NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
77-01	European Innovation Could Assist Space Shuttle Experimenters	January 7, 1977 (UR)
77-02	Orbiter Crew Escape System Tested	January 11, 1977
77-03	Shuttle Contract Agreement to Rockwell International	January 12, 1977
77-04	JSC Combines Science Organizations	January 17, 1977
77-05	Space Shuttle Astronaut Applications Pass the 1,000 Mark [cut at Headquarters]	
77-06	Note to Editors (Overland) [Didn't go out]	January 19, 1977 Upon Receptp
77-07	February 17-18, Observance of Black History Month at JSC	January 28, 1977
77-08	Northrop Contract Extended	February 4, 1977
77-09	Eighth Annual Lunar Science Conference March 14-18	February 8, 1977
77-10	NASA Symposium'77 to be Held at the JSC	February 24, 1977
77-11	Lockhedd Awarded Support Services Contract	February 25, 1977
77-12	Ham Std. gets Shuttle Spacesuit Contract	February 28, 1977
77-13	Amer. Airlines gets Contract to Maintain Shuttle Carrier Aircraft	February 28, 1977
77-14	European Innovation Could Assist Space Shuttle Experimenters	March 1, 1977
77-15	Wildland Inventory Experiment Begun by NASA & BLM	March 1, 1977
77-16	Gibson Rejoins Astronaut Office	March 4, 1977
77-17	Astronaut Evans to Leave NASA	March 8, 1977
77-18	Ham. Std. gets Shuttle Oxygen System Contract	March 7, 1977
77-19	Solar Heating System for Mission Control Center	3-10-77
77-20	Construction Begun on New Lunar Sample Building	3/14/77

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
77-22	NASA Picks Northrop to Maintain Aircraft at JSC	4/8/77 2 pm cst
77-23	NASA Negotiates with Kentron for support contract at JSC	4/8/77 2 pm cst
77-24	NASA Negotiates with Pan-Am for JSC Maint. Contract	4-12-77 2pm cst
77-25	NASA signs Add-on contract with Rockwell for Shuttle work	4-12-77 2pm cst
77-26	NASA Awards Rockwell to cover Orbiter Changes	4-15-77
77-27	Space Engineers Design Emergency Console	4-22-77
77-28	Hometown Release on R. Frazer - Exceptional Service Award	Upon receipt 4-26-77
77-29	Hometown Release On Simpkinson - Exceptional Service Award	Upon receipt 4-26-77
77-30	Fact Sheet - Space Solar Power	April 1977
77-31	Contractor Announced for NASA-BLM Earth Resources Project	Upon Rec't (5-6-77)
77-32	Spacelab network simulation starts at JSC	5-13-77
77-33	Note To Editors	5/19/77
77-34	NASA Modifies Contract to Cover Engr. Changes	6-2-77
77-35	Pan American Gets JSC Maintenance Contract	6/7/77
77-36	Astronaut Carr Leaves NASA to Join Engineering Firm	6-16-77
77-37	NASA Gives Rockwell Go for Third Orbiter Start	6/20/77
77-38	NASA Reduces Shuttle Orbiter Contract	6/20/77
77-39	Over 8,000 Apply for Space Shuttle Astronaut Program at JSC	7/15/77
77-40	NASA Amends Rockwell Contract to Cover Orbiter Changes	7-19-77 2 p.m. CDT
77-41	Third manned captive flight of Shuttle Orb.	7-21-77 Immediate
77-42	NASA to interview Astronaut Applicants	7-29-77 Immediate

NEWS RELEASE LOG

NUMBER	TITLE	RELEASE DATE
77-43	Note To Editors - Summer Workshop on Near Earth Resources to be held August 6-13, 1977	August 4, 1977
77-44	Second Group of Astronaut Applicants to be Interviewed	August 9, 1977
77-45	Lockheed Awardec Contract for Technical Support Services	August 9, 1977 3:00 p.m. CDT
77-46	Third Group of 20 Astronaut Applicants Include Eight Women	August 25, 1977 1:00 pm CDT
77-47	Lunar Science Stations To Ceasee Functioning Septeember 30	Sept. 1, 1977
77-48	First Shuttle Payload to Investigate Earth Resources	Upon Receipt Typed 9-7-77
77-49	Second Shuttle Orbiter FF Set for Sept. 13	Sept.9, 1977
77-50	JSC Extends Lockheed Contract for Computer Services	Sept. 13, 1977 2:00 pm CDT
77-51	NOTE TO EDITORS - JSC to Get Saturn V First Stage Display	Sept. 15, 1977
77-52	NASA Selects Fourth Group of Astronaut Applicants	
77-53	Third Free Flight of Shuttle scheduled for 9/23	9/20/77 Upon Receipt
77-54	Fifth Group of Astronaut Candidates	Immediate 9-26-77
77-55	NASA, St. Regis Paper Company Sign Cooperative Agreement Forest Resources Applications	September 28, 1977
77-56	Sixth Group of Applicants come here	Immediate October 3, 1977
57	NTF	
58	4th FF & [illegible] 12	
77-59	Seventh Group of Astronaut Applicants Report 10/17/77	October 12, 1977
60		
61		
62		
63		

77-64	Saturn V Upper Stages Arrive for JSC Display	10/19/77
77-65	Fifth Shuttle Orbiter Free Flight Set for October 26	10/20/77
77-66	Eighth Group of Astronaut Applicants October 25-29	10/20/77 2 pmCDT
77-67	The Johnson Space Center will host visits from two dignitaries	October 21, 1977
77-68	NASA Signs Supplemental Agreement with Ford Aerospace	10/31/77
77-69	JSC Picks Taft Broadcasting for TV Contract Negotiations	10/31/77
77-70	Ninth Group of Astronaut Applicants for Shuttle at JSC Nov. 7-11	11-4-77 noon
77-71	JSC Picks ILC Industries for Shuttle Crew Equipment	11-4-77 2 pm CST
77-72	Stonesifer Heads New JSC Experiments Office	11-4-77
77-73	NASA's Landsat to Monitor Commercial Timber Resources	Upon recpt.
77-74	Shuttle Orbiter Ferry Flights Planned	11-7-77
77-75	Tenth Group of Astronaut Applicants	11-11-77
77-76	NASA Signs Add-On to Orbiter Contract	11-15-77 2:00 pm
77-77	NASA Signs Add-On to Ford Contract	11-15-77 2:00 p
77-78	United States, Soviet Space Talks Scheduled	Upon Recpt.
77-79	JSC Extends Alpha Constr. Pact	11-17-772:00 pm
77-81	NASA Signs Orbiter Contract Add-On	12-5-77
77-82	Hometown Release on Thornton	Upon Recpt
77-83	Hometown Release on Giuli	" "
77-84	JSC Signs IBM to Maintain Orb. Data Processing	11-28-77
77-85	NASA Supplement Covers Dozen Orb. Changes	12-12-77
77-86	Mission Control Center Benefits from solar power	12-15-77

77-87	James E. Myrick	12/14/77
77-88	New Lunar Science Teaching Aid Developed By NASA	12/15/77

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon

For Release:

RELEASE NO: 77-02

January 12, 1977

ORBITER CREW ESCAPE SYSTEM TESTED

A test to determine the effectiveness of the crew escape system for the Space Shuttle Orbiter was successfully conducted Tuesday for the NASA by the U.S. Air Force at Holloman Air Force Base, Alamogordo, New Mexico.

Two instrumented dummies were ejected from a mockup of the Orbiter and were landed "safely" by parachute at the high-speed test track of the USAF's 6585th Test Group at Holloman. The dummies, attached to ejection seats, were propelled 300 feet into the air where individual parachutes were deployed.

- more -

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

Tuesday's test, which was the fourth of a series which began in December, was a static firing in which the upper portion of the Orbiter crew compartment remained in a fixed position. The next test, scheduled in early February, calls for the cabin section, equipped with ejection seats and dummies, to be propelled along the test track. The escape system will be initiated while the test article is traveling at speeds up to 438 knots.

The crew ejection system, seat and parachute system, will be aboard the Orbiter later this year during the Approach and Landing Tests at the NASA Dryden Flight Research Center. The Orbiter will be carried to an altitude of about 24,000 feet by a modified NASA 747 jetliner. The initial flights will be with an unmanned Orbiter, followed by a series of flights with astronauts in the Orbiter which will not be released from the 747. The final "free" flight tests will have the astronauts at the controls when the Orbiter is released from the 747 and descends to landings at the Edwards Air Force Base.

The static test was designed to verify the capability of the escape system to provide safe crew escape and recovery while the Orbiter is atop the 747 on the ground. Subsequent dynamic tests will determine the effectiveness of the system during inflight phases of the ALT program and during launch phases of Shuttle before the Orbiter reaches the altitude of 75,000 feet.

###

NASA-JSC

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon

For Release:

RELEASE NO: 77-03

January 12, 1977

SHUTTLE CONTRACT AGREEMENT TO ROCKWELL INTERNATIONAL

NASA has signed a supplemental agreement to the Shuttle Orbiter contract with Rockwell International, Space Division. Value of the procurement action is $10,031,250.

This agreement incorporates nine contract changes previously authorized by NASA for configuration change to the Orbiter for the Approach and Landing Test, changes in definition of a quarter scale ground vibration test model and additional simulation efforts to cover support of Orbiter 102, the first orbital flight test vehicle.

The majority of the work covered in these changes has been or will be performed at the RI facility at Downey, California, with support from RI field offices in Houston, Texas, and at the Kennedy Space Center, Florida. This supplemental agreement brings the estimated value of the basic Shuttle contract to $3.038 billion.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:
January 17, 1977

RELEASE NO: 76-04

JSC Combines Science Organizations

Richard S. Johnston has been named Director of Space and Life Sciences at the NASA Johnson Space Center, Houston, in a merger of two Center organizations -- the Life Sciences Directorate and the Science and Applications Directorate. The reorganization is effective immediately.

Peter J. Armitage is Assistant Director for Plans and Programs. Dr. Lawrence F. Dietlein is Assistant Director for Life Sciences, and Dr. Owen K. Garriott is Assistant Director for Science.

The new organization absorbs the five divisions in the former directorates: Science Payloads Division, Space Research and Operations Division, Bioengineering Systems Division, Earth Observations Division, and Lunar and Planetary Sciences Division.

- more -

Johnston, 50, began his federal service in 1946, at the U.S. Naval Research Laboratory as a research chemist. He transferred to the U.S. Navy Bureau of Aeronautics (BuAer) in 1955, where he worked on aircraft liquid oxygen breathing systems and low-altitude escape systems.

Johnston transferred to the NASA Space Task Group at Langley Field, Virginia, in 1959, as an environmental control system engineer on Project Mercury, later becoming chief of the Manned Spacecraft Center (now Johnson Space Center) Crew Systems Division. He was named special assistant to the JSC director in 1968, and managed the Apollo Lunar Quarantine Program and the preparation and operation of the Lunar Receiving Laboratory.

He was appointed deputy director of JSC Medical Research and Operations in 1970, and became Director of Life Sciences in 1972. He joined the Bunker Ramo Corporation, Oak Brook, Illinois in January 1976 as special assistant to the president, but returned to JSC and federal service in the fall of 1976.

"I enjoyed my brief stay in industry," said Johnston, "but I missed JSC, its people and the broad spectrum of scientific and technical problems we encounter in the space program. The new directorate will be a challenging job for me professionally, and I feel that JSC will receive many benefits from pooling its limited resources into a stronger science organization."

###

NASA News

National Aeronautics and
Space Administration

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

For Release:
January 28, 1977

Bruce L. Bennett

RELEASE NO: 77-07

JSC TO OBSERVE BLACK HISTORY MONTH

Guest speakers, public school groups, and art and jewelry displays will highlight JSC's February 17-18 observance of Black History month.

U. S. Representative Bob Gammage, NASA Federal Women's Program Coordinator Oceola Hall and Houston City Attorney Otis King will speak on the second day.

The theme, "Heritage Days: The Black Perspective," recalls such black contributions as the development by botanist and chemist George Washington Carver of hundreds of products from peanuts and sweet potatoes. It also reflects the works of inventor-draftsman-engineer Lewis H. Latimer, including his patent drawing of the first telephone and his invention of the first incandescent light bulb with a carbon filament.

African-style jewelry, portraits and graphic art works will be exhibited both days at the Building 2 Auditorium. Performances of the Woodson

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

Carter Junior High School modern dance group and the Forest Brook High School stage band are scheduled to begin at 11:30 am, Thursday, February 17.

At 1 pm Friday, February 18, the program will be opened by Attorney Henry Smith, Chairman of JSC 1977 Black History Observance program committee.

Gammage will speak following the welcoming by Administration and Program Support Director Philip Whitbeck.

After Hall's presentation, King will be the concluding speaker of the afternoon.

Other JSC and contractor employees participating on the program include Rhonda Alcorn, Theodore Bossette, Herman Hines, Izella Mitchell, Shirley Price and Horace Williams.

All JSC and contractor employees have been invited.

###

NASA News

National Aeronautics and Space Administration

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

Terry White

For Release:
February 4, 1977

RELEASE NO: 77-08

NORTHROP CONTRACT EXTENDED

The NASA Johnson Space Center, Houston, has signed a contract with Northrop Services, Inc., for operation and maintenance of life sciences and engineering laboratories, and the Lunar Curatorial Laboratory at the Center.

Effective February 1, 1977, and expiring January 31, 1978, the cost-plus-award-fee contract is valued at $9,083,393, bringing the total estimated value of the Northrop contract to approximately $46,230,135.

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-09

For Release:

Upon Receipt

EIGHTH ANNUAL LUNAR SCIENCE CONFERENCE MARCH 14 - 18

The Johnson Space Center and the Lunar Science Institute will host the 8th annual Lunar Science Conference, March 14 through 18, at the space center in Houston. More than 600 scientists from around the world are expected to attend.

New information gained about the moon from a wide variety of scientific studies of lunar samples and data obtained from Apollo surface and orbital experiments, and new interpretations and refinements of previous models of lunar origin and history will be presented at the conference.

This eighth consecutive lunar science meeting is also the second "planetary" science meeting, continuing a trend begun at last year's conference where topics of planetary interest were introduced for the first time.

- more -

The conference was expanded to include the planets last year because of the accumulating data from the recent NASA and Soviet exploratory missions to Venus, Mercury, Mars and the outer planets which provide important data on planetary origin and evolution, which is of primary concern to lunar scientists.

This year's conference will include papers based on the recent exploration of Mars by the Viking spacecraft.

Also at this year's conference the Soviet Union will present lunar material from their recent Luna 24 mission to NASA scientists for examination and analysis.

A delegation of Soviet scientists will present five half-gram-size samples retrieved by the Luna 24 spacecraft last August. Two samples from the Luna 24 mission are already at the Johnson Space Center Lunar Curatorial Facility. They were presented to the agency this past December at ceremonies in Moscow. The Luna 24 samples represent material from the easternmost limb of the moon, an area not previously sampled by either the U.S. Apollo program or the U.S.S.R. Luna program.

The scientific topics to be considered at this eighth conference are:

Constraints on structure and composition of
Planetary interiors.

Characteristics and movements of materials on
lunar, planetary and asteroidal surfaces.

Characterization and evolution of maria and other
volcanic landforms.

Characterization and evolution of planetary crusts.

Nature and effects of impact processes.

Extraterrestrial meterials as solar/interplanetary/ interstellar probes.

Earliest history of the solar system.

The conference will open with a general session followed by four days of concurrent sessions concerning the various topics outlined. A summary session will be presented on Friday, March 18.

Conference co-chairmen are Dr. Michael Duke, Acting Chief, Lunar and Planetary Sciences Division, JSC, and Dr. Robert Pepin, outgoing Director, Lunar Science Institute.

###

Editor's Note:

Reporters wishing to cover the conference should report to the News Center, Building 2, Johnson Space Center (713/483-5111). Conference personnel will not accredit newsmen. A summary press conference is planned following the summary session on Friday. Transcripts of the summary session, press conference, and any special sessions scheduled will be made available to media about 4 weeks following the conference.

For further information please contact Johnson Space Center, Public Information Office, (713) 483-5111.

February 9, 1977

NASA-JSC

NASA News

National Aeronautics and
Space Administration

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

Janet Wrather

RELEASE NO: 77-10

For Release:

Upon Receipt

NASA SYMPOSIUM '77 TO BE HELD AT THE JOHNSON SPACE CENTER

More than 2000 students from Texas junior and senior high schools will gather at the Johnson Space Center, March 1-3, to participate in "NASA Symposium '77."

A first-of-its-kind event for NASA, the symposium is designed to motivate youth -- particularly female and minority students -- to seek engineering and science careers.

Some 700 students and counselors from school districts in 17 Texas cities are expected to attend each day of the event.

JSC and contractor employees will conduct workshops and will discuss their own careers as scientists or engineers. Tours of various work areas are also planned.

"Hopefully, the use of center employees as 'role models' will serve as an effective motivating factor for the students," stated Joseph Atkinson, Chief of the Equal Employment Opportunity Office.

- more -

A special guest at the symposium will be actress Nichelle Nichols of the Star Trek television series.

Themes for the symposium include: Space Research Activities -- Past, Present, Future; Space Technology -- Its Practical Applications and Benefits; NASA's Research and Development Program; Motivating Minorities and Women Into Science and Engineering Careers; and Future Careers in Science, Engineering and Technology.

Administrators from colleges and universities which enroll high percentages of minority and female students have been invited to attend a seminar during the symposium concerning NASA's research, training and employment opportunities. The information they receive will be passed on to their students.

Symposium activities will take place in the Buildings 2 and 30 auditoriums, the Gilruth Center and appropriate job-site areas.

Awards will be given to students who submitted outstanding science papers prior to the symposium. The papers are being judged by professional scientists and engineers.

Programs similar to Symposium '77 have been held in the past at three universities. This will be the first time NASA has sponsored one of the events at a field center. A similar symposium has been scheduled at Kennedy Space Center, Florida.

###

February 24, 1977

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:

RELEASE NO: 77-11

February 25, 1977
2:00 p.m. CST

LOCKHEED AWARDED SUPPORT SERVICES CONTRACT

The NASA Johnson Space Center, Houston, has awarded a contract to Lockheed Electronics Company, Inc. Systems and Services Division for site support services at the Center's White Sands Test Facility, Las Cruces, New Mexico.

The estimated amount of the cost-plus-award-fee contract is $12 million, and covers the third year of support services at White Sands. The total three-year value is estimated at $24 million.

###

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

NASA-JSC

, 4 / / 6 93

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-12

For Release:

February 28, 1977
2:00 p.m. CST

HAMILTON STANDARD GETS SHUTTLE SPACESUIT CONTRACT

The NASA Johnson Space Center, Houston, has signed a letter contract with Hamilton Standard Division of United Technologies Corporation, Windsor Locks, Connecticut, for fabrication and field support of Space Shuttle crew spacesuits.

Called the Extravehicular Mobility Unit (EMU), the system consists of a spacesuit with integrated life support backpack for astronaut spacewalks outside the Shuttle Orbiter's pressurized cabin. The spacesuit will be small, medium and large upper and lower torso standardized sections instead of the individually customed-fitted suits in earlier manned space flight programs.

Hamilton Standard will provide equipment and spares for seven suits and supporting hardware, and training, manpower and field support at JSC and other NASA centers.

The letter contract to Hamilton Standard is valued at $2 million, and the estimated value of the final definitive contract is $18.5 million.

###

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

NASA-JSC

1411 94

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-13

For Release:

February 28, 1977
2:00 p.m. CST

AMERICAN AIRLINES GETS CONTRACT TO MAINTAIN SHUTTLE CARRIER AIRCRAFT

The NASA Johnson Space Center has signed a letter contract with American Airlines, Inc. Maintenance and Engineering Center, Tulsa, Oklahoma, for maintenance and operations support of the Boeing 747 Shuttle Carrier Aircraft "NASA 905."

American Airlines will perform the work primarily at the NASA Dryden Flight Research Center, California, where the aircraft serves to carry the first Space Shuttle Orbiter in atmospheric and glide-flight landing tests. The letter contract is for an initial value of $200,000, and the total estimated contract cost is $806,000.

###

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-14

For Release:

Upon Receipt

EUROPEAN INNOVATION COULD ASSIST SPACE SHUTTLE EXPERIMENTERS

In a novel twist to an old story, the space agency stands to benefit from an industrial innovation. Spin-offs usually come from, rather than go to, the National Aeronautics and Space Administration.

This particular industrial spin-off is a European innovation establishing standards for electronic subassemblies used between computers and scientific hardware. The standards, known as CAMAC, have been used in Europe for over six years ahd have resulted in tremendous cost savings for European university and industrial experimenters.

At the Johnson Space Center, Houston, equipment built to CAMAC standards has been used for six years in scientific experiments flown aboard high-altitude balloons. The CAMAC equipment has performed satisfactorily at great reductions in cost over previously-used custom-built electronic assemblies.

Cost savings are envisioned during the 1980 Shuttle era by which time experimenters from many different American universities and companies will share Shuttle Orbiter space with European experimenters.

The CAMAC equipment would provide data and control links between the Shuttle Orbiter computers and experiment hardware in the payload bay. Experimenters would be able to cut experiment costs since major electronics sections would be assembled from a CAMAC subassembly pool. Experiments with common subassemblies would be able to share spare parts, thereby reducing the cost of reliability.

The CAMAC equipment has been shown to be compatible with the "shirt sleeve" environment aboard the Orbiter. The Marshall Space Flight Center, Huntsville, Alabama, is currently examining different CAMAC equipment to determine reliability during the stresses of launch and landing.

###

March 7, 1977

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-15

For Release:

Upon Receipt

WILDLAND INVENTORY EXPERIMENT BEGUN BY NASA & BLM

The National Aeronautics and Space Administration and the Department of the Interior have begun preliminary work on an experiment involving the remote sensing of wildland resources in the western United States.

Interior's Bureau of Land Management (BLM) and NASA's Johnson Space Center (JSC) have identified joint responsibilities for the cooperative experiment which will test and implement a system using Landsat satellite information to provide the BLM with an inventory of major streams, soil and vegetation types, drainage patterns, major lakes, ponds, and other reservoirs, and fire occurrence and hazards.

Landsat is an Earth resources satellite which provides multispectral information capable of being computer enhanced and processed. It orbits the Earth at an altitude of 570 miles. Two Landsat satellites are presently in orbit with a third due for launch this October.

- more -

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

NASA will provide satellite data and sophisticated processing techniques to extract inventory information from the data. Most of the NASA share of the experiment will be done at the space center in Houston.

The experiment will concentrate first on a portion of southcentral Alaska east of Mount McKinley National Park. The area is called the Denali Planning Unit by the BLM and includes northern spruce and fir trees in a tundra ecology.

The second phase, if approved, will concentrate on the Shivwits Planning Unit, an area in northwestern Arizona representing a desert ecology. The final phase of the experiment will cover the Owyhee Planning Unit in southwestern Idaho representing the sagebrush and grassland community of the intermountain west.

Each phase of the experiment will last about one year. At the completion of the experiment, now expected to be late 1979, the partners expect to have developed an automated inventory system capable of providing extensive, timely information about the BLM's land holdings.

This experiment is a continuation of NASA's applications program in the Earth resources disciplines. Previous applications which NASA has developed for other agencies and private concerns include a water mapping system for the Corps of Engineers, a forest inventory system for the U.S. Forest Service, and a coastal wetlands inventory system for the Sate of Louisiana, all using Landsat information. The applications program aims to transfer the technology gathered during these experiments to all possible public users.

The Bureau of Land Management is an agency of the U.S. Department of the Interior which has broad management authority over 473 million acres of land in 11 western states including over two-thirds of Alaska. The BLM was recently granted the authority to inventory public lands and to prepare comprehensive land-use programs for the lands held in public trust under the BLM's stewardship.

The Johnson Space Center is NASA's lead center for the development of earth resources applications programs.

###

March 7, 1977

NASA News

National Aeronautics and
Space Administration

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

Jack Riley

RELEASE NO: 77-16

For Release:

March 4, 1977
2:00 p.m. CST

GIBSON REJOINS ASTRONAUT OFFICE

Dr. Edward G. Gibson, science pilot on the 84-day Skylab 4 mission in 1973-74, will rejoin the Johnson Space Center's Astronaut Office on Monday, March 7.

Gibson, 40, resigned from NASA in December 1974, to become a senior staff scientist at Aerospace Corp., El Segundo, California. In 1976, he joined ERNO, Bremen, West Germany, prime contractor for Spacelab which will fly aboard the Space Shuttle.

He will be assigned to the Mission Specialist Office, headed by Astronaut Joseph P. Kerwin, MD. Gibson's Ph.D. degree is in engineering and physics.

###

NASA News

National Aeronautics and
Space Administration

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

Jack Riley

For Release:
March 8, 1977

RELEASE NO: 77-17

ASTRONAUT EVANS TO LEAVE NASA

Astronaut Ronald E. Evans will leave NASA March 15 to become a coal industry executive.

Evans, 43, command module pilot of Apollo 17 in 1972, has been named Executive Vice President of Western America Energy Corporation and Director of Marketing for WES-PAC Energy, the coal producing concern of WAEC. Headquarters is in Scottsdale, Arizona, where the Evans family will reside.

"I really appreciate the opportunity I've had to participate in this nation's space program, and I'd like to thank everyone involved for their help to me and in making the program a success," he said.

Evans was selected as a NASA astronaut in 1966. He logged 301 hours and 51 minutes in space during Apollo 17's mission to the moon, including a one-hour, six-minute "space walk." He was a member of the astronaut support crews for Apollos 7 and 11 and was backup command

-more-

module pilot for Apollo 14 and the Apollo-Soyuz Test Project.

He retired from the Navy as a captain in May 1976, but remained in the astronaut corps where he has been responsible for the operational aspects of the ascent phase of the Space Shuttle orbital flight tests scheduled to begin in 1979.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-18

For Release:

March 7, 1977
2:00 p.m. CST

HAMILTON STANDARD GETS SHUTTLE OXYGEN SYSTEM CONTRACT

The NASA Johnson Space Center, Houston, Texas, has awarded Hamilton Standard Division of United Technologies Corporation, Windsor Locks, Connecticut, a contract for development and production of the Space Shuttle portable oxygen system.

The system consists of a face mask, rebreather loop, heat exchanger, oxygen bottle and recharge kit which can operate independently or connected to the Shuttle Orbiter's oxygen system. Orbiter crew and passengers will use the portable oxygen system for emergency oxygen in case of cabin atmosphere contamination, for prebreathing prior to spacewalks for denitrogenizing crewmen's circulatory systems, life support during rescue operations, and emergency oxygen after landing if the atmosphere around Orbiter is contaminated.

The cost-plus-fixed-fee contract is valued at $2,752,000.

###

NASA News

National Aeronautics and
Space Administration

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

Milt Reim

RELEASE NO: 77-19

For Release:

March 10, 1977

SOLAR HEATING SYSTEM FOR MISSION CONTROL CENTER

A solar heating system for year-round humidity control of computer areas in the Mission Control Center at the National Aeronautics and Space Administration's Johnson Space Center is scheduled for completion later this year.

The estimated 1,527,922,000 BTU's annual energy savings of this system is enough to provide heat and hot water for at least 16 average size four-bedroom homes in the Houston area.

The $309,000 project provides for solar collector panels to be mounted on the roof of Mission Control Center. The area of the panels will be approximately 5,600 square feet and they will be oriented south with a 29 degree tilt angle to provide maximum exposure to the sun. The solar collectors will be set back from the edge of the Mission Control Center

- more -

roof and will not be readily visible from the ground level.

NASA and the Energy Research and Development Administration are jointly funding the program. The goal of the program is to stimulate the advancement of an industrial, commercial and professional capability for using solar energy in heating and cooling of residential and commercial buildings to reduce the demand on present fossil fuel supplies.

Most of the computer equipment in the Mission Control Center is in operation 24 hours a day year-round. The solar heating system will provide at least a 30 percent savings in natural gas used for reheating the building air after it is chilled for humidity control.

On cloudy days and at night, the existing steam converter currently in use for Mission Control Center will provide the additional heat needed.

Final design of the solar collection system is scheduled for completion in mid-March. Modification to the present system to tie-in the solar system will begin in May with installation of the solar collectors on the roof of the Mission Control Center in August and September. Activation of the system is scheduled for October.

This project is one of several scheduled for facilities at NASA centers in California, Florida, Virginia, and Alabama.

The role of government in the solar energy field is to stimulate potential users of the equipment and to assist industry with development and demonstration programs that will lead to the early, widespread use of this energy source.

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:

Upon Receipt

RELEASE NO: 77-20

CONSTRUCTION BEGUN ON NEW LUNAR SAMPLE BUILDING

Construction for the Johnson Space Center's new Lunar Curatorial Facility began Monday, March 14. The new facility will replace the presently crowded facility in Building 31.

General contractor for the construction is Spaw-Glass, Inc., of Houston. Construction is expected to be completed by September 1978. Construction budget is $2.02 million. A special feature of the new facility is a glass viewing area on the second floor so clean-room operations can be viewed from outside the clean area.

The new facility will be a 14,000-square-foot two-story addition to Building 31. It will provide clean, secure storage space, processing, experimental and simulation labs for the samples.

NASA astronauts brought back from the moon 844.1 pounds of material. One hundred twenty-one pounds of it is in back-up storage in San Antonio, and the remainder is stored at JSC. In addition to American lunar samples, the Curatorial Facility also houses a small collection of lunar material provided by the USSR Academy of Sciences from the Soviet Luna exploration program.

###

March 14, 1977

NASA News

National Aeronautics and
Space Administration

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

For Release:
Upon Receipt

NOTE TO EDITORS

SHUTTLE CREWS PRESS CONFERENCE AND BRIEFINGS ON SHUTTLE ORBITER OPERATIONS

April 4-5, 1977, NASA Johnson Space Center, Houston, Texas

Briefings on Space Shuttle Program and Orbiter systems and flight operations will be held Monday and Tuesday, April 4-5:

Monday

1:00 pm	Space Shuttle	Robert F. Thompson, Manager Space Shuttle Program, JSC
	Shuttle Orbiter	Aaron Cohen, Manager Orbiter Project Office, JSC
	Orbiter Subsystems	Lewis R. Fisher, Deputy Manager Orbiter Engineering Office, JSC

Tuesday

9:00 am	Approach & Landing Test (ALT)	Donald K. Slayton, Manager Approach & Landing Test, Shuttle Program Office, JSC
	ALT Flight Operations	M. P. "Pete" Frank, Chief, Flight Control Division, JSC
12:30 pm	ALT Crews Press Conference with Astronauts Fred Haise, Gordon Fullerton, Joe Engle and Richard Truly	

Briefings and press conference will be in Room 135, Building 2 at the NASA Johnson Space Center.

For additional information call the Public Information Office, 713/483-5111.

###

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

RELEASE NO: 77-21/1

For Release:

Upon Receipt

HAROLD BLACK PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Harold Black, formerly of Clifton, New Jersey, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Black is the son of Mr. and Mrs. Louis Rosen of 217 E. 9th st., Clifton.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in early 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

Black serves as Instrumentation and Communications Systems Officer. He manages and operates Orbiter communications and instrumentation systems.

He is a 1961 graduate of Newark College of Engineering with a BS degree in electrical engineering.

###

3-24-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/2

MICHAEL F. COLLINS PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Michael F. Collins, formerly of El Campo, Texas, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Collins is the son of Mr. and Mrs. Leslie W. Collins of 911 Ave. F., El Campo.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the

-more-

NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

As the lead Aerodynamics Flight Controller, Collins is responsible for safety-of-flight monitoring of the stability and control, vehicle dynamics and structural loads of the Orbiter.

Collins works in the Flight Dynamics Section, Flight Control Division. He is a 1966 graduate of the University of Texas at Austin with a BS degree in aerospace engineering.

###

3-24-77

NASA News

National Aeronautics and
Space Administration

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

For Release:
Upon Receipt

Bruce L. Bennett

RELEASE NO: 77-21/3

JAMES M. HELFLIN PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

James M. Helflin, formerly of Edmond, Oklahoma, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) Program.

Helflin is the son of Mr. Jim Helflin of Edmond.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

As Shuttle Mission Officer for Kinematics, Hydraulics, Electrical, and Environmental Systems, Helflin provides realtime flight test support by determining operational suitability of the Orbiter electrical, mechanical and environmental systems.

Helflin works in the Electrical, Mechanical and Environmental Systems Branch, Flight Control Division.

He is a 1966 graduate of Central State University with a BS degree in physics and mathematics.

###

3-24-77

NASA News

National Aeronautics and
Space Administration

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

For Release:

Upon Receipt

Bruce L. Bennett

RELEASE NO: 77-21/4

CORNELIUS L. GRIFFITH PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Cornelius L. Griffith, formerly of Evansville, Indiana, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT).

Griffith is the son of Mrs. Thelma E. Griffith and the late Cornelius A. Griffith of 810 Line St., Evansville.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the

-more-

NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

As Loads Monitor, he is responsible for monitoring the stresses and strains in the struts connecting the Orbiter to the 747 carrier aircraft. He also monitors other aerodynamic parameters to insure that flight conditions are maintained.

Griffith works in the Flight Dynamics section, Flight Control Division.

He is a 1971 Princeton University graduate in aerospace engineering.

###

3-29-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/5

LARRY R. BELL PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Larry R. Bell, formerly of Texas City, Texas is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Bell is the son of Mr. Homer Bell of Livingston, Texas.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

Bell serves as the Shuttle Mission Officer for Kinematics, Hydraulics, Electrical and Environmental Systems.

He is in the Flight Control Division's Electrical Power section, and is a 1965 graduate of Lamar University with a BS degree in mechanical engineering.

###

3-29-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/6

DON BOURQUE PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Don Bourque, formerly of St. Martinville, Louisiana, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Bourque is the son of Mr. and Mrs. Sevan Bourque of Route 2, Box 332, St. Martinville.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

Bourque serves as the prime Flight Controller for Guidance, Navigation and Control Systems. He monitors all onboard avionics from the Mission Control Center which includes computer complex, sensors, controllers,

-more-

and other electronics and actuators required to fly the Orbiter manually or automatically. He also determines crew actions required to proceed with the flight safely.

Bourque is employed in the Guidance and Propulsion Branch, Flight Control Division. He earned a BS degree in Electrical Engineering in 1961 from the University of Southwestern Louisiana, Lafayette, La.

###

3-30-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/7

JOHN L. NELSON PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

John L. Nelson, formerly of Cheyenne, Wyoming, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Approach and Landing Test (ALT) program.

Nelson is the son of Mr. and Mrs. Paul D. Nelson, 1319 West 32nd St., Cheyenne.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

As Data Processing System (DPS) Flight Controller during ALT, he monitors the Shuttle data processing system and recommends corrective action when problems occur in the DPS area.

Nelson works in the Guidance and Propulsion Systems Branch, Flight Control Division.

He is a 1967 graduate of New Mexico State University with a BS degree in mechanical engineering. Nelson is married to the former Aurelia Alvarez of Las Cruces, New Mexico.

###

3-31-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/8

JACK KNIGHT, JR. PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Jack Knight, Jr., formerly of Nashville, Georgia, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Knight is the son of Mr. and Mrs. Jack Knight, Sr. of Box 5, Nashville.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

Knight serves as Flight Test Engineer for Environmental, Electrical, and Mechanical Systems. He monitors and evaluates the health of the systems and recommends alternate or corrective procedures if required.

Knight works in the Electrical, Mechanical and Environmental Systems Branch, Flight Control Division.

He is a 1965 graduate of Georgia Institute of Technology with a BS degree in electrical engineering.

###

3-31-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/9

EDWARD LIEBMAN PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Edward Liebman, formerly of Brooklyn, New York, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. Tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

Liebman's duty is to monitor and analyze Space Shuttle telemetered data as well as crew comments related to the guidance, navigation and control systems of the vehicle. He also recommends solutions and reconfigurations in response to onboard malfunctions.

Liebman is employed in the Guidance and Propulsion Branch, Flight Control Division at JSC.

He received a BME degree in 1960, and MME degree in 1964 from the City College of New York.

###

4-6-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/10

DAVID A. BALLARD PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

David A. Ballard, formerly of Ware, Massachusetts, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Ballard is the son of Mr. Russell Ballard of Ware.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

Ballard serves as Flight Data File Manager, Flight Activities Officer and Secretary of the Crew Procedures Control Board.

He is in Flight Operation's Crew Training and Procedures Division, and is a 1961 graduate of the University of Florida with a BS degree in electrical engineering.

###

4-6-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release
Upon Receipt

RELEASE NO: 77-21/11

EUGENE H. JOHNSON, JR. PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Eugene H. Johnson, Jr., formerly of Littlefield, Texas is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Johnson is the son of Mr. and Mrs. O. B. Hinson of Fort Stockton, Texas.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

Johnson serves as the lead optical system support engineer. He prepares test procedures and certifies documents for ALT camera systems. In

-more-

addition, he is the lead engineer for maintenance and operation of 16mm cameras for ALT.

Johnson was graduated in 1956 with a BS degree in electrical engineering from Texas Tech University.

###

4-6-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/12

LINDA PRITCHARD PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Linda Pritchard, formerly of Newport News, Virginia, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Pritchard is the daughter of Mr. and Mrs. Calvin Manly Pritchard, Jr., 7 Digges Dr., Newport News.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

Pritchard's duty is to monitor and analyze Space Shuttle telemetered

-more-

data as well as crew comments related to the guidance, navigation and control systems of the vehicle. She also recommends solutions and reconfigurations in response to onboard malfunctions.

Pritchard is employed in the Guidance and Propulsion Branch, Flight Control Division at JSC.

She is a 1976 mathematics graduate of Virginia Polytechnic Institute and State University.

###

4-6-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/13

DONALD R. PUDDY PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Donald R. Puddy, formerly of Ponca City, Oklahoma, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Puddy is the son of Mr. and Mrs. Lester A. Puddy of 2411 Mockingbird Ln., Ponca City.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more

As Flight Director, Puddy has total operational responsibility for the realtime conduct of the five captive active and eight free flights scheduled for May 1977 - February 1978.

Puddy is assigned to the Flight Operations Directorate.

He is a 1960 graduate of the University of Oklanoma witn a BS degree in mechanical engineering and is currently working on a Masters in Business Administration at the University of Houston, Clear Lake City.

###

4-7-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/14

HERSHEL R. PERKINS PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Hershel R. Perkins, formerly of Barksdale, Texas, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Perkins is the son of Mrs. Lillie Perkins of Barksdale.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

As Shuttle systems specialist, Perkins monitors the flight control systems.

He attended the University of Houston.

###

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/15

HAROLD CLANCY PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Harold Clancy, son of Mr. and Mrs. Harold Clancy of Elmhurst, Illinois, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

As Control Officer, Clancy monitors the Orbiter control systems and assures that the backup control system is operating properly.

He was graduated in 1963 with a BS degree in physics from John Carroll University.

###

4-7-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/16

MAKOTO SUGANO PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Makoto Sugano, formerly of Chicago, Illinois, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Sugano is the son of Mr. and Mrs. Takeo Sugano of 6007 S. Sheridan Rd. 29E.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

Sugano is responsible for realtime monitoring of Orbiter aerodyanmic characteristics.

He is employed in the Mission Operations Branch, Flight Control Division. He is a 1970 aerospace engineering graduate of the University of Illinois.

###

4-7-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release
Upon Receipt

RELEASE NO: 77-21/17

TRAVIS R. BRICE PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Travis R. Brice, formerly of Splendora, Texas, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Brice is the son of Mr. and Mrs. James H. Brice of Splendora.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

As Loads and Dynamics Officer, Brice will assist in managing the captive, active and free flights.

He received a BS degree in aerospace engineering in 1964 from Texas A&M University and in 1968 received a MS degree from the University of Tennessee Space Institute.

###

4-7-77

NASA News

National Aeronautics and
Space Administration

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

Bruce L. Bennett

For Release:
Upon Receipt

RELEASE NO: 77-21/18

DR. CHARLES HUGH DOPSON PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Dr. Charles Hugh Dopson, formerly of Rayville, Louisiana, is a member of the flight control team participating in NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Dopson is the son of Mr. and Mrs. M. L. Dopson of 209 Sixth St., Rayville.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

-more-

As Communications and Command Officer, Dopson is responsible for mission planning and control of spacecraft communications and commands during manned flights operations.

He is employed in the Communications and Command Section, Flight Control Division.

Dopson received a doctorate in physics from Rice University in 1970, and a doctorate in physiology in 1970, and a doctorate in physiology in 1974 from the University of Texas (Houston).

###

4-7-77

NASA News

National Aeronautics and Space Administration

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

Bruce L. Bennett

For Release:
Upon Release

RELEASE NO: 77-21/19

CHARLES DEITERICH PARTICIPATES IN SPACE SHUTTLE ORBITER APPROACH AND LANDING TESTS (ALT)

Charles Deiterich, formerly of Galena Park, Texas, is a member of the flight control team participating in the NASA Johnson Space Center's Space Shuttle Orbiter Approach and Landing Test (ALT) program.

Deiterich is the son of Mr. and Mrs. Harry Deiterich of 1406 Third St., Galena Park.

The ALT program is to confirm the subsonic airworthiness and pilot-guided and automatic landing capabilities of the Orbiter, a reuseable spacecraft scheduled to begin Earth orbital missions in 1979.

The Orbiter will be carried to altitude by a 747 jetliner for captive and free flights through January 1978. The tests are conducted at the NASA Dryden Flight Research Center in California. The control center for the test is at JSC in Houston.

As a Flight dynamics Officer, Deiterich is responsible for flight profile development and realtime trajectory control.

He is in the Flight Control Division's Flight Dynamics Section, and is a 1960 graduate of the University of St. Thomas.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:

April 11, 1977
2 p.m. CST

RELEASE NO: 77-22

NASA PICKS NORTHROP TO MAINTAIN AIRCRAFT AT JOHNSON CENTER

The NASA Johnson Space Center, Houston, has selected Northrop Worldwide Aircraft Services, Lawton, Oklahoma, for negotiations leading to award of a contract for maintenance and modification of aircraft assigned to the Center.

Aircraft assigned to JSC include 15 Northrop T-38A's for astronaut spaceflight readiness training; two T-38A's for Space Shuttle program support; one T-38A for aircraft research and development test projects; one Martin WB-57F, one Lockheed NP-3A, one Lockheed NC-130B, one Bell 206B helicopter and one Bell 47G helicopter for the airborne instrumentation research program; one Grumman G-159 for administrative transportation; one Boeing KC-135A for the reduced-gravity program; and two Grumman G-1159 Shuttle Training Aircraft. Northrop will provide servicing, maintenance, modification, and related engineering and logistics support for these aircraft.

Northrop's proposed estimated cost and award fee for the initial one-year contract is $4,789,000. The contract will begin May 1, 1977, and two additional one-year periods are expected to be negotiated.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release

RELEASE NO: 77-23

April 11,1977
2 p.m. CST

NASA NEGOTIATES WITH KENTRON FOR SUPPORT CONTRACT AT JOHNSON

The NASA Johnson Space Center, Houston, has selected Kentron Hawaii, Ltd. for negotiations which will lead to a cost-plus-award-fee contract for technical information and public affairs support services at the Center.

The proposed contract covers technical editing, writing and report preparation; preparation of program, flight and systems operation documentation; library materials processing and documentation retrieval; graphic arts services; logistical library services; publications and forms distribution; microfilming; and public affairs services.

Kentron's proposed cost and fee for providing the services from May 1, 1977 through April 30, 1978, is approximately $2,600,000.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-24

For Release:

April 12, 1977
2 p.m. CST

NASA NEGOTIATES WITH PAN-AM FOR JSC MAINTENANCE CONTRACT

The NASA Johnson Space Center, Houston, has selected Pan American World Airways, Inc. Aerospace Services Division of Cocoa Beach, Florida, for negotiations leading to award of a contract for maintenance and operations support services at the Center.

The contract will cover maintenance and operation of Center utility systems such as heating and cooling, electrical power, potable water and waste disposal; maintenance of buildings, roads, parking lots and drainage ditches; maintenance of JSC-occupied buildings and utility systems at nearby Ellington AFB; special-purpose equipment maintenance such as laboratory test, machine shop, photographic processing, cafeteria, printing and reproduction, and elevators; and facility emergency and disaster planning.

Pan America's proposed estimated cost and award fee for the initial one-year contract starting May 1, 1977, is $7,495,000. Two additional one-year extensions are expected to be negotiated.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-25

For Release:

April 12, 1977
2 p.m. CST

NASA SIGNS ADD-ON CONTRACT WITH ROCKWELL FOR SHUTTLE WORK

The NASA Johnson Space Center, Houston, has signed a supplemental agreement with Rockwell International Corporation Space Division, Downey, California, for additional work on the Space Shuttle Orbiter.

The agreement includes design changes in the Orbiter airlock and tunnel which permit "shirtsleeve" movement of crewmen between the Orbiter and the European-built Spacelab in Orbiter's cargo bay. Rockwell performs the bulk of the Orbiter work at the Downey plant and at field offices in Palmdale, California, Houston, and at Kennedy Space Center, Florida.

The $3,076,250 supplement brings the estimated value of the Orbiter cost-plus-award-fee contract to approximately $3,042,181,353.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-26

For Release:

April 15, 1977
2 p.m. CST

NASA AMENDS ROCKWELL CONTRACT TO COVER ORBITER CHANGES

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the contract with Rockwell International Corporation Space Division, Downey, California, covering eight engineering changes to the Space Shuttle Orbiter. The changes include incorporation of windows in both the Orbiter airlock and in the payload tunnel adapter, and other adaptations for the European-built Spacelab to be carried into space in Orbiter's 15 x 65 ft. cargo bay.

The supplemental agreement is valued at $5,189,500, bringing the estimated value of the cost-plus-award-fee Rockwell contract to $3,047,370,853.

Rockwell performs the bulk of the Orbiter work at its Downey plant with support from field offices in Houston and at NASA Kennedy Space Center, Florida.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

Release No.: 77-27

For Release
April 22, 1977

SPACE ENGINEERS DESIGN

EMERGENCY MEDICAL CONSOLE

Out in West Texas, where there is nothing but "miles and miles of miles and miles," physicians and nurses have better things to do than to figure out how to "patch" an incoming ambulance radio call into a hospital phone system. Most attempts at wiring together radio and telephone communications between a central hospital and on-scene ambulance paramedics usually resemble yesterday's spaghetti.

Communications and biomedical engineers at the NASA Johnson Space Center in Houston have designed and built a prototype emergency services communications unit which has been installed in the Odessa Medical Center Hospital. The hospital is one of several medical facilities in the Permian Basin Emergency Medical System, and is the medical "control center" for the 17-county system.

The communications console, scarcely larger than an electric typewriter, was built from commercially-available components and includes all emergency medical system (EMS) communications functions that are needed for a regional hospital. In the radio section of the console, easy-to-operate controls allow a physician or nurse to consult with local or regional ambulance drivers and paramedics, other hospitals, receive incoming electrocardiograms, set up a radio-to-telephone patch, and

- more -

page hospital staff members. The telephone system includes a hotline from the Emergency Medical System's resource control center, an automatic dialer for special-care centers and other facilities in the Permian Basin network, incoming or outgoing electrocardiographic data for cardioscope displays and strip recorders between hospitals, and a hospital intercom terminal.

After several months of field testing in the Odessa Hospital, NASA engineers will make whatever design changes are needed to the console.

Complete sets of design and manufacturing drawings for the console are expected to be available to EMS organizations by May 30, 1977 from the Technology Utilization Office, NASA Johnson Space Center, Houston, Texas 77058. EMS groups would then contract locally for construction of consoles fitting their specific needs.

- end -

NASA News

National Aeronautics and
Space Administration

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

Robert V. Gordon

For Release
Upon Receipt

RELEASE NO: 77-28

FRAZER RECEPIENT OF NASA EXCEPTIONAL SERVICE MEDAL

Robert R. Frazer who is currently NASA Palmdale Operations Manager recently received NASA's second highest award - the Exceptional Service Medal - for his work with the recently successful Viking Mars Project.

Frazer was recognized for "his outstanding contribution to the conduct of the Viking Lander integrated test program. His experience and professional skills were essential to the eventual success of Viking's exploration of Mars." In 1974-75 Frazer was temporarily assigned to Denver, Colorado where he served as assembly and test manager on the Viking Project.

During his more than 14 years with NASA , Frazer a native of Santa Monica, California, has served in various jobs with NASA's manned spaceflight team at the Johnson Space Center in Houston, Texas, and at the Rockwell International facilities at Downey, California.

- more -

Frazer received a Bachelor of Science Degree in Electrical Engineering from the New Mexico State University in 1958 and a Master's degree in business administration from the University of Neveda in 1971. Frazer has been at Palmdale since 1975.

Before joining NASA in 1963, Frazer was an electronics engineer with Shell Oil (1958-59), and engineer with General Dynamics Corporation (1959-62) and for two years he was a senior electronics engineer with the Aerojet General Corporation.

###

NASA News

National Aeronautics and Space Administration

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

Robert V. Gordon

RELEASE NO: 77-29

For Release:
Upon Receipt

SIMPKINSON RECEPIENT OF NASA EXCEPTIONAL SERVICE MEDAL

Scott H. Simpkinson, a native of Piqua, Ohio and a 1943 graduate of the University of Cincinnati, has for the fourth time been awarded the National Aeronautics and Space Administration's Exceptional Service Medal.

Simpkinson, 57, who has been with NASA since 1943 received the latest Exceptional Service Medal "in recognition of dedicated leadership as chairman of the Viking Special Critical Design Review Team which contributed significantly to the success of the Viking spacecraft." Two Viking spacecraft landed on Mars (July and September) in 1976, and provided scientists incredible information on the unexpectedly dynamic planet.

In more than three decades with NASA, Simpkinson has received more than 20 awards for his extra efforts during both manned and unmanned U.S. Space Programs. He is currently serving at the NASA Johnson Space Center, Houston, Texas, as Manager for Flight Safety for the Space Shuttle Program, this nation's next manned spaceflight program.

- more -

Simpkinson received a Bechelor of Science Degree in Mechanical Engineering from the University of Cincinnati in 1943. Simpkinson is married to the former Arleen Ann Baxa of Cleveland.

###

NASA News

National Aeronautics and
Space Administration

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

For Release:

Upon Receipt

RELEASE NO: 77-30

FACT SHEET

SPACE SOLAR POWER

April 1977

INTRODUCTION

To support a growing population and to improve the quality of life for that population, the requirements for energy in the U.S. and world will continue to increase. Projections indicate that U.S. requirements may grow by a factor of two to three between now and 2000.

The nation is actively pursuing alternate sources of energy because of the problems or concerns related to obtaining required energy for the future from oil, gas, nuclear, and coal sources. Solar energy is an obvious candidate for consideration. Solar energy is inexhaustible and clean. Its use in the past has been limited by the relative cost of collecting and converting solar energy into electrical power. The increasing costs of other energy sources will make solar energy more attractive.

During recent years a new concept for the collection of solar energy has been developed. This concept involves the location of solar power stations in space.

Engineers at the NASA Johnson Space Center, are presently studying the technical and economic feasibility of the commercial utilization of space solar power. These NASA studies have developed concepts for constructing large satellites in space which could collect a part of the seemingly limitless solar energy available there, convert the solar energy to electricity and then to radio frequency energy in the microwave spectrum, and subsequently transmit this microwave energy to receiving stations on earth where it would be converted back to electricity by a local power company for commercial distribution through their power lines.

A SPACE SOLAR POWER CONCEPT

The space solar power concept is illustrated in Figure 1. A large solar collector is located in a geosychronous orbit that is approximately 22,000 miles above the earth. In geosynchronous orbit there is no day or night, clouds, or atmosphere to interfere with the solar energy reaching the collector. Six to fifteen times as much solar energy will be received in space as on the ground in a given period of time for a given size collector. Equally important, it will be continuously received. The geosynchronous location of the solar collector means that it remains fixed over the same spot on the earth and can provide continuous power to a given location.

The solar energy collected in space is converted into microwave energy by devices such as klystrons or amplitrons. Energy is beamed to earth by using a transmitting antenna as illustrated by the circular device at either end of the large collector. The energy is received at the earth's surface by a "rectenna" (rectifying antenna). The received microwave energy is converted to conventional forms of electrical power and transmitted to nearby cities and industries. It should be noted that the receiving rectenna can be located in the area where the power is to be used and does not have to be located in areas of the country where there is a high percentage of sunlight. This is because the microwave beam is not affected by day, night, or clouds, and only by the atmosphere under particularly adverse conditions.

APPARENT ADVANTAGES AND NEW REQUIREMENTS

The apparent advantages of the concept and related requirements for new or improved technologies are summarized in Figure 2. Due to the day-night cycle, clouds and atmospheric effects, and relative earth-sun positions, the solar collector in space will be exposed to 6 to 15 times more sunlight over a period of time than an equal-sized collector located on earth. The location in geosynchronous orbit provides near continuous access to sunlight and allows the system to operate as a baseload plant.

Essentially, the microwave beam is unaffected by weather. This independence from weather results in location of receivers to meet power demands rather than obtain optimum sunlight conditions.

The concept appears to offer a number of advantages; however, for the system to be viable it requires new or improved technologies. Solar cells or other energy collection techniques need to be improved in efficiency while simultaneously reduced in weight and production costs. Transmission of large amounts of power by microwave techniques needs to be explored and systems optimized. Techniques for constructing large structures in space need to be developed and demonstrated. Cost of moving men and materials to orbit needs to be significantly reduced. Preliminary studies indicate the possibility of these technology advancements.

TYPICAL RESULTS OF INITIAL STUDIES

Preliminary studies of the space solar power concept have been conducted by industry and government.

The results presented in Figure 3 are considered typical of results from a number of studies. The studies considered a silicon solar cell system, although at the present time other photovoltaic and solar thermal systems are possible options.

The "range of estimates" presented reflects optimistic and conservative projections of the required technology. It should be noted that each of the weight estimates includes an allowance of 50 percent for growth or underestimation. The range of cost estimates is a reflection of these projections. The difficulties of projecting costs for a system 15 to 20 years in the future should be recognized. The primary intent of the present estimates was to determine whether the cost estimates would be in the tens of mills as compared to hundreds or thousands of mills per kilowatt-hour. The resulting estimates of 30-115 mills/kWh indicate that the potential costs are in a range where the concept is worthy of further investigation.

The significance of the cost of solar cells and space transportation is described later in this fact sheet. The environmental effects of the system are generally favorable, particularly in terms of minimal air and thermal pollution. Studies will be required to provide definite answers to questions related to the microwave beam.

The study indicated that the aerospace industry represents a base of knowledge, capability, and organization required for the development and implementation of the space power concept. In general, the requirements of the system represent extensions of capabilities developed and exercised during the past 20 years.

It was concluded that the space concept appeared competitive with other advanced power generation systems when a variety of factors were considered, including technological feasibility, cost, safety, natural resources, energy payback, environment, baseload characteristics, location flexibility, land use, and industrial capability.

A TYPICAL CONFIGURATION

Figure 4 presents a typical system configuration resulting from an initial study. The dimensions and weights are approximately midpoints of the ranges presented in Figure 3.

This configuration produces a total of 10,000 megawatts of power at the ground rectenna(s) for introduction into the electrical grid. Five thousand megawatts are available from each of two rectennas which operate with the same satellite. This particular two-antenna-rectenna combination is not required but is convenient to "balance" the Space Solar Station.

The large size of the satellite is related to its large power output capability. Additional studies will be required to determine the optimum size for the solar power stations, although they are expected to be quite large for reasons of economy. An additional consideration of utilizing this size for the study was the projected requirements for large electrical parks of this size in the period 2000 and beyond.

This configuration assumes silicon solar cells operating at a conversion efficiency of 10.3 percent at 100^{o}C. Reflectors are used to concentrate the sunlight on the solar cells. The energy from the solar cells is converted to microwave energy and transmitted to earth at a frequency of 2.45 GHz. The efficiency of this conversion and transmission is estimated to by 58.3 percent, resulting in an overall collection-conversion-transmission efficiency of 6 percent. The transmitting antenna consists mainly of microwave generators, in the form of klystrons or amplitrons, and waveguides.

The ground-based rectenna or rectifying antenna collects the microwave radiation from space and rectifies this power into direct current. The rectenna elements consist of a half-wave dipole antenna and a half-wave rectifier (Schottky barrier diode).

The weight of the configuration is estimated to be 75,000 metric tons. This total estimate was made by estimating the weights of each component in the system and adding a 50 percent growth allowance.

GROUND-BASED ACTIVITIES

Solar Cells

The Energy Research and Development Administration embarked on a program to reduce the cost of solar cells for terestrial applications. This work, in which the Jet Propulsion Laboratory is playing a key role, has a goal of achieving solar cells with a cost of $500 per kilowatt by 1986 (see Figure 5). Costs of $100-300 per kilowatt are projected by the year 2000 based on a demand of 50 gigawatts equivalent power. The implementation of a commercial Space Solar Power Program would increase this demand still further. The technical data and cost estimates presented herein assume a cost of solar cells varying from a conservative $500 per kilowatt to an optimistic $100 per kilowatt in the 1995-2025 period.

Present studies have emphasized silicon solar cells because they are technically the most advanced. In addition, our space experience has been limited to the silicon cells. Solar cells from materials such as gallium arsenide show considerable promise. Recent results of laboratory tests (see Figure 5) indicate an improvement in efficiency of these cells of 50 percent in the last 2 years. If further projected improvements are achieved, the size, weight, and cost estimates of the space system may be reduced by as much as 40 percent.

Microwave Transmission

Microwave transmission is basic to space and other communications systems. Microwave transmission of power in large quantities is less familiar. Early tests were conducted from a helicopter to ground. More recently, preliminary tests have been conducted within the context of the space solar power concept. Tests have been conducted using the microwave radiation capabilities of the large space tracking system located at Goldstone, California (see Figure 5). In these tests, 30 kilowatts of power were transmitted via microwave to a receiving antenna located at a distance of 1 kilometer from the transmitting antenna. Laboratory tests have also been conducted which have successfully demonstrated a number of concepts and components contained within the system.

The use of microwave transmission immediately raises questions as to its characteristics and effects. The characteristics of the full scale beam are shown in Figure 5 as a function of the power density at the receiving antenna and the surrounding area. The maximum intensity at the center of the rectenna is 23mW/cm^2. The intensity at the edge of the rectenna is 0.9 mW/cm^2. For reference, current U.S. standards for old and new microwave ovens are 10 and 5 mW/cm^2, respectively. Radiation beyond the edge of the rectenna is less than 0.1 mW/cm^2 or 1 to 2 percent of the allowable limit.

The earth rectenna and space satellite represent an integrated microwave transmission system. Failure of this system would not result in a movement of the beam "off" the rectenna, but a "defocusing" of the beam such that the level of dispersed radiation would be 0.003 mW/cm^2. It is recognized that, while the beam intensity beyond the edge of the rectenna is very low, research is required to conclusively establish that exposure to these levels would have no significant effects on humans, animals, or vegetation.

SPACE PROJECTS FOR EVALUATION OF CONCEPT

A complete evaluation of the concept will require continuing analysis, ground testing and development, and a series of space projects. Ground tests and development related to solar cells and microwave transmission have been mentioned. Also, ionospheric heating tests and electric propulsion devices should be pursued. Experiments should be conducted to develop techniques for beam fabrication, performance of "unjacketed" microwave power tubes, and properties of materials in space. In conjunction with ground development and space experiment activity, a series of space projects is required to synthesize the results of the smaller individual projects that lead to systems results on which future decisions and activities can be based.

Figure 6 illustrates a series of possible projects that will provide pertinent information and, if implemented, will lead to a large scale power generating capability. The initial project would consist of the construction in low earth orbit of a 500-kilowatt solar array and transmitting antenna. The project will allow evaluation of construction techniques and microwave transmission tests. Such a space power system would have continued use for other space applications.

Subsequent space projects require definition during the next several years. Conceptual projects are shown in Figure 6. The second project might be the construction of a larger 2- to 10-megawatt solar array in low earth orbit to allow construction productivity analyses and an antenna of a scale adequate to provide "proof of design concept."

The third project might involve the use of a test article at geosynchronous orbit to conduct phase control tests to earth, as well as to demonstrate manned and unmanned operations including refueling between low earth orbit and geosynchronous orbit in support of deployment/assembly of the test article.

A series of space projects plus ground development and space experiments would provide the basis for a complete evaluation of the space solar power option in the 1985-1990 time period. If the decision was made to proceed, a possible sequence of events would include the deployment of a 1000-megawatt prototype station utilizing previously developed transportation systems. This system probably would not be economically competitive. It would be a useful technical and demonstration activity prior to bringing on the large scale 10-gigawatt systems in the mid-1990's with requirements for large new transportation systems.

AN INITIAL FLIGHT PROJECT

The initial flight project is designed to achieve a number of related goals for the evaluation of the space power concept. The implementation of a 500-kW solar array represents an increase by a factor of 15-20 over past space power systems (Skylab - 30 kW). The antenna would provide the capability to assess the phased array techniques by measuring the beam pattern with a receiving antenna device located some 15 kilometers away (see Figure 7). The antenna would also allow assessment of a critical heating problem related to the microwave generators and the structure. The instrumented solar array would provide a test article for structural measurements to assess computer models.

One of the most important aspects of the test would be to evaluate various construction techniques. The figure illustrates the construction sequence. Structural members are fabricated with a beam builder and held in place by an appropriate jig. The latticework of beams is then passed through the jig, at which time the solar array blankets are attached to the structure. The antenna is taken to orbit in modules and assembled by using a remote manipulator.

The last illustration in the sequence shows the deployment of the receiving antenna which is located some distance from the solar array. This device is built on the ground and then packaged to be deployed in space with a minimum of manned assistance. Consequently, the overall project exercises the three basic construction techniques of fabrication (solar array structure), assembly (antenna modules), and deployment (receiving antenna).

SPACE CONSTRUCTION

The size of the solar power systems will require their construction in space. The space location, however, offers a number of advantages related to the zero gravity environment and the relatively small loads placed on the structures by the various environmental and systems forces involved.

Figure 8 presents an interesting comparison between a typical earth structure and a space structural beam such as might be used in constructing the solar power station.

Structural beam building machines for space use have received considerable study related to the space solar power concept. It appears that existing concepts used on earth may be applicable to space fabrication in a relatively straightforward manner.

SPACE TRANSPORTATION

Low-cost transportation is a key to the economic viability of the space power concept. Very large systems would ultimately be required to achieve minimum cost of electricity. The Shuttle system, however, which is now under development, will be adequate for initial space experiments and major low earth orbit space projects. The phase of space projects to be conducted at geosynchronous orbit would require an extension of the Shuttle system to provide greater payload capability and an orbital transfer vehicle to transport the test article to geosynchronous orbit and, also, to transport a small crew of men for short periods to assist in the deploymen t/assembly of the test article. This orbital transfer activity would require and demonstrate a refueling capability in low earth orbit, travel to geosynchronous orbit, and return to a low earth orbit base for transfer to the Shuttle and return to earth. Development and demonstration of this capability (low earth orbit to geosynchronous orbit and return) with its space facility and operations requirements is considered a desirable prerequisite to commitment to the large scale program activity. Figure 8A.

SPACE CONSTRUCTION

Because of the large size of the space solar power stations, these structures must be fabricated assembled and/or deployed in space. The conceptual equipment and techniques for fabricating and assembling a ladder-like structure of triangular cross section trusses is being studied by JSC engineers. Such a structure would be suitable for mounting solar cell arrays. The detail information contained herein is presented in the context of a proposed experiment to be conducted from the Shuttle in the 1980-84 time period as an early experiment in the development of techniques for the construction of large space structures that would be required for space solar power stations and other large systems.

BEAM BUILDER

The beam builder (concept) depicted on Figure 9 continuously and automatically fabricates a triangular cross section truss (dimensions on the order of 1.5 meters on the side) of practically any desired length, from strip material stored on reels. The strip material is processed and wound onto the reels as an earth-based operation, and the beam builder may be "reloaded" with material as often as desired. A likely material is graphite fiber reinforced thermoplastic (such as polysulfone), as is used in this design. The truss consists of three cap members (one at each corner of the triangle) plus side members which interconnect the caps to complete the truss. In operation, a cap is formed as follows: strip material unwinds from the reel and travels through a heating module where it is heated by radiant electric heaters, for example, to its plastic, or forming, temperature (about 600^{o}F). Then it travels through a series of matched rollers which form it from a flat strip to a flaged, triangular shape. As it leaves the last of the forming rollers, it enters a cooling section where its temperature is reduced to the "rigid" state (about 275^{o}F) by radiation to cold plates, for example. Now it is a finished cap moving through the beam builder to be joined to the side members. The side members are fabricated as follows: material is processed at earth-based facilities into a flat, patterned sheet, as indicated on the illustration, and wound onto a reel (three identical reels of material for the three sides). The material is unwound from the reel, heated in the same manner as the caps, and stiffening beads (the "beads" are not shown in the illustration) are formed into the cross member portions by a press forming mechanism (which momentarily translates the forming dies to match the velocity of the strip material as it moves through the beam builder). The material is then cooled (radiation to cold plates) and is positioned onto the caps where it is joined by ultrasonic spot welders.(Ultrasonic vibration produces melting of the thermoplastic at the faying surface with subsequent fusion of the surfaces.)

Precise coordination of the velocity of all members is required to fabricate a "straight" truss member and to avoid "buckling" of a cap member, for example, in case that cap is being driven through the forming rollers faster than the other caps.

A "closed-loop" type control system employing appropriate sensors, electronics and servo-mechanisms will be employed to control and coordinate the machine operations.

The rate of fabrication may be relatively slow, by commercial standards, to reduce power demands and minimize the weight and size of the beam builder. A fabrication rate of about one inch per second is considered to be appropriate. However, at this slow rate, the machine could fabricate a one-mile long truss in less than 18 hours.

The reel sizes indicated on the drawing are sufficient to fabricate a length of truss in excess on one kilometer, without reloading the beam builder.

MACHINE DESIGN-PROCESS OPTIONS

Figure 10 depicts, schematically, several process options that are representative of those that may be utilized by the beam builder to fabricate a truss beam. A primary objective of initial design studies of the beam builder will be to select the appropriate processes, considering the beam configuration to be fabricated, the material to be used for the beam, and the relative merits of the various fabrication processes.

As indicated by the illustration, the cap material stock is likely to be strip which is stored on reels, either multiple reels supplying thin strips which are "laminated" or consolidated into a single, thicker, strip by the beam builder, or a single reel of strip material of the desired thickness. The choice will depend on the desired final thickness and material type and characteristics. For graphite fiber reinforced thermoplastic material, for example, a single reel is a likely choice. In this case, multiple strips of "pre-prep" tape -- each with appropriate fiber orientation -- consolidated into a single composit strip on earth.

Three possible cap-forming processes, as indicated, are "spiral tubeform," "roll-form," and "pultrusion." These basic processes are in regular commercial use today. The spiral tubeform process can form a tubular cap member of relatively large diameter from narrow strip by spirally winding the strip and continuously joining the overlapping edges. A fundamental problem with this process for use in the beam builder, however, is that the forming mechanism plus the material supply reel must rotate about the longitudinal axis of the tube. The roll-form process uses mating rollers to continuously bend the flat strip into shape as it passes between the rollers. Multiple rollers, arranged in series so as to form progressively in "stages" are used for complex shapes, each stage of rollers forming a portion of the final shape. Almost any shape, including a closed section such as a tube, can be roll-formed. The pultrusion process uses dies (similar to extrusion dies) through which the flat strip is "pulled" to form the shape. The pultrusion process is most appropriate for thermosetting plastic where heated forming dies produce the formed shape and supply heat to provide the final thermal "cure" of the material.

The sidemembers of the truss beam (crossmembers and diagonals) may also be formed from strip, using the roll-form or pultrusion process. A continuously formed section would be periodically cut to the appropriate member length to span between the caps, and a mechanism would position each member for fastening to the caps. Sidemembers could also be preformed on earth and stored in "clips," from which they would be removed sequentially and assembled into the truss beam by automated mechanisms. The shape of the pre-forms would be selected so that they would stack together, as indicated, in a dense package.

An entirely different process than those previously described for fabrication of truss sidemembers involves spirally wrapping tape around the caps from six reels, as indicated. The tape would be a thermosetting composite which would be designed to thermally cure to a curved cross section shape as indicated, thus being capable of compression loading. Tension diagonals (X-members), may simply be cables or wires fed from supply reels in the spiral wrap manner, or the reels may be fixed and additional mechanisms employed to install the wires in a "back and forth" action between compression cross-members.

The sidemembers (crossmembers and diagonals) could be integrated in the form of a pre-cut sheet as shown in the illustration. Instead of cutting from a large sheet, the material could be fabricated in the pattern shown, using automated composite material layup machinery similar to that currently used for aircraft structure. Then, during beam builder operation, the sheet is unrolled from its supply reel, stiffening beads or flanges are formed in the appropriate members, and the sheet is joined to the caps.

For fastening the sidemembers to the caps, three appropriate techniques are bonding, welding, and punch tab. The punch tab technique would only be considered for metals, such as aluminum, and involves shearing a small tab from the pieces to be joined and bending it over to form a joint somewhat like a hollow rivet. Welding would likely be resistance spotwelding for metals and ultrasonic spotwelding for thermoplastics. Bonding would involve the application of a tape, activated by heat, between the faying surfaces to be joined. The use of rivets or bolts is not contemplated because of the problem of debris from punched or drilled holes.

STRUCTURE FABRICATION SYSTEM CONCEPT FOR LADDER CONFIGURATION (LONGITUDINALS)

Figure 11, indicates the use of the beam builder and an "assembly jig" which are carried into orbit in the Space Shuttle Orbiter's payload bay, deployed into operating position -- remaining attached to the Orbiter -- and used to fabricate a large, lightweight structural assembly (or "platform") with minimum participation by the four-man crew of the Orbiter, within a time frame of one week in orbit.

In operation, the beam builder is positioned to fabricate, in sequence, four longitudinal truss members, each 1.5 meters wide and about 200 meters long, and each being fabricated "in situ," such that when completed and cut off from the beam builder, the assembly jig will grip the beams through a system of rollers, maintaining their relative positions.

In this illustration, the beam builder has just commenced fabrication of the fourth longitudinal. By repositioning the beam builder to fabricate the longitudinals in their proper relative positions, the problem of repositioning the long members, with their very high mass moments of inertia about a transverse axis plus their flexibility, is avoided.

The next illustration depicts the final stage of fabrication.

STRUCTURE FABRICATION SYSTEM CONCEPT FOR LADDER CONFIGURATION (CROSSMEMBERS)

The beam builder as illustrated in Figure 12, is in position to fabricate 10.5-meter-long crossmembers, in situ, with the first crossmember nearing completion. When the first crossmember is completed, it will be cut off from the beam builder and gripped by the assembly jig rollers.

Crewmen will then exit from the Orbiter through its airlock and attach the crossmember to the longitudinals by using handheld ultrasonic welders to join two caps of the triangular crossmember truss to the caps of each longitudinal where they cross (four places at each longitudinal). After the first crossmember is attached, the structural assembly will be moved through the jig by driving appropriate rollers to a position for installation of another crossmember about 20 meters from the first. This operation is repeated until nine crossmembers are installed, to complete a structural platform about 10.5 meters wide by 200 meters long. This size is representative of the capabilities afforded by one "standard" shuttle mission.

The crew would be utilized (in extravehicular activities) to attach the crossmembers, inspect the fabrication process close up, and aid in assembly jig setup. Complete automation could be achieved; however, determining the value of the crew operations is an important part of the experiment.

After completion of the platform, various engineering tests and experiments would be performed while it is attached to the Orbiter, and a myriad of subsequent mission options are possible. The platform would, finally, be released from the jig and the jig and beam builder returned to earth in the Orbiter.

FABRICATION SEQUENCE LADDER CONFIGURATION

The sequence of fabrication of the structural platform, shown schematically on Figure 13, is as follows: The beam builder is first positioned relative to the assembly jig as shown in the left-hand view by a positioning mechanism on the jig. It fabricates the first longitudinal beam, to the proper length, and stops operation. The beam is "gripped" by rollers on the assembly jig and the beam builder cuts off the longitudinal beam. Then the beam builder is moved along a track on the side of the assembly jig until it is in position to fabricate the second longitudinal, adjacent and parallel to the first longitudinal, in the same operational manner. This sequence is repeated until the fourth longitudinal is completed.

The beam builder is then rotated into the position to fabricate the first crossmember. After it is completed, the crossmember is joined to the longitudinals by an Orbiter crewman using a portable ultrasonic spotwelder (16 places - where the crossmember and longitudinal beam cap members cross each other).

The partially constructed platform is then driven "across" the assembly jig by the retaining rollers until the longitudinals are in position relative to the beam builder for fabrication and attachment of the second crossmember in the same manner as the first. These events are repeated until installation of the last crossmember, which completes the construction of the platform.

SUBSYSTEM INSTALLATION

Figure 14 illustrates the installation of subsystems to the structural platform. Modularized equipment assemblies would be carried in the Orbiter payload bay and installed onto the platform, using the Orbiter's remote manipulator system (RMS) to move the equipment assemblies into position, and an Orbiter crewman to make the structural and electrical connections.

Representative subsystems include reaction control (RCS), solar cells and batteries, communications equipment, experiment equipment and data recorders.

Development of the techniques and design features necessary for equipment installation in space is an important objective of the construction experiment.

MISSION PROFILE

Figure 15 indicates possible significant mission events superimposed on a plot of platform altitude versus time resulting from normal orbital decay (without application of orbit-keeping propulsion). Because of its high drag area relative to its mass, the platform should be constructed at an orbital altitude of approximately 300 nautical miles to insure that it has adequate orbital lifetime for reasonable utilization of its experiment potentialities.

The platform can be constructed, and important structural engineering tests can be performed, utilizing a single Shuttle flight of seven days duration. The platform would be separated from the Orbiter at the end of the seven days and the Orbiter returned to Earth. Subsequently, the platform would be tracked by radar from Earth to determine its actual orbital decay rate. The platform would be in a free-drift attitude mode after separation from the Orbiter, but would tend to align itself along a radius toward the Earth's center due to gravity gradient forces.

A second Shuttle flight is contemplated about six weeks later, wherein the platform is reattached to the assembly jig that was used to construct it on the first flight. The development of the technique and equipment to "dock" the Orbiter to the large, lightweight structural platform is an important mission objective of the second flight -- being a requirement for full utilization of space construction. A wide range of subsequent accomplishments are possible on the second flight. For example, solar cell "blankets" could be installed on the platform to create a space solar power test bed. Reaction control systems could be added, to investigate the technology of attitude control and propulsion of large, relatively flexible structural assemblies. Special equipment could be installed to perform experiments utilizing the unique, large size of the platform, and its rapid orbital decay rate. The mission profile indicates two such experimental possibilities, the geodynamics and atmospheric composition experiments. For the geodynamics experiment, the platform's orbital attitude is very accurately tracked from the ground and a satellite in synchronous orbit, resulting in more accurate knowledge of the Earth's mass distribution. For the atmospheric composition experiment, a laser emitter and reflector are installed at opposite ends of the platform and the platform is set into rotation by the reaction control system. During the subsequent orbital decay period, the laser device obtains data that allow determination of the atmospheric composition from that initial altitude until entry into the lower atmosphere.

During atmospheric entry, the platform will be entirely "burned," due to its large area, low weight characteristics, constituting no hazard to the Earth's surface.

Figure 1

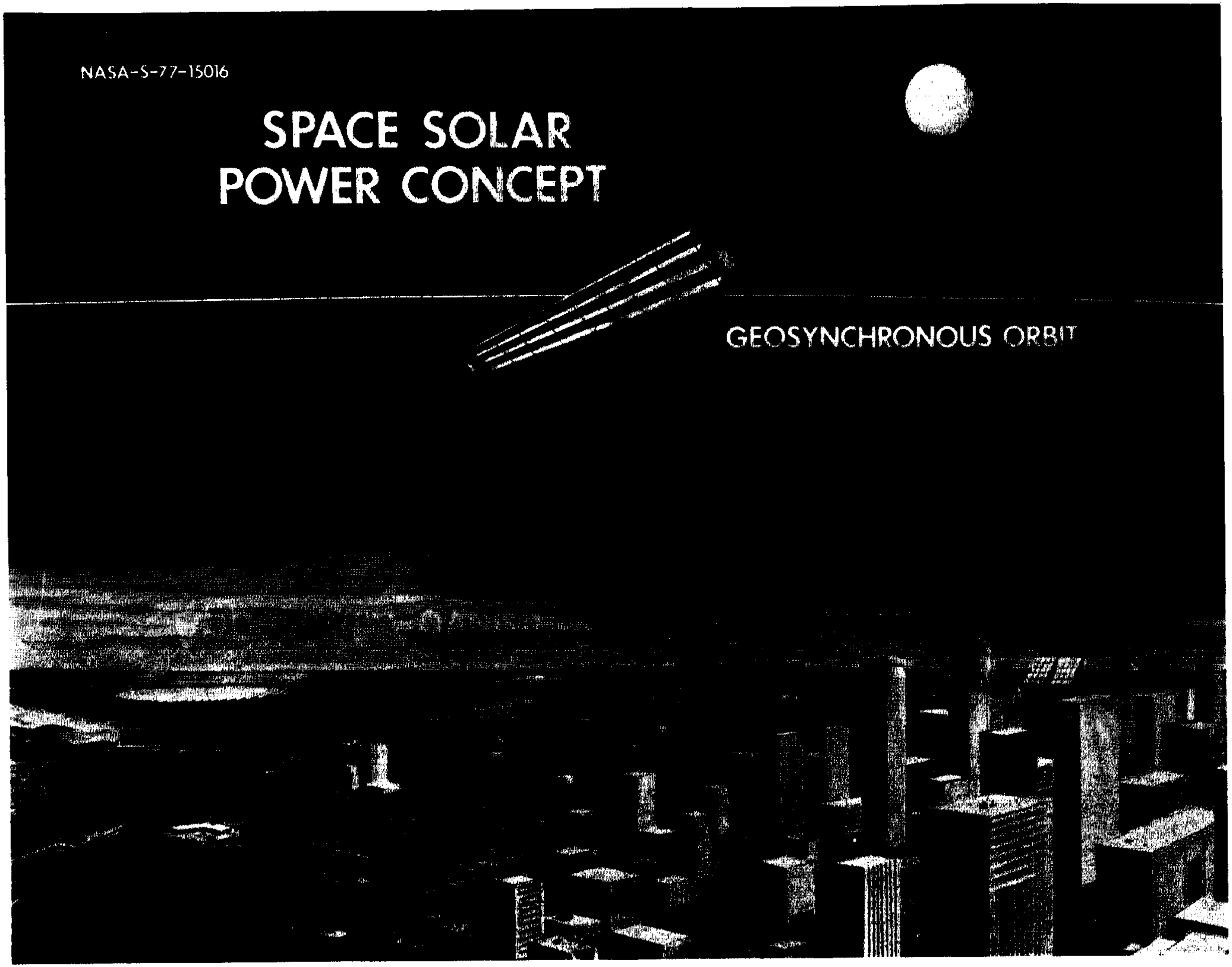

NASA-S-77-15016
SPACE SOLAR
POWER CONCEPT
GEOSYNCHRONOUS ORBIT

Figure 2

NASA-S-77-15009B

Why Consider Space Solar Power?

Apparent Advantages

- Greater insolation (6-15x)
- Base load capability
- Minimal day/night and weather concerns
- Geographical independence

New Requirements

- Power conversion
- Microwave power transmission
- Space construction
- Space transportation

Figure 3

NASA-S-77-15014

SPACE SOLAR POWER CONCEPT

TYPICAL RESULTS OF INITIAL STUDIES

- TECHNICAL FEASIBILITY - AN ENGINEERING PROJECT OF MAJOR PROPORTIONS BUT NOT REQUIRING SCIENTIFIC BREAKTHROUGHS
- TECHNICAL DATA - RANGE OF ESTIMATES
  - ENERGY CONVERSION-TRANSMISSION EFFICIENCIES - 8 TO 4 %
  - 10,000 MW PLANT - SIZE - 90 TO 180 SQ km
    WEIGHT - 50 000 TO 100 000 TONS
- ESTIMATED COST OF ELECTRICITY - 30 TO 115 MILLS/kWH
- MAJOR COST DRIVERS - SOLAR CELL PERFORMANCE AND SPACE TRANSPORTATION
- SIGNIFICANT ENVIRONMENTAL BENEFITS, AND QUESTIONS TO BE ANSWERED
- ENERGY PAYBACK RATIO PROMISING - 1 YEAR
- NATURAL RESOURCE REQUIREMENTS REASONABLE
- EXISTING TECHNOLOGICAL AND INDUSTRIAL BASE
- "COMPETITIVE" WITH OTHER ADVANCED SYSTEMS

Figure 4

NASA-S-77-15022

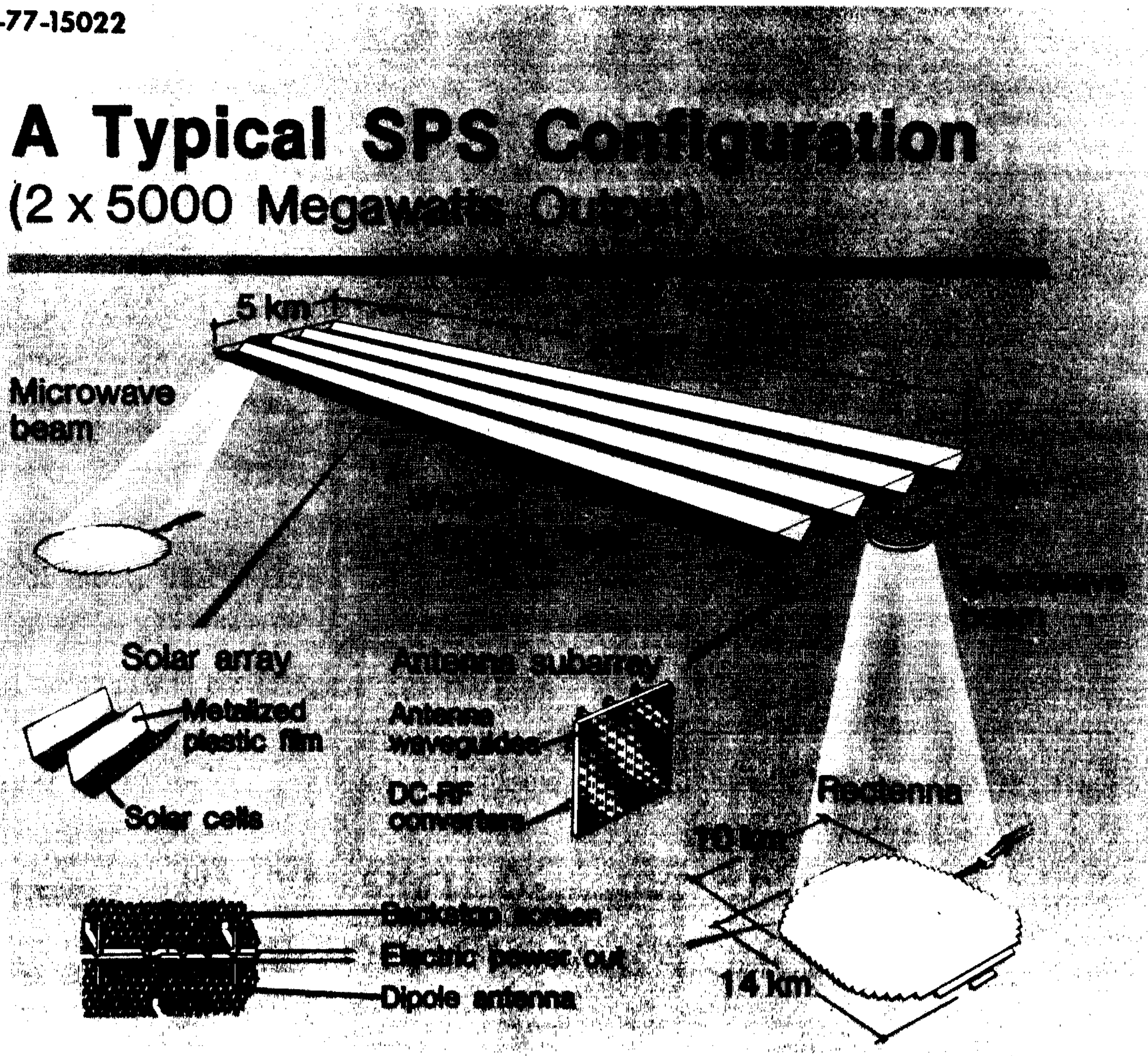


Figure 6

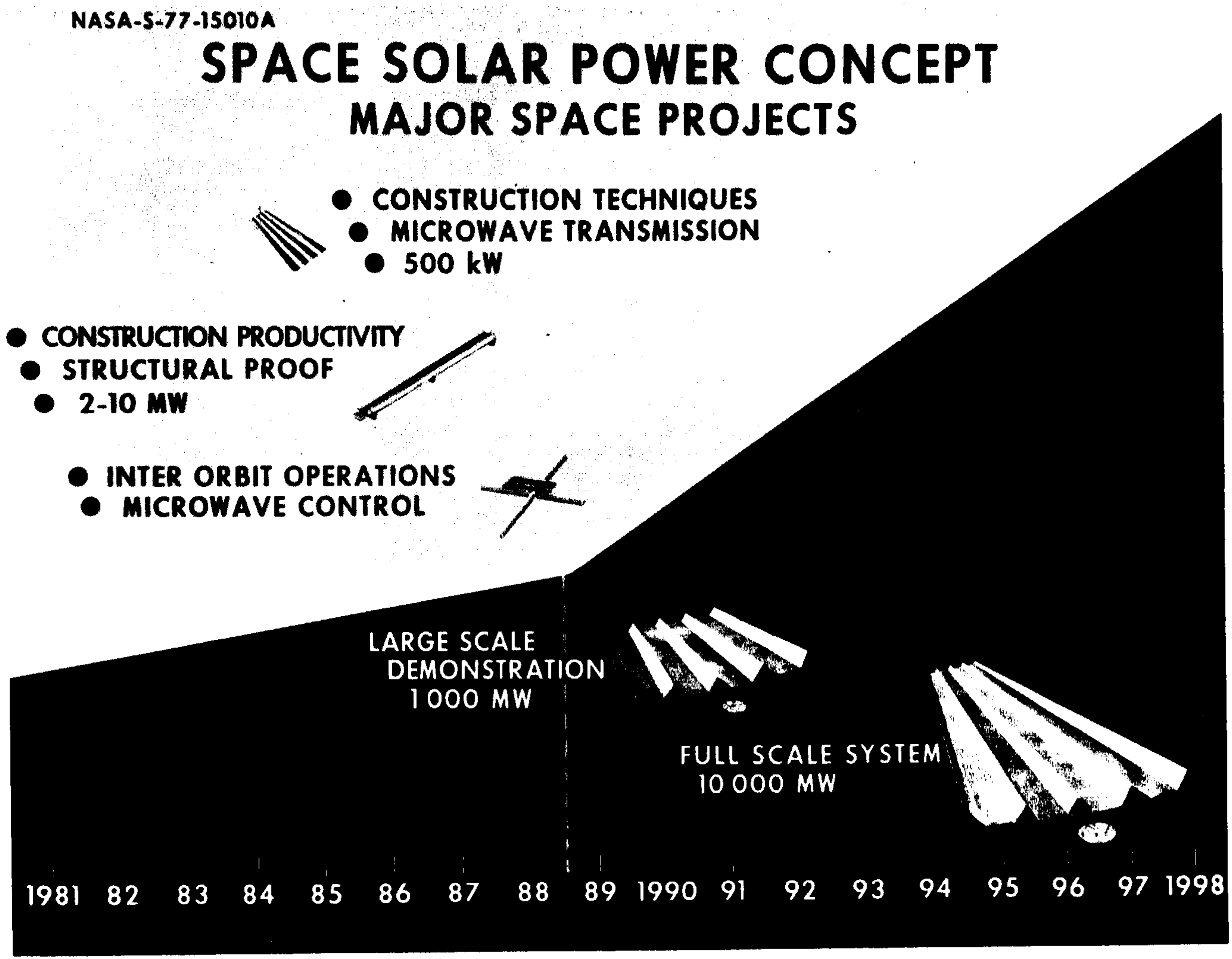

NASA-S-77-15010A
SPACE SOLAR POWER CONCEPT
MAJOR SPACE PROJECTS
● CONSTRUCTION TECHNIQUES
● MICROWAVE TRANSMISSION
● 500 kW
● CONSTRUCTION PRODUCTIVITY
● STRUCTURAL PROOF
● 2-10 MW
● INTER ORBIT OPERATIONS
● MICROWAVE CONTROL
LARGE SCALE DEMONSTRATION 1 000 MW
FULL SCALE SYSTEM 10 000 MW
1981 82 83 84 85 86 87 88 89 1990 91 92 93 94 95 96 97 1998

Figure 5

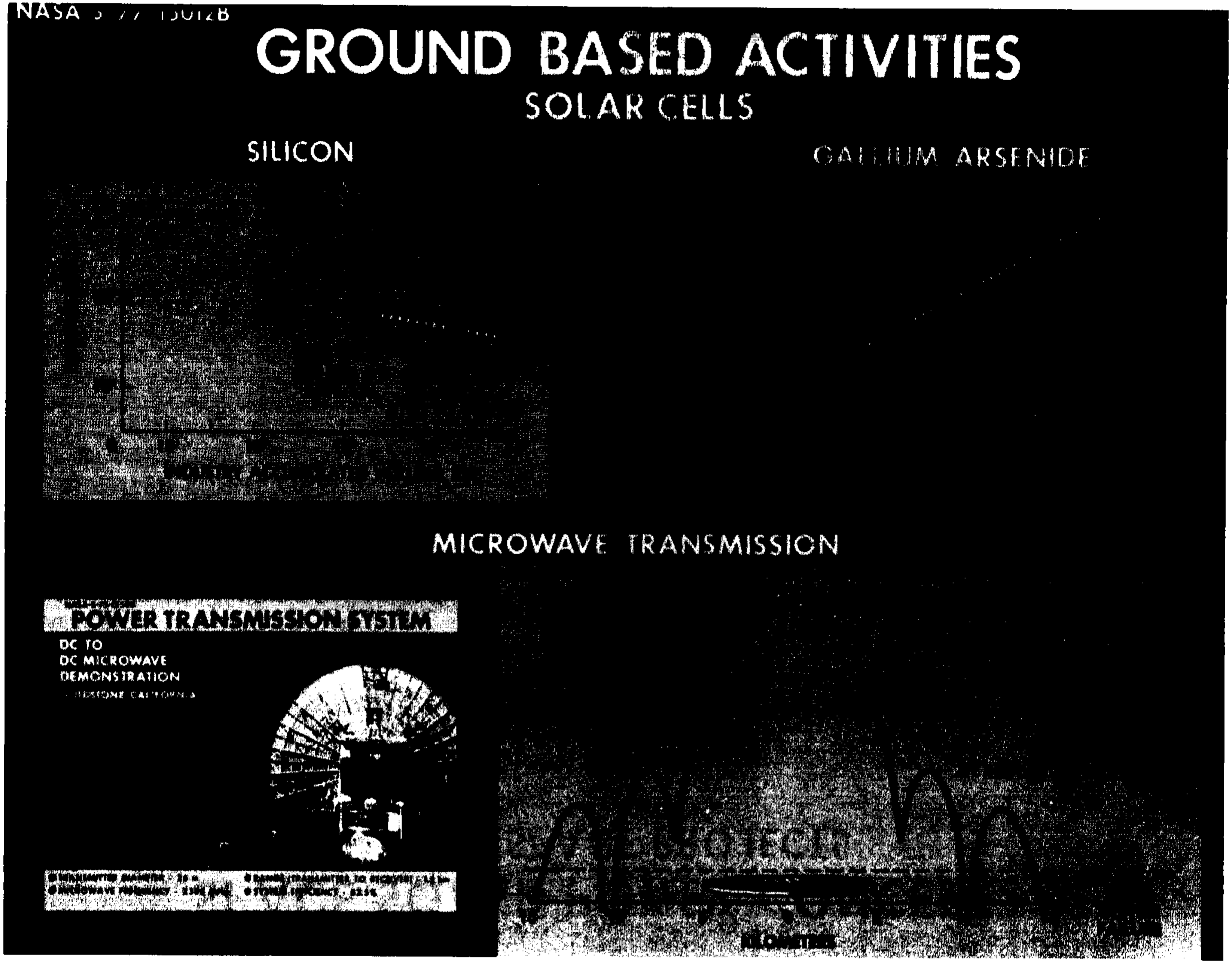

NASA 5 77 15012B
GROUND BASED ACTIVITIES
SOLAR CELLS
SILICON
GALLIUM ARSENIDE
MICROWAVE TRANSMISSION
POWER TRANSMISSION SYSTEM
DC TO
DC MICROWAVE
DEMONSTRATION
KILOMETERS

Figure 7

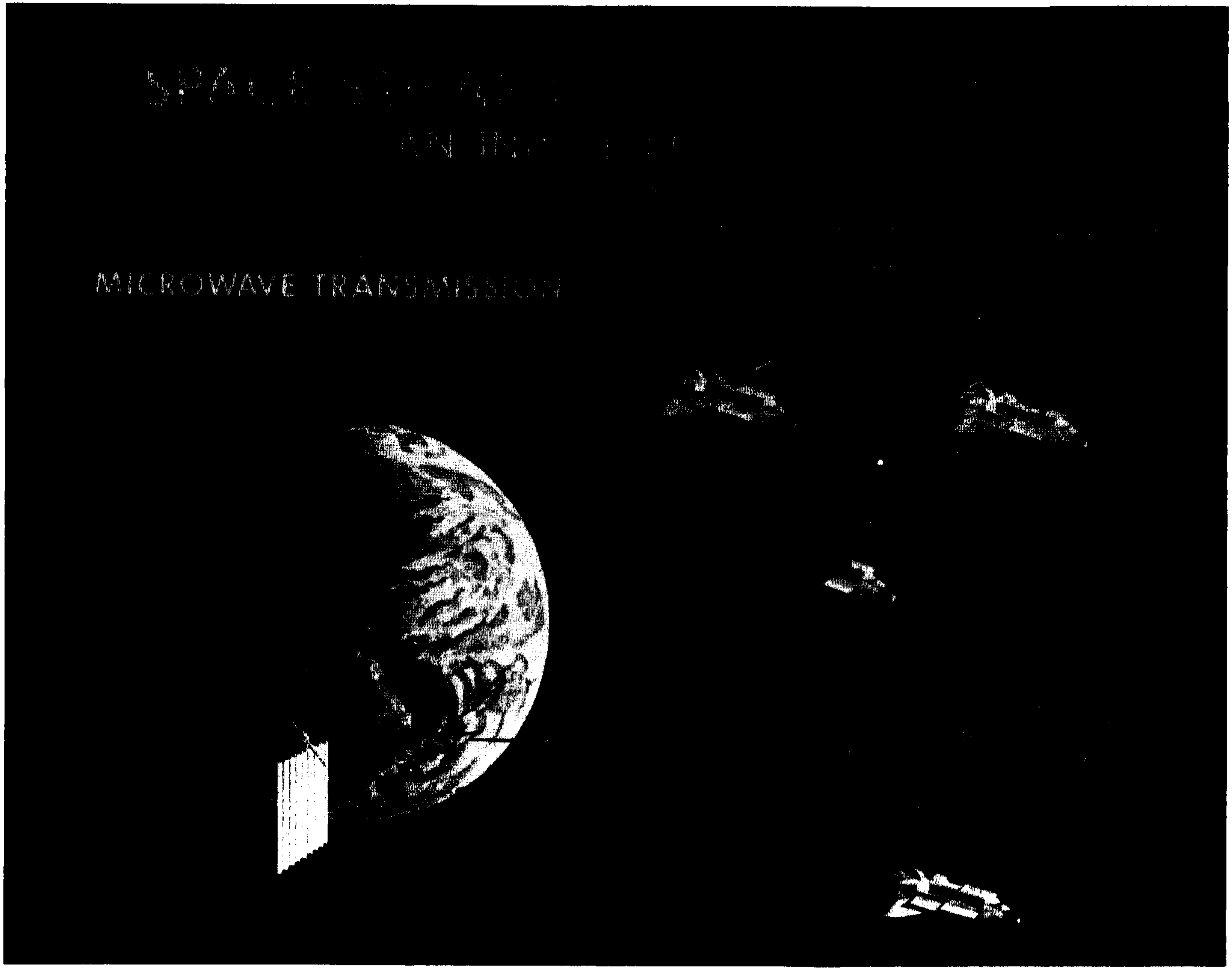


Figure 8

NASA-S-77-2235

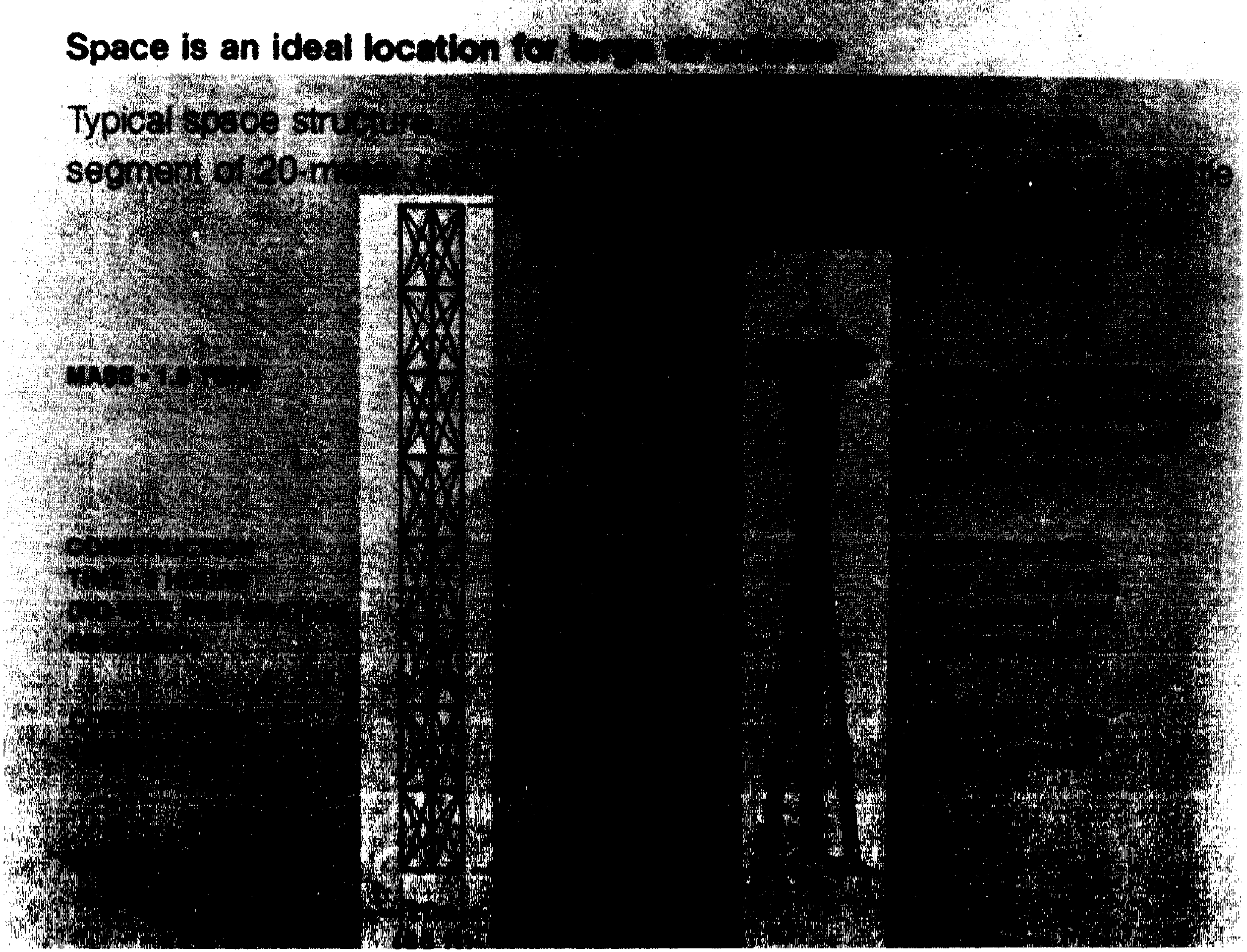
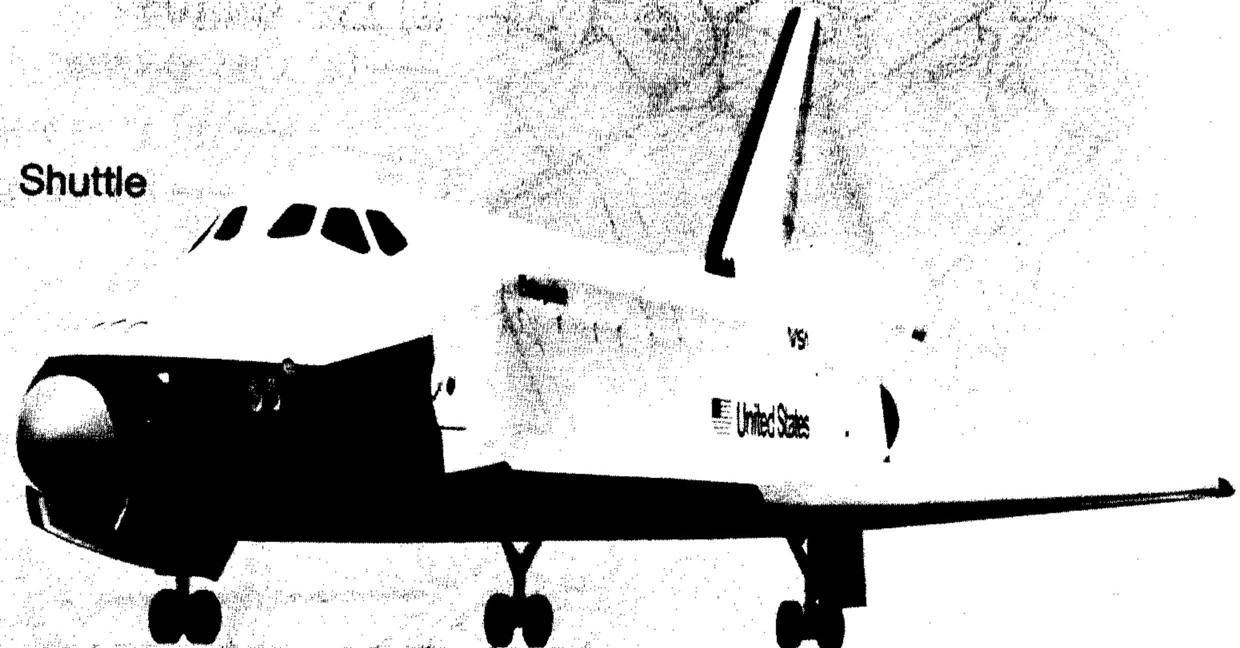


Figure 8A

NASA-S-77-15023

Space Transportation

Shuttle

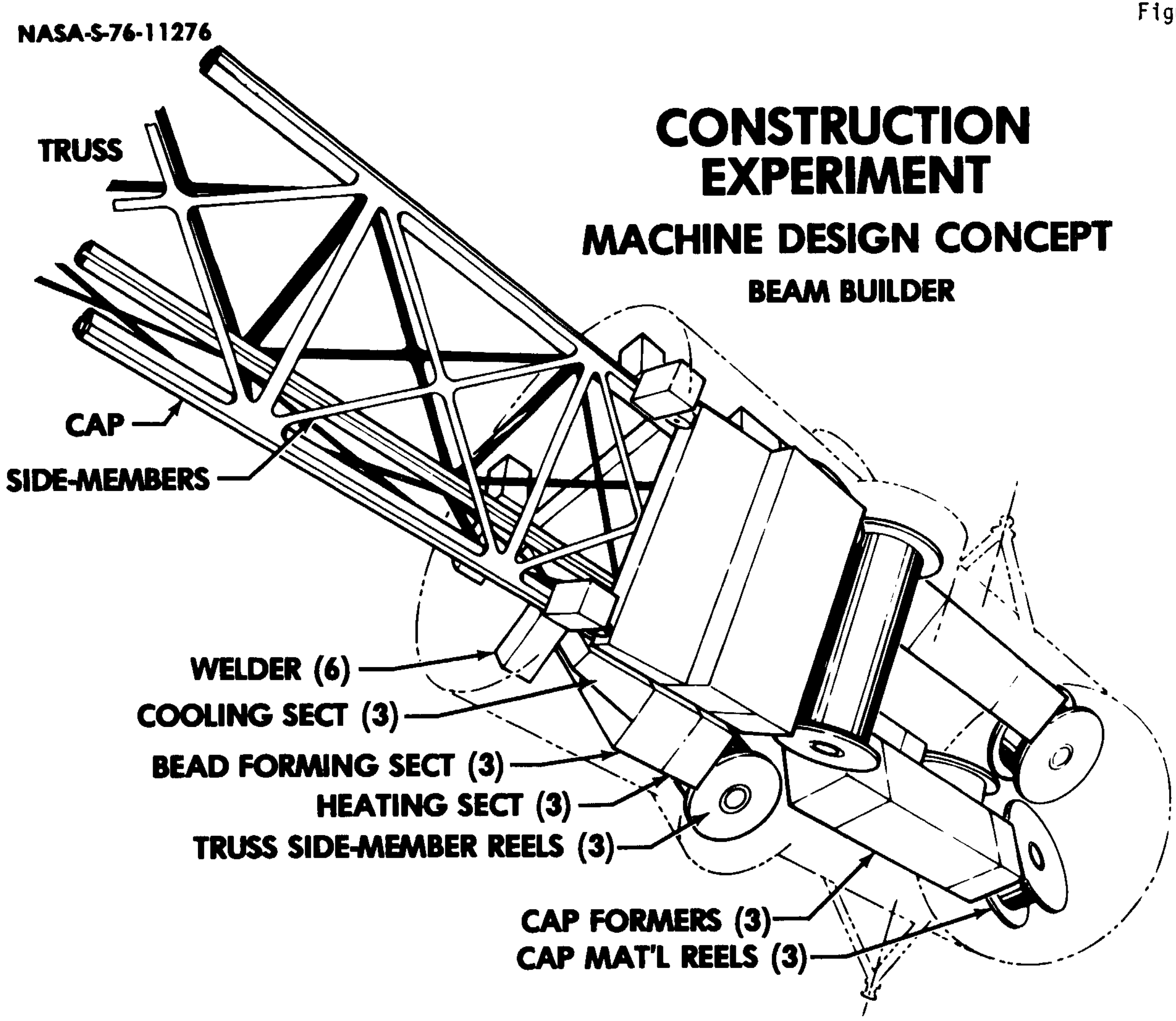


Provides transportation for initial space project

Shuttle use (1980-85) will provide basis for future transportation cost estimates

Geosynchronous testing may require augmented transportation capability

Figure 9

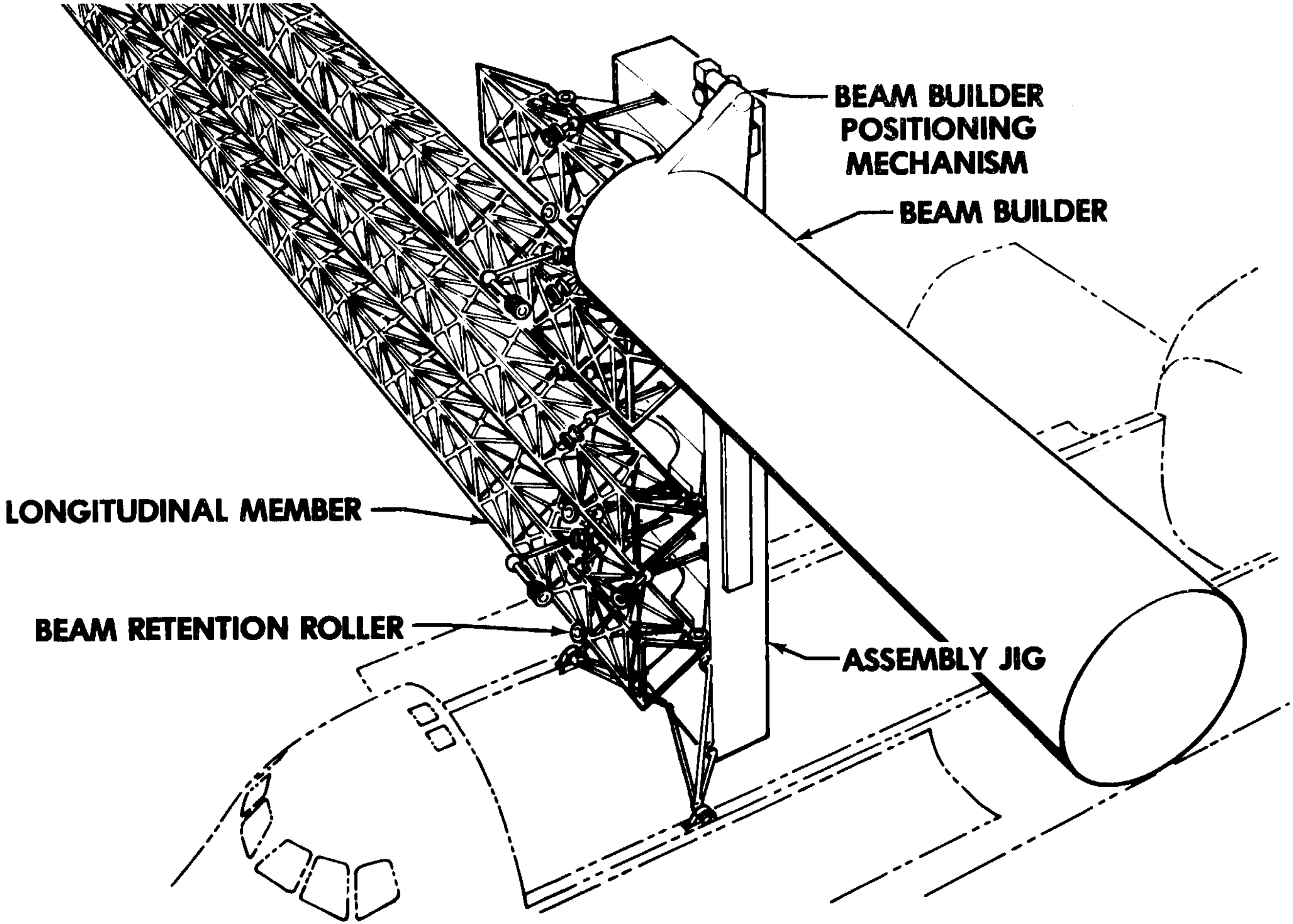

NASA-S-76-11276
CONSTRUCTION
EXPERIMENT
MACHINE DESIGN CONCEPT
BEAM BUILDER
TRUSS
CAP
SIDE-MEMBERS
WELDER (6)
COOLING SECT (3)
BEAD FORMING SECT (3)
HEATING SECT (3)
TRUSS SIDE-MEMBER REELS (3)
CAP FORMERS (3)
CAP MAT'L REELS (3)

NASA-S-76-11273

Figure 11

STRUCTURE FABRICATION SYSTEM CONCEPT FOR LADDER CONFIGURATION

LONGITUDINALS



NASA-S-76-11277

MACHINE DESIGN - PROCESS OPTIONS

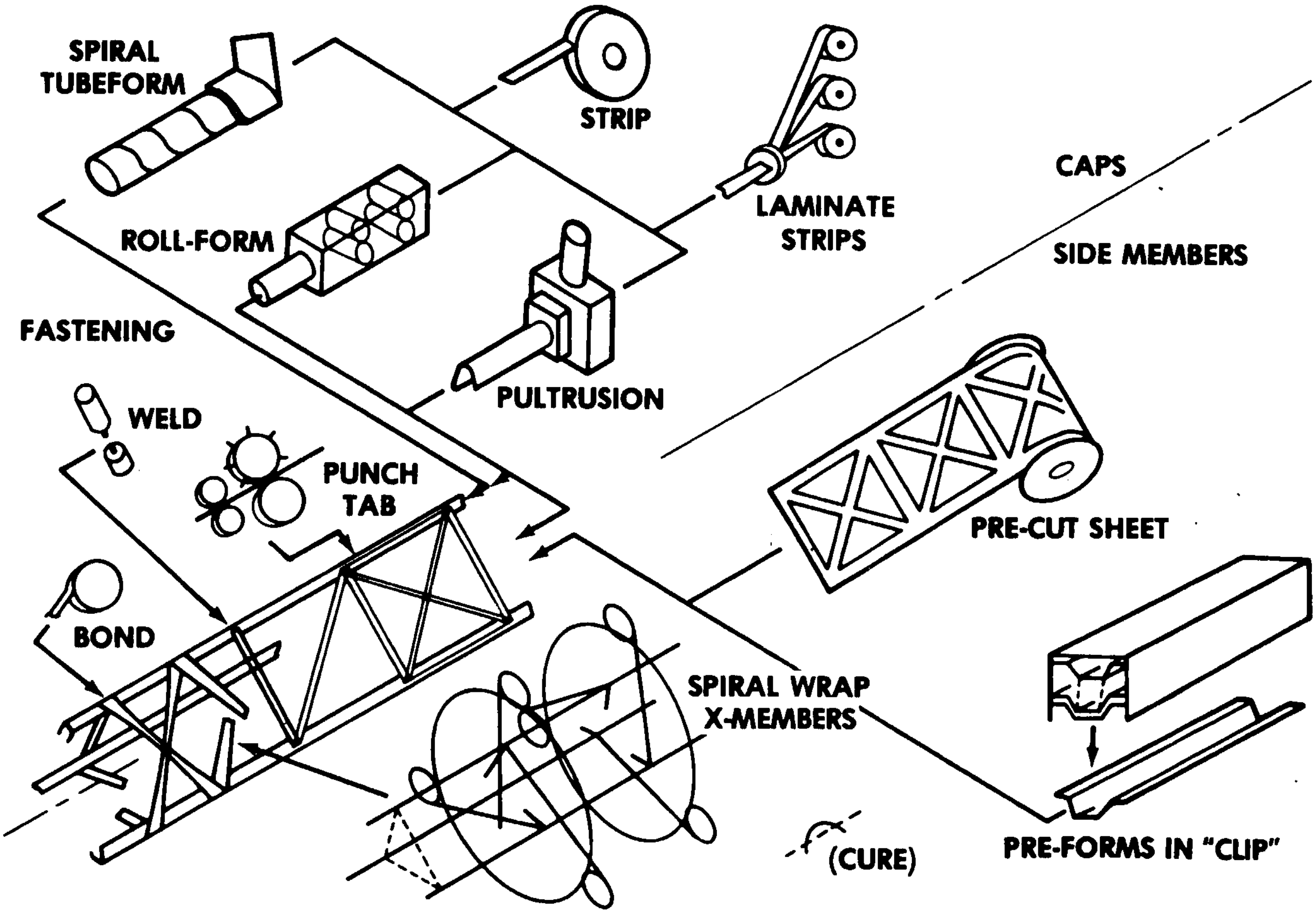
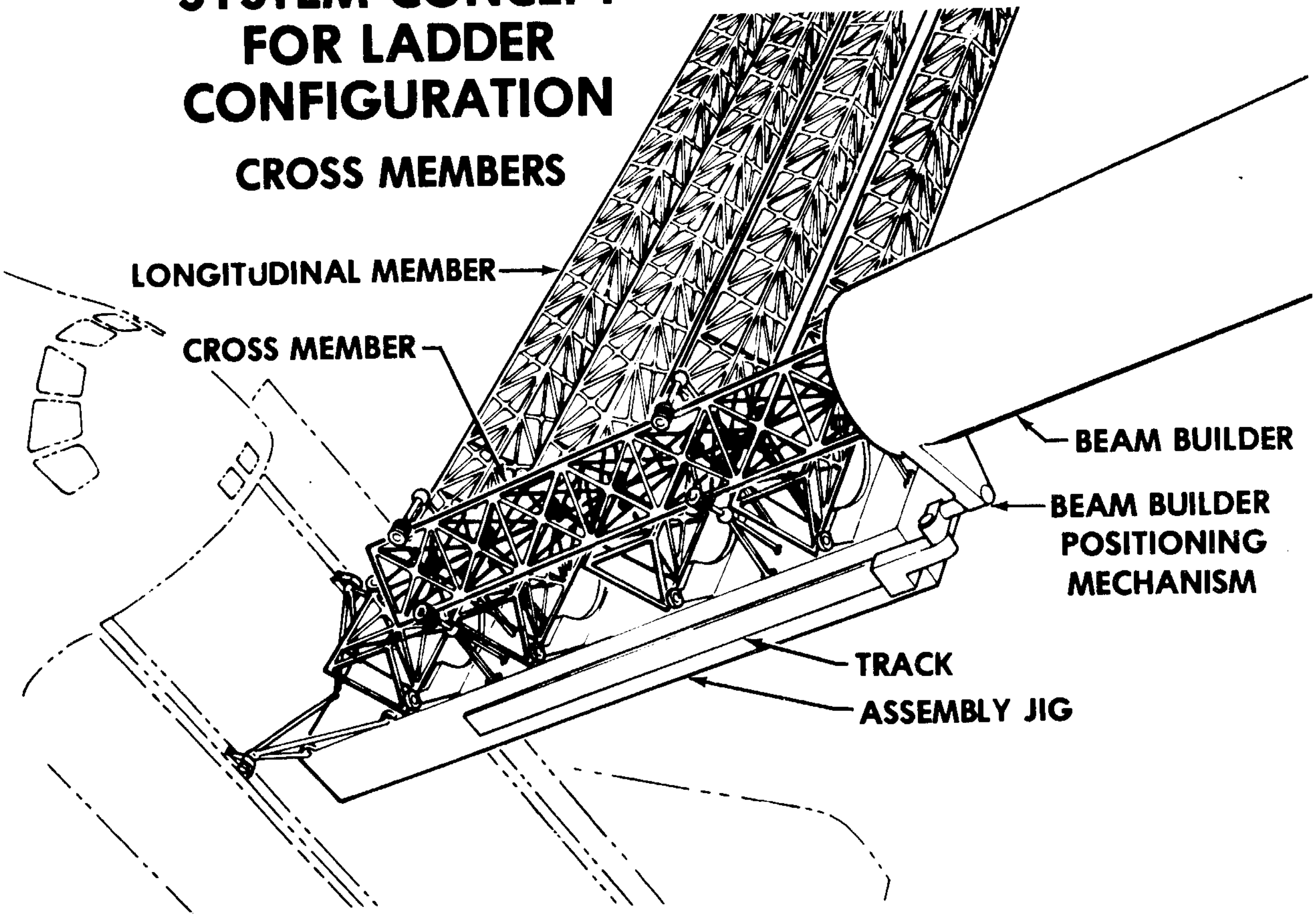


Figure 12

NASA-S-76-11272

STRUCTURE FABRICATION SYSTEM CONCEPT FOR LADDER CONFIGURATION

CROSS MEMBERS



NASA-S-76-11275

FABRICATION SEQUENCE LADDER CONFIGURATION

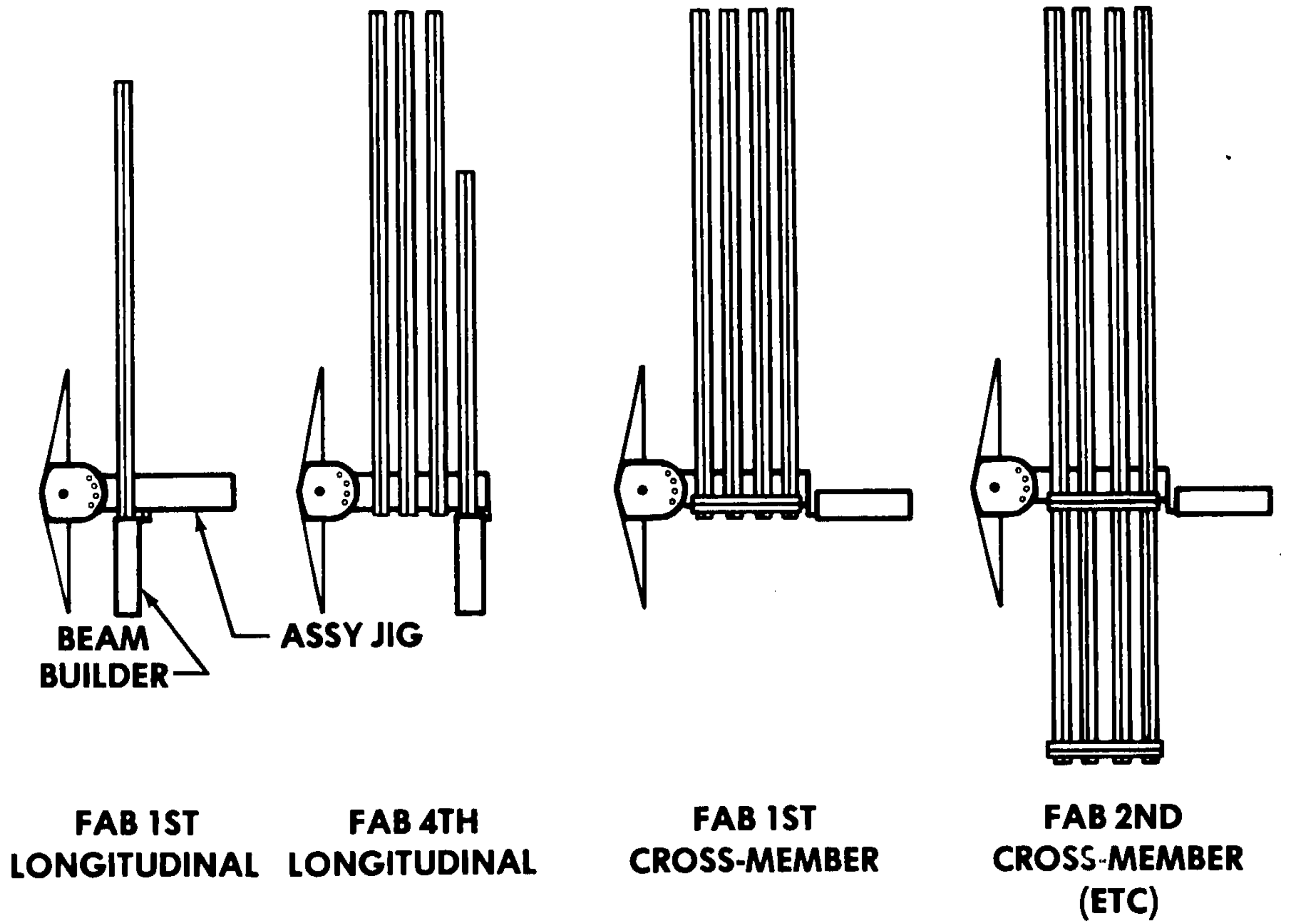
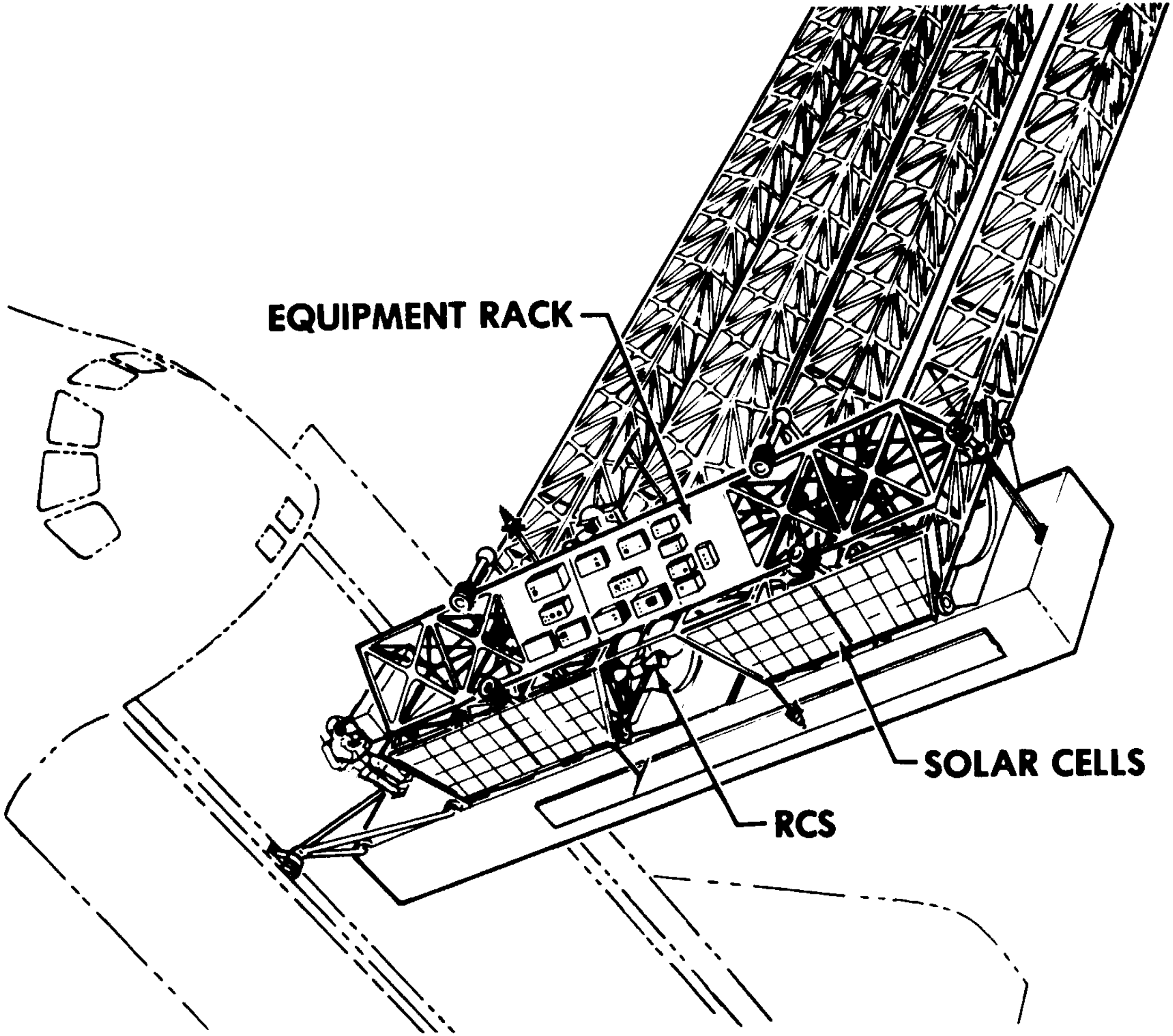


Figure 14

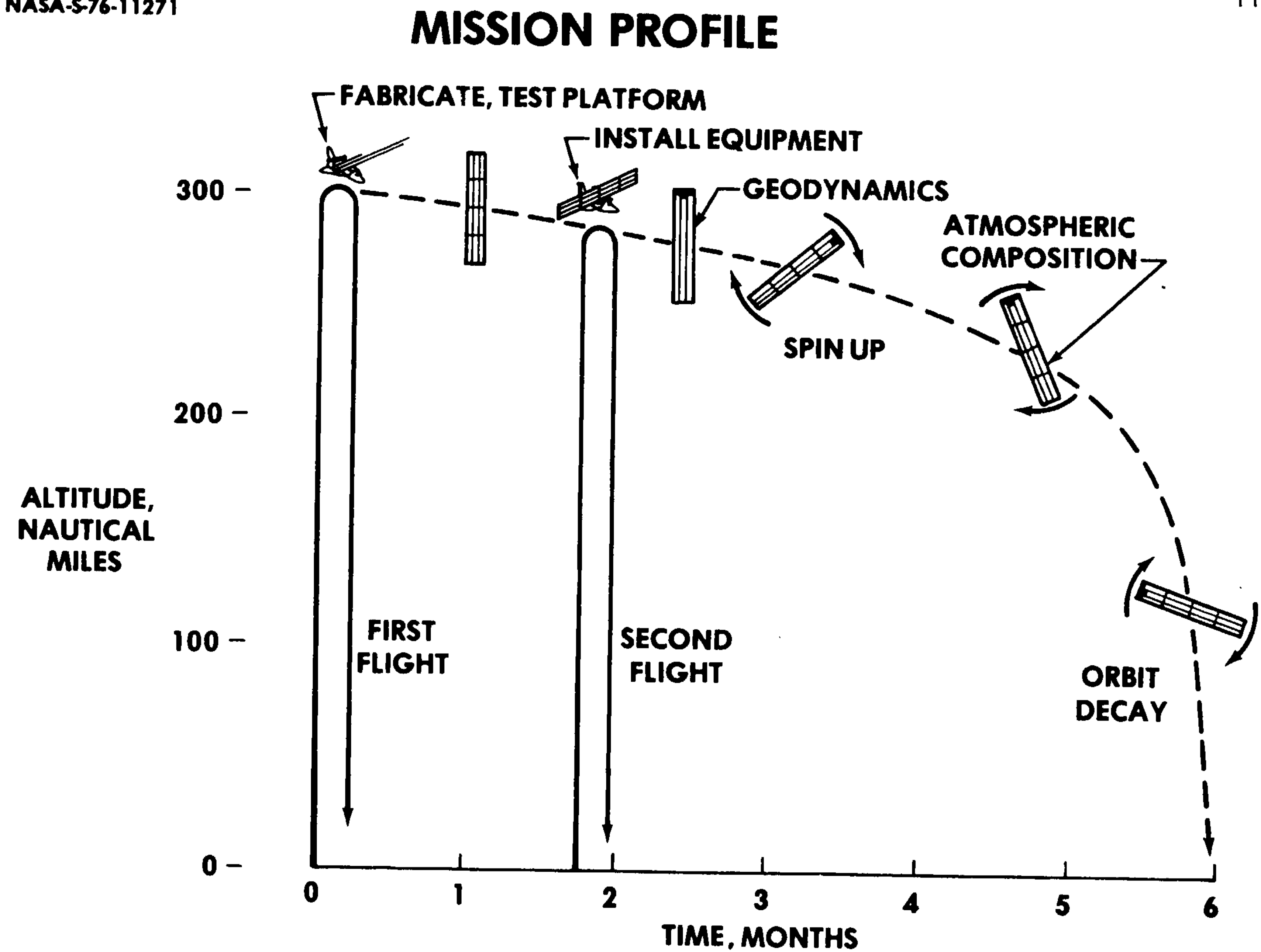
NASA-S-76-11274

SUBSYSTEM INSTALLATION



NASA-S-76-11271

Figure 15



☆ U.S. GOVERNMENT PRINTING OFFICE: 1977 — 771-015/768

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-31

For Release

Upon Receipt

CONTRACTOR ANNOUNCED FOR NASA-BLM EARTH RESOURCES PROJECT

ESL Incorporated, Sunnyvale, California, has been selected by the Johnson Space Center for award of a cost-plus-fixed-fee contract for primary work on a joint NASA-Bureau of Land Management earth resources applications project.

The ESL contract covers the time period May 1, 1977 through April 30, 1978. Contract amount is $399,600.

The NASA-BLM project involves application of Landsat data to the inventory of wildland vegetation in a representative area of Alaska east of Mount McKinley. The BLM is interested in developing an automatic inventory system for the 474 million acres currently in its custody. The Alaska area represents a tundra ecology.

ESL will be required to develop the vegetation inventory, the sampling methodology, the acreage compilations and verify accuracy for the satellite estimates. Complete documentation and technology transfer including training for BLM staff are included in the contract.

NASA will provide Landsat data and contractor supervision for the project. Should this first year effort prove successful, NASA has options for additional work covering representative desert and sagebrush grasslands ecologies.

Landsat is NASA's earth resources survey satellite. There are currently two in orbit.

###

May 11, 1977
NASA-JSC

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-32

For Release:

May 13, 1977

SPACELAB MEDICAL SIMULATION STARTS AT JOHNSON SPACE CENTER

Three life sciences specialists Tuesday will close the hatch behind them for a seven-day simulation of a typical Spacelab mission to be hauled into space in the 1980's aboard the Space Shuttle.

Astronaut-physician Dr. William E. Thornton, mission specialist, Dr. Carter Alexander, payload specialist, both of NASA Johnson Space Center, Houston; and payload specialist Dr. Bill A. Williams of NASA Ames Research Center, Mountainview, California, will live aboard a high-fidelity mockup of the Spacelab and the Shuttle Orbiter crew deck during the week-long Life Sciences Spacelab Mission Development Test III. Similar tests were held at Johnson Space Center in October 1974 and January 1976.

- more -

Spacelab is under development by a consortium of ten European nations and will be carried into space in Shuttle Orbiter's 15 x 65-foot payload bay. A wide range of scientific, medical and engineering experiments will be flown aboard each Spacelab mission.

Spacelab life sciences payloads, similar to the developmental experiments in the week-long simulation, will be aimed toward determining the effects of the space environment on living organisms while at the same time improving space crew health care during future space exploration missions. Additionally, the payloads will be used to develop life support systems for people living and working in space and applications of space technology toward clinical research and health care on Earth.

Medical monitoring and health services for the Spacelab simulation crew will be provided by Dr. Thornton.

A "rack" of 20 life sciences experiments was developed and built at the Ames Research Center and shipped to Houston for the simulation. An additional six Johnson Space Center experiments will be run during the seven days of the test in JSC's Bioengineering and Test Support Facility.

###

NASA News

National Aeronautics and
Space Administration

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

RELEASE NO: 77-33

For Release:
June 3, 1977

NOTE TO EDITORS

The first manned test flight of the Space Shuttle Orbiter scheduled for June 9, 1977, at the NASA Dryden Flight Research Center, Edwards, California, has been delayed. The exact date of the flight is expected to be one to two weeks beyond June 9, but is dependent upon successful completion of Orbiter ground tests currently underway at DFRC.

This flight begins the second phase of the Shuttle Approach and Landing Tests, a program designed to verify the aerodynamics and flight control characteristics of the Orbiter while still attached to the 747 carrier aircraft.

This postponement is due to the malfunction, during tests yesterday, of equipment associated with the vehicle's auxilary power system. A leak developed in a fuel pump seal in one of the three auxilary power units causing a small amount of APU fuel (hydrazine) to vent overboard.

This problem in APU #2 developed during a "mission run" of the Orbiter APU system, one of the final tests scheduled before the first manned flight. The test was halted when the leak was noticed about 30 minutes into the one-hour long scheduled test.

APU #2 will be replaced and a full mission run will be rescheduled at DFRC. This work is expected to take between four and seven days.

Media representatives planning to attend the manned captive active flights should contact Ralph Jackson at DFRC Public Affairs (805 258-8381) for additional details and proper accreditation.

Up-to-date status reports on Shuttle test flight activities at DFRC are available at 213 354-4213 (Los Angeles) or 805 258-4474 (Edwards).

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

Release No: 77-34

For Release:

June 2, 1977

NASA MODIFIES ORBITER CONTRACT TO COVER ENGINEERING CHANGES

The NASA Johnson Space Center has signed a supplemental agreement to the contract with Rockwell International Corporation Space Division, Downey, California, covering engineering changes in the Space Shuttle Orbiter.

The $1.1 million addition covers ten changes in the Orbiter flight control system and relocation of the remote manipulator system, and brings the total estimated value of the cost-plus-award-fee Rockwell contract to $3,052,386,391.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:

RELEASE NO: 77-35

June 7, 1977

PAN AMERICAN GETS JSC MAINTENANCE CONTRACT

The NASA Johnson Space Center, Houston, has signed a contract with Pan American World Airways, Inc. Aerospace Services Division for Center plant maintenance and operations support services. The contract covers operation of all utility systems and maintenance of utilities, buildings, roads, ditches and special equipment.

Pan American will employ about 300 people for the year ending April 30, 1978. The cost-plus-award-fee contract has an estimated value of $7,470,591.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release

RELEASE NO: 77-36

June 22, 1977
1:00 p.m. CDT

ASTRONAUT CARR LEAVES NASA TO JOIN ENGINEERING FIRM

Skylab 4 commander Gerald P. Carr, will leave the astronaut group at the NASA Johnson Space Center June 25, to join the Houston consulting engineering firm of Bovay Engineers, Inc.

Carr was one of 19 astronauts selected in April 1966, and shares the world's spaceflight duration record of 2,017 hours (84 days) with his Skylab 4 crewmates Dr. Edward G. Gibson and William R. Pogue. He retired from the U.S. Marine Corps in September 1975, to become a NASA civilian employee.

At Bovay Engineers, Carr will be the corporate manager for business development. "Leaving a career in aviation and spaceflight is a difficult thing to do, but I feel that it is time for me to take a new direction," said Carr. "I wouldn't trade the past 22 years as a Marine aviator and astronaut for any other experience, and I look back over those years with great satisfaction."

Carr headed the design support group within the JSC Astronaut Office at the time he joined Bovay. With Carr's departure, 27 astronauts remain on the active list at JSC.

NASA-JSC

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-37

For Release:

June 20, 1977
3:00 p.m. CDT

NASA GIVES ROCKWELL GO FOR THIRD ORBITER START

The NASA Johnson Space Center has signed a $40 million letter contract with Rockwell International Corporation Space Division, Downey, California, covering modifications to the first Space Shuttle Orbiter and for start of design work for the third Orbiter.

Funded in part by the Economic Stimulus Bill, the contract is aimed toward generating additional employment opportunities.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-38

For Release:

June 20, 1977
3:00 p.m. CDT

NASA REDUCES SHUTTLE ORBITER CONTRACT

The NASA Johnson Space Center has signed a supplemental agreement with Rockwell International Corporation Space Division, Downey, California, covering work deleted from the Space Shuttle Orbiter contract.

Covering two contract changes for deletion of a neutral-buoyancy trainer and vibroacoustic testing of the Orbiter aft fuselage, the decrease of $25,334,750 lowers the value of the cost-plus-award-fee Rockwell contract to $3,013,971,603. Most of the deleted work was to have been done in Rockwell's Downey plant with support from Houston and Kennedy Space Center field offices.

###

NASA News

National Aeronautics and
Space Administration

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

Milt Reim

For Release:

RELEASE NO: 77-39

July 15, 1977

OVER 8,000 APPLY FOR SPACE SHUTTLE ASTRONAUT PROGRAM AT JSC

Over 8,000 individuals have applied for the 30 to 40 positions the National Aeronautics and Space Administration has opened for Space Shuttle astronaut candidates.

To be eligible, applications had to be postmarked prior to midnight June 30. Many waited until the last day to apply and total application numbers are still being tallied.

The astronaut selection board at the Johnson Space Center in Houston is now in the process of narrowing the selection to those best qualified in each category. From these, approximately 150 applicants will be selected for preliminary screening and physicals at JSC.

Thirty to 40 candidates will be accepted for a two-year training and evaluation period at JSC. Pilot and mission specialist candidates will be notified of their selection by December.

The candidates will report for duty at JSC in Houston in 1978. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

- more -

The latest tally indicates that 8,037 men and women applied for the astronaut program. The mission specialist category had 6,735 applicants and the pilot category had 1,302 applicants.

A total of 24,618 inquiries were received after the program was announced a year ago, and of these 20,440 requested and were sent application packets.

Women applicants for the two positions numbered 1,142.

Pay for civilian candidates will be based on the Federal Government's General Schedule for pay scale from grades GS-7 through GS-15, with approximate salaries from $11,000 to $34,000 per year. Candidates will be compensated based on individual academic achievements and experience. Other benefits include vacation and sick leave and participation in the Federal Government retirement, group health and life insurance plans.

Military candidates will be assigned to JSC but will remain in active military status for pay, benefits, leave and other military matters.

Currently, 30 persons are available as Space Shuttle crewmen, including 10 scientists. Twenty-seven of them are astronauts assigned to the Johnson Space Center and three hold government positions in Washington, D.C.

The Space Shuttle is a reusable vehicle that will replace virtually all of this nation's space launch vehicles. Space missions could include deploying and retrieving satellites, servicing satellites in orbit, operating laboratories for astronomy, earth sciences, space processing and manufacturing, and developing and servicing a permanent space station.

- more -

Launched like a rocket, the Shuttle will perform earth orbital missions of up to 30 days, then land like an airplane and be refurbished for another mission. Pilot astronauts will control the Shuttle during launch, orbital maneuvers and landings and be responsible for maintaining vehicle systems. Mission specialist astronauts will be responsible for the coordination of overall Orbiter operations in the areas of flight planning, consumables usage and other activities affecting payload operations. At the discretion of the payload sponsor, the mission specialist may assist in the management of payload operations, and may, in specific cases, serve as the payload specialist. They will be able to continue in their chosen fields of research and to propose, develop and conduct experiments.

Crews will consist of a commander, a pilot and may include a mission specialist and payload specialists. Payload specialists need not be NASA employees.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:

July 19, 1977
2 p.m. CDT

RELEASE NO: 77-40

NASA AMENDS ROCKWELL CONTRACT TO COVER ORBITER CHANGES

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the Rockwell International Space Division contract for the Space Shuttle Orbiter.

Valued at $7,142,250, the supplement to the cost-plus-award-fee contract covers nine contract changes previously authorized by NASA. Rockwell does most of the Orbiter work at its Downey, California plant and at field offices in Palmdale, California and Houston.

###

NASA News

National Aeronautics and
Space Administration

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

Robert V. Gordon

For Release
Immediate

RELEASE NO: 77-41

THIRD MANNED CAPTIVE FLIGHT OF SHUTTLE ORBITER SCHEDULED

The third manned flight of NASA's Space Shuttle Orbiter "Enterprise" atop its 747 carrier aircraft now is scheduled for no earlier than July 26, at the NASA Dryden Flight Research Center, Edwards, California. Takeoff time of the 747/Orbiter is planned for 8 a.m. PDT.

Astronauts Fred W. Haise and C. Gordon Fullerton will be at the controls of the Orbiter during the 55-minute captive test flight which is a full dress rehearsal for next month's first free flight of the Orbiter. If flight and test objectives are sucessfully accomplished, the first free flight will be no earlier than August 12.

This is the second flight for Haise and Fullerton. Their first flight was June 18.

Astronauts Joe Engle and Richard Truly were the Orbiter pilots during the captive flight June 28.

The 747 will carry the Orbiter to a maximum altitude of 7,895 meters (25,905 feet) when the 747 will push over in a practice run of Orbiter-747 separation. The Orbiter and 747 crews will perform all of the functions

-more-

up to but not including actual separation. The 747/Orbiter will land at Edwards about 10 minutes after the pushover maneuver.

The 747/Orbiter combination will make one circuit of the 135 by 39 kilometer (84 by 24 mile) "racetrack".

The two previous manned captive flights met all test objectives. The first flight, which lasted 56 minutes, was a low altitude and low speed flight during which time flight control systems and Orbiter controls were tested by Haise and Fullerton. Engle and Truly reported everything went well during their 63 minute flight, which reached an altitude of 6,278m (20,600 ft.) and a top speed of 500 km/hr (310 mph).

###

July 21, 1977

THIRD MANNED CAPTIVE FLIGHT

Event	Altitude	T-Time*	PDT a.m.	EDT
Crew Wakeup		T-240	4:00	7:00
Crew Depart VOQ		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover		T-67	6:53	9:53
Orbiter/SCA Move From MDD		T-62	6:58	9:58
Orbiter/SCA Tow to NASA Ramp		T-56	7:04	10:04
SCA Engine Start		T-42	7:18	10:18
SCA Begin Taxi		T-32	7:28	10:28
SCA Arrive Runway		T-12	7:48	10:48
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff, Climbout		T-0	8:00	11:00
Intersect Racetrack	16,905(AGL)**	+13	8:13	11:13
In-Flight FCS Checks	22,705	+24	8:24	11:24
Reach MCT 200 FPM Ceiling	23,605	+28	8:28	11:28
SCA Begin SRT	24,705	+36	8:36	11:36
Pushover (Practice Separation)	25,905	+45	8:45	11:45
SCA Touchdown		+55	8:55	11:55
Deploy Landing (Orbiter) During SCA Rollout				

Note

* Events and times are preliminary and may change prior to flight day.

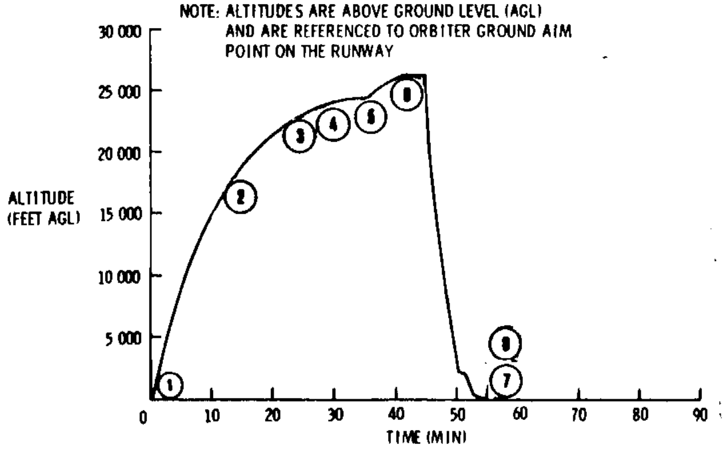
** Altitudes are above Ground Level (AGL) and are referenced to Orbiter ground aim point on the runway. Add 2,300 ft. to AGL to obtain altitude above Mean Sea Level (MSL).

MATED PROFILE CAPTIVE ACTIVE 3

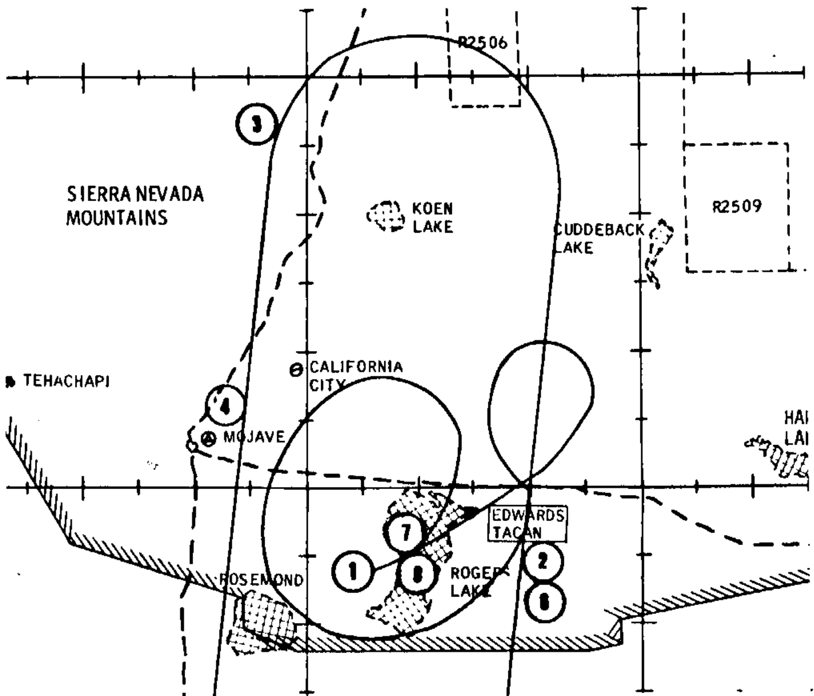
FLIGHT SEQUENCE

ITEM	TIME (MIN)	ALTITUDE (FEET AGL)	RANGE (NM)	EVENT
1	0	0	0	SCA TAKEOFF
2	13	16 905	12	INTERSECT RACETRACK
3	24	22 705	26	IN-FLIGHT FCS CHECKS
4	28	23 605	16	REACH MCT 200 FPM CEILING
5	36	24 705	29	SCA BEGIN SRT
6	45	25 905	9.5	PUSHOVER (PRACTICE SEP)
7	55	0	0	SCA TOUCHDOWN
8	55.5	0	0	DEPLOY LANDING GEAR DURING SCA ROLLOUT AT~125 KCAS

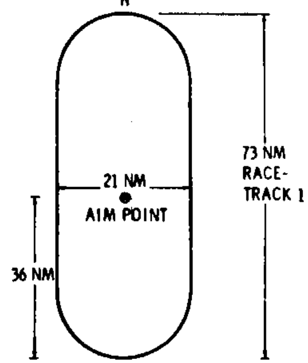
ALTITUDE PROFILE



GROUNDTRACK



RACETRACK DETAIL



DATE 06/27/77

NASA-JSC

OVERVIEW

NASA News

National Aeronautics and
Space Administration

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

John E. Riley

For Release
Immediate

RELEASE NO: 77-42

NASA TO INTERVIEW ASTRONAUT APPLICANTS

The first 20 of approximately 200 Space Shuttle astronaut applicants to be selected for individual interviews and physical examinations will report to the Johnson Space Center, Tuesday, August 2.

Women and minorities will be among the number chosen for further screening from 8,079 applicants. NASA expects the number to be interviewed at JSC to be about evenly divided between pilot and mission specialist applicants. All in the initial group are pilot applicants.

"We are pleased with the quality of applicants," JSC Director Christopher C. Kraft, Jr., said. "It is difficult to narrow the field for interviews and paring that number will be a real challenge."

Each group of applicants will spend about one week at JSC. Officials expect to complete the process by mid-November.

In December, NASA will select as many as 20 astronaut candidates in each of the two categories -- pilot and mission specialist. The candidates will report to JSC in mid-1978 for two years of training and evaluation. Final selection as an astronaut will depend on satisfactory completion of the evaluation period.

-more-

The names, places of birth, high school (HS), and current duty stations of the first 20 applicants selected for interviews are:

Maj. Gerald K. Bankus, 34, USAF
Milan, Missouri - HS: Bossier City, Louisiana
Pentagon, Washington, D.C.

Lt. Richard E. Batdorf, 30, USN
Wauseon, Ohio - HS: Bryan, Ohio
NAS Patuxent River, Maryland

Maj. John E. Blaha, 34, USAF
San Antonio, Texas - HS: Norfolk, Virginia
Pentagon, Washington, D.C.

Capt. Gary D. Bohn, 33, USAF
Halstead, Kansas - HS: Halstead, Kansas
Tyndall AFB, Florida

Capt. Claude M. Bolton, Jr., 31, USAF
Sioux City, Iowa - HS: South Sioux City, Nebraska
Edwards AFB, California

Lt. Cmdr. Daniel C. Brandenstein, 34, USN
Watertown, Wisconsin - HS: Watertown, Wisconsin
Attack Squadron 145, FPO San Francisco, California

Maj. Roy Bridges, Jr., 34, USAF
Atlanta, Georgia - HS: Gainsville, Georgia
Headquarters USAF/RDPN, Washington, D.C.

Maj. Frederick T. Bryan, 35, USMC
Melrose, Massachusetts - HS: Watertown, Mass.
Pacific Missile Test Center, Point Magu, California

Capt. John Casper, 34, USAF
Greenville, South Carolina - HS: Chamblee, Georgia
Edwards AFB, California

Lt. Cmdr. Michael L. Coats, 31, USN
Sacramento, California - HS: Riverside, California
USN Post Graduate School, Monterey, California

-more-

Maj. Stewart E. Cranston, 33, USAF
Watertown, South Dakota - HS: Rockledge, Florida
Tyndall AFB, Florida

Lt. Cmdr. John O. Creighton, 34, USN
Orange, Texas - HS: Seattle, Washington
Fighter Squadron Two, FPO San Francisco, California

Lt. Cmdr. William V. Cross II, 31, USN
Omaha, Nebraska - HS: Washington, D.C.
USS Nimitz, Norfolk, Virginia

Capt. Edward L. Daniel, 32, USAF
Eagle Pass, Texas - HS: Alexandria, Virginia
Edwards AFB, California

Capt. Michael E. Durbin, 35, USAF
Dallas, Texas - HS: Dallas, Texas
36th Tactical Fighter Wing, Bitburg, Germany

Lt. James O. Ellis, Jr. 30, USN
Spartanburg, South Carolina - HS: Marietta, Georgia
NAS Patuxent River, Maryland

Mr. James D. Erickson, 35, Civilian
Spokane, Washington - HS: Veradale, Washington
Federal Aviation Administration, Ft. Worth, TX

Lt. Cmdr. Kent H. Ewing, 34, USN
San Angelo, Texas - HS: College Park, Georgia
NAS Cecil Field, Florida

Capt. Guy S. Gardner, 29, USAF
Altavista, Virginia - HS: Alexandria, Virginia
Edwards AFB, California

Capt. Thomas E. Fitzpatrick, 32, USMC
Winter Haven, Florida - HS: Haines City, Florida
Naval Air Test Center, Patuxent River, Maryland

###

July 29, 1977

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:

RELEASE NO: 77-43

August 4, 1977

NOTE TO EDITORS

SUMMER WORKSHOP ON NEAR EARTH RESOURCES TO BE HELD AUGUST 6-13, 1977

A summer workshop on Near Earth Resources to discuss the possible scientific and technological exploitation of lunar and asteroidal materials will be held at the University of California at San Diego from August 6 through 13.

Participants for the workshop have been chosen already and represent a cross-section of geo-scientists and geo-engineers from government, private industry and the university community.

Purpose of the workshop will be to explore present lunar and asteroidal knowledge to determine the level of our understanding. Gaps in this knowledge will be examined to ascertain the importance of finding the answer. The technological and scientific utilization of lunar and asteroidal materials also will be discussed. The group will be working towards recommendations concerning what research should be attempted and what exploitation can be accomplished.

Lunar researcher and UC professor Dr. James Arnold is chairman of the workshop committee and will present the group's recommendations to NASA Office of Space Science officials at the conclusion of the workshop.

Recommendations of the workshop will be used as a step in providing the Office of Space Science with a logical and useful rationale for scientific and technological follow-up to the previous decade's extra-terrestrial exploration.

- more -

A press conference will be held at 1 p.m., Saturday, August 13, in Urey Hall at UC/San Diego. Copies of the list of recommendations will be made available to members of the press.

For further information:

La Jolla, California

Florence Kirchner 714 452-2909 or 3575

Paul Lowenburg 714 452-3120

Houston, Texas

Charles Redmond 713 483-5111

###

PRESS COVERAGE: Prof. Arnold has asked that the press not attend the actual working sessions. But aside from these sessions, he has assured his full cooperation with members of the news media to discuss the activities of the workshop. Prof. Arnold and some of his colleagues will be working on a report of the workshop activities on Sunday, August 14. He has indicated a willingness to speak with the media at that time to give a summary of the proceedings and recommendations.

COMMENTS FROM PROF. ARNOLD:

"It is only in the last few years that proposals to use the resources of the Moon and of the Earth-crossing asteroids for human benefit have begun to be developed and put forward to technically qualified audiences. The materials on the surface of these bodies are accessible from space in a way that the Earth's resources are not. Their gravitational binding energies are far less than the Earth's.

"Our task at the workshop will be to survey what is known, and what is not known about the useful materials on the surface of the Moon, and in the Earth-crossing asteroids. The two cases are quite different. We know a lot about the Moon, but there are critical gaps. We have only fragments of information about the Earth-crossing asteroids, except for the fact that some smaller representatives of this group, called meteorites, are in our hands.

"Examples of the questions we will examine are:

1. Is there a reason to expect local occurrences of 'ores' on the moon?

2. Are there likely to be many Earth-crossing asteroids of small enough size to be interesting? If so, how can we best find them?

3. How well can we identify the chemical components of asteroid surfaces from Earth-based operations?

4. What else do we need to be confident of our knowledge?

5. What is our knowledge of critically volatile substances, particularly water, on any of these objects?"

# # # #

FOR FURTHER ASSISTANCE: Contact PAUL LOWENBERG, Public Information Office, (714) 452-3120.

NASA News

National Aeronautics and
Space Administration

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

Milton Reim

For Release
August 11, 1977

RELEASE NO: 77-44

SECOND GROUP OF ASTRONAUT APPLICANTS TO BE INTERVIEWED

The second group of 20 Space Shuttle astronaut applicants to be selected for individual interviews and physical examinations will report to the Johnson Space Center, Monday, August 15.

Approximately 200 of the 8,079 who applied for the astronaut program will be coming to JSC for further screening. Women and minorities will be among those chosen for screening here at JSC.

This second group, like the first group are all pilots. They will be at JSC for one week. The selection process is expected to be complete by mid-November.

In December, NASA will select as many as 20 astronaut candidates in each of the two categories -- pilot and mission specialist. Reporting date for the candidates will be in mid-1978. Satisfactory completion of a two year training and evaluation period will be a requirement for final selection as an astronaut.

The names, place of birth, high school (HS), and current duty station of the second group of 20 applicants selected for further screening are:

-more-

Lt. Col. Leslie B. Anderson, III, 36, USAF
Wooster, Ohio; - HS: Winter Haven, Florida
436th Tactical Fighter Training Squadron, Holloman AFB, NM

Capt. Richard S. Couch, 31, USAF
Hamilton, Ontario, Canada; - HS: Texarkana, Arkansas
4950th Test Wing, Wright-Patterson AFB, OH

Major Richard O. Covey, 31, USAF
Fayetteville, Arkansas; - HS: Shalimar, Florida
AFFTC, Detachment 2, Eglin AFB, FL

Capt. Dale S. Elliott, 32, USAF
Lake Charles, Louisiana; - HS: Burlingame, CA
3246th Test Wing, Eglin AFB, FL

Lt. Robert L. Gibson, 30, USN
Cooperstown, New York; - HS: Huntington, New York
Strike Aircraft Test Directorate Fighter Branch, Naval Air Test Center, Patuxent River, MD

Capt. Ronald J. Grabe, 32, USAF
New York, New York; HS: New York, New York
USAF/RAF Exchange Program, Amesbury, Wiltshire, England

Stanley D. Griggs, 37, Civilian
Portland, Oregon; - HS: Portland, Oregon
CC52/Johnson Space Center, Houston, TX

Major James G. Hart, 35, USMC
Minneapolis, Minnesota; - HS: Faribault, Minnesota
Air Test & Evaluation Squadron 5, Naval Air Facility, China Lake, CA

Lt. Cmdr. William B. Hayden, 32, USN
Oakland, California; - HS: Rockville, Maryland
Fighter Squadron 14, Naval Air Station Oceana, Virginia Beach, VA

Lt. David T. Hunter, 29, USN
Tacoma Park, Maryland; - HS: Marietta, Georgia
Strike Aircraft Test Directorate, Naval Air Test Center, Code SY90 Patuxent River, MD

Major Jack M. Jannarone, 34, USAF
Ft. Gordon, Georgia; - HS: Highland Falls, New York
6512th Test Squadron/DOTF, Fighter Branch, Edwards AFB, CA

-more-

Major Don E. Kenne, 35, USAF
Baltimore, Maryland; - HS: Dayton, Ohio
475th Test Squadron, Air Defense Weapons Center, Tyndall AFB, FL

Capt. Kerry E. Killebrew, 30, USAF
Murray, Kentucky; - HS: Memphis, Tennessee
6512th Test Squadron/DOTF, Fighter Branch, Edwards AFB, CA

Major James R. Klein, 35, USAF
Dubuque, Iowa; - HS: Cedar Rapids, Iowa
USAF Test Pilot School, Edwards AFB, CA

Lt. Joseph F. Lucey, 31, USN
Minneapolis, Minnesota; - HS: Minneapolis, Minnesota
Strike Aircraft Test Directorate Fighter Branch, Naval Air Test Center, Patuxent River, MD

Lt. Cmdr. John M. Luecke, 33, USN
Macomb, Illinois; - HS: Freeport, Illinois
Box 84, COM NAV ACTS UK, FPO New York

Lt. Cmdr. Jon A. McBride, 33, USN
Charlestown, West Virginia; - HS: Beckley, West Virginia
Air Test & Evaluation Squadron 4, Point Mugu, CA

Lt. Cmdr. Charles R. McRae, 33, USN
Miami, Florida; - HS: Miami, Florida
Strike Aircraft Test Directorate, Naval Air Test Center Patuxent River, MD

Capt. Michael D. Marks, 34, USAF
Salt Lake City, Utah; - HS: Hazelwood, Missouri
Air Force Flight Test Center/DOVA, Edwards AFB, CA

Capt. Marvin L. Martin, 30, USAF
Nevada, Missouri; - HS: Nevada, Missouri
USAF Test Pilot School, Edwards AFB, CA

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-45

For Release:

August 9, 1977
3:00 p.m. CDT

LOCKHEED AWARDED CONTRACT FOR TECHNICAL SUPPORT SERVICES

Lockheed Electronics Company, Inc., 16811 El Camino Real, Houston, Texas 77058, has been awarded a contract for technical support services for the Earth Resources Laboratory at the Slidell Computer Complex, Slidell, Louisiana.

Lockheed will furnish all personnel, including management and staff, necessary to support operation and maintenance of four laboratories: Data Acquisition Laboratory, Data Systems Laboratory, Data Processing Laboratory, and Data Preparation Laboratory.

The contract is a cost-plus-award-fee type contract and is awarded for a 24-month period beginning August 1, 1977, and ending July 31, 1979. The contractor will employ approximately 80 persons, and the estimated amount of the contract is $4,004,715.

###

NASA News

National Aeronautics and
Space Administration

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

Milton Reim

For Release:
August 25, 1977
1:00 pm CDT

RELEASE NO: 77-46

THIRD GROUP OF 20 ASTRONAUT APPLICANTS INCLUDES EIGHT WOMEN

The third group of 20 Space Shuttle astronaut applicants selected for individual interviews and physical examinations are all in the Mission Specialist category. They will report to the Johnson Space Center, Monday, August 29, and be here one week.

Eight of the 20 astronaut applicants in this group are women. All 20 in this group have PHD or medical degrees or both, and one has a degree in veterinary medicine.

Approximately 200 of the 8,079 who applied for the astronaut program will be coming to JSC for further screening. The selection process is scheduled to be completed in mid-November.

The astronaut candidates selected for the two-year evaluation period before final selection as an astronaut will be notified in December. As many as 20 astronaut candidates will be named in each of the two categories --- pilot and mission specialist.

The names, sex; male (M), female (F), age, military rank and or degree(s), place of birth, high school (HS) and current duty station of this third group of 20 applicants selected for further screening are:

-more-

James P. Bagian, (M), 25, MD
Philadelphia, PA; HS: Philadelphia, PA
Naval Air Test Center, Patuxent River, MD.

Stephen C. Boone,(M), 39, MD, PHD
Navasota, TX; HS: Bellaire, TX
Walter Reed Army Medical Center, Washington D.C.

Nitza M. Cintron, (F), 27, PHD
San Juan, P.R.; HS: Santuree, P.R.
Johns Hopkins University School of Medicine, Baltimore, MD

Mark S. Davis, (M), 33, Lt. USN, MD
Philadelphia, PA; HS: Philadelphia, PA
Naval Regional Medical Center, Oakland, CA

Danielle J. Goldwater, (F), 29, MD
West Haven, CT; HS: New Haven, CT
Stanford Hospital, Stanford University, CA

Lionel O. Greene, Jr. (M), 29, PHD
Brooklyn, N.Y.; HS: Los Angeles, CA
NASA Ames Research Center,Moffett Field, CA

Dale A. Harris, (M), 31, PHD
Amarillo, TX; HS: Amarillo, TX
Letterman Army Institute of Research, Presidio of San Francisco, CA

James R. Hickman, (M), 35, Lt. Col. USAF, MD
Elkhorn City, KY; HS: Huntington, W. VA
USAF School of Aerospace Medicine, Brooks AFB, TX

Michael P. Hlastala, (M), 33, PHD
Uniontown, PA; HS: Seattle, WA
University of Washington, Seattle, WA

Harry P. Hoffman,(M), 34, Lt. Cmdr. USN, MD
New Bern, N.C.; HS: Bloomsburg, PA
Air Test and Evaluation Squadron 4, NAS Pt. Mugu, CA

Bruce A Houtchens, (M), 39, MD
Olympia, WA; HS: Seattle, WA
University of Utah, Salt Lake City, Utah

Michael D. Kastello, (M), 32, Capt. US Army, PHD, DVM
LaSalle, IL; HS: LaSalle, IL
US Army Medical Institute of Infectious Disease, Fredrick, MD

-more-

Wayne F. Kendall, (M), 39, Major USAF, MD
Harrison, ARK; HS: Harrison, ARK
Wright-Patterson Aerospace Medical Research Laboratory, OH

Shannon W. Lucid, (F), 34, PHD
Shanghai, China; HS: Bethany, OK
Oklahoma Medical Research Foundation, Oklahoma City, OK

B. Tracey Sauerland, (F), 29, MD, PHD
New Britain, CT; HS: New Britain, CT
JSC Space and Life Sciences Directorate, Houston, TX

Margaret R. Seddon (F), 29, MD
Murfreesboro, TN; HS: Murfreesboro, TN
City of Memphis Hospital, Memphis, TN

Anna L. Sims, (F), 28, MD
Albany, N.Y.; HS: San Pedro, CA
Harbor General Hospital, Torrance, CA

Stephen C. Textor, (M), 29, MD
Denver, Colorado; HS: Anoka, Minn.
Boston University Hospital, Boston, MA

Victoria M. Voge, (F), 34, Lt. Cmdr. USN, MD
Minneapolis, Minn.; HS: New Brighton, Minn.
Naval Aerospace Medical Institute, Pensacola, FLA

Millie H. Wiley, (F), 31, PHD
Mineral Wells, TX; HS: Mineral Wells, TX
Veterans Administration Hospital, San Francisco, CA

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-47

For Release:

Upon Receipt

LUNAR SCIENCE STATIONS TO CEASE FUNCTIONING SEPTEMBER 30

On September 30, against the backdrop of a waning moon, science instruments on the lunar surface will be turned off and the ALSEP (Apollo Lunar Surface Experiments Package) control center at NASA's Johnson Space Center, Houston, will be dismantled.

The Apollo lunar science stations will be shut down because of dwindling power reserves at the stations and budgetary limitations here on Earth.

Since July 20, 1969, scientists on Earth have been receiving a continuous stream of information about the Moon, from the Moon. For the past eight years much of what has been learned about the Moon has been sent by the five ALSEP's left on the Moon's surface by the Apollo explorers.

There are five operating stations, one each for Apollo missions 12, 14, 15, 16 and 17. The Apollo 11 crew placed a prototype station on the Moon in July 1969. That first station, with a design life of only 14 days, lasted 45 days and quit due to power supply failure. The remaining five Apollo stations have been nothing short of tenacious. Specifications called for a one-year operating life for the first four ALSEP's and two years for the Apollo 17 station. Apollo 12

- more -

ALSEP is now well into its eighth year and Apollo 17 ALSEP its fifth year. Over 153,000 commands have been transmitted from Earth and executed by the moon stations. More than one trillion (10^{12}) bits of lunar science and engineering data have been received on Earth. The total accumulated operating time for all ALSEP stations exceeds 29 years, this for equipment designed for a cumulative total of only six years. The extended life is attributed to the high reliability required for the first year's operation.

The stations were built to provide long-term lunar surface geophysical and electrical data. The surface experiments included measuring the heat produced by the Moon's interior, the kind and amount of charged particles in the Moon's tenuous ion atmosphere, measuring the magnetic environment, and most importantly of all, measuring and providing seismic data on moonquakes and meteroid impacts. Because of the extended life of the ALSEP stations, earth scientists received a real bonus from the science stations, rather than only one or two seismometers operating at any given time, all four seismometers (one each on Apollo 12, 14, 15 and 16) have been operating as a seismic network for the past five years. This network has greatly enhanced the analyses of the few large events which occur each year.

It is the seismic experiments which have intrigued scientists. For eight years seismologists have been awaiting a large meteoroid impact on the Moon's far side. With the information from such an event scientists might finally have been able to answer one of the Moon's most perplexing questions: "What is the deep interior of the Moon like and does the Moon have a molten core?"

At the end of this fiscal year the ALSEP stations will be left on their own, all but their transmitters muted. Funding for the technical and scientific support needed to maintain the stations will cease on September 30. The timing is perhaps appropriate, for every day the small radioactive thermoelectric generators which power the stations decay a little more. When next year rolls around there are good odds that at least one of the stations will have so little power only the transmitters could function anyway.

The past eight years have been a time of tremendous increase in the knowledge and understanding about the Moon. The returned lunar samples have played an essential part in this knowledge explosion, but for some aspects of the Moon, only the ALSEP's could have helped. The ALSEP seismic information, magnetometer and heat flow experiments have contributed the principal information about the Moon's interior. It is now believed the Moon's crust is multi-layered and from 60 to 100 km thick with the secondary boundary occuring about 20 km deep. The lunar upper mantle has been determined to be fairly homogeneous and to extend to about 500 km. It is believed to consist of olivine or olivine-pyroxene matter, although other compositions also have been proposed. From 500 km deeper the seismic data indicate the Moon may be iron-enriched, although there is insufficient data to determine whether or not the Moon has a small or molten core.

Moonquakes have been discovered to show periodicity and to recur at several places in the interior. The mechanism for this has been

- more -

hypothesized as release of tidal stress in the region between 1100 and 1500km depth and may occur along possible previously existing faults or local inhomogeneities at depth. The time cycle of the deep-focus moonquakes follows the tidal cycles so closely it appears likely that tidal forces are a major factor in triggering deep-focus moonquakes.

Charged-particle, supra-thermal ion and solar wind experiments have also provided the principal data for a new understanding of the Earth's magnetosphere and the interaction of the magnetosphere with the solar wind. Ion measurements also detected a lunar surface electric potential of about +10 volts in daylight and about -100 (to periodically -250) volts in night. These experiments also provided new information concerning the electrostatic lines of force associated with the transition of the terminator across the lunar surface. The phenomenon is thought to be the result of a cloud of hot solar wind electrons near the terminator (the cloud presumably generated by the limb shock of the solar wind).Extensive lunar soil sputtering resulting from solar wind impingement was also measured by the ALSEP's and further augmented by sample analysis on Earth.

Other questions about the Moon which have not been answered by the Apollo program and the years of subsequent study include where the Moon originated and whether or not there is recoverable water on the planet.

Even though the experiments will be terminated, the transmitters will continue to serve Earth as a reference point in astronomy. The Jet Propulsion Laboratory will continue to use the signals from the

ALSEP transmitters to assist in the Lab's deep space work including geodetic and astrometric studies and spacecraft navigation. Also, the motion of the lunar orbit will be accurately monitored against a background of extra-galactic stars to test gravitational theories.

During the past eight years many of the instruments associated with each ALSEP station have experienced engineering problems. Since July, this year, engineers at JSC have been performing more than their usual maintenance and engineering functions on the ALSEP stations. In preparation for the Sept. first shutdown, the ALSEP stations have been put through a slightly different routine to extract the last ounce of engineering data possible. There are few engineering mysteries still puzzling the JSC team but each station, over the years, has developed a personality and a final understanding of that personality will assist in the design of similar stations. The Moon and Mars are the only planets now equipped with remote sensors, but it is expected that other planets will have them too and a thorough understanding of the harsh environment involved and the effects of time will enhance further the reliability of these devices.

One station in particular, the Apollo 14 ALSEP, has a rather dramatic history of engineering problems. The ALSEP 14 station started working correctly and continued this for four years, then it quit for two days in March 1975, and started up again; then it quit again; then it started up again. This "on-again, off-again" performance was repeated six times in the last two years. The problem has been diagnosed as an intermittent short circuit in one of two power conditioning units.

- more -

The short seems related to the temperature of the unit, in turn related to the position of the Sun over the lunar landscape. It is problems like this, however, that need to be fully understood to insure the proper performance of future generations of remote science stations.

Over the years the ALSEP program has cost $200 million, including the design and development of the stations themselves, the support engineering work in Houston and the science analysis work performed in dozens of university labs throughout the world. The stations have been costing about $2 million a year to operate. The program has involved hundreds of engineers and scientists and has produced a tremendous source-bank of information about the Moon, both as a planet and as an object wading through the electric and magnetic environment of the Earth and Sun.

###

September 1, 1977

Note

Bendix Aerospace, Ann Arbor, Michigan, was prime contractor for the ALSEP equipment and provided technical support for the JSC control operations.

General Electric furnished the radioisotope thermoelectric generators which provided electric power.

NASA JSC provided project management, operations control and integration; and NASA Goddard provided tracking and communications with the stations.

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:

RELEASE NO: 77-48

Upon Receipt

ALSO RELEASED AT NASA HEADQUARTERS

FIRST SHUTTLE PAYLOAD TO INVESTIGATE EARTH RESOURCES

The first payload to be carried into space by the Space Shuttle will carry out investigations in Earth resources, environmental quality and severe storm research in 1979.

The payload, under management of the NASA Office of Applications, and the Johnson Space Center Space and Life Sciences Directorate, and Earth Resources Program Office, will be on the second Orbital Flight Test (OFT-2) scheduled for launch from the Kennedy Space Center, Florida. Space Shuttle Orbiter 102, sister ship to the "Enterprise" now undergoing Approach and Landing Tests at NASA's Dryden Flight Research Center, California, will make the first several Shuttle space flights.

The Orbital Flight Test program is a series of six developmental missions in 1979 and 1980 leading up to operational readiness of the Space Shuttle in May 1980.

- more -

Objective of the OFT missions is to evaluate the performance of the Space Shuttle and its systems and to provide early demonstrations of the Shuttle's capability to do what it is designed to do in space.

The first orbital Shuttle mission (OFT-1) will carry instrumentation to evaluate its performance and also will carry a special package called the Induced Environment Contamination Monitor (IECM) to measure the effects of the Shuttle on the space immediately around it. The IECM will be carried on all six Orbital Flight Test missions.

The payload carried on the second Shuttle flight, like the Shuttle Orbiter itself, is reusable. This will permit adjustment and modification of the payload instruments and other hardware to allow its use on subsequent flights at relatively low cost.

The first Shuttle payload investigations and the principal investigators as currently assigned are:

- All-Weather Surface Observation Investigation

  Principal Investigator - Dr. Charles Elachi,
  NASA Jet Propulsion Laboratory, Pasadena, California

For several years NASA research spacecraft have acquired data about Earth resources using space sensors that see in the visible and near infrared portions of the electromagnetic spectrum. This investigation will extend these observations into the microwave portion of the spectrum.

Using an active microwave system (radar), this investigation will add a valuable new demension to the earlier data and also allow observations through cloud cover. This information will be particularly important to mineral exploration and to areas where clouds are present a high percentage of the time. This investigation is also the start of a program to determine the optimum design for active microwave sensors.

- Measurement of Air Pollution from Satellites
  Principal Investigator - Dr. Henry H. Reichle, Jr., NASA Langley Research Center, Hampton, Virginia

This investigation will measure the amount and circulation of carbon monoxide in the middle and upper troposphere. This will be the first measurement from space of pollutants in the lower atmospheric levels. As such, this investigation is an important step toward measuring and monitoring global pollution where it most directly affects people and communities on Earth.

- Shuttle Multispectral Infrared Radiometer
  Principal Investigator - Dr. Alexander F. H. Goetz, NASA Jet Propulsion Laboratory

This investigation will use a special instrument to provide for testing of various combinations of spectral bands and bandwidths in the near-infrared portion of the spectrum. This allows continued research to optimize infrared sensor systems for future Earth resources satellites. On the OFT-2 mission, this instrument will test spectral bands not now used by the Landsat Earth resources satellite but which appear to have important applications to mineral and oil and gas exploration.

- Ocean Color Experiment
  Principal Investigator - Mr. Hongsuk H. Kim, NASA Goddard Space Flight Center, Greenbelt, Maryland

The bioproductivity of the oceans is an important indicator of the biological health of our planet and the impact of man's activities. It is also of direct interest to commercial fisheries for locating and evaluating fishing areas. This investigation will attempt to get bioproductivity data by measuring variations in water color in the open oceans. These variations are expected to identify concentrations of chlorophyll as an indicator of the presence of plankton and algae. Such concentrations are feeding ground for many commercially sought fish.

- Nighttime and Daytime Optical Survey of Thunderstorm Lightning and Convective Behavior
  Principal Investigator - Dr. Bernard Vonnegut, State University of New York at Albany

This investigation will examine the correlation between lightning and various types of severe storms. A standard 16mm movie camera will be used, equipped with a photocell attachment that records lightning flashes as signals on the sound track of the film. This is expected to reveal details of convective circulation in storms and their relationship to the character, location and extent of associated lightning discharges. It is hoped that this data will lead to the development of satellite systems that can identify severe storms day or night.

Payload hardware and science and technical integration and mission support are estimated at approximately $10 million.

###

September 8, 1977

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon

For Release:

RELEASE NO: 77-48

Sept. 2, 1977

NOTE TO EDITORS

The second Free Flight of Orbiter Enterprise has been rescheduled for no earlier than September 13 at the NASA Dryden Flight Research Center, Edwards, California. Change-outs, updates and testing of the Orbiter's five onboard computers since the initial Free Flight on August 12 has taken longer than anticipated. One computer of the redundant set of four computers failed after separation of the Orbiter from its 747 carrier aircraft. The failure has been isolated and identified as a single defective solder joint in one of the computer's printed circuit boards (PCB). The PCB has been replaced. Other PCB's will be replaced in another onboard computer as a precautionary measure. Work is anticipated to be completed in time for the new flight date of September 13.

###

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon
Johnson Space Center, Houston, Texas
(Phone: 713 483-5111)

David Garrett
Headquarters, Washington, D.C.
(Phone: 202 755-3090)

Ralph B. Jackson
Dryden Flight Research Center, Edwards, California
(Phone: 805 258-8311)

For Release:

Upon Receipt

RELEASE NO: 77-49

SECOND SHUTTLE ORBITER FREE FLIGHT SET FOR SEPTEMBER 13

The second Free Flight of the Shuttle Approach and Landing Test, with astronauts Joe Engle and Richard Truly at the controls of Orbiter Enterprise is scheduled for no earlier than September 13, 1977, at the NASA Dryden Flight Research Center, Edwards, California.

This flight which closely duplicates the initial Free Flight on August 12, calls for the 75-ton (68,040 kg) Orbiter to be released from atop its 747 carrier aircraft for an unpowered landing on the dry lakebed runway, number 15 at the Edwards Air Force Base. Engle and Truly are scheduled for about a five-minute Free Flight from the time explosive bolts separate the Orbiter from the 747 at about 24,000 feet (7315 m) until the craft sets down on the desert runway.

- more -

Engle, 43, (Colonel USAF), NASA astronaut since 1966, and Truly, 38, (Commander USN), were aboard the Enterprise on June 28, 1977, for a 62-minute captive flight during which they performed flight and systems checks while the Orbiter remained firmly attached to the 747. Truly has been a NASA astronaut since 1969.

This second solo flight follows a series of unmanned and manned captive flights which began at the Dryden in mid-February. Three more Free Flights (after FF2) for the Orbiter are planned in the Approach and Landing Test series before the Orbiter is ferried to the NASA Marshall Space Flight Center, Huntsville, Alabama, for vibration testing early in 1978.

Takeoff time for the second flight is set for 8 a.m. PDT with separation of the two vehicles about 45 minutes after takeoff. The combined weight of the vehicles is 585,000 lbs. (265,350 kg).

The second solo flight will generally follow this pattern:

The flight path of the Orbiter and 747 follows a racetrack pattern with separation occuring when the vehicles are about 8 miles (13 kilometers) to the right and flying parallel to the landing runway (#15).

At this point of separation the 747 will be pitched down to a minus 6 degrees and accelerate to approximately 270 knots (500 kmh, 310.7 mph) equivalent air speed (KEAS). The Orbiter pilot will initiate separation by arming and firing a series of explosive bolts (seven) at an altitude of about 24,000 ft. (7315 meters) above runway level.

Immediately after separation the Orbiter crew will command a pitch up maneuver which will provide a vertical separation of more than 200 ft. (60 meters) in about five seconds. While the 747 turns left, the Orbiter will be commanded to a right turn to provide horizontal separation of the two vehicles.

About 1 minute and 15 seconds after separation and when the Orbiter is about 18,000 ft (5486 meters), the crew will command a 55 degree left roll generating a 1.8-g load turn on the Orbiter. One minute later, when the Orbiter has descended to an altitude of about 14,000 ft. (4267 meters), a second left roll of about 10 degrees is performed. This lines the vehicle up to its final approach to the lakebed runway.

At an altitude of 900 ft. (274 meters) the crew commands a change in the vehicle's attitude bringing it from a -9 degree glide slope to a -1.5 degree slope. The landing gear is then deployed, between 200 and 300 ft. (60-90 meters) altitude and landing flare is initiated which establishes a sink rate of approximately 3 ft. (1.m) per second which is held until touchdown. Airspeed at touchdown is expected to approximate the 185 knots (212.9 mph, 342.6 kmh) touchdown speed of the first Free Flight.

Elapsed time from Orbiter separation to touchdown is 5 minutes and 01 seconds. During rollout various braking and steering methods will be evaluated at different speeds.

Astronauts Fred W. Haise and C. Gordon Fullerton, who comprised the crew during the August 12 Free Flight, are tentatively scheduled to pilot the Enterprise during the third Free Flight about two to three weeks later.

###

ALT FREE FLIGHT TIMELINE

Event	Altitude**	T-Time*	PDT a.m.	EDT
Crew Wakeup		T-240	4:00	7:00
Crew Depart Quarters		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup Trailer		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover		T-67	6:53	9:53
Orbiter/SCA Move From MDD***		T-62	6:58	9:58
Orbiter/SCA Tow to NASA Ramp		T-56	7:04	10:04
SCA Engine Start		T-42	7:18	10:18
SCA Begin Taxi		T-32	7:28	10:28
SCA Arrive Runway		T-12	7:48	10:48
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff Climbout		T-0	8:00	11:00
		T+00		
Intersect Racetrack	16,400	T+12	8:12	11:12
FCS Checks***	22,000	T+22	8:22	11:22
Reach Maximum Climb Thrust	24,100	T+28	8:28	11:28
SCA Begin SRT Climb***	24,100	T+31	8:31	11:31
Pushover	26,500	T+45	8:45	11:45
		Separation Point		
Orbiter Separation	23,200	0:00	8:46	11:46
Roll Right	22,900	0:03	8:46:03	11:46:03
Roll Left 55°	15,600	1:16	8:47:16	11:47:16
Roll Left	12,000	2:35	8:48:35	11:48:35
Initiate Preflare	900	4:24	8:50:24	11:50:24
Deploy Gear	200	4:43	8:50:43	11:50:43
Touchdown		5:01	8:51:01	11:51:01

Note

* Events and times are preliminary and may change prior to and during flight and are dependent upon atmospheric and flight conditions.

** Altitudes are Above Ground Level (AGL) and are referenced to Orbiter ground aim point on the runway. Add 2,300 feet to AGL to obtain altitude above Mean Sea Level (MSL).

*** SCA - Shuttle Carrier Aircraft
MDD - Mate-Demate Device
FCS - Flight Control System (or Forward Crew Station)
SRT - Special Rated Thrust

ALT Free Flight 1

August 12, 1977

Actual Times/Altitudes Timeline

Event	PDT	Altitude, AGL	Speed, kts
SCA/Orbiter brake release, takeoff	8:00:00		
Intersect racetrack	8:15:30	19,500	
Flight control systems check	8:22:14	22,500	
Begin special-rated thrust	8:36:43	26,200	
Pushover for Orbiter separation	8:47:40	28,000	
Orbiter separation	8:48:29	24,000	270
Orbiter landing	8:53:51	0	185

Total Orbiter Free Flight time: 5 min 22 sec; Average rate of sink 4615 fpm; Touchdown was about .75 mile long (beyond predicted TD point); Touchdown-to-stop rollout approximately 11,000 feet.

MATED PROFILE FREE FLIGHT 2 - RWY 15

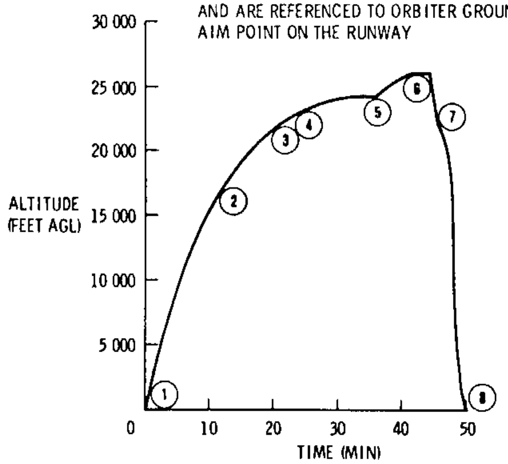
FLIGHT SEQUENCE

ITEM	TIME (MIN)	ALTITUDE (FEET AGL)	RANGE (NM)	EVENT
1	0	0	0	SCA TAKEOFF
2	12	16 400	8	INTERSECT RACETRACK
3	22	22 000	32	IN-FLIGHT FCS CHECKS
4	28	24 100	14	REACH MCT 200 FPM CEILING
5	35	24 100	31	SCA BEGIN SRT
6	45	26 500	9	SCA PUSHOVER
7	46	23 200	7	SCA ORBITER SEPARATION
8	51	0	0	ORBITER TOUCHDOWN

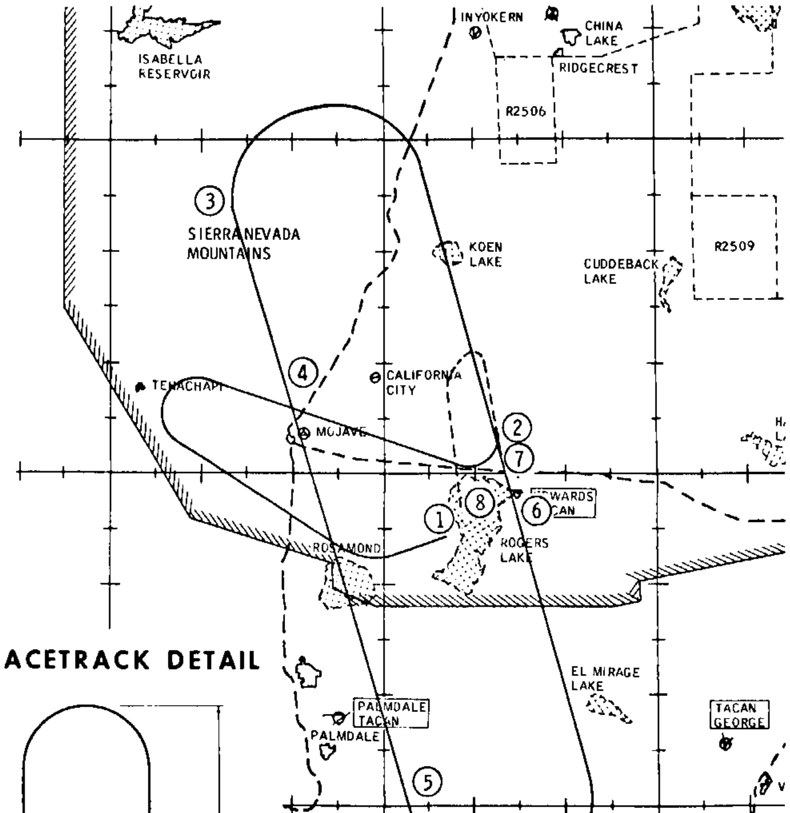
NOTE: THERE IS ONLY 1 FULL GO AROUND FOR FREE FLIGHT 2. IF THE ORBITER DOES NOT SEPARATE ON THE FIRST ATTEMPT, THE FLIGHT WILL BE TERMINATED.

ALTITUDE PROFILE

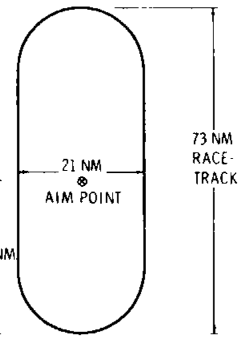
NOTE: ALTITUDES ARE ABOVE GROUND LEVEL (AGL) AND ARE REFERENCED TO ORBITER GROUND AIM POINT ON THE RUNWAY



GROUNDTRACK



RACETRACK DETAIL



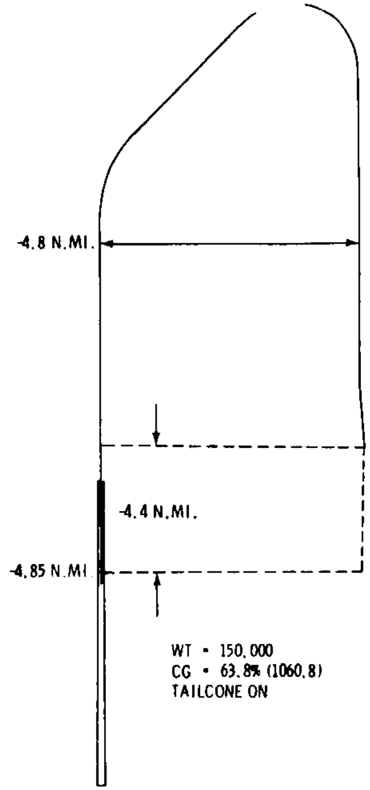
A

DATE 08/26/77

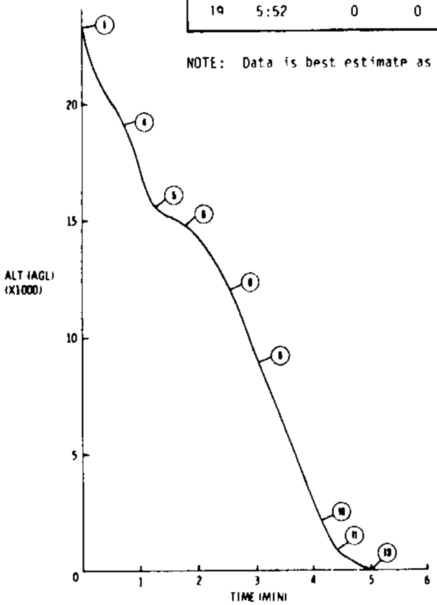
ALT FREE FLIGHT 2 - RWY 15

ITEM	TIME	ALT(AGL)	KEAS	α	θ	ACTION
1	0:00	23200	270	9	.5	SEP; $\dot{\theta}$ = 2 deg/sec, 3 sec; $\dot{\theta}$ = 0
2	0:03	22900	255	5	6	ROLL RIGHT Φ = 20 deg; AT 'CHASE TWO CLEAR,' $\dot{\theta}$ = -1 deg/sec to θ = -10 deg, ROLL TO ψ = 332 deg
3	0:38	19800	285	5	-10	$\dot{\theta}$ = 2 deg/sec to θ = -5 deg TO HOLD AS = 290
4	0:40	19200	290	5	-5	PTIS; STICK INPUTS
5	1:16	15600	290	5	-4.5	$\dot{\theta}$ = 1 deg/sec TO θ = 3; ROLL LEFT 55 deg; HOLD N_Z = 1.8g, TURN TO ψ = 197 deg
6	1:50	14800	200	9	8	Φ = 0; $\dot{\theta}$ = -1 deg/sec TO θ = 2 HOLD AS = 200
7	2:00	14600	200	9	3	STICK INPUTS; PTIS
8	2:35	12000	200	9	2	ROLL LEFT Φ = 30 deg; $\dot{\theta}$ = -1 deg/sec TO θ = -10 deg, TURN TO ψ = 152 deg
9	3:06	8700	270	5	-10	$\dot{\theta}$ = 1 deg/sec TO θ = -7 deg; SB = 50% HOLD AS = 270; STICK INPUTS
10	4:11	2000	270	5	-7	SB→CLOSE
11	4:24	900	270	5	-5	INITIATE PREFLARE
12	4:43	200	250	5.5	5	AT AS = 250, DEPLOY GEAR
13	5:01	0	185	9	9	T.D. AS < 220; $\dot{h}$ < 10 fps
14	5:11	0	130	--	--	STEER WITH AILERON
15	5:15	0	115	--	--	HARD BRAKING
16	5:20	0	100	--	--	GENTLE TO MODERATE DIFFERENTIAL BRAKING
17	5:30	0	60	--	--	HARD BRAKING
18	5:42	0	20	--	--	GENTLE TO MODERATE BRAKING
19	5:52	0	0	--	--	ORBITER STOP

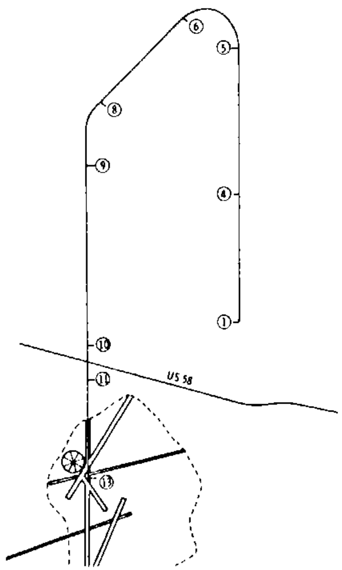
NOTE: Data is best estimate as of 8/24/77 and is subject to minor variation on or near launch date.



WT = 150,000
CG = 63.8% (1060.8)
TAILCONE ON



B



DATE 08/26/77
NASA-JSC

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:
September 13, 1977
2:00 p.m. CDT

RELEASE NO: 77-50

ALSO RELEASED AT NASA HEADQUARTERS

JSC EXTENDS LOCKHEED CONTRACT FOR COMPUTER SERVICES

The NASA Johnson Space Center has extended the contract with Lockheed Electronics Company, Inc., for engineering, scientific and Computing Center support services for the Houston center. The contract covers management, facilities and materials for general electronic and scientific support services for the JSC Engineering and Development, Space and Life Sciences, and Data Systems and Analysis Directorates.

Lockheed will employ approximately 1800 people under terms of the cost-plus-award-fee contract. Valued at an estimated $41,056,000, the contract period is from September 1, 1977 to February 28, 1978, with an option to extend to May 31, 1978.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-51

NOTE TO EDITORS

For Release:

Upon Receipt

JSC TO GET SATURN V FIRST STAGE DISPLAY

A 144-ton first stage of the Saturn V launch vehicle, used for boosting Apollo missions to the Moon and for placing the Skylab space station into orbit, will arrive at the Johnson Space Center Monday for permanent display.

The S-IC stage will leave the Michoud Assembly Facility aboard the NASA Barge Little Lake at 5 a.m. CDT Friday and will arrive at the JSC dock on Clear Lake at 1 p.m. Monday. Movement of the 33 by 138-foot stage from the dock to its exhibit location near the Center's Antenna Test Range will be made at 1 a.m. Wednesday morning when NASA Road 1 traffic is at a minimum.

JSC will eventually add the S-II and S-IVB upper stages and an Apollo spacecraft to the permanent exhibit.

###

September 14, 1977

NASA News

National Aeronautics and
Space Administration

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

Milt Reim

For Release:

RELEASE NO: 77-52

September 15, 1977
1 p.m. CDT

FOURTH GROUP OF 20 ASTRONAUT APPLICANTS REPORT TO JSC SEPTEMBER 19

The fourth group of Space Shuttle astronaut applicants will report to the Johnson Space Center Monday, September 19 for a week of physical examinations and individual interviews. All are pilots in this group, 19 military and one civilian.

Services represented are U.S. Air Force, 12; U.S. Navy, four; and the U.S. Marine Corps, three. This is the third group of pilots selected for screening at JSC.

Of the 8,079 who applied for the astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. The final group is scheduled to report in mid-November.

Notification of selection of as many as 20 astronaut candidates in each of the two categories will be made in December. The pilot and mission specialist candidates selected will report at a later date to JSC for a two-year evaluation and training period before their final selection as astronauts.

The names, age, military rank, place of birth, high school (HS) and current duty station of each of the pilots in this fourth group of 20 astronaut applicants are:

- more -

Frederick H. Hauck, 36; Commander USN
Long Beach, California; (HS) Washington, D.C.
Naval Air Station, Whidbey Island, Washington

Ralph J. Luczak, 31; Captain USAF
St. Louis, Missouri; (HS) Clayton, Missouri
USAF 4950th Test Wing, Wright Patterson AFB, Ohio

Donald L. Marx, 35; Major USAF
Gary, Indiana; (HS) Merrillville, Indiana
Air Command & Staff College, Maxwell AFB, Alabama

Edward D. Mendenhall, 41; civilian
Orange, New Jersey; (HS) Summit, New Jersey
NASA Johnson Space Center, Aircraft Operations, Houston, Texas

Edward T. Meschko, 33; Major USAF
Trenton, New Jersey; (HS) Owensboro, Kentucky
USAF Flight Test Center, Edwards AFB, California

Alfred P. Metz, 31; Captain USAF
Springfield, Ohio; (HS) Springfield, Ohio
USAF Flight Test Center, Edwards AFB, California

David W. Milam, 37; Major USAF
Tucson, Arizona; (HS) Pueblo, Colorado
USAF Test Pilot School, Edwards, AFB, California

Stephen J. Monagan, 33; Captain USAF
Waterbury, Connecticut; (HS) Waterbury, Connecticut
3246th Test Wing, Eglin AFB, Florida

Roger A. Moseley, 31; Major USAF
St. George, Utah; (HS) Lawton, Oklahoma
3246th Test Wing, Eglin AFB, Florida

Steven R. Nagel, 30; Captain USAF
Canton, Illinois, (HS) Canton, Illinois
USAF Flight Test Center, Edwards AFB, California

Bryan D. O'Conner, 31; Captain USMC
Orange, California; (HS) Twentynine Palms, California
Naval Air Test Center, Patuxent River, Maryland

Alva E. Peet, Jr., 38; Major USMC
Jacksonville, Florida; (HS) Louisville, Kentucky
Naval Air Station, Pt. Mugu, California

- more -

Larry G. Pearson, 34; Lt. Commander USN
Redlands, California; (HS) San Antonio, Texas
Pacific Missile Test Center, Pt. Mugu, California

Gary L. Post, 37; Major USMC
Trilla, Illinois; (HS) Mattoon, Illinois
Naval War College, Newport, Rhode Island

Kenneth N. Rauch, 33; Lt. Commander USN
Syracuse, New York; (HS) Baldwinsville, New York
Student, Canadian Forces College, Toronto, Ontario, Canada

Richard N. Richards, 31; Lieutenant USN
Key West, Florida;(HS) St. Louis, Missouri
Naval Air Test Center, Patuxent River, Maryland

Francis R. Scobee, 38; Major USAF
Cle Elum, Washington; (HS) Auburn, Washington
USAF Flight Test Center, Edwards AFB, California

Brewster H. Shaw, Jr., 32; Captain USAF
Cass City, Michigan; (HS) Cass City, Michigan
USAF Test Pilot School, Edwards AFB, California

Loren J. Schriver, 32; Captain USAF
Jefferson, Iowa; (HS) Paton, Iowa
USAF Flight Test Center, Edwards AFB, California

Ivan J. Singleton, 38; Major USAF
Tulsa, Oklahoma; (HS) Tulsa, Oklahoma
USAF Flight Test Center, Edwards AFB, California

###

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon
Johnson Space Center, Houston, Texas
(Phone: 713 483-5111)

David Garrett
Headquarters, Washington, D.C.
(Phone: 202 755-3090)

Ralph B. Jackson
Dryden Flight Research Center, Edwards, California
(Phone: 805 258-8311)

For Release:

Upon Receipt

Release No: 77-53

Third Shuttle Orbiter Free Flight Set For September 23

The third Free Flight of Orbiter Enterprise, now scheduled for no earlier than September 23, 1977, at NASA's Dryden Flight Research Center, Edwards, California, includes a 65-second test of the spacecraft's automatic landing system during a five minute powerless descent to a dry lakebed runway in the Mojave Desert.

Astronauts Fred W. Haise and C. Gordon Fullerton will be at the controls of Enterprise when it is released from its 747-carrier aircraft at an altitude of 24,100 ft. (7345.7 m). Haise and Fullerton will fly the Orbiter, directing it through one tight 55 degree bank and guiding it to a landing on runway 17 at Edwards Air Force Base. This is the second Free Flight for Haise and Fullerton.

- more -

At about 8,400 ft. (2560.3 m) Haise will engage Enterprise autoland system which turns flight control over to the craft's onboard computers which are in turn linked to a microwave landing system providing informational direction as Enterprise makes its final approach for landing.

At 2,000 ft. (609.6 m) altitude and less than one-minute from touchdown the crew will disengage the autoland system, takeover, and guide the 75-ton craft to a landing.

This flight closely follows the flight pattern of the two previous Free Flights of August 12 and September 13. The familiar racetrack pattern will be followed by the 747/Orbiter until separation. After a series of explosive bolts are fired, the Orbiter makes a right roll in a separation maneuver from the 747.

The flight will look like this:

- Separation occurs at about 24,100 ft. (7345.7 m) altitude as Enterprise and the 747 combination are descending at a rate of 250 kts (463 km/h; 287.5 mph). Three seconds after the seven explosive bolts are fired, the Orbiter is commanded to a right roll for separation from the carrier aircraft.

- At 19,000 ft. (5791.2 m) and at a speed of 290 kts (537 km/h; 333.5 mph) the crew directs various flight control inputs to determine aeroflight characteristics of the Orbiter with the vehicle's center of gravity being slightly aft.

- One minute and 16 seconds after release and at an altitude of 15,300 ft. (4663.4 m) Haise will push Enterprise into a tight 55 degree left roll. This turn generates a 1.8 g load on the vehicle and crew and decreases the Orbiter's speed from 290 kts (537 km/h; 333.5 mph) to 200 kts (370.4 km/h; 230 mph).

- A second set of program test inputs are directed into the system by the crew to determine Enterprises' aeroflight characteristics at the reduced speed of 200 kts (370.4 km/h; 230 mph).

- The crew commands a final left roll at an altitude of 12,100 ft. (3688 m) for the final approach to landing. When Enterprise reaches 8,400 ft. (2560.3 m) altitude, Haise activates the automatic landing system. For tne next 65 seconds Haise and Fullerton, fly "hands off," as they monitor the descent of Enterprise to an altitude of 2,000 ft. (609.6 m). Haise disengages the autoland system and takes control of the Enterprise for its final approach and landing.

- Touchdown which is scheduled for 5:17 seconds after release is expected to be in the 185-194 kts (342.6-359.3 km/h; 212.7-223 mph) touchdown speed of the previous Free Flights. Gentle to moderate braking and nose gear wheel steering will be applied during rollout.

###

September 20, 1977

ALT FREE FLIGHT TIMELINE

Event	Altitude**	T-Time*	PDT a.m.	EDT
Crew Wakeup		T-240	4:00	7:00
Crew Depart Quarters		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup Trailer		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover		T-67	6:53	9:53
Orbiter/SCA Move From MDD***		T-62	6:58	9:58
Orbiter/SCA Tow to NASA Ramp		T-56	7:04	10:04
SCA Engine Start		T-42	7:18	10:18
SCA Begin Taxi		T-32	7:28	10:28
SCA Arrive Runway		T-12	7:48	10:48
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff Climbout		T-0	8:00	11:00
		T+00		
Intersect Racetrack	16,400	T+12	8:12	11:12
FCS Checks***	22,000	T+22	8:22	11:22
Reach Maximum Climb Thrust	24,100	T+28	8:28	11:28
SCA Begin SRT Climb***	24,100	T+31	8:31	11:31
Pushover	26,500	T+45	8:45	11:45
		Separation Point		
Orbiter Separation	24,100	0:00	8:46	11:46
Roll Right	24,000	0:03	8:46:03	11:46:03
Roll Left 55° (1.8G's)	15,300	1:16	8:47:16	11:47:16
Complete Turn (200 KTS)	14,300	1:55	8:47:55	11:47:55
Program Test Inputs (Low Speed)	13,800	2:11	8:48:11	11:48:11
Roll Left - Pitch -10°	12,100	2:46	8:48:46	11:48:46
Engage Autoland	8,400	3:17	8:49:17	11:49:17
Control Stick Steering (Pilot)	2,000	4:22	8:50:22	11:50:22
Initiate Preflare	900	4:40	8:50:40	11:50:40
Deploy Landing Gear	200	4:59	8:50:59	11:50:59
Touchdown (185 KTS)	0	5:17	8:51:17	11:51:17

Note

* Events and times are preliminary and may change prior to and during flight and are dependent upon atmospheric and flight conditions.

** Altitudes are Above Ground Level (AGL) and are referenced to Orbiter ground aim point on the runway. Add 2,300 feet to AGL to obtain altitude above Mean Sea Level (MSL).

*** SCA - Shuttle Carrier Aircraft
MDD - Mate-Demate Device
FCS - Flight Control System (or Forward Crew Station)
SRT - Special Rated Thrust

ALT Free Flight 1

August 12, 1977

Actual Times/Altitudes Timeline

Event	PDT	Altitude, AGL	Speed, kts
SCA/Orbiter brake release, takeoff	8:00:00		
Intersect racetrack	8:15:30	19,500	
Flight control systems check	8:22:14	22,500	
Begin special-rated thrust	8:36:43	26,200	
Pushover for Orbiter separation	8:47:40	28,000	
Orbiter separation	8:48:29	24,000	270
Orbiter landing	8:53:51	0	185

Total Orbiter Free Flight time: 5 min 22 sec; Average rate of sink 4615 fpm; Touchdown was about .75 mile long (beyond predicted TD point); Touchdown-to-stop rollout approximately 11,000 feet.

ALT Free Flight 2

September 13, 1977

Actual Times/Altitudes Timeline

Event	PDT	Altitude AGL
Takeoff	8:00	
Pushover	8:48:34	28,300
Separation	8:49:24	24,000
Main Gear	8:54:55	
Nose Gear	8:55:10	
Stop	8:56:10	

Highest Speed:	300 knots
Lowest Speed:	185 knots
Touchdown:	194 knots
Free Flight Total:	5 min, 31 sec

Touchdown 680 ft. past aim point

MATED PROFILE FREE FLIGHT 3

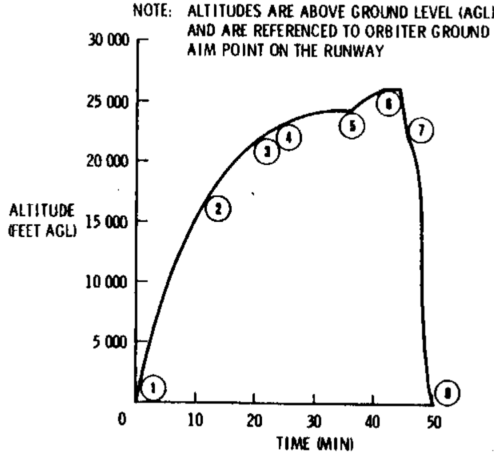
FLIGHT SEQUENCE

ITEM	TIME (MIN)	ALTITUDE (FEET AGL)	RANGE (NM)	EVENT
1	0	0	0	SCA TAKEOFF
2	12	16 400	8	INTERSECT RACETRACK
3	22	22 000	32	IN-FLIGHT FCS CHECKS
4	28	24 100	14	REACH MCT 200 FPM CEILING
5	35	24 100	31	SCA BEGIN SRT
6	45	26 500	9	SCA PUSHOVER
7	46	24 100	7	SCA ORBITER SEPARATION
8	51	0	0	ORBITER TOUCHDOWN

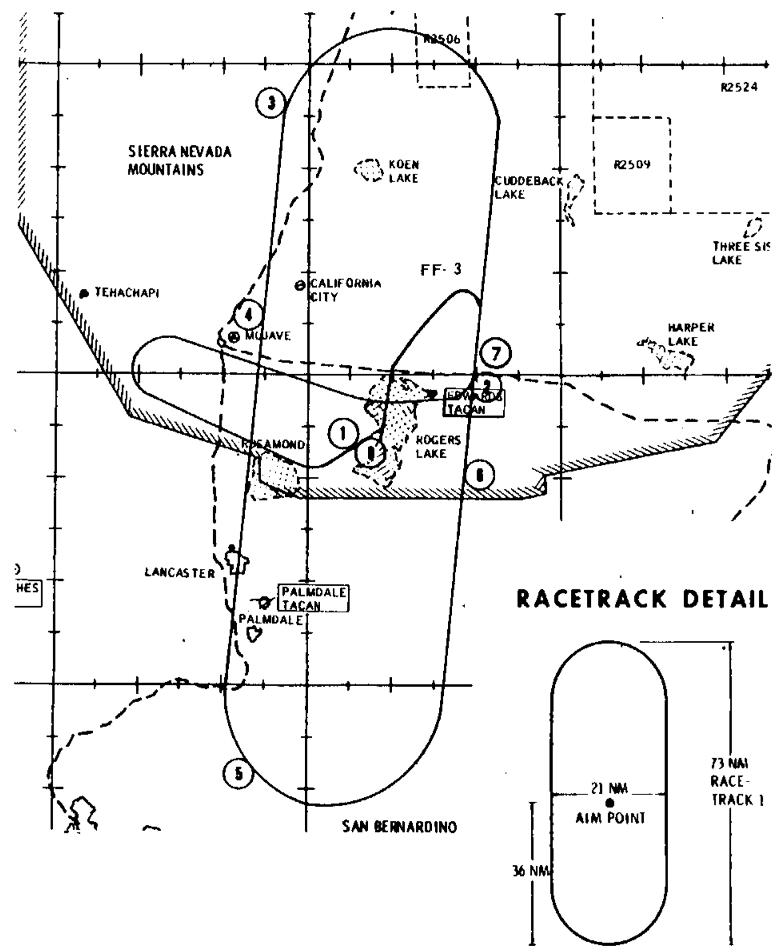
NOTE: THERE IS ONLY 1 FULL GO AROUND FOR FREE FLIGHT 3. IF THE ORBITER DOES NOT SEPARATE ON THE FIRST ATTEMPT, THE FLIGHT WILL BE TERMINATED.

ALTITUDE PROFILE

NOTE: ALTITUDES ARE ABOVE GROUND LEVEL (AGL) AND ARE REFERENCED TO ORBITER GROUND AIM POINT ON THE RUNWAY



GROUNDTRACK



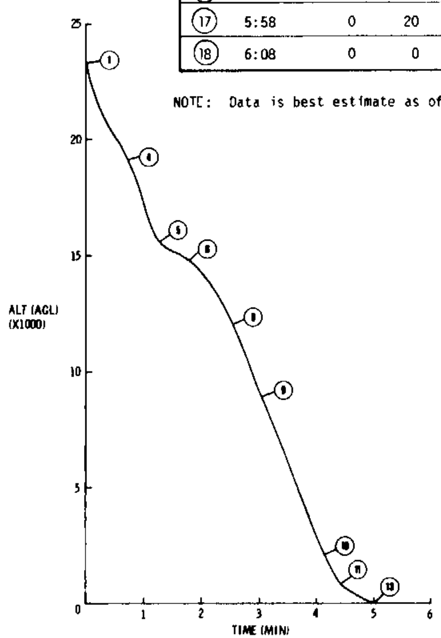
A

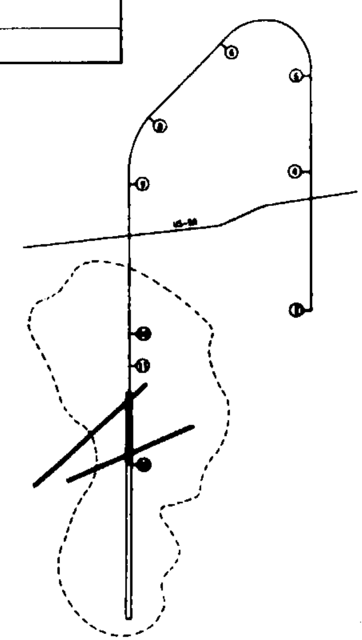
DATE 09/16/77

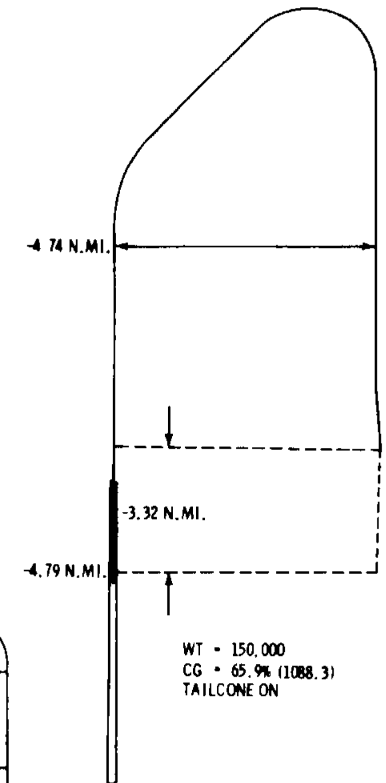
ALT FREE FLIGHT 3

ITEM	TIME	ALT(AGL)	KEAS	α	θ	ACTION
1	0:00	24 100	250	9	.5	SEP; $\dot{\theta}$ = 2 deg/sec, 3 sec; $\dot{\theta}$ = 0
2	0:03	24 000	245	5	6	ROLL RIGHT φ = 20 deg; AT 'CHASE TWO CLEAR,' $\dot{\theta}$ = -1 deg/sec to θ = -10 deg, ROLL TO ψ = 355 deg
3	0:41	19 500	285	5	-10	$\dot{\theta}$ = 2 deg/sec to θ = -5 deg TO HOLD AS = 290
4	0:44	19 000	290	5	-5	PTIS; STICK INPUTS
5	1:16	15 300	290	5	-4.5	$\dot{\theta}$ = 1 deg/sec TO θ = 3 deg; ROLL LEFT 55 deg; HOLD N_Z = 1.8g, TURN TO ψ = 220 deg
6	1:55	14 300	200	9	8	φ = 0; $\dot{\theta}$ = -1 deg/sec TO θ = 2 deg HOLD AS = 200
7	2:11	13 800	200	9	3	STICK INPUTS; PTIS
8	2:46	12 100	200	9	2	ROLL LEFT φ = 30 deg; $\dot{\theta}$ = -1 deg/sec TO θ = -10 deg, TURN TO ψ 175 deg
9	3:17	8 400	270	5	-10	$\dot{\theta}$ = 1 deg/sec TO θ = -7 deg; SB = 50% HOLD AS = 270; CENTER NEEDLES, SELECT AUTO (20 SEC); CSS; STICK INPUTS
10	4:22	2 000	270	5	-7	SB+CLOSE
11	4:40	900	270	5	-5	INITIATE PREFLARE
12	4:59	200	250	5.5	5	AT AS = 250, DEPLOY GEAR
13	5:17	0	185	9	9	T.D. AS < 220; $\dot{h}$ < 10 fps
14	5:27	0	130	--	--	COAST
15	5:31	0	115	--	--	GENTLE TO MODERATE DIFFERENTIAL BRAKING
16	5:36	0	100	--	--	MODERATE TO HARD BRAKING
17	5:58	0	20	--	--	GENTLE TO MODERATE BRAKING
18	6:08	0	0	--	--	ORBITER STOP

NOTE: Data is best estimate as of 9/15/77 and is subject to minor variation on or near launch date.







WT = 150,000
CG = 65.9% (1088.3)
TAILCONE ON

B

DATE 09/16/77
NASA-JSC

NASA News

National Aeronautics and
Space Administration

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

Milton E. Reim

For Release:
Immediate

RELEASE NO: 77-54

FIFTH GROUP OF ASTRONAUT APPLICANTS REPORT TO JSC SEPTEMBER 26

The fifth group of Space Shuttle astronaut applicants is scheduled to be at the Johnson Space Center this week for individual interviews and physical examinations. This group includes pilot and mission specialist applicants.

Seventeen of the twenty are pilot applicants and three are mission specialist applicants.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. The final group of applicants is scheduled to report in mid-November.

From the approximately 200 finalists, as many as 20 astronaut candidates will be selected in each category -- pilot and mission specialist. Notification of those selected will be made in December. The astronaut candidates will report to JSC at a later date for a two-year evaluation and training period before their final selection as astronauts.

The names, age, military rank and/or degree, place of birth, high school (HS), and current duty station or place of employment of the individuals in this fifth group are:

-more-

Norman L. Suits, 39; Lt. Colonel USAF
Chebanse, Illinois; (HS) Moral Township, Indiana
F-15 Joint Test Force, Edwards AFB, California

Bronson W. Sweeney, 33; Major USMC
Fall River, Massachusetts; (HS) Newport, Rhode Island
Naval Air Test Center, Patuxent River, Maryland

Paul D. Tackabury, 32; Captain USAF
Canastota, New York; (HS) Canastota, New York
USAF Flight Test Center, Edwards AFB, California

James W. Tilley II, 34; Captain USAF
Milwaukee, Wisconsin; (HS) Milwaukee, Wisconsin
3246th Test Wing, Eglin AFB, Florida

David M. Walker, 33; LCDR USN
Columbus, Georgia; (HS) Eustis, Florida
NAS Oceana Virginia Beach, Virginia

George J. Webb, Jr., 34; LCDR USN
Jacksonville, Florida; (HS) McLean Virginia
Cecil Field, Florida

Donald E. Williams, 35; LCDR USN
Lafayette, Indiana; (HS) Otterbein, Indiana
NAS, Lemoore, California

Robert C. Williamson, Jr., 31; LCDR USN
West Chester, Pensylvania; (HS) Alexandria, Virginia
NAS Oceana, Virginia Beach, Virginia

Paul D. Young, 34; Major USMC
Ada, Oklahoma; (HS) Roff, Oklahoma
Fleet Marine Force Pacific (Okinawa)

Steven A. Hawley, 25; Ph.D. (mission specialist)
Ottawa, Kansas; (HS) Salina, Kansas
Cerro Tololo Interamerican Observatory, La Serena, Chile

Gary W. Matthes, 35; Major USAF
St. Louis, Missouri; (HS) Jennings, Missouri
USAF Flight Test Center, Edwards AFB, California

-more-

Robert L. Oetting, 37; Major USAF
Alton, Illinois; (HS) Wood River, Illinois
USMC Air Station, Cherry Point, North Carolina

Isaac S. Payne, IV; 37; Major USAF
Malakoff, Texas; (HS) Portland, Oregon
Hqs. USAF, The Pentagon, Washington, D.C.

Wilton T. Sanders, III, 29; Ph.D (mission specialist)
Greenwood, Mississippi; (HS) Norfolk, Virginia
Department of Physics, University of Wisconsin, Madison, Wisconsin

Michael E. Sexton, 36; Major USAF
Pendleton, Oregon; (HS) Pendleton, Oregon
36th TAC Fighter Wing F-15 Squadron, Bitberg AFB, Germany

David M. Sjuggerud, 35; LCDR USN
Blair, Wisconsin; (HS) Menomonie, Wisconsin
Naval Air Systems Command, Washington, D.C.

Paul S. Skabo, 35
Dixon, Illinois; (HS) Minot, North Dakota
Federal Aviation Agency, Atlanta, Georgia

James L. Spencer, III, 35; LCDR USN
Charleston, South Carolina; (HS) Quantico, Virginia
Naval Air Test Center, Patuxtent River, Maryland

Will R. Stewart, 32; Captain USAF
Montclair, New Jersey; (HS) Nutley, New Jersey
USAF Flight Test Center, Edwards, AFB, California

Joseph J. C. Degioanni, 31, Ph.D., M.D. (mission specialist)
Italy; (HS) Montreal, Canada
Resident, Aerospace Medicine, Johnson Space Center, Houston, Texas

###

September 26, 1977

NASA News

National Aeronautics and
Space Administration

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

Milton E. Reim

For Release:
Immediate

RELEASE NO: 77-56

SIXTH GROUP OF ASTRONAUT APPLICANTS - ALL MISSION SPECIALISTS

The sixth group of 20 Space Shuttle astronaut applicants will report to the NASA Johnson Space Center, Monday, October 3, for a week of individual interviews and physical examinations. Applicants in this group are all in the mission specialist category and includes one woman.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. The screening process is expected to be complete by mid-November.

As many as 20 astronaut candidates will be selected in each category -- mission specialist and pilot. Those selected will be notified in December.

The candidates will report to JSC at a later date for a two-year evaluation and training period. Satisfactory completion of this period will determine their final selection as astronauts.

The names, age, military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this sixth group are:

-more-

George R. Carruthers, 38
Cincinnati , OH; (HS) Chicago, IL
Naval Research Lab, Washington, D.C.

Douglas L. Dowd, 34, Captain US Army
Miami, FLA; (HS) Midland, TX
Mission Planning and Analysis Division, NASA/JSC, Houston, TX

Michael J. Frankston, 26
New York, NY; (HS) New York, NY
Remote Sensing Laboratory, Mass. Institite of Tech., Cambridge, MA

Robert B. Giffen 35, Major USAF
Princeton, NJ; (HS) Asheville, NC
U. S. AF Academy, Colorado

Alan M. Goldberg, 28
Providence, RI; (HS) Providence, RI
Dept. of Earth & Planetary Science, Mass. Institute of Tech., Cambridge, MA

Douglas R. Hansmann, 32
Olympia, Washington, (HS) Mt. Vernon, Washington
Cardio-Dynamics Laboratories, Los Angeles, CA

Frank R. Harnden, Jr., 31
Pittsfield, MA; (HS) Dallas, TX
Smithsonian Astrophysical Observatory, Cambridge, MA

William D. Heacox, 35
Pipestone, MN; (HS) Spokane, WA
NRC Research Associate, NASA/Goddard Space Flight Center, Greenbelt, MD.

Jeffrey A. Hoffman, 32
New York, NY; (HS) Scarsdale, NY
Center for Space Research, Mass. Institute of Tech., Cambridge, MA

R. Jerry Jost, 30
Portland, Oregon; (HS) Sherwood, Oregon
Space Physics Dept., Rice University, Houston, Texas

Donald W. McCarthy, Jr., 29
Minneapolis, MN; (HS) Hopkins, MN
Lunar & Planetary Lab., University of Arizona, Tucson, AZ

Roger P. Neeland, 35, Major USAF
Milwaukee, WI; (HS) Chadron, NE
U. S. Air Force Academy, Colorado

George D. Nelson, 27
Charles City, Iowa; (HS) Willmar, MN
Astronomy Dept., University of Washington, Seattle, WA

Arthur L. Pavel, 30, Captain USAF
Downey, CA; (HS) Orange, CA
USAF Test Pilot School, Edwards AFB, CA

Charles J. Peterson, 31
Seattle, WA; (HS) Yakima, WA
Cerro Tololo Inter-American Observatory, LaSerena, Chile

Larry D. Petro, 29
Lansing, Michigan; (HS) Niles, Michigan
Hale Observatories, Carnegie Institute of Washington, Pasadena, CA

Lawrence S. Pinsky, 31
New York, NY; (HS) Oxon Hill, MD
Physics Department, University of Houston, Houston, Texas

Sally K. Ride, 26
Los Angeles, CA; (HS) Los Angeles, CA
Physics Dept., Stanford University, Stanford, CA

Richard J. Terrile, 26
New York, NY; (HS) Flushing, NY
Division of Geological & Planetary Science, California Institute of Technology, Pasadena, CA

Bobby L. Ulich, 30
Bryan, TX; (HS) Lubbock, TX
National Radio Astronomy Observatory, Tucson, AZ

###

October 3, 1977

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon

For Release:

RELEASE NO: 77-57

Upon Receipt

NOTE TO EDITORS

The fourth Free Flight of the Space Shuttle Enterprise is scheduled for Wednesday, October 12. The crew of the Orbiter will be Joe Engle and Richard Truly, the same crew that piloted the second Free Flight on September 13. Take-off is slated for 8 a.m. PDT (10:00 a.m. CDT).

This will be the first flight of the Orbiter in its space flight configuration. The tail cone which had been installed on the aft section of the Orbiter to smooth the airflow and reduce drag has been removed. Three simulated main Shuttle engines have been installed.

The News Room at the Dryden Flight Research Center will open at 8 a.m. PDT on Tuesday, October 11 and 5 a.m. PDT on Wednesday, October 12. Accreditation from the previous Free Flights will be accepted. Press passes will be required for access to take-off and landing sites.

Up to date status reports are available 24 hours a day by calling Los Angeles (213) 354-4213, Washington (202) 755-0670, or Dryden (805) 258-4474, Johnson Space Center (713) 483-5111. Additional details are available by calling (805) 258-8381, Monday through Friday from 7:30 a.m. to 4:00 p.m.

###

October 4, 1977

NASA News

National Aeronautics and
Space Administration

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

Robert Gordon
Johnson Space Center, Houston, Texas
(Phone: 713 483-5111)

David Garrett
Headquarters, Washington, D.C.
(Phone: 202 755-3090)

Ralph B. Jackson
Dryden Flight Research Center, Edwards, California
(Phone: 805 258-8311)

For Release

Upon Receipt

RELEASE NO: 77-58

FOURTH SHUTTLE ORBITER FREE FLIGHT SET FOR OCTOBER 12

Orbiter *Enterprise* will undergo its first test in its space flight configuration at the NASA Dryden Flight Research Center, Edwards, California, when astronauts Joe Engle and Richard Truly bring the 75-ton spacecraft into a steep powerless landing closely resembling landings the Space Shuttle Orbiter will experience upon its return from space in 1979.

Engle and Truly who piloted *Enterprise* on the second Free Flight test on September 13 will be at controls during this the shortest and steepest flight in the Approach and Landing Test Program. Flight time from separation to touchdown on the dry lakebed runway (#17) at the Edwards Air Force Base is slightly more than 2 min 30 sec.

- more -

Enterprise which has been piloted to three successful free flights will be without its aft tailcone which provided smooth airflow and reduced drag of the 747/Orbiter combo. The 5750 lb. (2608 kg.) tailcone has been removed and has been replaced by three simulated engines. This configuration represents how the Orbiter will return from space.

The three Shuttle main Engines are only used at launch to orbit in tandem with two solid rocket boosters which furnish liftoff power for the Shuttle. These engines are not used during reentry or during landing.

Without the tailcone it is estimated the 747 will receive about three times the amount of buffeting. This buffeting is expected to reduce by 50 percent the stability of the 747 carrier aircraft and also reduce the rudder control of the 747 by nearly 20 percent.

In previous free flights, with tailcone on the 747 has been able to attain release altitude of more than 23,000 ft. and launch separation of 270 knots in about 45 minutes. Without the tailcone, release altitude will be about 18,000 ft. and an airspeed of 245 knots.

Discrete checks will be made by onboard crew members and ground controllers throughout the climb to altitude to assure the 747/Orbiter can reach proper altitude without excessive buffeting which might interfere with a nominal separation of the two craft. A practice separation will be conducted at 18,000 ft. (5486 m.) AGL, after which the 747 with its engines pushed to special rated thrust will climb back to 22,000 ft. (6705 m.) AGL for pushover and release of the Orbiter.

- more -

Enterprise will descent to the Edwards dry lake runway at about a 22-degree angle, much like a dive bomber attack. Approach angle on the three previous flights has been about 11 degrees. Release of *Enterprise* occurs when the vehicles are several miles north of California Highway 58, north of Edwards.

During climb to altitude the 747/Orbiter follow along a race-track pattern which is 73 nautical miles (135.2 km.) in length.

The flight is as follows:

- After takeoff various buffet, flutter, load stabilization control checks are made as the mated configuration climbs to altitude. Approximately 25 minutes after takeoff the 747 noses over to perform a 'dress rehearsal' for a separation at about 18,000 ft. (5486 m.) AGL. This practice separation run is concluded at about 14,500 ft. (4420 m.) AGL when another series of flight control checks are conducted aboard the Orbiter.

- The crew of the 747 then applies special rated thrust to the modified engines for the climb from 18,500 ft. (5639 m.) AGL to the separation altitude. Pushover of the 747 will occur at about 56 minutes after takeoff at 22,000 ft. (6706 m.) AGL.

- Separation occurs about one minute after pushover when the 747/Orbiter reaches an altitude of about 18,200 ft. (5547 m.) AGL. The Orbiter is now about 20 miles (32.2 km.) from touchdown.

- Sixteen seconds after separation the Enterprise crew initiates aerodynamic stick (ASI) inputs to the Orbiter to determine control surface and aerodynamic responses of the vehicle.

- A slight left turn, the first of two turns is commanded by the crew 30 seconds after release, followed by a pushover of the Orbiter at 39 seconds. Five seconds later when the Enterprise is at 15,500 ft. (4724 m.) AGL controls are commanded to pull the Orbiter nose back up to slow its descent. Another pushover and pullup follow to an altitude of about 12,500 ft. (3810 m.) AGL where another series of aerodynamic stick inputs (ASI) are reinitiated to test the control surfaces and handling capabilities of the Orbiter after one minute and 10 seconds of free flight.

- At 8,200 ft. (2500 m.) AGL and when Enterprise is descending at a speed of about 290 knots (537 km/h) the speed brakes are deployed to about 30 percent which reduces the Enterprise's speed. A few seconds later at 1 min 34 sec after separation the second left turn is performed, lining the vehicle up for its final approach to landing on runway 17.

- Two minutes after separation and about 30 seconds and 1,900 ft. (579 m.) AGL from landing, the Enterprise crew commands a preflare (pulling the nose up) which reduces airspeed for landing.

- Touchdown of Enterprise is about 2 min 34 sec after separation from the 747.

###

ALT FREE FLIGHT TIMELINE

Event	Altitude**	T-Time*	PDT a.m.	EDT
Crew Wakeup		T-240	4:00	7:00
Crew Depart Quarters		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup Trailer		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover		T-67	6:53	9:53
Orbiter/SCA Move From MDD***		T-62	6:58	9:58
Orbiter/SCA Tow to NASA Ramp		T-56	7:04	10:04
SCA Engine Start		T-42	7:18	10:18
SCA Begin Taxi		T-32	7:28	10:28
SCA Arrive Runway		T-12	7:48	10:48
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff Climbout		T-0	8:00	11:00
MD/CSS LIM/Load Check	3,000	T+3	8:03	11:03
SCA Buffett Check	7,500	T+8	8:08	11:08
Separation Data Run	18,500	T+25	8:25	11:25
FCS Data Run	14,500	T+29	8:29	11:29
SRT	18,500	T+40	8:40	11:40
shover	22,000	T+56	8:56	11:56

Separation Point

Event	Altitude**	T-Time*	PDT a.m.	EDT
Separation, pullup,	18,200			
Body Flap 34%	17,700		8:57	11:57
Pushover	17,850		8:57:11	11:57:11
First left turn, ASZ's Pushover	16,700		8:57:32	11:57:32
Pullup	15,500		8:57:44	11:57:44
Pushover	14,500		8:57:55	11:57:55
Pullup	13,000		8:58:08	11:58:08
ASI's	12,300		8:58:12	11:58:12
Second Left Turn, Speedbrake 30%	7,300		8:58:36	11:58:36
ASI's	5,000		8:58:48	11:58:48
Speedbrake closed, Initiate Preflare	1,900		8:59:05	11:59:05
Deploy Landing Gear	200		8:59:23	11:59:23
T.D.	0		8:59:35	11:59:35
Mod-hard Differential Brake			8:59:45	11:59:45
Gentle-mod Brake			8:59:50	11:59:50
Orbiter Stop			9:00:00	11:00:00

ACTUAL TIMES/ALTITUDES TIMELINE

Free Flight 1 (Haise & Fullerton)
August 12, 1977

Event	PDT	Altitude, AGL	Speed, knots
SCA/Orbiter brake release, takeoff	8:00:00		
Intersect racetrack	8:15:30	19,500	
Flight control systems check	8:22:14	22,500	
Begin special-rated thrust	8:36:43	26,200	
Pushover for Orbiter separation	8:47:40	28,000	
Orbiter separation	8:48:29	24,000	270
Orbiter landing	8:53:51	0	185

Total Orbiter Free Flight time: 5 min 22 sec
Averate rate of sink: 4615 fpm
Touchdown was about .75 mile beyond predicted TD point
Touchdown-to-stop rollout approximately 11,000 feet

Free Flight 2 (Engle & Truly)
September 13, 1977

Event	PDT	Altitude, AGL	Speed, knots
Takeoff	8:00:00		
Pushover	8:48:34	28,300	
Separation	8:49:24	24,000	
Main Gear	8:54:55		
Nose Gear	8:55:10		
Stop	8:56:10		

Highest Speed: 300 knots
Lowest Speed: 185 knots
Touchdown: 194 knots
Free Flight Total: 5 min 31 sec
Touchdown 680 ft. past aim point

Free Flight 3 (Haise & Fullerton)
September 23, 1977

Event	PDT	Altitude, AGL	Speed, knots
Takeoff	8:00:47		
Pushover	8:44:58	26,700	
Separation	8:45:37	21,400	250 (287 mph)
Touchdown (main)	8:51:12		191 (219 mph)
Nosegear	8:51:23		
Rollout		9,147	

Touchdown 786 ft. beyond aim point
Autoland System: 45 seconds
Total Free Flight: 5 min 34 sec

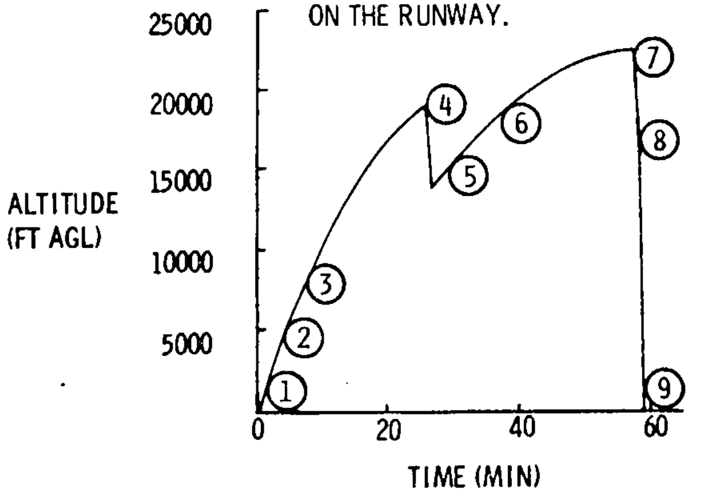
MATED PROFIL⌐ ⌐REE FLIGHT 4

FLIGHT SEQUENCE

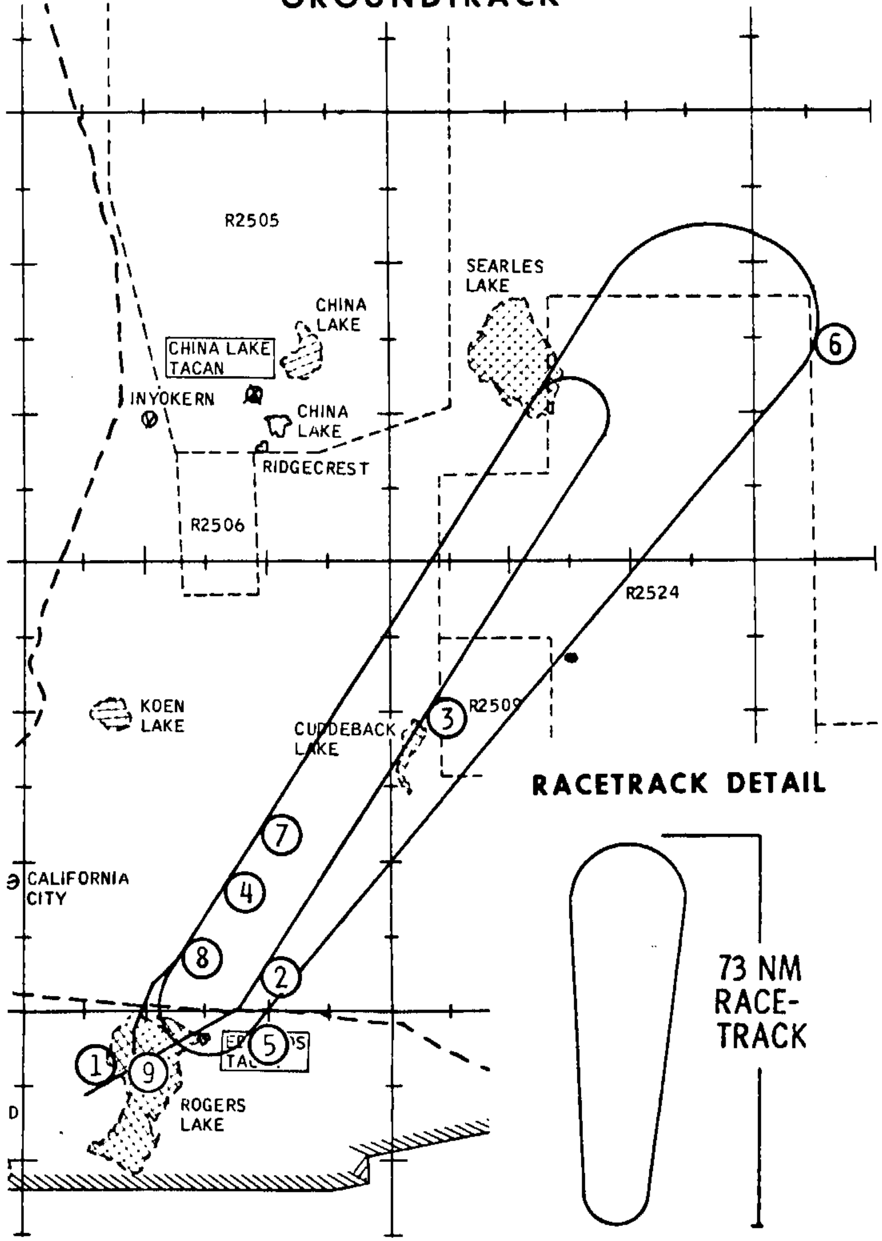
ITEM	TIME	ALT (AGL)	RG (NM)	EVENT
1	0	0	0	SCA TAKE OFF
2	3	3 000	11	MD/CSS LIM/LOAD CHK
3	8	7 500	35	SCA BUFFET CHK
4	25	18 000	27	SEP DATA RUN
5	29	14 500	14	FCS CHKS
6	40	18 500	64	SRT
7	56	22 000	30	PUSHOVER
8	57	18 200	20	SEP
9	59	0	0	ORBITER LANDING

ALTITUDE PROFILE

NOTE: ALTITUDES ARE ABOVE GROUND LEVEL (AGL) AND ARE REFERENCED TO ORBITER GROUND AIM POINT ON THE RUNWAY.



GROUNDTRACK



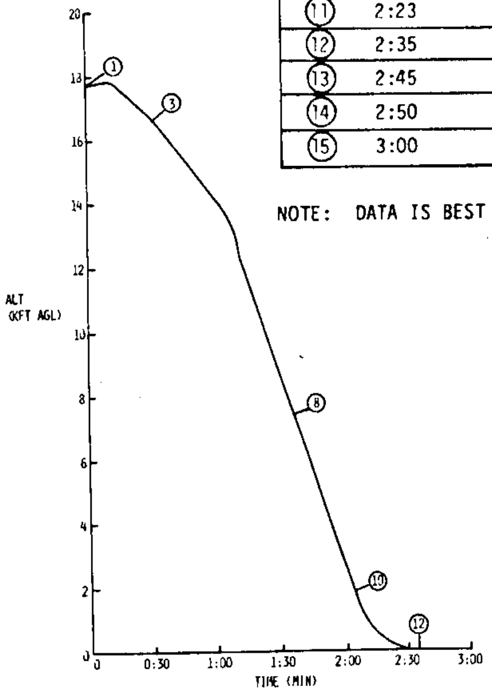
A

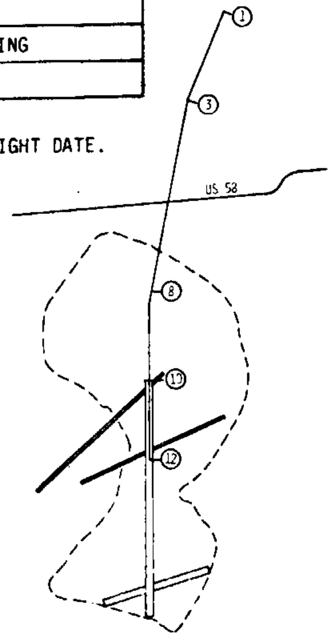
DATE 09/30/77

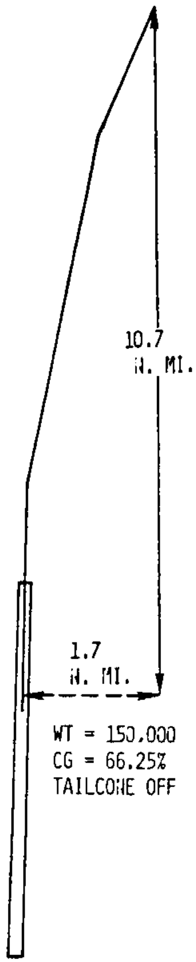
ALT FREE FLIGHT 4

ITEM	TIME	ALT(AGL)	KEAS	α	θ	ACTION
1	0:00	17 700	245	10	.5	SEP; $\dot{\theta}$ = 2 DEG/SEC TO θ = 15 DEG; ψ = 195 DEG ; BF = 34%
2	0:11	17 850	197	8	15	$\dot{\theta}$ = -3 DEG/SEC TO θ = -1.5 DEG, AERO STICK INPUTS
3	0:32	16 700	185	9	-1.5	ROLL LEFT TO ψ = 185 DEG; $\dot{\theta}$ = -2 DEG/SEC TO θ = -12 DEG
4	0:44	15 500	192	6	-12	$\dot{\theta}$ = 2 DEG/SEC TO θ = 10 DEG
5	0:55	14 500	186	13	10	$\dot{\theta}$ = -2 DEG/SEC TO θ = -25 DEG
6	1:08	13 000	220	3	-25	$\dot{\theta}$ = 2 DEG/SEC TO θ = -16 DEG
7	1:12	12 300	230	9	-16	AERO STICK INPUTS
8	1:36	7 300	290	6	-16	SPD BRK TO 30%; ROLL LEFT TO ψ = 175 DEG
9	1:48	5 000	290	4	-16	AERO STICK INPUTS
10	2:05	1 900	290	4	-16	SPD BRK CLOSE; PREFLARE
11	2:23	200	250	6	0	DEPLOY GEAR
12	2:35	0	185	8	8	TOUCHDOWN
13	2:45	0	130	--	--	MODERATE TO HARD DIFFERENTIAL BRAKING
14	2:50	0	100	--	--	GENTLE TO MODERATE BRAKING, NOSEWHEEL STEERING
15	3:00	0	0	--	--	ORBITER STOP

NOTE: DATA IS BEST ESTIMATE AS OF 9/28/77 AND IS SUBJECT TO MINOR VARIATION ON OR NEAR FLIGHT DATE.







WT = 150,000
CG = 66.25%
TAILCONE OFF

B

DATE 09/30/77

NASA-JSC

NASA News

National Aeronautics and Space Administration

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

Milton E. Reim

For Release:

RELEASE NO: 77-59

October 12, 1977

SEVENTH GROUP OF ASTRONAUT APPLICANTS TO REPORT TO JSC OCTOBER 17

Twenty more mission specialist astronaut applicants are scheduled to report to the NASA Johnson Space Center, October 17, for a week of physical examinations and individual interviews. Eight of the group reporting are women.

To date 140 astronaut applicants have been selected to come to JSC for further screening. Of the seven groups reporting, 77 have been pilots and 63 in the mission specialist category. Of the above, 17 are women and all are mission specialist applicants.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 for further screening. Screening of the applicants is expected to be complete by mid-November.

As many as 20 astronaut candidates will be selected in each category---mission specialist and pilot. Those selected will be notified in December. They will report to JSC at a later date for a two-year evaluation and training period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this seventh group are:

- more -

Jack L. Bufton, 32; Ph.D.
Kenmore, NY; (HS) Warren, PA
NASA/Goddard Space Flight Center, Greenbelt, MD

Samuel H. Clarke, Jr., 40; Ph.D.
Bristol, VA; (HS) Enid, OK
U.S. Geological Survey, Office of Marine Geology, Menlo Park, CA

Kathleen Crane, 26; Ph.D.
Washington, DC; (HS) Falls Church, VA
Scripps Institute of Oceanography, La Jolla, CA

Bonnie J. Dunbar, 28
Sunnyside, WA; (HS) Sunnyside, WA
Rockwell Internation Space Division, Downey, CA

Brady A. Elliott, 30
Columbus, OH; (HS) North Canton, OH
Texas A&M University (Research Assistant), College Station, TX

Joan J. Fitzpatrick, 27; Ph.D.
Bayonne, NJ; (HS) Bayonne, NJ
Colorado School of Mines Research Institute, Golden, CO

Salvatore Giardina, Jr., 34
Hoboken, NJ; (HS) Union City, NJ
State of Arizona, Oil and Gas Commission, Tempe, AZ

David S. Ginley, 27; Ph.D.
Denver, CO; (HS) Denver, CO
Sandia Laboratories, Albuquerque, NM

Carolyn S. Griner, 32
Granite City, IL; (HS) Winter Park, FL
NASA/Marshall Space Flight Center, Huntsville, AL

Evelyn L. Hu, 30; Ph.D.
New York, NY; (HS) New York, NY
Bell Laboratories, Holmdel, NJ

Carol B. Jenner, 27; Ph.D.
Washington, DC; (HS) O'Fallon, IL
University of Wisconsin, Madison, WI

- more -

Mary Helen Johnston, 32; Ph.D.
West Palm Beach, FL; (HS) Fort Pierce, FL
NASA/Marshall Space Flight Center, Huntsville, AL

H. Louise Kirkbride, 24
Philadelphia, PA; (HS) Upper Darby, PA
Jet Propulsion Laboratory, Pasadena, CA

Larry A. Mayer, 25
New York, NY; (HS) New York, NY
Scripps Institute of Oceanography, La Jolla, CA

Harry Y. McSween, Jr., 32; Ph.D.
Charlotte, NC; (HS) Clinton, SC
University of Tennessee, Knoxville, TN

Richard W. Newton, 29; Ph.D.
Baytown, TX;(HS) Baytown, TX
Texas A&M University, College Station, TX

William H. Peterson, 36
Brooklyn, NY; (HS) San Francisco, CA
University of Miami (Graduate Research Asst.), Miami, FL

Wayne R. Sand, 36
Conrad, MT; (HS) Valier, MT
University of Wyoming, Laramie, WY

Brian H. Shoemaker, 40; CDR-USN
Noranda, Quebec, Canada; (HS) Bishop, CA
NAS North Island, San Diego, CA

Ritchie S. Straff, 24
Philadelphia, PA; (HS) Ardmore, PA
M.I.T. (Graduate Student), Cambridge, MA

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:

RELEASE NO: 77-64

October 19, 1977

NOTE TO EDITORS

SATURN V UPPER STAGES ARRIVE FOR JSC DISPLAY

Upper stages of the Saturn V launch vehicle used for Apollo lunar landing missions and for placing the Skylab space station into Earth orbit will arrive by barge at the NASA Johnson Space Center October 24.

The S-II and S-IVB second and third stages will dock at the JSC barge dock on Clear Lake at 12 noon, and preparations for moving the stages at 6 p.m. the following day will begin. The two upper stages will join the Saturn V first stage in the display area near the JSC visitor parking lot.

Included on the barge are a spacecraft/lunar module adapter (SLA) and a launch escape system. The display, when completed, will include an Apollo spacecraft in a 370-foot long horizontal "stack." The three Saturn V stages have been in storage at the NASA Michoud Assembly Facility near New Orleans.

###

NASA News

National Aeronautics and
Space Administration

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

For Release:

Upon Receipt

Robert Gordon
Johnson Space Center, Houston, Texas
(Phone: 713 483-5111)

David Garrett
Headquarters, Washington, D.C.
(Phone: 202 755-3090)

Ralph B. Jackson
Dryden Flight Research Center, Edwards, California
(Phone: 805 258-8311)

RELEASE NO: 77-65

FIFTH SHUTTLE ORBITER FREE FLIGHT SET FOR OCTOBER 26

Astronauts Fred W. Haise and C. Gordon Fullerton are scheduled to make a pinpoint landing of Orbiter Enterprise on a hard surface runway at Edwards Air Force Base, California, for the first time in the fifth and final free flight in the Shuttle Approach and Landing Test (ALT). The flight which lasts less than two minutes is scheduled for no earlier than October 26, 1977 with takeoff time set for 8 a.m. PDT.

This is the first time a hard surface runway landing will be attempted and the second time the Orbiter is to be flown without its aft tailcone. The tailcone provided smooth airflow and reduced drag of the 747/Orbiter combo during mated flight. Without the tailcone the

- more -

747/Orbiter combination did experience additional buffeting during its climb to separation altitude. The 747 crew and the Orbiter astronauts reported the level of buffeting was acceptable.

Haise and Fullerton will attempt to land the 75-ton Enterprise at a point one third down the 15,000 ft (4578 m) concrete runway and bring it to a stop before reaching the 10,000 ft (3048 m) mark. Touchdown on the previous flights with landings on dry lakebed runways has ranged from 500 to 1,000 ft (152-305 m) beyond the aim point.

This will be the third free flight and shortest for Haise and Fullerton who brought Enterprise in for successful landings on August 12 and September 23, 1977. Flight time from release from the 747 carrier aircraft to touchdown is 1:55 seconds. The fourth flight on October 12 was 2:34 seconds in duration.

Flight five, as in the fourth flight with astronauts Joe Engle and Richard Truly at the controls, will closely resemble landings the Space Shuttle Orbiter will experience upon its return from space in 1979.

Three simulated Orbiter main engines have replaced the smooth 5750 lb (2608 kg) tailcone. The three Shuttle main engines are only used at launch to orbit in tandem with two solid rocket boosters which furnish liftoff power for the Shuttle. These engines are not used during reentry or during landing.

- more -

Enterprise will be prepared for a series of ferry verification flights atop the 747 after this flight. It will be shipped to the NASA Marshall Space Flight Center, Huntsville, Alabama, early in 1978 for a year long series of ground vibration tests. It then will be returned in 1979 to the Rockwell International Space Division facility at Palmdale where it will be prepared for space flight.

The second Orbiter (102) which is currently under construction at the R-I Palmdale plant will be the first vehicle to be used in the Shuttle Orbital Flight Test (OFT) program which is scheduled to begin in mid-1979. Six OFT flights are planned to demonstrate the Orbiter's capabilities in Earth orbit before the start of the Shuttle operational flights which are scheduled to begin in 1980.

The final flight of *Enterprise* will mark the last time Shuttle Orbiters will land at this desert air base until 1979-80 period when the first four OFT flights set down after low earth orbital flights. Subsequent OFT flights and operational flights will land either at the NASA Kennedy Space Center, Florida or at Vandenberg Air Force Base, California.

Haise and Fullerton will bring *Enterprise* in at a 22-degree glide path, much like Engle and Truly did during the previous flight. At one point during their flight Engle and Truly were guiding the Orbiter in at a 25-degree glide path. Commercial passenger jets descend at a glide slope of about three degrees.

- more -

It will be a straight-in approach for Haise and Fullerton following release from the 747 carrier aircraft. Enterprise will be released from the 747 at about an altitude of 17,000 ft (5182 m) when the vehicles are about 10 nm (18.5 km) from touchdown.

After release the flight sequence will be as follows:

- Separation will occur when the mated vehicles are descending at a speed of 245 kts (454 km/h). Three seconds after release, the Orbiter crew commands a slight right roll for clearance from the 747.

- Twenty seconds after separation and at an altitude of 15,200 ft (4633 m) Enterprise is commanded to a 22-degree glide slope, increasing its speed to 290 kts (537 km/h). Enterprise is now four nm (7.4 km) from touchdown.

- When the speed of 290 kts is reached, Commander Haise deploys Enterprise's speed brakes. This occurs 34 seconds after separation when the craft is at an altitude of 11,700 ft (3566 m).

- The speed brakes are closed when Enterprise reaches 2000 ft (610 m) at which time a preflare (final pre-landing maneuver) is performed.

- At 1:42 seconds after separation, when Enterprise is 200 ft (61 m) above the hard runway, pilot Fullerton drops the landing gear. The vehicle is now traveling at the speed of 250 kts (463 km/h).

- Touchdown is expected at 1:55 seconds after release. Speed at touchdown is expected to be about 185 kts (343 km/h). Hard braking will be applied after touchdown in an attempt to bring the

- more -

Enterprise to a stop at the 10,000 ft (3048 m) runway marker. (On FF-4 Engle and Truly brought *Enterprise* to a stop 5,725 ft (1744 m) after touchdown.

- Descent rate of *Enterprise*, during this flight, will vary from an overall average 9,234 feet per minute (fpm) (46.4 m/s) to a maximum of 12,510 fpm (63.5 m/s) between pitch-down and flare.

- more -

ALT FREE FLIGHT TIMELINE

E[illegible]	Altitude**	T-Time*	PDT a.m.	EDT
Crew Wakeup		T-240	4:00	7:00
Crew Depart Quarters		T-210	4:30	7:30
Crew Arrives Trailer (physical & breakfast)		T-195	4:45	7:45
Crew Departs for Suitup Trailer		T-160	5:20	8:20
Crew Departs Trailer		T-125	5:55	8:55
Start Ingress		T-120	6:00	9:00
Ingress Complete		T-98	6:22	9:22
ALT Ground Team/Flight Team Handover				
Orbiter/SCA Move From MDD***		T-46	7:14	10:14
Orbiter/SCA Tow to NASA Ramp				
SCA Engine Start		T-35	7:25	10:25
SCA Begin Taxi		T-28	7:32	10:32
SCA Arrive Runway		T-13	7:49	10:49
Navigation Update		T-4	7:56	10:56
SCA Brake Release, Takeoff Climbout		T-0	8:00	11:00
		T+00		
Intersect Racetrack	6,000	T+06	8:06	11:06
FCS Checks***	19,000	T+31	8:31	11:31
S[illegible] Begin SRT Climb***	20,000	T+44	8:44	11:44
[illegible] ver	22,000	T+54	8:54	11:54
		Separation Point		
Separation 245 kts (Range to TD 10 nm)	17,000	0:00	8:55:00	11:55:00
Roll Right 20° 235 kts	17,600	0:03	8:55:03	11:55:03
Accelerate to 290 kts	15,200	0:20	8:55:20	11:55:20
Pitchup 2°/sec to 17°; Speed Brake 50%	11,700	0:34	8:55:34	11:55:34
S/B Close; Preflare 290 kts	2,000	1:24	8:56:24	11:56:24
Gear Deploy 250 kts	200	1:42	8:56:42	11:56:42
Touchdown 185 kts	0	1:55	8:56:55	11:56:55
Nosewheel Touchdown, Hard Braking 130 kts		2:05	8:57:05	11:57:05
Orbiter Stop		2:15	8:57:15	11:57:15

Note

* Events and times are preliminary and may change prior to and during flight and are dependent upon atmospheric and flight conditions.

** Altitudes are Above Ground Level (AGL) and are referenced to Orbiter ground aim point on the runway. Add 2,300 feet to AGL to obtain altitude above Mean Sea Level (MSL).

*** SCA - Shuttle Carrier Aircraft
MDD - Mate-Demate Device
FCS - Flight Control System (or Forward Crew Station)
SRT - Special Rated Thrust

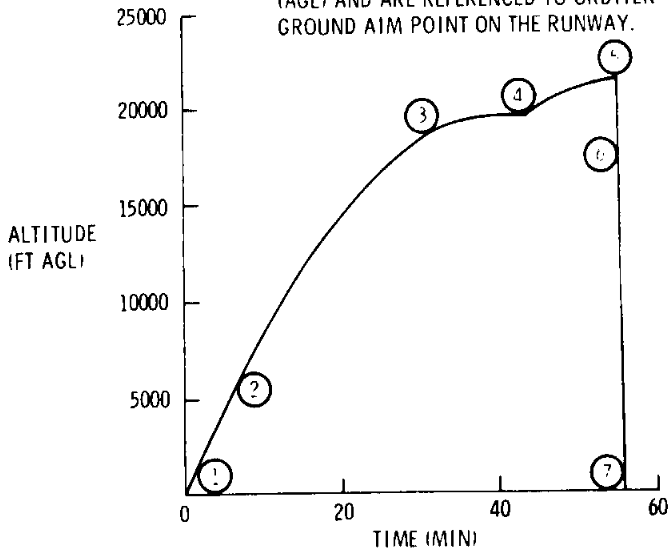
MATED PROFILL REE FLIGHT 5

FLIGHT SEQUENCE

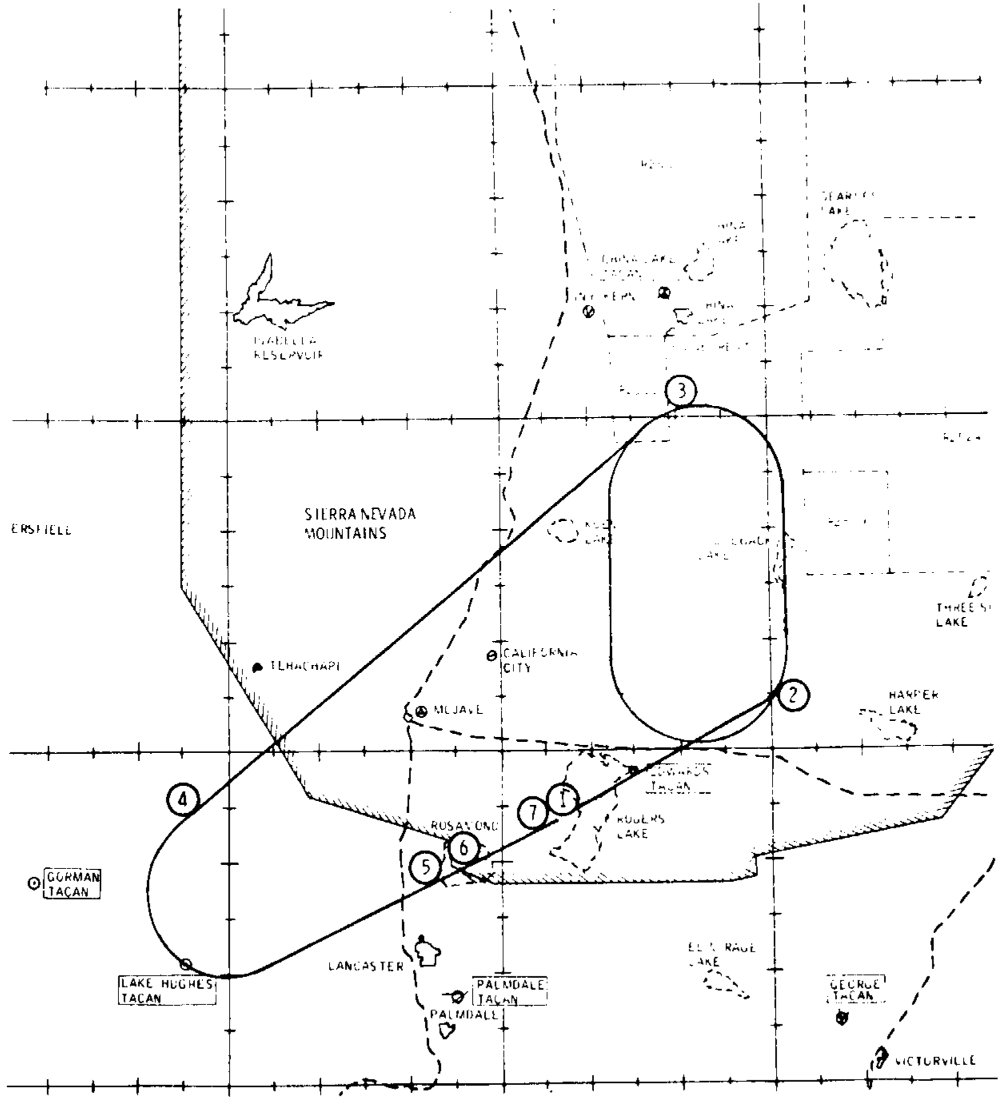
ITEM	TIME	ATL (AGL)	RG (NM)	EVENT
1	0	0	0	SCA TAKE OFF
2	6	6 000	23	INTERSECT RACETRACK
3	31	19 000	37	INFLIGHT FCS CHECK
4	44	20 000	33	SRT
5	54	22 000	14	PUSHOVER
6	55	17 700	12	SEP
7	57	0	0	ORBITER LANDING

ALTITUDE PROFILE

NOTE: ALTITUDES ARE ABOVE GROUND LEVEL (AGL) AND ARE REFERENCED TO ORBITER GROUND AIM POINT ON THE RUNWAY.



GROUNDTRACK



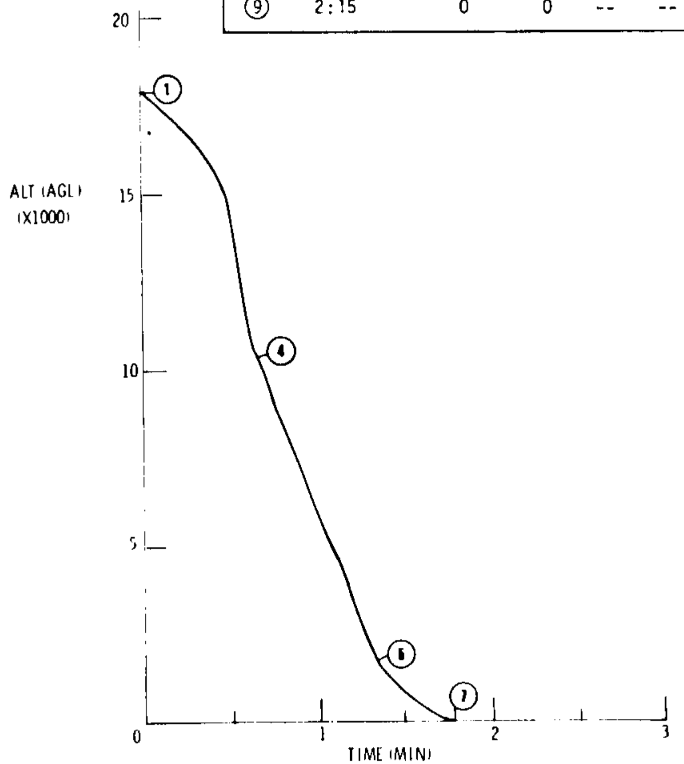
A

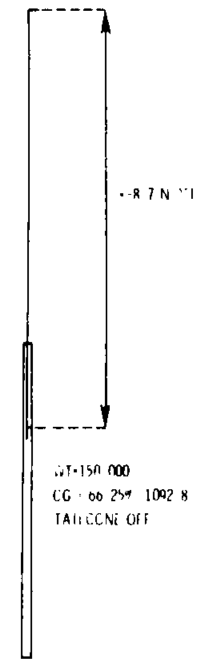
DATE 10/07/77

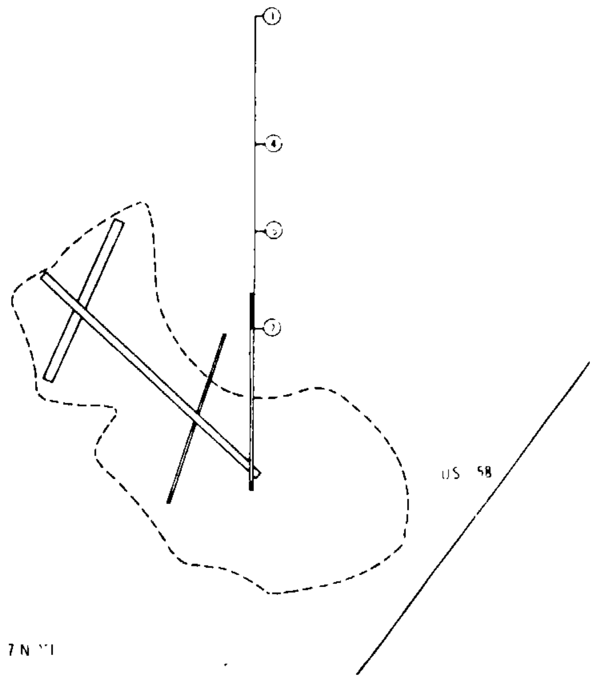
OVERVIEW

ALT FREE FLIGHT 5

ITEM	TIME	ATL(AGL)	KEAS	α	θ	ACTION
①	0:00	17 700	245	10	.5	SEP; $\dot{\theta}$ = 2°/SEC, 3 SEC; $\dot{\theta}$ = 0
②	0:03	17 600	235	9	6	ROLL RIGHT Φ = 20°; AT 'CHASE TWO CLEAR,' $\dot{\theta}$ = -2°/SEC TO θ = -22°, ROLL TO ψ = 045°
③	0:20	15 900	235	4	-22	ACCELERATE TO 290
④	0:37	11 700	290	4	-17	$\dot{\theta}$ = 2°/SEC TO θ = -17; S/B = 50%
⑤	1:24	1 900	290	4	-17	S/B-CLOSE; PREFLARE
⑥	1:42	200	250	6	0	GEAR DEPLOY
⑦	1:55	0	185	8	8	TOUCHDOWN
⑧	2:05	0	130	--	--	AT NOSEWHEEL TOUCHDOWN, HARD BRAKING
⑨	2:15	0	0	--	--	ORBITER STOP







B

DATE 10/07/77

PHASE III APPROACH AND LANDING TESTS

(Free Flight)

ACTUAL TIMES/ALTITUDES TIMELINE

Free Flight 1 (Haise & Fullerton)
August 12, 1977

Event	PDT	Altitude, AGL	Speed, knots
SCA/Orbiter Brake Release, Takeoff	8:00:00		
Intersect Racetrack	8:15:30	19,500	
Flight Control Systems Check	8:22:14	22,500	
Begin Special-Rated Thrust	8:36:43	26,200	
Pushover for Orbiter Separation	8:47:40	28,000	
Orbiter Separation	8:48:29	24,000	270
Orbiter Landing	8:53:51	0	185

Total Orbiter Free Flight Time: 5 min 22 sec
Average Rate of Sink: 4615 fpm
Touchdown was about .75 mile beyond predicted TD point
Touchdown-to-stop rollout approximately 11,000 feet

Free Flight 2 (Engle & Truly)
September 13, 1977

Event	PDT	Altitude, AGL	Speed, knots
eoff	8:00:00		
iover	8:48:34	28,300	
Separation	8:49:24	24,000	
Main Gear	8:54:55		
Nose Gear	8:55:10		
Stop	8:56:10		

Highest Speed: 300 knots
Lowest Speed: 185 knots
Touchdown: 194 knots
Free Flight Total: 5 min 31 sec
Touchdown 680 feet past aim point

Free Flight 3 (Haise & Fullerton)
September 23, 1977

Event	PDT	Altitude, AGL	Speed, knots
Takeoff	8:00:47		
Pushover	8:44:58	26,700	
Separation	8:45:37	21,400	250 (287 mph)
Touchdown (main)	8:51:12		191 (219 mph)
Nose Gear	8:51:23		

Total Free Flight: 5 min 34 sec
toland System: 45 sec
chdown 786 feet beyond aim point
lout: 9,147 feet

e Flight 4 (Engle & Truly)
October 12, 1977

Event	PDT	Altitude, AGL	Speed, knots
Takeoff	7:45:51		
Pushover	8:49:37	23,000 feet	
Separation	8:50:14	20,536 feet	240
Touchdown (main)	8:52:48		
Touchdown (Nose gear)	8:52:54		
Rollout	8:53:33	(5,000 feet runout)	

PHASE II APPROACH AND LANDING TESTS
(Orbiter manned, systems active)

FLIGHT #1: June 18, 1977

SCA/Orbiter Brake Release:	8:06 a.m. (PDT)
SCA/Orbiter Landing:	9:01:46 a.m. (PDT)
SCA/Orbiter Weight:	263,088 kilograms (580,000 lbs)
Flight Duration:	55 min 46 sec
Maximum Speed:	181 KEAS (208 mph)
Maximum Altitude:	4562 meters (14,970 ft)

Spacecraft Commander Fred Haise and Pilot Gordon Fullerton were at the controls of the Space Shuttle Orbiter during this first manned captive flight. This flight was a once around a racetrack-like flight path which measured approximately 125 kilometers (78 statute miles) on the "straight-a-ways" with 16 kilometer (10 statute mile) curves.

FLIGHT #2: June 28, 1977

SCA/Orbiter Brake Release:	7:49:50 a.m. (PDT)
SCA/Orbiter Landing:	8:52 a.m. (PDT)
SCA/Orbiter Weight:	253,018 kilograms (557,800 lbs)
Flight Duration:	1 hr 2 min
Maximum Speed:	270 KEAS (310 mph)
imum Altitude:	6714 meters (22,030 ft)

Spacecraft Commander Joe Engle and Pilot Dick Truly were at the controls of the Space Shuttle Orbiter during this second manned captive flight. This flight consisted of a modified racetrack-like trajectory as well as a "Grand Prix" roadrace-like trajectory.

FLIGHT #3: July 26, 1977

SCA/Orbiter Weight:	565,000 lbs
Duration:	59 min 53 sec
Maximum Speed:	312 mph
Maximum Altitude:	27,992 ft (AGL)

Spacecraft Commander Haise and Pilot Fullerton were at the controls of Enterprise during this third and final captive flight, a full dress rehearsal of the planned August 12 free flight. The SCA/Orbiter reached a maximum altitude of 27,992 ft (AGL) at which time pitch over was performed. The carrier aircraft landing gear was deployed to simulate the free flight approach and landing profile. A practice separation run was normal and "abort separation" was performed one minute after pushover. Enterprise landing gear was deployed for the first time after the SCA landed on runway 22. The final approach profile was identical to that planned for the first free flight.

APPROACH AND LANDING TESTS SUMMARY RESULTS

PHASE I APPROACH AND LANDING TESTS
(Orbiter unmanned and systsms inactive)

TAXI TESTS: February 15, 1977

Three taxi tests assessed the mated capability of the Shuttle Orbiter piggyback atop the 747 in ground handling and control characteristics up to the flight takeoff speed. The tests also validated the 747 steering and braking.

FLIGHT #1: February 18, 1977

Duration: 2 hr 5 min
Maximum Speed: 287 mph
Maximum Altitude: 16,000 ft

FLIGHT #2: February 22, 1977

Duration: 3 hr 13 min
Maximum Speed: 328 mph
Maximum Altitude: 22,600 ft

--ight #2 accomplished a series of flutter and stability control tests. During this ght, the two right engines of the 747 were reduced to idle thrust. The flight ..s termed "super."

FLIGHT #3: February 25, 1977

Duration: 2 hr 28 min
Maximum Speed: 425 mph
Maximum Altitude: 26,600 ft

This flight concluded the flutter tests and concentrated on stability/control/flight evaluation and airspeed calibration. Stability and control were evaluated by idling the #4 engine of the 747 to simulate an engine failure.

At the completion of this flight, it was stated that if flights #4 and #5 follow the same successful pattern, flight #6 would not be necessary.

Flight #4: February 28, 1977

Duration: 2 hr 11 min
Maximum Speed: 425 mph
Maximum Altitude: 28,565 ft

This flight simulated emergency descent of the mated vehicles and a missed landing -oach, as well as maneuvers required of the 747 when the mated vehicles enter the aration flight phase.

- more -

GHT #5: March 2, 1977

Duration: 1 hr 39 min
Maximum Speed: 474 mph
Maximum Altitude: 30,000 ft

NASA News

National Aeronautics and Space Administration

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

Milton E. Reim

RELEASE NO: 77-66

For Release:

October 20, 1977
2:00 p.m. CDT

EIGHTH GROUP OF ASTRONAUT APPLICANTS TO BE AT JSC OCTOBER 25-29

The eighth group of Space Shuttle astronaut applicants is scheduled to report to the NASA Johnson Space Center on Tuesday, October 25 for five days of physical examinations and individual interviews.

Members of this next group are all mission specialist applicants. Nineteen of the applicants are military and one civilian. Services represented are: United States Air Force - 13; United States Army - three; United States Navy - two; and United States Marine Corps - one.

From July 1976, when the program was announced, until June 30, 1977, the application deadline, 8,079 applied for the Space Shuttle astronaut program. Approximately 200 of these applicants are being brought to JSC in groups of 20 for further screening.

Including this group, 160 applicants have been selected to come to JSC for further screening. Of the above, 77 are pilot applicants and 83 are mission specialist applicants.

As many as 20 astronaut candidates will be selected in each category---pilot and mission specialist. Those selected will be notified in December and report to JSC at a later date for a two-year training and evaluation period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this eighth group are:

- more -

Thomas N. Almojuela, 34; Major USA
Seattle, WA; (HS) Bainbridge Island, WA
NASA/Ames, Moffett Field, CA

Robert F. Behler, 29; Capt. USAF
Rome, NY; (HS) Norman, OK
6512 Test Sq., Edwards AFB, CA

Donald C. Bulloch, 32; Major USAF
Alexandria, LA; (HS)Belle Chasse, LA
AirCommand & Staff College, Maxwell AFB, AL

William J. Fields, 35; Major USAF
Baltimore, MD; (HS) Baltimore, MD
Armament Development Test Center, Eglin AFB, FL

William F. Harrison, 32; Lt.Cdr. USN
Charleston, SC; (HS) Hicksville, NY
NAS Whidbey Island, Oak Harbor, WA

Jane L. Holley, 30; Capt. USAF
Shreveport, LA; (HS) Annandale, VA
USAF Tactical Fighter Weapons Center, Nellis AFB, NV

Robert A. Lancaster, Jr., 30; Capt. USAF
Washington, DC; (HS) Fairmont Heights, MD
Aeronautical Systems Division, Wright Patterson AFB, OH

Johnnie B. Ligon, 35, Capt. USAF
Henderson, KY; (HS) Evansville, IN
3246th Test Wing, Eglin AFB, FL

John M. Lounge, 31; Lt. USN
Denver, CO; (HS) Burlington, CO
Naval Electronics Systems Command, Washington, DC

Richard M. Mullane, 32; Capt. USAF
Wichita Falls, TX; (HS) Albuquerque, NM
3246th Test Wing, Eglin AFB, FL

George C. Nield IV, 27; Capt. USAF
Washington, DC; (HS) Annandale, VA
USAF Flight Test Center, Edwards AFB, CA

- more -

Frederick K. Olafson, 30; Capt. USAF
Seattle, WA; (HS) Westport, WA
3246th Test Wing, Eglin AFB, FL

Ellison S. Onizuka, 31; Capt. USAF
Kealakekua, HI; (HS) Kealakekua, HI
USAF Test Pilot School, Edwards AFB. CA

Michael T. Probasco, 26; 1st Lt. USAF
Houston, TX; (HS) Topeka, KS
SA-ALC/MMSRE, Kelly AFB, TX

Jerry L. Ross, 29; Capt. USAF
Gary, IN; (HS) Crown Point, IN
USAF Flight Test Center, Edwards AFB, CA

Vernon P. Saxon, Jr., 32; Capt. USAF
Birmingham, AL; (HS) Bellevue, NE
USAF Test Pilot School, Edwards AFB, CA

Charles W. Schillinger, 34; Capt. USMC
Chicago, IL; (HS) Holland, MI
NAS Whidbey Island, Oak Harbor, WA

Robert L. Stewart, 35; Major USA
Washington, DC; (HS) Hattiesburg, MS
US Army Aviation Engineering Flight Activity, Edwards AFB, CA

Erik M. Stolle, 29; civilian
Pensacola, FL; (HS) Chatsworth, CA
USAF Test & Evaluation Center, Kirtland AFB, NM

Charles A. Vehlow, 31; Capt. USA
Waukesha, WI; (HS) Waukesha, WI
Naval War College of Command & Staff, Newport, RI

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:
October 21, 1977

RELEASE NO: 77-67

NOTE TO EDITORS

THE JOHNSON SPACE CENTER WILL HOST VISITS FROM TWO DIGNITARIES THIS HOLIDAY WEEKEND

On Saturday, His Excellency, Mr. Leo Tindemans, the Prime Minister of Belgium, will visit the space center beginning at 2:45 pm. Mr. Tindemans will be shown exhibits and training facilities by Dr. Owen Garriott, science pilot on the Skylab 3 mission.

On Monday, His Royal Highness, The Prince Charles, Prince of Wales, will visit the center beginning at 10:20 am. Christopher Kraft, Jr., center director, and John Young, astronaut office chief, will tour the Prince.

Photo opportunities are planned for both events. No interviews will be scheduled.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-68

For Release:

October 31, 1977

NASA SIGNS SUPPLEMENTAL AGREEMENT WITH FORD AEROSPACE

The NASA Johnson Space Center has signed a supplemental agreement to the contract with Ford Aerospace Communications Corporation, Houston, covering maintenance and operations, ground data hardware and software engineering at the Center.

Also covered under the contract are systems engineering and integration, logistics and reliability for the Mission Control Center and other ground-based data systems managed by JSC.

The supplement to the cost-plus-award-fee contract is valued at $2,253,113, bringing the cumulative contract value to $49,766,449.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-69

For Release:

October 31, 1977

JSC PICKS TAFT BROADCASTING FOR TV CONTRACT NEGOTIATIONS

The NASA Johnson Space Center, Houston, has selected Taft Broadcasting Corporation of Houston for negotiations leading to a television support services contract at the Center.

Covering engineering, installation, maintenance and operation of television systems, the proposed cost and fixed-fee contract will run from January 1 through December 31, 1978, and will have an estimated value of $981,429. The contract will provide for two additional one-year optional extensions.

###

NASA News

National Aeronautics and
Space Administration

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

Milton E. Reim

For Release:
Friday, November 4 , 1977
Noon

RELEASE NO: 77-70

NINTH GROUP OF ASTRONAUT APPLICANTS FOR SHUTTLE AT JSC NOV. 7-11

The ninth group of Space Shuttle astronaut applicants is scheduled to be at the NASA Johnson Space Center, November 7-11 for a week of physical examinations and individual interviews.

This group includes 21 mission specialist applicants and two pilot applicants. Eleven of the applicants are military with representatives from each of the four services. Two of the applicants are women bringing the total number of women applicants to 20.

Of the 8,079 who applied for the Space Shuttle astronaut program, approximately 200 are being brought to JSC in groups of 20 or more for further screening. With this group, 183 applicants have been selected to come to JSC for further screening. Of the above, 79 are pilots and 104 are mission specialist applicants.

As many as 20 astronaut candidates will be selected in each category -- pilot and mission specialist. Those selected will be notified in December and will report to JSC at a later date for a two-year training and evaluation period. The candidates will become astronauts after satisfactory completion of the two-year period.

The names, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this ninth group are:

-more-

Lt. Franklin S. Achille, 29, USN
Doylestown, PA; (HS) Los Altos, CA
Naval Air Test Center, Patuxent River, MD

Lt. David W. Anderson, 29, USN
Lincoln, IL; (HS) Princeton, IN
Naval Air Test Center, Patuxent River, MD

Maj. Guion S. Bluford, Jr., 34, USAF
Philadelphia, PA; (HS) Philadelphia, PA
Wright Patterson AFB, Dayton, OH

Lt. Joseph C. Boudreaux III, 30, USN
New Orleans, LA; (HS) Severna Park, MD
Cruiser Destroyer Group 5, FPO San Francisco, CA

David R. Dougherty, 32, Ph.D
Enid, OK; (HS) Enid, OK
Louisiana State University, Baton Rouge, LA

Capt. Thomas E. Edwards, 35, Ph.D, US Army
Starkville, MS; (HS) Starkville, MS
US Army Air Mobility Research and Development Lab
NASA/Langley Research Center, Hampton, VA

Maj. John M. Fabian, 38, Ph.D, USAF
Goosecreek, TX; (HS) Pullman, WA
USAF Academy, CO

William F. Fisher, 31, MD
Dallas, TX; (HS) N. Syracuse, NY
Los Angeles, CA

CDR Stuart J. Fitrell, 38, USN (Pilot)
Cleveland, OH; (HS) East Cleveland, OH
Commanding Officer, Attack Squadron 66, NAS, Cecil Field, FL

Lt. Dale A. Gardner, 28, USN
Fairmont, MN; (HS) Savanna, IL
NAS, Pt. Mugu, CA

Robert L. Golden, 37, Ph.D
Alameda, CA; (HS) Alameda, CA
NASA/Johnson Space Center, Houston, TX

Terry J. Hart, 31
Pittsburgh, PA; (HS) Pittsburgh, PA
Bell Telephone Laboratories, Whippany, NJ

-more-

Barbara J. Holden, 32, Ph.D
Los Angeles, CA; (HS) Lincoln, NE
Naval Weapons Center, China Lake, CA

Gary R. Jackman, 32, Ph.D
Waterbury, CT; (HS) Cheshire, CT
University of Florida, Gainesville, FL

Lawrence W. Lay, 33, DO
Kansas City, MO; (HS) Kansas City, MO
Flint Osteopathic Hospital, Flint, MI

Samuel E. Logan, 30, MD
Los Angeles, CA; (HS) Woodland Hills, CA
UCLA Medical School, Los Angeles, CA

Gregory B. McKenna, 28, Ph.D
Pittsburgh, PA; (HS) Pittsburgh, PA
National Bureau of Standards, Washington, D.C.

Judith A. Resnik, 28, Ph.D
Akron, OH; (HS) Akron, OH
Xerox Corporation, El Segundo, CA

Capt. Eugene A. Smith, 32, USAF
Utica, NY; (HS) Middleville, NY
Office of the Secretary of the Air Force
Los Angeles Air Force Station, CA

Maj. Robert C. Springer, 35, USMC (Pilot)
St. Louis, MO; (HS) Ashland, OH
Naval Air Test Center, Patuxent River, MD

Norman E. Thagard, 34, MD
Marianna, FL; (HS) Jacksonville, FL
Medical University of South Carolina, Charleston, SC

James D. vanHoften, 33, Ph.D
Fresno, CA; (HS) Millbrae, CA
University of Houston, Houston, TX

Capt. Robert C. Ward, 35, USAF, MD
Homestead, FL; (HS) Miami, FL
Hill AFB, UT

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-71

For Release

November 4, 1977
2 p.m. CST

JSC PICKS ILC INDUSTRIES FOR SHUTTLE CREW EQUIPMENT

The NASA Johnson Space Center has selected ILC Industries, Inc. of Frederica, Maryland, for negotiations leading to a contract for development, production and support of Space Shuttle crew equipment and stowage provisions.

Estimated value of the cost-plus-fixed-fee contract will be $1.2 million. The contract will begin January 2, 1978 and end September 30, 1980.

Covered under the contract will be crew clothing "shipsets," Orbiter survival kit, crew lifevest, personal hygiene kits, ancillary crew provisions, and Orbiter stowage provisions. The contract will also cover replacement, servicing and maintenance, and special studies involving the crew equipment.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-72

For Release:

November 4, 1977

STONESIFER HEADS NEW JSC EXPERIMENTS OFFICE

John C. Stonesifer has been named to head the newly created JSC Life Sciences Experiments Program Office. JSC is the lead NASA field center for program management, planning, development and operation of life sciences experiments to be carried aboard Space Shuttle and other future spaceflight programs.

Life sciences flight experiment activities at JSC, at Ames Research Center and at Kennedy Space Center will be managed by the new program office.

Stonesifer will continue as acting chief of the JSC Bioengineering Systems Division until a replacement is named.

Stonesifer joined NASA in 1957 at the Langley Research Center and transferred to the NASA Space Task Group in 1962 during Project Mercury. He was chief of the JSC Recovery Branch before becoming chief of the Bioengineering Systems Division. He holds a BS degree from the University of Miami.

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:
Upon Receipt

RELEASE NO: 77-73

ALSO RELEASED AT NASA HEADQUARTERS

NASA'S LANDSAT TO MONITOR COMMERCIAL TIMBER RESOURCES

NASA and the St. Regis Paper Co., New York City, have agreed to use NASA's Landsat satellite to demonstrate the technical and economic effectiveness of monitoring commercial timber resources scattered throughout a five-state area from 900 kilometers (560 miles) altitude. The Landsat data will be computer processed into a forest resource information system to be used in the management of the St. Regis timberland reserves.

NASA's Johnson Space Center, Houston, Texas, will provide technical expertise in the development of an automatic classification system covering forested areas.

The objectives of the cooperative venture are: to identify kinds of trees, estimate timber volume and productivity, implement techniques to detect changes in the health and growth of the forests and integrate the new technology with existing operational data bases (aerial photography and survey information).

- more -

Remotely sensed forest resource information (Landsat data) will be provided by Johnson Center through the Laboratory for Applications of Remote Sensing (LARS), Purdue University, Lafayette, Indiana. LARS will be operating under a separate contract from Johnson Center.

The St. Regis project manager will direct day-to-day operations of the experiment, expected to last through 1980. The NASA project manager will coordinate the LARS-Purdue and Johnson Center technical efforts.

The land area to be surveyed as part of the experiment consists of forestland owned by the St. Regis Co. in Florida, Georgia, Alabama, Mississippi and Louisiana.

All software and techniques developed through this experiment will be considered in the public domain and can therefore benefit other forest resource managers besides St. Regis.

This experiment is the first major demonstration of its kind between a private company and NASA. Cooperative ventures exploring applications of Landsat and other remote sensors in the past have been with NASA and other U.S. or foreign government departments.

Landsat, circling the globe 14 times a day 900 km (560 miles) overhead, surveys Earth natural resources with an electronic multispectral scanner that returns data for visual images and computer tapes from which experts can distinguish different types of terrain, vegetation, soils, rock outcrops and other surface features.

Besides mapping forests and possible mineral areas, the data has been used for -- among other things -- measuring crop acreages, mapping snow cover, detecting oil slicks, mapping urban and agricultural land use, detecting offshore dumping of sewage and industrial waste, monitoring the environmental effects of strip mining and locating potential earthquake zones.

Landsat-1 has been in operation since July 1972 and a sister spacecraft, Landsat-2, since January 1975. A third one is planned for launch by NASA next year.

###

November 7, 1977

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

For Release:
November 7, 1977

RELEASE NO: 77-74

ALSO RELEASED AT NASA HEADQUARTERS
AND DRYDEN FLIGHT RESEARCH CENTER

SHUTTLE ORBITER FERRY TEST FLIGHTS PLANNED

Four ferry test flights of the Space Shuttle Orbiter *Enterprise*, mated to the Boeing 747 Shuttle Carrier Aircraft (SCA), have been scheduled for November 14, 15, 17 and 18 at NASA's Dryden Flight Research Center.

The flights will be made to measure the performance of the mated combination with a three degree forward angle between them. Previous flights were flown with a six degree angle.

Data gathered will be used for planning the first ferry flight, now scheduled for March 1978, when Orbiter Vehicle 101 (the *Enterprise*) will be transported atop the 747 to the NASA Marshall Space Flight Center in Huntsville, Alabama, for ground vibration tests.

Subsequent ferry flights will transport future Orbiters to NASA's Kennedy Space Center in Florida where they will be launched into space following their construction at the Rockwell International facility, Palmdale, California. After the first four orbital flights, which will be recovered at Dryden, the Orbiter used in those tests will also be returned to Kennedy atop the SCA.

In subsequent flights, the Orbiters will return and land at the Florida center.

In addition to determining what the best speed and altitudes are for ferry flight configuration, other test conditions to be explored include holding-pattern performance and engine-out performance, both in cruise and the landing/takeoff pattern. The first flight will primarily examine buffet and flutter on the SCA's horizontal tail.

Maximum speed for the series of four ferry flight tests should be approximately 450 mph, peak altitude will be 26,000 feet, and top take-off weight will be 710,000 lbs.

Crew for 747 will be Fitzhugh Fulton, SCA commander, and Tom McMurtry, SCA pilot. Flight engineers will be Victor Horton and Skip Guidry. The four were members of the prime crew who flew the 747 in the approach and landing test flights, completed on October 26, 1977.

The NASA Johnson Space Center, Houston, is responsible for the design, development and testing of the Space Shuttle Orbiter.

###

NASA News

National Aeronautics and
Space Administration

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

Milton E. Reim

RELEASE NO: 77-75

For Release:

November 11, 1977
Noon

TENTH GROUP OF ASTRONAUT APPLICANTS REPORT TO JSC NOVEMBER 14

The tenth group of Space Shuttle astronaut applicants is scheduled to report to the NASA Johnson Space Center on November 14, for a week of physical examinations and individual interviews.

This group includes 24 mission specialist applicants and one pilot applicant. Eight of the applicants in this group are military and one is a woman.

There were 8,079 applicants for the Space Shuttle astronaut program. From these, 208 have been selected to be brought to JSC in groups of 20 or more for further screening.

Including this group of 25 applicants, 80 pilot and 128 mission specialist applicants (21 were women) will have been at JSC for further screening prior to the final selection.

Notification of selection of as many as 20 astronaut candidates in each of the categories---pilot and mission specialist---will be made in December. The candidates will report at a later date to JSC for a two-year evaluation and training period before their final selection as astronauts.

The name, age, degrees and/or military rank, place of birth, high school (HS), and current duty station or place of employment of the individuals in this tenth group are:

- more -

Atwood, William B., 30, Ph.D.
Nashua, NH; (HS) Williamstown, MA
CERN, EP Division, Geneva, Switzerland

Belcher, Robert C., 28
Del Rio, TX; (HS) Brackettville, TX
University of Texas (graduate student), Austin, TX

Bird, Ronald S., 35, LCDR, USN, Ph.D.
Ann Arbor, MI; (HS) Clearwater, FL
Pacific Missile Test Center, Pt. Mugu, CA

Buchli, James F., 32, Capt., USMC
New Rockford, ND; (HS) Fargo, ND
Naval Air Test Center, Patuxent River, MD

Cox, John T., 33, Ph.D.
New York, NY; (HS) Sherman Oaks, CA
NASA/JSC, Houston, TX

Cruce, Andrew C., 34, Ph.D.
Fresno, CA; (HS) Tulsa, OK
Naval Air Test Center, Patuxent River, MD

Diner, David J., 24, Ph.D.
New York, NY; (HS) Bronx, NY
Caltech, Pasadena, CA

Ephrath, Ayre R., 35, Ph.D.
Czechoslavakia; (HS) Tel Aviv, Israel
University of Connecticut, Storrs, CT

Galik, Richard S., 26, Ph.D.
Hackensack, NJ; (HS) Lyndhurst, NJ
Rittenhouse Labs, University of Pennsylvania, Philadelphia, PA

Gregory, Frederick D., 36, Maj., USAF (Pilot)
Washington, D.C.; (HS) Washington, D.C.
Armed Forces Staff College, Norfolk, VA

Hagar, Hamilton, Jr., 37, Ph.D.
New York City, NY; (HS) Sarasota, FL
Jet Propulsion Laboratory, Pasadena, CA

Jones, John F., Jr., 31, Ph.D.
Detroit, MI; (HS) Berkley, MI
Sandia Laboratories, Livermore, CA

Lichtenberg, Byron K., 29
Stroudsburg, PA; (HS) Stroudsburg, PA
MIT, Cambridge, MA

Maine, Richard E., 26
Louisville, KY; (HS) Charlottesville, VA
NASA/Dryden Flight Research Center, Edwards AFB. CA

McNair, Ronald E., 27, Ph.D.
Lake City, SC; (HS) Lake City, SC
Hughes Research Laboratories, Malibu, CA

Ortega, Joseph K. E., 31, Ph.D.
Trinidad, CO; (HS) Denver, CO
University of Colorado, Boulder, CO

Rhoads, Harold S., 31, Capt., USAF, Ph.D.
Lexington, KY; (HS) Lexington, KY
4950th Test Wing, Kirtland AFB, NM

Richards, David W., 34, M.D., Ph.D.
San Pedro, CA; (HS) Demarest, NJ
North Broward Emergency Physician, Ft. Lauderdale, FL

Schlein, Paul B., 33, LCDR, USN, Ph.D.
Stockton, CA; (HS) Manteca, CA
NAVELEX, Washington, D.C.

Sessoms, Alan L., 30, Ph.D.
New York, NY; (HS) New York, NY
Harvard University, Cambridge, MA

Strada, Joseph A., 32, LCDR, USN, Ph.D.
Philadelphia, PA; (HS) Cherry Hill, NJ
SAMSO, Los Angeles Air Force Station, CA

Sullivan, Kathryn D., 26
Paterson, NJ; (HS) Woodland Hills, CA
Dalhousie University (graduate student), Halifax, Nova Scotia

Vieira, David J., 27, Ph.D.
Oakland, CA; (HS) Castro Valley, CA
Lawrence Berkeley Lab, University of California, Berkeley, CA

Walton, James R., 30, Capt., USAF, Ph.D.
Ithaca, NY; (HS) Pittsburgh, PA
366th Tactical Fighter Wing, Mountain Home AFB, ID

Weir, Charles R., 29, Lt., USCG
Sidney, NE; (HS) Gurley, NE
Oceanographic Unit, U.S. Coast Guard, Washington, D.C.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-76

For Release:

November 15, 1977
2:00 p.m. CST

NASA SIGNS ADD-ON TO ORBITER CONTRACT

The NASA Johnson Space Center, Houston, has signed a supplemental agreement with Rockwell International Corporation's Space Division of Downey, California, covering engineering change orders on the Space Shuttle Orbiter.

The supplement is valued at approximately $226 million, bringing the total Rockwell contract value to approximately $3.2 billion.

Covered in the supplement are changes such as addition of the Orbiter lightning protection system, payload and systems integration activities, avionics changes, spares provisioning, support of the Shuttle carrier aircraft during Approach and Landing Test, and many miscellaneous changes.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

Release No: 77-77

For Release:

November 15, 1977
2:00 p.m. CST

NASA SIGNS ADD-ON TO FORD CONTRACT

The NASA Johnson Space Center, Houston, has signed a contract modification with Ford Aerospace and Communications Corporation covering hardware and software systems engineering, and maintenance and operations of the Mission Control Center and other ground-based data systems at JSC.

Valued at $1,412,716, the modification brings the total value of the cost-plus-award-fee Ford contract to $51,279,165.

###

NASA News

National Aeronautics and
Space Administration

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

Milton Reim

For Release:
Upon Receipt

RELEASE NO: 77-78

ALSO RELEASED AT NASA HEADQUARTERS

UNITED STATES, SOVIET SPACE TALKS SCHEDULED

NASA and the Soviet Union's Academy of Sciences will hold discussions November 14-17 in Moscow concerning further cooperation in space. The talks are a result of an agreement reached by NASA and the Soviet Academy of Sciences May 11, 1977, following a meeting of representatives of the two agencies in Washington.

The U.S. delegation is headed by Dr. Noel Hinners, Associate Administrator for Space Science, NASA Headquarters. The Soviet delegation is expected to be led by Dr. Boris Petrov, Chairman of the Intercosmos Council of the Soviet Academy of Sciences.

The Moscow meetings are exploratory and their purpose is to identify candidate areas for studies to define a possible joint experimental program in the 1980's using spacecraft of the U.S. Space Shuttle type and the Soviet Salyut type.

- more -

The delegation will meet as two working groups; one on science and applications, chaired by Dr. Hinners, and one on operations, chaired by Dr. Glynn Lunney, manager of the Shuttle Payload Integration and Development Program Office at NASA's Johnson Space Center, Houston, Texas.

The two working groups will seek to define scientific areas for possible experimentation which might benefit from the flexible delivery capability and large capacity of the Space Shuttle and the capability for longer stay time in orbit represented by the Salyut.

In another area, the eighth annual meeting of the NASA-Soviet Space Biology and Medicine Working Group will be held November 19-25 at NASA's Wallops Flight Center, Wallops Island, Virginia. Prior to the formal meeting, a workshop on simulated weightlessness will be held November 16-18 in Bethesda, Maryland. The workshop and meeting are part of a continuing program under the 1971 Science and Applications Agreement between NASA and the Soviet Academy of Sciences.

The meeting will focus on biomedical results, including the preliminary results of the Cosmos 936 flight on which U.S. experiments were flown; a briefing from the Soviets on Salyut 5/Soyuz 19 mission; and a U.S. briefing on the Spacelab Missions Demonstration Test. Participants will also discuss forcasting man's health state in weightlessness and the research approach to studying space motion sickness.

The U.S. delegation of the formal meeting will be headed by Dr. David Winter, NASA Director for Life Sciences. Dr. Rufus Hessberg, Director of Space Medicine, will head the U.S. workshop participants. The Soviet leader at both meetings will be Dr. Nikolai Gurovsky of the U.S.S.R. Ministry of Health.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-79

For Release
November 17, 1977
2 pm CST

JSC EXTENDS ALPHA CONSTRUCTION PACT

The NASA Johnson Space Center, Houston has awarded a cost-plus-award-fee contract to Alpha Building Corporation of Houston for continued construction support services at the Center.

The contract covers minor construction and alteration of laboratory systems, facilities, utilities, roads, sewers, walks and other projects estimated at $10,000 or less. Beginning December 1, 1977 and ending November 30, 1978, the estimated cost and fee for the contract is $1,670,000.

NASA has the option at the end of the second contract year to extend for one additional year.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-80

For Release:

November 22, 1977
2 p.m. CST

JSC BROADENS SINGER SIMULATOR CONTRACT

The NASA Johnson Space Center, Houston, has modified the contract with the Link Division of the Singer Company to cover additional work at the JSC simulation complex. The addition covers major modifications to the Shuttle Procedures Simulator, increase in Shuttle Mission Simulator and Orbiter Aeroflight Simulator activity, and broadening of contract scope to include simulated space operations with the Interim Upper Stage and Solid Spinning Upper Stage.

Work performed under the contract includes systems and hardware engineering, software development, drafting and illustration, modifications to simulators, maintenance, operations and servicing. The JSC simulation complex is used for Space Shuttle flight crew training.

The total estimated cost of the additional work in the Singer cost-plus-award-fee contract is $6,092,500, bringing the contract total value to $13,035,541. The contract runs from July 31, 1976 to July 30, 1978.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77- 81

For Release:

November 25, 1977
2:00 pm CST

JSC SIGNS ADD-ON TO ORBITER PACT

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the Shuttle Orbiter contract with Rockwell International Space Division, Downey, California, covering engineering changes. The changes are Orbiter training equipment, modifications to the Boeing 747 Shuttle Carrier Aircraft used for ferry flights and the now-completed approach and landing tests, and spare parts.

Valued at $2,665,958, the supplement brings the total estimated worth of the Rockwell Orbiter contract to $3.2 billion.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-81

For Release:

December 5, 1977
2:00 p.m. CST

NASA SIGNS ORBITER CONTRACT ADD-ON

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the Rockwell International Corporation cost-plus-award-fee contract covering three subcontracts. Changes to the Rockwell contract are on a cost-plus-fixed-fee basis.

Covered are multiplexer interface adapters and inertial measurement units supplied by Singer Kearfott, and thermal circuit breakers supplied by Mechanical Products.

The addition to the Rockwell contract for the Space Shuttle Orbiter is valued at approximately $4.6 million, bringing the estimated total contract value to $3.27 billion.

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-82

For Release:

Upon Receipt

FRIENDSWOOD, TEXAS RESIDENT NOMINATED FOR SPACELAB CREW POSITION

William E. Thornton, 1963 graduate of the University of North Carolina Medical School, has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Dr. Thornton, an astronaut with the Johnson Space Center in Houston, is one of 18 scientists from across the country being considered for the position of Spacelab "payload specialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

- more -

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained specifically for the one mission, unlike NASA's permanent astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

Thornton, a member of the highly successful 56-day Skylab medical experiments simulation team, and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Alabama, where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas subh as thermodynamics, materials processing and lubrication.

The flight will last seven days.

###

December 5, 1977

Alumni Review
Roland Giduz, Editor
General Alumni Assoc. of
the Univ. of N.C.

Box 660
Univ of N.C.
Chapel Hill, N.C. 27514

Chapel Hill Newspaper
Ladd Baucom, Editor
Orville B. Campbell, Publisher
505 W. Franklin St.
Chapel Hill, NC 27514

Chapel Hill + UNC

NASA News

National Aeronautics and
Space Administration

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

Amos Crisp, 205/453-0034
Residence, 205/539-5640

For Release
Release No. 77H-122

FRIENDSWOOD RESIDENT NOMINATED FOR SPACELAB CREW POSITION

MARSHALL SPACE FLIGHT CENTER, Ala. -- William E. Thornton, 1963 graduate of UNC Medical School, ~~Friendswood, Texas~~ has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Dr. Thornton, an astronaut with the Johnson Space Center in Houston, is one of 18 scientists from across the country being considered for the position of Spacelab "payload specialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained specifically

-more-

November 25, 1977

for the one mission, unlike NASA's permanent astronaut-pilots and astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

A member of the highly successful 56-day Skylab medical experiments simulation team, Thornton and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Ala., where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The introduction of the payload specialist fulfills a promise made by NASA years ago to the scientific community--that the new Space Shuttle would at last enable scientists to ride up into earth orbit and actually operate their own experiments in space.

The 18 American candidates for Spacelab 1 positions represent a wide range of disciplines and backgrounds. They include medical doctors, academic researchers and industrial scientists. The candidates range in age from 24 to 60.

-more-

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas such as thermodynamics, materials processing and lubrication.

The flight will last seven days.

-30-

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-83

For Release:

Upon Receipt

SEABROOK, TEXAS RESIDENT NOMINATED FOR SPACELAB CREW

R. Thomas Giuli, son of Mr. and Mrs. Thomas Giuli, PH-1, 2415 Ala Wai Blvd., Honolulu, has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Giuli, an astronomer with the NASA Johnson Space Center, Houston, Texas, is one of 18 scientists from across the nation being considered for the position of Spacelab "payload spacialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

- more -

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained specifically for the one mission, unlike NASA's permanent astronaut-pilots and astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

Giuli and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Alabama, where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas such as thermodynamics, materials processing and lubrication.

The flight will last seven days.

###

December 5, 1977

Advertiser
George Chaplin, Editor
T. Twigg Smith Publisher
News Bldg
605 Kapiolani Blvd.
Honolulu, Hi 96813

Star Bulletin
A. A. Smyser, Editor
J. A. Scott, Publisher
News Bldg.
605 Kapiolani Blvd.
Honolulu, Hi 96813

sent copies to
Honolulu Papers

R. Thomas Giuli, son of Mr. and Mrs. Thomas Giuli, PH-1, 2415 Ala Wai Blvd., Honolulu, hass been nominated for a crew position aboard Spacelab 1, an orbiting scientific labxoratory scheduled for launch in mid-1980. Giuli, an astronomer with the NASA Johnson Space Center, Houston, Texas, is one of 18 scientists from across the nation being considered for the position of Spacelab "payload specialist."

NASA News

National Aeronautics and
Space Administration

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

Amos Crisp, 205/453-0034
Residence, 205/539-5640

For Release:
Release No. 77H-122

Penthouse - 1 2415 Ala Wai Blvd HA 96815 Honolulu

SEABROOK RESIDENT NOMINATED FOR SPACELAB CREW

Thomas & Doris

MARSHALL SPACE FLIGHT CENTER, Ala. -- R. Thomas Giuli of Seabrook, Texas, has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Giuli, an astronomer with the Johnson Space Center in Houston, Texas, is one of 18 scientists from across the country being considered for the position of Spacelab "payload specialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

-more-

November 25, 1977

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained specifically for the one mission, unlike NASA's permanent astronaut-pilots and astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

Giuli and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Ala., where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The introduction of the payload specialist fulfills a promise made by NASA years ago to the scientific community--that the new Space Shuttle would at last enable scientists to ride up into Earth orbit and actually operate their own experiments in space.

The 18 American candidates for Spacelab 1 positions represent a wide range of disciplines and backgrounds. They include medical

-more-

doctors, academic researchers and industrial scientists. The candidates range in age from 24 to 60.

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas such as thermodynamics, materials processing and lubrication.

The flight will last seven days.

-30-

NASA News

National Aeronautics and
Space Administration

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

Terry White

For Release:
November 28, 1977
2:00 pm CST

RELEASE NO: 77-84

JSC SIGNS IBM TO MAINTAIN ORBITER DATA PROCESSORS

The NASA Johnson Space Center has signed a cost-plus-award-fee contract with International Business Machines Corporation of Gaithersburg, Maryland, for maintenance of Space Shuttle Orbiter data processing hardware. IBM will furnish people, equipment, materials, facilities, services and management for maintaining IBM-built Orbiter data processing equipment.

The contract is valued at about $2,236,300.

###

NASA News

National Aeronautics and
Space Administration

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

Terry White

RELEASE NO: 77-85

For Release:

December 12, 1977
2:00 p.m. CST

NASA SUPPLEMENT COVERS DOZEN ORBITER CHANGES

The NASA Johnson Space Center, Houston, has signed a supplemental agreement to the cost-plus-award-fee Rockwell International Corporation Space Shuttle Orbiter contract. Supplements covering changes are on a cost-plus-fixed-fee basis.

The supplemental agreement covers 12 previously-authorized changes and proposals, including Government-supplied equipment (GSE), overhaul and repair, spares, hardware for component testing, and special studies.

The supplement adds $3,437,644 to the estimated $3.2 billion Orbiter contract.

###

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77- 86

For Release:

December 15, 1977

MISSION CONTROL CENTER TO BENEFIT FROM SOLAR POWER

The Mission Control Center at the Lyndon B. Johnson Space Center was recently modified to enable the dehumidification equipment servicing the building to operate partially through solar power.

Normally the moisture in the computer facility is extracted from the building air system by passing air over cooling coils where the moisture condenses out. The air then passes through a heat exchanger where it is heated to the proper temperature using hot water from the space center's central steam plant.

Solar panels installed on the roof of the control center will be used to supplement the steam system. The solar panels are part of a closed system which circulates water through the panels, a heat-exchanger, pumps, expansion tanks, and back through the solar panels.

-more-

Weather service calculations for the Houston area indicate the solar system should be able to provide complete or supplemental heating for 60 percent of the time. The heat the panels provide will save about 1.5 million cubic feet of natural gas a year. This is the equivalent gas use of about 16 4-bedroom homes.

The mission control solar system construction cost is about $240,000. The solar system was constructed as part of a joint NASA/Department of Energy solar energy demonstration project. Several other NASA centers are also participating in the project.

###

December 15, 1977

NASA News

National Aeronautics and
Space Administration

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

Charles Redmond

RELEASE NO: 77-87

For Release:

Upon Receipt

HOUSTON RESIDENT NOMINATED FOR SPACELAB CREW

James E. Myrick, son of Mr. and Mrs. Charles E. Myrick of Centre, Alabama, has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Myrick, an anlytical biochemist with the Johnson Space Center in Houston, is one of 18 scientists from across the country being considered for the position of Spacelab "payload specialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

- more -

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained specifically for the one mission, unlike NASA permanent astronaut-pilots and astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

Myrick and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Alabama, where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas such as thermodynamics, materials processing and lubrication.

The flight will last seven days.

###

December 14, 1977

Gadsden Times
401 Locust St.
P.O. Box 188
Gadsden, AL 35967

NASA News

National Aeronautics and
Space Administration

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

Amos Crisp, 205/453-0034
Residence, 205/539-5640

For Release:
Release No. 77H-123

HOUSTON RESIDENT NOMINATED FOR SPACELAB CREW

MARSHALL SPACE FLIGHT CENTER, Ala. -- James E. Myrick ~~of Houston~~, Texas, has been nominated for a crew position aboard Spacelab 1, an orbiting scientific laboratory scheduled for launch in mid-1980. Myrick, an analytical biochemist with the Johnson Space Center in Houston, is one of 18 scientists from across the country being considered for the position of Spacelab "payload specialist."

The first Spacelab mission is scheduled to have two such payload specialists aboard. Because this particular mission is a joint venture of NASA and the European Space Agency, one of these scientists will be a European.

Spacelab, which fits inside NASA's new Space Shuttle, consists of a pressurized, "shirtsleeve" environment laboratory module and an outside pallet for instruments which require exposure to space. The payload specialists who will operate this laboratory are unique in several ways.

They will be selected by the scientists who have experiments aboard the mission, not by NASA. They will be trained

-more-

November 25, 1977

specifically for the one mission, unlike NASA's permanent astronaut-pilots and astronaut-mission specialists. The responsibility of flying and maintaining the Space Shuttle vehicle will rest with the astronauts, leaving the payload specialists free to concentrate on operating the instruments and experiments put aboard by their scientific colleagues.

Myrick and the other 17 American candidates for this position aboard the first Spacelab were interviewed recently at NASA's Marshall Space Flight Center in Huntsville, Ala., where the first payload specialists are expected to undergo more than a year of training prior to their flight. Early next year the selection committee is expected to recommend two American and two European candidates for training. One pair will actually fly in space to operate the experiments of the scientists who selected them. The other two will provide support from the ground control center during the mission.

The introduction of the payload specialist fulfills a promise made by NASA years ago to the scientific community--that the new Space Shuttle would at last enable scientists to ride up into earth orbit and actually operate their own experiments in space.

The 18 American candidates for Spacelab I positions represent a wide range of disciplines and backgrounds. They include medical doctors, academic researchers and industrial scientists. The candidates range in age from 24 to 60.

-more-

The Spacelab 1 mission emphasizes stratospheric and upper atmospheric research, but research will also be done in plasma physics, biology, medicine, astronomy, solar physics, Earth observations and in technology areas such as thermodynamics, materials processing and lubrication.

The flight will last seven days.

-30-

NASA News

National Aeronautics and Space Administration

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

Charles Redmond

RELEASE NO: 77-88

For Release:
Upon Receipt

NEW LUNAR SCIENCE TEACHING AID DEVELOPED BY NASA

The National Aeronautics and Space Administration has developed a new lunar and planetary sciences teaching aid using actual samples of lunar material encased in a clear plastic disk. The new aid is aimed at both the earth science student through the Aerospace Education Program and the museum visitor through the NASA exhibits program.

The sample disks will be used as the basic component in both programs and is designed to be hand held so that both sides of a sample can be seen and, because of the clear plastic encasing, viewed through a microscope for greater resolution of the samples themselves.

The packets are designed to extend the lunar and planetary science education programs which have been developed by NASA over the past eight years. Presently, colleges can borrow thin-section microscope slides of lunar material. These thin-section kits include an extensive teaching manual and present lunar and planetary science material at a level appropriate to university petrology and mineralogy classes.

- more -

In addition to the thin-section kits, NASA has several dozen representative lunar samples prepared in display cases for exhibition at state fairs and museums.

Up to now there has been no program using lunar material which has been aimed at the secondary earth science student or the more curious science museum visitor. Many high schools and several museums throughout the country have innovative and entertaining "hands on" science classes and displays which invite participation. The new lunar sample educational packets are aimed for these audiences.

The program designed for high school earth science audiences will include a film on lunar science, the sample disk, workbook material, slides, an audio cassette, and will involve considerable interaction between the teacher and the class. The museum program will use a shorter sound-slide presentation and the disk. Both programs involve the student directly by means of the student's close examination of the samples and the interactive nature of the teacher's discussion material.

Student reaction to the material has already been tested using students at Houston-area and Lincoln, Nebraska, high schools. Reaction from both students and teachers has been extremely favorable. Museum visitor reaction will be tested early next year when eight prototype museum kits will be sent to the following museums: Pacific Science Center, Seattle, Washington; Oregon Museum of Science and Industry, Portland, Oregon; Palace of Arts and Science Exploratorium, San Francisco, California; Lawrence Hall of Science, Berkeley, California; Des Moines Center for Science and Technology, Des Moines, Iowa; Cranbrook Institute of Science, Bloomfield Hills, Michigan; Maryland Academy of Sciences/Maryland Science Center, Baltimore, Maryland; and the National Air and Space Museum, Smithsonian Institution, Washington, D.C.

The sample disks are methacrylate plastic, six inches in diameter, one-inch thick, and contain a one-half gram sample of each of the following lunar soil types: Lunar breccia (a broken surface soil type); a lunar basalt (solidified volcanic matter); a lunar anorthosite (an igneous rock composed of calcium, aluminum, silicon, and oxygen); a sample of the Moon's orange glassy soil; a sample of lunar Mare soil; and a sample of lunar Highland soil.

Eventually one hundred lunar sample disks are expected to be made for use in both of the programs. Each of the six samples in the disks weighs one-half gram and has been extensively analyzed by university or government researchers. The results of that analysis are included with each of the disks. The total amount of lunar material expected to be used for the program is about two-thirds of a pound. Apollo astronauts brought back 843.5 pounds of lunar material during the lunar explorations in the late 1960's and early 1970's.

Schools or museums interested in participating in this new program should contact the Public Affairs Office, Code AP4, L. B. Johnson Space Center, Houston, Texas 77058.

###

December 16, 1977