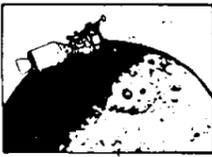


ROUNDUP

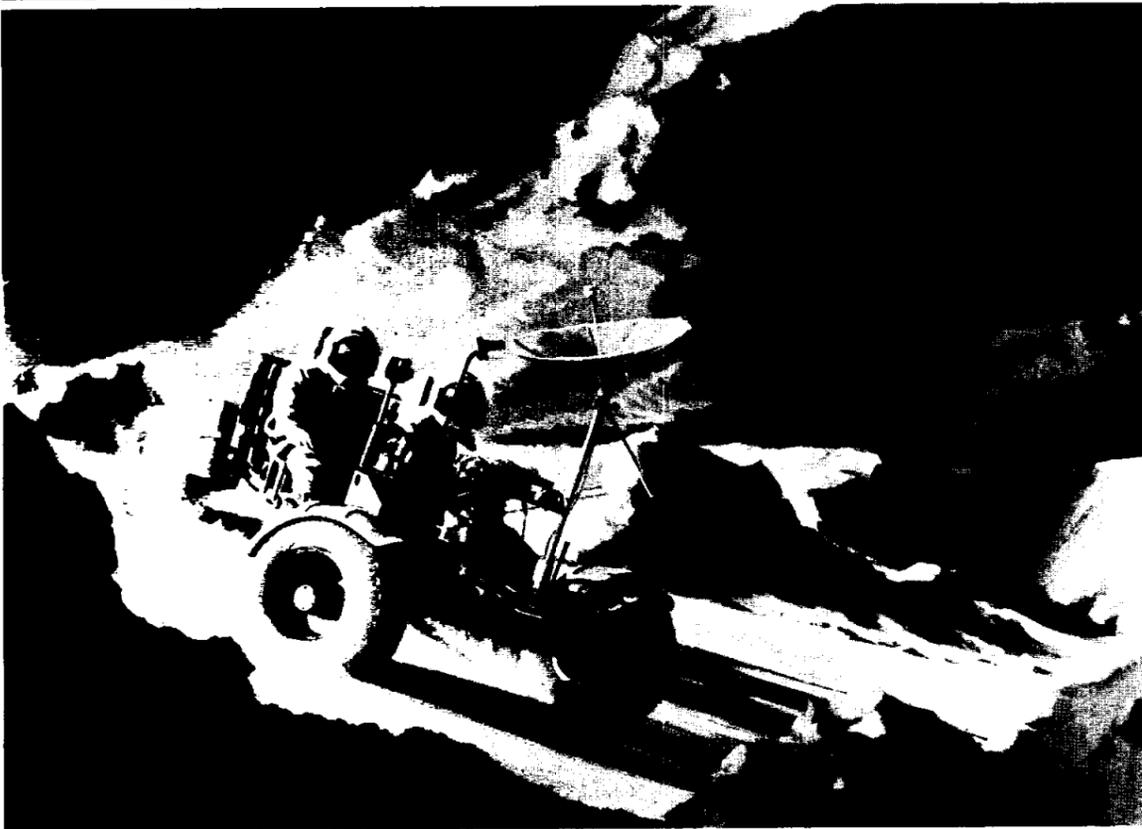
NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



VOL. 10 NO. 19

JULY 30, 1971



MOON BUGGY—In this artist's concept, Apollo 15 Commander Dave Scott (right) and Lunar Module Pilot Jim Irwin guide their lunar roving vehicle along the edge of the (approximately) half-mile-wide, 600-foot-deep Hadley Rille, with the Apennine Mountains in the background. Lunar touchdown is scheduled for late this afternoon. (See TV schedule, page 4). Photo courtesy of Teledyne Ryan

Lunar Touchdown on tap for today

Astronauts David Scott and James Irwin are scheduled to become the seventh and eighth Americans to leave their footprints in the lunar dust and the first to motor across the lunar surface.

While Scott and Irwin explore a rugged region of the moon, Command Module Pilot Alfred Worden is set to conduct an important series of lunar orbital photographic and scientific experiments as he circles the moon in the command ship "Endeavour."

The moon ship "Falcon" is scheduled to set down on the lunar surface late this afternoon in an area of rough ter-

rain near the Apennine mountain range and the rim of gorge-like Hadley Rille.

Launch of the Apollo 15 mission on Monday, July 26 at Cape Kennedy was letter perfect. Thunderstorms the night before blastoff caused some concern, but by morning the skies were clear. Over one million people are estimated to have watched the liftoff from the roadways, waterways, and viewing areas around the Cape.

On Monday and into Tuesday there was a possibility that the mission would not include a lunar landing. The possibility arose as a result of an electrical short in the circuits leading to the service propulsion system in the command module. A successful ignition of the SPS engine on Tuesday at 1:30 p.m. CDT brought the "go ahead" for plans to land on the moon.

An hour and a half after the lunar landing today, Commander Scott is to open the LM hatch for a standup EVA during which he will describe and photograph the terrain surrounding the landing site. The descriptions will aid controllers here in pinpointing the actual landing site.

The first EVA in which both Scott and Irwin are to leave the "Falcon" begins tomorrow morning (Saturday). After collecting a contingency soil sample, unpacking the lunar roving vehicle (LRV), and taking a test ride on the "moon buggy," the men are scheduled to drive to the rim of Hadley

Rille, to the base of the Apennine front between Elbow and St. George crater and to a possible Apennine debris flow area.

Returning to the landing site, the crew will deploy the Apollo Lunar Surface Experiments Package and erect an American flag. The first EVA is scheduled to last seven hours. Some of the experiments included in the ALSEP are the passive seismic experiment, the suprathreshold ion detector, the solar wind spectrometer and the lunar surface mag- (See *FIRST* Page 3)

Bailey, Bockting appointed to posts on MSC Council

Robert J. Bailey of the Apollo Spacecraft Program Office has been selected by MSC Director Robert R. Gilruth as chairman of the NASA Exchange Council-MS. He replaces former chairman Donald T. Gregory.

Marilyn J. Bockting of Flight Crew Operation has been appointed as secretary to the Council. She replaces Evelyn Teeters.

Bob, a veteran of 27 years with the government, came to MSC from Langley Research Center as a member of the Space Task Group. He and his wife Florence have three children, Diane, Judy, and Robert, Jr.

(See *COUNCIL*, Page 2)



SNOWED UNDER—Jean Ellis, secretary to Chief Scientist Gene Simmons, is almost hidden by the pile of envelopes containing "On the Moon with Apollo 15" which she is preparing for mailing. The 46-page, illustrated guidebook, written by Simmons, is available to the general public and explains the Science activities to be conducted on the lunar surface by the Apollo 15 crew.

15 Crew to wear suits

Following an evaluation of operational procedures for Apollo 15, NASA has decided that the astronauts will wear their pressure suits during jettison of the lunar module.

This maneuver is scheduled for 5:55 p.m. (CDT) Monday, August 2, shortly after the lunar landing crew has returned to the command module following their expedition to the surface of the moon.

The decision to have the crewmen fully suited at that time was based on a reevaluation of the requirements for crew members to wear pressure suits during different phases of the Apollo 15 mission.

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

The evaluation included a review of design, test and flight data of the windows, hatches,

valves, and tubing and wiring that penetrate the cabins of both the lunar module and command module.

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

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

No change was made in plans for the crew to be unsuited during reentry and splashdown. Although wearing suits would increase safety during reentry down to approximately 50,000 feet, the time from that altitude to the water is insufficient for removal of suits before splashdown.



A WALK IN SPACE—Apollo 15 crewman Al Worden (left) will retrieve film cassettes containing photos of the lunar surface taken from lunar orbit. The EVA will happen on the homeward portion of the mission when the CSM is approximately 200,000 miles from Earth, traveling at a speed of about 2,300 miles per hour. Crew member Jim Irwin (right) will play out combination umbilical/tether line and monitor the operation which is scheduled to be televised to Earth.



BIRD IN HAND WORTH TWO IN BUSH—The young man in this photo is holding a captured migratory bird. After it has been examined, the bird will be released to continue its migration while being tracked by ground radar at NASA's Wallops Island Facility.

NASA Center works "for the birds"

Not all of NASA's experiments take place thousands of miles out in space. One new project is a lot closer to Earth.

This is a migratory bird experiment by Cornell University at Ithaca, New York, for which NASA's Wallops Island Facility in Virginia is providing support.

Over the years, scientists have been fascinated with the built-in navigational systems of migrating birds.

Radar studies of bird migrations have provided descriptive information on the behavior of birds in flight. Experimental studies on captive animals have provided insight into the types of sensory cues that animals use.

However, until recently, it has not been possible to combine these two techniques and to manipulate experimentally the navi-

gational system of a free-flying bird as it travels along its migratory route.

Dr. Stephen T. Emlen and Natalie Demong of Cornell have devised a technique that makes this manipulation possible. Birds are captured in nets, examined, and then released to continue on their migrations under varying cloud conditions and darkness which is, in effect, a manipulation of their navigational system.

The bird is placed in a specially designed box and carried aloft by a weather balloon to an altitude of 3,000 to 6,000 feet. The bird is released at the desired altitude and can be tracked by ground radar as it actually makes its orientational decision and departs on migration.

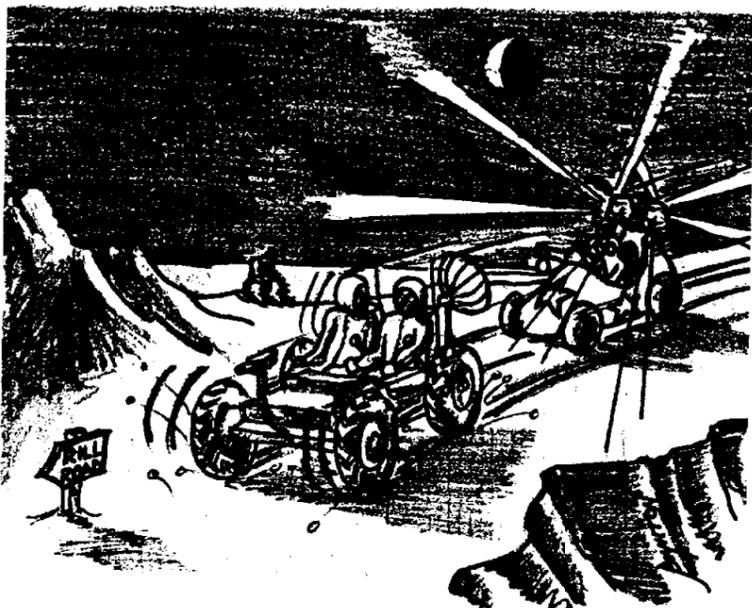
The Wallops Island Space Range Radar tracking radar is being used in these studies. This is a powerful, narrow beam, tracking radar. It has a 60-foot diameter "dish" antenna with digital position recording capability. In addition, the video return or blip in the radar monitor can be photographed on Polaroid film for real-time data.

The results from these studies are expected to give a much better idea of the importance of celestial, magnetic, topographic, and meteorological cues in the guidance systems of nocturnally migrating birds.

Hqs. PAO named

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

Donnelly will be responsible for the development and direction of NASA's public affairs activities including Public Information, Public Services, and Educational Programs.



UH, DAVE, I DON'T KNOW HOW TO TELL YOU THIS

(courtesy of John H. Boynton, MPAD)

Roundup Swap-Shop

(Deadline for Swap-Shop classified ads is Thursday of the week preceding Roundup publication date. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 20 words, including name, office code and home telephone number. Send ads, typed or legibly written, to Roundup Editor, AP3)

If you sent an ad to the ROUNDUP for publication and it did not appear in this column, it could be that you did not follow the directions above for submitting ads. Some editors may be clairvoyant; this one is not. Ads improperly submitted are consigned to the round file. EDITOR.

MISCELLANEOUS

Cage grown quail, dressed/frozen, \$1 each. Pirtle, 474-2138.

Portable stereo record player, good cndn \$35. 2-man tent needs minor repair, \$5. 3" reflecting astronomical telescope with two objectives and tripod, good cndn, \$15. 2-ton window air conditioner, good cndn \$75. Lippitt, M19-3200.

Singers best straight stitch portable sewing machine xint cndn. Gravett, 932-5241.

Amateur radio equipment; Swan 240 3 band SSB xceiver with AC supply/speaker, \$150; C.E. SSB transmitter 20A, with VFO, \$70; Drake SSB receiver 1A, \$75. Wiseman, Dickinson 534-3802.

Baby bed \$10. Wood play pen (folds up) \$5, Bassinette \$3, Potty chair \$2, used Avalon Hill games in good condition 1/2 price. Fischer, GR2-6910.

22" self-propelled lawn mower including grass catcher, \$15. B. Reina, 488-1326.

Lady Remington electric steam hair roller set, good condition, \$10. Newton, 491-4619.

20 gallon aquarium, stand, light, pump, etc., everything for the aquarium, including the fish. Lohman, 487-4233.

Cleveland Tenor Sax, excellent condition, good high school instrument, \$245. Miller, 471-2789.

Ping Pong Table and equipment, Spurlin, 643-4957.

Singer Zig Zag sewing machine and attachments, \$60. Spurlin, 643-4957.

Antique white bedroom set, bookcase headboard, mattress, box springs, double dresser, mirror and chest, Grundig 880 Hi-Fi and gold swivel chair, \$100. Marlowe, 482-3616.

Complete Danish modern bedroom suite, including mattress and box springs, "A real steal" for only \$250. Moving, must sell. Heyer, 747-6966.

Learn Macrame. Complete course \$9,

classes Aug. 2,3 at 6:30 p.m. Redding, 932-2077.

Golf clubs and bag. Putter, 3,4,5,6,7,9, Wedge, two woods, good cndn, \$35 or best offer. Worley, 488-3294.

Hi point tennis racket, used only 5 times, \$13 or best offer. Worley, 488-3294.

Sears 2-can garbage toter, \$5. 2ea. 8.50x14 tires, \$2 ea. Hooper, 488-4120.

Home accessories, some furniture, women's clothes—sizes 10, 12, and 14; bicycles, fishing tackle, original paintings, etc. July 30 and 31, 10 to 7, 435 Pebblebrook, El Lago Village, (Seabrook).

Alto sax, Buescher, good cndn, \$125. Jones, 479-4653 after 6:00 p.m.

Trombone, King Liberty model, xln cndn, \$135. Glover, 944-4863, evenings.

Spinnet piano, \$360; wall, mantle clocks, \$18-70; oak buffet, \$65. Franklin, 644-0853.

Eight piece bedroom set, \$75. Turley, 877-3180.

"Go Cart" Dual Motor mounts, one 10 horse West Bend engine, \$150. Alford, 488-3484.

Sony model 650, Three-motor, Three-head Solenoid-operated stereo, tape-deck, S-O-S-, Echo, etc., Wanchu, 644-7777.

VEHICLES

61 Red VW. New ring and valve job; new tires, runs great. Price open. No rust. Eggleston 877-1261.

68 Corvette-Hardtop, 4/speed, all power, A/C, custom paint, \$2600. Harris, 941-3710.

61 Falcon Econoline, good tires, runs good, paneled inside, radio. Brewer, 473-7355.

64 Cutlass Olds, air conditioned, power brakes and steering, console shift w/tachometer, radio and heater, \$600. Pirtle 474-2138.

67 Triumph TR-4A, Excellent condition, dark green, D. White, 488-1024.

Mini bike-4HP; 2 months old; xln cndn, \$120. Jones, 479-4653 after 6 p.m.

68 VW Bug, automatic, sun roof, am/fm radio, new tires and battery, one owner, good condition. Natl, 877-1725.

66 Olds-98, 4-door, low mileage, loaded. Selling wholesale for \$950. Smith, 481-4336 after 5 p.m.

67 Chev. Bis., 327, 5 chrome rims, radio, air, 55K miles. Eaves, 697-2686 or Wise, 861-5648.

70 American Motors Hornet Sedan. Clean, air conditioned, automatic transmission, radio, heater, \$1700. Pearson, 877-2701.

67 Ford country squire station wagon (10 passenger) air, power, radio, good tires, new battery, 390 engine mechanically in good condition. Garcia, 591-2916.

20-inch girls' bicycle with training wheels, \$15. Turley, 877-3180.

69 VW, A/C, low mileage, good cndn, \$1200. Suler, 488-4091 or 941-1929, evenings.

64 Chevy pick up, V8, SWB, air, radio, fair cndn, \$365. Wright, 877-3059.

65 Volkswagen, rebuilt engine, new paint job, \$425. Alford, 488-3484.

Suzuki 50, needs repair, \$50. Alford, 488-3484.

Sears-Cushman motor scooter, runs good, \$50. Polifka, 474-3342.

BOATS

Low profile marine camper-combination camper (sleeps 4) fiberglass boat, w/5 HP motor. Xln cndn. \$775. Tippitt, 944-4381.

14 ft., wide beam, vee hull, wood boat, and big wheel trailer, \$65. Mathias, 877-1047.

LIDO 14 sailboats, where they are, condition, cost and other information maintained by Lido fleet. Hoover, 877-3366.

15' fiberglass boat (Sabre), 40 hp and trailer, xln cndn; ski equipment. \$500. Henderson, 471-4653.

15' fiberglass tri-hull boat with 75 hp Evinrude and trailer. Nice, \$1575. Wright, 877-3059.

12' sailing catamaran and trailer, \$300. Polifka, 474-3342.

REAL ESTATE & RENTALS

Fairmont Park, 3-2-2, living room, den, central A/C, built-ins, covered patio. Near schools, pool privileges. 5 1/4% FHA, equity, \$133/mo. Henderson, 471-4653.

Arlington Heights, 4-2 1/2-2, corner lot, fenced, screened patio, fireplace; refrigerator, washer, dryer, and built-in color TV

Schiesser Gets Thurlow Award

Emil R. Schiesser, assistant chief of MPAD Mathematical Physics Branch, July 1 accepted the Institute of Navigation 1970 Thurlow Award at the Institute's annual meeting banquet in Pasadena, California.

Schiesser was picked for the award because of his role in the design of Apollo lunar landing trajectories.

Button, Button . . .

Apollo 15 crew patch buttons have been distributed to all on-site MSC and contractor employees by the Employee Activities Association. The Exchange Council is footing the bill for the buttons.

Council members

(Continued From Page 1)

Marilyn has been with the government for 17 years, the past eight of which have been at MSC. An administrative assistant in Flight Crew Operations, Marilyn is a resident of Nassau Bay.

Other members of the Council are Roy C. Aldridge, William A. Stransky, Chris C. Critzos, John W. Harris, Elwyn H. Yeater, and Robert F. LaMere.

The new appointments to the Council became effective earlier this month.

included, \$31,500. Brown, 946-3554.

Sun Valley, 3-1 1/2-2, brick, central heat, air units, Pasadena schools, low down payment. Kleinjan, 944-4957.

Beach home for weekly rental at Spanish Grant, West Galveston. On beach, well-furnished all but linens. Wasson, 488-2722 after 6 p.m.

Lot on Lake Livingston, Point Lookout, 75 x 137, power, water, restricted, \$3500. Richardson, 946-7587.

50 x 90 bulkheaded lot on beautiful Demi-John Island. Marina, swimming pool, club, utilities. Klotz, 488-1514.

Alameda mall area, 3/2/2, den, playroom, 5 1/4%, \$133 per month, equity, walk to 3 Pasadena schools. Brown, 944-4631.

3-2-2, Fairmont Park, 5 1/4% FHA, \$133 mo., 1 block from elementary & junior high, pool privileges. Equity, by owner. Henderson, 471-4653.

5 acres in San Leon off Highway 517 near fig farm, \$1300/acre. 10 acres off Highway 2004 in Alta Loma, \$1500/acre. Cotton, 932-2931 after 5 p.m.

WANTED

Two bicycles-boy and girl-must be in good condition. Bednarczyk, 483-4598.

Good quality used piano for beginner student. Reasonable price. Autery, 472-5956 after 5:30 p.m.

Attic fan, 36" or larger. Odenwalder, 534-2702.

Set of childrens golf clubs. Pay up to \$15 depending on condition. Morton 877-1716.

PETS

Wire Fox Terrier Pups, AKC, \$30. Pereboom, 485-4995.

Sealpoint siamese kittens, purebred, box trained, 8 weeks old, \$12.50. Brown, 944-4631.

Irish setter pups, AKC, FDSB. National Championship field trial and show lineage. Morris, 591-2910, after 6 p.m.

Dates set for Air Show in Galveston

The Clear Lake Chamber of Commerce, Houston Junior Chamber of Commerce, and the Galveston Chamber of Commerce will sponsor the first annual Gulf Coast Aerospace Exposition and Air Show on Saturday and Sunday, August 21 and 22.

The Exposition will be at Scholes Field in Galveston with the USAF Thunderbirds, U. S. Army Golden Knights, and many other nationally known performers participating in the Air Show.

Aerospace manufacturers, distributors, the military, and civilian government agencies, including MSC, will provide displays, exhibits, and aerial demonstrations.

Jim Donnell of the Standards Engineering Office here represents the Clear Lake Chamber and is static display coordinator for the show. Donnell states, "We already know this year's show is going to be the finest ever held in the South, and we hope everyone will come. There will be plenty of parking space and something to see and do all day."

Admission to the shows and exhibits is \$2.00 per car.

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON TEXAS

The Roundup is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

Editorial Staff: Sydni Shollenberger, A. "Pat" Patnesky

BE PREPARED FOR QUERIES

How to answer those questions about benefits of space research

NASA employees are frequently asked about the benefits of aerospace research and development to the so-called man in the street. The following outlines some of the highlights of down-to-earth applications growing out of space research and development and may help you answer questions on "spin off" and space benefits.

GENERAL BENEFITS

As in the past three successful lunar landing missions, the Apollo 15 expedition currently underway is expected to yield valuable and unique scientific information and knowledge about our moon, sun, and earth and how man functions in strange environments.

NASA has a broad responsibility, which includes developing the tools and techniques for expanding our knowledge of phenomena in the atmosphere and space.

NASA's research work in aeronautics and astronautics has revolutionized such fields as weather forecasting and communications and promises even more far-ranging development in monitoring the earth's resources.

Other fields, medical technology in particular, have also benefited from space-related investigations.

AERONAUTICS

A joint study by the Department of Transportation and NASA gives top priority to the need for reducing aircraft noise and airport area congestion. NASA is currently working on quieter jet engines. The DOT-NASA study asks a reduction of at least ten decibels each ten years until aircraft noise is suppressed into community background noise.

NASA hopes to find a way to provide an effective air transportation system for travellers in smaller cities and less densely populated areas. A concept called the "dial-a-plane" system makes use of computerized routing and could work somewhat as a cross between an air charter taxi operation and a scheduled air shuttle.

The supercritical wing is a new airfoil shape that would allow aircraft of the future to travel farther on less fuel. Shaped almost the opposite from conventional wings, the supercritical wing has a relatively flat top and a rounded bottom to delay the rise in aerodynamic drag until the aircraft is flying at a higher speed.

Borrowing from Apollo technology, NASA will soon begin flight research to demonstrate that aircraft of the future can be flown by an electronic control system like that used in spacecraft.

General aviation manufacturers are usually small compared to other aerospace manufacturers and lack the large engineering staffs

needed to adapt new technology rapidly to their needs. Realizing this problem, NASA contracted for approximately 10,000 aeronautical documents to be organized, catalogued, and evaluated. Material pertinent to the design of light aircraft is presented in the form of abstracts.

EARTH RESOURCES

NASA research continues to contribute to the increasingly important field of remote sensing of earth resources. One of the objectives of a recently expanded Airborne Research Program is to simulate over four ecological test sites (one in Arizona, two in California, and the Chesapeake Bay area) as closely as possible to data output of the Earth Resources Technology Satellite scheduled for launch in 1972.

The program will provide government agencies and university scientists who will analyze data with experience in using aircraft-obtained data similar to that which will be obtained by ERTS.

A cooperative smog research program involving space scientists and California air pollution experts has begun. Flights will trace the photochemical production of pollution and their dispersion in the atmosphere. Participation by NASA in smog research is the re-

sult of specialized instrumentation and research techniques at Ames Research Center, originally developed to explore the evolution of planetary atmospheres and for investigations into the origins of life.

With the Department of Agriculture, NASA is conducting a corn blight watch. Goals of the project are to monitor development and spread of corn blight during the growing season across the corn belt region; evaluate remote sensing techniques in assessing levels of infection in the corn belt; evaluate remote sensing's capability to assess the status and probable impact on corn blight and other plant problems; and evaluate results for feasibility of application to similar situations occurring in the future.

In the Caribbean, the government of Jamaica has asked the U.S. to assist in surveying the island's natural resources. In April, a specially instrumented aircraft from MSC made flights over the island and its surrounding waters at various altitudes to gather the data.

In another international development, Canada and the U. S. have agreed to a joint program for the use of satellites and aircraft in surveys of the natural environment.

The program will investigate remote sensing to monitor air, water, land, forest, and crop conditions, and the mapping of ice movements and ocean currents in Canadian and American waters. Mapping of geologic, hydrologic, vegetation, and soil phenomena
(See DOWN, Page 4)

New attractions open in Virginia

Two NASA facilities in Virginia have recently announced features of interest to tourists.

During the summer, free tours of Wallops Island are available daily, including Saturday and Sunday, beginning at 10:00 a.m. and 2:00 p.m. EDT. Monday through Friday, visitors are also permitted to tour an exhibit area on the Main Base. No reservations are required and cameras are permitted.

Langley Research Center has opened a Visitor Information Center. One striking item displayed is a full-sized engineering model of Viking spacecraft which NASA plans to land on Mars in 1976.

The Langley Visitor Center is open daily, except Monday.

Craftsman Ship to arrive on Tuesday

Marshall Space Flight Center's Manned Flight Awareness mobile exhibit "Craftsman Ship" will be at MSC and open to employees and visitors from August 3 through 5.

The exhibit van will be parked in the driveway between Buildings 1 and 13.



CONGRATULATIONS, MA'AM—Howard Gibbons, Acting Public Affairs Officer, presents a 15-year service award to Evelyn Smith. Other recent award winners in the Public Affairs Office were "Pat" Patnesky (the man behind the camera), who received a Quality Salary Increase, and Doug Ward, who was given a Sustained Superior Performance award.

First EVA begins tomorrow morning

(Continued From Page 1)

netometer.

The second EVA, which begins on Sunday morning August 1, will take the moon travelers to the Apennine front.

Included in this excursion will be a stop at the South Cluster, a group of secondary craters believed to have been formed by a group of objects striking the moon simultaneously. These objects were then possibly thrown out from another spot on the lunar surface by the impact of a single object from space.

The crew is also scheduled to gather samples and take photographs along the rim of Front Crater, the southernmost stop of this EVA which is to last for seven hours.

The final traverse is to begin in the early morning hours of Monday, August 2, and will take Scott and Irwin north of the landing site to another area along the edge of Hadley Rille

and to a group of craters, including Chain and Eaglecrest, which are called, collectively, the North Complex.

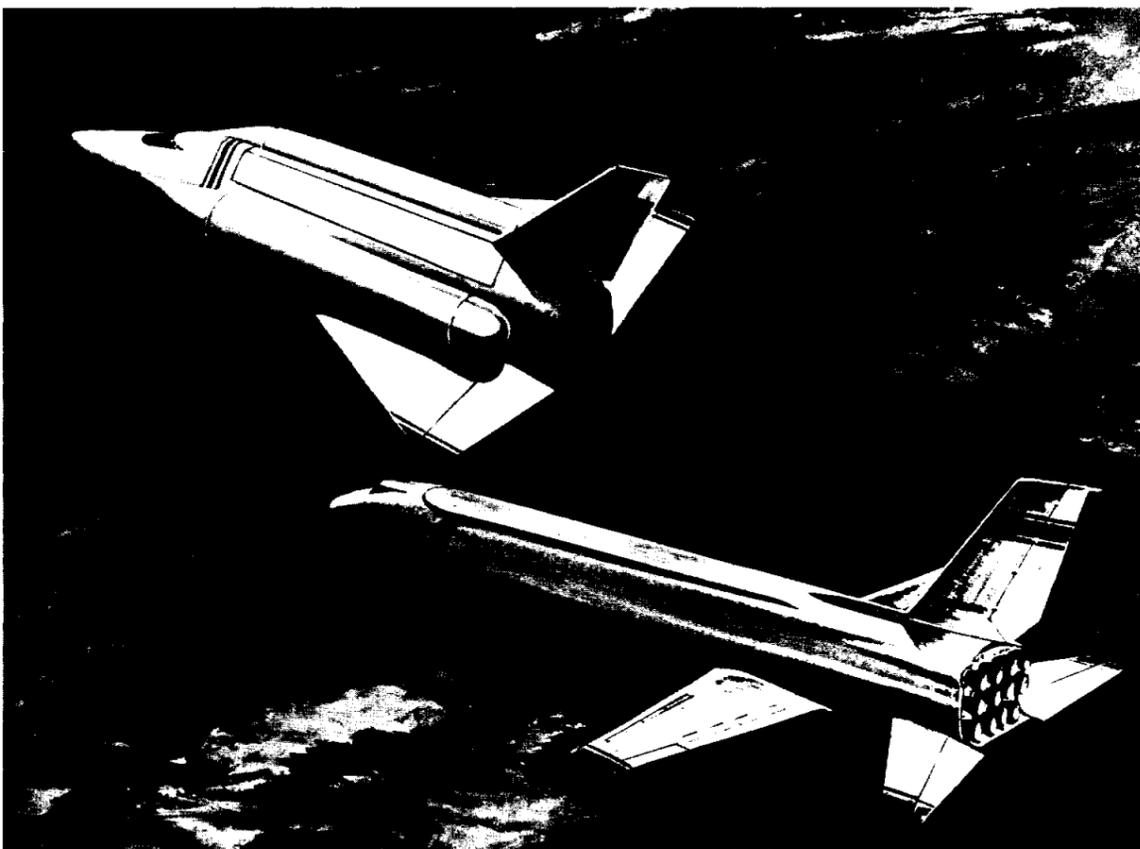
Splashdown for Apollo 15 will occur on Saturday, August 7, in the Pacific, north of Hawaii. The prime recovery ship is the USS Okinawa.

Picnic plans told

A carnival theme has been chosen for the annual MSC picnic which will be held this year as last at Camp Mansion in Friendswood. The date selected is Saturday, September 25, from 11:00 a.m. to 5:00 p.m.

Food will be served from noon until 3:00 p.m. Tickets are \$1.50 for adults (age 12 and over) and \$1.00 for children ages 3 to 12. Children under 3 will be admitted without charge.

More details on the picnic will be published in the near future.



SHUTTLE SEPARATION—The Orbiter is shown separating from the Booster at an altitude of about 40 miles in this version of a Space Shuttle by a Grumman Aerospace Corporation artist. Hydrogen/oxygen fueled engines in the Orbiter ignite to propel the stage to an assigned altitude and orbit of about 250 miles. The Orbiter in this concept, which is one of the latest concepts, has external hydrogen tanks which can be jettisoned.



COMPUTERS, CAMERAS, ACTION!—For the first time on an Apollo lunar landing mission, a television camera on the moon's surface will be manipulated by remote control from earth. In the Mission Control Center here, Edward Fendell (foreground) and Granvil Pennington will man the consoles which are tied in with the communications systems to control the camera. Two advantages of this new system of remote control are the increased time it will allow Apollo 15 crewmen Dave Scott and Jim Irwin to explore the lunar surface and the greater clarity and sharpness it will produce in the TV pictures received on earth.

Scientists asked to express interest in defining future planetary missions

Space scientists are being invited by NASA to help define a proposed series of small spacecraft missions to the planet Venus.

The proposed missions, to be called Planetary Explorers, would involve spin-stabilized Explorer-class spacecraft launched by Thor-Delta rockets. These low cost multipurpose spacecraft could be flown as orbiters or probes into the Venusian atmosphere.

Such missions are not yet authorized. But NASA's "Invitation for Participation in Mission Definition for Planetary Explorer Missions to Venus" says that emphasis on low cost makes it important to have early scientific participation with the engineering planning team to insure a match between mission capability and scientific requirements.

The first opportunity for such a flight would be in December 1976. The scientists will help define the typical payload for initial missions and will recommend subsequent orbiter and probe missions for the 1978 and 1980 opportunities.

The spacecraft are currently estimated to weigh between 750 and 880 pounds. Orbiting missions would carry 50 to 100 pounds of scientific instruments. For probe missions, the probe would carry about 75 pounds of science with some 25 pounds on the spacecraft bus which would impact the planet following probe separation.

Scientific objectives of the two types of Planetary Explorer missions are to study:

- *Probe missions*
- the nature and composition of the Venusian clouds,
- the composition and structure of the atmosphere to the surface of the planet,
- and the general circulation pattern of the atmosphere.

Orbiter missions

- The detailed structure of the upper atmosphere and ionosphere by direct measurement,
- the interaction of the solar wind with the Venus ionosphere and the magnetic field in the vicinity of the planet,
- the characteristics of the atmosphere and surface of Venus on a planetary scale by use of remote sensing experiments,
- and gravitational field harmonics from perturbation of the orbit.

Scientists interested in participating in mission definition for the Planetary Explorers should submit a letter of intent to NASA Headquarters by August 15. Final proposals are due on November 1, and selection of scientists to participate is planned by December 15.

Mission definition for the Planetary Explorers will be done for NASA's Office of Space Science and Applications by the Goddard Space Flight Center.

Remaining Mission Events (covered by TV)

Event	Time (CDT)	Date
LM landing	5:15 p.m.	July 30
EVA-1 (7 hr)	8:34 a.m.	July 31
EVA-2 (7 hr)	6:04 a.m.	Aug 1
EVA-3 (6 hr)	2:44 a.m.	Aug 2
LM liftoff	12:04 p.m.	
Rendezvous LM/CSM	1:44 p.m.	
Transearth EVA	10:41 a.m.	Aug 5
Press conference	2:54 p.m.	Aug 6
Splashdown	3:46 p.m.	Aug 7

TEN YEARS AGO IN SPACE

—On July 21, Mercury-Redstone 4, called Liberty Bell 7, was launched from Cape Canaveral with Astronaut Virgil "Gus" Grissom as the pilot. The spacecraft reached a peak altitude of 118 statute miles downrange from the Cape. The spacecraft was lost during recovery operations.



BETTER LATE THAN NEVER (OR The Medal that Came Twenty-Five Years Later)—In 1946-47, M. Dean Sprake (left) of Crew Systems Division took part as a member of the Navy in the fourth Antarctic expedition. Because of the time involved in Congress' authorizing the medals, time spent in striking the medals, and the time lapse since he retired from active duty, it was just two weeks ago that Sprake received the Antarctic Service Medal from Navy Captain Alan B. Shepard.

Down-to-earth Space benefits listed

(Continued From Page 3)

will also be carried out.

Means for detecting and determining the size of oil slicks with airborne sensing devices and later, it appears, by satellite, have been developed. The sensors can detect and distinguish between heavy and light crude oils and light diesel oil.

MEDICAL DEVELOPMENTS

Many dramatic developments in the medical field have had their origins in aerospace research.

A NASA scientist conducting basic research into the effects of space radiation on body cells has discovered intercellular linkages that may help in understanding the behavior of certain types of cancer. He was studying the effects of ionizing space radiations in interfering with normal cell division.

Doctors can watch a movie of the beating of a patient's diseased heart—identifying dead spots or scar tissue in the heart wall, aneurysms, and other malfunctions—with a computer method devised by a NASA-Stanford University team.

A small analog computer that can continuously monitor changes in a patient's blood pressure and cardiac output has been developed at Lewis Research Center.

Scientists from the Stanford University School of Medicine and NASA have successfully used sonar circulation to monitor a patient's heartbeat and blood circulation. The studies can be made by a trained person in the doctor's office or at bedside in a matter of minutes.

A brain sensor and radio transmitter system developed for space medical research with test pilots appears to allow major improvements in diagnosis and treatment of schizophrenic mental patients.

The computer used to enhance pictures radioed back from the moon and Mars has been successfully used to analyze pictures of human chromosomes. Chromosomes in a human blood cell have been analyzed in three minutes, about one-tenth the time required previously.

A pressure suit made for test

pilots saved the life of a young woman whose internal bleeding could not be stopped by established procedures.

OTHER FIELDS

Early weather warnings from satellites are credited with saving thousands of lives and crops. ESSA has estimated that 50,000 people would have perished when Hurricane Camille hit the Gulf Coast in August 1969, if they had not been evacuated.

Techniques developed in the space program to separate chemical fuels in NASA boosters are now being adapted to separate oil from our natural waters to reduce pollution.

Work done in developing high performance in rocket engines has been adapted for use in reducing industrial pollution.

An entire industry has grown out of research and development in communications satellites. Progress in this field has reduced the cost of a single telephone channel across the ocean from \$16,000 to about \$600.

The computer industry, stimulated and accelerated by space research requirements, has grown to an \$8 billion a year industry employing 800,000 people.

A. Robinson dies

Alice D. Robinson, an employee of the Astronaut Office for the past nine years, died on July 11 at her home in La Porte.

Involved in the coordination of astronaut public appearances, Miss Robinson had received both Sustained Superior Performance and Outstanding Performance awards for her work. She had been with the Government for 22 years.

As organist at St. John's Episcopal Church in La Porte, she started a fund to purchase a new



organ. The fund is being continued in her memory.

Prior to joining MSC, she worked for the Office of the General Counsel, Department of the Air Force, and for the Federal Aviation Agency in Washington, D.C.

Apollo 15, ALSEP A2 site will be last to enter the shadow, some nine minutes after ALSEP 4.

The moon will penetrate more deeply into the shadow (umbra) during this eclipse than it did during the first eclipse of this year.

Eclipse in August

The second total eclipse of the moon in 1971 will occur in the afternoon hours of Friday, August 6. No portion of the eclipse will be visible to observers in North America.

However, the rover TV camera left on the lunar surface by the Apollo 15 crew will record the eclipse, which occurs within 27 hours of Apollo 15's splashdown in the Pacific.

As the moon passes through the earth's shadow, the first ALSEP in place on the lunar surface to experience the effects of the eclipse will be Apollo 12, ALSEP 1. The Apollo 14, ALSEP 4 site will follow three minutes later, and the