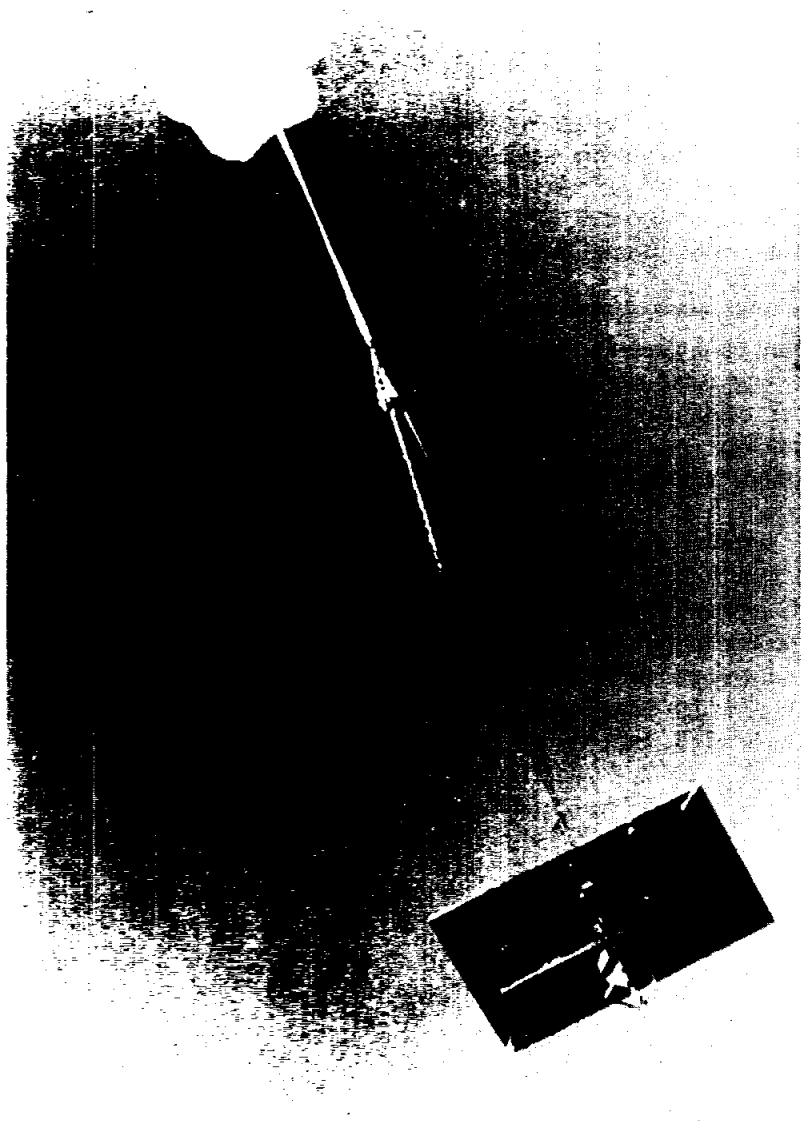
ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 9 NO. 25 October 9, 1970



'UP and AWAY' - The recent launch of a scientific payload by MSC's Science and Applications Directorate made an interesting sight as it took off from Minneapolis, Minn. The payload rose to a float altitude of about 130,000 feet and then because of a non-operative descent system remained airborne for more than 347 hours. It landed in Canada near a farming community outside of Regina. The payload was recovered and scientist are currently assessing the data gathered by this project, the Cosmic Ray Emulsion Plastic Experiment (CREPE).

SEA OF RAINS

Fourth U.S. Lunar Landing Scheduled for Hadley-Apennine

A northern lunar plain cut by a large gorge that runs along the base of some of the Moon's highest mountains has been chosen by the National Aeronautics and Space Administration as the landing site for Apollo 15, presently scheduled for launch on July 25, 1971.

Called Hadley-Apennine, the site for the fourth U. S. manned lunar landing is named for the nearby Apennine Mountains and the meandering Hadley Rille, half a mile wide, 600 feet deep, and 60 miles long.

The site is about three degrees east of the center of the Moon as viwed from Earth and 25 degrees —about 465 miles—north of the lunar equator on the edge of the massive Mare Imbrium (Sea of Rains). In contrast, the sites where Apollos 11 and 12 landed, last year, and the Fra Mauro site for Apollo 14, scheduled to be launched on Jan. 31, 1971, are all within 70 miles of the equator.

A mission to the Hadley-Apennine region presents a unique scientific opportunity in the Apollo program. On the lunar surface the astronauts will obtain samples and make observations relating to three key problems.

First, they will collect materials from the base of the Apennine Mountains, which rise over 8,000 feet from the mare surface near the landing point. Such samples are expected to contain a mix of the old lunar crust existing before the formation, probably by impact, of the Imbrium basin, perhaps more than four billion years ago, and of rocks from deep within the Moon which were ejected during the impact.

Besides extending the time-scale back beyond the 3.7-billion-year average age of Apollo 11 samples, these rocks are expected to be significantly different in composition from either the Apollo 11 or 12 basalts.

Second, the astronauts will make trips to the rille area in an attempt to obtain evidence bearing on the origin of those strange lunar features, resembling dry river beds on Earth. Samples from near the rille may indicate whether or not water was a factor in its formation. Visual observations and photography of the layering in the rille walls may indicate whether the structures are a result of collapse of lava tubes or erosion by, for example, volcanic ash flows or surface materials made to behave like fluids by degassing from the lunar interior.

Third, sampling of the fresh-looking mare and volcanic-looking features at this location is expected to extend the age scale established on Apollo 11 and 12 to younger ages.

The astronauts will use the Lunar Roving Vehicle, planned

(Continued on page 4)

'SURVIVAL OF MAN'

New Division Chief Sees Vital Role for Earth Resources Program

A man considered by many in the scientific community to be one of the pioneers of modern remote sensing, is personally convinced man must change his ecology in order to survive.

"And we here at the Manned Spacecraft Center can prove helpful in the process of change," says Marvin R. Holter new Chief of the Earth Observation Division of the Science and Applications Directorate. A veteran of 25 years in remote sensing development systems, Holter said NASA's earth resources program is one of the tools which can be utilized in expanding man's understanding of his environment.

"The program (earth resources) is entering a change of phase," he explained. "I anticipate we will be putting our technology, as it exists today, to practical applications."

Holter who admits man has made ecological mistakes said, "we've reached the point where we can't make any more mistakes. We have to change our ecology in order to survive."

The earth resources survey program, a small but major activity at MSC for the past six yers, has developed the technology and has amassed photographic and sensing data useful in man's understanding of his environment.

"We now have the power (through aircraft and spacecraft sensing) to predict change, in advance," Holter explained "and at the same time to be able to predict what effect such changes will have on our ecology."

MSC aircraft have during the past six years, logged thousands of hours flying missions for government and university scientists gathering data on agriculture, forestry, geology, geography, hydrology and oceangraphy.

"During the next year," Holter said "We will be applying this ability and technology to the Lake Ontario project, among others. The lake project is part of the work being carried out by the International Hydrological Decade

(Continued on Page 2)

Marvin Holter

OFO-RM Launch Set for Oct. 19

The Orbiting Frog Otolith (OFO) is one of two spacecraft which have been rescheduled for launch on a Scout vehicle by the National Aeronautics and Space Administration, no earlier than Oct. 19, from the NASA Wallops Station, Wallops Island, Va.

Also on board the solid propellant Scout will be the Radiation Meteroid (RM) spacecraft to demonstrate and evaluate improved instrumentation and to gather near-Earth data of scientific interest.

Two male bullfrogs (Rana Catesbiana) will be monitored in OFO for about five days alternately in the weightlessness of space and during periods of partial gravity created by spinning them up to 50 revolutions per minute, producing a one-half g acceleration condition.

Originally scheduled for Aug-19, the mission was postponed when the frogs were stricken with a fatal virus infection.

Johnston Named to MR&O Post

Richard S. Johnston has been named Deputy Director for Biomedical Engineering for the Medical Research and Operations Directorate.

MSC Director Dr. Robert R. Gilruth said the appointment has been made in recognition of the large medical responsibility in Skylab and advanced manned flight programs, with increased medical responsibility in Skylab and advanced manned flight programs with increased medical experiment hardware requirements. The new appointment follows a center decision to have the Medical Directorate totally responsible for these medical experiments.

As Deputy Director for Biomedical Engineering, Johnston will report directly to the Medical Director Dr. Charles A. Berry and be responsible for all program-oriented biomedical engineering efforts. This includes medical experiment hardware, diagnostic and therapeutic systems, and monitoring systems.

Johnston has held numerous top management positions since he joined NASA in 1959. His previous assignments have been manager of the Experiment Office of the Apollo Scapecraft Program Office, Special Assistant to the Director and Chief of Crew Systems Division.

In addition to serving as Deputy Director he will also serve as Acting Manager (Chief) of the newly formed Skylab Project Support Office in the Medical Directorate.

United Fund Message

October 9, 1970

To All MSC Employees

The 1971 United Fund Drive for the Manned Spacecraft Center will be an intensified campaign from October 5 through October 23, 1970. The theme of this year's Drive is "Think Twice—Give Once."

Each year MSC personnel have achieved 100 percent or more of our assigned goal. It is my sincere hope that MSC employees will once more contribute to this deserving campaign as liberally as possible.

It has been through your wholehearted support of this worthwhile program that we have met our goals in the past. Again we will need your full cooperation to meet the goal of $100,000 for 1971.

The team captain in your area will be contacting you to request your donation or pledge. With your support and that of your fellow employees, MSC will once again meet its quota.

Robert R. Gilruth
Director, MSC

EARTH RESOURCES

(Continued from Page 1)

(IHD). The IHD is a group of international organizations dedicated to advance our knowledge of the extent and amount of rainfall, depth and density of snowpacks and levels of rivers, lakes and irrigation reserviors.

Primary purpose of the Lake Ontario project, Holter said, is a study of the lake and its water shed; including agriculture, industrial and urban activities along the 180 by 60 mile lake. The RB57, one of the three MSC aircraft used in the earth resource survey program has already made one flight over the lake and is tentatively scheduled to fly several missions early next year and gather photographic and other sensing data over a 100,00 square mile area.

"We welcome the request to take in this project," Holter explained. "The program (earth resources) cannot be a success unless there are a number of activities—such as the hydrological decade—which succeed," he said.

Holter, who came to MSC from the University of Michigan where he was a professor on remote sensing, said the technology and data is available, the next step is to put this to practical application. Author and co-author of about two dozen publications on remote sensing and data systems, the Earth Observations Division Chief is "tremendously excited and interested" in MSC's future role in earth resour'ces."

"Personally," Holter said "I feel we are involved in the survival of the human race."

Holter, his wife Frances and their two pre-school age daughters now call El Lago home, far from the campus of the University of Michigan where he spent 23 years.

Born in Fairport, N. Y. in 1922, Holter said he will miss his 13-acre farm which he worked as a hobby in Ann Arbor. However, he is looking forward to pursuing his other hobbies, amateur radio, photography and reading.

Holter received a BS in physics from the University of Michigan in 1949, an MS in math in 1951 and an MS in physics in 1958. He held numerous positions at the university, the most recent being professor of remote sensing and head of the sensing laboratory.

Handicapped are Success at MSC

'SPACE APPLICATIONS'

MSC Materials Experts Help Fire Fighters

By Terry White

Firefighters suits, hospital garments and playing cards may seem far afield from each other, but a group of materials experts at the National Aeronautics and Space Administration's Manned Spacecraft Center are looking at ways to make these items virtually fireproof in all conditions.

The firefighters garments will be made in the Center's Crew Systems Division crew equipment shop and provided to the Houston Fire Department for evaluation under actual field conditions by firemen answering residential and industrial fire alarms.

Scheduled for delivery to the Houston Fire Department in early December, the firefighters garments will be made of a five-layer sandwich of fire-resistant materials evolving from the nation's manned space flight program. The outer layer is of a material called Durette, with inner layers of Fluorel on Durette, woven Fypro, batt Fypro, and a liner of woven Fypro.

Costs of making the suits will be borne by NASA, and the Houston Fire Department will provide the agency with a report on the field testing of the garments.

In another application of space-evolved fire-resistant materials, patient gowns, bed linens and mattress covers of Beta cloth will be tested by the University of Texas M. D. Anderson Hospital and Tumor Institute in Houston. The gowns and linens will be used in the Radio-Therapy Unit at Anderson for patients receiving cobalt radiation treatment in a chamber pressurized to three atmospheres of 100 percent oxygen. The high-pressure oxygen environment enhances receptivity of tumors to radiation therapy.

A potential hazard in any kind of pure oxygen environment is that the intensity of a fire is increased by oxygen saturation of the fuel; flammable materials such as regular hospital clothing burn faster. By eliminating flammable materials in high-level applications, the risk of fire is minimized.

Beta cloth for the hospital's evaluation garments is being donated by Owens-Corning Fiberglas.

Fireproof playing cards grew out of a need for some sort of leisure ttime recreational facilities for crews on long-duration space missions - - - again, in spacecraft cabins with 100 percent oxygen atmosphere.

Printed on fire proof paper supplied by Scheuffelen Paper Company of West Germany, the playing cards have applications in other types of closed spaces filled with a high percentage of oxygen such as in deep-sea diving decompression chambers. Recently, a crew in a simulated space station 90-day run at McDonnell-Douglas Corporation, Huntington Beach, Calif., plant whiled away part of off-duty hours with fireproof playing cards.

The U. S. Playing Card Company of Cincinnati, Ohio is printing 200 decks of standard Bicycle playing cards on fireproof paper for potential use in the Skylab earth-orbital manned workshop, now scheduled for flight in late 1972 and early 1973. The cards also will be provided to other agencies for evaluation in confined quarters where flammable material such as ordinary paper would be a hazard.

GOING TO A FIRE is a coat made of space-evolved fire resistant material will make the fireman's job safer. The sketch above shows the type of fire fighters' suit that will be fabricated in Crew Systems Division crew equipment shop for evaluation by the Houston Fire Department. Material layers used in the suit are: 1. Fluorel-coated Durette, 2. women Fypro lining, 3. batt Fypro, and 4. an inner layer of woven Fypro.

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.

MSC EMPLOYS HANDICAPPED—The summer of 1970 brought special emphasis to MSC's year around policy of hiring the handicapped. A number of summer positions were set aside for use in this special program. As part of 'Hire the Handicapped Week Oct. 5-9' MSC takes pride in its handicapped. Several of the numerous workers in this category are shown at their jobs: Thomas Garrison, (top left) and (left to right) Pam Justice, Carole Miller, Demaris Cosby, Jeannette Franklin and Christine McDonough. MSC Personnel Division reports that in every case the handicapped employees in the summer program performed exceptionally well.

MSC CREDIT UNION RECEIVES THRIFT AWARD—Mrs. Peggy Ray (right) accepts Honor Thrift Award from Ross Pearson, credit union examiner. Pearson presented the award to the MSC Federal Credit Union following the annual examination which revealed the MSC group is "in excellent condition; its financial condition is sound and growth is outstanding." Credit Union shares increased 7.8% since the last examination and assets passed the $3 million mark. In the photo, left to right, are Pearson, Jennetta Sowders, Charlotte McKinney, Pat Nichols, Becky Lancaster and Mrs. Ray.

Twin Scientific Launches Successful in Brazil

Brazilian launch teams, in support of the National Aeronautics and Space Administration, successfully launched two scientific payloads to an altitude of about 530 nautical miles above the Atlantic Ocean on September 25 and September 30.

Preliminary data from the two flights indicates the experiments, which were designed to measure the radiation environment over the Atlantic Ocean, performed satisfactorily. Data gathered by the experiments was telemetered to ground stations.

The scientific payloads, each weighing 110 pounds, were launched from the Barrerio de Inferno range near Natal. Launch vehicle was the Black Brant IV, a two stage solid propellant vehicle built by the Bristol Aerospace Limited of Winnpeg, Canada.

The instruments were developed by the NASA and the University of California. NASA's Goddard Space Flight and the Manned Spacecraft Center's Space Physics Division were responsible for launch, instruments and data gathering.

NASA Study Group To Review Procedures

The National Aeronautics and Space Administration announced today the formation of a steering group to "guide a comprehensive study of the complete NASA acquisition process."

Named to head the group is Richard C. McCurdy, NASA Associate Administrator for Organization and Management.

The group is formed to carry out instructions last Sept. 1 of former NASA Administrator Dr. Thomas O. Paine for a review of the agency's acquisition process of services and hardware.

MSC Bowling Standings

Jimmy Warren Memorial League

Team	Win	Loss
Fabricators	18	6
Achievers	16	8
Alley Oops	14	10
Mixers	14	10
Chokers	13½	10½
Blitzers	12	12
Bit Pickers	12	12
Real Timers	11	13
Road Runners	11	13
Pin Pounders	10	14
Strikers	8½	15½
Hexes	4	20

SORRY JUNE — The ROUNDUP regrets the omission of JUNE ROACH's name in the front page captions of the last issue. Forgive us June—and for you fellows here is another photo of pretty June,

Roundup Swap-Shop

(Deadline for Swap-Shop classified ad is Thursday of the week preceding **Roundup** publication date. Ads are limited to MSC civil service employees and assigned military personel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to **Roundup** Editor, AP3)

MISCELLANEOUS

Non-registered high-spirited Apaloosa mare (5 yrs.) Saddle and bridle. $250. Broussard, 483-4336 before 4:30 p.m.

Complete golf rig, 3 woods, irons 2-9, wedge & putter, moulded top bag, golf cart, $150. Canin 591-2856.

1969 Cimatti motorcycle 10cc, 900 miles, $190. Gus McCown, 477-1559.

Danish modern walnut, dining room suite, table, 6 chairs, china closet, exclnt condition, $225. 534-2067.

Remington 22. cal rifle, tube feed, bolt action $15; classical guitar $65; S. Gorman 521-9805.

26' sailboat, Thunderbird, all racing sails, radio, heac, tape, sleeps four, $5,900. Harron 488-0395.

1970 Suzuki TC-90 Blazer motorcycle $365, 1970 Suzuki 50 motorcycle $180, 1969 Cameo travel trailer, 17 foot, exclnt $1,600 Donnell 877-1746.

Sailboat 14' fiberglas Lido, top condition, $950 Davidson 946-2523.

Coldspot refrigerator in good working condition. Lattier, 534-2756.

Sears Jumbo guitar with metal strings. Hardly used. Brown 471-0066.

Lady's 26" Schwinn bike, royal blue, headlight, basket, horn, $45. Messenger, 471-1079.

Hotpoint clothes dryer, $35. Johnson, 474-2422.

21' Sterncraft, 327 Chev engine, outdrive head, marine radio, tandem trailer, power winch, Ettredge 591-2110.

Dress form $10, crib $10. 20" bicycle $10, call Mechelay 534-3994.

Roberts 1040 Reel tape deck, exlnt cdtn, $135. Call Moravek after 5 P.M. at 472-4545.

Honda Super Cub, 55cc, good condition. $65. Soens 877-2380.

Beige fabric covered sofa, convertible to double bed. Very good condition, $90. G. H. Pittman 488-1243.

Sunbeam hooded hairdryer, good condition; Boy's Tonka trucks & other games Anne Brenton, 483-5338.

Bruning drafting machine, cost $110 will sell for $55. B. Reina, 488-1326.

Cannon 35 mm electric eye camera, case & manual. Exclnt cdtn. $30. Krisberg 944-4319.

Wedding dress size 8, w/illusion net veil. $50 Ohnesorge 534-3602.

RCA solid state stereo prtbl phono, diamond stylus, microphone, detachable speakers, like new $75. Wade 649-0554.

Man's 3-speed bicycle, good condition w/ head lights, rear basket, $20. Finlayson 591-3446

Yoga classes for women. Beginning Oct. 12, call Linda Talbert 643-9206.

AUTOS

Dodge Polara, 4 dr, A/C, full power, exclnt condition $700, McElmurry, 591-4665.

1970 Ford F-250 Camper special, heavy duty, extras, with 8 ft 1970 Camper, $4,200, D. Wiseman, 534-3802.

1961 Tempest, 4 cyl., A/C, auto trans., good running condition & clean $250. F. Wittler, Dickinson 534-3916.

1967 Sunbeam Alpine (Series IV Red). Wire Wheels and new engine and tires. 10,000 miles remains on Chrysler warranty, $1,195. Jones 944-1321

1957 VW, Sun roof, 31,000 miles, good condition, $425. House, 482-7016.

1962 Ford ½ ton SWB pick-up with camper, new engine & other new items, $600 w/O camper, $700 with camper. Donnell 877-1746.

1969 Peugeot Station Wagon, 25,000 miles, auto., air, radio, $2,000. Call Bailey 488-0079 after 5 P.M.

1965 Rambler classic, 4 dr sedan, auto., radio, air, $395. Trent 932-6106.

1961 Chevy pickup truck. Runs good, body rusted, $200 cash. Chisholm, 944-2410.

1964 VW Meyers Baja bug, on/off road, new tires, wheels, paint, battery $500 includes spare parts. 686-1923 Ellis.

1969 Road-runner, 383, 4 spd, new tires, mags, tape & gauges. Exlnt cdtn. Call Cragg after 5 P.M. 946-7002.

1963 Pontiac Bonneville, air, power, runs well $445 Call Allen 487-3637 after 6 P.M.

1959 T-Bird fine shape, low mileage. Gillen 877-1666.

MGA, good condition, green, white top, wire wheels, new tires, $395. Call Bill ext 2189.

REAL ESTATE

League City, brick 3-2-2½, large oak trees, fenced, porch, cent A/H, Long 488-2887 or 488-4218, David C. Lang.

For Sale or Trade - River front lot on Sabine River in Deweyville, Tex. Riveroaks addition. Smith 488-3238.

Uease 3-2-2 Bay Colony in LaPorte, air, bay & pool privileges $175 per mo. Mayhew 591-3291.

Will sell, lease or trade commercial lot on Padre Island, Corpus Christi. $28,000. Hooper at 488-4120.

Large wooded lot (6/10th acre) Friendswood-Imperial Gardens, Falling Leaf Dr. Call MI-9-3412 after 6 P.M.

House for lease - Nassau Bay, Polynesian 4 BR, 2½ baths, lge family room, wet bar, fenced heated pool, on water, unfurnished, $450 per mos. Jere Cobb 591-2607.

Room & board - single male, nice residential home, close to NASA. Call after 4:30 P.M. - 877-4314.

WANTED

Want to trade - Remington Model 48 #12 gauge automatic for 16 or 20 gauge. Good condition. Chisholm 944-2410.

Wanted - to join car pool from Gulf Fwy/ Broadway to MSC 8:30-5 P.M. Stuber 649-4133.

PETS

Husky puppies for sale, $75. Gregory 488-3702.

AKC miniature Schnauzer puppies $125, call Linda after 5 P.M. at 585-5948.

LOST & FOUND

Lost - one pair aviator type prescription sunglasses w/case Bldg 12 & 30 area. Heetderks, ext 4491 or 5276.

Blood Drive Scheduled Oct. 15

Facilities for the Oct. 15 MSC Blood Drive will be in the auditorium of Building 7-A (Room 141) instead of Bldg. 8 as previously announced.

Blood Services is cooperating with Brooke Army Medical Center in drawing the blood. The Bloodmobile will be sent to Ellington to take care of donors at that location.

All blood from this drive will be donated to Brooke Army Medical Center and will be used in the Armed Services at home and abroad.

All personned connected with MSC are eligible to donate blood and thus become members of the Blood Deposit Program as in previous drives. Employees who are interested in donating blood should contact their blood representative as soon as possible.

MSC GA Match Scheduled Oct. 17 at Hermann Park

Hermann Park Golf Course will be the site Oct. 17 for the eighth official tournament of the MSC Golf Association.

Dick Hart, tournament chairman, requests association members who plan to play at Hermann Park send in their entry no later than Oct. 13. The tournament starts at 11:30 a.m.

REMEMBER 'OKTOBERFEST'—Tomorrow is the BIG DAY at Camp Manison starting at 12 noon and lasting until 6 P.M. MSCers bring your family and join in the fun. Many exciting activities are scheduled for the lil' kids, the teenyboppers, and the big kids. DON'T FORGET 12 NOON 'TIL 6 PM. .... and don't forget the 'Costume Contest' to be held at 2 P.M.

Crew Health Stabilization Plan Announced for Apollo 14

A new program designed to minimize or eliminate possible exposure of future Apollo flight crews to disease or illness will be introduced 21 days prior to the launch of Apollo 14.

The new program, the Flight Crew Health Stabilization Proggram, in addition to providing close clinical surveillance of the crew and those they work closely with, will also control and limit the number of persons having contact with the crew, and implement a regimen limiting the crew to primary and training areas where microbial contamination is minimized.

Twenty-one days prior to launch, the Apollo 14 crew will take up residence in the crew quarters in the Manned Spacecraft Operations Building at Kennedy Space Center or in their own residence or the crew reception area of the Lunar Receiving Laboratory if and when they are in Houston.

Dr. Charles A. Berry, Director of Medical Research and Operations at the NASA Manned Spacecraft Center, said "The most important factors in making this plan to reduce the possibility of crew, illness effective, are an awareness of, acceptance of and emphasis on preventive medicine by all management levels and by flight crews."

The program generally provides for:

—Crew health to be stabilized by implementation of epidemiology, clinical medicine, and immunology programs, and limitation of the number of personal contacts with the flight crews.

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

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

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

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

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

—Mission essential personnel designated as secondary contacts may only occupy primary areas when these areas are not occupied by the flight crew.

During 60 days prior to launch all illness occuring in family members of prime, backup and support crews as well as close contacts of these families will be reported to medical officials.

Primary contacts (family members, backup crew members, mission essential personnel) will be given physical examinations as early as 90 days prior to launch. Those stationed at Houston will receive their physicals 45 days prior to launch.

The follow-on medical surveillance, which will be supervised by the Medical Research and Operations Directorate, is expected to maximize the possibility that those who come in contact with the crew prior to launch are healthy. The Medical personnel at MSC and KSC will maintain and evaluate information relating to crew movements, crew health, primary contact and family health and community health as well as environmental monitoring of the primary areas, food and water.

LANDING SITE

(Continued From Page 1)

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

The astronauts will deploy a science station, the Apollo Lunar Surface Experiments Package (ALSEP), containing a seismometer, magnetometer, heat flow experiment, and atmosphere and ion detectors.

The seismometer should be able to pick up seismic signals which originate in both highlands, east of the site, and in the mare basin, west of the site, which is the location of a major mascon—a large positive gravity anomaly detected by the unmanned Lunar Orbiter spacecraft.

Many scientists believe that mascon is caused by dense rocks deep in the Imbrium basin. If so, seismic waves traveling through such rocks should have high velocities relative to the velocities already measured in lunar material.

The Apollo 15 mission will provide an opportunity to obtain a heat flow measurement near a highlands mass. Such data bears on the interpretation of the thermal history of the Moon and, when compared to data to be obtained at other sites, can lead to better knowledge of the very diverse maria and highlands.

The rille at Hadley-Apennine is thought to be associated with volcanic activity. If, in fact, there are lunar transient events around the edges of circular maria, it is possible that gases still escape from the lunar interior. The atmospheric and ion detectors on the Apollo 15 ALSEP, being near the head of Hadley Rille, will be in an excellent position to detect such events.

Apollo 15 will be the first mission to carry a new set of orbital sensors in the Service Module, including cameras, geochemical indicators, and a sub-satellite. Hadley-Apennine is particularly well suited for this payload because its high latitude results in far greater ground-track coverage than previous Apollo missions. The cameras and geochemical sensors will also be able to "map" a significant part of the lunar backside.

The sub-satellite is a small satellite that will be ejected from the Service Module early in the mission and remain in lunar orbit after the astronauts return to Earth. It will contain particle detectors and a magnetometer, thus providing data to correlate with the surface magnetometer and particle detectors and a S-band transponder.

The high inclination will allow the sub-satellite to fly over several mascons many times in its expected one-year life. The tracking experiment should then yield more refined data than available from Lunar Orbiter spacecraft from which scientists can construct better gravity profiles for mascons and may obtain a better understanding of what those structures really are.

Apollo 15 will be commanded by David R. Scott, a USAF colonel; with Alfred M. Worden, a USAF major, as Command Module Pilot and James B. Irwin, a USAF lieutenant colonel, as Lunar Module Pilot. The backup crewmen are U. S. Navy Captain Richard F. Gordon, Jr., Civilian Vance D. Brand, and Civilian scientist/astronaut Harrison H. Schmitt.

Moon Samples Returned By Luna Quarantined

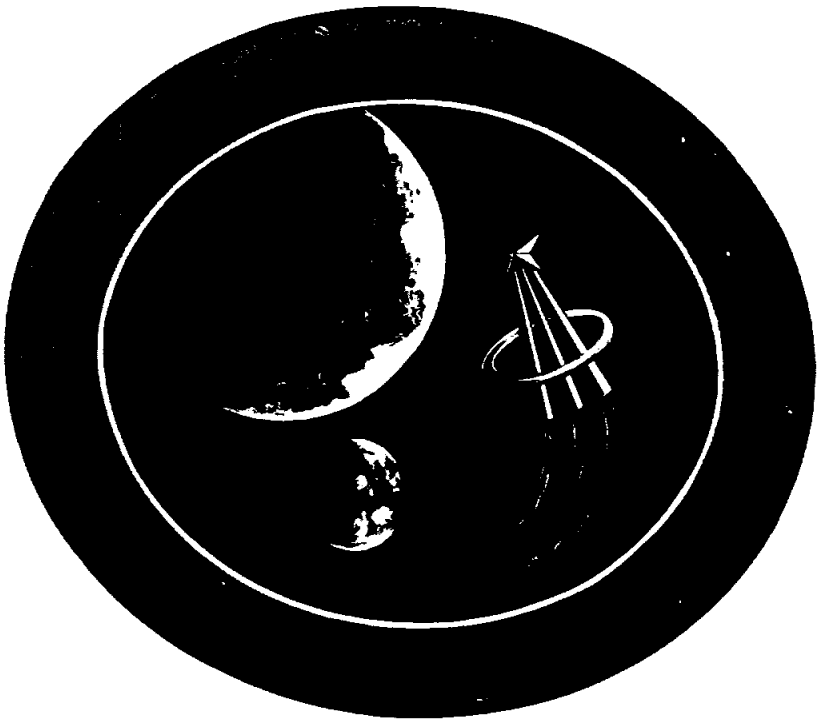
The Soviet news agency Tass has reported that samples of Moon's Sea of Fertility returned to earth by Luna 16 are being isolated from the earth environment in a "special reception laboratory."

According to Tass the sample scooped up by Luna 16, "a friable, brown-grey dust-like material," was placed in a chamber filled with helium and equipped with glove ports, diamond cutting saw, biocular microscope, scales, a small vibrating devise for sorting different rock sizes, and an assortment of tools.

The Soviet news agency described the function of the laboratory as two-fold -- to prevent strange microbes which may be present in the lunar rock from entering terrestrial environment, and to keep the samples in their initial state as they were on the moon.

After initial analysis in the "quarantine period," Tass said samples of lunar rock will be delivered to different institutes of the USSR Academy of Sciences for a detailed and all-around investigation.

Destination - Fra Mauro



CREW PATCH - The Apollo 14 crew patch designed by Astronauts Alan Shepard, commander; Stuart Roosa, command module pilot; and Edgar Mitchell, lunar module pilot, shows the astronaut lapel pin approaching the moon from liftoff point on earth. Launch for the next U.S. manned lunar landing is scheduled no earlier than January 31, 1971.

Argentina Site For MSC Project

NASA Manned Spacecraft Center scientists are in Argentina preparing for a series of balloon-launched studies of cosmic rays.

Members of MSC's Space Physics Division, assisted by launch teams from the National Center for Astmospheric Research, are preparing to launch two payloads within the next several weeks.

PROS and CONS—Should it be Dscartes, Tycho, Davy rille, Marius Hills, Copernicus, etc.? Lunar scientists, attending a recent conference at the Lunar Science Institute, voiced their opinions—with dramatic gestures — on future landing sites for Apollo. The session which highlighted discussions on the structure, composition and history of the Moon's surface served also as an open forum on the future of the Apollo lunar landing program. Some of the expressions which were captured by ROUNDUP photographer Andrew Patnesky were those of (l-r): Dr. Harold Masurky of U.S. Geological Survey; Dr. Eugene M. Shoemaker, California Institute of Technology (Cal Tech): Leon T. Silver, Cal Tech; Dr. Thomas Gold, Cornell University; Dr. Masurky; Dr. A. W. G. Cameron, Yeshiva University, New York City and Dr. Harold C. Urey, University of California.