was made by the NASA Manned Spacecraft Center in Houston. MSC set aside $299,250 in technology funds for the six-month study effort.

Weld bonding is an effective and economical method for joining lightweight structures. It combines metal/metal-epoxy bonding techniques with spot welding through use of adhesive materials.

Lockheed will conduct the study in two parts. In part one, the contractor will apply the techniques to the manufacture of tanks using liquid hydrogen. Part two of the study investigates the application of weld bonding for tanks holding liquid oxygen.

The contract calls for Lockheed to furnish more than two dozen weld bonded joints and tank specimens to MSC for further testing.

The fixed price award is to run through July 31, 1972.

- end -

March 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 9, 1972

Don J. Green
(713-483-5111)

RELEASE NO: 72-56

PITTMAN RECEIVES ACHIEVEMENT AWARD

Galen H. Pittman, formerly of Loraine, Illinois, but now employed at the NASA Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo Moon flights.

Pittman's certificate reads:

"For his outstanding leadership and technical direction in establishing the physiological training facility."

Pittman is Chief of MSC's Physiological Training Section. His group develops physiological training for NASA personnel, for members of the Federal Aviations Agency and for the military.

Pittman graduated from Western Illinois State University, Macomb, in 1941 with a Bachelor of Science degree.

He is a retired USAF officer, and also served in the capacity of an elementary school principal in Illinois for a short time.

-more-

Pittman is a member of the Retired Officer Association and the Aerospace Medical Association.

He is married to the former Barbara Cannon, of Crooksville, Ohio. They have three children and are residents of Houston.

-end-

March 9, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATELY

RELEASE NO: 72-57

NASA SPACE SCIENCE PROGRAM AT _____

_____ will host the National Aeronautics and Space Administration's mobile lecture-demonstration program at _____, _____.

Representing the Manned Spacecraft Center, Houston, Texas, the program will be conducted by Mr. James D. Poindexter. A member of the Oklahoma State University faculty, he has served as a Space Science Specialist for six years, in addition to eight years as a science teacher in public schools.

Mr. Poindexter received his Master of Science degree from Eastern New Mexico University, and is a veteran of three years military service during the Korean conflict. He is a private pilot, and a member of the National Educational Council, National Association of Rocketry, and the Civil Air Patrol.

- more -

The NASA Space Science Education Project or "Spacemobile", as it has commonly become known during the past nine years, is a national program which is taken directly to students in their schools. Transported in a conventional panel truck, many scale models of launch vehicles, spacecrafts, satellites, electronic equipment, audiovisuals, and other equipment items are used for realistic and understandable demonstrations of many scientific principles and concepts involved in space exploration.

Last year, 7,520 programs were arranged and presented to an audience of more than two million students. Programs are supported regionally from various NASA centers. With four of the mobile units, the Manned Spacecraft Center conducts programs in an 8-state region of 870,000 square miles or about one-fourth of the land of the United States. It includes the states of Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Colorado, and New Mexico. Scheduling of the schools within each state is normally handled by the State Department of Education.

A typical program lasts for about one hour and is presented in the school auditorium to an assembly of several hundred students. Discussions and demonstrations include aeronautical research, propulsion, orbits, probes, space communications, human factors, and manned space flight. Other topics include SKYLAB, NASA's next program to build and fly a prototype space station as an orbital workshop and laboratory for scientific experiments and work, and the Space Shuttle, a reusable spacecraft with landing capabilities much like a conventional spacecraft.

Following the auditorium program, the lecturer is available for classroom visits for further indepth discussions of space topics directly related to specific disciplines or to the special interests of the students.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATELY

RELEASE NO: 72-58

NASA SPACE SCIENCE PROGRAM AT _____

_____ will host the National Aeronautics and Space Administration's mobile lecture-demonstration program at _____, _____.

Representing the Manned Spacecraft Center, Houston, Texas, the program will be conducted by Mr. John Scott West. A member of the Oklahoma State University faculty, he has served as a Space Science Specialist for four years, in addition to seven years as a science teacher and counselor in public schools.

Mr. West received his Masters of Education degree from Southwest Texas State College. He holds a Texas Teachers Certificate (Secondary) and Principals' Administration Certificate. He is a member of Lions International.

- more -

The NASA Space Science Education Project or "Spacemobile", as it has commonly become known during the past nine years, is a national program which is taken directly to students in their schools. Transported in a conventional panel truck, many scale models of launch vehicles, spacecrafts, satellites, electronic equipment, audiovisuals, and other equipment items are used for realistic and understandable demonstrations of many scientific principles and concepts involved in space exploration.

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- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATELY

RELEASE NO: 72-58

Sample

NASA SPACE SCIENCE PROGRAM AT FRANKLIN ELEMENTARY SCHOOL

Franklin Elementary School will host the National Aeronautics and Space Administration's mobile lecture-demonstration program at 9 a.m., March 22, 1972.

Representing the Manned Spacecraft Center, Houston, Texas, the program will be conducted by Mr. John Scott West. A member of the Oklahoma State University faculty, he has served as a Space Science Specialist for four years, in addition to seven years as a science teacher and counselor in public schools.

Mr. West received his Masters of Education degree from Southwest Texas State College. He holds a Texas Teachers Certificate (Secondary) and Principals' Administration Certificate. He is a member of Lions International.

- more -

The NASA Space Science Education Project or "Spacemobile", as it has commonly become known during the past nine years, is a national program which is taken directly to students in their schools. Transported in a conventional panel truck, many scale models of launch vehicles, spacecrafts, satellites, electronic equipment, audiovisuals, and other equipment items are used for realistic and understandable demonstrations of many scientific principles and concepts involved in space exploration.

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A typical program lasts for about one hour and is presented in the school auditorium to an assembly of several hundred students. Discussions and demonstrations include aeronautical research, propulsion, orbits, probes, space communications, human factors, and manned space flight. Other topics include SKYLAB, NASA's next program to build and fly a prototype space station as an orbital workshop and laboratory for scientific experiments and work, and the Space Shuttle, a reusable spacecraft with landing capabilities much like a conventional spacecraft.

Following the auditorium program, the lecturer is available for classroom visits for further indepth discussions of space topics directly related to specific disciplines or to the special interests of the students.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATELY

RELEASE NO: 72-59

NASA SPACE SCIENCE PROGRAM AT _____

_____ will host the National Aeronautics and Space Administration's mobile lecture-demonstration program at _____, _____.

Representing the Manned Spacecraft Center, Houston, Texas the program will be conducted by Mr. Thomas J. Hill. A member of the Oklahoma State University faculty, he has served as a Space Science Specialist for four years, in addition to 10 years as a science teacher in public schools.

Mr. Hill received his Bachelor of Science degree from Sam Houston State University, and has completed course work toward a Master of Science degree at Texas A&M University and Michigan Institute of Technology. He is a member of Kappa Delta Pi, and is a veteran of two years military service.

- more -

The NASA Space Science Education Project or "Spacemobile", as it has commonly become known during the past nine years, is a national program which is taken directly to students in their schools. Transported in a conventional panel truck, many scale models of launch vehicles, spacecrafts, satellites, electronic equipment, audiovisuals, and other equipment items are used for realistic and understandable demonstrations of many scientific principles and concepts involved in space exploration.

Last year, 7,520 programs were arranged and presented to an audience of more than two million students. Programs are supported regionally from various NASA centers. With four of the mobile units, the Manned Spacecraft Center conducts programs in an 8-state region of 870,000 square miles or about one-fourth of the land of the United States. It includes the states of Texas, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Colorado, and New Mexico. Scheduling of the schools within each state is normally handled by the State Department of Education.

A typical program lasts for about one hour and is presented in the school auditorium to an assembly of several hundred students. Discussions and demonstrations include aeronautical research, propulsion, orbits, probes, space communications, human factors, and manned space flight. Other topics include SKYLAB, NASA's next program to build and fly a prototype space station as an orbital workshop and laboratory for scientific experiments and work, and the Space Shuttle, a reusable spacecraft with landing capabilities much like a conventional spacecraft.

Following the auditorium program, the lecturer is available for classroom visits for further indepth discussions of space topics directly related to specific disciplines or to the special interests of the students.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATELY

RELEASE NO: 72-60

NASA SPACE SCIENCE PROGRAM AT _____

_____ will host the National Aeronautics and Space Administration's mobile lecture-demonstration program at _____, _____.

Representing the Manned Spacecraft Center, Houston, Texas, the program will be conducted by Mr. Nelson J. Ehrlich. A member of the Oklahoma State University faculty, he has served as a Space Science Specialist for two years, in addition to seven years as a science teacher in public schools.

Mr. Ehrlich received his Master of Science degree, and has completed his course work toward a Ph. D. at Oklahoma State University.

- more -

The NASA Space Science Education Project or "Spacemobile", as it has commonly become known during the past nine years, is a national program which is taken directly to students in their schools. Transported in a conventional panel truck, many scale models of launch vehicles, spacecrafts, satellites, electronic equipment, audiovisuals, and other equipment items are used for realistic and understandable demonstrations of many scientific principles and concepts involved in space exploration.

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- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 10, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-61

HEATING ARRAY CONTRACT AWARDED

A $75,000 contract to design and then build a heating unit capable of producing high temperatures for testing Space Shuttle materials has been awarded to the McDonnell Douglas Corporation, St. Louis, Missouri, by the NASA Manned Spacecraft Center.

The unit--technically called a Heating Array--is to be built to a size approximately three feet by three feet. It will be capable of generating heat up to 2500 degrees Fahrenheit and maintaining that rate for a quarter of an hour.

The unit also must be constructed to operate in a vacuum chamber at atmospheres equivalent to 200,000 feet (60,960 meters) altitude down to sea level.

Test materials--generally sized 12 inches square--will be placed near the unit and subjected to thermal investigation.

-more-

It is anticipated that the external surfaces on a returning Orbiter will heat up to approximately 2000 degrees F when the delta-wing vehicle returns from space.

Surface materials under consideration at this time are the ablative ones where excessive heat is dispersed by charring or melting and Reusable External Insulation (REI) which heats up but re-radiates much like coils on an electric burner.

A fixed-price-research-and-development contract has been negotiated. It will run through February 28, 1973.

The work will be monitored by MSC's Structures and Mechanics Division.

-end-

March 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 15, 1972
10:00 a.m.

RELEASED BY NASA HEADQUARTERS
Bill O'Donnell
(202/755-3114)

RELEASE NO: 72-62

SPACE SHUTTLE DECISIONS

NASA announced today that the space shuttle booster stage will be powered by solid rocket motors in a parallel burn configuration. The booster stage will be recoverable. Requests for proposals for design and development of the space shuttle are expected to be issued to industry about March 17.

The booster decision settles the principal question left open for further study at the time the decision to proceed with the development of the space shuttle was announced by President Nixon in January.

In announcing this decision, NASA Administrator James C. Fletcher, stated that it means that the space shuttle will cost less to develop than forecast in January. Development cost is now estimated at $5.15 billion compared to the earlier estimate of $5.5 billion. While this reduction is accompanied by some increases in the estimated cost per mission, the estimate of $10.5 million for the configuration selected is well within the acceptable range for economical use of the space shuttle system, Dr. Fletcher said.

NASA's booster studies since January have shown that both solid and liquid propelled configurations would have been feasible from a technical point of view. The decision was based on the lower cost and lower technical risks shown in the studies for the solid rocket system.

- more -

Industry responses to the requests for proposals for design and development of the Space Shuttle will be received by NASA late in the Spring and selection of contractors is expected in the Summer.

The Space Shuttle will be developed over the next six years. Horizontal test flights are to begin in 1976, and manned orbital test flights in 1978. The complete Shuttle system is to be operational before 1980.

The Space Shuttle will be the first reusable space vehicle. It will be boosted into space through the simultaneous operation of its solid-propellant booster engines and its Orbiter stage high-pressure liquid oxygen-liquid hydrogen main engines. The booster rockets will detach at an altitude of about 40 kilometers and descend into the ocean to be recovered and reused. The Orbiter, under its own power, will continue into low Earth orbit.

The Shuttle will be able to place satellites in orbit, return satellites from orbit, permit in-orbit repair and servicing of satellites, deliver propulsive stages and satellites to low Earth orbit and conduct short-duration science and applications missions with self-contained experiments in low Earth orbit. The Shuttle orbiter stage will be a delta-winged airplane-like vehicle that will be capable of landing on conventional runways. It will then be serviced and prepared for another mission. About the length of a DC-9 airplane, it will be designed for reuse more than 100 times.

The orbiter will have a cargo compartment measuring about 18 meters (60 feet) in length and 4.5 meters (15 feet) in diameter. It will be able to place 29,500 kilograms (65,000 pounds) in a 185-kilometer (100 nautical-mile) due East orbit. The Orbiter will carry a four-man crew-pilot, co-pilot, and two specialists.

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

The Manned Spacecraft Center (MSC) has program management responsibility for program control, overall systems engineering and systems 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 is responsible for the orbiter stage of the shuttle. Kennedy Space Center will be responsible for design of launch and recovery facilities. Marshall Space Flight Center (MSFC) is responsible for the development, production and delivery of the orbiter main engine, the solid booster, and the hydrogen-oxygen propellant tank. MSFC also will accomplish and/or manage certain shuttle tasks where the Center has unique capabilities.

- end -

March 15, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-63

SPACE SHUTTLE FACT SHEET

Attached is a Space Shuttle Fact Sheet including data on operations, configuration and economics.

March 15, 1972

Revised 3/15/72

THE SPACE SHUTTLE

The space shuttle is being developed by NASA as the key to the nation's future space program.

- A bipartisan majority in Congress approved $118.5 million for FY 1972--for studies and for starting development.
- The President approved proceeding with development on January 5, 1972.
- The FY 1973 budget includes $228 million to carry the work forward in that fiscal year.
- The space shuttle can be developed without an increase in the present NASA budget level.

What is the Space Shuttle?

The space shuttle will be an entirely new way of getting to and from space:

- It will be an airplane-like vehicle that can be used over and over to take satellites to orbit and bring them back for repair and reuse.
- It can perform manned missions in orbit but its principal use will be to conduct missions with unmanned satellites more efficiently and economically than we now do with launch vehicles that are destroyed on every launch.

What will it look like?

Each space shuttle consists of an orbiter and a booster:

- The orbiter will look like an airplane and be about the size of one of the smaller jet airliners. It will be powered by three high pressure hydrogen-oxygen rocket engines. It will have a large cargo bay, 15 feet in diameter and 60 feet in

length which carries up to 65,000 lbs. It will have a two-man crew and can carry 2 - 12 scientists and technicians.

- The booster will be an unmanned ballistic-type vehicle, using recoverable solid rocket engines.

How will it work?

- The booster and orbiter stages will be joined for launch, with the orbiter in a "piggyback" position.

- At altitude the orbiter will separate, fly in orbit like a spaceship.

- In orbit the crew and the scientists and technicians on board will launch unmanned satellites and space probes, conduct observations and experiments, and retrieve satellites placed in orbit in previous missions.

- When its mission is completed the orbiter will land like an airplane and be made ready for its next flight.

What will the Space Shuttle do?

- It will do more efficiently the same types of useful civilian and military space missions we are doing today by providing access to space and return to earth on a routine, quick reaction, and economical basis.

- Specifically, it will be used by NASA, the Department of Defense, and other agencies to carry out unmanned, man-tended, and manned missions (non-astronauts can participate in manned missions!) for:

  -- Scientific exploration: instruments, observatories, and telescopes to study the earth, planets, sun, and universe;

  -- Civilian applications: weather, communications, navigation, monitoring the environment, earth resources, and new ideas for the future; and

-- Military applications: these will take advantage of the shuttle's economical, routine, quick reaction capability.

What will the Space Shuttle cost?

Cost estimates based on utilization of solid propellant booster:

o Development (spread over six years)	$ 5.15 billion
o Facilities	300.0 million
o Additional investment (depends on future requirements):	
-- Each additional orbiter	250.0 million
o Cost per flight (including booster costs)	10.5 million

o The cost of the space shuttle program can fit within a total annual NASA budget at approximately the current level (measured in 1971 dollars).

What future savings will there be?

After development, the space shuttle is far more economical to operate than conventional launch vehicles:

o The cost per mission ($10.5 million) is less than most existing launch vehicles, even though the shuttle's 65,000 lb. capacity is far greater than any of them (except for the giant Saturn V).

o An index of the shuttle's efficiency is the fact that the cost per pound in orbit when fully loaded will be about $160 compared to $900 to $5,600 per pound for conventional launch vehicles. Of course, the shuttle doesn't have to be fully loaded to be more economical than existing launch vehicles.

o The savings from the shuttle's lower launch costs and from the reuse and design simplifications of payloads the shuttle makes possible are estimated at about $13 billion over 12 years, an average of a little over $1 billion per year, assuming a realistic combined

NASA, DOD, and other user mission model with an average of less than 50 mission per year over the period 1979-1990. This mission model could be flown without an increase in the current level of NASA and DOD space budget (in 1971 dollars).

- Economic analysis shows that when all factors are considered the shuttle would be a good investment at this time even if we were to assume an average total of only 30 flight per year for NASA, DOD, and all other users over the period 1979-1990.

In Summary - Why the Space Shuttle?

- The United States must continue to do useful things in space.
- The cost of doing business in space must be reduced.
- The space shuttle offers the most effective way:
  - To maintain an advanced U.S. capability in space.
  - To improve the effectiveness while reducing the cost of our space operations--civilian and military.
  - To do this within a total NASA budget than can be held at approximately the present annual level.

Revised 3/15/72

APPENDIX TO SPACE SHUTTLE FACT SHEET

SPACE SHUTTLE ECONOMICS

1. Justification

The justification of the space shuttle is not based on the details of space shuttle economics alone. It is a fact that the shuttle is a good investment and will make possible significant savings in future space operations. But the fundamental reason for developing the space shuttle is the necessity to have a means for routine quick reaction and economical access to space and return to earth in order to achieve the benefits of the scientific, civil, and military uses of space that will be important in the decade of the 1980's and beyond. The space shuttle program is also the lowest cost approach for providing a continuing useful capability for manned space flight and for maintaining a clear U.S. presence in space.

2. Funding Requirements

a. The development cost for the space shuttle is now estimated to be $5.15 billion.

b. The additional investment costs for procurement of production flight hardware and facilities is estimated at about $1.3 billion, on the reasonable assumption that the initial inventory will include: 3 production orbiters, 2 refurbished orbiters, and the initial production boosters.

c. The total investment, therefore, required to develop the shuttle and procure flight hardware and provide facilities will be approximately $6.45 billion.

3. Implied Future Commitments

a. The full development of the shuttle, the initial investment required, and its subsequent operation, together with a continuing well-balanced program in science, applications, and aeronautics, can be supported at an essentially constant total NASA budget level, i.e., about $3.4 billion in 1971 dollars.

b. The peak annual total funding level required for the shuttle during the development period is estimated at about $1.2 billion. As stated above, this will not require an increase over the current total NASA budget level.

4. Relation of Shuttle Funding to Other Space Program Funding

a. There has been some confusion on funding levels required for the shuttle because some people have incorrectly counted the cost of future satellites and other payloads and mission support in future years as a part of the development or investment costs of the space shuttle system. In this way, figures of $10 billion or more have been arrived at as the "true" cost of the shuttle system. This line of reasoning seems to assume that future satellites and payloads would be put in space only because we will have a shuttle, or would be put in space at a rate which is unreasonably high because we have the shuttle, thereby leading to annual budget levels far greater than current levels.

b. The facts are:

(1) The decision to develop the shuttle does not entail an increased level of future expenditures for the satellites and payloads it will carry or for conducting shuttle missions.

(2) The scientific and civil and military applications missions the shuttle will perform will be the same ones that would otherwise be launched by expendable boosters, although the additional capabilities of the shuttle will mean that many missions will be performed differently and more effectively.

(3) After development, the cost of performing these missions will be less with the shuttle than without, because the shuttle will be a more economical launch vehicle and because payload costs can be reduced by reuse and redesign.

(4) Economical use of the shuttle including mission costs is achievable with total annual budgets for space at substantially the current levels. Numbers of the order of $10 billion or more, if correct at all, relate to expenditures that would be spread over a long period of time and which need not exceed the present annual levels.

5. Illustration of Expected Economies through Use of the Shuttle

a. A realistic combined mission model for NASA, DOD, and other users, one of several that has been studied, calls for some 580 missions over a 12-year period (1979-1990), an average of less than 50 missions per year. Models like this are not approved plans, but provide assumptions to test the reasonableness of developing the space shuttle from an economic standpoint.

b. In this model, launch and launch-related costs using existing conventional vehicles would be some $13.2 billion over those 12 years. Using the shuttle, the total launch costs, including procurement of replacement boosters, drop to about $8.1 billion, an economy of some $5.1 billion.

c. The payload development and procurement costs for this mission model would, for conventional launches, run about $35.1 billion over these 12 years divided between NASA, DOD, and other agencies. Because of payload reusability, design simplification, and lower risk factors, the 580 shuttle missions would have payload costs of about $26.8 billion. This is an economy of another $8.3 billion.

d. Therefore, the assumed 12-year flight program can be carried out with the shuttle about $13.4 billion cheaper than without, an average saving of over $1 billion per year.

e. The average total annual cost for launch and payloads in the assumed mission model is about $4.0 billion without the shuttle and about $2.9 billion with the shuttle. These levels are compatible with the current levels of the total space budgets for NASA, DOD, and other agencies.

6. Shuttle Amortization over 580 Missions in 12 Years

a. Investment in space shuttle, including initial inventory, as in Item 2 above (details shown below): $6.45 billion

(1) Development, test, and procurement of 2 orbiters and 2 boosters (5.15)

(2) Refurbish 2 orbiters and procure 3 more, including engines, and initial production boosters (1.0)

(3) Facilities for development, test, and launch capability (.3)

b. Additional investments required to fly mission model assumed in Item 5 above: 1.6 billion

c. Total development and investment 1972-1990 (sum of Items 6a and 6b): 8.05 billion

d. Net reduction in cost of 580 missions because of shuttle operations, as in Item 5d above: 13.4 billion

e. Twelve-year benefit saving realized from shuttle investment (Item 6d minus 6c): 5.35 billion

f. Thus, even if the space programs of NASA, DOD, and other agencies terminated in 1990, the shuttle would have more than paid for itself by then.

7. Additional Points

a. The specific missions that justify the shuttle are those that could and would otherwise be justified on their own merits with conventional launch vehicles; the shuttle makes them more effective and less expensive.

b. The shuttle is self-sufficient; it does not require a space station in order to meet the good investment criterion, or to conduct useful manned missions in earth orbit.

c. Without the shuttle, the U.S. will have no program of manned space flight after 1973.

8. Conclusion

Even though the primary justification for the space shuttle is not economics, for mission models at current space budget levels and similar to those now in effect the shuttle investment will be returned with billions to spare. If, as is likely, new useful and economically beneficial mission possibilities open up during the 1980's because of the routine and quick access to space the shuttle provides, the investment will be returned many times over.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
March 17, 1972
2:00 p.m.

RELEASE NO: 72-64

NASA RELEASES SPACE SHUTTLE RFP

NASA today requested the aerospace industry to submit proposals for development of a Space Shuttle. The request originated from the Manned Spacecraft Center in Houston, Texas.

In its instructions to industry, the space agency notes that, "The primary objective of the Space Shuttle Program is to provide a new space transportation capability that will reduce substantially the cost of space operations, and provide a capability designed to support a wide range of scientific, defense, and commercial uses."

The Space Shuttle will be powered by a combination of solid rockets and liquid propelled rockets. Called parallel burn configuration, the Solid Rocket Motors will burn at the same time the orbiter's main engines are burning.

The Space Shuttle Program will consist of two phases:

1. The Shuttle System Development and Production Phase, and

2. The Shuttle Operational Phase.

Technical proposals are to be submitted by May 12, 1972, with costs proposals due a week later.

The Space Shuttle will be developed over the next six years.

Overall management of the program is in NASA's Office of Manned Space Flight, Washington, D. C. MSC has program management responsibility for program

- more -

control and also is responsible for the orbiter stage. Marshall Space Flight Center, Huntsville, Alabama, is responsible for the solid boosters, main engines, and hydrogen-oxygen propellant tank. Kennedy Space Center, Florida, is responsible for design of launch and recovery facilities.

- end -

March 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 21, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-65

NASA CALLS FOR SHUTTLE SIMULATION STUDY

Approximately three dozen industrial firms have been invited by NASA to submit proposals to study and define simulation requirements for the purpose of developing recommendations for a Space Shuttle mission simulator.

The Manned Spacecraft Center notes the importance of simulators in its request for proposals. It told potential aerospace contractors that during the training of "...space vehicle flight crews....full mission simulators are a major training aid." They have been used successfully in all the major manned space programs.

MSC set aside approximately $200,000, in technology funds for the study.

Several tasks are called out in the proposal including the need to "(a) establish mission simulator requirements, and (b) define a mission simulator system which meets these require-

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ments."

The contractor also is requested to define "visual system requirements,...but no visual system design work will be performed."

The Space Shuttle is planned for use in the late 1970's. It will transport personnel and cargo to and from low Earth orbit.

Shuttle is a new version of NASA exploration--one that significantly reduces costs of operation. Forecasts include the launching into Earth orbit of unmanned scientific and industrial experiments, defense missions and the placement of communications and other satellites.

A firm-fixed-price type of contract is planned for this study. Proposals are to be submitted by March 30, and the study is to be concluded one year after contract award.

It will be conducted under the direction of the Crew Training and Simulation Division.

-end-

March 21, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 23, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-66

MSC ISSUES CALL FOR SHUTTLE RCS ENGINE STUDY

A request for proposals to study and then design a hypergolic bipropellant system for the Space Shuttle orbiter Reaction Control System (RCS) has been issued to the aerospace industry by NASA.

The work will be done for the Manned Spacecraft Center in Houston.

RCS systems for the Phase B Shuttle baseline used combinations of oxygen and hydrogen as primary propellants. With present space transportation configurations, the need for systems which can be developed at lower costs and weight becomes more important.

A current candidate is the hypergolic bipropellant system using a fuel and oxidizer which ignite spontaneously upon contact. System ingredients consist of nitrogen tetroxide as the oxidizer and aerozine (50% hydrazine and 50% unsymmetrical dimethyl hydrazine) as the fuel.

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According to instructions issued to industry,"...the overall program objective is to...define the level of the current technology base in the area of hydrazine type fuel/ nitrogen tetroxide...for RCS engines suitable for Space Shuttle."

This can be accomplished by a program of engine analysis, design, fabrication, and test, according to MSC.

One of the objectives, in addition to the study, is to provide suitable engine hardware for test and evaluation. The testing will be done at MSC by members of the Propulsion and Power Division.

A cost-plus-fixed-fee contract is planned. Proposals are to be submitted by April 17, and the work is to be concluded 15 months after contract award.

-end-

March 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 23, 1972

Don J. Green
(713/483-511)

RELEASE NO: 72-67

RUMMEL EARNS ACHIEVEMENT AWARD

Dr. John A. Rummel, formerly of Pittsburgh, Pennsylvania, but now employed at the NASA Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the physiological effects of space flight.

Rummel's certificate reads:

"For his outstanding leadership and technical direction of research programs which have contributed to an understanding of the physiological effects of space flight."

Rummel is Chief of the Environmental Physiology Laboratory. He graduated from Juniata College, Huntingdon, Pennsylvania, in 1962 with a Bachelor of Science degree. He was awarded a Master of Science degree from Rice University, Houston, in 1964 and earned his PhD in 1966 from the Baylor University College of Medicine, also in Houston.

Rummel is married. The couple has one child and are residents of Houston.

-end-

March 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 23, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-68

GILLEN EARNS ACHIEVEMENT AWARD

Richard J. Gillen, formerly of Bloomington, Illinois, but now employed at the NASA Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on spacecraft life support systems.

Gillen's certificate reads:

"In recognition of his outstanding contributions to advanced life support systems technology. His leadership, professional competence, and personal dedication have significantly contributed to the Manned Spacecraft Center's progress in the development of advanced life support systems."

He is Chief of the Environmental Control System Development section. His group has the responsibility for the development and testing of systems that keep man alive while out in space.

The Superior Achievement Award is the second commendation Gillen has earned during his NASA tenure. He received a

-more-

Sustained Superior Performance (SSP) award in 1969. This commendation is different than the latest award. An incremental salary increase accompanies the SSP.

Gillen graduated from the University of Illinois, Champaign, in 1955 with a Bachelor of Science degree in Mechanical Engineering. He earned a Master of Science degree in Aeronautical Engineering in 1962 from the USAF Institute of Technology, Wright-Patterson Air Force Base, Ohio.

He is married to the former Winifred J. Hastings of Schiller Park, Illinois. They have seven children and are residents of Seabrook, Texas--a suburban community near Houston.

-end-

March 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

John E. Riley
(713/483-5111)

FOR RELEASE:
March 24, 1972
11:00 a.m.

ALSO RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-69

USSR/NASA MEETING IN HOUSTON

A small group of Soviet engineers will meet here next week with their MSC counterparts to discuss technical details of docking mechanisms as part of a continuing U.S.-U.S.S.R. study of compatible rendezvous and docking systems.

The engineers on both sides are members of working group No. 3, one of several working groups which make up the full delegations which have met twice in Moscow and once at MSC since October 1970.

The names of the Soviet participants are not yet available. The U.S. members are headed by Donald C. Wade, Assistant Chief of the Structures and Mechanics Division.

The discussions, which are expected to begin on Monday, March 27, will cover such areas as capture latch concepts and geometry, docking ring and guide geometry, and dynamic characteristics of docking systems.

This interim working session is in support of the next meeting of the full delegations, expected to be held at MSC sometime next summer, and will not determine the final design of compatible hardware.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 27, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-70

RFP ISSUED FOR SHUTTLE OMS STUDY

Approximately 20 industrial firms have been invited to submit proposals to study helium regulator systems that could be used by the Space Shuttle orbiter.

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

Helium regulators comprise part of an Orbital Maneuvering System (OMS) package--rocket propulsion the craft uses while flying in space. They have been a part of the Apollo spacecraft, but--in that case-- they were designed for use only on a single mission.

In a space transportation system where multiple use is necessary, the regulators must be more resistant to contamination, more reliable, and capable of extended life.

NASA notes that...."The Orbital Maneuvering System (OMS) of the Space Shuttle may be a pressure fed rocket propulsion system utilizing helium pressurant and nitrogen tetroxide and

-more-

hydrazine base propellants..."

"The criticality (of the OMS helium regulator) is accented by the lack of existing satisfactory hardware and by the lack of design data to utilize in developing such hardware."

MSC believes this study will correct these deficiencies.

The contractor also will build a prototype helium regulator and associated equipment for testing.

A cost-plus-fixed-fee research and development contract is planned. Proposals are to be submitted by May 1 and the work is to be finished one year after contract award.

Shuttle is a new NASA capability--one that reduces the per pound costs in orbit to about $160 compared with the $900 to $5,600 in orbit costs for conventional launch vehicles. Savings result mainly from vehicle reuse and lower launch costs.

First operational Space Shuttle flights are planned for the late 1970's.

-end-

March 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 30, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-71

HAFPTS: TV FOR SHUTTLE USE

NASA has invited ten aerospace industrial firms to submit bids for a television system to be used on a Shuttle orbiter to aid cargo handling in space.

The system bears the space age name of "Head-Aimed Foveal/ Peripheral Television System;" acronym is HAFPTS.

HAFPTS is a part of a Remote Manipulator System, called RMS, which will accompany each orbiter into space.

The work will be done for NASA's Manned Spacecraft Center in Houston.

MSC notes that there is a requirement to "investigate the application of RMS for....Shuttle docking and cargo handling. Of major concern in this activity, is the selection and implementation of a visual system that will couple the operator to the remote task as completely and naturally as possible--to give him the impression that he is actually there performing work."

-more-

"HAFPTS, with fast zoom....represents candidate techniques for RMS in that head-aiming provides an automatic and natural sense orientation in the remote visual field while leaving hands and feet free to perform other control functions," according to the MSC technical writer who is assigned to investigate this system.

The HAFPTS consists of a display and control unit, head piece assembly, remote sensor assembly, separate "joystick" control unit, origin transfer control unit, and cabling.

The winning contractor is requested to deliver to MSC one Head-Aimed Foveal/Peripheral Television System approximately six months after contract award.

A firm-fixed-price research and development contract is planned. Proposals are to be submitted by April 17.

The work will be monitored by the Telemetry and Communications Systems Division.

-end-

March 30, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
March 30, 1972

Don J. Green
(713/483-5111)

RELEAE NO: 72-72

NASA REQUESTS SHUTTLE TRAINING AIRCRAFT STUDY

NASA today asked the aerospace industry to bid on proposals for a study of an airplane capable of simulating the subsonic flight characteristics of the Space Shuttle orbiter.

In this connection, the contractor will study aircraft handling qualities and flight control procedures with and without jet engines during flights from 35,000 feet altitude to landing.

The study is to "provide sufficient data to assure NASA that the proposed Shuttle Training Aircraft (STA) configuration is technically feasible and acceptable," and "that the recommended design can meet specified requirements."

A firm-fixed-price type of study contract is planned. Bids are due by April 17. The work will be undertaken for the Manned Spacecraft Center in Houston.

-end-

March 30, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 6, 1972

Douglas K. Ward
(713/483-5111)

ALSO RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-73

NASA HANDICAPPED EMPLOYEE WINS FEDERAL AWARD

Miss Shirley Price, an administrative aide at NASA's Manned Spacecraft Center, Houston, has been selected for the "Fourth Outstanding Handicapped Federal Employee of the Year Award."

The award is made each year by the Civil Service Commission to recognize persons with "exceptional job performance...in spite of severely limiting physical factors."

Miss Price is just under four feet tall and without arms. She is one of 21 children (of whom 16 are still living) born to poor Negro parents in Hitchcock, Texas.

Miss Price was a precocious child and won many church awards for her singing ability. Even with her severe handicaps, she persevered and completed high school with excellent grades.

She was graduated with academic honors from Texas Southern

-more-

University. While at Texas Southern, she worked as an assistant social worker, and after obtaining her B.S. degree, she attended graduate school at the University of Wisconsin.

At the Manned Spacecraft Center, she controls a 10,000-item data library used in connection with an experiment designed to measure cosmic ray bombardment of the Earth's atmosphere. She also uses and interprets UNIVAC 1108 computer runs. She types (with her toes) at 45-50 words per minute, files, and answers telephones.

Miss Price has received the Young Women's Association Award of the Baptist Convention; the Peacock Record Company's Courage Award Trophy; and the Texas Governor's Citation as Handicapped Employee of the Year. She has served as President of the Interdenominational "Celestial Chorus," and Vice President of the Baptist Training Union.

She is a member of the Alpha Kappa Alpha National Sociology Honor Society and her hobbies include drawing, sketching, embroidering, crocheting, and knitting--all of which she does with her toes.

Ten persons were nominated for the Civil Service Commission's award. Miss Price reviewed the award at ceremonies today at the Department of Commerce Auditorium, Washington, D.C.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 4, 1972

ALSO RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-74

NASA NEGOTIATES SHUTTLE ENGINE CONTRACT

The NASA is awarding a 90-day letter contract to the Rocketdyne Division of North American Rockwell Corp., Canoga Park, California to begin work on the development and production of the rocket engine for the Space Shuttle orbiter stage.

Estimated amount of the letter contract is $9,800,000 and the contract will permit work to get underway while NASA and Rocketdyne are negotiating a cost-plus-award-fee contract for the engine. Total cost of the negotiated contract is estimated at $450,000,000.

The three liguid oxygen and liguid hydrogen engines in the Shuttle orbiter will be operated simultaneously with the Shuttle booster solid-propellant engines for launch. The orbiter engines will continue to operate to place the orbiter in low earth orbit. The engine and the Shuttle will be designed

-more-

for multiple reuse. The engine will be throttleable to accomodate vehicle flight requirements, including emergencies.

The negotiated contract will call for delivery of the first flight engines by 1977. Rocketdyne will work on the engine at its Canoga Park plant. Engine system development testing is planned at NASA's Mississippi Test Facility near Bay St. Louis. The Shuttle engine program is managed by the NASA George C. Marshall Space Flight Center, Huntsville, Alabama.

-end-

April 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 6, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-75

URBAN SYSTEMS PROJECT OFFICE

An Urban Systems Project Office has been established at the NASA Manned Spacecraft Center, Houston, to apply space technology and techniques to urban problems and systems.

The new MSC organization is part of a cooperative effort between the U.S. Department of Housing and Urban Development, NASA and the Atomic Energy Commission designed to develop new methods of servicing urban areas.

The new effort, called Modular-Sized Integrated Utility System (MIUS), is directed at investigating and demonstrating the feasibility of servicing communities of limited size with a complete range of utilities generated by a single processing plant.

NASA's participation, in which MSC will furnish life support engineering expertise, was secured in a Memorandum of Understanding signed by HUD Assistant Secretary for Research

-more-

and Technology Harold B. Finger and NASA Deputy Administrator George M. Low.

Concerning NASA's role in the program, Dr. Low said, "The NASA aerospace team has extensive capabilities in systems engineering, environmental control, water supply, waste management, materials structures, habitability, and electrical power generation and distribution which are directly applicable to this group effort."

"The melding of both civilian and space technology may hold the solutions to servicing urban problems of today and tomorrow," Dr. Low said.

MSC will be the lead field center in performance of the NASA responsibilities and will seek and coordinate support from other NASA elements. The MSC Urban System Project Office-USPO-will be responsible for the management of the design, development, verification, fabrication, installation, and evaluation of urban systems in support of this program.

Edward L. (Ted) Hays, 29-year veteran aerospace engineer and presently Deputy Chief of Crew Systems at MSC, will be project manager. Approximately 35 NASA engineers and technicians will be transferred from within MSC and assigned to USPO.

At present the principle function of USPO's activity will be concentrated on an economically acceptable modular sized integrated utility system design definition in support of the HUD program. In describing USPO's work, Project Manager Hays said, "Basic design criteria would emphasize economic practicality, environmental quality and energy and other natural resource conservation."

The Modular-Sized Integrated Utility System approach will include electricity, heat, air conditioning, waste water and solid waste treatment and water supply. These services appear to be applicable to apartment complexes, conduminiums, shopping centers, urban development areas and new community developments.

Hays described the USPO effort as a ground base analog of the space station electrical power, heat rejection, and solid waste and water management system. Integration of these various functions and facilities should be more economical than independent design and management of the individual items and processes, Hays explained.

-end-

April 6, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 7, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-76

LIFE SCIENCES DIRECTORATE

The Medical Research and Operations Directorate at the NASA Manned Spacecraft Center has been redesignated the Life Sciences Directorate.

In announcing the reorganization, MSC Director Dr. Christopher C. Kraft said, "With the impending phaseout of the Apollo Program and the Skylab Program nearing a flight operational phase, it is felt that new emphasis must be placed on the bioengineering and biomedical aspects of long duration manned space flights. In the original concept of Medical Research and Operations Directorate (MR&OD), we were concerned with the ability of man to endure the environment of space. Now, however, the Life Sciences Program is being expanded to include experiments in developmental biology and immunology."

The reorganization will not require an increase in personnel strength.

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The reorganized directorate will have all biomedical research activities centralized into the Biomedical Research Division; all medical, operational, and environmental health activities will be consolidated into the Health Services Division; and all equipment development, testing and integration will be centralized within the Bioengineering Systems Division.

Richard S. Johnston, who has served as Acting Director of MR&OD, becomes Director of Life Sciences. Dr. Lawrence F. Dietlein, who has served as MR&OD Assistant Director of Medical Research since 1967, will become Deputy Director of Life Sciences at MSC.

Dr. Willard R. Hawkins will be the Life Sciences Directorate's Deputy Director for Medical Operations. Dr. Hawkins has been Chief of Medical Operations Division since 1967.

Chief of the Biomedical Research Division will be Edward L. Michel, who has been Chief of the Biomedical Laboratories Division since 1969.

Dr. George G. Armstrong, Jr. will be Chief of the Health Services Division. He has been Deputy Chief of Medical Operations for the past three years.

John C. Stonesifer, who has been Chief of MR&OD's Project Support Division for the past 18 months, becomes Chief of the Bioengineering Systems Division.

-end-

April 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 6, 1972

ALSO RELEASED AT NASA HEADQUARTERS

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-77

FINALISTS FOR SKYLAB STUDENT PROJECT

The selection of 25 national finalists in the Skylab Student Project was announced today by the National Science Teachers Association and the National Aeronautics and Space Administration.

A limited number of these experiments and demonstrations proposed by high school students will be chosen by NASA for performance in space flight aboard the Earth orbital Skylab manned space station in 1973. Selection of flight experiments and demonstrations will be completed by June 1, 1972.

The 25 student finalists and their teacher-sponsors will be invited to attend the Skylab Student Education Conference at the Kennedy Space Center, Fla., at the time of the Skylab launch. The national finalists and sponsors also will receive special medallions. Plaques will be presented to their schools.

Proposals by the 25 finalists were chosen from 3,409 submitted by U.S. secondary school students across the nation and overseas. The Skylab Student Project is designed to stimulate interest in science and technology by directly involving secondary school students in space research.

Skylab is an experimental space laboratory to conduct scientific, technological, and biomedical investigations from the vantage point of space. The first

- more -

manned mission will last up to 28 days, the second and third 3-man missions are planned to last up to 56 days.

The Skylab program will test equipment and techniques to gather information on Earth's ecology, oceanography, water management, agriculture, forestry, geology, and geography. Astronomy experiments will substantially increase knowledge of the Sun which sustains life on Earth. Habitability, biomedical, behavioral, and work effectiveness experiments will further evaluate man's capabilities in space flight.

The 25 finalists are:

DANIEL S. BOCHSLER, [illegible], Box 18, Silverton, Oregon, 97381. "Possible Constituents of Objects within Mercury's Orbit." Silverton Union High School. Mr. John P. Daily, Teacher/Sponsor.

Experiment. To investigate the reports of sightings of an object or objects within the orbit of the planet Mercury. Photographs would be taken using the Skylab solar telescope.

KENT M. BRANDT, [illegible] Grand Oak Drive, Grand Blanc, Michigan 48439. "Chicken Embryology in Zero Gravity." Grand Blanc Senior High School. Mr. Charles E. Martell III, Teacher/Sponsor.

Experiment. To observe and study fertilized chicken eggs in a zero gravity environment from the splitting of the blastodisc, the growth of the embryo, and then the hatching of the chick.

VINCENT W. CONTRERAS, [illegible] Cloverdale Road, Rockford, Illinois, 61111. "Zero Gravity, Mass Measurement." Harlem High School, Miss Mary D. Lundquist, Teacher/Sponsor.

Experiment. To determine a effective method for the measurement of unlike powders and materials in a zero gravity environment. Five methods were proposed.

TROY A. GRITES, [illegible] Kent, Washington, 98031. "Space Observation and Prediction of Volcanic Eruptions." Kent Junior High. Mr. Richard D. Putnam, Teacher/Sponsor.

Experiment. [illegible] use of the Skylab infrared spectrometer and ultraviol[illegible] be able to predict volcanic eruptions which in turn may save thousands of lives.

W. BRIAN DUNLAP, 8898 Ashley [illegible], Youngstown, Ohio, 44515. "Wave Motion Theory Liquid in Zero Gravity." Austintown Fitch High School. Mr. Neal L. Pallante, Teacher/Sponsor.

Experiment. To determine the wave motion and behavior over the surface of liquid in zero gravity with normal wave motion and behavior under Earth's gravitational field.

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RELEASE NO: 72-77

JOHN C. HAMILTON, 13 Hon. Parker, Aiea, Hawaii, 96701. "Spectrography of Selected Nebulae." Aiea High School, Mr. James A. Fuchigami, Teacher/Sponsor.

Experiment: To obtain spectrographs in the ultraviolet of most of the presently known quasars to observe the spectral lines that have been shifted from the expreme ultraviolet and even possibly, the X-ray regions to aid in identifying some of the elements present in the observed quasars; and to use the spectrographs in the near and far infrared to obtain quasars which have one or no spectral lines present on ground-based spectrographs to record the displaced lines so that the red shift can be accurately determined.

JAMES E. HEALY, 84 S. Gillette Avenue, Bayport, New York, 11705. "Universal Gravitational Constant: Determination in Space." St. Anthony's High School, Dr. Paul Mottl, Teacher/Sponsor.

Experiment: To exploit the absence of gravity in an attempt to determine the universal gravitation constant.

ALLISON HOPFIELD, 183 East [illegible], Princeton, New Jersey, 08540. "Photography of Luminescent Clouds." Princeton Day School, Mr. Walton Sylvester, Director, Duncan Planetarium.

Experiment: To photograph the clouds of matter on the Moon's orbit 90 degrees before and 90 degrees after the Moon to gather information about the depth and composition of these clouds.

KATHY L. JACKSON, 16614 Dogwood Forest, Houston, Texas, 77058. "A Quantitative Measure of Motor Sensory Performance During Prolonged Inflight Zero 'g'." Clear Creek High School, Mrs. Mary E. Kinsey, Teacher/Sponsor.

Experiment: To quantitatively measure motor sensory degradation in human performance resulting from prolonged inflight zero "g", to obtain quantitative information on the difficulty encountered in the performance of fine manipulative motor skills requiring endurance task under weightless conditions over an extended period of time in zero "g"; and to compare inflight zero "g" Skylab human performance data with existing pre-flight ground base data.

(OVER)

ROGER G. JOHNSTON, 1321 [illegible], St. Paul, Minnesota, 55113. "Capillary Action Studies in a State of Free Fall." Alexander Ramsey High School. Mr. Theodore E. Molitor, Teacher/Sponsor.

Experiment. To study the [illegible] of Skylab's weightlessness on capillary action, to determine if capillary action is present, to compare the contact angles and the maximum capillary heights of liquids in weightlessness and on the Earth's surface, to [illegible] the largest radius of a capillary tube in which the capillary height of the liquid approaches [illegible] weightless state, and to determine [illegible] of various liquids traveling through [illegible].

JEANNE L. LEVENTHAL, [illegible], Berkeley, California, 94708. "X-Ray Emission from the Planet Jupiter." Berkeley High School. Mr. [illegible] B. Choulett, Teacher/Sponsor.

Experiment: To search [illegible] from Jupiter and to attempt to derive [illegible] of the x-ray emission with both solar activity and Jovian decametric radio emission. Both correlations may lead to a new understanding of the [illegible] of the Jovian magnetic field.

KEITH D. McGEE, 122 [illegible], Garland, Texas, 75041. "Effect of Zero-Gravity on the Colloidal State of Matter." South Garland High School. [illegible] B. Patterson, Teacher/Sponsor.

Experiment: To investigate the effect of zero-gravity environment on the colloidal state of matter, as opposed to the known characteristics of this state in a one-g environment.

TODD R. MEISTER, 33-04 [illegible], Jackson Heights, New York, 11372. "An In Vitro Study [illegible] Selected Isolated Immune Phenomena." Bronx High School of Science. Mr. Vincent G. Galasso, Teacher/Sponsor.

Experiment: [illegible] study of the effects of 0-gravity on phenomena [illegible] cellular and humoral immunity, [illegible] chemotactical response of cells in 0-gravity [illegible] effects of 0-gravity on the [illegible] dividing cells as reflected in [illegible] surface membranes and in [illegible] changes in cell secretions.

GREGORY A. MERKEL, [illegible], Springfield, Massachusetts, 01119. "Brownian Motion and Dissolution of a Salt in Zero Gravity." Wilbraham and Monson Academy, Mr. Solon S. Economou, Teacher/Sponsor.

Experiment: To qualitatively determine any effect zero gravity might have on Brownian motion, dissolution of a salt, and the tendency toward equilibrium throughout an aqueous system.

JUDITH S. MILES, [illegible], Lexington, Massachusetts, 02173. "Web Formation in Zero Gravity." Lexington High School, Mr. J. Michael Conley, Teacher/Sponsor.

Experiment: To compare the web of a spider spun in a zero gravity environment with one constructed on Earth to determine if the spider's behavior in web building is influenced by gravity.

CHERYL A. PELTZ, 7117 S. [illegible], Littleton, Colorado, 80120. "Cytoplasmic Streaming in Zero Gravity." Arapahoe High School, Mr. Gordon R. Scheels, Teacher/Sponsor.

Experiment: To observe the effects of zero gravity on the mechanism which transports and distributes energy (cytoplasmic streaming) in plant cells to determine if agricultural food stuffs may be grown in space.

TERRY C. QUIST, 3610 [illegible], San Antonio, Texas, 78228. "Earth Orbital Neutron Analysis." Thomas Jefferson High School, Mr. Michael B. Wurst, Teacher/Sponsor.

Experiment: To study the high energy neutron population of Skylab Earth orbital altitudes by recording neutron impacts on foils of fissionable material.

JOE W. REIHS, 12324 [illegible], Baton Rouge, Louisiana, 70815. "X-Ray Content in Association with Stellar Spectral Classes." Tara High School, Mrs. Helen W. Boyd, Teacher/Sponsor.

Experiment: To establish a possible relationship between the age of a star, its spectral class, and the amount of x-rays emitted by a given star.

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DONALD W. SCHLACK, 9217 Appleby Street, Downey, California, 90240. "Phototropic Orientation of an Embryo Plant in Zero Gravity." Downey High School, Miss Jean C. Beaton, Teacher/Sponsor.

Experiment: To determine whether light can provide for total plant orientation [illegible] in the absence of gravity and what is the [illegible] intensity of light that is needed?

[illegible] SHANNON, 2849 [illegible] Atlanta, Georgia, 30345. "[illegible] Ultraviolet Wavelengths." Fernbank Science Center, [illegible] Knappenberger, Teacher/Sponsor.

Experiment: To study [illegible] pulsars in the ultraviolet wavelengths.

[illegible] SHERHART, 2144 [illegible], Michigan, 48072. "Testing Flow Properties of Powdered Solids in Zero Gravity." [illegible] High School, Mrs. Helen L. Politzer, Teacher/Sponsor.

Experiment: To test the flow properties of powdered solids to evaluate the possibilities of using powdered solids in place of liquids in a zero gravity environment.

ROBERT L. STABALE, Huntington Hills-North, Rochester, New York, 14622. "Behavior of [illegible] and Bacterial Spores in the Skylab and [illegible]." Harley School, Mr. Alex H. Soames, Teacher/Sponsor.

Experiment: To determine if [illegible] bacterial spores can survive for [illegible] of time in space, how they are affected by [illegible] exposure, and to determine the effects of the Skylab environment, particularly weightlessness, on the [illegible] growth, and mutations of several vegetative [illegible] forms.

KEITH L. STEIN, 2167 [illegible] South, Westbury, New York, 11590. "Effects of [illegible] Long-duration Exposure to Zero and Artificial Gravity." W. Tresper Clarke High School, Mr. Dennis E. Unger, Teacher/Sponsor.

Experiment: To determine the effect of long-duration exposure to zero and various levels of gravity, interspersed with entry, [illegible] and launch accelerations, on the survivability, growth and development of algae, daphnia, and other microorganisms. Also to investigate the effect of gravity on enzyme action.

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RELEASE NO: 72-77

JOEL G. [illegible], [illegible] Street, West Point, Nebraska, 68788. "Plant Growth in Zero Gravity." Central Catholic High School, Mrs. Lois M. Schaaf, Teacher/Sponsor.

Experiment. To compare root and stem growth in radish seedlings in a zero gravity environment with such growth on Earth to determine the influence of gravity on plant growth.

JOE B. ZMOLEK, 1914 Hazel Street, Oshkosh, Wisconsin, 54901. "Earth's Absorption of Radiant Heat." Lourdes High School, Mr. William L. [illegible], Teacher/Sponsor.

Experiment: To demonstrate the effects of the atmosphere upon the absorption of radiant energy at various locations and to arrive at a coefficient of atmospheric absorption at specific locations and during specific weather conditions.

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April 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
April 7, 1972
Noon

RELEASE NO: 72-78

MSC NEGOTIATES FOR SHUTTLE SPACE WALKING STUDIES

Parallel contracts for space walking studies as they pertain to the Space Shuttle are under negotiation between NASA and two aerospace firms.

Discussions are underway between the Manned Spacecraft Center and LTV Aerospace Corporation, Dallas, Texas, for one study. MSC is negotiating with United Aircraft Corporation, Hamilton Standard, Windsor Locks, Connecticut, for the other.

The contractors are to investigate emergency, contingency and normal Extra Vehicular and Intra Vehicular Activities (EVA/IVA) -- synonyms for traverses by astronauts while outside Earth's atmosphere. The contractors will also study protective equipment needed to perform EVA/IVA tasks.

Both contracts are firm-fixed-price research and development studies and each is to terminate approximately December 31, 1972. The LTV contract is in the amount of $126,000, with the Hamilton Standard award funded at $98,511. Dollar difference represent slightly different work tasks assigned to each firm.

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April 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 11, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-79

MSC TO BUILD SHUTTLE TV TEST UNIT

Approximately 20 industrial firms have been invited to submit proposals to study and build television components which provide the best picture of Space Shuttle activities.

The request was issued by the NASA Manned Spacecraft Center in Houston.

MSC is asking for specifications for a Video Optimization Breadboard System, as this test unit is to be called. The system should be designed to "minimize the amount of time the Shuttle astronauts spends in adjusting the camera and will establish optimal electronic operating conditions... based on response to the scene being viewed."

"Control and adjustment of the camera will be accomplished by having the operator first select an area of interest in the video display," according to MSC. "The system will then automatically evaluate the video in this area...compute all

-more-

the camera and lens functions...and generate the required camera control signals."

Major components of the breadboard will include camera, lenses, mixing and shading units, synchronizing generator, and cabling. The completed unit will be shipped to MSC for testing approximately nine months after contract award. Proposals are to be submitted by April 28.

A firm-fixed-price research and development contract is planned. The work will be done for MSC's Telemetry and Communications Systems Division.

-end-

April 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 7, 1972

Douglas K. Ward

RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-80

NASA REPS TO MOSCOW FOR LUNAR SAMPLE

Two NASA representatives will go to Moscow April 11 to receive a lunar sample returned to Earth by the Soviet unmanned spacecraft Luna 20.

Under the NASA-Soviet Academy of Sciences agreement of January 21, 1971, samples of lunar material obtained by each country are made available to the other.

Dr. Paul W. Gast, Chief, Planetary and Earth Sciences Division, and Dr. Michael B. Duke, Lunar Sample Curator, both of the Manned Spacecraft Center, Houston, will spend two days in Moscow.

In June 1971 NASA representatives went to Moscow to take custody of lunar material returned by the Soviet Luna 16 spacecraft. In January of this year three Soviet scientists who were attending the Third Annual Lunar Science

-more-

Conference in Houston received lunar material returned by the Apollo 14 mission.

The exchange of lunar samples is part of the NASA-Soviet Academy agreement to coordinate a wide range of space research and exploration activities planned by the two countries.

-end-

April 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 12, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-81

MSC REQUESTS SPACE SHUTTLE TEST ENGINE

A request to provide a hydrazine monopropellant engine which might be used by the Shuttle orbiter for maneuvering while in space, has been issued by NASA to the aerospace industry.

The call for competitive bids went to eight firms recently from the Manned Spacecraft Center in Houston.

Until recently the propellant for orbiter Reaction Control Systems (RSC) was planned as a hydrogen and oxygen type. With increased emphasis on low cost, NASA is evaluating the development of Earth storable fuels, as represented by two candidates. They are the hypergolic bipropellants (those using nitrogen tetroxide as the oxidizer and aerozine as the fuel) and the hydrazine monopropellant.

"Both of these candidates are well developed with demonstrated capabilities and successful backgrounds," MSC has told the contractor." The primary advantages of the

-more-

monopropellant system are simplicity and low cost while bipropellants have advantages in specific impulse and experience on manned applications."

Several existing designs will be tested at MSC with the objective of obtaining information on:

1. pulse performance/thermal requirements,
2. steady state specific impulse,
3. catalyst life, and
4. reusability.

The contractor has been requested to deliver an operational "off-the-shelf" engine, special tools, spare parts and manuals.

A firm-fixed-price supply type of contract is planned; however, NASA has reserved the option of making multiple awards, "if it is more advantageous to the Government...."

The Space Shuttle looks more like an airplane than a space vehicle. It is intended to combine the qualities of both and reduce the per pound cost in orbit to about $160 compared with the $900 to $5,600 costs for conventional launch vehicles.

The Shuttle consists of two sections; stage one is the orbiter, and the other stage--called booster--is three large

tanks.

They are beneath the orbiter. A center tank contains propellant--liquid oxygen and liquid hydrogen--for the rocket engines located in the orbiter. The two other tanks contain a solid, rubbery-type fuel which feeds engines located on the tanks themselves.

At vertical take-off from the launch pad, all engines are ignited simultaneously. This is called parallel burn configuration by space engineers.

The tanks are jettisoned during the course of the flight. The solid rockets plummet into the water, are recovered, refurbished and reused. At the end of the mission, the orbiter returns to Earth where it lands on a runway like a conventional airliner.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 14, 1972

Douglas K. Ward
(713/483-5111)

ALSO RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-82

HINNERS JOINS NASA

Dr. Noel W. Hinners has been appointed Deputy Director and Chief Scientist, Apollo Lunar Exploration, Office of Manned Space Flight, NASA Headquarters. He will report to Capt. William T. O'Bryant, Director of Apollo Lunar Exploration. As Deputy Director he will be responsible for scientific objectives of the program.

Prior to joining NASA on April 3, Dr. Hinners was Associated with Bellcomm, Inc., since 1963. During his service with Bellcomm, an organization which has provided scientific and system engineering support to the manned space flight program, he was a member of the technical staff, supervisor of the lunar science group and most recently head of the lunar exploration department.

Dr. Hinners has served as chairman of NASA's Lunar Dust

-more-

Erosion Study Committee in 1969-70, and the Apollo Photo Data Users Group in 1971. He also was chairman of the Apollo Site Selection Committees for Apollo 12 - 17 missions.

Dr. Hinners was born in Brooklyn, N.Y., Dec. 25, 1935. He received his Bachelor of Science degree from Rutgers University, Master of Science degree from California Institute of Technology and Ph.D in geochemistry and geology from Princeton University.

He is a member of Phi Beta Kappa, and Sigma Xi honorary societies.

He is married to the former Diana Platt and has one child. The family lives in Rockville, MD.

-end-

April 14, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATE

Don J. Green
713/483-5111

RELEASE NO: 72-83

ALSO RELEASED AT NASA HEADQUARTERS AND KSC

SPACE SHUTTLE OPERATIONAL SITE SELECTED

NASA Administrator Dr. James C. Fletcher announced today that the selection of Kennedy Space Center in Florida and Vandenberg AFB in California as the sites from which the Space Shuttle will be operated.

The initial launch and landing site will be at the Kennedy Space Center, Florida. This site will be used for research and development launches expected to begin in 1978 and for all operational flights launched into easterly orbits. Facilities for all Shuttle users at the Kennedy Space Center will be provided by NASA, largely through modifications of existing facilities built for the Apollo and other programs.

Toward the end of this decade it is planned that a second operational site will be phased in at Vendenberg AFB, California, for Shuttle flights requiring high inclination orbits. The basic Shuttle facilities required at Vandenberg are planned to be provided by the DOD.

These decisions, which have been concurred in by the DOD, were reached by the Administrator of NASA after nearly a year of study by a Site Review Board chaired by Dr. Floyd L. Thompson, former Director of NASA's Langley Research Center. During the past year several Shuttle configurations have been under consideration. The site selection decision follows NASA's decision announced

March 13, 1972, that the Space Shuttle will use water recoverable solid rocket boosters.

The Ralph M. Parsons Company of Los Angeles supported the board in facilities and cost studies. The Shuttle study contractor teams headed by North American Rockwell, McDonnell Douglas, Grumman and Lockheed contributed conceptual data concerning launch facility requirements as a part of the recently completed Phase B studies.

During the evaluation, the board reviewed data to all available alternatives, including 150 potential launch sites. Personnel associated with the evaluation visited more than 40 sites. Consideration was given to booster recovery, launch azimuth limitations, latitude and altitude effects on launch and landing performance, abort considerations, relative cost, environmental effects, and impact on present and future programs.

Dr. Fletcher stated that the board's studies of all alternatives clearly showed that the Kennedy-Vandenberg combination has cost, operational and safety advantages over any possible single site or any other pair of sites in the United States.

Preliminary estimates for establishment of the developmental and operational facilities required at KSC are about $150 million. This amount is a part of the total of about $300 million previously estimated by NASA for facilities required for the development, production, test, and initial operation of the Space Shuttle.

The operational facilities and equipment required at Vandenberg AFB are expected to cost about $500 million. This amount is compatible with the allowance for facilities in the estimates of future investment costs for Shuttle operations included in the NASA and DOD studies which demonstrated that the Space Shuttle will produce a substantial net savings in future civil and military space program costs.

RELEASE NO: 72-83

The Space Shuttle will be a manned reusable space vehicle which will carry out various space missions in earth orbit. It will consist of a manned, reusable orbiter powered by three large liquid rocket engines mounted "piggyback" on a large expendable propellant tank plus two large recoverable solid propellant rockets. The orbiter, about the size of a DC-9 jetliner,will be piloted by two men in space who will fly it back to earth and land it like an airplane.

- end -

April 14, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
April 19, 1972

Don J. Green
(713/483-5111)

ALSO RELEASED AT NASA HEADQUARTERS

RELEASE NO: 72-84

NASA EXTENDS STC SUPPORT CONTRACT

NASA has extended its contract with Service Technology Corporation, Dallas, Texas for one year for institutional support services. The work will be done at the Manned Spacecraft Center, Houston, Texas from April 1, 1972 through March, 1973.

The contract is a cost-plus-award-fee and is valued at $16,037,00. Approximately 984 Houston area personnel are employed under the terms of the contract.

The required services include operation and control of utility plants, maintenance of facilities, minor construction, and repairs and alterations. Also included are technical writing, editing and report preparation; identification, cataloging, library services, receipt, storage and issue; exhibit services;

-more-

public information and visitor orientation services.

The contract extension represents the second year of a possible three-year program.

-end-

April 19, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 1, 1972

John E. Riley
(713/483-5111)

RELEASE NO: 72-85

MORRIS NAMED ASPO MANAGER

Owen G. Morris has been appointed Manager, Apollo Spacecraft Program, Dr. Christopher C. Kraft, Jr., MSC Director, announced today.

Morris, who has been manager for the lunar module in the program office, succeeds Brig. Gen. James A. McDivitt, who has been named Special Assistant to the Center Director for Organizational Affairs.

The appointments are effective immediately.

Morris, 45, is a native of Shawnee, Oklahoma. He received a Bachelor of Science degree in mechanical engineering in 1947 and a Master of Aeronautical Engineering degree in 1948, both from the University of Oklahoma.

In 1948, he joined NASA's predecessor, the National Advisory Committee on Aeronautics (NACA), at Langley Research Center, Virginia. He transferred to the Space Task Group in 1961 and was assigned as Chief, Mission Engineering Branch, Apollo Spacecraft Program Office. He has served in the program office since that time.

Morris is married to the former Moree Glover of Tulsa, Oklahoma. They have two daughters, Deborah and Janine. The family lives in Seabrook, Texas.

- end -

May 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-86

TEMPLE EARNS ACHIEVEMENT AWARD

John H. Temple, formerly of Miami, Florida, but now employed at the NASA Manned Spacecraft Center, was awarded a Superior Achievement certificate for his work during 1971 on the Apollo man-to-the-moon program.

Temple's certificate reads:

"For his outstanding accomplishments in the development of mission rules for the Apollo 14 and 15 missions. His exceptional performance in the flight control planning effort and in the specification of operational mission decision criteria was instrumental in the success of the mission operations team in the conduct of flight operations during these missions."

Temple graduated from the University of Texas, Austin, in 1963 with a Bachelor of Science degree in Aerospace engineering.

He is unmarried and lives in Houston.

-end-

May 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 2, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-87

HEIDELBAUGH AWARDED AIR FORCE COMMENDATION MEDAL

Lt. Colonel Norman D. Heidelbaugh, U.S.A.F., VC, was recently awarded the U.S. Air Force Commendation Medal at NASA's Manned Spacecraft Center in Houston, Texas, Dr. Heidelbaugh's award was in recognition of his achivements in conceiving, implementing and directing the food safety procedures for the Skylab Manned Spaceflight Program.

The Skylab Program, scheduled for launch early in 1973, will include extensive medical experiments to determine the physiological performance of man during extended periods of spaceflight.

Dr. Heidelbaugh holds a Doctorate in Veterinary Medicine (V.M.D.) from the University of Pennsylvania (1954), a Masters degree in Public Health (M.P. H.) from Tulane (1958), and a M.S. and Ph.D. in Food Technology from the Massachusetts Institute of Technology (1963). Dr. Heidelbaugh is presently

-more-

Chief, Food Science, at NASA's Manned Spacecraft Center, where he directs a program in development of new foods for the the nation's Apollo, Skylab and Shuttle Space Programs.

Dr. Heidelbaugh's primary professional activities have involved the application of nutrition and food science in the development of new foods and food processing techniques for human and animal feeding. He has authored over 40 scientific publications in these fields. In 1964, he received the U.S. Air Force Legion of Merit in recognition of his developemnt of processing methods which destroy Foot-and-Mouth disease virus in meats. In 1966, he received the Air Force Association's Texas Scientist of the Year Award in recognition of his contributions to space food systems.

Dr. Heidelbaugh's recent accomplishments in food safety provides procedures which solve the complex problems of provision of nutritionally complete and safe foods during extended storage periods inherent to long-duration manned space flight.

-end-

May 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 2, 1972

Milton E. Reim
(713/483-5111)

RELEASE NO: 72-88

TINDALL NAMED DIRECTOR OF FLIGHT OPERATIONS

Howard W. Tindall, Jr. has been named Director of Flight Operations of the Manned Spacecraft Center by Dr. Christopher C. Kraft, Jr., Center director, effective April 30, 1972.

Tindall has been serving as Deputy Director of Flight Operations since March 1970 and previously held key management positions at MSC. He succeeds Sigurd A. Sjoberg who has been serving as acting Director of Flight Operations in addition to his official assignment as Deputy Center Director.

He joined NACA (National Advisory Committee for Aeronautics) NASA's predecessor in 1948 as mechanical engineer. Since joining MSC in 1961, Tindall held successively responsible positions in providing preflight and operational trajectory data in Mission Planning for the Mercury, Gemini and Apollo programs. He was responsible for technical direction of the

-more-

Massachusetts Institute of Technology's work on the Apollo spacecraft guidance and navigation computer programs.

In 1967, in addition to his assignment as Deputy Chief of the Mission Planning and Analysis Division, he was appointed as Chief of Apollo Data Priority Coordination, Apollo Spacecraft Program. In this capacity, he was responsible for coordinating all MSC and contractor efforts in development of the techniques and procedures for utilizing the Apollo trajectory control systems for manned missions.

As director of Flight Operations, Tindall will be responsible for management and direction of four organizational divisions within FOD. This directorate is responsible for space flight mission planning and analysis, network and control center requirements and implementation; recovery support; direct support to manned space flight missions in real time from the Mission Control Center; and planning, coordinating and directing all Center computing facilities.

Tindall was born in New York City, N.Y., February 20,1925. He was graduated from Brown Univeristy, Providence, R.I. with a BS degree in mechanical engineering. He received the NASA Exceptional Service Medal in 1969 and 1970 and the Institute

of Navigation Norman P. Hays Award in 1970.

He is married to the former Jane Smith of Hampton, VA. They have four children: Dana, August 1954; Mark, August 1956; Amy, May 1958; and Claudia, July 1961. The Tindalls reside in Friendswood, Texas.

-end-

May 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D. C. 20546

Richard Friedman
(Phone: 202/755-3897)

RELEASE NO: 72-88

FOR RELEASE:
April 24, 1972
12:00 Noon CST
1:00 p.m. EST

US/USSR REPORTS ON DOCKING

The Academy of Sciences of the USSR and the National Aeronautics and Space Administration have approved a second set of reports by Joint Working Groups on studies of compatible rendezvous and docking systems for manned spacecraft. The working groups met in Moscow, Nov. 29 - Dec. 6, 1971.

Purpose of the meetings was to define technical requirements for the possible rendezvous and docking of US and USSR manned spacecraft. Compatible systems would permit emergency assistance as well as joint experiments. No decision has been taken that would commit either the US or the Soviet Union to a joint manned space mission.

-more-

The meetings took place under the NASA/Soviet Academy agreement of Oct. 28, 1970. A previous meeting was held at the Manned Spacecraft Center, Houston, Texas, from June 21-25, 1971.

Working Group 1 substantially completed general documentation on life support systems, coordinate systems, and constraints on spacecraft configuration. The Group agreed on objectives and preliminary documentation requirements for a possible test mission, as well as to exchanges on launch windows, certain program elements of a test mission, and communications channels which the respective control centers would require.

Working Group 2 listed guidance and control systems and onboard equipment of US and USSR spacecraft which would need to be compatible. Documentation on lights, docking targets and contact conditions, control systems and radio tracking has been nearly completed.

With respect to a possible test mission, Working Group 2 considered communications and tracking systems and agreed on docking contact criteria and on a docking target for installation in the center of the docking hatch. Additional work will be necessary on control stabilization requirements and their relationship to spacecraft size, and on the design, development schedule, evaluation and installation of the new docking target concept.

Working Group 3 agreed to a series of basic values for a compatible docking system, including the diameter of the tunnel through which astronauts and cosmonauts might pass. Further study is required for the development of a single joint concept. Also still to be agreed are programming and methods of conducting tests at various stages of development. The Working Group agreed to create a scale model of a docking system that would allow verification of the parameters and ensure compatibility at an early stage of development. It was agreed that the next meeting of the Joint Working Groups would be held in the United States.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 3, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-89

MSC PARTICIPANTS AT ASMA

Seventeen NASA Manned Spacecraft Center physicians and engineers and an astronaut are scheduled to take part in the 43rd annual meeting of the Aerospace Medical Association at Bal Harbour, Florida, May 8-11, 1972.

The MSC participants will present papers on various medical aspects of manned space flight including biomedical findings of recent Apollo flights and discussions on biomedical programs and experiments scheduled for Skylab.

Dr. Charles A. Berry, Director of NASA Life Sciences, will serve as chairman of the Skylab Flight Medical Experiments panel (May 10 at 10:30 a.m.) and the panel Apollo Flights Status Reports (May 11 at 2:00 p.m.).

Scientist-astronaut Dr. William Thornton will be on a panel "Bioinstrumentation Hazards in Research and Clinical Medicine" (May 9 at 2:30 p.m.). Dr. Thornton who was selected

-more-

as a scientist-astronaut in 1967, is presently assigned to the group of astronauts working on Skylab.

Other MSC participants on the Skylab program scheduled for May 10, are Richard S. Johnston, Director of MSC Life Sciences, Dr. L. F. Dietlein, Deputy Director of MSC Life Sciences, Dr. W. Royce Hawkins, Deputy Director for Medical Operations, Life Sciences, John C. Stonesifer, Chief, Bioengineering Systems Division, and Dr. Malcolm Smith, Chief of Food and Nutrition at MSC.

MSC Life Sciences participants in the Apollo flight status report on May 11, are Dr. John Rummel, Dr. Carter Alexander, Dr. Ben Wooley, Richard Sauer, and Dr. Gerald Taylor.

The ASMA conference will be held at the Americana Hotel at Bal Harbour. Several thousand aerospace physicians and engineers from government agencies, industry, and universities as well as aerospace representatives from foreign governments and aerospace industries are scheduled to attend.

- end -

May 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 4, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-90

SPACE SHUTTLE THERMAL TEST ARTICLE RFP ISSUED BY MSC

A Request for Proposals (RFP) to study and then develop a set of drawings of a scale model of a Space Shuttle orbiter to be used for thermal testing has been issued to the aerospace industry by NASA.

The work will be done for the Manned Spacecraft Center in Houston. Once a scale model is constructed, thermal testing will be done in the huge vacuum chamber at MSC's Space Environmental Simulation Laboratory.

NASA notes that "Full-scale thermal vacuum testing of the complete Space Shuttle will not be possible because the (vehicle) size exceeds any existing thermal test facility."

High reliability testing using scale models has been developed by the space agency in its unmanned programs. The same techniques will be applied to the Space Shuttle, and from early results, MSC will have data influencing design and construction of full scale orbiters.

Four tasks are called for in the Thermal Scale Model study. They are:

1. Development of a study plan.
2. Drawings of a Thermal Scale Model.
3. Development of preliminary test plans; and
4. Scale model cost estimates.

- more -

MSC has set aside approximately $100,000, in technology funds for the first competitive phase of the study. A cost-plus-fixed-fee type of contract is planned for this work. Drawings and plans are to be completed six months after contract award.

The study will be monitored by the Structures and Mechanics Division.

- end -

May 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
May 4, 1972

RELEASE NO: 72-91

MSC RELEASES GEOSYNCHRONOUS PROGRAMS STUDY RFP

NASA today asked the aerospace industry to bid on proposals for a study of new geosynchronous programs.

The investigation -- officially called Pre-Phase A Study -- will be monitored by the Manned Spacecraft Center in Houston.

Geosynchronous altitudes are 19,322 nautical miles (37,784.3 kilometers) above Earth's equator.

The proposal calls for the definition of concepts of fully-automated (unmanned) platforms to space platforms suitable for manned-attendance. Candidate concepts include such potential programs as orbiting solar observatories, large space telescopes, station modules, and Earth observatories.

A fixed-price-research-and-development contract is planned with approximately $200,000 in technology funds set aside. Pre-Phase A of the study will be concluded ten months after contract award.

The work will be monitored by MSC's Program Planning Office.

- end -

May 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 5, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-92

NASA AWARDS SHUTTLE SIMULATOR STUDY CONTRACT TO MCDONNELL DOUGLAS

A $112,000 contract for a visual system definition study leading to the development of a Space Shuttle mission simulator has been awarded to McDonnell Douglas Corporation, St. Louis, Missouri by the NASA Manned Spacecraft Center.

McDonnell Douglas will study development of visual simulators capable of different mission phases including:

1. Simulation of a vertical launch of mated booster and orbiter.

2. Capability of orbiter insertion through ranges of 50 to 500 nautical miles (92.6 to 926.0 kilometers).

3. Orbiter re-entry from 300,000 feet (91,440 meters).

4. Simulation of orbiter approach and landing capability under all flight conditions.

5. Orbiter rendezvous and dock with space station.

6. Horizontal take-off and ferry capability of orbiter.

7. Simulation of orbiter abort conditions.

-more-

End product of the study will be three reports. The first report will acquire information on techniques, systems, and equipment which might be applied to the visual development of simulations.

Report number two will include analysis of visual systems and techniques, and the third report is to be a design study of the recommended systems.

Approximately seven engineering personnel living in the St. Louis area will be employed during the one-year projected lifetime of the study.

McDonnell Douglas was one of seven companies which submitted proposals for the study to MSC.

MSC's Training and Simulation Division will monitor the study.

-end-

May 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 5, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-93

MSC ISSUES CALL FOR MEDICINE AND HEALTH SUPPORT SERVICES

Several professional firms have been invited by NASA to submit proposals to perform Occupational Medicine and Environmental Health Support Services for the Manned Spacecraft Center, Houston, Texas.

The request calls for work of a cardiopulmonary nature, for the staffing and operation of an Environmental Health Laboratory, radiological and space radiation dosimetry, support for manned tests, and the operation of the MSC Clinic.

A cost-plus-award-fee contract is contemplated.

"Use of an award-fee....contract is intended to encourage the contractor to perform in an excellent manner, exercise strict cost controls and be appropriately rewarded," according to the announcement.

The maximum program is for five years consisting of a one year basic contract with four one-year "soft" options.

-more-

"This period," according to NASA, "is predicated upon the need for program continuity and is intended to provide program stability through uninterrupted service."

The initial contract is to be in force by October 1, 1972, and to end the following September.

More than 139,000 man-hours of direct labor are allocated for the first year of the proposed contract, providing employment for approximately 66 Houston-area physicians, technicians, specialists and professional personnel.

Firms intending to submit proposals are requested to have their bids in by May 10.

-end-

May 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 4, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-94

CHARLESWORTH MANAGER EARTH RESOURCES OFFICE (ERPO)

Clifford E. Charlesworth, Deputy Manager of the Skylab Program Office at the NASA Manned Spacecraft Center, has been named manager of the newly created Earth Resources Program Office. Charlesworth is a former resident of Jackson, Mississippi.

A former Gemini and Apollo flight director, Charlesworth will direct MSC's effort associated with the Earth Resources Program, including the integration of the center activities and be responsible for the coordination, direction, and program management of the center's earth resources program. Earth resource experiments are one of the main objectives of the Skylab program which is currently scheduled for three separate manned missions beginning in 1973.

Skylab's Earth Resources Experiment Package (EREP) offers an opportunity to expand investigations of remore sensing of

-more-

the Earth from orbit. The EREP package is composed of five experiments: S-190 Multispectral photographic facility, S-191 Infrared spectrometer, S-192 Multispectral scanner, S-193 Microwave Radiometer/scatterometer and altimeter, and S-194 L-band radiometer.

Detailed organizational planning of this new program office is currently in progress and will be announced in the near future.

Charlesworth, 40, is a 1958 graduate of Mississippi College, Clinton, Mississippi and joined the NASA in April 1962.

Prior to joining the NASA Charlesworth served as a Junior Physicist with the Naval Mine Defense Laboratory in Panama City, Florida from 1958-60 and then transferred to the Naval Ordnance Depot, Corona, California where he performed postflights analysis of airborne and ship components of air-to-ground weapon systems.

Charlesworth is married to the former Jewell Davis and the couple and their two children David Alan, 10, and Leslie Ann, 9, reside in Friendswood, Texas.

-end-

May 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 8, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-95

MSC ISSUES BID FOR SPACE SHUTTLE FOOD STUDY

NASA today asked more than 25 companies to bid on a study of foods and the galley equipment that might be used in the orbiter of the Space Shuttle.

The request was issued from NASA's Manned Spacecraft Center in Houston.

"The....objective of the....system is to provide hygenic, nutritionally complete, highly acceptable, and convenient food for the flight crew....passengers, and ground alert crews of the Space Shuttle," according to the proposal. "The objective of this study is to identify and define optimum food items and types and supporting components of the Space Shuttle Food System."

The request also calls for the contractor to identify state-of-the art food processing modes, and for research and development into new food technology methods.

-more-

A life-size mockup of a Space Shuttle orbiter galley will be built for testing and evaluation of equipment.

The technical monitor notes that, "This mockup will not be functional in regards to hardware aspects of plumbing, refrigerations, heating, etc...." The finished product will be shipped to MSC where food evaluation will take place.

NASA has set aside approximately $143,000 of technology funds for this study. A fixed-price-research-and-development type of contract is planned. Proposals are to be submitted by May 22, and the work is to be completed 14 months after contract award.

Space Shuttle is a new NASA capability--one expected to reduce the per pound costs in orbit mainly from vehicle reuse and lower launch costs.

First operational Shuttle flights are planned for the late 1970's.

-end-

May 8, 1972

NEWS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713/483-5111)

FOR RELEASE:
May 11, 1972

RELEASE NO: 72-96

NASA EXTENDS TRANSPORTATION SUPPORT SERVICE CONTRACT

NASA has extended its contract with Associated American Corporation, Houston, Texas, for one year for transportation and hauling services. The work will be done at the Manned Spacecraft Center, Houston.

The contract extension represents the second year of a possible three-year program, and the extension will remain in effect through March 1973.

The contract is a cost-plus-fixed-fee and is valued at $387,720. Approximately 47 Houston-area personnel are employed under the terms of the contract.

Required services include moving and hauling, packing, shipping, receiving and delivery.

- end -

May 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 11, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-97

SHUTTLE PASSENGER COUCH REQUEST GOES TO INDUSTRY

A request to design, build and test a couch to be used by passengers aboard the Space Shuttle has been issued by NASA to the aerospace industry.

The call for competitive bids went to ten firms recently from the Manned Spacecraft Center in Houston.

"The passenger couch will serve as the support (seat) during launch, entry and landing for personnel other than the pilot and co-pilot," according to the MSC technical writer. It...."is also envisioned as a multi-functional system providing....a capsule habitat which deletes the requirement for private quarters and furnishings for dining."

The couch --- looking similar to a barber's chair --- will be designed for relaxation, sleeping, eating and as a work space. Provisions also will be made for the stowage of personal gear.

-more-

According to the proposal, "The system shall be designed to operate in an oxygen-nitrogen mixture at 14.7 pounds per square inch area (psia) under zero and Earth gravity conditions."

It is to be designed to "....withstand a launch/entry load of three g's for 30 minutes and a crash load of nine g's." It is to be adjustable, with the capability to lock into pre-selected positions for launch and entry and to a flatbed configuration for sleeping.

Couch dimensions are approximately 78 inches long, 36 inches wide, and 18 inches deep.

MSC has set aside approximately $150,000 in technology funds for this effort. A firm-fixed-price-research and development contract is planned. Bids are due at MSC by May 18. The finished product is to be delivered to MSC for test and evaluation by 13 months after contract award.

The work will be done for MSC's Spacecraft Design Division.

-end-

May 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 10, 1972

Doug K. Ward
(713/483-5111)

RELEASE NO: 72-98

CONRAD EJECTS SAFELY FROM T-38

Astronaut Charles (Pete) Conrad Jr., ejected safely from a T-38 jet aircraft while attempting an emergency landing at Bergstrom Air Force Base near Austin, Texas tonight at about 8:45 p.m. CDT.

Conrad, a veteran of three space flights and commander of the first Skylab mission in 1973, parachuted to safety, landing about 100 yards from the base operations building at Bergstrom. The two-seat jet aircraft crashed in an open field about two miles from the base, remote from any residential area.

Conrad was returning to Ellington Air Force Base near the Manned Spacecraft Center, Houston, after visiting the ILC Industries facility in Dover, Delaware earlier today. ILC is the manufacturer of space suits for NASA's manned missions.

Conrad flew first from Dover to Dobbins Air Force Base, Marietta, Georgia. The flight from Dobbins to Ellington was diverted to Bergstrom, about 160 miles west northwest of Houston, because of unsatisfactory weather conditions in the Houston area.

Conrad, a Navy captain, was taken to the USAF hospital at Bergstrom for a routine examination and returned to Houston later in the evening.

- end -

May 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Bob Gordon
(713/483-5111)

FOR RELEASE:
May 12, 1972
A. M.

RELEASE NO: 72-99

US/USSR JOINT WORKING GROUP ON SPACE BIOLOGY AND MEDICINE TO MEET AT MSC

The second meeting of the US/USSR joint working group on Space Biology and Medicine will be held at the NASA/Manned Spacecraft Center, Houston, on May 12 - 19, 1972.

Aspects of the biomedical results of manned spaceflight to be discussed at the meeting include data from the Soyuz 11-Salyut mission, preliminary data from Apollo 16, pre and postflight examination procedures and methods of prediction of inflight status of crew members.

The meeting is being held in accordance with the recommendations of the NASA/USSR Academy of Sciences summary of results of January 21, 1971, signed by Drs. Keldysh and George Low, NASA Deputy Administrator. The first meeting of the working group took place in Moscow October 9-13, 1971, where Soyuz and Apollo data were exchanged.

Soviet participants are working group members O. G. Gazenko, Director of the Institute of Biomedical Problems, acting co-chairman in the absence of N. N. Gurovskiy; Dr. L. I. Kakurin, Institute of Biomedical Problems, and Dr. P. V. Simonov, Institute of Higher Nervous Activity and Neuro-Physiology, USSR Academy of Sciences. Additional space medicine experts in the Soviet delegation are Drs. I. I. Bryanov, Y. M. Svirezhev and I. B. Krasnov of the Institute of Biomedical Problems and Yuri Khomenko of the Scientific Group, Soviet Embassy, Washington, D. C.

- more -

U. S. participants are working group members, Dr. Charles A. Berry, NASA Director of Life Sciences, co-chairman; Dr. Edward J. McLaughlin, NASA Life Sciences Directorate and Dr. Harry Eagle, National Academy of Sciences. Invited guests include Dr. Edward Kass, chairman of the Space Medicine Committee, National Academy of Sciences and a number of NASA space medicine experts from the Manned Spacecraft Center and Ames Research Center.

- end -

May 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 11, 1972

Jack Riley
(713/483-5111)

RELEASE NO: 72-100

BOARD NAMED TO INVESTIGATE T-38 ACCIDENT

Astronaut Stuart A. Roosa today was named chairman of the MSC board which will investigate the cause of last night's aircraft accident in which Astronaut Charles Conrad, Jr. parachuted to safety at Bergstrom Air Force Base, Austin, Texas.

Other board members are: Astronaut Henry W. Hartsfield, Jr.; Kenneth Thompson, Quality Assurance Branch, Aircraft Operations Division; Frank Marlow, Pilots Branch, Aircraft Operations Division; and Dr. Charles Ross, Flight Medicine Branch, Medical Operations Division.

-end-

May 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 12, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-101

MSC EXTENDS APS DESIGN STUDY CONTRACT

The NASA Manned Spacecraft Center has extended its contract with the McDonnell Douglas Corporation for design study of Auxiliary Propulsion Systems (APS) for the Space Shuttle orbiter vehicle.

An expanded work statement to include a study of Earth storable propellants necessitated the contract extension through October 15, 1972.

NASA has set aside $196,000 more in technology funds for the work. This increases the total dollar value of the design study to $576,000.

Two sub-systems make up the Shuttle APS on the orbiter. They are a system called Orbital Maneuvering--acronym OMS--and one called Reaction Control--acronym RCS.

The contract calls for a five part study as follows:

1. Definition of requirements

-more-

2. Candidate RCS comparisons

3. Integration of RCS and OMS

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

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

Approximately six St. Louis-area engineering personnel are employed by this contract.

-end-

May 12, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 12, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-102

FOUR COMPANIES SUBMIT PROPOSALS FOR SPACE SHUTTLE PROGRAM

Four aerospace companies today submitted proposals for the Space Shuttle Program contract.

The companies are Grumman Aerospace Corporation, Bethpage, New York, Lockheed Missiles & Space Company, Inc., Sunnyvale, California, North American Rockwell, Space Division, Downey, California and McDonnell Douglas Corporation, Astronautics Company, St. Louis, Missouri.

The proposals were submitted to the Contracting Officer, Space Shuttle Procurement Branch, at NASA's Manned Spacecraft Center, Houston, Texas.

Deadline for technical proposals was 1:00 p.m. Central Daylight Time, with cost proposals due a week later.

The Space Shuttle will be a manned reusable space vehicle which will carry out various missions in Earth orbit. It will consist of a manned, reusable orbiter powered by three large

-more-

liquid rocket engines mounted "piggyback" on a large expendable propellant tank plus two large recoverable solid propellant rockets.

The orbiter, about the size of a DC-9 jetliner, will be piloted by two men in space who will fly it back to Earth and land it like an airplane.

-end-

May 12, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 12, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-103

MSC ASKS FOR SHUTTLE APU HARDWARE

A request for proposals to design and build two monopropellant auxiliary power unit gas generator assemblies for a Space Shuttle test program has been issued by NASA.

The aerospace industry is to develop these units for the Manned Spacecraft Center, Houston, Texas.

"NASA has tentatively selected a monopropellant hydrazine Auxiliary Power Unit (APU) as the....source of hydraulic and electrical power during the boost, entry and landing phase of... "Space Shuttle flights, according to the work statement that was mailed to the companies.

"Although other more complex systems....showed weight advantages over the hydrazine system, the latter was selected primarily because of lower overall projected costs and a higher degree of safety and reliability," the statement continued.

-more-

While the Shuttle is in orbit, APU's are inactive. Then the electrical power used by the orbiter is provided by batteries and by oxygen/hydrogen fuel cells.

The objective of this contract is to study and develop units capable of reuse "for up to 100 flights." The two gas generators called for in this bid each are required to function for 1,000 hours.

The Gas Generator (GG) system consists of a chamber, valves, instrumentation, and equipment for testing. The units will be delivered to MSC for test and evaluation, and testing will be done by members of the Propulsion and Power Division.

A cost-plus-fixed fee contract is planned. Proposals are to be submitted by May 26, and the work is to be concluded 13 months after contract award.

The Space Shuttle will be a manned reusable space vehicle which will carry out various mission in Earth orbit. It will consist of a manned, reusable orbiter powered by three large liquid rocket engines mounted "piggyback" on a large expendable propellant tank plus two large recoverable solid

propellant rockets. The orbiter, about the size of a DC-9 jetliner, will be piloted by two men in space who will fly it back to Earth and land it like an airplane.

-end-

May 12, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 15, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-104

AMS-CARGO HANDLING IN SPACE

NASA has invited several companies to submit bids for the study of a system for handling cargo in space. This cargo includes satellites, modules, and other hardware. It will be carried into Earth orbit by a Space Shuttle.

Jointed much like the posterior legs of a grasshopper, the early configuration of the system bears a unique engineering title of Attached Manipulator System--AMS for short.

Objective of the study is to design an AMS for dynamic testing and for use in a zero gravity simulation facility to evaluate Shuttle orbiter cargo and payload handling operations.

Future space missions will require a great diversity of operations including "the deployment and release....of payloads for many sizes and shapes...," according to the work statement issued by NASA.

The man and the machine in manipulator systems can be

-more-

so well integrated, the statement said that the operator "develops a sense of presence, (and) his control and displays are so realistic that he feels he is actually present at a remote site performing the tasks."

MSC engineering sketches envision a double jointed/device with each boom approximately 13.5 feet (4.1 meters) long and with rotational capability of up to 290 degrees.

Component parts planned in the study include the booms, a control and display unit, instrumentation, and the subsystem required for remote operation.

The AMS will be electrically operated and designed to be controlled by one operator.

It is called an attached manipulator because one end of the device is rigidly attached to supporting structure where the device is performing.

A firm-fixed-price-research-and-development type of study contract will be awarded. Proposals are to be submitted by May 26.

-end-

May 16, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 13, 1972

Doug Ward
(713/483-5111)

RELEASE NO: 72-105

LARGE METEORITE HITS MOON

Scientists working on the data transmitted to earth from the four seismic stations now operating on the lunar surface report that there must be a new crater on the moon about the size of a football field or larger.

Dr. Gary Latham of Columbia University's Lamont Doherty Geological Observatory, Palisades, New York, said the crater was formed by a meteorite that collided with the surface of the moon early Saturday morning (5-13 at 0349 CDT) very near the instrument installed by the Apollo 14 astronauts. Dr. Latham said " in fact, it landed uncomfortably close, perhaps within a few tens of miles, although the precise location cannot be determined until the data tapes are received from the Manned Space Flight Network".

Dr. Latham, Principal Investigator for the passive seismic experiments left on the moon, said signals which may

-more-

correspond to the rain of debris thrown out by the impact and landing in the near vicinity of the station were recorded for about one minute, although the total signal lasted over three hours. No signs of damage to the station have yet been detected, Latham said.

The signal was so large at station 14 that the seismometers were knocked completely off-scale for 16 minutes, when a command was sent to reduce their sensitivity. Scientists estimate that the energy of the impact was equivalent to about 1,000 tons of TNT, about 100 times larger than the impact of the Saturn SIVB stage, and by far the largest seismic event yet detected on the moon. Dr. Latham estimated the meteorite must have been about ten feet in diameter.

Judging from the fact that this is the first event of such large magnitude recorded in the nearly three years since the first station was installed, Latham said, impacts of this size must be rare on the moon.

Since the signals were well recorded at all four stations, the farthest some 600 miles from the impact point, seismologists expect that the new data will provide information on the structure of the deep interior of the moon. Dr. Latham said

this impact was large enough that "we should record reflections from the lunar core if one exists". In fact he said, it may have set the entire moon into oscillation: but the vibrations would be very weak, and it will take lengthy analysis to discover if they are present.

"We were extremely fortunate that this meteorite waited until all four stations were installed and operating in the quiet of lunar night before it slammed into the moon", Dr. Latham said.

-end-

May 13, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

May 18, 1972

Robert Gordon
(713/483-5111)

RELEASE NO: 72-106

US/USSR MEDICAL WORKING GROUP

The Joint US/USSR Working Group on Space Biology and Medicine, established under the January 21, 1971, agreement between the U.S. National Aeronautics and Space Administration and the Academy of Sciences of the USSR, today completed seven days of meetings at the Manned Spacecraft Center, Houston, Texas, devoted to extending cooperation in space biology and medicine between the United States and the Soviet Union.

The Joint Working Group continued the exchange of data and results from the Apollo and Soyuz/Salyut Programs and developed recommendations and procedures for expanded exchange of information and cooperation in space biology and medicine.

The Joint Working Group also discussed pre-and post-flight examination procedures, prediction of inflight status of crewmen, the problem of biological exploration in space,

-more-

and the need for the exchange of medical terminology.

The recommendations of the Joint Working Group will be forwarded to Dr. James C. Fletcher, Administrator of NASA, and Academician M. Keldysh, President of the Academy. The text of the recommendations will be published when approved, probably in about two months.

The Joint Working Group was co-chaired by Dr. Charles A. Berry for NASA and acting in place of Dr. N. N. Gurovskiy, Professor O. G. Gazenko for the Academy.

-end-

May 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 19, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-107

MSC ANNOUNCES CIVIL SERVICE REDUCTION

The Manned Spacecraft Center today notified 60 Civil Service employees they will be released as a result of manpower reductions of the National Aeronautics and Space Administration.

An additional 103 employees were informed they will be reassigned or placed in jobs at a lower grade.

The move is to be concluded by June 29 and it will reduce the MSC work force to 3,817 Civil Service personnel, the maximum ceiling authorized.

The number of employees being separated now is smaller than previously projected because of resignations and retirements, the Personnel Office said.

Among the 60 employees scheduled to leave are 32 engineers and scientists and 18 technicians. Most of them are stationed at the Center, although 12 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, data systems, quality assurance, electrical and mechanical engineering and mechanical equipment.

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

- more -

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

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) 483-6131.

MSC Director Christopher C. Kraft, Jr., 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."

- end -

May 19, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 22, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-108

SHUTTLE CONSUMABLE STUDY

A Request for Proposals (RFP) to study management of consumables onboard the Space Shuttle was issued today by the Manned Spacecraft Center, Houston.

"The concept of performing onboard consumables is not entirely new," MSC notes. It was used in early manned flight; however, because of space limitations and more complex flights, the monitoring of consumables reverted to the Mission Control Center.

The study calls for development of new management techniques which are economical but still meet all the requirements. In order to do this, MSC has budgeted approximately $160,000 in technology funds.

There are four objectives to the study:

1. Develop a consumable management philosophy
2. Select candidate concepts for the Shuttle
3. Define operational requirements

-more-

4. And, evaluate costs and reliability.

Consumables which are to be studied include electrical, the propellants, fluids, the environmental systems and the storage areas.

A firm-fixed-price research and development type of contract is planned for this study. Bids are due in by May 30. Drawings and plans are to be completed approximately one year after contract award.

The study will be monitored by the Mission Planning and Analysis Division.

-end-

May 22, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 22, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-109

MSC AWARDS RCS TEST PROGRAM TO BELL AEROSPACE

A $400,000 contract for a metal bellows system test program for the Reaction Control System (RCS) of the Space Shuttle orbiter has been awarded to Bell Aerospace Corporation, Buffalo, New York.

The award was made by the NASA Manned Spacecraft Center in Houston.

The contract effort is technically called an "Evaluation of Metal Bellows Technology for Space Shuttle RCS Application."

Bell Aerospace will use "USAF minuteman III post boost propulsion system technology (and apply it) to the requirements of the Space Shuttle RCS," according to the work statement.

A test program utilizing this technology will provide an indication of the capability of this kind of tank for RCS application while the orbiter is in space.

The Minuteman III tanks will be used for vibration testing.

-more-

Metallurgical inspection will follow to determine metal fatigue. At least three tank assemblies will be tested.

A cost-plus-fixed-fee type of contract has been signed.

Approximately 10 engineering personnel living in the Buffalo area will be employed during the lifetime of the contract. All testing and reports are to be completed by February 12, 1973.

-end-

May 22, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 22, 1972
1:00 P. M.

RELEASE NO: 72-110
RELEASED AT NASA HEADQUARTERS

Preparations are being made for possible firing of the Apollo 16 Active Seismic Experiment as early as May 23, 1972. The experiment emplaced at the Descartes site has gone through a complete lunar cycle and radioed data indicates that the central station and experiment have stabilized to the lunar conditions.

The venting of the nearby Lunar Module tanks which does produce seismic noises is decreasing to what appears to be a satisfactory level. Firing of the mortar charges will be commanded when and only if such LM disturbances are at an acceptable minimum.

NASA officials and the Principal Investigator are desirous of activating the mortar package as soon as acceptable conditions are met to avoid exposing the experiment to additional thermal cyclic conditions unnecessarily.

The Active Seismic Experiment is designed to measure the subsurface properties of the moon in the region of the landing site to a depth of about 150 meters (500 feet). This will be

-more-

done by launching four seismic charges at different times which will land at ranges from 150 to 1500 meters (5,000 feet) from a set of sensitive geophones.

Analysis of the velocity, attenuation and frequency of the resulting seismic waves will allow the investigators to obtain a greater understanding of the structure of the outer layers of the moon's surface.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 24, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-111

MSC CALLS FOR SHUTTLE THERMAL STUDY

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

In its instructions to industry, the space agency calls for Thermal Protection System (TPS) materials capable of sustaining surface temperatures in two ranges.

Range A included temperatures from 800 degrees to 1000 degrees Fahrenheit, and range B includes temperatures from 2500 degrees to 3000 degrees F.

The call to industry is to investigate materials which are "weight competitive and lower cost than the reusable surface insulation, " that has been studied to date.

"The reuse capability of 100 missions is desired; however, lesser capability will be considered and the use of ablative class materials is not excluded, " MSC has told the bidders.

The end product of the study includes detailed reports, identification of the selected materials and delivery of material to MSC for tests.

The contract calls for the delivery of two sheets of the material each sized two feet by four feet by 1/2 inch thick. One sheet must be developed for testing in the 800 to 1000 degree range and the other sheet for testing at the higher temperatures.

- more -

The proposal calls for a firm-fixed-price contract. MSC had budgeted approximately $200,000, in development funds. The agency has indicated that it desires to award four contracts competitively to aerospace companies.

Proposals are to be submitted by June 5 and the work is to be completed about 10 months after contract award.

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

- end -

May 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 23, 1972

Douglas K. Ward
713/483-5111

RELEASE NO: 72-112

APOLLO 16 ACTIVE SEISMIC EXPERIMENT FIRED

Scientists, early this morning, sent radio commands to the moon, launching three of the four explosive mortar charges left at the Descartes site by the Apollo 16 astronauts.

The explosive charges were designed to give investigators a greater understanding of the structure of the outer layers of the moon's surface to a depth of about 150 meters (500 feet).

The fourth grenade was not launched after an attitude sensor on the mortar pack showed the device may have been knocked out of position by previous firings. Dr. Robert L. Kovach of Stanford University, Principal Investigator for the Active Seismic Experiment, said it appeared the three mortars which were fired provided good data. He said a fuller assessment of the results from the experiment can be made in about one week, after investigators have a chance to review tapes of the data recorded at Manned Space Flight Network receiving stations at Goldstone, California and at Honeysuckle Creek, Australia.

The first grenade, containing 272 grams (.6 lb) of explosive and with a predicted range of 915 meters (3,000 feet), was fired at 12:48 a.m. CDT, May 23. A second grenade with an explosive charge of 45 grams (.1 lb) and a predicted range of 153 meters (500 feet) was fired 44 minutes later at 1:32 a.m.; and a third grenade

- more -

with a charge of 136 grams (.3 lb) and a predicted range of 305 meters (1,000 feet) was fired at 1:40 a.m.

Following the launching of the third grenade, the mortar package pitch sensor shifted to off scale high, indicating either that the sensor had failed or that one or more of the four stakes which anchor the mortar sub-pallet to the lunar surface had pulled out of the ground, allowing the package to pitch up and back more than 12 degrees from horizontal.

Scientists and NASA officials elected not to fire the fourth grenade, which contains a 454 gram (1 pound) charge and has a predicted range of 1,500 meters (5,000 feet), to avoid any possible damage to the rest of the science package experiments.

An analysis of data on the pitch sensor is underway in an effort to determine, if possible, if the sensor has failed or if the mortar package has shifted its position. If it can be determined that the sensor failed and that the mortar package is still properly oriented, it may still be possible to fire the fourth grenade.

- end -

May 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

John E. Riley
713/483-5111

FOR RELEASE:
May 23, 1972

RELEASE NO: 72-113

ASTRONAUTS MITCHELL AND IRWIN TO RETIRE

Astronauts Edgar D. Mitchell and James B. Irwin today announced plans to retire from their military services and NASA within the next several months.

The plans are subject to the approval of their respective services and effective dates are not yet available. Mitchell, a Navy captain, and Irwin, an Air Force colonel, have not announced their plans after retirement.

As lunar module pilot on Apollo 14, January 31-February 9, 1971, Mitchell was the sixth man to set foot on the moon. Irwin was the eighth man on the moon as lunar module pilot of Apollo 15, July 26-August 7, 1971. Both were selected as astronauts in April 1966.

Based on Irwin's plans to retire, a new backup crew for the Apollo 17 mission has been named, effective July 1. Crew members are John W. Young, commander; Stuart A. Roosa, command module pilot; and Charles M. Duke, Jr., lunar module pilot. Young and Duke were prime crewmen on Apollo 16, and Roosa was the prime CMP on Apollo 14 and backup CMP on Apollo 16.

The original Apollo 17 backup crew was made up of David R. Scott, commander; Alfred M. Worden, command module pilot; and Irwin, lunar module pilot.

- more -

Scott, Worden and Thomas K. Mattingly, prime command module pilot on Apollo 16, have been assigned to the Space Shuttle Program in the Astronaut Office. Mattingly recently became a father and requested an assignment which would allow him to spend more time with his family during the next six months than would be possible as a backup crewman.

- end -

May 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 24, 1972

Robert Gordon
(713/483-5111)

RELEASE NO: 72-114

SKYLAB STUDENT AWARD-NEBRASKA

The National Aeronautics and Space Administration has awarded the Skylab Medallion to Joel G. Wordekemper, of West Point, Nebraska, in recognition of his selection as a finalist in the nationwide competition of the Skylab Student Project.

Wordekemper, a student at Central Catholic High School, is the only Nebraska student selected as a finalist in the national contest. His contest entry "Plant Growth in Zero Gravity" is designed to compare root and stem growth in radish seedlings in a zero gravity environment.

The blue medallion has a black base with gold engraving and is embedded in heavy, polished plastic. The school and the student's teacher, are recognized for their contribution to his project, which has been judged worthy of the scientific objectives of Skylab. Several of the student experiments will

-more-

be selected and flown aboard the manned orbital laboratory in 1973.

Mrs. Lois M. Schaaf, Wordekemper's science teacher at Central Catholic High School, also was presented a Skylab Medallion.

The student winners, their teachers, and parents were guests of NASA and the National Science Teachers Association at the Marshall Space Flight Center, Huntsville, Alabama for three days earlier this month. Next year they have been invited to see the launch of Skylab at the Kennedy Space Center, Florida and to participate in a Skylab Student Education Conference.

Skylab, the experimental space laboratory will conduct scientific, technological, and biomedical investigations from the vantage point of space. The first manned mission will last up to 28 days, the second and third 3-man missions are planned to last up to 56 days.

The program will test equipment and techniques to gather information on Earth's ecology, oceanography, water management,

agriculture, forestry, geology and geography. Astronomy experiments will substantially increase knowledge of the Sun which sustains life on Earth. Habitability, biomedical, behavioral, and work effectiveness experiments will further evaluate man's capabilities in space flight.

-end-

May 24, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 25, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-115

MSC MEMORIAL WEEKEND VISITOR HOURS

The NASA Manned Spacecraft Center today announced visitor hours for the Memorial Day weekend.

The Center will be open from 9 a.m. to 4 p.m. on May 27 and 28. It will be closed on May 29 in observance of Memorial Day.

It was noted also that all buildings will be without air conditioning on May 27 and 28. The cooling and heating system will be taken out of service for major maintenance.

-end-

May 25, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 26, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-116

HUNTOON MOVES TO NEW JOB UNDER INTERGOVERNMENTAL PERSONNEL ACT

The Manned Spacecraft Center has logged the first NASA assignment under a personnel lend-lease law designed to facilitate the mobility of trained personnel between various national, state and local government agencies.

The first man to move from NASA to another organization is Harrison Huntoon of the Management Analysis Office. He will serve one to two years as chief of Planning and Evaluation for the Galveston (Texas) County Health District.

His move is being made under the Intergovernmental Personnel Act of 1970.

President Nixon has directed Federal departments and agencies to make effective use of the personnel mobility provision to improve the performance of services by national, state and local governments.

He also has encouraged state governors to make use of the act.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 26, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-117

LOW DENSITY ABLATOR STUDY CONTRACT AWARDED

The Manned Spacecraft Center has announced that it has signed a $168,000 contract with General Dynamics Corporation for a design study of ablative materials with qualities of low density.

Such materials could be used in heat protection of the Space Shuttle orbiter.

The work will be done in the company's Convair Division, San Diego, California.

MSC calls for reports and drawings describing a Thermal Protective System (TPS) using low density ablator materials. One of the options the contractor will consider is the direct bonding of the material to the orbiter. Another is the investigation of mechanical attachment techniques. A third is the application of roughly formed materials which later could be machined to the shape of the vehicle.

-more-

Sample tiles sized 12 x 12 inches with thickness of two inches down to one inch will be delivered to MSC for specialized testing.

A firm-fixed-price contract has been awarded.

Approximately eight San Diego area engineering personnel will be employed under the terms of the contract.

-end-

May 26, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D. C. 20546
Phone: (202) 755-8370

72-117A

FOR RELEASE:
11 AM, FRIDAY,
May 26, 1972

Miles M. Waggoner
(Phone: 202/755-8370)

RELEASE NO: 72-113

VON BRAUN TO RETIRE FROM NASA

Dr. Wernher von Braun, Deputy Associate Administrator has retired from NASA to join Fairchild Industries as Corporate Vice-President for Engineering and Development. The move is effective July 1.

Commenting on Dr. von Braun's decision, Dr. James C. Fletcher, NASA Administrator said:

"Dr. von Braun's decision to retire from NASA is a source of great regret to all of us at the agency.

"For more than a quarter of a century, he has served the United States as the leader in space rocket development. His efforts first put the United States in space with Explorer I. As Director of the Marshall Space Flight Center for over 10 years, he directed the development of the world's most powerful rocket, the Saturn V -- which has taken 10 American astronauts to the surface of the Moon.

"All of us in NASA will miss the daily stimulation of his presence, but we are confident that we will continue to have the benefit of his inspiration and counsel in the continuing exploration and use of space."

Dr. von Braun said, "I leave NASA with a deep feeling of gratitude for the wonderful and unique opportunities the agency has given me during the last 12 years.

"Most recently I have devoted my energies to help define future program objectives for the agency. I am leaving with the knowledge that NASA has enough well thought out plans to keep it moving ahead for many years to come, even though some of these may have to be deferred because of budget constraints.

"I would like to devote my time now to help implement some space projects I feel are of particular importance. I think I can do this best in private industry where the tools of progress are being made.

"I have enjoyed to the fullest, my past association with the space agency and those fellow scientists and engineers with whom I worked.

"I look forward to a continuing rewarding association with them and wish them luck and success."

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Douglas K. Ward
(713) 483-5111

FOR RELEASE:
May 30, 1972

RELEASE NO: 72-118

APOLLO 16 SUBSATELLITE APPARENTLY CRASHES

The Particles and Fields Subsatellite placed in lunar orbit by the Apollo 16 astronauts has apparently crashed into the lunar surface after completing 425 revolutions of the moon.

Radio contact with the 40 kg (90 lb.) subsatellite was not re-established when it should have reappeared on the front-side of the moon on its 426th revolution.

The last tracking data, from the 416th revolution, showed the subsatellite in an orbit which brought it to within 5 km (2.8 nm) at a point on the back-side of the moon located at 10.16 degrees north latitude and 111.94 degrees east longitude.

The subsatellite is believed to have hit the moon near its last known perilune (low point of orbit) at about 5 p.m. CDT, May 29.

The subsatellite, containing three scientific experiments, was ejected from the scientific instrument module bay of the Apollo 16 command and service module April 24, before the astronauts fired their spacecraft main engine to take them out of lunar orbit.

- end -

May 30, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
May 31, 1972

Terry White
713/483-5111

RELEASE NO: 72-119

APOLLO 15 CREW GETS COLLIER TROPHY

The Robert J. Collier Trophy, one of the nation's oldest aviation awards, tonight will be presented to the Apollo 15 crew in a dinner ceremony at the Sheraton Park Hotel in Washington, D. C.

Vice President Spiro Agnew will present the Collier Trophy to David R. Scott, James B. Irwin and Alfred M. Worden "for demonstrating superb skill and courage, and to Dr. Robert R. Gilruth as representative of the engineering genius of the manned space flight team, culminating in Apollo 15 --- man's most prolonged and scientifically productive lunar mission." Apollo 15 landed in the Hadley Rille region of the Moon in July 1971, for three days of extensive exploration and first use of the electric-powered Lunar Roving Vehicle.

The Collier Trophy was established in 1912 by the Aero Club of America -- later to become the National Aeronautic Association -- for the greatest achievement in aeronautics or astronautics in the United States toward improving performance, efficiency and safety of air or space vehicles. The trophy earlier had gone to the original seven Mercury Astronauts, the Apollo 8 and Apollo 11 crews.

- end -

May 31, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 1, 1972

News Center
713/483-5111

RELEASE NO: 72-120

BOARD REPORTS CAUSE OF T-38 CRASH

The fatal crash of a NASA T-38 aircraft on Matagorda Island, Texas, January 20, 1972, was due to the inability of the pilot to attain visual flight conditions at sufficient altitude to effect a pullout, according to the Accident Investigation Board.

The Board, appointed by Dr. Christopher C. Kraft, Jr., Director of the NASA Manned Spacecraft Center, concluded that the crew encountered a weather condition which the Board believes was interpreted by the pilot as a cloud deck when in reality it was a fog bank which was moving into the approach area of the runway which the aircraft was approaching.

Examination of the aircraft revealed that the pilot initiated an attempt to pull out of the landing pattern, but at an altitude too low to avoid impacting the ground.

A complete investigation of the aircraft components and onboard data recording devices indicated that all aircraft systems were operating normally prior to the impact. The aircraft impacted 3,740 feet short of the runway at approximately 3:27 p.m. CST. NASA Manned Spacecraft Center pilots Stuart M. Present and Mark C. Heath were killed in the crash.

Members of the Investigation Board were Harold E. Ream, Chairman, MSC Aircraft Operations; Astronaut Joe H. Engle; Conway H. Roberts, Flight Crew Operations Directorate; George L. Bosworth, Aircraft Systems Quality Assurance, and Dr. Clarence A. Jernigan, M. D., Medical Officer.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 1, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-121

MSC EXTENDS RPP THERMAL CONTRACT WITH LTV

The NASA Manned Spacecraft Center has renegotiated and extended its thermal protection system contract with LTV Aerospace Corporation, Dallas, Texas. The contract provides for advanced development of a substance which possibly could be used on the Space Shuttle orbiter.

The substance, called Reinforced Pyrolyzed Plastics (RPP), has been under study since March 1971.

Approximately $493,500, of research and development funds have been set aside for this current effort. The work is technically called "Development of a Fail Safe Design Oxidation Resistant Reinforced Carbon Thermal Protection System for the Wing Leading Edge of a Space Shuttle Orbiter"; short title RPP.

Together with previous funds expended on the study, the total dollars set aside are $767,500.

-more-

RPP is basically an all-carbon material reinforced for strength and treated to resist oxidation at extreme temperatures. Under earlier contracts, LTV developed fabrication techniques and coating methods. It also did extensive testing to determine if the material meets the 3,000 degree Fahrenheit temperature and 100-mission requirements.

The major goal of this investigation is to develop the wing leading edge design that not only can meet these requirements but also provide for a "fail safe" mission.

Fail safe means that the material must be capable of accomplishing one reentry mission without depending upon the oxidation-resistant coatings.

A cost-plus-fixed-fee type of contract has been signed.

Approximately two dozen engineering personnel living in the Dallas area will be employed during the lifetime of the contract.

Testing will be accomplished at the contractor's Dallas plant, and he will deliver four 10 by 12 inch panels to MSC for evaluation.

All testing and reports are to be completed by mid-January, 1973.

-end-

June 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 2, 1972

Robert Gordon
(713/483-5111)

RELEASE NO: 72-122

MAJOR SKYLAB TEST COMPLETED

Operational aspects of pre-flight verification-type test of the NASA Skylab Workshop has been completed at the McDonnell Douglas Corporation plant at Huntington Beach, California.

Participating in the test were two teams of astronauts who performed checkout activities in two six-hour shifts daily. Their work inside the Workshop was monitored by closed circuit television.

The 14.4-meter (48-foot) long workshop, 6.6 meters (22 feet) in diameter, is scheduled to be launched early next year as part of the NASA Skylab space station. McDonnell Douglas built the Workshop under the direction of the NASA Marshall Space Flight Center, Huntsville, Alabama.

During the three-day test, Skylab astronauts and engineers activated a major portion of the Workshop to

-more-

demonstrate that it will support activities planned for the initial 28-day mission and two later 56-day missions. Total mission time, manned and unmanned, will be eight months.

Astronauts taking part in the test woked with the Workshop hardware in much the same way as they are expected to do in space. They demonstrated that they can operate experiment hardware, and use the life support systems, including food preparation, refrigeration and water.

The test team checked to see that installed and part of the stowed equipment was accessible and that mechanical and electrical equipment functioned as intended. The crewmen also worked with tools to be used during the Earth orbital missions to mount, stow and maintain equipment.

The test team was composed of NASA Skylab officials, McDonnell Douglas engineers and principal investigators for the scientific and technical experiments on Skylab.

A practice test recently conducted in the Workshop "1-G" trainer at the NASA Manned Spacecraft Center in Houston verified procedures for the California test.

The test at Huntington Beach is one of the last two

major tests there for the Workshop. A flight demonstration or "all systems" test will be conducted before the spacecraft is shipped to the NASA Kennedy Space Center in Florida this summer.

Members of the Skylab crew taking part in this test include:

Charles Conrad, Jr., Paul J. Weitz, Joseph P. Kerwin, the prime Skylab 2 crew; Russell L. Schweickart, Story Musgrave, and Bruce McCandless II, the Skylab 2 backup crew; Alan Bean, Owen Garriott and Jack R. Lousma, the Skylab 3 prime crew; Vance D. Brand, William E. Lenoir and Don L. Lind, the Skylab 3 and 4 backup crew.

-end-

June 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 2, 1972

Douglas K. Ward
(713/483-5111)

RELEASE NO: 72-123

ZARCARO NAMED DEPUTY EARTH RESOURCES PROGRAM OFFICE

John G. Zarcaro, formerly Chief of the Science Mission Support Division at the NASA Manned Spacecraft Center, has been named Deputy Manager of a newly-formed Earth Resources Program Office at the Center.

Mr. Zarcaro, a native of Asbury Park, New Jersey, will assist the Program Manager, Clifford E. Charlesworth, in the coordination, direction and management of the Center's earth resources program. As Deputy Manager, Mr. Zarcaro will have full authority to issue technical direction and to establish program office policy on behalf of the Program Manager.

NASA's Earth Resources Technology Satellite (ERTS), scheduled for launch this summer, and its Skylab missions, beginning in 1973, will gather large amounts of new information on Earth's environment and its resources. The Earth Resources Program Office will have a major role in both these missions,

-more-

coordinating efforts at MSC to provide "ground truth" information used in validating data collected from space and helping obtain the maximum possible practical return from the information gathered. It will be responsible for coordinating the design and development of experiments and equipment which will be flown in aircraft and spacecraft to survey earth resources from vantage points ranging from a few thousand feet to hundreds of miles above Earth's surface. And it will work with other organizations at MSC, the outside scientific community, and other governmental agencies and groups in determining future mission objectives and payloads.

Mr. Zarcaro, 39, obtained his Bachelor of Science degree from the Massachusetts Institute of Technology in 1954. Before joining the Manned Spacecraft Center in 1962, he served five years as a Navy jet pilot in anti-submarine activities, was a research engineer at Princeton University's Forrestal Research Center, and was Project Manager of the Navy Free Stream Test Facility, Lakehurst,New Jersey. Mr. Zarcaro has been closely involved with all U.S. manned space programs to date -- Mercury, Gemini, Apollo and Skylab. His recent assignments with NASA

include Mission Staff Engineer for the Apollo Spacecraft Program Office; Chief of the Lunar Missions Office and Chief of the Science Missions Support Division.

Mr. Zarcaro is married to the former Rose Veronica Gonzalez of New Orleans, Louisiana. The couple live in Seabrook, Texas with their children John, 14, Michael, 12, Rose Ann, 10, and Anthony 7.

-end-

June 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 6, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-124

TRW WINS SHUTTLE PAYLOAD STUDY CONTRACTS

Two study contracts relating to development and safety concepts for containerized payloads that might be used on the Space Shuttle have been awarded to TRW Systems Group, Redondo Beach, California.

The work will be done for the NASA Manned Spacecraft Center. MSC has awarded $134,160 in technology funds for the performance of the studies; of this amount, $67,138 has been allocated for a contract called "Space Shuttle Sortie Payload Safety Criteria Study" and the balance is for a contract called "Space Shuttle Sortie Payload Systems Compatibility Criteria Study."

The products of these studies, "....will result in the definition of criteria which will form the basis of specifications to be developed later when quantitative Shuttle data is available."

-more-

TRW will concentrate on sortie mission payloads which will be mounted on pallets, and operated from a space vehicle orbiting above Earth from seven to 30 days.

Both contracts are firm-fixed-price studies. They are to be concluded by May 18, 1973.

Four companies competed for the award which went to TRW.

-end-

June 6, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 6, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-125

GRUMMAN AWARDED SHUTTLE CPI THERMAL CONTRACT

A $248,500 contract to study and develop test samples of Closed Pore Insulation (CPI) for possible thermal use on the Space Shuttle orbiter has been awarded to the Grumman Aerospace Corporation, Bethpage, New York.

The award was made by the NASA Manned Spacecraft Center using technology funds set aside for the Shuttle.

CPI is a research and development effort by NASA to find materials capable of withstanding the varied environments through which the orbiter must fly.

"CPI material through closed pore construction offers unique advantages over other known materials since it cannot absorb water and has sufficient strength to permit incorporation of mechanical attachments for direct application to the (Space Shuttle) primary structure, "MSC has told the contractor.

-more-

Grumman will furnish the agency with a dozen test speciments of varying sizes. The "titles" will be delivered to MSC's Structures and Mechanics Division for further testing.

The firm-fixed-price award runs through December 1, 1972.

-end-

June 6, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 6, 1972

Douglas K. Ward
(713/483-5111)

RELEASE NO: 72-126

SCIENTISTS REPORT EVIDENCE OF LUNAR CRUST, MANTLE AND CORE

Scientists studying seismic signals produced when a large meteoroid struck the moon May 13, have confirmed the moon has a crust 65 kilometers (38 miles) thick. They also report evidence of a lunar mantle and possibly a core.

Dr. Gary Latham of Columbia University's Lamont Doherty Geological Observatory, Palisades, New York, said although evidence for a lunar core is still very tentative, seismic signals appear to show a change in velocity indicating a change of state in lunar material at a depth of about 1,000 kilometers (600 miles).

Dr. Latham, principal investigator for the network of four passive seismic stations placed on the moon by Apollo astronauts, said the lunar crust, measured in the Fra Mauro region where Apollo 14 landed, is about twice as thick as the crust beneath the continents of Earth.

-more-

He said the lunar highlands appear to be solid rock below the thick regolith or soil-like layer which covers them. This, he said, is consistant with evidence from analysis of lunar samples, which suggests the highlands are remnants of a primitive crust formed by extensive melting of the lunar surface shortly after the moon was formed.

Below the crust, beginning at a depth of about 65 kilometers (38 miles), Dr. Latham said a change in reflected seismic waves shows the moon has a mantle similar to Earth's. The seismic velocity of rock in the lunar mantle is about 8.2 kilometers per second, Dr. Latham said. This compares with a seismic velocity of about nine kilometers per second measured for the same layer during the Apollo 15 mission. Dr. Latham said the 8.2 km/sec velocity appear to be the more valid reading and is more consistent with known rock types at pressures which would be expected at that depth. Rocks rich in ferro-magnesian minerals such as olivine and pyroxene are dominant in Earth's mantle and also produce seismic velocities of about 8.2 km/sec.

The May 13 meteoroid impact was the largest recorded in the three years Apollo science stations have been operating on the moon. Dr. Latham said the meteoroid struck the moon

142 kilometers (88 miles) due north of the Apollo 14 landing site at Fra Mauro, releasing energy equal to an explosion of about 200 tons of TNT. He said the meteoroid was about 2 meters (6 feet) in diameter and gouged out a crater about 100 meters (300 feet) in diameter.

Dr. Latham said the University of Texas, McDonald Observatory at Fort Davis will attempt to observe the crater and pinpoint its location as soon as conditions permit.

-end-

June 6, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Jack Riley
713/483-5111

FOR RELEASE:
June 7, 1972
10:00 a.m.

RELEASE NO: 72-127

BRIG. GEN. JAMES A. MC DIVITT RETIRES

Brig. Gen. James A. McDivitt, 42, today announced his retirement from the Air Force and NASA, effective September 1.

On that date, the former astronaut will become Senior Vice President, Consumer Power Company, which has headquarters in his hometown of Jackson, Michigan. He will be on terminal leave from July 1 until his retirement date.

General McDivitt, who commanded the Gemini 4 and Apollo 9 space missions, has been Special Assistant to the Center Director for Organizational Affairs since May 1, 1972. He served as Manager, Apollo Spacecraft Program from September, 1969 through April, 1972, which encompassed Apollo missions 12 through 16. He left the Astronaut Office in June, 1969 to become Manager for Lunar Landing Operations in the Apollo Spacecraft Program Office.

General McDivitt's election to the executive position with Consumer Power Company was announced today by A. H. Aymond, Chairman of the Board and President. Company officials responsible for finance, law, controller and public relations will report to General McDivitt, Aymond said.

Consumer Power Company is one of the 10 largest operating electric and gas utilities in the United States and operates throughout Michigan's lower peninsula outside Detroit. General McDivitt has resigned from the firm's board of directors to which he was elected in January, 1971.

- more -

General McDivitt joined the Air Force in 1951 and flew 145 combat missions during the Korean War. He was selected as a NASA astronaut in September, 1962, after experience as an Air Force experimental test pilot.

In June, 1965, he commanded the 4-day Gemini 4 mission during which the late Astronaut Edward H. White II performed the first U.S. extravehicular activity. In March, 1969, he commanded the 10-day Apollo 9 mission which first demonstrated the complete Apollo spacecraft in earth orbit. Highlights of the mission included the first flight of the lunar module, the first rendezvous and docking between the lunar module and the command module, the first joint operation of the two modules, and an extravehicular period.

General McDivitt is a graduate of the University of Michigan. He is married to the former Patricia A. Haas of Cleveland, Ohio, and they are the parents of four children. His parents, Mr. and Mrs. James McDivitt, live in Jackson.

- end -

June 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713) 483-5111

FOR RELEASE:
June 7, 1972

RELEASE NO: 72-128

MSC ISSUES SHUTTLE OMS VALVE DEVELOPMENT RFP

A request to provide prototype helium solenoid isolation valves for testing in the Orbital Maneuvering System (OMS) of the Space Shuttle has been issued by NASA to the aerospace industry.

The call for competitive bids went to ten firms recently from the Manned Spacecraft Center in Houston.

MSC has told contractors that, "The ...OMS of the Space Shuttle will be a pressure fed rocket propulsion utilizing helium pressurant and nitrogen tetroxide and hydrazine base Earth storable propellants.... Existing Apollo helium isolation valves were designed for single mission usage and....are not sufficiently contamination tolerant or propellant compatible to economically and reliably satisfy the Space Shuttle requirements."

A more reliable system must be developed.

The end product of the effort will be the delivery of prototype valves to MSC for test and evaluation. The contractor also will provide reports including cost studies, current technical state-of-the-art of helium valves and contractor test results.

A cost-plus-fixed-fee research and development contract is planned. Proposals are to be submitted by June 12 and the work is to be finished one year after contract award.

- more -

The OMS provide the rocket propulsion which the Orbiter uses while flying in space.

The Space Shuttle will be a manned reusable space vehicle which will carry out various missions in Earth orbit. It will consist of a manned, reusable orbiter powered by three large liquid rocket engines mounted "piggyback" on a large expendable propellant tank plus two large recoverable solid propellants rockets.

The orbiter, about the size of a DC-9 jetliner, will be piloted by two men in space who will fly it back to Earth and land it like an airplane.

Typical shuttle missions under study include:

1. The deployment of a meteoroid satellite,
2. A large space telescope mirror,
3. The deployment of an astronomy explorer satellite,
4. The deployment of a High Energy Astronomical Observatory (HEAO) and,
5. An infrared telescope manned mission.

- end -

June 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 9, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-129

MSC CALLS FOR BID ON SHUTTLE THERMAL TEST UNIT

A request to design and then build a heating unit capable of producing high temperatures for testing materials used externally on the Space Shuttle orbiter has been issued by NASA.

The Request for Proposals (RFP) was released recently by the Manned Spacecraft Center in Houston.

MSC desires to have a unit--technically called a High Temperature Leading Edge Heating Array--built to a size capable of testing a section of a wing span 30 inches long. The unit must be capable of generating surface temperatures up to 3500 degrees Fahrenheit.

The effort will be divided into two phases, according to the instructions to industry. Phase I consists of a study of the design approach with subsequent analysis. Phase II consists of the fabrication of the full-scale array.

It is anticipated that some areas of the external surfaces

-more-

of the orbiter will heat up approximately 3200 degree F for short periods when the Space Shuttle returns from space.

Several materials are likely candidates for the Space Shuttle, including reinforced carbons known as pyrolyzed plastics.

MSC has set aside approximately $70,000 in technology funds for the first phase of this development. Additional funds are set aside for the Phase II effort.

Contractor bids on the leading edge heating unit are due at MSC by June 18. A firm-fixed-price research and development contract is called for by MSC. The period of performance for both phases of work is approximately one year from contract award, and the work will be monitored by the Structures and Mechanics Division.

-end-

June 9, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 9, 1972
2:00p.m.

Douglas K. Ward
(713/483-5111)

RELEASE NO: 72-130

ITEK AMPS CONTRACT

The NASA Manned Spacecraft Center has awarded an estimated $1.8 million contract to Itek Corporation, Optical Systems Division, Lexington, Massachusetts for three multispectral camera systems to be flown aboard MSC's earth resources aircraft in conjunction with upcoming Skylab missions.

The Airborne Multispectral Photographic System (AMPS) will be a modified version of the multispectral photographic camera which will be flown on the earth-orbital Skylab missions as part of experiment S-190. The Skylab S-190 multispectral photographic facility will obtain photographs from an altitude of 378 kilometers (235 miles), each showing more than 20,000 square kilometers (8,000 square miles) of earth's surface. Scientists will evaluate the photographs, taken with a variety of film types and filter combinations, as an aid in detecting and assessing water pollution, in

-more-

mapping geological features, in assessing urban and metropolitan growth and land use patterns, and in inventorying crop, range land and forest resources.

The AMPS will be similar to the Skylab experiments but will be modified for operation from aircraft flying at altitudes from about 16,000 meters (10,000 feet) to about 96,000 meters (60,000 feet). The aircraft photographs will provide greater resolution but with a smaller field of view than comparable photos from space and will be used to validate conclusions drawn from space photography.

The cost-plus-incentive-fee contract calls for delivery of the first AMPS by January 29, 1973. The second camera system is to be delivered by March 26, and the third by May 21. The S-190 multispectral photographic camera to be flown aboard Skylab is also being built by Itek under a previous contract with MSC.

-end-

June 9, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 11, 1972
2 p.m.

Don J. Green
(713) 483-5111

RELEASE NO: 72-131

MSC EXTENDS PROTECTIVE SERVICES CONTRACT

The Manned Spacecraft Center has extended its contract with Wackenhut Service, Incorporated, Coral Gables, Florida, for one year for protective services.

Protective services include fire prevention, security, emergency ambulance calls and safety. The work will be performed at NASA's field center located in Houston, Texas.

The contract is a cost-plus-award-fee and is valued at $1,500,000. Together with previous funds expended for these services, the total dollars set aside are $4,336,500.

Approximately 140 Houston-area personnel are employed under the terms of the contract.

The contract extension represents the third -- and final -- year of the program, and the extension will remain in effect from July 1, 1972, through June 30, 1973.

Wackenhut was the successful bidder from among five companies who in 1970 bid competitively for the award.

- end -

July 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 20, 1972

Don J. Green
(713) 483-5111

RELEASE NO: 72-132

HONEYWELL AWARDED IMU STUDY CONTRACT

The Manned Spacecraft Center has announced that it has signed a $125,000 contract with the Florida Operations of Honeywell, Inc., St. Petersburg, for a study of an Inertial Measurement Unit (IMU) program for the Space Shuttle orbiter.

Honeywell will develop alternative approaches to allow NASA to assess the feasibility of adapting existing IMU's, called off-the-shelf items, for the Space Shuttle.

A firm-fixed price contract has been awarded, and the report is to be completed by October 15.

- end -

June 20, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 20, 1972

Terry White
(713) 483-5111

RELEASE NO: 72-133

BATTERY ACCIDENT BOARD FINDINGS

Faulty design of a water-tight battery enclosure used in underwater astronaut training at the NASA Manned Spacecraft Center has been pinpointed as the primary contributing factor to a February 29 explosion which killed one man and injured another.

In a report submitted to NASA Administrator Dr. James C. Fletcher, the accident investigation board said that the battery enclosure was not designed to eliminate explosive mixtures of hydrogen and oxygen and ignition sources, but rather to withstand high internal pressures.

While it is generally known that lead-acid storage batteries give off gas, many people do not realize that storage batteries give off hydrogen continuously -- whether in use or not. Near the end of a charge, greater quantities of hydrogen and oxygen are given off. Hydrogen and oxygen are easily ignitible over a wide range of mixture proportions.

In reconstructing the events leading up to the accident, the investigation board determined that an explosive mixture of hydrogen and oxygen that was present in the battery was detonated when a switch was closed.

- more -

The February 29 battery box explosion in the Center's crew training building killed Kirby C. Dupree and injured James E. Scott, both employees of Brown & Root-Northrop.

The board has recommended the use of power supplies other than batteries, detailed engineering review of all equipment designed for the training facility, inclusion of battery handling procedures in safety manuals, and regular review of designs and operating procedures by technical experts and by safety engineers.

The accident investigation board is chaired by Clarence E. Propp of the MSC Power and Propulsion Division. Board members are Dr. Charles K. LaPinta, James B. Trout, Louie G. Richard, Harley F. Erickson, and Edwin J. Burke. Douglas L. Campbell of the MSC Safety Office serves as board consultant.

- end -

June 20, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 22, 1972

Terry White
(713/483-5111)

RELEASE NO: 72-134

MSC EMPLOYEES GET APOLLO 16 AWARDS AT MSFC

Twelve NASA Manned Spacecraft Center employees and two engineering teams today will receive Apollo 16 achievement awards in ceremonies at the NASA Marshall Space Flight Center, Huntsville, Alabama.

Receiving NASA Exceptional Service Medals will be Melvin F. Brooks, Richard R. Baldwin, Gary A. Coultas, William C. Fischer, Tommy W. Holloway, James C. McPherson, David L. McCraw, Archibald E. Morse, Jr., Jones W. Roach, John R. Seviere, James C. Stokes, Jr.and Clinton L. Taylor.

Accepting the Apollo 16 Engineering Support Team Group Achievement Award will be Ronald W. Kubicki of the Apollo Spacecraft Program Office, and Paul D. Gerke of the Lunar Surface Project Office will accept a similar award for the Ultra-Violet Camera Team. The Engineering Support Team is being recognized for its real-time analysis of the Apollo 16

-more-

service propulsion system problem which delayed the lunar landing by two revolutions.

A total of 25 Exceptional Service Medals will be given employees of MSC and other NASA field centers, four Group Achievement Awards, eight Exceptional Scientific Achievement Medals; 10 Public Service Awards to individual aerospace contractor employees and three industry Public Service Group Achievement Awards.

-end-

June 22, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
June 23, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-135

SKYLAB SMEAT TEST

Three astronauts will spend up to 56 days in an altitude test chamber at the NASA Manned Spacecraft Center beginning no earlier than July 19 to obtain medical data and evaluate medical experiment equipment for Skylab, which is scheduled for flight in 1973.

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate Skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere

-more-

for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Although the maximum duration of the test is 56 days management officials may terminate the test early when test objectives are met and experiment data and operational procedures are verified.

The crew day will start at 7 a.m. CDT and end at 11 p.m. CDT. Three one-hour eat periods are scheduled daily for each crewman.

Certain medical experiments will be performed to duplicate Skylab-2 (the first manned mission) for the first 28 days and for the remaining 28 days, will duplicate the 56-day mission. The crew is scheduled a day-off once each week.

Selected crew discretion activities and educational programs are scheduled and will include courses in solar physics, astrodynamics, electronics, Command and Service Module, commercial pilot's licenses, and Russian language. The chamber's closed-circuit television will be utilized for the courses.

The test will be conducted in the 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 has been modified to resemble the crew quarters area of the Skylab Orbital Workshop.

Simulating the flight environmental conditions, the cabin atmosphere will be 70 percent oxygen and 30 percent nitrogen at a total pressure of 5 psia. Carbon dioxide levels will be controlled (4.0 to 5.5 mm Mercury range), and temperature will remain within 67 to 78 degrees Fahrenheit. Hunidity 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.

Crippen, 35, is a lieutenant commander, USN, and became an astronaut in 1969. Born in Beaumont, Texas, he is a 1960 graduate of the University of Texas and received his commission through the Navy's Aviation Program at Pensacola, Florida.

Dr. Thornton, 43, has been a scientist-astronaut since

August 1967. Born in Faison, North Carolina, Dr. Thornton received a bachelor of science degree in physics and a doctorate in medicine from the University of North Carolina in 1952 and 1963, respectively.

Bobko, 34, is a major in the USAF and has been an astronaut since 1969. A native of New York, New York, Bobko is a member of the first graduating class of the Air Force Academy in 1960.

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 is a series of experiments aimed at research, earth survey, solar astronomy, and selected scientific and manufacturing experiments.

The launch of an unmanned workshop will be followed by three separate manned launches of three-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.

-end-

June 23, 1972
NASA — MSC

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 3, 1972

Milt Reim
(713/483-5111)

RELEASE NO: 72-137

DUNSEITH, NEW DEPUTY DIRECTOR OF FLIGHT OPERATIONS

Lynwood C. Dunseith has been appointed Deputy Director of Flight Operations, Manned Spacecraft Center by Christopher C. Kraft, Jr., Center Director.

In his new position he will assist the Director of Flight Operations in planning and directing all phases of flight operations activities.

Dunseith's most recent position at MSC was as Assistant Director for Computation and Flight Support with responsibility for planning, coordinating, and directing all Center computing facilities.

He began his career in the space program at NASA Lewis Research Center, Cleveland, Ohio, where he was involved with work on rocket engines. In 1959, he joined the NASA Space Task Group at Langley, Virginia, in the development of the real-time mission support computer program for Project Mercury.

-more-

From 1962 to 1966, as head of the Flight Software Branch, Mission Planning and Analysis Division, he was instrumental in the development and operation of the Mission Control Center Real-Time Computer Complex.

Dunseith became chief of the Flight Support Division in 1967 and was responsible for coordinating and establishing requirements for mission control ground instrumentation for MSC spaceflight missions, including control centers, and interface with network and launch facility mission support sites. He was also responsible for the operation of the Manned Spaceflight Mission Control Center in support of all manned spaceflight programs until December 1970.

He was born July 4, 1931 in Lafayette, Alabama. In 1953 he was graduated from Auburn University with a BS degree in chemical engineering. He then served in the U.S. Air Force until joining Lewis in 1957.

Dunseith is the recipient of the MSC Certificate of Commendation, December 1968, NASA Exceptional Service Medal, January 1969; and Arthur Fleming Award 1970. He is a member of Phi Lambda Upsilon, professional engineering society.

He is married to the former Janie Martin of Bloomington, Texas, and they have three children, Robin, 12, Lynwood C., Jr., 4, and Andrew,2. The family resides in the NASA area.

-end-

July 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

John E. Riley
(713/483-5111)

July 3, 1972

RELEASE NO: 72-138

APOLLO-SOYUZ TEST PROJECT MEETING

Approximately 25 Soviet visitors are scheduled to arrive at the Manned Spacecraft Center Thursday, July 6, for two weeks of meetings on the Apollo-Soyuz Test Project, a cooperative rendezvous and docking space mission planned for 1975.

President Nixon announced agreement to conduct the mission during his visit to Moscow in May this year.

Senior members of the U.S.S.R. delegation are Boris N. Petrov, Chairman of the Soviet Intercosmos Council, and Konstantin D. Bushuyev, ASTP Director for the U.S.S.R. Mrs. Petrov is expected to accompany her husband.

Glynn S. Lunney, ASTP Project Manager for the U.S. said goals of the meeting will be the preliminary definition of all elements of the test mission, including defining the mission plan and detailed design requirements for the compatible systems.

The number of working groups in each delegation has been increased from three to five. They are: No. 1, Mission Planning and Operations;

- more -

No. 2, Guidance and Control; No. 3, Docking Mechanism Design; No. 4, Communications; No. 5, Life Systems and Crew Transfer.

Chairmen of the U.S. working groups, in order, are: M. P. Frank, Flight Director; Donald C. Cheatham, Assistant Chief for Engineering and Development, Guidance and Control Division; Donald C. Wade, Assistant Chief, Structures and Mechanics Division; R. H. Dietz, Head, ASTP Office, Telemetry and Communications Systems Division; and Robert E. Smylie, Chief, Crew Systems Division.

The Soviet visitors are expected to arrive in Houston early Thursday morning. A welcoming ceremony and exchange of documents is scheduled for 3 p.m. Thursday at MSC. The first working meeting is scheduled for Friday afternoon after each group has had an opportunity to read the documents exchanged on Thursday. The groups will work Mondays through Saturdays during the visit.

This will be the second meeting of the full delegation at MSC. The group met here in June 1971, to discuss the feasibility of compatible rendezvous and docking systems. In addition, the U.S. delegation has visited Moscow twice and individual working groups have exchanged visits during the past two years.

- end -

July 3, 1972
NASA — MSC

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 5, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-139

SHUTTLE AIRCRAFT CONTRACT

Trans Continental Air Transport of Dallas, Texas has been awarded a contract by the NASA to furnish charter aircraft service between the Manned Spacecraft Center and the Marshall Space Flight Center, Huntsville, Alabama for a 12-month period ending June 1973.

Trans Continental Air Transport will operate three round trips each week between MSC, Houston, and the MSFC facility in Alabama. The aircraft will depart from Ellington Air Force Base and land at the Redstone Arsenal Army Airport at Huntsville.

The contractor will operate a turbine-powered propeller driven/Lockheed Electra aircraft with a seating capacity of 94 passengers. Total value of the one year contract is $608,447.

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July 5, 1972
NASA — MSC

COMMUNIQUE ON RESULTS OF APOLLO-SOYUZ TEST PROJECT MEETINGS

July 6-18, 1972

A meeting with the representatives of the Academy of Sciences of the USSR and National Aeronautics and Space Administration was held at the Manned Spacecraft Center, Houston, USA, on July 6-18, 1972. The meeting was for the purpose of discussing and coming to agreements on discussions for conduct of work for realization of compatible means of rendezvous and docking for Soviet and American spacecraft and systems.

The Soviet delegation was headed by the President of Council of INTERCOSMOS (AS-USSR), Boris N. Petrov, and the Soviet Technical Director of Project, Konstantin D. Bushuyev. The American delegation was headed by Christopher C. Kraft, Director, Manned Spacecraft Center-NASA, and Glynn S. Lunney, Technical Director of the Project.

The delegates based their discussions on the agreement between the USSR and the USA on cooperation in the exploration and peaceful use of outer space, that was signed in Moscow by President of the Council of Ministers of the USSR, A. N. Kosygin, and President of the United States, Richard M. Nixon.

This agreement provides for the docking in space of a Soviet type Soyuz spacecraft and the American type Apollo spacecraft in 1975. Delegations discussed the specific technical problems connected with

the realization of such a flight. The first experimental flight with docking in space of the American and Soviet spacecraft, including transfer of cosmonauts and astronauts from one spacecraft to another will provide for the test of compatible means of rendezvous and docking of spacecraft, the development of which pursue the humane objectives of increasing the security of manned space flight, and insuring the possibility of further scientific experimentation in the future.

Both delegations have agreed on three basic documents--Project Technical Proposal, Organizational Plan, and Project Schedules. In addition, the working groups have prepared and agreed to a series of technical documents. The basic documents are subject to the approval of the leaders of the Academy of Sciences, U. S. S. R., and the National Aeronautics and Space Administration.

Major agreements reached during the meetings here include: the launching of Soyuz first, acceptable launch windows (including times of day of launch), communications equipment necessary for the Soyuz at the U. S. selected frequency will be provided by the U. S. and each country will build its own equipment for communications at the U. S. S. R. selected frequency, the development of the technical requirements for a compatible docking system and in other system and mission areas which will allow design and development to proceed.

Areas in which further attention is required include: possible emergency extravehicular activity, possible adjustment of cabin pressures, use of a television system as a docking aid, attitude control after docking, and a specific launch date. Both countries have agreed that the mission will be flown during the second half of 1975.

All future meetings will utilize working groups in the following five areas: Mission Model and Operational Plans, Control and Guidance, Docking Mechanism, Means of Communication and Tracking, and Life Support Systems and Crew Transfer.

The delegations agreed on the following nominal mission sequence:

The U. S. S. R. Soyuz Spacecraft with two crewmen will be launched first. Approximately 7 1/2 hours later, the U. S. A. Apollo spacecraft will be launched from the Kennedy Space Center, Florida, with three crewmen aboard. Apollo launch opportunities also exist at 31 and 54 1/2 hours after Soyuz launch.

About one hour after orbital insertion, the Apollo command and service module will separate from the S-IVB launch vehicle stage, turn around, dock to and extract the docking module from the spacecraft/launch vehicle adapter in the same manner as it now does the lunar module.

The docking module will have a docking mechanism on its forward end which will be compatible with a unit on the Soyuz, and the docking module will serve also as an airlock for atmospheric adaptation for crew transfer. The Soyuz cabin atmosphere is essentially air to approximately 15 pounds per square inch pressure, and the Apollo cabin atmosphere is 100 percent oxygen at 5 psia.

The two spacecraft will dock approximately one day after Apollo liftoff, and they will remain docked for about two days' duration. Crewmen will exchange visits and conduct activities together.

Technical provisions have been made to permit television transmissions to earth during the docked operations.

Each country has agreed to develop and produce its own docking system independently. Both have accepted a common concept of a peripheral androgynous type system which will assure compatibility. This is an entirely new design for both countries.

Flight control decisions affecting joint elements of the mission, including countdown coordination, will be made after consultation with the control center of the other country. Communications between the U. S. and U. S. S. R. control centers will be by voice, teletype, and television.

Both countries have agreed that a sufficient level of familiarization and training, where applicable, with the other country's vehicle must be defined and provided for flight safety assurance. The necessary training will be conducted in each country for the other country's flight crew and ground operations personnel.

It was agreed also that as a minimum, flight crews should be trained in the other country's language well enough to understand it and act in response to established voice communications regarding normal and contingency courses of action.

A public information plan which takes into account the obligations and practices of both countries will be developed.

- end -

17.VII.72

7/17/72

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 10, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-140

MSC AWARDS SHUTTLE THRUST CHAMBER CONTRACTS

Two aerospace companies have been awarded technology contracts totaling more than a half million dollars to build and test thrust chambers for engines used in maneuvering the Shuttle orbiter while in space.

The contracts were awarded to Textron Incorporated, Bell Aerospace Division, Buffalo, New York in the amount of $261,500 and Rocketdyne Division of North American Rockwell Corporation, Canoga Park, California in the amount of $258,000.

NASA's Manned Spacecraft Center, Houston, Texas made the award.

The contracts are part of a continuing allocation of technology funds to develop the most effective propulsion system for the orbiter. Rocketdyne and Bell each will build an experimental thrust chamber and associated test equipment.

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The chambers are approximately six feet long and about three feet in diameter.

Propulsion-energy used to test the chambers will be a hypergolic bipropellant--a mixture of nitrogen tetroxide and aerozine 50 (that is, 50% hydrazine and 50% unsymmetrical dimethyl hydrazine). Use of alternate propellants, such as hydrazine, also will be studied.

A firm-fixed-price contract has been awarded. The contract runs through June 30, 1973. MSC's Propulsion and Power Division will monitor the program.

-end-

July 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 11, 1972.

Don J. Green
(713/483-5111)

RELEASE NO: 72-141

GEOSYNCHRONOUS PROGRAMS STUDY CONTRACT GOES TO CALIFORNIA FIRM

NASA's Manned Spacecraft Center, Houston, today awarded a $200,000 contract to North American Rockwell, Space Division, Downey, California to study the feasibility of multipurpose platforms for the support of spacecraft operating in geosynchronous orbit.

Geosynchronous altitudes are 19,322 nautical miles (37,784 kilometers) above Earth's equator.

North American will study concepts of fully-automated (unmanned) platforms as well as platforms suitable for manned-attendance. Typical activities normally conducted in geosynchronous orbit include communications, earth observations and navigation.

Called a Pre-Phase A Study, this fixed-price-research-development contract will run through May 31, 1973. MSC's Program Planning Office will monitor the study.

-end-

July 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

Don J. Green
(713/483-5111)

July 10, 1972

RELEASE NO: 72-142

MSC AWARDS $540,000 SHUTTLE RCS CONTRACT TO BELL AEROSPACE

Textron Incorporated, Bell Aerospace Division, Buffalo, New York, was awarded a $540,000 NASA contract to study and design a hypergolic bipropellant engine for the Space Shuttle orbiter Reaction Control System (RCS).

The RCS system provides the thrust for normal and emergency attitude control maneuvers of the Shuttle while it flies in space.

Systems used in earlier spacecraft used combinations of oxygen and hydrogen as primary propellants. With new space transportation, the need for systems which can be operated at lower costs and weight becomes more important.

Hypergolic bipropellants using fuel and oxidizer which ignite spontaneously upon contract are current candidates. One combination of the hypergolic consists of nitrogen tetroxide as the oxidizer and aerozine (50% hydrazine and

-more-

50% unsymmetrical dimethyl hydrazine) as the fuel.

NASA's Manned Spacecraft Center, Houston, has the management responsibility for the 15 month cost-plus-fixed-fee contract.

According to instructions issued to Bell, the contractor will "....define the level of the current technology base in the area of hydrazine type fuel/nitrogen tetroxide....for RCS systems."

Another of the tasks is to provide suitable engines for test and evaluation. The testing will be done at MSC by members of the Propulsion and Power Division.

The Bell contract runs through October 15, 1973. Approximately a dozen specialized engineering and technical personnel living in the Buffalo area will be employed.

Together with other MSC contracts currently in effect, the Buffalo division of Bell has received more than one million dollars of technology funds for Space Shuttle propulsion development.

-end-

July 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 11, 1972

John P. Donnelly
(202/755-3828)

RELEASE NO: 72-143

RELEASED AT NASA HEADQUARTERS

APOLLO 15 STAMPS

NASA has conducted an inquiry into the question of unauthorized postal covers reported to have been carried by the crew on the Apollo 15 mission last July.

Astronauts David Scott, Alfred Worden and James Irwin have acknowledged carrying approximately 400 unauthorized postal covers on this mission, 100 of which were given by the crew to an acquaintance who is now in Germany. These are the postal covers which apparently were later sold to stamp collectors for approximately $1500 apiece.

In the course of its inquiry, NASA learned that the Apollo 15 crew had at one time agreed to provide 100 of the covers to their acquaintance in return for a "trust fund" for their children. After the covers had been given to the acquaintance, however, they realized--on their own--that this was improper and they declined either to accept the "trust fund" or an alternative offer of stamps in exchange for the 100 postal covers.

NASA has authorized astronauts, within established procedures, to carry personal souvenir type items, including some postal covers, on Apollo 15 and other manned space flights, subject to the condition that these articles would be retained

- more -

by the astronauts or given to acquaintances and were not to be used or given for commercial or fund-raising purposes or for personal gain.

(On Apollo 15, 232 covers were authorized in addition to the 400 covers.)

NASA said the Apollo 15 crew exercised poor judgment in their actions. Therefore, Astronauts Scott, Worden and Irwin will be reprimanded; and their actions will be given due consideration in their selection for future assignment.

Commenting on the agency's disciplinary action, Dr. George Low, NASA Deputy Administrator, said: "Astronauts are under extreme stress in the months preceding a flight to the moon and their poor judgment in carrying the unauthorized covers must be considered in this light. Nonetheless, NASA cannot condone these actions."

- end -

July 11, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 17, 1972
2:00 p.m.

Robert V. Gordon
(713) 483-5111 (MSC)

RELEASE NO: 72-144

SKYLAB CSM 116 DELIVERED

First of the Apollo spacecraft--Command and Service Module 116--that will transport astronauts to and from NASA's Skylab Earth orbiting workshop is scheduled for shipment from Downey, California to Cape Kennedy, Florida on July 18.

CSM 116 will become the first major segment of Skylab flight hardware to be delivered to the Cape for the start of prelaunch operations. CSM 116, one of four command and service modules being built for the NASA Manned Spacecraft Center by the North American Rockwell Corporation will be shipped by aircraft from the NR plant at Downey.

Other segments of Skylab--the orbital workshop, multiple docking adapter, airlock module and the Apollo Telescope Mount--are undergoing final checkout at contractor plants and the Manned Spacecraft Center.

Three manned flights, for durations ranging up to 56 days are planned for Skylab. The Apollo CSM will carry the three-man crews to the Skylab orbital workshop which is scheduled for launch in April 1973.

More than 50 experiments are planned for the Skylab Program, the objectives of which are to extend the duration of manned space flight and conduct a series of medical, scientific, and technological investigations. Of particular importance is a series of experiments aimed at medical research, earth survey, solar astronomy, and selected scientific and manufacturing experiments.

-more-

The CSM will dock to the Skylab's docking adapter and then return the crews to earth at the close of each manned mission. While docked the CSM will be in a generally powered-down mode, with the exception of the communications, instrumentation, and thermal control systems.

The CSM communication system will be used for transmitting voice and television signals from the orbital workshop, and the thermal control system will stabilize the temperatures on the spacecraft systems, components, and propellants.

Some changes have been made in the command and service module craft for the unique requirements of the Skylab missions. Included changes are:

A 12-tank reaction control system propellant storage module, with a total of 1,500 pounds of propellants to more than double the former RCS propellant capacity, has been added to sector one of the service module (the area used for the "J" mission scientific instrument module). The storage module basically will provide propellants for increased spacecraft maneuverability and control capability and provide backup deorbit capability to the service module's main propulsion engine. The modification includes four monomethyl hydrazine (MMH) fuel tanks, five nitrogen tetroxide oxidizer tanks, and three helium tanks.

Capability of the spacecraft's thermal control system has been expanded basically through added thermostat-controlled heaters that will maintain temperatures above the freezing points for propellants, components, and propellant lines. While it is docked to the orbiting laboratory, one side of the spacecraft will be in the shade and the other in the sunlight, except when the Skylab maneuvers to perform Earth resources experiments.

Insulation and a heat-reflecting thermal control paint have been added on the side which will be exposed to the sunlight, for passive control, and the heaters will help in controlling the temperature on the shaded side. Temperatures on the cold side of the spacecraft are expected to approach minus 100° F.

A storage tank capable of storing approximately 540 pounds of water has been added to the service module to eliminate water dumps and the resulting thrust forces on the workshop while the fuel cells are used to supply power to the command/service module craft during initial docked operations. After fuel cell shutdown, power for the spacecraft systems will be provided by Skylab's solar array/battery system.

Three 500-ampere-hour batteries have been added to sector one of the service modules to provide primary power for CSM undocking and de-orbit activities in lieu of these fuel cells ehich were deactivated earlier in thc mission.

One of the three fuel cells has been deleted because of the lessened power requirements for Skylab missions.

Two of the four service module service propulsion system (SPS) propellant tanks, and one of the two helium tanks have been deleted since less than half of the SPS propellant capacity is needed.

Additional stowage capacity has been provided aboard the command module by increasing locker size. The lockers will be used for carrying various supplies to the Skylab, and for returning experiment data and film cannisters to Earth.

- end -

July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713) 483-5111

RELEASE NO: 72-145

FOR RELEASE:
July 17, 1972

MSC EXTENDS RSI THERMAL CONTRACT

The NASA Manned Spacecraft Center has renegotiated and extended contracts with three aerospace companies for continued development of new surface materials for the orbiter stage of the Space Shuttle.

The companies are: McDonnell-Douglas Corporation, St. Louis, Missouri, an additional $350,000 award; General Electric Company, Aerospace Group, Philadelphia, Pennsylvania, $346,000, and the Lockheed Aircraft Corporation, Missiles and Space Company, Sunnyvale, California, $345,000. The different dollar amounts are influenced by different development tasks allotted to each firm.

A six-month extension has been negotiated. It dates from June 30, 1972. The firms will continue to develop and test ceramic insulator materials for orbiter thermal protection.

Called Rigidized Reusable Surface Insulation (RSI), this type of material appears to best meet the requirements of lightweight, reusability and low costs--all program goals for the Shuttle.

The companies will deliver sample tiles sized about a foot-square to MSC for specialized testing. NASA plans to expose the panels to hard vacuum infrared transmissions, radiation, micrometeoroid bombardment, freeze/thaw cycles, dust, rain, and chemical contaminants.

Together with previous technology funds expended over the past year, the total dollars set aside are $2,007,700.

The contract is a firm-fixed-price. MSC's Structures and Mechanics Division will monitor the work.

- end - July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
(713) 483-5111 (MSC)

FOR RELEASE:
July 17, 1972

RELEASE NO: 72-146

HELIUM REGULATOR STUDY CONTRACT GOES TO MARQUARDT

The Marquardt Company, CCI Aerospace Corporation, Van Nuys, California, was awarded a $181,846 NASA contract to study helium regulator systems that could be used by the Space Shuttle orbiter.

Helium regulators comprise part of an Orbital Maneuvering System (OMS)--rocket propulsion the craft uses while flying in space. They are used in spacecraft today, but they have been designed for only a single mission.

In a transportation system such as the Space Shuttle where multiple use is necessary, the regulators must be more resistant to contamination and capable of extended life.

"The OMS...may be a pressure fed rocket propulsion system utilizing helium pressurant and nitrogen tetroxide and hydrazine base propellants," NASA told the contractor.

"The criticality (of the OMS helium regulator) is accented by the lack of existing satisfactory hardware and by the lack of design data to utilize in developing such hardware."

Marquardt will build prototype regulators and associated equipment for testing. Hardware evaluation will be accomplished at the Manned Spacecraft Center, Houston; the field center with management responsibility for the contract.

A cost-plus-fixed-fee research and development contract was signed. The work will be completed by June 30, 1973.

Six firms bid on the study.

- end -

July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 17, 1972

Don J. Green
(713) 483-5111 (MSC)

RELEASE NO: 72-147

SHUTTLE TRAINING AIRCRAFT STUDY CONTRACTS AWARDED

NASA's Manned Spacecraft Center, Houston, has awarded two parallel contracts for the study of an airplane capable of simulating subsonic flight characteristics of the Space Shuttle orbiter.

The study contracts were awarded on July 1, 1972, to Grumman Aerospace Corporation, Bethpage, New York, $150,000 and to Lockheed Aircraft Corporation, the Georgia Division, Marietta, Georgia, $149,000.

The studies are to "provide sufficient data to assure NASA that the proposed Shuttle Training Aircraft (STA) is technically feasible and acceptable," and "that the recommended design can meet specified requirements."

The contractors will study aircraft modifications necessary to provide simulated Shuttle handling qualities and flight control procedures with and without jet engines during flights from 35,000 feet altitude to landing.

A firm-fixed-price type of study is planned. The work is to be completed by December 31, 1972.

- end -

July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 17, 1972

Don J. Green
(713) 483-5111 (MSC)

RELEASE NO: 72-148

MARTIN-MARIETTA, DENVER, TO BUILD SHUTTLE PASSENGER COUCH

The Martin-Marietta Corporation, Denver Division, Colorado was awarded a $130,000 contract to design, build, and test a couch to be used by passengers aboard the Space Shuttle.

The passenger couch will serve as the support (seat) during launch, entry, and landing for personnel other than the pilot and co-pilot," according to the technical writer.

"It is also envisioned as a multi-functional system providing a capsule habitat which deletes the requirement for private quarters and furnishings for dining."

The couch--looking similar to a barber's chair--will be designed for relaxation, sleeping, eating, and as a work space. Provisions also will be made for the stowage of personal gear.

Couch dimensions are approximately 78 inches long, 36 inches wide, and 18 inches deep.

A firm-fixed-price-research and development contract was awarded. The finished product will be delivered to the Manned Spacecraft Center, Houston, for evaluation and test by July 31, 1973.

The work will be done for MSC's Spacecraft Design Division.

- end -

July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 14, 1972
3:00 p.m.

Douglas K. Ward
(713/483-5111)

RELEASE NO: 72-149

AST RONAUTS CHAPMAN AND ENGLAND RESIGN

Astronauts Philip K. Chapman and Anthony W. England today announced their resignations from the astronaut corps.

Dr. Chapman said he has accepted a job as Principal Research Scientist with AVCO Everett Research Laboratories in Everett, Massachusetts, and will also work as a senior research associate in the Measurement Systems Laboratory at the Massachusetts Institute of Technology, Cambridge, Mass.

Dr. England is accepting a position with the Regional Geophysics Group of the U. S. Geological Survey in Denver. He will assist in developing techniques using radar from airplanes and spacecraft to learn about the surface and subsurface structure of the earth and other planets. Dr. England will also continue as a co-investigator for the electrical surface properties experiment which will be conducted on the lunar surface during Apollo 17.

- more -

Dr. Chapman, a native of Melbourne, Australia, was selected as a scientist-astronaut by NASA in 1967. While in training as an astronaut, Dr. Chapman has continued to work on research projects in his field of physics, including experiments on gravity aimed at checking the fundamental basis of Einstein's general theory on relativity. Dr. Chapman will continue this work at MIT. His job at AVCO Everett Laboratories will deal with high-energy laser research.

Dr. Chapman was Mission Scientist on the Apollo 14 mission and assisted in training the Apollo 16 crew in conducting experiments from lunar orbit. Prior to his selection as an astronaut he was a staff physicist at MIT, obtaining his Ph. D. there in science and instrumentation in 1967.

Dr. Chapman's resignation from NASA is effective today.

Dr. England, whose hometown is Fargo, North Dakota, was selected as a scientist-astronaut in 1967. He served as Mission Scientist on Apollo 13 and Apollo 16, assisting in training prime and backup crew members in the geology of landing sites. He also served as spacecraft communicator on the Apollo 16 mission, handling communications between the astronauts on the lunar surface and the flight control team in the Mission Control Center. Dr. England has also participated in

manned vacuum chamber tests to verify that Apollo Lunar Surface Experiments could be operated satisfactorily by astronauts in the lunar environment.

Dr. England received his Ph. D. degree in geophysics from the Massachusetts Institute of Technology in 1970 and was a graduate fellow at MIT for three years prior to his selection as an astronaut. His resignation from NASA is effective August 14.

Center Director Dr. Christopher C. Kraft, Jr. expressed appreciation to Chapman and England for their contributions to the Apollo program over the past five years.

"All of us at the Manned Spacecraft Center wish them every success in their future endeavors in the scientific community," he said.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 14, 1972

Douglas K. Ward
(713/483-5111)

RELEASE NO: 72-150

PRELIMINARY RESULTS FROM APOLLO 16 SAMPLE ANALYSIS

Scientists at NASA's Manned Spacecraft Center report many of the rocks returned from the moon on the Apollo 16 mission are formed of a low-density, aluminum and calcium-rich material which may have been part of the original lunar crust.

Dr. Paul W. Gast, Chief of the Planetary and Earth Sciences Division at MSC, said as much as 90 percent of the material collected in the Descartes highlands where Apollo 16 landed contains large amounts of aluminum and calcium. He noted that instruments flown in lunar orbit showed large areas of the lunar highlands also to be rich in aluminum, leading scientists to believe they are dealing with typical highland rocks in the Apollo 16 samples.

Dr. Gast said the Apollo 16 sample contains four major rock types. The most interesting and perhaps the most

-more-

important of these, he said, is a very white rock never before seen in lunar samples. Scientists call this rock a cataclastic anorthosite. It appears to be formed by shearing and crushing of older, more primitive crustal rocks.

Geologists believe the lunar highlands are remnants of the moon's crust which formed more than four billion years ago. The crust has since been battered by meteoroids--some as large as the state of Rhode Island--leaving its surface heavily cratered and creating large basins which were later flooded with molten rock to form the dark colored mare or seas that are visible from earth.

A network of seismic stations set up on the moon by Apollo astronauts has confirmed the existence of a lunar crust and has shown the crust to be about 60 kilometers (38 miles) thick, or about twice as thick as earth's crust beneath the continents.

Dr. Gast noted that the lunar crust is strikingly different from earth's crust. The crust on the moon, he said, comprises nearly ten percent of the moon's total mass while only about half of one percent of earth's mass is in its crust. The moon's crust also appears much more uniform in

its chemical composition than the earth's crust. Also, anorthosite, which is an important component in the lunar crust and which is abundant in the lunar highlands, is found in relatively few areas on earth.

Dr. Gast said the moon must at one time have been melted to a great depth, allowing the low-density aluminum and calcium-rich mineral plagioclase to float to the surface like slag in a blast furnace before it cooled to form the anorthosite-rich crust.

The record of earth's original crust has been largely obliterated by the forces of water, wind and ice, which level entire mountain ranges in a few millionsof years and by mountain building and volcanic forces which bulge and reshape the crust and expose it to additional erosion. These forces do not exist or are far less significant on the moon, leaving a relatively undisturbed record scientists hope to decipher in understanding how planetary crusts are formed.

If additional study proves the white, crystalline pieces of cataclastic anorthosite from Apollo 16 to be part of the moon's primitive crust, and if the original crustal material has not been altered too greatly, scientists may be able to

establish when the moon's crust formed and learn something about the conditions under which it formed.

A second type of Apollo 16 rock--a grey and white breccia--is much different in appearance from the white cataclastic anorthosite but may in fact be related to it and may also be formed from crustal material. The breccia, or fragmental rock, appears to have formed by crushing and shearing of massive, pre-existing igneous complexes. They differ from breccias returned from previous Apollo landing sites, which were formed from the regolith. They have numerous white to dark grey fragments held together by a light grey matrix. Preliminary chemical analysis of the rocks at MSC shows the white and grey fragments also to be rich in anorthosite, with the darker fragments representing material that has been partially remelted. The grey matrix that holds the fragments together appears to be a finely ground mixture of the larger light and dark fragments.

The abundance of anorthositic material in the breccias reinforces the belief that the lunar highlands and hence the lunar crust are rich in anorthosite. The breccias have extremely complex structures and histories produced during a period of intense meteorite bombardment in the early history

of the moon. These rocks may be less useful in understanding the early history of the moon's crust because they have been so greatly modified; but scientists may learn from them much about the temperatures and pressures produced when giant meteoroids struck the moon early in its history.

Another type of breccia found in the Apollo 16 sample appears to have formed at lower temperature and under less pressure, presumably a product of smaller meteoroid impacts, than its tougher counterpart. This breccia is light grey with many small fragments rich in anorthosite and a matrix of the same composition as the fragments it binds together. Its texture is typical of breccias returned on previous lunar missions.

The fourth major Apollo 16 rock type is a very tough, cohesive rock which was formed at high temperatures from a molten or near-molten material. These crystalline or igneous rocks include a type of basalt also found at the Apollo 14 landing site at Fra Mauro and to a lesser extent at the Apollo 15 Hadley-Apennine site and at the Apollo 12 site in the Ocean of Storms. This basalt is characterized by its high radio-activity and its high content of the elements

potassium and phosphorous. Instruments flown in the lunar orbit have shown that material of similar radioactivity is concentrated in the western mare basins forming the Sea of Rains and the Ocean of Storms, but is rare in the eastern mare basins and in the lunar highlands. Some scientists believe they are very old rocks formed before the great mare basins were filled, possibly representing a sub-crustal layer on the moon.

An Apollo 16 rock of special interest is called "Rusty Rock"; and as its name implies, parts of it are coated with a reddish brown material that appears to be common rust. Though iron is abundant in lunar rocks, hydrated iron oxide or rust is extremely rare, presumably because the moon lacks water. Scientists are interested in determining how much might be due to exposure of the rock to moisture in the spacecraft cabin atmosphere and on earth before it reached the Lunar Receiving Laboratory at MSC. The distribution of coatings leads scientists to believe they could not have been caused solely by moisture encountered after leaving the moon.

Results of preliminary sample studies at MSC will aid

the Lunar Sample Analysis Planning Team in working out a general plan for distributing Apollo 16 materials for detailed studies to 189 scientific teams in the United States and 15 foreign countries. NASA has begun distributing about 452 grams (one pound) of Apollo 16 material to the world scientific community and will begin distributing an additional two kilograms (about four pounds) in late July or early August. The remainder of the Apollo 16 sample, some 93 kilograms (205 pounds) will be stored at MSC under carefully controlled conditions for future study.

NASA has also distributed a small amount of sample collected by the Soviet Union's unmanned Luna 20 spacecraft to 40 U.S. scientists as part of a lunar sample exchange agreement between the U.S. and the U.S.S.R.

NASA received two grams (less than one tenth of an ounce) of Luna 20 material and has distributed about 25 percent of this interesting lunar highlands sample to U.S. scientists who will attempt to determine its age and will study its optical properties, mineralogy, petrology and chemical makeup.

Luna 20 landed last February in a highlands region between the Sea of Rains and the Sea of Crisis and returned

about 50 grams (one and three-fourths ounces) of lunar material to earth.

Preliminary chemical analysis shows the Luna 20 sample to contain less aluminum than the meterial collected by Apollo 16. The lower aluminum content of the Luna 20 sample could mean this areaof the highlands is composed of less anorthositic rock than the Descartes highlands.

-end-

July 14, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 17, 1972

Terry White
(713/483-5111)

RELEASE NO: 72-151

APOLLO 11 THIRD ANNIVERSARY

Regular activities for the public open-house at the NASA Manned Spacecraft Center will be expanded Thursday in observance of the third anniversary of the first manned landing on the Moon.

A special program in the Mission Control Center will feature a re-creation of radio transmissions between the Apollo 11 crew and Mission control during the landing on July 20, 1969. Display screens in the control room will duplicate actual flight controller displays as well as show the motion pictures taken by the Apollo 11 crew during the historic landing at Tranquility Base.

Neil Armstrong and Edwin "Buzz" Aldrin spent two and a half hours exploring the landing site before rejoining Mike Collins in lunar orbit for return to Earth carrying the first fragments gathered from another celestial body.

Other areas included in the Center's do-it-yourself tour include the centrifuge building, the exhibit hall and the crew training building. Apollo 11 souvenir pictures and folders will be given visitors as long as the supply lasts.

-end-

July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 17, 1972

Terry White
(713/483-5111)

RELEASE NO: 72-152

SHUTTLE SPACE SUIT

A fourth-generation space suit capable of protecting astronauts for as many as 50 six-hour space walks is in preliminary planning at the NASA Manned Spacecraft Center here.

Requests for proposals have gone out to several companies for development of a prototype space suit for use in the Space Shuttle program, space stations and other future Earth orbital space vehicles. The companies have until July 28 to submit their proposals, and prototype suits would be delivered to MSC 18 months after a cost-plus-fixed fee contract is signed with the successful bidder.

The new suits must be able to give trouble-free service for space flights lasting up to a year, during which as many as 50 extravehicular activity (EVA) periods of six hours would be run. These EVAs, for example, would be in assembling or servicing satellites and space vehicles in Earth orbit or in retrieving satellites for refurbishment back on Earth.

Specifications on the request for proposals call for a fully mobile suit with a high degree of hand dexterity while the suit is pressurized at eight pounds per square inch. The suit must weigh nor more than 40 pounds and be capable of in-flight maintenance and repairs.

The feasibility of using a single-plane hard ring body seal instead of a slide fastener will be examined during prototype development. Slide fasteners were used for crew entry in the Mercury, Gemini and Apollo/Skylab suits.

Apollo helmets, neck rings and gas connectors already on hand at MSC will be furnished the contractor for installation on the prototype suits.

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July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 17, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-153

ATM FLIGHT VEHICLE TEST

The Apollo Telescope Mount (ATM) orbital solar observatory, which will be launched aboard the first Skylab flight in 1973, will undergo extensive thermal vacuum testing at the NASA Manned Spacecraft Center beginning July 25.

This is the first major piece of flight hardware to undergo testing at MSC. Major spacecraft components of Apollo and Skylab have undergone testing at MSC, including the recently completed vibro-acoustic test of the Skylab orbital assembly test article.

The 22,000 pound ATM was brought to MSC from the Marshall Space Flight Center, Huntsville, Alabama where it was constructed. The vacuum chamber test which will simulate the harsh environment of space will be conducted in Chamber A of the Space Environment Simulation Laboratory, Building 32.

The Skylab ATM is a solar observatory which will operate from earth orbit. 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 up to 56-days over an eight month period.

The ATM provides a major advance in astronomy and solar physics, giving scientists a view of the sun's activity without the distorting effects of the Earth's atmosphere. The instruments will measure radiation from the Sun in the extreme ultraviolet and x-ray portions of the electromagnetic spectrum, which cannot penetrate the Earth's atmosphere, and also obtain pictures of the Sun's corona in the white light portion of the spectrum.

- more -

Ground-based scientists "see" the Sun only in visible light and in portions of the infrared and radio frequencies of the spectrum. The ATM, however, offers opportunities not available with unmanned spacecraft.

An astronaut will do tasks requiring judgment to select targets of scientific interest and to point the telescopes. Skylab astronauts will control all ATM experiment operations in acquiring the data, including "space walks" to retrieve exposed film from the "sun end" of the ATM.

Skylab crew members will assist in portions of the test which include operation of the ATM control and display panel which is located in a manlock on the third level of Chamber A.

Two major tests, each lasting 10-days, are scheduled. The first begins July 25 and is scheduled to end on August 4, and the second portion begins late in August. Approximately 400 NASA and contractor engineers and technicians will take part in the test.

Upon test completion, the ATM will be prepared for shipment to the Kennedy Space Center, Florida. The vehicle is scheduled to arrive at KSC on October 1.

Eugene H. Cagle of the Marshall Center's ATM Project Office is the ATM engineering manager responsible for test operations. P. M. Hughes, Jr., of the MSFC Quality and Reliability Assurance Laboratory is the test team leader.

Other key Marshall Center personnel on temporary duty at MSC for the tests include William H. Evans, Jr., Dewey B. Channell and Robert A. Dornbos, test conductors.

In addition, about 150 other MSFC and contractor employees are at MSC to prepare for the test and operate the ATM during the tests. MSC personnel are providing test facility support.

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July 17, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 18, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-154

EDUCATORS AT MSC

Two groupstotaling 46 educators from 32 colleges and universities are working at the Manned Spacecraft Center, Houston, under the Summer Faculty Fellowship Program.

The program here, one of ten at NASA centers throughout the nation, is sponsored by the space agency in conjuction with the American Society for Engineering Education.

Through the program, university and college faculty members work with NASA officials on projects of mutual interest.

The program at the Manned Spacecraft Center is in two groups. Thirty one educators are in a research group and 15 are in a design group. Some universities have more than one member attending.

Barbara Eandi, of MSC's University Affairs Office, is the Center's representative to the group.

Universities and colleges represented and the faculty members from each are:

University of Houston -- Dr. Charles Dalton, Dr. Junh-Chang Huang; Dr. Franklin J. Kay, Dr. Benjamin T. Rhodes, Jr.; University of Texas, Arlington Branch -- Professor Ramon E. Goforth, Dr. Alfred R. Potvin; University of Texas, El Paso Branch -- Dr. Robert G. McIntyre; Houston Community College -- Dr. Theodore F. Leibried, Jr., Dr. Dinanath D. Nadkarni; Southern Methodist University, Dallas, Texas -- Dr. Carlos W. Coon, Jr.; Texas A and M University, College Station -- Dr. Francis W. Holm; California State Polytechnic College, Pomona, Branch -- Dr. John R. Biddle, Dr. Edward C. Hohmann; California State Polytechnic College, Fullerton Branch -- Dr. James J. Rizza; California State Polytechnic

-more-

College, San Luis Obispo Branch -- Dr. Patrick O. Wheatley; United States Air Force Academy, Colorado Springs-- Captain Donald A. Carey; Walla Walla College, Washington -- Dr. Jon A. Cole, Dr. Rodney Heisler; Pennsylvania State University, University Park -- Professor Larry O. Degelman.

University of Southwest Louisiana, Lafayette -- Dr. Stephen J. Gold, Dr. Ronald J. White, Professor Robert W. Cline; University of Puerto Rico, Mayaguez -- Dr. Attru M. Chowiah, Professor William A. Heenan, Professor Rafael Munoz; Cornell University, Ithaca, New York -- Professor Dean R. Heerwagen; College of the City of New York -- Professor Walter Konon; Bradley University, Peoria, Illinois -- Professor James. G. Seckler; University of Florida, Gainesville -- Dr. Clark I. Cross; Florida Institute of Technology, Melbourne -- Professor Thomas L. DeFazio.

Centenary College, Shreveport, Louisiana -- Dr. Robert D. Deufel; Kansas State University, Manhattan -- Dr. Richard R. Gallagher, Professor Dominic Chi-Lung Huang; University of New Mexico, Albuquerque -- Dr. Youn-Chang Hsu; Iowa State University, Ames -- Dr. Francis H. Maillie; Memphis State University, Tennessee -- Dr. Charles F. Morris; Georgia Institute of Technology, Atlanta -- Dr. Lawrence W. Rehfield; Hunter College, New York City -- Dr. David Rimberg; Clemson University, South Carolina -- Dr. Myron Spector.

University of Missouri, Columbia -- Dr. Dennis L. Tebbe; University of Missouri, Rolla Branch -- Dr. William H. Tranter; Athens College, Alabama -- Professor George O. Williams, Jr.; Old Dominion University, Norfolk, Virginia -- Dr. Edward G. Keshock; University of Illinois, Urbana -- Dr. Curtis O. Pedersen; Arizona State University, Tempe -- Donald L. Snider; and Virginia Military Institute, Lexington -- Dr. Clarence R. Wimberly.

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July 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 18, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-155

SKYLAB MENU

When it's chow time on Skylab, astronauts who will spend four to eight weeks in Earth orbit, will have a menu which is as close to "home cooking" as modern food technology can make it.

Aerospace doctors and technicians are developing a food system designed to compensate partially for astronauts' long absence from the usual fare of Earthlings and the warmth and delight of home-cooked meals with family and friends.

Dr. Malcolm C. Smith, Chief of Food and Nutrition at the NASA Manned Spacecraft Center said "For the first time, a diet has been provided (for astronauts) which is conventional in appearance, superb in taste and yet satifies the most rigorous nutritional requirements. The food system is so designed that the Skylab crews will have a relatively wide range of selection from a set of conventional food items while still rigidly adhering to the experimental requirements."

For the first time astronauts will prepare their meals from an assortment of frozen as well as the conventional space foods similar to that carried on manned Gemini and Apollo missions.

Astronauts will "cook" their own meals on a special food tray developed for Skylab. Frozen foods will be stored in a freezer in the Skylab orbital workshop.

In addition to being the most palatable menu carried into space thus far, the Skylab food system is designed to meet the requirements and objectives of an important series of medical investigations. Dr. Smith explained that the medical experiments are profoundly influenced by the nature and amount of food that the astronauts consume.

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One of the experiments which is in the area of Nutrition and Musculoskeletal Function includes at least three different investigations which demand precise knowledge of nutrient and mineral intake. One such investigation, Mineral Balance, depends upon the complete and accurate knowledge of everything the crew member consumes and of everything he excretes. Another investigation, Assay of Body Fluids, is also dependent upon close surveillance of certain types of nutrient intakes.

In addition to these inflight experiments there are a number of pre and post-flight medical experiments which are dependent on a detailed quantitative knowledge of what each crew member consumes throughout his exposure to orbital flight.

The Skylab food system will maintain a caloric level between 2,000 to 2,600 calories. The diet will be baselined to provide at least the minimum dietary allowances of protein, carbohydrate, fat, minerals, and vitamins which are recommended by the National Academy of Science.

More than 70 different items form the basic menu for Skylab missions. The final selection will be made by each crew member.

The Skylab menu will consist of the following food types:

Dehydrated - ready to eat rehydratable foods such as cream of tomato soup, scrambled eggs, salmon salad, beverages and deserts.

Intermediate Moisture - precooked, thermally stabilized or fresh food with moisture content partially reduced such as dry roasted peanuts, cookies, and bacon wafers.

Wetpack - precooked, or thermally stabilized food with approximately 30 to 95 percent moisture content such as turkey and gravy, meat balls with sauce and chili without beans.

Frozen - precooked, thermally stablized or fresh food stowed below minus 10°c to retard spoilage such as prime rib of beef, filet mignon, shrimp cocktail and lobster Newburg.

All food and water for the three manned Skylab missions -- one 28 day mission and two 56-day missions - will be stowed aboard the Orbital Workshop which will be launched by the Saturn V. Dr. Smith estimated

approximately 2,000 lbs. of food and about 6,000 lbs. of water will be required for the three manned missions.

The food tray will measure about 13 1/2" X 15" thick. There will be six of the trays, one for each crewmember, carried aboard the OWS when it is launched from Cape Kennedy. The tray has individual recessed compartments into which the canned food item is placed for heating.

At meal time the crew member selects his meal -- filot mignon, a vegetable, beverage and desert -- from food compartment. He places the itmes to be warmed in the food tray and then flips the warmer switch and presto he has a three course meal.

Dr. Smith said "We have every expectation that the Skylab food system will provide the most palatable food that has ever been taken into space, and will at the same time support the most rigidly defined metabolic experiment ever conducted on man in space."

-end-

July 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

FOR RELEASE:
July 20, 1972
A.M.

RELEASE NO: 72-156

STUDENT EXPERIMENTS SELECTED FOR SKYLAB

Experiments proposed by 19 high school students from 16 states have been approved for the Earth-oribiting manned Skylab space station in 1973.

Selection of the young experimenters was announced today by the National Science Teachers Association (NSTA) and NASA as part of the Skylab Student Project. The nationwide project directly involves secondary school students in space research.

Kathy L. Jackson, a 17 year old Clear Creek High School senior is among the winners whose experiment was accepted by the NASA for the Skylab mission. She is the daughter of John and Mrs. Jackson of 18718 Capetown Drive, Clear Lake City.

The 19 experimenters are from the 25 national winners selected by NSAT and announced in April. The 25 proposals had been selected for detailed review from 3,409 submitted by U.S. secondary school students. The NASA review determined,because of Skylab performance requirements and scheduled constraints, the six other proposals could not be accommodated.

- more -

Skylab is an experimental space laboratory that will be orbited next year to conduct scientific, technological, and biomedical investigations from the vantage point of space. The first manned mission, with three astronauts, will last up to 28 days, the second and third 3-man missions are planned to last up to 56 days.

The Skylab space station will test equipment and techniques for gathering information on Earth's ecology, oceanography, water management, agriculture, forestry, geology, and geography. Astronomy experiments will substantially increase knowledge of the Sun which sustains life on Earth. Habitability, biomedical, behavioral, and work effectiveness experiments will further evaluate man's capabilities in space flight.

The 25 finalists and their teacher-sponsors have been invited by NSTA and NASA to attend the Skylab Educational Conference at the Kennedy Space Center, Florida, at the time the Skylab is launched. The finalists, sponsors, and schools received special medallions.

The experiment evaluation and flight selection process involved NASA Skylab Program personnel from the Marshall Space Flight Center, Huntsville, Ala.; the Manned Spacecraft Center, Houston; and the Kennedy Space Center, Florida.

Preliminary designs were developed for experiments requiring flight hardware. Other experiment proposals can be satisfied by using data from existing experiments of Skylab principal investigators.

The student finalists participated in a week of preliminary design reviews at the Marshall center where they and their teacher sponsors and parents were joined by Skylab scientists, engineers, technicians and project officials.

The 19 students will remain closely involved in the development of experiment equipment (where hardware is required) and in the planning of how their investigations (including data retrieval and processing, flight planning and crew training) will be conducted.

The student experiments are being handled in a manner very similar to the mainline Skylab experiments. Some students will work very closely with teams of Skylab investigators.

RELEASE NO: 72-156

The students and experiments selected for participation in Skylab are:

DANIEL C. BOCHSLER, Route 2, Box 75, Silverton, Oregon, 97381. "Possible Confirmation of Objects within Mercury's Orbit." Silverton Union High School, Mr. John P. Daily, Teacher/Sponsor.

This experiment will attempt to identify a planetary body which may orbit the Sun at a distance approximately 0.1 the distance from Earth to the Sun (Mercury's orbit is 0.3 to 0.4 the distance to Earth's orbit). The experiment is to be performed by examining about 30,000 Skylab solar telescope photographs.

VINCENT W. CONVERSE, 1704 Roosevelt Road, Rockford, Illinois, 61111. "Zero Gravity Mass Measurement." Harlem High School, Miss Mary J. Trumbauer, Teacher/Sponsor.

This experiment complements the existing Skylab specimen mass and body mass measurement devices. The equipment consists of a simple leaf spring anchored at one end with a container at the other end into which is placed the mass to be measured. The experiment operates on the same principle as the baseline Skylab mass measurement devices and can therefore be used as an excellent demonstration of these.

TROY A. CRITES, 736 Wynwood Drive, Kent, Washington, 98031. "Space Observation and Prediction of Volcanic Eruptions." Kent Junior High, Mr. Richard C. Putnam, Teacher/Sponsor.

The aim of this experiment is to analyze infrared surveys of known volcanoes obtained by baseline Skylab earth resources experiment equipment. The data will be compared to ground-based data to determine whether remote sensing can detect increased thermal radiation which may precede an imminent eruption.

W. BRIAN DUNLAP, 6695 Abbot Avenue, Youngstown, Ohio, 44515. "Wave Motion Thru a Liquid in Zero Gravity." Austintown Fitch High School, Mr. Paul J. Pallante, Teacher/Sponsor.

The aim of this experiment is to observe the motion of a gas bubble surrounded by a fluid when excited by a calibrated oscillation. Two liquids of different viscosity will be used. Provisions will be made for varying the size of the bubble.

JOHN C. HAMILTON, 12 Honu Street, Aiea, Hawaii, 96701. "Spectrography of Selected Quasars." Aiea High School, Mr. James A. Fuchigami, Teacher/Sponsor.

In this experiment, selected photographs obtained by the ultraviolet stellar astronomy equipment will be analyzed. Photographs of target areas in which quasars have been identified will be studied to obtain spectral data in the ultraviolet region to augument existing data in the radio and visible ranges.

RELEASE NO: 72-156

ALISON HOPFIELD, 183 Hartley Avenue, Princeton, New Jersey, 08540. "Photography of Libration Clouds." Princeton Day School, Mr. Norman Sperling, Director, Duncan Planetarium

This experiment will use the Skylab solar telescope cameras to obtain invormation on two regions in the Moon's orbit. At two points in the orbit of the Moon, ahead of and following the Moon in its path, a condition of gravitational equilibrium is conducive to the collection of space particles. When each of these regions comes within sight of the Skylab solar telescopes the Brightness and polarization of the reflected light will be measured.

KATHY L. JACKSON, 18718 Capetown Drive, Houston, Texas, 77058. "A Quantitative Measure of Motor Sensory Performance During Prolonged Inflight Zero "g". Clear Creek High School, Mrs. Mary K.Kimzey, Teacher/Sponsor.

This experiment uses a standard eye-hand coordination test aparatus to measure changes in motor sensory skill of crew members.

ROGER G. JOHNSTON, 1833 Draper Drive, St. Paul, Minnesota, 55113. "Capillary Action Studies in a State of Free Fall." Alexander Ramsey High School, Mr. Theodore E. Molitor, Teacher/Sponsor.

The aim of this experiment is to determine if the zero gravity environment induces changes in the characteristics of capillary and wicking action from the familiar Earth-Gravity characteristics.

* JEANNE L. LEVENTHAL, 1511 Arch Street, Berkeley, California, 94708. "X-Ray Emission from the Planet Jupiter." Berkeley High School, Mr. Harry E. Choulett, Teacher/Sponsor.

The aim of this experiment is to detect X-Rays emitting from Jupiter. The X-Ray Emission detected by Skylab will be compared with solar activity and Jupiter's radio emission to derive more information on the mechanisms of that great planet.

TODD A. MEISTER, 33-04 93 Street, Jackson Heights, New York, 11372. "An In Vitro Study of Selected Isolated Immune Phenomena." Bronx High School of Science, Mr. Vincent G. Galasso, Teacher/Sponsor.

This experiment aims to determine if the absence of gravity affects representative life processes.

Part A (Chemotaxis) utilizes guinea pig macrophage under the influence of casein and incrporates a filter to trap migrating cells.

Part B (Antigenicity) measures concentrations of antigen/antibody.

Part C (Mobility) demonstrates the mobility of a ciliated cell by microscopic observation and by photomicroscopy.

JUDITH S. MILES, 3 Dewey Road, Lexington, Massachusetts, 02173. "Web Formation in Zero Gravity." Lexington High School, Mr. J. Michael Conley, Teacher/Sponsor.

This experiment will observe the web building process and the detailed structure of the web of the common cross spider (arenus diadematus) in a normal environment and in a Skylab environment. Analysis of experiment results will be similar to analysis of similar experiments, without the Skylab environment, performed by the Research Division of the North Carolina Department of Mental Health, Raleigh, N.C.

CHERYL A. PELTZ, 7117 S. Windermere, Littleton, Colorado, 80120. "Cytoplasmic Streaming in Zero Gravity." Arapahoe High School, Mr. Gordon B. Scheels, Teacher/Sponsor

The aim of this experiment is to perform microscopic observation of leaf cells of elodea plants in zero gravity to determine if there is any difference between the intracellular cytoplasm compared with cytoplasmic motion of similar leaf cells on Earth.

TERRY C. QUIST, 3818 Longridge Drive, San Antonio, Texas, 78228. "Earth Orbital Neutron Analysis." Thomas Jefferson High School, Mr. Michael Stewart, Teacher/Sponsor.

In this experiment, detectors inside Skylab record impacts of high energy neutrons. The detectors mounted on the inboard faces of water tanks, will be able to discriminate between neutrons in four energy spectra. The neutrons, which have been moderated by their passage through the water in the tanks, impact the detectors and produce fission particles which in turn interact with a plastic material. Chemical treatment of the interaction reveals readily identifiable tracks.

* JOE W. REIHS, 12824 Wallis Street, Baton Rouge, Louisiana, 70815. "X-Ray Content in Association with Stellar Spectral Classes." Tara High School, Mr. Helen W. Boyd, Teacher/Sponsor.

The primary aim of this experiment is to make observations of celestial regions in X-Ray wavelengths in an attempt to relate X-Ray emissions to other spectral characteristics of stars observed.In addition, observations of the Sun in X-Ray and other spectral regions will be studied to re-evaluate the Sun and its relation to other stellar classes.

DONALD W. SCHLACK, 9217 Appleby Street, Downey, California, 90240. "Phototropic Orientation of an Embryo Plant in Zero Gravity." Downey High School, Miss Jean C. Beaton, Teacher/Sponsor.

JOEL G. WORDEKEMPER, 810 East Sherman Street, West Point, Nebraska, 68788. "Plant Growth in Zero Gravity." Central Catholic High School, Mrs. Lois M. Schaaf, Teacher/Sponsor.

These two experiments have been combined into a single joint experiment whose objectives are:

1. To determine the differences in root and stem growth and orientation of radish seeds in specimens grown in zero gravity and on Earth under similar environmental conditions.

2. To determine whether light can be used as a substitute for gravity in causing the roots and stems of radish seeds to grow in the appropriate direction in zero gravity, and to determine the minimum light level required.

NEAL W. SHANNON, 2849 Foster Ridge Road, Atlanta, Georgia, 30345. "A Search for Pulsars in Ultraviolet Wavelengths." Fernbank Science Center, Dr. Paul H. Knappenberger, Teacher/Sponsor.

Objective of this experiment is to make ultraviolet observations of selected celestial regions in an attempt to relate ultraviolet emissions with known radio-emitting pulsars and with the pulsar in the Crab Nebula which is known to emit in visible light and radio spectra.

ROBERT L. STAEHLE, Huntington Hills-North, Rochester, New York, 14622. "Behavior of Bacteria and Bacterial Spores in the Skylab and Space Environments." Harley School, Mr. Alan H. Soanes, Teacher/Sponsor.

In this experiment colonies of various species of bacteria will be studied in the Skylab zero gravity environment to determine if this environment induces variations in survival, growth and mutations of the spores which are different from those observed in identical colonies on Earth.

JOE B. ZMOLEK, 1914 Hazel Street, Oshkosh, Wisconsin, 54901. "Earth's Absorption of Radiant Heat." Lourdes High School, Mr. William L. Behring, Teacher/Sponsor.

Objective of this experiment is to derive information on the attenuation of heat energy in Earth's Atmosphere. Measurements are to be made simultaneously at the Earth's surface and at Skylab altitude to determine differences in radiant heat levels.

* The approved experiment relays on the use and availability of the Apollo Telescope Mount equipment is contingent upon the resolution of operational and technical uncertainties that influence whether or not this type of observation can be made.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 20, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-157

OMS STUDY CONTRACT AWARDED

NASA's Manned Spacecraft Center, Houston, today awarded a $181,000 contract to McDonnell Douglas Corporation, Astronautics Company-East, St. Louis, Missouri, for a design study of a system for maneuvering the Space Shuttle orbiter while in space.

The system bears the name of an Orbital Maneuvering System, acronym OMS. It must be light-weight, have high performance, high reliability, long life and low cost.

McDonnell Douglas will conduct the study in four phases:

1. Define OMS requirements;
2. Design an OMS baseline system;
3. Study alternate concepts; and
4. Update the baseline system.

Propellants for the study will consist of nitrogen tetroxide and aerozine 50 (50% hydrazine and 50% unsymmetrical dimethyl hydrazine); hypergolics which will be carried into space in liquid form.

Additional propellant combinations such as liquid oxygen and either liquid hydrogen or hydrocarbon as a fuel also will be studied.

The Space Shuttle represents a new version of NASA exploration--one that reduces costs of operation. Forecasts for Shuttle use include the launching into Earth orbit of unmanned scientific and industrial experiments, defense missions, and the placement of communications and other satellites.

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A firm-fixed type of contract has been awarded. Approximately six enginnering and technical personnel living in the St. Louis area will be employed under the contract.

MSC's Power and Propulsion Division will monitor the work, which is scheduled for completion in mid-July, 1973.

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July 20, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 20, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-158

GRUMMAN TO BUILD HEAT PIPE CONTROL SYSTEM

A $200,000 contract to continue the design, and to build and test systems that control Space Shuttle orbiter heating has been awarded to the Grumman Aerospace Corporation, Bethpage, New York.

Technically called Space Shuttle Heat Pipe Thermal Control Systems, the final product is the building of several prototype systems. One system will be used to cool the orbiter electronics--called avionics. Another system will be built for temperature control of the well area housing the landing gears, as well as the airbreathing engines.

The contractor also will study thermal control methods for remotely located units such as the flight and voice recorders.

The NASA Manned Spacecraft Center, which awarded the contract notes that "Current heat pipe systems are still....considered to have higher risk factors because adequate technology and testing have not been developed...."

"The fabrication and testing of candidate heat pipe systems can reduce the technology risk factor such that the advantages of heat pipes can be realized for Space Shuttle orbiter application."

Grumman initially will test the prototype systems in its Bethpage installation. Later, the models will be delivered to MSC for further testing and as "working display" hardware.

Together with previous technology funds expended over the past year, the total dollars allocated to Grumman for heat pipe work is $264,000.

A 15 month fixed-price-research-development contract has been negotiated, with the option for one month extension. The work dates from June 30, 1972.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 20, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-159

SINGER COMPANY WINS SHUTTLE SIMULATOR STUDY CONTRACT

The Singer Company, Binghamton, New York, was awarded a $135,530 contract to study and define simulation requirements for a Space Shuttle mission simulator.

Singer will perform several tasks including, "(a) establish mission simulator requirements, and (b) define a mission simulator system which meets these requirements."

The contractor also will define "visual system requirements....but no visual system design work will be performed."

NASA's Manned Spacecraft Center in Houston will have management responsibility for the study.

A firm-fixed-price contract has been awarded, and it will remain in effect through June, 1973. The study will be conducted under the direction of the Crew Training and Simulation Division.

-end-

July 20, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 20, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-160

TRW AWARDED CONTRACT TO STUDY PROPELLANT SEALS

A contract to study, design and test seal materials for storing propellants planned for use on the Space Shuttle has been awarded to TRW Systems Group, Redondo Beach, California.

The work will be done for the NASA Manned Spacecraft Center. MSC has awarded $84,500 in technology funds for the performance of the work.

Purpose of the contract is to gather information on the manner which propellants such as nitrogen tetroxide and hydrazine combinations affect seals during periods of storage.

TRW also will develop specific models for testing at MSC.

A firm-fixed-price type of contract has been signed. It will remain in effect through June, 1973. MSC's Propulsion and Power Division will monitor the contract.

-end-

July 20, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 25, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-161

MARTIN-MARIETTA DESIGNS SHUTTLE CREW AREA MOCKUP

The NASA Manned Spacecraft Center has renegotiated and extended its contract with the Martin-Marietta Corporation, Denver Division, for continued design of a Space Shuttle configured crew compartment to be tested in a neutral buoyancy tank.

The mockup will be full size and capable of submersion in the water filled tank. It is approximately 20 feet long x 16 wide and 15 high. The design will be such that, "suited subjects can safely carry out the test sequences," according to the work document.

The crew compartment is being developed to help evaluate the galley, equipment bay, couches, docking area, access to the flight deck, and hygiene facilities.

MSC has set aside $98,000 of technology funds for this

-more-

phase of the work. Together with previous funds spend over the past year, the total dollars set aside are $173,670. This phase of the contract runs for ten months from June 30, 1972.

The work is to be performed for MSC's Spacecraft Design Division.

-end-

July 25, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 26, 1972

John E. Riley
(713/483-5111)

RELEASE NO: 72-162

SCOTT ASSIGNED TO ASPO

Colonel David R. Scott has been appointed Technical Assistant to the Manager, Apollo Spacecraft Program, effective immediately.

Scott, 40, an Air Force officer and veteran of three space flights, succeeds Ronald W. Kubicki, who was recently named Manager for Command, Service and Lunar Modules.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
IMMEDIATE
July 26, 1972

ALSO RELEASED AT NASA HEADQUARTERS

William W. Pomeroy
202/755-3114

MSC RELEASE NO: 72-163

SHUTTLE CONTRACTOR SELECTION

The National Aeronautics and Space Administration today selected the Space Division of North American Rockwell Corporation of Downey, California, for negotiation of a contract to begin development of the Space Shuttle System.

As prime contractor, North American Rockwell Corporation will be responsible for design, development, and production of the orbiter vehicle and for integration of all elements of the Space Shuttle System.

- more -

July 26, 1972

The contract will be awarded on a cost reimbursement basis plus fixed and award fees. The contractor's proposal estimates the cost of orbiter development and shuttle integration at $2.6 billion over a period of about six years. The contractor's estimate of the cost of the first increment covering a period of approximately two years is $540 million.

Other major elements of the Space Shuttle System will include the Space Shuttle Main Engine, a 470,000-pound-thrust hydrogen-oxygen engine already under contract to the Rocketdyne Division of North American Rockwell Corporation; a large external hydrogen and oxygen tank; and twin solid rocket boosters.

The external tank and the solid rocket boosters are planned to be procured by NASA when Space Shuttle Systems engineering by the prime contractor has progressed sufficiently to enable NASA to solicit competitive proposals for these system elements. The planned site for assembly of the tanks is the government-owned facility at Michoud, Louisiana, where Saturn rockets used for the Apollo program were assembled.

Selection was made by NASA Administrator James C. Fletcher following an intensive evaluation by NASA of proposals submitted by four major aerospace corporations: Grumman Aerospace Corporation; Lockheed Missiles and Space Co., Inc.; McDonnell-Douglas Corporation; and North American Rockwell Corporation. All four firms had participated in extensive system definition studies which were completed in February of this year. Proposals were received from them in mid-May, and analysis and evaluation of the proposals was carried out over a two-month period by an evaluation board and supporting teams totalling 416 people drawn from eight NASA Centers and from the U.S. Air Force.

Overall program management responsibility for the Space Shuttle System within NASA has been assigned by the Office of Manned Space Flight to the Manned Spacecraft Center, Houston, Texas.

Project offices will be at the Manned Spacecraft Center for the orbiter vehicle; at the Marshall Space Flight Center, Huntsville, Ala., for the shuttle main engine, the external tank, and the solid rocket boosters; and at the Kennedy Space Center, Fla., for the launch, landing, and turn-around operations.

Employment generated by the orbiter development and shuttle integration portion of the shuttle project will build up to a maximum of roughly 15,000 by 1975 and 1976, and will gradually decrease thereafter. It is not possible at this time to define the geographical distribution of this employment because a very substantial portion of the work will be carried out under subcontract to firms as yet not selected by the prime contractor. It is, however, a reasonable prediction that the Far West will perform somewhat less than half of the work, with the remainder broadly distributed geographically among the various regions of the country.

The Air Force has been actively involved in the Space Shuttle definition study phase and will maintain an active interest during the design and development period as a prospective major user of the Space Shuttle.

The Space Shuttle will be developed over the next six years. Horizontal test flights are planned to begin in 1976, and manned orbital test flights are scheduled in 1978. The

complete Shuttle system is to be operational by 1980.

The Space Shuttle will be the first reusable space vehicle. The orbiter stage will be a delta-winged airplane-like vehicle capable of landing on conventional runways. It will have a cargo compartment measuring about 18 meters (60 feet) in length and 4.5 meters (15 feet) in diameter, and will be able to place 29,500 kilograms (65,000 pounds) in a 185-kilometer (100-nautical-mile) due East orbit.

The orbiter will be boosted into space through the simultaneous operation of the solid-propellant booster rockets and the orbiter stage high-pressure liquid oxygen-liquid hydrogen main engines. The booster rockets will detach at an altitude of about 40 kilometers (25 miles) and descend into the ocean to be recovered and reused. The orbiter, under its own power, will continue into low Earth orbit.

The Space Shuttle will be able to place satellites in orbit; return satellites from orbit; permit in-orbit repair and servicing of satellites; deliver propulsive stages and

satellites to low Earth orbit, and conduct short-duration science and applications missions with self-contained experiments in low Earth orbit.

The Space Shuttle will be employed as an operational system by both NASA and the Department of Defense. Primary operational sites for the Space Shuttle will be the Kennedy Space Center in Florida and Vandenberg Air Force Base in California.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
July 31, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-164

TROMBLY SUPPORTS SKYLAB TEST

Joe Trombly, formerly of Pompano, Florida, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center, taking part in the 56-day manned altitude chamber test which started July 26, in support of Skylab.

Three astronauts will spend up to 56 days in an altitude test chamber at the NASA center in Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Trombly, 35, is a project engineer with the Crew Systems Division of the Engineering and Development Directorate at MSC. He is a graduate of the University of Miami, receiving his BSME in 1963.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Trombly is Crew Systems Division Project Manager for this Skylab test. He is responsible for all crew system personnel and operations in support of the test.

Trombly is married to the former Patricia J. Staton of Atlanta, Georgia. The Trombly's reside in League City, Texas with their two children -- Todd, three and Tia, one.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 31, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-165

HESS SUPPORTS SKYLAB TEST

Clifford W. Hess, formerly of Lancaster, Pennsylvania, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in the 56-day manned altitude chamber test which started July 26, in support of Skylab.

Three astronauts will spend up to two months in an altitude test chamber at the NASA center in Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Hess, 29, is an aerospace technologist with Crew Systems Division at NASA's Manned Spacecraft Center. He is a graduate of Drexel University, Philadelphia, Pennsylvania, from which he received a BSME in 1966.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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Hess is facility engineer for the Skylab test and is responsible for monitoring, maintaining, and trouble shooting vacuum chamber systems during the two month operation. Between 1966 and 1968, he served as director during vacuum chamber tests of pressure suits and various spacecraft environmental control systems.

From 1969, until his present test assignment, Hess was facility manager for the test operations involving the environmental systems of the Lunar Module and the Apollo portable life support systems used by astronauts who walked on the surface of the Moon.

Hess is married to the former Claudia Conley of Beaumont, Texas. They reside in Houston, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 31, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-166

MAYS SUPPORTS SKYLAB TEST

Jackie D. Mays, formerly of Bentonville, Arkansas, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in the 56-day manned altitude chamber test which started June 26, in support of Skylab.

Three astronauts will spend up to 56-days in an altitude test chamber at the NASA center in Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Mays, 35, is a test engineer in the Crew Systems Division of the Engineering and Development Directorate at MSC.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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Secondary objectives of the test include the evaluation of selected items of experiment, 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 its participation during the space flight.

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.

Mays is a test director for the Skylab test. As test director, he is responsible for the management of the test and supervises scores of engineers and scientists in the Test Director's Operations Room adjacent to the 20-foot chamber.

Mays is married to the former Barbara June Samsel of San Antonio. The Mays and their two children, Debbie, 14, and Jeff, 11, reside in Pearland, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 1, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-167

MANDELL SUPPORTS SKYLAB TEST

Arthur Mandell, formerly of Huntington, New York, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in the 56-day manned altitude chamber test which started July 26, in support of Skylab.

Three astronauts will spend up to two months in an altitude test chamber at the NASA center at Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Mandell, 38, received his bachelor in electrical engineering from City College of New York in 1958, and a master of science in 1969, from Long Island University. He has been an aerospace engineer with the NASA since 1967 and until March 1971, was assigned to the Grumman Aircraft Corporation, Bethpage, L. I., where he was responsible for acceptance checkout equipment with the resident NASA program office.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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Secondary objectives of the test include the evaluation of selected items of experiment, 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 its participation during the space flight.

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.

Mandell is test project manager for the Life Sciences Directorate at the Manned Spacecraft Center and has the overall responsibility for the Skylab test. He also functions as the Senior Experiments Officer with operational and administrative test team management.

Mandell is married to the former Maxene Rebhun of Brooklyn. The Mandells and their three children -- Brian 8, Keith 6, and Celeste 3, reside in Seabrook, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

July 31, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-168

NASA AWARDS WASTE MANAGEMENT CONTRACT FOR SHUTTLE

NASA's Manned Spacecraft Center has awarded a $238,000 contract to the Hamilton Standard Division of United Aircraft Corporation, Windsor Locks, Connecticut to design and build a prototype waste collection system for use on the Space Shuttle orbiter.

MSC notes that "Previous concepts for waste management have placed emphasis on collection and storage of human wastes in a zero-g environment for male crewman only."

"With the arrival of the Space Shuttle program, accommodations which are as Earthlike as possible in the human and operational aspects for both male and female crew members... are required."

Hamilton Standard has been requested to build a system which will be evaluated at the contractor's plant and later at MSC.

-more-

A cost-plus-fixed-fee contract has been awarded. It is in effect for 18 months from July 5, 1972.

-end-

July 31, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 1, 1972
3:00 p.m., CDT

ALSO RELEASED AT NASA HEADQUARTERS

Richard Friedman
202/755-3897

MSC RELEASE NO: 72-169

US-USSR SPACE BIOLOGY REPORT

NASA and the Academy of Sciences of the USSR have approved recommendations developed at a second meeting of their Joint Working Group on Space Biology and Medicine.

The meeting was held at NASA's Manned Spacecraft Center, Houston, Texas, May 12-18, 1972, following the first meeting held in Moscow in October, 1971.

The Joint Working Group continued its exchange of information, initiated in Moscow, of experience in manned space flight. The U. S. presentations included the pre- and post-flight medical requirements and flight crew health stabilization program for Apollo 16, a discussion of the preliminary physiological results of that mission, and a glossary of space medicine terminology intended to aid in the mutual understanding of technical and scientific exchanges.

- more -

The USSR presentations detailed the medical findings of the Soyuz/Salyut mission, including the postflight autopsy results, the pre- and postflight clinical-physiological examination procedures of cosmonauts, and a special paper dealing with theoretical aspects of predicting crewman physiological response during flight.

The data presented regarding the Soyuz/Salyut flight reveal no indication of deterioration of the physiological status or performance efficiency of the crew during the entire course of the mission prior to the accident. The in-flight data were similar to those of previous Soyuz missions, and generally similar to in-flight Apollo data, and are consistent with both U.S. and USSR findings that a general adaptive process occurs during weightless flight.

The medical information concerning the death of the cosmonauts presented by the Soviets confirms their previous announcement of a loss of pressure in the landing compartment. The death of the cosmonauts was the result of a rapid decompression of the landing capsule which occurred approximately one-half hour before the space ship had returned to Earth. Specifically, the loss of pressure in the landing capsule to zero mm Hg. created conditions incompatible with sustaining human life. Thus, the causes of death of the cosmonauts were the occurrence of hypoxia and gaseous embolism (dysbarism).

A detailed review and evaluation of the data of the Soyuz/Salyut 24 day mission, the longest manned flight to date, reveals no indication of a need to modify current Skylab mission plans from a medical point of view.

An additional and significant development resulting from the meeting was the agreement that the Joint Working Group strive toward the development of common pre- and postflight medical examination procedures for flight crews. Attainment of this objective will permit direct comparison of US and USSR pre- and postflight data on selected body functional areas and thereby increase the information base of both parties regarding man's physiological responses to space flight.

As an initial step, four areas are being considered; namely, orthostatic tolerance (cardiovascular response), vestibular measurements, exercise-working capacity and biochemical examination of body fluids (blood and urine). Details regarding the procedures for these examinations will be exchanged through correspondence and current plans include in-depth discussions of these areas, during the next meeting in Moscow early in 1973.

-more-

Soviet Working Group Members were Dr. O. G. Gazenko, Acting Chariman, Dr. L. I. Kakurin and Dr. P. V. Simonov. They were supported by four specialists in biology and medicine. U. S. Working Group Members were Dr. Charles A. Berry, Chairman, Drs. E. J. McLaughlin and Harry Eagle, supported by experts from the Manned Spacecraft Center, Ames Research Center and NASA Headquarters. Dr. Edward Kass, National Academy of Sciences, was an invited participant.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

FOR RELEASE:
August 2, 1972

RELEASE NO: 72-170

REPORT ON FIRST WEEK OF SMEAT

After reviewing results of the first week's operation of the manned Skylab medical experiment test being conducted at the NASA Manned Spacecraft Center, management officials' Wednesday reported that man, experiment hardware, procedures and systems are performing satisfactorily.

Richard S. Johnston, Director of Life Sciences at MSC, said astronauts Bob Crippen, Karol Bobko, and Dr. Bill Thornton are in good physical condition after seven days inside the altitude chamber. The crew has been living and working inside a 20-foot chamber, which has been configured to resemble the Skylab orbital workshop, since Wednesday, July 26.

The Skylab Medical Experiment Altitude Test (SMEAT) is providing scientists and engineers data on the performance of medical experiments which will be used in Skylab earth orbital missions scheduled for 1973. The crew is breathing a mixture of 70 per cent oxygen and 30 per cent nitrogen inside the chamber and following a simulated Skylab mission profile.

The crew began their second week shortly after 7 a.m. When they awoke they reported to test officials outside the chamber that they were in good spirits and raring to start the second week of the test.

- more -

Scientists and engineers reported results of the first week's run to the Test Operations Management Committee, a group of top MSC management officials assigned the responsibility of overseeing the SMEAT operations. Johnston, who is chairman of the committee, said "the test is going very well, test procedures are moving along smoothly and each day we are becoming more proficient."

More than 30 medical, technical and engineering experiments are being conducted during the 56-day run of SMEAT. In addition to gaining vital base line medical data, the test is also providing verification of systems and procedures to be used in next year's Skylab missions.

Although the test is moving along satisfactorily, Johnston said there has been several minor equipment and procedural problems. As these anomolies occur they are quickly worked out and necessary changes instituted. Johnston said none of the problems have resulted in disruption of test timeline nor cancellation of any of the detailed test objectives.

- end -

August 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 2, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-171

MSC ADDS $365,500 TO LTV THERMAL CONTRACT

NASA has awarded an additional $365,500 to LTV Aerospace Corporation, Dallas, Texas, for work on a thermal protection system that could be used on the Space Shuttle orbiter.

The work is technically called "Development of a Fail Safe Design Oxidation Resistant Reinforced Carbon Thermal Protection System for the Wing Leading Edge of the Space Shuttle Orbiter"; short title RPP.

LTV will perform "destructive evaluation of one full-scale leading edge prototype" panel of a wing area produced under previous contracts. The contractor also will investigate the cause of a phenomena called "crazing" -- minute cracks that have developed in the material after high heating.

Reinforced Pyrolyzed Plastic materials have been studied intensively as candidate Shuttle thermal materials since 1970. More than a million dollars ($1,015,000) in technology funds have been expended on development and test.

The dollars allocated for new work increases the funding of the current contract to $859,000. All testing and reports are to be completed by April 20, 1973.

- more -

RPP is basically an all-carbon material reinforced for strength and treated to resist oxidation at extreme temperatures. The contractor developed fabrication techniques and coating methods under technology programs. RPP has been heat tested at temperatures up to 3000 degrees Fahrenheit.

NASA has a cost-plus-fixed-fee type of contract with LTV. More than two dozen personnel living in the Dallas area are employed as result of this award.

The Manned Spacecraft Center in Houston is managing the work.

- end -

August 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

Louise Dick
202/755-8370

FOR RELEASE:
August 3, 1972
2 P.M.

RELEASE NO: 72-172

LOCKHEED TO DEVELOP IMBLMS GROUND TEST UNIT

The National Aeronautics and Space Administration today selected Lockheed Missiles & Space Co., Inc., Sunnyvale, California, for negotiation of a contract to design, fabricate, test, install on site, and operationally verify a field test unit of a health care delivery system using the Integrated Medical and Behavioral Laboratory Measurement System (IMBLMS) concept. This concept, as applied in a remote area on Earth, will be evaluated by NASA for possible use in advanced long-duration manned space missions.

Under the cost-plus-fixed-fee contract to be negotiated Lockheed will develop the ground-based test unit over a four-year period. The development program will be carried out in three phases. During the first 12-month period the contractor will define and design the system. At NASA's option the second 12-month period will be devoted to fabrication and checkout of a test unit. During the third phase, of 24 months duration, the test unit will be installed at a remote site on Earth, and will undergo operational testing and system evaluation. The contractor has estimated the cost of the first phase at approximately $1 million.

The IMBLMS concept is a fully instrumented system to provide remote medical care making optimum use of medical instrumentation, computer based data

- more -

management techniques, and advanced communication techniques, including data links, voice, and television. An ultimate flight system will be operated by specially trained paramedical crew members aboard a spacecraft to transmit medical information from space to physicians in a control center on Earth. In addition to transmitting information on man's vital functions such as cardiovascular and respiratory measurements, the system will have the capability to transmit x-rays, biochemical and microscopic analytical data to enable physicians on the ground to diagnose illnesses and prescribe treatment.

The Health Service and Mental Health Administration (HSMHA) of the Department of Health, Education and Welfare will join with NASA in operational testing of the ground based unit at a site still to be selected by a joint HEW-NASA team under the leadership of the Administrator of HSMHA.

To evaluate the technical requirements for remote health care in space, the ground based test unit will be installed at a sparsely populated site on Earth to provide medical care to local residents. Trained physician's assistants will employ the unit to transmit medical information on residents of the area to physicians at an established medical facility many miles from the remote site in the same manner crewmen in a spacecraft will communicate with physicians at a ground control center during a space mission.

If the IMBLMS concept test program is successful, it will provide systems technology to improve health care and medical services to remote areas on Earth.

Lockheed was one of three companies which responded to NASA's request for proposals to design, develop and test the IMBLMS system. The contract will be managed by the NASA Manned Spacecraft Center, Houston.

- end -

August 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 4, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-173

GENERAL DYNAMICS AWARDED SHUTTLE RCS STUDY CONTRACT

General Dynamics, Convair Aerospace Division, San Diego, California was awarded a $92,800 contract to study the effect that jet thrusters will have on a Space Shuttle orbiter's aerodynamics as it re-enters from space.

The purpose of the contract is to determine the best configuration for the Reaction Control System (RCS) for the orbiter.

"Experience has shown that the interaction of RCS jets with the vehicle flow field can have significant effect on the performance of the RCS. This effect can increase the thrust by as much as a factor of two, or it can degrade the thrust by perhaps 50 per cent....", the technical writer at the NASA Manned Spacecraft Center told General Dynamics.

The degredation depends upon the location of the nozzle on the vehicle, according to MSC. Present orbiter concepts

-more-

show thrusters mounted on each wing tip and in a pod on the tip of the vertical stabilizer.

A firm-fixed-price type of contract has been awarded for this study. It runs through March, 1973 and will be monitored by MSC's Engineering Analysis Division.

-end-

August 4, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

Don J. Green
(713/483-5111)

August 7, 1972

RELEASE NO: 72-174

MOTION PICTURE CONTRACT AWARDED

The NASA Manned Spacecraft Center has selected the A-V Corporation, Houston, Texas to provide motion picture services at the Houston center.

Value of the cost-plus-fixed-fee contract is $469,360. Approximately 18 Houston area personnel are employed under the terms of the award.

This is the first year of the contract which has provisions for two additional one year extensions.

A-V was selected from among four firms responding to the NASA request.

-end-

August 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 7, 1972

Milton E. Reim
(713/483-5111)

RELEASE NO: 72-175

MSC AIRCRAFT MAINTENANCE AND MODIFICATION RFP

A request for proposals (RFP) for maintenance, modification and ground support of aircraft assigned to the Manned Spacecraft Center, has been issued by the National Aeronautics and Space Administration.

The solicitation issued at MSC asks that the contractor furnish all necessary personnel, equipment, materials, services and management for maintenance and modification of aircraft permantly assigned to MSC. Also included will be transient aircraft from the NASA centers, and other Government or civilian aircraft on NASA business.

The RFP asks that the contractor supply engineering, design, fabrication, and installation of electronic systems, subsystems, components and equipment in aircraft, or special ground equipment as required.

Servicing, maintenance and modification of radio, radar,

-more-

auto pilot navigation and electronic test systems or related equipment installed on or associated with NASA aircraft will be required of the contractor.

Other items asked for in the RFP include operation of an onsite supply and purchasing system to obtain, perform physical condition inspection, control, protect, preserve, and maintain all government-furnished and contractor acquired property.

Emergency logistic support for NASA aircraft or aircraft serviced by NASA shall be provided by the contractor, as well as procurement and maintenance of all equipment required for NASA assigned personnel to perform their flying duties.

Only one contract will be awarded under this solicitation, however, companies who have specialized skills may join with other companies in a joint venture or in a prime-subcontractor relationship.

A cost-plus-award-fee type of contract is contemplated for this procurement with the period of performance to begin no later than January 1, 1973 and ending no later than December 31, 1973, with two one-year extensions to be negotiated.

Firms interested in responding to this RFP are asked to

attend a pre-proposal conference which will be held beginning at 9:00 a.m. August 11, 1972 in the Building 30 auditorium at the Manned Spacecraft Center.

Contract proposals submitted must be in the proper office at MSC on or before 4:30 p.m. local time, September 5, 1973.

-end-

August 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 7, 1972

Robert V. Gordon
(713/483-5111)

RELEASE NO: 72-176

SKYLAB CREW COMPLETES CHAMBER TEST

Three astronauts concluded an altitude chamber test inside portions of what will be their actual home in space for four weeks next year.

Astronauts Charles Conrad Jr., Paul J. Weitz and Joseph P. Kerwin spent Thursday checking out the Skylab space station's Airlock Module (AM) and Multiple Docking Adapter (MDA) in a vacuum chamber.

The space simulation was done in the McDonnell Douglas Astronautics Company facility at St. Louis, Missouri, where the AM/MDA flight hardware is nearing completion.

The mated airlock and docking adapter is the nerve center of Skylab, controlling the internal atmosphere and temperature, distributing electrical power, and channeling communications and data. It also houses experimental facilities and numerous controls and displays.

Skylab is an experimental manned space laboratory to conduct

-more-

scientific, technical and biomedical investigations from the vantage point of space. In addition to Earth resources experiments, Skylab will permit astronomy observations outside the dense Earth atmosphere and life science studies that will further evaluate man's capabilities in space.

Conrad, Weitz and Kerwin went through the procedure they will follow next spring when they rendezvous and dock with Skylab in Earth orbit--occupy the station, turn on power, pressurize and activate equipment.

The Skylab crew entered the chamber wearing pressurized space suits and took positions in the AM/MDA. An hour after pumpdown began, the pressure was equal to that of an altitude of 45,720 meters (150,000 feet), less than 0.02 pounds per square inch. Pressure inside the AM/MDA,however, was held at 5 psi, which was high enough for the astronauts to remove their space suits and work in constant wear garments. For the repressurization, the crew hooked up biomedical equipment and sensors but did not don pressure suits.

The AM/MDA tested in part of the Skylab to be launched next April 30 by a two-stage Saturn V rocket. It will be placed into Earth orbit at an altitude of 435 kilometers (260 miles).

Conrad, Kerwin and Weitz are to be launched the next day, May 1, in Apollo command-service module carried into orbit by a Saturn IB rocket. They will occupy the station for 28 days before returning to Earth in the Apollo command module.

Two other crews of three astronauts are to man the station next year for stays of up to 56 days in space.

The AM was manufactured by McDonnell Douglas and the MDA by Martin-Marietta Corporation and the NASA-Marshall Space Flight Center, Huntsville, Alabama. NASA-Marshall manages the Skylab program and is responsible for most of the hardware.

-end-

August 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 7, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-177

HOMICK SUPPORTS SKYLAB TEST

Dr. Jerry L. Homick, formerly of Sewickley, Pennsylvania, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a 56-day manned altitude chamber test which started July 26 in support of Skylab.

Three astronauts will spend up to two months in an altitude test chamber at the NASA center at Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Dr. Homick, 30, is a research psychologist with the Biomedical Research Division of NASA's Life Sciences Directorate at the Manned Spacecraft Center. He received a BA from Pennsylvania State University in 1964, a MA from Kent State University in 1966, and in 1968, he received his PhD from Kent State.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Dr. Homick has been with the NASA since 1968, and is serving as a principle investigator for the environmental noise study phase of this Skylab test. This study is designed to analyze the chamber noise environment and to assess the physiological and psychological effects, if any, on the crew during the two month test.

Dr. Homick is married to the former Mary Lynne Hinkle of Ashtabula, Ohio. The Homicks reside in La Porte, Texas with their children Teri Lynne,six, and Dana Rene', two.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

FOR RELEASE:
August 8, 1972

RELEASE NO: 72-178

GRAVES ASSISTS IN SKYLAB TEST

Richard C. Graves, formerly of El Paso, Texas, is a member of the scientific team at NASA's Manned Spacecraft Center, taking part in the 56-day manned altitude chamber test in support of Skylab which started July 26.

Three astronauts will spend up to 56 days in an altitude test chamber at the NASA center in Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Graves, 36, is a research microbiologist in the Life Sciences Directorate at the Manned Spacecraft Center. He graduated from the University of Texas, El Paso, in 1959 with a BS in chemistry. In 1963, he received his MS in medical microbiology from the University of Oklahoma.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Graves is principal coordinating scientist for the medical support branch for SMEAT and is the principal investigator studying environmental microbial parameters of the chamber. During Apollo 11 and subsequent lunar landing missions, Graves served as Quarantine Officer in the Lunar Receiving Laboratory at Houston.

Graves is married to the former Mae Allen of Scottsdale, Arizona. The Graves and their three children reside in Clear Lake City, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 8, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-179

SMITH SUPPORTS SKYLAB TEST

Jasper C. Smith, Jr., formerly of Beaumont, Texas, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in the 56-day manned altitude chamber test which started July 26 in support of Skylab.

Three astronauts will spend up to two months in an altitude chamber at the NASA center at Houston to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Smith, 36, is a supervisory aerospace engineer with the Crew Procedures Division of Flight Crew Operations Directorate at MSC. He received his BSME in 1958 from Lamar University and did post graduate work at the Dallas College of Southern Methodist University 1960-63.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Smith is supervisor of the technology experiments section and is responsible for assuring the availability of current and accurate experiment procedures to the SMEAT crew during the two month test. Since joining the NASA in 1964, Smith has served as spacecraft system specialist in electrical power, fuel cell, cryogenic and sequential and docking systems on both the Gemini and Apollo spacecraft.

Smith is married to the former Dorothy Del Stanley of Buna, Texas, and they reside with their two children, Sunee Del and Larkin Andrew, in Deer Park, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 8, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-180

NASA EXTENDS DYNALECTRON CONTRACT AT WHITE SANDS

NASA has extended its contract with Dynalectron Corporation, Land-Air Division, Holloman AFB, New Mexico, for one year for support services at the White Sands Test Facility, near Las Cruces, New Mexico.

The work will be done for the Manned Spacecraft Center.

Estimated value of the cost-plus-award-fee contract is $2,315,667. The award, not to exceed $20,000, is based on contractor's performance proficiency.

Approximately 160 New Mexico area engineering, administrative and technical personnel are employed under terms of the award. They will provide services in technical and administrative operations, maintenance, laboratories, security and fire protection.

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The dollars allocated for the work increases the funding of the contract to $4,661,281.

The second and final year of the extension will remain effective through June 30, 1973.

-end-

August 8, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 9, 1972

Milton E. Reim
713/483-5111

RELEASE NO: 72-181

SKYLAB TRAINING

Skylab flight controllers are getting primed for their role in the longest and most ambitious manned space venture to date.

A thorough familiarization with all the vehicles, vehicle systems and their operation is the prelude to simulations scheduled to begin late this fall.

The length of the Skylab mission, the multiplicity of complex systems and experiments dictates the need for more flight controllers. A total of five complete teams of flight controllers will be trained to take care of these extra requirements. The extra flight controllers will also provide a means for periodically giving some time off to the team members during the mission.

Implementation of this training for Skylab is provided by the Mission Simulation and Training Branch of Flight Control Division, utilizing many of the same methods used to train the many outstanding Gemini and Apollo flight control teams.

The training program includes programmed instruction, classroom briefings, video tape briefings, crew station familiarization, on-the-job-training, culminating with mission simulations with the crewmen of Skylab. When the actual mission is flown the flight controllers will, as past flight control teams have indicated, feel that they have "flown" the mission many times before.

- more -

All flight controllers must have general knowledge of the Saturn IB and Saturn V launch vehicles, the Saturn Workshop (Apollo Telescope Mount, Orbital Workshop, Multiple Docking Adapter, Airlock Module), Command & Service Module, Extravehicular Activity Equipment, Selected Experiments and Mission Control Center and Manned Space Flight Network systems.

In addition, they are required to have specific detailed knowledge of spacecraft hardware, systems and their operation in the areas included in their particular discipline.

For most of the flight controllers it is somewhat like going back to college. Each man is issued texts for study on his own time. These provide basic information on spacecraft systems and technical subjects that do not change appreciably.

Current information on Skylab systems and scientific subjects is presented in classroom and video tape briefings. The classroom sessions offer various levels of detail permitting those requiring an overview of the subject to attend only the first portion of the courses.

The flight controller normally receives the majority of his speciality training with on-the-job-training. This generally consists of development of systems handbooks, mission control requirements, mission rules and operational procedures.

Practical training exercises providing the flight controller with visual as well as actual contact with the machines he is helping control from the ground is provided by the Crew Station Trainers (CST).

The Crew Station Trainers familiarize the flight controller with the location and function of all controls and displays with emphasis on the physical layout of control and display panels, general spacecraft system functions and associated terminology.

Actual physical constraints of the real crew station are accurately portrayed in the Command Module CST, while the Saturn Workshop CST accurately represents the panel configuration but not their relative locations. The controls and displays are dynamically responsive as in the manned flight vehicles.

Practical application of systems management with emphasis on location, identification, configuration and interaction of switches, circuit breakers and displays is provided the flight controllers in the Crew System Trainers.

The flight controllers also evaluate crew checklist procedures and familiarize themselves with the physical activities associated with specific periods of activity in the mission profile.

The final product of all this training is a flight control team and flight crews moulded through the medium of a simulated mission environment, commonly referred to as simulations.

Simulations in Mission Control Center encompass the total interrelationships expected to be experienced during an actual mission. Emphasis is on validation of operational concepts and procedures, exercise of operational procedures and integrating the individual disciplines into a team operation.

Skylab simulations are currently scheduled to begin sometime in October in preparation for the launch of the Orbital Workshop next April, followed one day later by the launch of the first of three Skylab crews. The first crew is scheduled to spend 28 days in the earth orbiting space station. An interval of 60 days with the OWS unmanned will be followed by a second crew manning the station for 56 days. Another interval of 30 days unmanned and the final crew will man the station for another 56 days. The manned portion of the Skylab mission will be concluded in December of 1973.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 9, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-182

NASA/NR SIGN SHUTTLE LETTER CONTRACT

The National Aeronautics and Space Administration and North American Rockwell (NR) Space Division, Downey, California today signed a letter contract authorizing the firm to proceed with the development of the Space Shuttle.

Signing for the government at Space Division in California was Henry P. Yschek, MSC contracting officer, and for NR was John J. Roscia, Corporate Vice President and General Counsel.

The letter provides North American authority to proceed with orbiter work while the government and the contractor negotiate a definitive contract.

NASA also obligated $12,300,000 as the initial funding under the contract which has been assigned number NAS9-14000.

-end-

August 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 16, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-183

TAYLOR RECEIVES SERVICE AWARD

Clinton L. Taylor, formerly of Ranger, Texas, but now employed at NASA's Manned Spacecraft Center in Houston, was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the Moon.

Making the presentation was Dr. James Fletcher, NASA Administrator. He was assisted by his deputy Dr. George W. Low.

This is the fourth award Taylor has received during his NASA tenure. He was cited for Examplary Performance during 1963 and again in 1965. In addition, he received a certificate of the Medal of Freedom which was presented to NASA employees who participated in 1970, in the successful return of the disabled Apollo 13 vehicle.

Taylor is Deputy Director of Administration and Program Support; the housekeeping organization at MSC.

He has a bachelor of science degree in mechanical engineering at the University of Texas, Austin. Taylor is a member of the Instrument Society of America and the American Ordnance Association.

He is married to the former Marion Nowotny. They have one daughter and reside in Houston.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 22, 1972
2:00 p.m.

Don J. Green
(713/483-5111)

RELEASE NO: 72-184

NASA EXTENDS CONTRACT WITH MURDOCK, INC.

NASA has extended its contract with Murdock, Incorporated, Compton, California, for one year for sheet metal and machine fabrication.

The work will be done for the Manned Spacecraft Center.

Estimated value of the cost-plus-fixed-fee contract is $594,400.

Approximately 20 craftsmen located in the California area will be employed under the terms of the award. The contractor builds special tools, scale size models of the Space Shuttle, power control boxes, brackets for cameras and other metal items under the terms of this contract.

Dollars allocated for the work increases the funding of the contract to $1,487,106.

This is the second year of the contract. The contract runs through August 14, 1973 with NASA having the option to extend for one additional year.

NASA — MSC

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 21, 1972

William J. O'Donnell
(202/755-3114)

RELEASED AT NASA HEADQUARTERS

MSC RELEASE NO: 72-185

PETRONE NAMED ASTP PROJECT OFFICER

Dr. Rocco A. Petrone, Apollo Program Director at NASA, has been assigned additional responsibilities as Program Director of the NASA portion of the US/USSR Joint manned space flight mission.

As Program Director of the Apollo Soyuz Test Project (ASTP), Petrone will have overall responsibility for the direction and management of the United States portion of the joint mission including the spacecraft and docking module activities, flight operations and crew operations at the NASA Manned Spacecraft Center, Houston: launch vehicle activities at the NASA Marshall Space Flight Center, Huntsville, Alabama; and launch operations at the John F. Kennedy Space Center, Florida.

The Command and Service Module for ASTP will be managed at the NASA Manned Spacecraft Center by the Apollo Spacecraft Program Office under Owen Morris. Within that office, Dr. Glynn

-more-

S. Lunney is Project Director and will act as the chairman of the U.S. Working Groups responsible for the direct contact with the U.S.S.R. in the establishment of joint project agreements.

The Saturn IB launch vehicle will be managed by the Saturn Program Office, Richard G. Smith, Manager, at the Marshall Space Flight Center.

AT KSC, the ATSP will be managed by Robert C. Hock, Apollo/Skylab Program Manager.

Agreement to carry out the joint mission was reached by President Nixon and Soviet Premier Alexei Kosygin in Moscow, May 24. The mission is scheduled to be flown in 1975.

In the mission, a Soviet Soyuz spacecraft will be launched by the Soviet Union. About 7 1/2 hours later an Apollo spacecraft will be launched on a Saturn IB rocket from the Kennedy Space Center, Florida. The Apollo orbit will have an inclination of 51.6 degrees to the equator and the Apollo will rendezvous and dock with the Soyuz.

During docked operations, Soviet cosmonauts and U.S. astronauts will visit the spacecraft of the other nation by transferring through a docking module joining the two crafts.

A major purpose of the mission is to demonstrate systems which will permit the docking of any future manned spacecraft of either nation in Earth orbit.

In carrying out his responsibilities, Petrone will utilize personnel of the Apollo Program. The Apollo Program will complete its flight activities with the Apollo 17 mission scheduled for launch December 6, 1972. Landing will be in the Taurus-Littrow area on the Moon.

-end-

August 21, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 22, 1972
IMMEDIATE

ALSO RELEASED AT NASA HEADQUARTERS

William J. O'Donnell
(202/755-3114)

MSC RELEASE NO: 72-186

NASA REVISES FY73 OPERATING PLAN

NASA has revised its fiscal year 1973 operating plan to keep its expenditures for the year within the agency's $3.2 billion spending limitation.

In revising its operating plan to stay within the existing expenditures limitation, NASA has found it necessary to accelerate the reduction of work in some areas, principally in Manned Space Flight. These work reductions are for the most part in general support catagories and do not affect the launch schedules of Apollo 17 or Skylab missions nor do they compromise safety or quality assurance requirements.

The reductions in work will be accomplished at the Manned Spacecraft Center, Houston; the Marshall Space Flight Center, Huntsville, Alabama; and the Kennedy Space Center, Florida. The reductions will require layoffs of personnel of support service contractors at the centers. NASA is working

-more-

with these contractors to effect the necessary reductions.

NASA earlier had announced reductions in its Civil Service complement to be made during fiscal year 1972 and 1973.

-end-

August 22, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

MSC News Center
713/483-5111

FOR RELEASE:
August 23, 1972
IMMEDIATE

RELEASE NO: 72-187

SUPPORT CONTRACTOR MANPOWER REDUCTION

Support contractor manpower at the Manned Spacecraft Center will be reduced by some 1200 to 1400 positions in order to meet the Agency's FY 73 expenditure level.

This reduction estimate is a preliminary one determined by NASA. MSC management is working with the contractor firms that support operations at the center to implement plans with the hope of reducing these impact estimates.

Manpower reductions normally expected as a result of the completion of Apollo this year and Skylab next year are being accelerated to meet the expenditure ceiling of the Agency.

Launch dates for Apollo 17 in December and Skylab missions beginning in the spring of 1973 will not be affected nor will items associated with quality or safety be affected.

- more -

The reduction in Fiscal Year 1973 expenditures within the Office of Manned Space Flight affect all three OMSF Centers-- MSC, Marshall Space Flight Center, Huntsville, Alabama; and Kennedy Space Center, Florida.

- end -

August 23, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 22, 1972

RELEASED AT NASA HEADQUARTERS
David Garrett
(Phone: 202/755-3114)

MSC RELEASE NO: 72-188

APOLLO 17 PRELIMINARY TIMELINE

Apollo 17 astronauts are scheduled to touch down on the Moon's surface at 2:55 p.m. EST, Dec. 11, 1972, where they will conduct the sixth and final scientific lunar expedition planned in the Apollo program.

Astronauts Eugene A. Cernan, Ronald E. Evans, and Harrison H. (Jack) Schmitt are set for liftoff from NASA's Kennedy Space Center, Fla., at 9:53 p.m. EST Dec. 6 with the objective of exploring the Taurus-Littrow area of the Moon deploying scientific experiments on the lunar surface, and conducting extensive experiments from lunar orbit.

Spacecraft Commander is Navy Captain Cernan. Evans, a Navy Commander, is the command module pilot and civilian Schmitt is the lunar module pilot.

Taurus-Littrow, a combination mountainous highlands and lowlands valley region, is an important site in completing the scientific network on the Moon and will offer the opportunity to sample materials from large, steep-sided mountains and dark non-mare material filling the valleys. The landing point is 20° 10' north and 30° 45' east of the center of the Moon as viewed from Earth.

The first lunar surface expedition is planned to begin at about 6:33 p.m. EST on Dec. 11. The second and third are scheduled for 5:13 p.m. and 4:33 p.m. EST on December 12 and 13, respectively. The lunar roving vehicle will be used by Cernan and Schmitt on all three of the seven-hour trips.

The lunar module is scheduled to liftoff the Moon at 5:56 p.m. EST, December 14, and dock with Evans in the Command Service Module at 7:53 p.m.

During the return flight to Earth, Evans will maneuver outside the Apollo spacecraft to retrieve film from the service module experiment bay at about 2:33 p.m., December 17.

Spashdown is planned for 2:24 p.m. on Dec. 19 at 17.9° South Latitude and 166° West Longitude in the Pacific Ocean.

Longest of any of the Apollo flights, total mission duration is planned for 304 hours and 31 minutes.

Following is the preliminary timeline of Apollo 17 events:

Event	December Date	EST
Launch	6	9:53 pm
Translunar Injection	7	1:14 am
Lunar Orbit Insertion	10	2:49 pm
Descent Orbit Insertion #1	10	7:06 pm
Descent Orbit Insertion #2	11	1:54 pm
Lunar Landing	11	2:55 pm
Start EVA 1	11	6:33 pm
Start EVA 2	12	5:13 pm
Start EVA 3	13	4:33 pm
Lunar Liftoff	14	5:56 pm
Transearth Injection	16	6:33 pm
Transearth Coast EVA	17	About 2:33 pm
Splashdown	19	2:24 pm

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
713/483-5111

FOR RELEASE:
August 28, 1972

RELEASE NO: 72-189

MARTIN AWARDED SHUTTLE CARGO HANDLING STUDY CONTRACT

NASA's Manned Spacecraft Center has awarded a $226,256 contract to Martin Marietta Corporation, Denver Division, in Colorado to study a system for handling cargo in space. It will be carried into Earth orbit by a Space Shuttle.

Jointed much like the hind legs of a grasshopper, the early configuration of the system bears a name of Attached Manipulator System - AMS for short.

The AMS will be electrically operated and designed for single operator use. It is called attached manipulator because -- one end is attached to a supporting structure in the cargo bay of the Space Shuttle. The device will be used to remove space systems such as weather satellites from the Space Shuttle cargo bay and place them in orbit and retrieve satellites from orbit for repair and reuse.

Objective of the study is to design an AMS for dynamic testing and for use in a zero gravity simulation facility to evaluate orbiter cargo and payload handling operations.

The man and the machine in manipulator systems can be so well integrated, the contractor has been told, that the operator "develops a sense of presence, (and) his control and displays are so realistic that he feels he is actually performing the tasks."

Martin Marietta has been awarded a firm-fixed-price-research-and-development type of study contract. The study is to be concluded by January 1, 1973.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 29, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-190

GUILLORY SUPPORTS SKYLAB TEST

Ted A. Guillory, formerly of Alexandria, Louisiana, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a manned altitude chamber test, now in its second month, in support of Skylab.

Three astronauts have been in an altitude test chamber at the NASA center at Houston since July 26, to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Guillory is a graduate of Louisiana Tech. where he received a bachelor of science in civil engineering in 1962. He is responsible for the data management and flight data files for the Skylab medical test.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Guillory is married to the former Julia Brown of Pineville, Louisiana. The Guillory's and their two children -- Cherie and Todd - - reside in Pasadena, Texas.

- end -

August 29, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

FOR RELEASE:
August 29, 1972

RELEASE NO: 72-191

LEECH SUPPORTS SKYLAB TEST

Ted B. Leech, formerly of Nashville, Tennessee, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a manned altitude chamber test, now in its second month, in support of Skylab.

Three astronauts have been in an altitude test chamber at the NASA center in Houston since July 26, to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Leech is a graduate of Vanderbilt University where he received a bachelor of mechanical engineering. He has been with the NASA since 1961 and is presently in charge of the 20-foot diameter vacuum chamber being used for the Skylab medical test and also serves as assistant test director.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

The ground-based simulation test is directed primarily toward obtaining and evaluating baseline medical data from those medical experiments which may be affected by the Skylab environment. There are 16 experiments scheduled for Skylab which will be conducted in SMEAT involving 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, 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 its participation during the space flight.

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.

Leech is married to the former Carol Johnson of Newport News, Virginia. The Leech's reside in Houston, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Robert V. Gordon
713/483-5111

FOR RELEASE:
August 30, 1972

RELEASE NO: 72-192

DUNAWAY SUPPORTS SKYLAB TEST

Jack Q. Dunaway, formerly of San Antonio, Texas, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a manned altitude chamber test, now in its second month, in support of Skylab.

Three astronauts have been in an altitude test chamber at the NASA center in Houston since July 26, to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Dunaway is a 1954 graduate of the University of Texas. He has been with NASA since 1964 and has received the Apollo Achievement Award and the NASA Group Achievement Award.

Dunaway serves as a senior electrical engineer for the Skylab medical test and is responsible for electrical power, lighting, instrumentation, and fire detection.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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Dunaway is married to the former Doreen Gage of Binghampton, New York. The Dunaway's and their two children reside in Houston, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 30, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-193

SEVIER SUPPORTS SKYLAB TEST

John Sevier, Jr., formerly of Middlesboro, Kentucky, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a manned altitude chamber test now in its second month in support of Skylab.

Three astronauts have been in an altitude test chamber at the NASA center in Houston since July 26, to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Sevier is a 1951 graduate of M.I.T. where he received a bachelor of aerospace engineering. He also attended University of Virginia and William and Mary College. Sevier is Chief of the Operations Branch of the Apollo Spacecraft Program Office.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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Sevier is married to the former Sylvia Thyng of Boston, Massachusetts. The Seviers' and their four children reside in Seabrook, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 1, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-194

BURGETT SUPPORTS SKYLAB TEST

Frank A. Burgett, formerly of Warren, Pennsylvania, is a member of the engineering and scientific team at NASA's Manned Spacecraft Center taking part in a manned altitude chamber test,now in its second month in support of Skylab.

Three astronauts have been in an altitude test chamber at the NASA center in Houston since July 26, to obtain medical data and evaluate medical experiment equipment for Skylab which is scheduled for flight in 1973.

Burgett is a 1965 graduate (BS in electrical engineering) of Cleveland State University. He has been with the NASA since 1962 and is presently project facility engineer and is responsible for the closed circuit television system, audio communications and biomedical monitoring for this Skylab medical test.

- more -

Astronauts Robert Crippen, Dr. William Thornton and Karol Bobko comprise the test crew for the Skylab Medical Experiment Altitude Test (SMEAT). Crippen is crew commander, Dr. Thornton, science pilot and Bobko is the pilot.

The test will closely simulate skylab mission conditions, with the exception of weightlessness, to obtain baseline data which can be compared to actual flight data in assessing a crew's status during long duration weightlessness flights. SMEAT will be conducted in Crew System Division's 20-foot chamber which will provide an atmosphere for the crew duplicating the Skylab Orbital Workshop atmosphere.

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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.

Burgett is married to the former Dorothy Ann Valencish of Cleveland, Ohio. The Burgetts' and their son Wade, 2, reside in Houston, Texas.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-195

McPHERSON RECEIVES SERVICE AWARD

James McPherson, formerly of Oneonta, Alabama, but now employed at NASA's Manned Spacecraft Center in Houston, was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the Moon.

Making the presentation was Dr. James Fletcher, NASA Administrator. He was assisted by his deputy Dr. George W. Low.

This is the fourth award McPherson has received during his NASA tenure. He was cited with a Superior Achievement Award in 1968 and 1969, and also received a Certificate of Commendation in 1969.

McPherson is an Assistant Chief in MSC's Planning Division; an organization responsible for planning lunar flights.

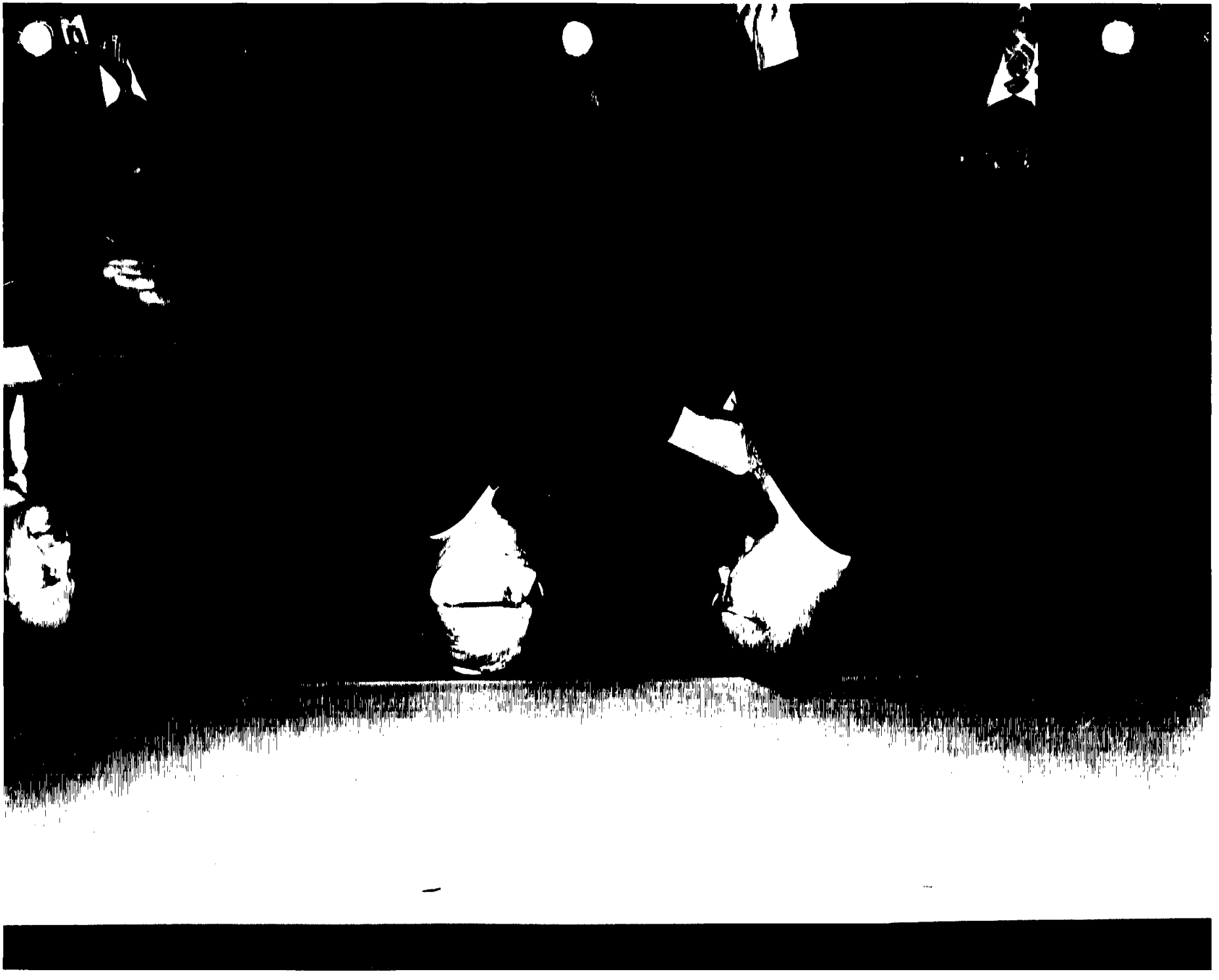
He has a Master of Science and a Bachelor of Science degree from Auburn University in Alabama.

He is married to the former Gustavia Daily. They have two children and reside in Houston.

-end-

left to right

James C. McPherson, Dr. James Fletcher, NASA Administrator, and Dr. George Low, NASA Deputy Administrator



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

September 1, 1972

Don J. Green
(713/483-5111)

RELEASE NO: 72-196

STOKES RECEIVES SERVICE AWARD

James C. Stokes, Jr., formerly of Lynchburg, South Carolina, but now employed at NASA's Manned Spacecraft Center in Houston, was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the Moon.

Making the presentation was Dr. James Fletcher, NASA Administrator.

This is the fourth award Stokes has received during his NASA tenure. He received Certificates of Commendation during three succeeding years--1968, '69 and 1970. Stokes is Chief of the Flight Support Division, an organization responsible to astronaut training.

He has a Bachelor of Science Degree in Physics from the Citadel, Charleston, South Carolina.

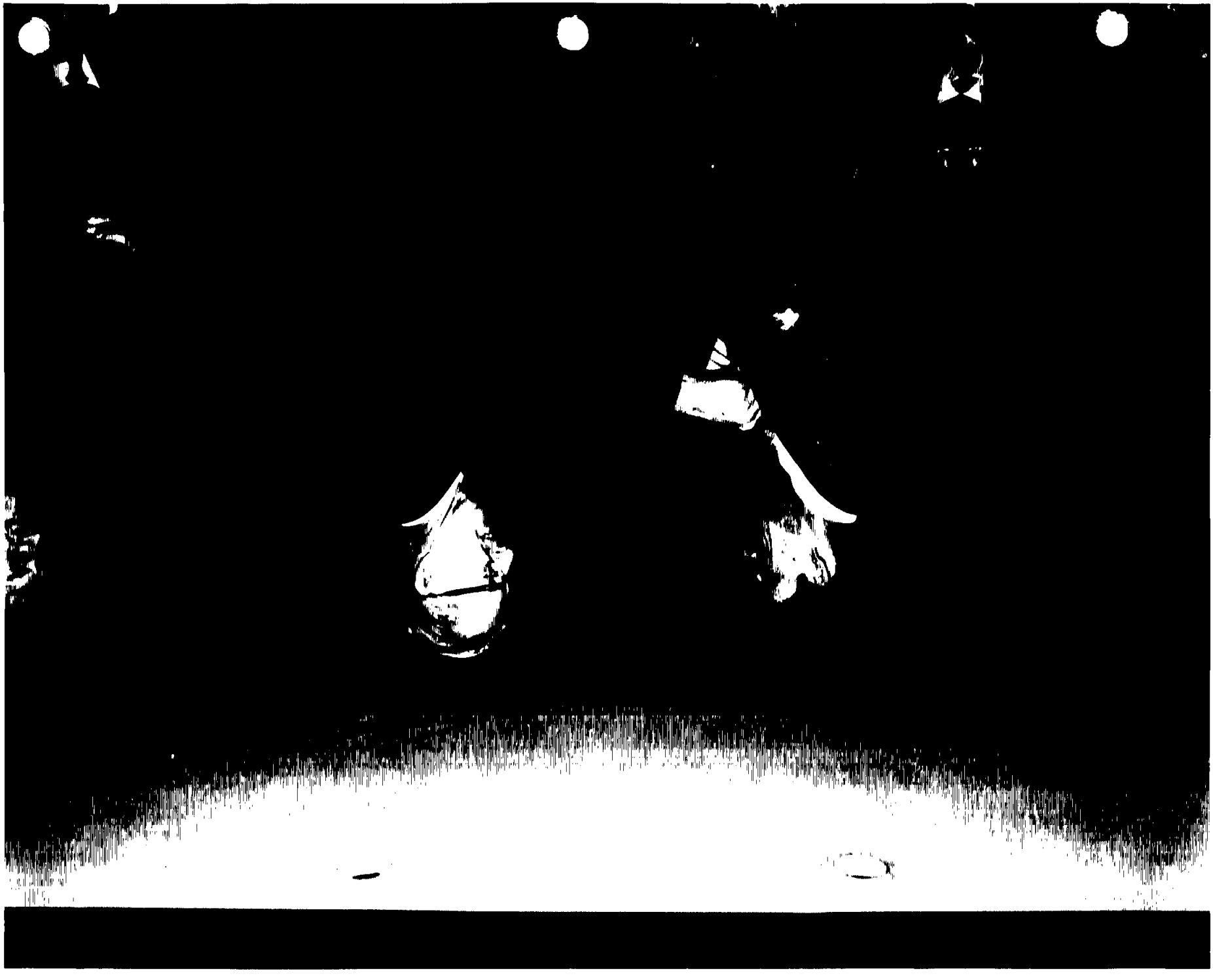
He is married to the former Rita Smith, Waco, Texas. The couple have one daughter and reside in Seabrook, Texas.

-end-

September 1, 1972

left to right

James C. Stokes Jr., Dr. James Fletcher, NASA Administrator; and Dr. George Low, NASA Deputy Administrator



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
August 31, 1972

MSC News Center
713/483-5111

RELEASE NO: 72-197

WORDEN ASSIGNED TO AMES RESEARCH CENTER

Lt. Colonel Alfred M. Worden has been reassigned from the Astronaut Office at the Manned Spacecraft Center to the Airborne Science Office, Space Science Division, at the Ames Research Center, Mountain View, California, effective September 11, 1972.

Worden's assignment will include those of a research engineer and test pilot.

Ames programs in airborne science and Space Shuttle vehicle simulation studies will utilize Worden's space flight and test pilot experience to develop and evaluate systems and procedures from an astronaut's point of view.

Worden will also participate in other NASA programs such as earth resources surveys and high altitude astronomy, using specially-equipped NASA aircraft at Ames.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 6, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-198

SKYLAB SIMULATION

The prime and backup crews for the first manned Skylab mission Wednesday began an 11-day simulation during which they will duplicate flight tasks in Skylab simulators and trainers at the NASA Manned Spacecraft Center.

Prime crew members Charles P. Conrad, Jr., Dr. Joseph P. Kerwin and Paul J. Weitz and backup crew members Russell L. Schweickart, Dr. Story Musgrave and Bruce McCandless, II, will work alternately in the command module and Skylab simulators and five trainers -- orbital workshop, multiple docking adapter, airlock module, Apollo Telescope Mount, and command module 1-g trainer -- which are located in the Building 5 Mission Simulation and Training Facility at MSC. The realistic trainers represent the elements of the total Skylab spacecraft.

The Skylab assembly will be launched unmanned aboard at Saturn V in the spring of 1973, and will be visited three times by three-man crews over an eight-month period. Twenty-four hours after the Saturn V launch, the first crew of Conrad, Kerwin and Weitz will be launched aboard a Saturn 1B, and will rendezvous and dock with the orbital assembly for a stay of 28-days.

The Orbital Workshop,which has approximately 9,555 cubic feet of working and living area, houses most of the Skylab experiments, has two solar array panels for power generation, and the complete crew quarters and commodities for sleeping,

- more -

eating and housekeeping during all mission operations. The OWS is the third stage of a Saturn V launch vehicle which has been modified for Skylab.

The Multiple Docking Adapter provides facilities for docking the command and service module and crew working areas for operation of the Apollo Telescope Mount, earth resources and space manufacturing experiments. The MDA which has 1,140 cubic feet of working space, also provides transfer of personnel, equipment, power, and electrical signals between the CSM and the OWS.

The Airlock Module has a special hatch airlock compartment and services for supporting extravehicular activity by astronauts who will leave the vehicle to replace and retrieve the film in the telescope mount. The airlock module also provides the main power distribution control and atmosphere supply and conditioning equipment for the entire orbital assembly.

The Apollo Telescope Mount provides a mounting structure, electric power system, the pointing system, and environmental control system for the six solar experiments.

The simulation, which will occur on consecutive days exclusive of week-ends, will operationally test 11 selected days of the first Skylab mission and will consist of the following:

During the first 8 days, crew members (prime and backup) will participate in activities concerned with launch (in the Command Module Simulator), operational and experiment activities in the Skylab Simulator, and in the orbital workshop, docking adapter, airlock module, and Apollo telescope mount trainers.

The final three days will be devoted to deactivation of the Skylab assembly and undocking and will be conducted using the simulators and trainers.

Purpose of the simulation is to evaluate spacecraft systems, crew systems, and experiment procedures in addition to evaluating checklists, flight data files, and stowage control in a continuous time line. The simulation will be conducted as a nominal mission without the introduction of planned malfunctions, however, should problems occur, they will be handled in real time, as would any actual flight problem.

The work day will commence at crew awakening and terminate at the beginning of the scheduled flight plan sleep period. The crew will eat their meals in the orbital workshop utilizing the vehicle's food and water system and will eat the food items scheduled for Skylab.

"Air to ground" communications will be conducted between the crew members and a special Operations Center established in Building 5. Communications and voice transmissions will follow the Skylab flight plan protocol and transmissions will simulate flight plan protocol at time periods when the vehicle is in contact with a ground station.

The Operations Center will be staffed by specialists in operations and systems and will include a test conductor, capsule communicator, flight activities officer, systems specialist, experiment operations specialist, and flight plan specialist.

On the fourth day of the simulation, shortly after the evening meal, there will be change of crews with the on-duty crew going home and the new crew remaining in the workshop for several hours completing various simulation activities, reviewing the next day's flight plan and configuring the trainers for the next day. The new crew returns the following day at 6 a.m. to continue with the simulation, picking up where they left off the night before, after relieving the previous crew.

This exchange of crews continues from the fourth through the ninth day of the simulation. Schedule, mission phase, date and time, crew and location are:

Sim Day	Mission Phase	Date	Time Start/Stop	Crew	Location
1	Launch	9-6-72	8 am-6 pm	Backup	CSM Simulator
2	Activation Orbital Assembly (OA)	9-7-72	6 am-10 pm	Prime	CM 1-g trainer
3	Activation OA	9-8-72	6 am-10 pm	Prime	Orbital Workshop
4	In-orbit	9-11-72	6 am-8 pm 7 pm-10 pm	Prime Backup	" " " "
5	In-orbit	9-12-72	6 am-8 pm 7 pm-10 pm	Backup Prime	" " " "
6	In-orbit	9-13-72	5 am-8 pm 7 pm- 10 pm	Prime Backup	" " " "
7	In-orbit	9-14-72	6 am-8 pm 7 pm - 10 pm	Backup Prime	" " " "
8	In-orbit	9-15-72	6 am-8 pm 7 pm-10 pm	Prime Backup	" " " "
9	Deactivation	9-18-72	6 am-8 pm 7 pm-10 pm	Backup Prime	" " " "
10	Deactivation	9-19-72	7 am-9 pm	Prime	" "
11	Deactivation	9-20-72	9 am-2 pm	Backup	" "

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Jack Riley
713/483-5111

FOR RELEASE:
UPON RECEIPT
September 19, 1972

RELEASE NO: 72-199

ALSO RELEASED AT NASA HEADQUARTERS

ASTP FOURTH MEETING RESULTS APPROVED

The Academy of Sciences of the USSR and the National Aeronautics and Space Administration have approved the results of the fourth meeting of Joint Working Groups on the Apollo/Soyuz Test Project (ASTP), held at Houston July 6-18, 1972. The ASTP calls for the U.S. and Soviet manned spacecraft to rendezvous and dock, by means of compatible systems, in mid-1975. Commitments for this project were signed by President Nixon and Premier Kosygin at their May 24 summit meeting.

The working groups agreed that future work would be based on three documents for ASTP: Project Technical Proposal, Organizational Plan, and Project Schedules. The working groups also agreed to a series of supplementary technical documents.

During the course of the meeting, the working groups decided that, in the 1975 mission, the Soyuz spacecraft would be launched first and the Apollo second at agreed times of day. They further agreed on the principles of manufacture and exchange of recovery communications equipment. They concluded that the technical requirements for the compatible docking systems and other system and mission technical areas were sufficiently advanced to allow system design and development to proceed.

- more -

Areas requiring further study and decision include: possible crew transfer by extra vehicular activity (EVA) in an emergency situation, study of whether changes can be made in the spacecraft pressures to shorten the time required for crew transfer; use of a television system for docking; use of attitude control propellant after docking; and the choice of a specific date in July 1975 for conduct of the mission.

It was further agreed that in future there would be five working groups instead of three:

Working Group 1. Mission Model and Operational Plans

Working Group 2. Control and Guidance

Working Group 3. Docking Mechanism

Working Group 4. Means of Communication and tracking

Working Group 5. Life Support Systems and Crew Transfer

The next meeting of working groups will be held in Moscow in October 1972.

- end -

September 19, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 22, 1972

Jack Riley
713/483-5111

RELEASE NO: 72-200

APOLLO 17 MISSION PATCH

Early in March of this year, Astronaut Eugene A. Cernan put into words on paper the Apollo 17 mission patch ideas he and his fellow crewmen, Ronald E. Evans and Harrison H. Schmitt, had been discussing.

The ideas were formless in terms of design, so the words dealt with the message the crew wanted the patch to convey.

"Our desire is that Apollo 17 symbolize not the end of an era, but rather the culmination of the beginning of mankind's greatest achievements in his history -- achievements which only have as their bounds the infinity of space and time -- symbolization that man's seemingly impossible dreams can become limitless realities," he wrote.

"We would like to recognize the historical foundation upon which the thoughts of the future are based -- and, so as never to forget, we also hope to pay tribute to the Apollo Program and our nation, its people and its heritage, which have made these accomplishments all possible. The symbolism which captures these ideas sounds sophisticated and complicated to create. We hope it is not, because it is our desire to capture our theme with simplicity."

With these words as a guide, and with further collaboration with the crew, artist Robert T. McCall designed the patch which was made public this week.

- more -

The dominant design element is Apollo, the Greek god of the sun. The particular image selected is the Apollo of Belvedere sculpture which is in The Vatican Gallery in Rome.

Suspended in space behind the head of Apollo is an American eagle of contemporary design. The red bars of the eagle's wings represent the bars in the American flag; the three white stars symbolize the three astronauts of the Apollo 17 crew.

The background of the patch is deep blue space and within it are the moon, the planet Saturn and a spiral galaxy or nebula. The moon is partially overlaid by the eagle's wing, suggesting that this is a celestial body that man has visited and in that sense conquered.

The thrust of the eagle and the gaze of Apollo to the right and toward Saturn and the galaxy is meant to imply that man's goals in space someday will include the planets and perhaps even the stars.

The colors of the emblem are red, white and blue, the colors of the American flag, with the addition of gold to symbolize the golden age of space flight which will begin with the Apollo 17 lunar landing.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 22, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-201

ATM SHIPMENT

The Apollo Telescope Mount (ATM) orbital solar observatory which will be launched aboard the first Skylab flight in 1973, was shipped Friday to Cape Kennedy, Florida, from the NASA Manned Spacecraft Center where it recently completed extensive thermal vacuum testing.

The 22,000 pound ATM was flown aboard the Super Guppy air transport to Cape Kennedy where it will undergo final pre-launch checkout.

The Skylab ATM is a solar observatory which will operate from earth orbit and provide a major advance in astronomy and solar physics. It will give scientists a view of the sun's activity without the distorting effects of the Earth's atmosphere.

The Skylab orbital assembly which consists of the ATM, airlock module, docking adapter and workshop, will be launched

-more-

in the spring of 1973 and will be visited by three separate three-man crews for durations of up to 56-days over an eight month period. The first manned flight is scheduled for 28 days and the second and third manned flights will be 56-days duration.

The ATM has been at MSC since mid-July and has been subjected to two major tests in the vacuum chamber in the Space Environment Simulation Laboratory, Building 32. The ATM was constructed at the NASA Marshall Space Flight Center, which also manages the ATM experiment program.

Skylab astronauts will control all ATM experiment operations in acquiring the data, including "space walks" to retrieve exposed film from the "sun end" of the ATM. Eight major solar instruments are being used to provide high spatial and spectral resolution in the ultraviolet, x-ray, white light and hydrogen-alpha bads of the spectrums.

The ATM is expected to be the forerunner of more advanced solar and stellar observatories which will provide increased data-gathering capability for astronomers.

-end-

September 22, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 27, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-202

ROCKET RESEARCH AWARDED SHUTTLE PROPULSION SYSTEM CONTRACT

Rocket Research Corporation, Redmond, Washington, was awarded a $310,000 contract to study and test a Reaction Control System (RCS) for use on the Space Shuttle orbiter.

RCS provides power for electrical and other systems during the re-entry portion of Space Shuttle flight. The system also acts as a backup for the fuel cells.

Rocket Research has been asked to study a system using monopropellant hydrazine. Monopropellants appear to offer advantages over other concepts in terms of reliability and cost.

"Although monopropellant systems have been used in space, the Shuttle imposes requirements on the RCS which... have not been a part of earlier engine designs..,"according to the MSC technical manager." "Requirements such as exposure

-more-

to launch vibration, to atmospheric reentry, and to repeated starts, are representative of the demands upon the system."

Rocket Research has been asked to study and design a system, to build the hardware and to test it at the Washington facility. The hardware also will be tested at the Manned Spacecraft Center.

A cost contract with no fee has been awarded, and it runs through December, 1973. The work will be monitored by MSC's Propulsion and Power Division.

-end-

September 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 27, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-203

HOGG, BUILDS LUNAR EXHIBIT

Visitors to the NASA Manned Spacecraft Center, Houston, Texas, are intrigued by realtime signals from the Moon which are displayed by an exhibit designed and built by David N. Hogg, a 1964 Texas Tech. University graduate.

The Portable Apollo Lunar Surface Experiment Package (ALSEP) Display Rack, which has proven to be a popular attraction, has a guide on duty to explain and operate the electronic devise for visitors. The Rack displays live data coming from the moon by sound, television, and on a chart recorder.

The original Rack was built by Hogg in 1971, and was sent to Geneva, Switzerland, where it was displayed at The Third United Nations Conference on the Peaceful Uses of Atomic Energy. A second Rack was displayed in Seattle at the Pacific Science Center during April, May and June, and is the one now on display at the NASA Visitor Center.

-more-

RELEASE NO: 72-203

David's wife, formerly Sissie Thompson, is a 1962 graduate of Texas Tech, and is the niece of Mr. and Mrs. Ray Riddlesperger, Route #1, Jacksonville, Texas. David and Sissie live in Houston with their 2-year-old son, Andrew, and a 5-year-old daughter, Jennifer.

-end-

September 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 27, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-203

HOGG, BUILDS LUNAR EXHIBIT

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-more-

RELEASE NO: 72-203

David's wife, formerly Patsy (Sissie) Thompson, is a 1962 graduate of Texas Tech, and a Kilgore native. She is the granddaughter of Mrs. Bessie Burcalow, 710 Carlisle Drive, and the niece of Mr. and Mrs. Howard E. Thornbrugh, 1204 East North. David and Sissie reside in Houston with their 2-year-old- son, Andrew and 5-year-old daughter, Jennifer.

-end-

September 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
September 27, 1972

Don J. Green
713/483-5111

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-more-

RELEASE NO: 72-203

David's wife, formerly Patsy Thompson, is a 1962 graduate of Texas Tech. She is the daughter of Mrs. Rose A. Thompson of 2508-21 Street, Lubbock, Texas. David and Patsy live in Houston with their 2-year-old son, Andrew, and 5-year-old daughter, Jennifer.

-end-

September 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 2, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-204

ROACH RECEIVES SERVICE AWARD

Jones W. Roach, formerly of Richmond, Texas, but now employed at NASA's Manned Spacecraft Center was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the Moon.

Making the presentation was Dr. James Fletcher, NASA Administrator.

Roach is the Assistant Chief of the Flight Control Division, an organization responsible for planning and controlling lunar flights. He joined NASA in 1962 and has worked in the flight control area during his entire space tenure.

He has a Bachelor of Science degree in Electrical Engineering from the Virginia Military Institute, Lexington.

He married the former Shirley Ann Jessen, Council Bluff, Iowa. The couple have two children and reside in Seabrook, Texas.

-end-

October 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 15, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-205

RESEARCH PROCEDURES HAVE POTENTIAL APPLICATION

A unique collection of biomedical research talent and instrumentation being applied at the NASA Manned Spacecraft Center toward a quick and accurate method of predicting infectious diseases in astronauts may contribute toward the improvement of medical care available to the general public.

Longer duration manned spaceflight missions, beginning with Skylab, impose new demands for high resolution assessment of the health status of crews prior to and during flight. Routine analytical procedures currently in use in clinical laboratories do not normally provide the sensitivity necessary to (1) detect subtle changes in physiological functions or (2) detect infectious processes during their early incubation period.

A system of analytical procedures utilizing the latest sophisticated laboratory instrumentation in the fields of spectrophotometry, cytofluorometry, and electron microscopy

-more-

has been developed for the manned Skylab program by researchers in the Manned Spacecraft Center's Cellular Analytical Laboratory. These procedures provide NASA with a new set of techniques to supplement existing laboratory analyses for improving the capability for the early detection of illnesses and for a better assessment of flight crew health status prior to and following spaceflight. The Cellular Analytical Laboratory of the Life Sciences Directorate is the prime in-house NASA facility active in the development and implementation of early disease detection and identification through structural and chemical analysis of the cellular elements of man's blood.

Under the direction of Dr. Stephen L. Kimzey, the Cellular Laboratory represents a unique medical research effort which utilizes the latest in high resolution analytical procedures for the chemical and structural characterization of individual cellular elements of the body. Although the research talent and instrumentation utilized are not in themselves new, their assembly in one facility and their coordination in a single research project distinguishes this laboratory from any in the world.

The medical research team, composed of government, in-house

support contractor (Northrop Services, Inc.) and university research scientists and technicians have, over the past several years, developed many of these procedures in blood cellular analysis, first for use in the manned Apollo flights and now considerably improved for Skylab.

The Cellular Analytical Laboratory is responsible for coordination of the Skylab M110 Medical Experiment Series which includes five individual experiments and seven scientific investigators outside of the NASA. This activity includes scheduling pre- and inflight blood sampling as well as postflight blood sampling and the preparation and distribution of these blood samples to these outside scientists. In addition, the Cellular Analytical Laboratory is responsible for the completion of one of these five experiments.

In Experiment M115, Special Hematologic Effects, these cell analysis techniques will be used extensively to evaluate the influence of long duration spaceflight on man's immunological and hematological systems. Lymphocytes (a type of white blood cell) will be examined for changes in the intracellular nucleoprotein content and distribution which occur in response to a foreign challenge (viral or bacterial). Such changes

preceed by several days the changes in body fluid composition measured by standard laboratory procedures. These data, which are collected from individual cells and analyzed by digital computer, are used to establish the reactive capability of the lymphocyte.

Also being applied to this program is a complete electron microscopy facility, including scanning and transmission electron microscopes and an electron probe x-ray microanalyzer. Red blood cells are examined by electron microscopy for structural changes and by x-ray analysis for alterations of internal electrolyte composition. Such changes might be expected to occur if the characteristics of the blood plasma were changed. In this sense, the red cell represents a model system to evaluate the functional state of other body tissues and processes.

Dr. Kimzey explains that in addition to improving the quality of medical assessment of spaceflight crews, the work of the Cellular Analytical Laboratory may contribute toward the improvement of medical care available to the general public.

Toward this end a series of cooperative efforts have been established with medical schools in the MSC area and with other government agencies throughout the country. Studies with the University of Texas Medical Branch at Galveston have applied

these procedures to the evaluation of lymphocytes of burn patients to determine their cellular resistance to infection.

An Early Detection of Disease Program is being conducted with the Departments of Microbiology and Medicine at Baylor College of Medicine. Work is also in progress with the Texas Children's Hospital in Houston to evaluate changes in muscle potassium and sodium concentrations associated with malnutrition. A joint effort is soon to be conducted with the Environmental Protection Agency and Oak Ridge National Laboratory to identify and quantitate the early response of sputum cells which are exposed to environmental agents having carcinogenic potential.

Thus this active NASA laboratory fulfills the agency's combined requirements for operational medical support of manned spaceflight and advanced research and development to improve medical technology for future mission support and contributes to the solution of existing national health problems with special cellular analytical procedures.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 2, 1972

Jack Riley
713/483-5111

RELEASE NO: 72-206

ASTRONAUT MITCHELL RETIRES

Astronaut Edgar D. Mitchell retired from the Navy and NASA effective Sunday, October 1.

He became the sixth man to walk on the moon during the Apollo 14 mission January 31 - February 9, 1971. Captain Mitchell announced his plans to retire last May. He has completed 20 years service in the Navy.

Captain Mitchell has formed Edgar D. Mitchell and Associates, Inc., to research the psychic potential of man and other forms of life. He is president of the Houston-based organization, which will use multidisciplinary teams for scientific research into psychic phenomena. Approximately 75 scientists, physicians, psychiatrists, psychologists, educators and business executives are supporting the research program, Captain Mitchell said.

-more-

RELEASE NO: 72-206

He was selected as a NASA astronaut in April, 1966. As lunar module pilot of Apollo 14, he accumulated 216 hours of spaceflight. He conducted a personal experiment in extrasensory perception during the mission.

-end-

October 2, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

October 5, 1972
10:00 a.m.

Jack Riley
713/483-5111

RELEASE NO: 72-207

ALSO RELEASED AT NASA HEADQUARTERS

ASTP MEETING IN MOSCOW

United States and Soviet working groups will begin two weeks of meetings in Moscow Monday, October 9, on the Apollo-Soyuz Test Project, a joint manned space mission planned for 1975.

The working groups represent the National Aeronautics and Space Administration and the Academy of Sciences of the U.S.S.R. The joint mission was provided for by the agreement which President Nixon and Chairman Kosygin signed in Moscow last May 24.

An Apollo spacecraft and a Soviet Soyuz will dock in earth orbit and the crews will exchange visits. The mission is designed to test equipment and techniques which will permit cooperative scientific missions as well as establish an international crew rescue capability in space.

-more-

RELEASE NO: 72-207

Three of the five working groups established during meetings here in July of this year will travel to the Soviet Union. They are Working Groups No. 1, Mission Model and Operational Plans; No. 3, Docking Mechanism; and No. 5, Life Support Systems and Crew Transfer.

Representatives of North American Rockwell Corporation, prime spacecraft contractor for the mission, interpreters and secretaries bring the total number in the U.S. group to 27.

Goal of the meetings will be to reach decisions in the following areas: spacecraft operating pressures, provisions for television as a docking aid, requirements for extravehicular activity, mission sequence including launch windows and trajectory plan and detailed timelines. A detailed review of the docking mechanism design will be conducted also.

Members of the two other working groups, No. 2, Control and Guidance, and No. 4, Communications and Tracking, and their Soviet counterparts are expected to meet here in November.

Glynn S. Lunney, Manager for ASTP, Apollo Spacecraft Program, will head the U.S. group. MSC working group members are: Hugh Scott, Clarke Covington, M. P. Frank, Col. Thomas P. Stafford, Robert Ward, Edgar C. Lineberry, Donald C. Wade, Robert White,

RELEASE NO: 72-207

William Creasy, Lawrence Williams, C. C. Johnson, John Schliesing, R. E. Smylie, W. W. Guy, Dr. W. R. Hawkins, Raymond Zedekar, and H. E. Smith.

Accompanying them are: Dr. O. E. Anderson, Jr., NASA Headquarters Office of International Affairs; George Jeffs, Kenneth Bloom and Alex Sementovsky, North American Rockwell Alex Tatistcheff, Natalie Latter and E. N. Harrin, interpreters; Betsy Bednarcyk and Lois Ransdell, secretaries.

-end-

October 5, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 6, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-208

SPACE SHUTTLE FOOD STUDY CONTRACT AWARDED

A study contract to analyze "state-of-the-art advances in space food technology," for application in the Space Shuttle program has been awarded to The Pillsbury Company, Minneapolis, Minnesota.

The work will be done for the NASA Manned Spacecraft Center. MSC has awarded $139,500, in technology funds for the performance of the study.

In addition to food studies, the construction of a life size mockup of the galley is to be a part of the effort. The mockup will be used for display and demonstration of flight food systems. It will not contain heating or refrigeration characteristics, but will be constructed so that it can be readily disassembled and packaged for shipping.

Objective of the study is to identify the best food items and types for the crew, flight passengers and for the ground alert crews that service the Space Shuttle orbiter.

A firm-fixed-price contract has been issued. It is to be concluded January 18, 1974, with delivery of reports and the mockup. MSC's Biomedical Research Division will monitor the contract.

- end -

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 18, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-209

NORTH AMERICAN SELECTS AMERICAN AIRLINES FOR GROUND OPERATIONS FOR SPACE SHUTTLE

Award of a subcontract to American Airlines Maintenance and Engineering Center, Tulsa, Oklahoma, to provide engineering support for maintainability and ground operations on the Space Shuttle Orbiter Program was announced by North American Rockwell's Space Division.

Value of the agreement over the six-year orbiter design, development and test phase is estimated in excess of tens of millions of dollars, said a Space Division official.

Under the agreement, American Airlines will lend its commercial airline experience and knowledge to a variety of Shuttle maintenance, turnaround and ground operations. The airline provided similar support to Space Division in its Space Shuttle study and proposal preparation work leading to award of the contract.

A major objective of the Shuttle Program is to develop

-more-

ground maintenance and servicing techniques leading to a two-week turnaround time between missions. The Shuttle orbiter is being designed for an operational lifetime of more than 100 missions.

The Space Shuttle is the nation's first reusable space transportation system. A literal space truck, it will be able to carry up to 65,000 pounds of varied cargo to earth orbit. Equipped with a pair of rocket boosters, the Shuttle orbiter will lift-off from the ground like a rocket ship, perform its mission in space, and then return to earth to land on a runway similar to a conventional jetliner.

NR's Space Division in July was selected by the NASA as the prime contractor for the development of the Space Shuttle system. In this capacity, the division is responsible for the design, development and production of the orbiter vehicle and for the integration of all elements of the system.

-end-

October 18, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
October 25, 1972
2:00 p.m.

Don J. Green
713/483-5111

RELEASE NO: 72-210

NASA EXTENDS COMPUTER CONTRACT AT MSC

NASA has extended its contract with Lockheed Electronics Company, Inc., Plainfield, New Jersey, for one year for computer support services at the Manned Spacecraft Center, Houston.

Estimated value of the cost-plus-award-fee contract is $27,333,456. The award, not to exceed $1,680.000, is based on contractor's performance proficiency. Total for the previous year was $26,600,000 including fee.

Approximately 1400 Houston area engineering, administrative and technical personnel are employed under terms of the award. Lockheed will provide support in the scientific, technical and administrative computer areas.

This is the second year of a contract contining provisions for negotiation over a five year period.

The second year option remains effective through August 31, 1973.

NASA — MSC

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Don J. Green
713/483-5111

FOR RELEASE:
November 2, 1972

RELEASE NO: 72-211

NORTH AMERICAN SELECTS MASSACHUSETTS FIRM FOR SPACE SHUTTLE COMPUTER CONTRACT

Intermetrics Incorporated of Cambridge, Massachusetts, will provide an advanced form of computer programming language for the Space Shuttle project under an estimated $1 million contract with North American Rockwell's (NR) Space Division, it was announced today.

Under the 21-month contract, the Cambridge firm will produce a high level computer programming language, designated HAL, which will be tailored specifically for the Space Shuttle's flight computers, said Buz Hello, Space Division vice president and Space Shuttle program manager.

The HAL computer language is an extension of work Intermetrics has done in the past on manned space programs for the National Aeronautics and Space Administration's Manned Spacecraft Center. The language will be further refined for the Space Shuttle.

An invaluable asset of the HAL language is that it is readable in basic English in the form that it will be introduced into the shuttle's flight computers, enhancing its reliability.

The Space Shuttle is the first reusable space transportation system. The keystone of the nation's future in space, the shuttle will be able to carry up to 65,000

pounds of varied cargo into Earth orbit at considerable savings over today's costs.

NR's Space Division in July was selected by NASA as the prime contractor for the Space Shuttle system under an estimated $2.6 billion development contract. In this capacity, the division is responsible for the design, development and production of the shuttle's payload-carrying orbiter vehicle and for the integration of all elements of the system.

NR plans to subcontract more than 50 percent of the dollar value of its Space Shuttle contract. Potential program subcontractors and suppliers have been identified in almost every state of the union.

- end -

November 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 3, 1972
2:00 p.m.

Jack Riley
713/483-5111

RELEASE NO: 72-212

APOLLO/SOYUZ MEETINGS

Agreements reached during the October 9-20 meetings in Moscow between the United States and the Soviet Union represent major steps toward the goal of a cooperative manned space mission in 1975.

"Cooperation between the joint working groups is excellent, and we have established a sound basis in many of the detailed technical areas," reported Glynn S. Lunney, U.S. Project Technical Director for the Apollo-Soyuz Test Project. "For example, a comprehensive design review of the docking mechanism was successfully conducted during the meetings."

The mission in which American and Soviet crews will exchange visits after linking their spacecraft in earth orbit is designed to test equipment and techniques which will permit cooperative scientific missions as well as establish an international crew rescue capability in space.

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Agreements include:

For a launch period in the second half of 1975, July 15 will be the target launch date for Soyuz.

Apollo will have five launch opportunities beginning 7 1/2 hours after Soyuz lifts off and extending into the fifth day after the Soviet launch. This is an addition of two opportunities. Launching on either of the last two opportunities would shorten the amount of time the spacecraft could remain docked. The earlier opportunities would permit approximately two days of docked operations. Studies will continue in this area.

While the spacecraft are docked, atmospheric pressures in the cabins will be adjusted so that pre-breathing pure oxygen to remove nitrogen from the blood will not be required for transfer from Soyuz to Apollo. The Soyuz pressure will be lowered from its normal 14.7 pounds per square inch to 10 pounds, and the Apollo pressure will remain at its usual five pounds.

The first joint crew training session is scheduled for next summer when Soviet cosmonauts will visit the United States for several weeks. American astronauts will spend an equal amount of time in Russia beginning in the fall of 1973. Future training sessions will be scheduled based on experience gained from these visits.

Joint crew training in both countries will include lectures on the design and operation of spacecraft systems, as well as the use of simulators and mockups. In the U.S.S.R. crews will receive lectures in Russian and in the U.S. in English. Interpreters will be provided.

The Soviet two-fifths scale model of the docking mechanism will be tested with the U.S. two-fifths scale model during a meeting of the docking mechanism group in Moscow in December. The Soviet model was demonstrated during the recent meeting.

Results of joint analysis permit the deletion of further consideration of extravehicular crew transfer. In an emergency which prevents transfer when a U.S. astronaut is in Soyuz and a Soviet cosmonaut is in Apollo, the crewmen will land in the spacecraft they are visiting. Further studies of this and other contingency situations will be required.

Sufficient propellant will be budgeted for the Apollo spacecraft to allow it to maintain attitude control while the spacecraft are docked. Both countries will continue to study alternate methods of stabilization as a contingency measure.

The exchange of working groups will be more frequent. Working Groups No. 1, Mission Model and Operational Plans; No. 3, Docking Mechanism; and No. 5, Life Support Systems and Crew

Transfer, attended the October meetings in Moscow. Working Groups No. 2, Control and Guidance, and No. 4, Communications and Tracking, will meet at the Manned Spacecraft Center next month; and Working Group No. 3 will return to Moscow in December.

All five of the joint working groups will meet at MSC in March 1973. Preliminary discussions on the subject of joint experiments will begin then.

In addition to the scheduled meetings, the project technical directors, Lunney for the U.S. and Prof. K. D. Bushuyev for the U.S.S.R., will meet as deemed necessary.

The working groups represent the National Aeronautics and Space Administration and the Academy of Sciences of the U.S.S.R. The joint mission was provided for by the agreement which President Nixon and Chairman Kosygin signed in Moscow last May 24.

-end-

November 3, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 3, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-213

HOLLOWAY RECEIVES SERVICE AWARD

Tom Holloway, formerly of Jasmine, Arkansas, but now employed at NASA's Manned Spacecraft Center in Houston, was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the Moon.

Making the presentation was Dr. James Fletcher, NASA Administrator.

Holloway is Chief of the Missions Operations Section at the space center.

He has a Master of Science degree in Mechanical Engineering from the University of Arkansas, Fayetteville.

Holloway is married to the former Shirley A. Shoffner. They have three children and reside in Seabrook, Texas, a small community near the space center.

-end-

November 3, 1972

left to right

Tommy W. Holloway, Dr. James Fletcher, NASA Administrator, and Dr. George Low, NASA ✱ Deputy Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 3, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-214

SEVIER RECEIVES SERVICE AWARD

John Sevier, Jr., formerly of Middlesboro, Kentucky, but now employed at NASA's Manned Spacecraft Center, was awarded an Exceptional Service Medal for his work in connection with the Apollo 16 flight to the moon.

Making the presentation was Dr. James Fletcher, NASA Administrator.

Sevier is Chief of the Operations Branch in the Apollo Spacecraft Program Office, an organization responsible for planning lunar flights.

He has a Bachelor of Science degree in Aeronautical Engineering from the Massachusetts Institute of Technology, Cambridge, and has taken advanced work at the University of Virginia, Charlottesville, and at William and Mary College, Williamsburg, Virginia.

This is the fourth award Sevier has received during his NASA tenure.

-more-

He was previously cited with a Certificate of Commendation; a second Exceptional Service Medal, and a Group Achievement Award given to the team that plans traverses over the lunar surface.

Sevier is married to the former Sylvia Thyng. They have four children and reside in Seabrook, Texas, a small community near Houston.

-end-

November 3, 1972

left to right

John R. Sevier Jr., Dr. James Fletcher, NASA Administrator and Dr. George Low, NASA Deputy Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:

November 7, 1972

Don J. Green
(713-483-5111)

RELEASE NO: 72-215

INITIAL SPACE SHUTTLE HARDWARE PROCUREMENT ACTION INITIATED BY NR

Requests for proposal (RFP) for the design, definition and fabrication of three major structural components of the Space Shuttle orbiter were released today by North American Rockwell's (NR) Space Division.

Release of the RFPs is the first procurement activity by NR for Space Shuttle hardware. The three components are the payload-carrying orbiter's wing, and mid-fuselage, and the vertical stabilizer.

Major aerospace firms across the country are expected to be among the bidders for one or more of the subcontracts. Plans call for the selection of the winning subcontractors shortly after the first of the year, said Bastian (Buz) Hello, Space Division vice president and Space Shuttle program manager.

Deadlines for receipt of proposals from interested companies for the components are: vertical stabilizer December 15; wing January 10, 1973, and mid-fuselage January 24th. A bidder's

-more-

conference will be held at the Space Division's Downey, California, headquarters within the next two weeks to clarify any questions and to provide required additional information for potential competing firms.

Hello added that each of the subcontracts will have two phases. Under the first, the subcontractor will support Space Division in the preliminary design and the preparation of definitive specifications. The second phase will include design, development and fabrication of the hardware needed for the Space Shuttle orbiter program.

Among the potential bidders for one or more of the major subsystems are The Boeing Co., Seattle, Washington; Beech Aircraft Corp., Wichita, Kansas; Cessna Aircraft Corp., Wichita, Kansas; General Dynamics Corp., San Diego, California; Fairchild Republic Division, Farmingdale, Long Island, N.Y.; Grumman Aerospace Corp., Bethpage, Long Island, N.Y.; Lockheed Aircraft Corp., Burbank, California.; LTV-Vought Aeronautics Co., Grand Prairie, Texas; McDonnell Douglas Corp., St. Louis, Missouri; Martin Corp., Denver, Colorado; and the Northrop Corp., Hawthorne, California.

NR's Space Division in July was selected by the National Aeronautics and Space Administration as the prime contractor for the

Space Shuttle system under a six-year, estimated $2.6 billion development contract. In this capacity, the division is responsible for the design, development and production of the orbiter vehicle, and for the integration of all elements of the system.

The company plans to subcontract more than 50 percent of the dollar value of the contract. Potential program subcontractors and suppliers have been identified in almost every state of the union.

-end-

November 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Jack Riley
713/483-5111

FOR RELEASE:
November 8, 1972
2:00 p.m.

RELEASE NO: 72-216

ALSO RELEASED AT NASA HEADQUARTERS

CONTRACT FOR ASTP HARDWARE

NASA has signed a $64 million cost-plus-fixed fee award fee contract with North American Rockwell Corp., Downey, California, for design, development and test of the docking module, docking system and modification of an Apollo Command and Service Module for the Apollo Soyuz Test Project.

The hardware would be used in the joint US-USSR rendezvous and docking mission planned for launch in the summer of 1975.

North American has been working under a letter contract since June 30, 1972.

President Nixon and Soviet Premier Alexei Kosygin signed an agreement for the mission during the President's visit to Moscow, on May 24, 1972.

Under the contract, NAR will modify an Apollo Command and Service Module to augment the reaction control system, add heaters, modify controls and displays, modify the docking ring to add a new umbilical, revise stowage, make the CSM compatible with the Saturn IB launch vehicle and other minor modifications.

The docking module will be a structural and mechanical adapter to allow the Apollo Command Module to dock with the Soviet Soyuz Spacecraft, and to provide for crew transfer between the Apollo and Soyuz spacecraft. One end of the docking module would be equipped with an Apollo type docking system to permit docking to the Apollo

Command Module in a manner similar to docking and extracting the LM and the other end will have a newly-developed system that will permit docking with Soyuz.

Two docking modules and a mockup will be procured under the contract. One is the flight unit, a second is a thermal vacuum test unit with the capability to be converted to a backup flight unit, and the third is a test unit to be used also for training and spare parts.

In addition, seven units of the new docking system will be built.

The Docking Module is a cylindrical structure, 142 centimeters (4.7 feet) in diameter and 294 centimeters (9.7feet) in length. Equipped with the necessary stored gases, displays, and controls, it will serve as an airlock for the internal transfer of crewmen between the different atmospheres of the two spacecraft. In addition, much of the new compatible equipment will be located in this structure. On its forward end there will be the new universal docking device. Radio communications, docking displays, and antennas will also be mounted in the Docking Module.

- end -

November 7, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 10, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-217

MSC EMPLOYEES HONORED AT NASA CEREMONIES

Nine Manned Spacecraft Center personnel were honored today for outstanding service in spaceflight at ceremonies at NASA headquarters in Washington.

The NASA Medal for Distinguished Service, the highest award, went to Dr. Paul W. Gast, Chief of MSC's Planetary and Earth Sciences Division.

NASA Exceptional Scientific Achievement Medals were awarded to Dr. William C. Phinney and Dr. David W. Strangway. Dr. Phinney is Chief of the Geology Branch and Dr. Strangway heads the Geophysics Branch.

Exceptional Service Medals went to Kenneth B. Gilbreath, Porter H. Gilbert, and the SMEAT (Skylab Medical Experiment Altitude Test) Astronauts Robert L. Crippen, William E. Thornton and Karol J. Bobko. Mr. Gilbreath is Deputy Director of MSC's Center Operations Directorate while Mr. Gilbreath is the chief leagel officer.

-more-

Finally, the Equal Employment Opportunity Award went to Carlos Garza, MSC's EEO officer.

A total of 76 awards were presented to field center receipients by NASA Administrator Dr. James C. Fletcher.

-end-

November 10, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 13, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-218

PHINNEY RECEIVES SCIENTIFIC ACHIEVEMENT MEDAL

Dr. William C. Phinney, formerly of South Portland, Maine, but now employed at the NASA Manned Spacecraft Center in Houston, Texas was awarded the NASA Exceptional Scientific Achievement Medal for his work on the Apollo Moon flights.

Dr. Phinney's citation reads:

"For his outstanding scientific achievement in organizing and directing the geological training program that has significantly aided Apollo flight crews in their selection of lunar material for return to Earth and in accomplishing their extensive scientific investigations of the lunar surface."

Dr. Phinney is chief of MSC's Geology Branch. He has published several scientific papers.

Dr. Phinney graduated from the Massachusetts Institute of Technology, Cambridge, with a Bachelor of Science degree. He also earned a Master of Science degree from MIT, and in 1959 was awarded

-more-

a doctorate; also from the same institution.

He is a member of the American Association for the Advancement of Science and of Sigma Xi, American Geophysical Union.

Prior to joining NASA, Dr. Phinney was a Professor of Geology at the University of Minnesota, Minneapolis. He served with the university for more than 11 years.

Dr. Phinney is married to the former Colleen Murphy. They have four children and are residents of Houston.

-end-

November 13, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 14, 1972

Terry White
713-483-5111

RELEASE NO: 72-219

HOUSTON CHAMBER OF COMMERCE MSC TOUR

Future manned missionsinto space and applications of space technology to solve earthbound problems were the topics of briefings November 1 at the NASA Manned Spacecraft Center for 32 members of the Houston Chamber of Commerce board of directors and their representatives.

The group was greeted by MSC Director Christopher C. Kraft, Jr. who described the Skylab earth-orbital workshop, the Apollo-Soyuz Test Project NASA is planning in cooperation with the Soviet Union and the Space Shuttle reusable space vehicle. Kraft also discussed with the group an urban system project underway at MSC which will use space know-how in the design of waste treatment and utilities systems for cities.

The group also visited the Mission Control Center, the Earth resources laboratory and the Skylab crew training mockups where they were briefed by astronaut John L. Swigert.

On the MSC tour were: Weldon Weekley of Weekley, Elliott &

-more-

Penny Advertising Inc.; Searcy Bracewell of Bracewell & Patterson; Clark P. Lattin, Jr. of M. W. Kellogg Company; James R. Lesch of Hughes Tool Company; George T. Morse, Jr. of Peden Industries, Inc., Bernard Weingarten of J. Weingarten Inc., attorney Gail Whitcomb; and James A. Wilson of United Gas Inc.

Also: E. Clyde McGraw of Transcontinental Gas Pipe Line Corporation; George F. Reed, American General Insurance Company; J. F. Redmond, Shell Oil Company; James T. Baker, Foley's; L. Henry Gissel, Jr., Fulbright, Crooker & Jaworski; David E. Galbreath, First City National Bank; and Duke Walser, Tenneco Inc.

Also: Kenneth Fellows, Houston Natural Gas Corporation; Coulson Tough, University of Houston; Al Parsons, Southwestern Bell Telephone Company; W. E. Parnell, Armco Steel Corporation; Don D. Jordan, Houston Lighting and Power Company; Jack Horner, Texas Commerce Bank; Bob Wommack, Fadrique & Co.; Herbert Lightfoot, Industrial Fabricating Company; and John B. Freeman, Texaco Inc.

Also: Harvey E. Fisher, Jr. and G. A. Mierendorf, A. O. Smith Corporation of Texas; Arthur W. Stout, Jr., Todd Shipyards Corporation; and M. E. Norman, Norman, Payne & Schwinger, Inc.

Chamber of Commerce staff people on the tour were executive vice president and general manager Leonard S. Patillo, Economic Development Department manager J. L. Taylor, Jr. and Future Studies Department manager C. Floyd Martin.

-end-

November 14, 1972

#1 (S-72-52730)

A LOOK AT OUR HOME PLANET---High-resolution photography of the earth from National Aeronautics and Space Administration aircraft is viewed by member of the Houston Chamber of Commerce Board of Directors during their November 1 tour of the Manned Spacecraft Center. The photography, in color infrared and in multi-spectral imagery, is valuable in land-use, hydrology and geological exploration activities. Left to right are Jack Horner of Texas Commerce Bank, George T. Morse of Peden Industries, Inc., MSC Director of Science and Applications Anthony Calio, George F. Reed American General Insurance Company, Arthur W. Stout, Jr. of Todd Shipyards Corporation and David E. Galbreath of First City National Bank.

#2 (S-72-52731

A LOOK AT OUR HOME PLANET---High-resolution photography of the earth from National Aeronautics and Space Administration aircraft is viewed by members of the Houston Chamber of Commerce Board of Directors during their November 1 tour of the Manned Spacecraft Center. The photography, in color infrared and in multi-spectral imagery, is valuable in land-use, hydrology and geological exploration activities. Left to right are James R. Lesch of Hughes Tool Company, James A. Wilson of United Gas Inc., J. F. Redmond of Shell Oil Company, Clark P. Lattin, Jr. of M. W. Kellogg Company, Jack Horner of Texas Commerce Bank and Merritt J. Bender of MSC Earth Observations Division.

#3 (S-72-52732

A LOOK AT OUR HOME PLANET---High-resolution photography of the earth from National Aeronautics and Space Administration aircraft is viewed by members of the Houston Chamber of Commerce Board of Directors during the November 1 tour of the Manned Spacecraft Center. The photography, in color infrared and in multi-spectral imagery, is valuable in land-use, hydrology and geological exploration activities. Left to right are George T. Morse, Jr. of Peden Industries Inc., David E. Galbreath of First City National Bank, Arthur W. Stout, Jr. of Todd Shipyards Corporation and Coulson Tough of the University of Houston.

#4 (S-72-52733)

BEYOND APOLLO---NASA Manned Spacecraft Center Director Christopher C. Kraft, Jr. briefs member of the Houston Chamber of Commerce Board of Directors on the aims of the Space Shuttle program during the Chamber directors' tour of MSC November 1.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 16, 1972

Robert V. Gordon
713/483-5111

RELEASE NO: 72-220

ASSIGNMENT OF RAF MEDICAL OFFICER

Squadron Leader Michael W. Whittle, a medical officer with the Royal Air Force, this week begins a two year tour of duty with the NASA Manned Spacecraft Center, the first of several foreign aerospace doctors who will work with U.S. scientists on Skylab.

Richard S. Johnston, Director of Life Sciences at MSC, said Dr. Whittle is assigned to the food and nutrition area and will be assisting MSC doctors in the M070 series of Skylab medical experiments which are aimed at assessing the effect of spaceflight on the musculo-skeletal and endocrine systems. Aerospace doctors from West Germany, Spain and Sweden are scheduled for similar assignments with NASA within the next several months.

The doctors' respective countries finance the assignment. There is no expense to NASA.

Dr. Whittle is a graduate of King's College, University of London, where he received a doctorate in physiology (1962), the St. George's Hospital Medical School, London, where he received a doctorate in medicine with honors and the University of Surrey where he completed postgraduate studies in biomechanics in 1970.

Prior to joining the RAF, Dr. Whittle served as a house physician and house surgeon at St. George's Hospital (1966-67) and as senior house officer for research from 1967 through 1969. He has authored and co-authored several medical papers.

- more -

Dr. Whittle joined the RAF in December 1970, as a junior medical officer and rose to squadron leader with the Medical Branch of the RAF. He and his wife and three children will reside in El Lago, Texas.

- end -

November 15, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 21, 1972

Milton Reim
713/483-5111

RELEASE NO: 72-221

MQF LOANED TO USAF

The first home for the Apollo 11 returning moon explorers has been loaned to the United States Air Force for use on an errand of mercy.

The Mobile Quarantine Facility (MQF) used to return Astronauts Neil Armstrong, Michael Collins and Edwin Aldrin in July 1969 from the Pacific recovery ship to the Lunar Receiving Lab at the Manned Spacecraft Center in Houston is now on loan to the U.S. Air Force for another quarantine mission.

An outbreak of the contagious Lassa Fever has been encountered in the West African nation of Sierra Leone by members of the U.S. Public Health Service team from the Center for Disease Control, Atlanta, Georgia, currently there studying Lassa Fever and rendering assistance to the local population.

In the event members of the team from the USPHS contract the fever, the MQF will be used to transport them back to the United States. Lassa Fever is a contagious virus disease which

-more-

involves several body systems and has a high mortality rate. Intensive supportive medical care including cardiac monitoring and cardiovascular support are required for Lassa Fever victims. The MQF provides the capability for using such systems and avoids many quarantine problems.

The MQF unit was picked up by a Military Airlift Command C-141 aircraft from Ellington Air Force Base on October 20, 1972. Aeromedical transportation of Lassa Fever victims requires isolation/life support systems that only the MQF can currently provide for use in a C-141 aircraft.

Training in the operation of the MQF was provided to MAC medical personnel by NASA MQF engineers here at MSC. The MQF is pre-positioned at the 58th Aeromedical Evacuation Squadron, McGuire AFB, New Jersey until movement to Sierra Leone is required.

The MQF was developed in response to the requirement established by the Interagency Committee on Back Contamination. The return to Earth of lunar material created concern in the scientific community on the uncertainty of the type or existence of any pathogen on the lunar surface that might be introduced into the environment of Earth.

Outwardly the MQF resembles a travel trailer. It is 35 feet

(10.66 meters) long, nine feet (2.74 meters) wide and eight feet 8 inches (2.63 meters) high and weighs 12,000 pounds (5442 kilograms) without occupants.

The MQF is skid-mounted (instead of wheels) and all the systems are self-contained and designed to biologically isolate at least six people with adequate living facilities.

These facilities include sleeping quarters, galley, lounge, and lavatory. Biological isolation is insured by maintaining a negative differential pressure within the MQF with two fans, and by filtering all effluent air from the MQF through ultrahigh-efficiency biological filters.

Control of the interior environmental conditions is provided by two air conditioners and two space heaters. These are individually adjusted to maintain a comfortable temperature and humidity for the occupants.

Fresh water for the MQF is supplied through the water sub-system from either an internal 30-gallon tank or an external source. The water waste is contained in waste water tanks located below floor level at the forward end of the MQF.

Additionally, a fecal waste tank is provided for containment

of all waste from the toilet.

Most of the MQF functional systems are powered by electricity. This power is supplied either by external sources or onboard sources, a diesel powered auxiliary power unit and a battery powered emergency system.

Four of these units were built for the Apollo lunar program and three were used, one each on Apollo 11, 12 and 14.

-end-

November 21, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 27, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-222

SHUTTLE SIMULATION FLIGHTS PLANNED AT FRC

NASA's Flight Research Center, Edwards, California will soon begin a series of tests to evaluate a method of simulating the orbiter part of the Space Shuttle in flight at subsonic speeds.

The tests will be conducted later this month on the Flight Research Center's General Purpose Airborne Simulator (GPAS), a converted subsonic jet transport that is equipped with an electronic variable-stability and control system.

The flights are designed to determine the ability of aircraft of this type to match the final approach path of the orbiter in steep descents from nine kilometers (30,000 feet) down to landing. The flights will be made to evaluate the feasibility of using in flight thrust reversing to effectively simulate the performance of the orbiter both with and without landing engines.

Thrust reversers are mechanical devices that are used to divert forward the thrust from the aircraft engines. They are

-more-

normally used as a braking or slowing force on the aircraft during rollout following landing.

Two of the aircraft's four engines will be reversed in flight and run at varying power settings in order to reduce the normal lift/drag ratio of the test aircraft to that anticipated for the shuttle orbiter during this portion of its flight. Speed brakes, landing gear and other devices will also be extended if necessary to achieve the desired lift/drag ratio.

The program is in support of two study contracts awarded earlier by NASA's Manned Spacecraft Center, Houston. Data from the NASA Flight Research Center tests will be made available to the two contractors, Grumman Aerospace Corporation, Bethpage, New York and Lockheed Aircraft Corporation, Marietta, Georgia, to aid them in their study of airborne simulation of the orbiter.

The studies are aimed at providing assurance to NASA that the proposed shuttle training aircraft is technically feasible and acceptable.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 27, 1972

Terry R. White
713/483-5111

RELEASE NO: 72-223

MSC ANNUAL AWARDS CEREMONY

Individual and group awards today were presented to employees and engineering teams at the NASA Manned Spacecraft Center in recognition of their efforts in the manned space flight program. MSC Director Christopher C. Kraft, Jr., presented the awards in a late afternoon ceremony in the Center's auditorium.

A total of 39 MSC Certificates of Commendation and 69 Superior Achievement Awards went to MSC employees and 7 Group Achievement Awards were made to specialized engineering teams at the Center. Receiving group awards were the Earth Resources Aircraft Program Team, Personnel Management Team, Nonflammable Materials Development Team, Skylab Apollo Telescope Mount Thermo-Vacuum Test Team, Skylab Medical Experiment Altitude Test Team, Skylab Vibration and Acoustic Test Team, and the Space Shuttle Program Definition and Preliminary Design Team.

MSC Certificates of Appreciation were presented to two firms in the aerospace industry---TRW, Inc., and Dynalectron Corporation.

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Astronaut Karol Bobko accepted the NASA Exceptional Service Medal for his participation in the 56-day Skylab Medical Experiment Altitude Test, and MSC Equal Opportunity Programs Office Chief Carlos Garza received the NASA Equal Employment Opportunity Award.

Two non-NASA awards were also presented at the ceremony--- the Federation Aeronautique Internationale (FAI) Diplome d'Honneur to MSC Crew Systems Division for notable contributions to progress in aviation and astronautics, and the Geological Society of America Exception Service Certificate to the Apollo 15 and Apollo 16 crews for exceptional service in the science of geology during their exploration of Moon.

-end-

November 27, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 29, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-224

WESTHEIMER AWARDED HEAVY HAULING CONTRACT

The NASA Manned Spacecraft Center has signed a contract with Westheimer Rigging and Heavy Hauling Company, Inc., Houston, Texas for support services for hauling, rigging and assembling heavy equipment.

Work includes the loading or off-loading of space related equipment from aircraft including test articles for Skylab and the Space Shuttle, the handling of heavy articles and equipment, and the rigging of test articles and mockups.

A cost-plus-fixed fee contract has been negotiated beginning December 1, 1973, and continuing for one year. Provisions for negotiations of two additional one year extensions also are a part of the award.

Value of the contract is $342,700. Approximately 17 Houston area personnel are employed under terms of the contract.

Westheimer was selected from among four firms responding to the NASA request.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 28, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-225

GILBERT RECEIVES NASA EXCEPTIONAL SERVICE MEDAL

Porter H. Gilbert, formerly of Hopewell, Kentucky, but now employed at the NASA Manned Spacecraft Center in Houston was awarded the NASA Exceptional Service Medal for his service at MSC.

Gilbert's citation reads:

"For his expert counsel in Government procurement and general legal matters which has provided invaluable and outstanding support to the Manned Spacecraft Center and its organizations. He has made highly significant contributions and distinguished himself during important and complex negotations and Source Evaluation Board proceedings."

Gilbert is the Chief Counsel at MSC.

Gilbert is a member of the American Bar Association, the Federal Bar Association and the Kentucky State Bar Association.

He graduated from Berea College, Berea, Kentucky with a Bachelor of Arts degree in Economics. Then he attended the

-more-

University of Virginia and finally earned a Doctor of Law degree from the University of Kentucky, Lexington.

This is the fourth award Gilbert has received during his NASA tenure. He was honored with Outstanding and Sustained Superior Performance Ratings in 1958 and 1959. An incremental salary increase goes with the SSP. Gilbert also earned a Quality Salary Increase in 1963.

Prior to joining NASA, he was employed for some 11 years as a lawyer with the United States Air Force, Wright Patterson AFB, Ohio.

Gilbert is married to the former Golide C. Kidd. The couple lives in Pearland, a small community near Houston.

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November 28, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 30, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-226

NR RELEASES ORBITAL MANEUVER SYSTEM RFP FOR SPACE SHUTTLE

Twelve companies, spread from the West Coast to the East Coast, are expected to be among the competitors for a subcontract to design and build an important structural component for the Space Shuttle.

Requests for proposal (RFP) for the component, the shuttle orbiter's orbital maneuvering system pod, were released today by North American Rockwell's (NR) Space Division. The firm is the prime contractor for development of the Space Shuttle for the National Aeronautics and Space Administration's Manned Spacecraft Center.

A bidder's conference will be held December 14 at Space Division's Downey, California headquarters to provide required additional information for interested companies. Deadline for receipt of proposals for the component is January 31, 1973, with award of the subcontract following in late March.

The orbital maneuvering system is used to aid the shuttle's payload-carrying orbiter in performing orbital circularization and change, rendezvous, and deorbit maneuvers in space. Housed in two pods, one on each side of the orbiter's aft fuselage section, the system has two 6,000-pound thrust engines.

The subcontract package includes all of the equipment for the system with the exception of the two engines, which will be subcontracted at a later time. Among the elements in the package are the propellant tanks; the propellant gauging, pressurization and distribution mechanisms and subsystems, and the pods which will house the system.

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Among the companies receiving requests for proposals for the subcontract are: Martin Marietta Corp., Denver, Colo.; The Boeing Co., Seattle, Washington; Grumman Aerospace Corp., Bethpage, Long Island, and Bell Aerospace Corp., Buffalo, both of New York; McDonnell Douglas Corp., St. Louis, and Teledyne-Neosho, Neosho, both in Missouri.

Also included are Lockheed Missile and Space Co., Sunnyvale; General Dynamics Corp., San Diego; Rohr Corp., Chula Vista; TRW Systems, Redondo Beach; Aerojet Liquid Rocket Co., Sacramento, and Aeronutronics, Newport Beach, all of California.

NR's Space Division is developing the Space Shuttle system under a six-year, estimated $2.6 billion NASA contract. The company plans to subcontract more than 50 percent of the dollar value of the contract, and has identified potential subcontractors and suppliers in almost every state.

The Space Shuttle will be able to carry as much as 65,000 pounds of varied cargo into Earth orbit. Aimed at substantially reducing today's cost of space operations, the system will replace many of the launch vehicles in use today.

- end -

November 29, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
UPON RECEIPT

F. Dennis Williams
713/483-5111

RELEASE NO: 72-227

ALSO RELEASED AT NASA HEADQUARTERS

ALSEP - LUNAR EXPERIMENTS TO CONTINUE BEYOND APOLLO 17

Though Apollo 17 and the last Americans to explore the lunar surface are scheduled to splash into the Pacific December 19, an extensive scientific network will continue to send live reports from the Moon for at least two years.

The network has been an important product of the lunar research program carried out by Apollo spacecraft since November 1969. Powered by nuclear energy, the $125 million system allows direct relay of data to scientists on Earth from experiments on the Moon.

Apollo 17 astronauts will establish the fifth independent experimental station, bringing the total number of operating experiments to nearly two dozen. The instruments in the network measure such things as tremors beneath the lunar surface, heat radiating from within the Moon, gravitational and magnetic forces, and particles in the lunar atmosphere.

Most of the experiments had a life design goal of one year, but four of the five instruments carried by Apollo 12 continue to return information more than three years after they began operating.

All five stations include seismometers to record tremors caused by meteoroids, tidal stresses, and internal changes in the Moon. Because the Moon is extremely

quiet, the seismometers register shocks far smaller than would be noticeable on Earth.

The seismic network is providing a wealth of information about layers far beneath the Moon 's surface.

Even though there is a nearly perfect vacuum on the Moon, a variety of instruments measure the constantly changing lunar atmosphere. Solar winds, gases escaping from beneath the surface of the Moon, and dust thrown up by the impact of meteoroids all contribute to matter in the atmosphere.

A third attempt to measure the heat flowing from the center of the Moon will be made with an experiment to be set up during Apollo 17. Sensors will be placed in holes drilled 2.4 meters (8 1/2 feet) into the lunar crust to provide regular readings.

Three new pieces of equipment will be added to the lunar network during the final mission. Devices to measure lunar gravity, the size and speed of micrometeroids, and the elements of the lunar atmosphere will complement earlier instruments.

In addition to the more sophisticated geophysical network, three arrays of retroreflectors specially constructed to reflect laser beams sent from observatories on Earth were placed on the Moon during Apollo 11, 14, and 15.

By aiming a laser beam at any of the arrays and timing its return to Earth, the distance to the Moon can be calculated with remarkable precision, now equal to 15 centimeters (6 inches).

This is giving information about the mass distribution and wobbles of the Moon about its center. In addition, measurements of the variations in distance with time are giving both an improved orbit for the Moon and an accurate check on the theory of gravity.

A new lunar distance observing station designed for 2.5-cm (1-in.) precision is being constructed on Mt. Haleakala in Hawaii. New observations concerning the Earth should become possible with this increased precision. If major earthquakes tip the Earth slightly with respect to its axis of rotation, this should show up in the lunar distance observations. Continental drift and fluctuations in the Earth's rotation should also be detectable in a fairly short period of time.

The final group of five experiments for the Apollo 17 landing site have a life design goal of two years, twice as long as the earlier packages. They may operate much longer.

No one knows when the five stations may stop sending back data from the Moon, but their nuclear-powered generators may still be providing energy well into the twenty-first century, far longer than the experiments themselves will survive the cycle of extreme heat and cold on the lunar surface.

- end -

November 29, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
November 30, 1972

Don J. Green
713/483-5111

RELEASE NO: 72-228

MSC CALLS FOR BID ON CLOSED CIRCUIT COLOR TV SYSTEM

A request for closed-circuit Color Television System (CTS) for use in Space Shuttle training has been issued by NASA.

The Request for Proposals (RFP) was released recently by the Manned Spacecraft Center in Houston.

The system "will be used in the generation of out-the-window visual scenes for Shuttle-related simulation and procedures development and crew training," according to the work statement which accompanied the proposal bid.

The contractor will be responsible for development and fabrication of a system including camera head, control unit, synchronization generator, encoder and color TV monitor.

Contractor bids on the CTS are due at MSC by December 11. A firm-fixed-price contract is called for, and eligible bidders will include only those who qualify as small business concerns.

-end-

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Jack Riley
713/483-5111

FOR RELEASE:
December 1, 1972
A.M.

RELEASE NO: 72-229

ASTRONAUT STAFFORD PROMOTED

Astronaut Thomas P. Stafford, 42, today was promoted to Brigadier General in the U.S. Air Force.

The veteran of three space flights is the youngest officer of flag rank in any of the U.S. services. General Stafford will continue to serve as Deputy Director of Flight Crew Operations at MSC.

The Air Force nominated him for promotion in February, 1972, and the Senate confirmed the nomination in March. He is the third NASA astronaut to achieve flag rank. Alan B. Shepard, Jr., was promoted to Rear Admiral in the U.S. Navy in December, 1971, and James A. McDivitt was promoted to Brigadier General in the Air Force in March, 1972. He has since retired.

General Stafford is a native of Weatherford, Oklahoma. He was commissioned in the Air Force upon graduation from the U.S. Naval Academy in 1952.

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He was selected as an astronaut in September, 1962. He was pilot of the Gemini 6 spacecraft which performed the first rendezvous in space with the Gemini 7 spacecraft in December, 1965, and was command pilot of Gemini 9 in June, 1966.

In May, 1969, he commanded the Apollo 10 mission, the first flight to the moon of the complete Apollo spacecraft and a dress rehearsal for Apollo 11, the first lunar landing mission. General Stafford descended in the lunar module to within eight nautical miles of the lunar surface.

General Stafford served as Chief, Astronaut Office from August, 1969, until June, 1971, when he was named to his present position. He has logged 290 hours and 15 minutes in space and has completed five rendezvous. His aircraft flying time exceeds 6,000 hours.

General Stafford is married to the former Faye L. Shoemaker of Weatherford and they have two daughters, Dionne and Karin.

-end-

December 1, 1972

(RELEASED AT HOUSTON BY THE LUNAR SCIENCE INSTITUTE)

December 1, 1972

Dennis Williams
713/483-5111

POST-APOLLO LUNAR SCIENCE REPORT RELEASED BY LUNAR SCIENCE INSTITUTE

The Lunar Science Institute, which conducts advanced research under the sponsorship of an international consortium of universities, today released an extensive report on "Post-Apollo Lunar Science."

The report, prepared following a July conference of distinguished lunar scientists at the University of California - San Diego, expresses concern that the vast quantities of information available as the result of Apollo moon landings may fall into disuse unless action is taken to continue processing data, handling rock samples, and sponsoring research projects.

"A reasonable return on our national investment in the Apollo program requires extensive study of the information and materials returned by the Apollo missions. It also requires additional accumulation of data leading to a precise definition of the problems to be attacked in the return phase of exploration," the paper says.

The report specifically recommends that the lunar sample processing and storage facilities be fully maintained after Apollo 17 to document and safeguard samples, and to offer assistance to scientists.

-more-

In addition, the scientists ask that funds be provided to continue operating the network of nuclear-powered scientific experiments placed on the surface of the Moon during the Apollo landings.

Although the report emphasizes that we must not fail to take advantage of information already gathered, it observes that only a fraction of the lunar surface has actually been investigated.

All 14 lunar landings made by the United States and the Soviet Union have been on the near side of the Moon. More than half of the sites selected by American scientists in 1967 have since been eliminated due to reductions in the budget for lunar exploration.

The most important regions left for investigation are the polar areas and the far side of the Moon, which is markedly different from the side that faces the Earth.

The report recommends that the nation undertake several more modest lunar missions in the post-Apollo period so that gaps in our knowledge might be filled and so that future landing sites might be selected.

First priority for missions in the near future, the report says, should be given to a polar-orbiting satellite equipped with remote-sensing equipment. Less than 20 percent of the

lunar surface has been explored from orbit so far.

The scientists says that additional seismic stations on the surface of the Moon would contribute substantially to the surface experiments network.

The study recommends that international cooperation be strongly encouraged as a means to accomplish further lunar exploration.

In addition to presenting recommendations for future activities, the Post-Apollo report summarizes the major discoveries made so far as a result of the Apollo program:

---mountains on the Moon are arranged in circles, unlike those on Earth, and extensive evidence indicates that the basins and surrounding mountains were formed about 4 billion years ago by the impact of meteorites as large as 1000 kilometers (600 miles) in diameter;

---these lunar basins or "seas" were later filled in by volcanic eruptions;

---since 2.5 billion years ago the surface has remained much the same;

---the debris from uncountable large and small meteorites covers the surface of the Moon to a depth of a few meters (yards);

---solar winds striking the Moon have not changed noticeably in the past 5 million years, reducing the likelihood that they brought about the Ice Ages on Earth;

---the Moon's center of mass is about 2 kilometers (1.2 miles) closer to the Earth than the body's physical center;

---water never covered the surface of the Moon;

---during the crystalization of lunar rocks, there was very little oxygen on the lunar surface;

---no form of life ever developed on the Moon.

-end-

November 29, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
December 1, 1972

Milton E. Reim
713/483-5111

RELEASE NO: 72-230

LLTV RETIRED

"I think it does an excellent job of actually capturing the handling characteristics of the lunar module in a landing maneuver. It's really a great deal different than any kind of aircraft that I've ever flown...," Neil Armstrong, the first moon walking astronaut told newsmen in mid-June of 1969, just after he had completed a training flight in the Lunar Landing Training Vehicle (LLTV) at Ellington Air Force Base.

Now the last moon walker, Eugene Cernan, commander of the Apollo 17 mission has completed his training in the LLTV and the vehicle has been retired. The final flight of the LLTV was piloted by Cernan on November 13, 1972. This was his 46th flight in the LLTV.

Early in the 1960s, engineers and pilots were confronted with the question of how to train to land a vehicle like the lunar module on the moon with one-sixth the earth's gravity

-more-

and no atmosphere.

In order to investigate the problems associated with the terminal phase of a manned lunar landing mission, a free-flight lunar-landing research vehicle (LLRV) was constructed by the Bell Aerospace Corporation to specifications established by the NASA Flight Research Center at Edwards, California.

The first flight in the development of the research vehicle to simulate the final portion of the descent and hover of the lunar module was made on October 30, 1964, by the late Joe Walker at the Flight Research Center. Nearly 200 flights were made with the LLRV before the program was transferred to the Manned Spacecraft Center in the early part of 1967.

In mid-1966, NASA/MSC ordered three Lunar Landing Training Vehicles which were modified versions of the LLRV, with deliveries commencing in December 1967. First flight of the LLTV was October 8, 1968, at Ellington AFB.

The LLTV, a wingless free-flight trainer, has a CF-700 turbofan jet engine as its main source of power for flight. The jet engine produces a maximum of 4200 pounds (1991 kilograms) of downward thrust to lift the 4100 pound (1863 kilograms) vehicle to the altitude of about 400 feet (131 meters) for a

lunar landing simulation. During the lunar simulation phase of flight, the jet engine thrust is automatically adjusted to support five-sixths of the vehicle's weight as two throttleable 100 to 500 pound (45 to 227 kilograms) lift rockets support the remaining one-sixth of the weight.

There are no aerodynamic control surfaces on the LLTV so attitude control is maintained by the use of 8 small attitude rockets with a thrust of 90 pounds (41 kilograms) each.

Due to jet engine and lift rocket fuel limitations, flights are less than 10 minutes duration with the last 90 seconds of each flight devoted to the lunar simulation phase.

All prime and backup commanders of Lunar Landing missions practiced lunar module-like landings in the LLTV at Ellington AFB. Astronaut pilots include Neil Armstrong, Charles Conrad, James Lovell, Alan Shepard, David Scott, John Young, Eugene Cernan, Richard Gordon and Fred Haise.

Flights in the earlier LLRV were made by Astronauts Frank Borman, Bill Anders, Edwin Aldrin and the late C.C. Williams.

Checkout flights with the LLRV and LLTVs were performed by NASA pilots at Edwards FRC and Ellington AFB. NASA/MSC pilots who flew the flight tests and acted as instructor pilots were

Joe Algranti, Harold "Bud" Ream, Jere Cobb, and the late Stu Present. FRC pilots on the program were Joe Walker, Don Mallich and Colonel E.E. Kleuver, U.S. Army.

Three of the wingless vehicles have met untimely ends. LLRV No. 1 crashed on a training flight on May 6, 1968. Cause of the accident was loss of attitude control due to depletion of attitude control propellant. The pilot, Neil Armstrong, ejected with no injury.

LLTV No. 1 crashed on December 8, 1968, after pilot Joe Algranti ejected safely. This accident was caused by loss of attitude control due to inadvertent flight outside the vehicle control system capability during the initial flight test program.

The third accident occurred on January 29, 1971, when LLTV No. 2 on a routine test flight experienced a loss of attitude control due to an electrical system failure. Again, the pilot, Stu Present, escaped without injury using the Weber ejection seat system.

The LLRV was flown 83 times at Ellington AFB. A total of 439 flights were logged on the three LLTVs, with LLTV No. 3 (NASA 952), the only remaining vehicle, accounting for 254 of those flights.

At the end of the Apollo program, LLTV No. 3 will be offered to the Smithsonian Institution in Washington, D.C. for use as an exhibit in the National Air and Space Museum.

-end-

December 1, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

FOR RELEASE:
December 8, 1972

Bill Pomeroy
NASA HEADQUARTERS
202/755-3114

RELEASE NO: 72-230

FIRST ALSEP STATION BEGINS 4TH YEAR

The first nuclear-powered scientific data station installed on the Moon, the Apollo 12 ALSEP, has begun its fourth year of uninterrupted operation.

Valid scientific and engineering data continue to be sent to Earth from four experiments and the ALSEP Central Station has responded to more than 15,000 ground commands.

The basic radioisotopic thermoelectric generator, called SNAP-27, was designed to produce at least 63.5 watts of electrical power over the duration of one year. It is providing 69 watts, a reduction of about 5 watts since turn-on, November 19, 1969.

The SNAP-27 is one of a series of such atomic batteries developed and tested by the Atomic Energy Commission. Radioactive decay of isotopic plutonium within a sealed fuel capsule generates heat that is converted directly into electrical power without any moving parts.

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During its three years of operation, the Apollo 12 ALSEP has undergone 37 lunations, lunar night and day periods. Each lunation subjects the exterior of the ALSEP Central Station and the experiments to temperature variations spanning approximately 550°F (-300°F to +250°F). Despite these large thermal swings, the Central Station and those experiments which require close thermal control vary internally only a few tens of degrees.

The Apollo 12 ALSEP is operating in a very stable condition and there is no indication of imminent failure. Apollo 14, 15 and 16 ALSEPs also continue to function satisfactorily.

-end-

December 8, 1972

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
Houston, Texas 77058

Al Alibrando
713/483-5111

FOR RELEASE:
December 9, 1972

RELEASE NO: 72-231

INTERNATIONAL YOUTH SCIENCE TOUR

More than 70 foreign students visiting space research and science centers in the United States will begin a three-day tour of the Manned Spacecraft Center on Monday, December 11.

In addition to observing the three periods of lunar exploration by Apollo 17 Astronauts Eugene Cernan and Harrison H. Schmitt, the students will visit the Lunar Receiving Laboratory, mission simulation, training and other facilities at MSC.

The International Youth Tour, which began December 2 in Washington is being conducted under the auspices of the National Aeronautics and Space Administration with the cooperation of the State Department. Following their visit to Washington, the students witnessed the Apollo 17 launch at Cape Kennedy and toured the Tennessee Valley Authority and Oak Ridge National Laboratory facilities in Tennessee.

They are visiting the NASA Marshall Space Flight Center in Huntsville, Alabama, today. On Sunday, December 10, the group will tour the facilities of the National Oceanic and Atmospheric Administration and the National Bureau of Standards in Boulder, Colorado.

The students were selected by their respective governments in response to a NASA invitation. They range in age from 15 to 17 and rank high academically with strong scientific interests.

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Following their visit to Houston, the students will tour the NASA Ames Research Center, Moffett Field, California, and the Jet Propulsion Laboratory, Pasadena, California.

Attached is the schedule for the visit of the International Youth Tour in Houston. The complete list of participating students and countries is available in the Apollo 17 News Center.

- end -

AGENDA

INTERNATIONAL YOUTH SCIENCE TOUR

December 11, 12, & 13, 1972

Monday, December 11

12:30 p.m.	Arrive EAFB via EAL Charter Flight - go to MSC	
1:30	Arrive Building 1 Auditorium to listen to lunar landing	
2:15	Take Group Photo with Astronaut Interview with Foreign Press/VOA View Exhibits	Building 1

	Bus #1	Bus #2	Bus #3
3:45	Mission Simulation & Training Facility Building 5	Crew Systems Division Building 7	Lunar Receiving Laboratory Building 37

5:00	Dinner - MSC Cafeteria #2	Building 11
6:30	Watch EVA #1, Second Floor Viewing Room - MCC	Building 30
8:30	Depart MSC for Airport Inn via NASA Buses	

Tuesday, December 12

8:00 a.m.	Breakfast - Airport Inn
9:00	Depart Airport Inn via charter buses for Jones Hall
10:00	Attend Student Concert by Houston Symphony Orchestra
12:00	Luncheon - Place to be determined.
1:30 p.m.	Depart for MSC

	Bus #1	Bus #2	Bus #3
2:00	Crew Systems Division Building 7	Lunar Receiving Laboratory Building 37	Mission Simulation & Training Facility Building 5
3:00	Lunar Receiving Laboratory Building 37	Mission Simulation & Training Facility Building 5	Crew Systems Division Building 7

4:00	View EVA #2 - MCC Second Floor Viewing Room	Building 30
5:00	Dinner - MSC Cafeteria #2	Building 11
6:00	Depart MSC for Sam Houston Colosseum - NASA Buses	
7:30	Attend Hockey Game - Sam Houston Colloseum	
9:30	Depart for Airport Inn - NASA Buses	

Wednesday, December 13

)0 a. m.	Breakfast - Airport Inn	
9:00	Board Buses for Sea Arama	
10:00	Sea Arama	
12:00	Board Buses for Houston	
1:00 p. m.	Lunch	
2:30	Arrive Astrodome	
4:00	Depart Astrodome	
5:00	Arrive MSC - Time available for interviews with Foreign Press	Building 1
6:00	Dinner - MSC Cafeteria #2	Building 11
7:00	View EVA #3 - MCC Second Floor Viewing Room	Building 30
11:00	Depart MSC for Hobby Airport (NASA Buses)	
11.45	Depart for Los Angeles	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Manned Spacecraft Center
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NASA EARTH OBSERVATIONS AIRCRAFT SURVEYS NICARAGUAN DISASTER AREA

A NASA C-130 earth observations aircraft is completing a two-day aerial photographic survey of the earthquake-stricken city of Managua, Nicaragua.

The survey, initiated at the request of the Nicaraguan government, covered more than 500 square miles as the aircraft made a series of overlapping flights Thursday.

Although data will not be processed until after the aircraft lands at Ellington Air Force Base late Friday afternoon, Allen H. Watkins, Assistant Manager of the Earth Resources Program, said that Thursday's flight appears to have been "very successful."

An estimated 90 per cent of the region was surveyed Thursday before the plane made its scheduled landing at Albrook Air Force Base in the Canal Zone.

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If weather conditions remain good today, the final 10 per cent of the survey will be completed during the return flight.

The aircraft carries a crew of fourteen including a complete earth observations team and two geologists--Dr. Robert Brown from the U.S. Geological Survey's National Center for Earthquake Research and Dr. David Amsbury from the Earth Observations Division of NASA's Manned Spacecraft Center.

Data from the survey aircraft, which carries mapping and multi-band cameras and thermal scanners, will be provided to Nicaraguan officials and to U.S. scientific teams sent to assess the damage to the capital city and surrounding area.

The aerial photographs will aid disaster relief officials in discovering open transportation routes, areas suitable for relief centers, and portions of the city requiring demolition teams.

The data are expected to be returned to Nicaragua Saturday, with arrangements being made to provide material to U.S. Geological Survey (USGS) and National Oceanographic and Atmospheric Administration (NOAA) earthquake teams at the

site.

In addition, the material will provide investigators in the United States with information on earthquake dynamics and on reasons for the heavy structural damage observed in Nicaragua.

This flight was one of more than 400 made by NASA aircraft in 1972 to support a variety of earth resources investigations.

-end-

December 29, 1972