

AT WORK ON THE LUNAR SURFACE—Apollo 14 astronauts, safely settled in the Fra Mauro lunar highlands, are depicted in this artist's concept. Commander Alan Shepard is shown in the foreground moving away from the lunar module with the modular equipment transporter (MET) while LM Pilot Edgar Mitchell prepares a communications antenna in the background. Photo Courtesy of Teledyne Ryan

Shepard, Roosa, Mitchell Healthy, Ready for Apollo 14 Moon Trip

All is in readiness at Cape Kennedy for the launch of Apollo 14 on Sunday, January 31, at 2:23 p.m. Central Standard Time.

The prime crew members, Alan B. Shepard, Jr., Commander; Stuart A. Roosa, Command Module Pilot; and Edgar D. Mitchell, Lunar Module Pilot, and members of the backup crew,

Eugene A. Cernan, Ronald E. Evans, and Joe H. Engle, have passed their final extensive physicals and have been declared flight ready.

Dr. Charles Berry said at the Cape Tuesday that Cernan, involved in a helicopter crash last Saturday, was recovering successfully from minor cuts and bruises.

The Apollo 14 Lunar Module (LM), named "Antares" for the brightest star in the constellation Scorpio, at which Shepard and Mitchell will be looking as they start down to the lunar surface, is to land in the hilly upland region north of Fra Mauro crater for a stay of about 33 hours. Commander Shepard and LM Pilot Mitchell will leave the spacecraft twice to set up scientific experiments on the lunar surface and to continue geological explorations.

Lunar samples brought back from the Fra Mauro formation are expected to provide information on the early history of the Moon, the Earth, and the solar

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Aldrin To Leave Astronaut Corps

Colonel Edwin E. Aldrin, Jr., who as an Apollo 11 astronaut was on the first crew to land on the lunar surface, recently announced his plans to return to the Air Force in July.

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

Colonel Aldrin was selected by NASA as an astronaut-trainee in 1963. He is a graduate of West Point and holds a Doctor of Science Degree from MIT.



"BUZZ" ALDRIN

Firefighters To Benefit From Flight Crew Research

Firefighting is a highly dangerous occupation. The death and injury rate among firefighters has risen steadily in recent years. Through the efforts of experts in the Crew Equipment Branch, headed by Dr. Matthew I. Radnofsky, firemen may soon be better protected from some of the hazards of battling fires.

Fireproof garments of two basic types, structural and proximity, have been fabricated in the crew equipment shop. Structural suits, now being tested in the field by the Houston Fire Department, are composed of five layers of fire-resistant materials — Durette, Fluorel-coated Durette, two layers of woven Fypro, and one layer of Durette batting.

These nonflammable materials, and many others, were developed in the effort to ensure maximum safety of Apollo crews in an oxygen-rich atmosphere. Testing in normal air led to further discoveries. NASA's desire to apply space technology to terrestrial problems led to the effort in designing and building fire-resistant

clothing for the firefighters. Proximity suits are the second basic type being built. They have an outer layer of aluminized Fypro, a second layer of Fluorel-coated Durette, a layer of Durette batting, and one of Fypro. The proximity suits are so-named because wearing them, firefighters can move close to the fire. These garments will be of particular value in aircraft fires, and they are currently being tested at airports and military airfields.

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Manned Space Flight Awareness Winners Depart For The Cape

A trip to Cape Kennedy for the launch of Apollo 14 begins today for ten MSC employees who have been named as Manned Space Flight Awareness honorees.

Those selected for the weekend journey are Ruth L. Wood, Administrative Directorate; Clifton A. Rogillio, Flight Crew Operations; Phyllis J. Johnson, Medical Research and Operations; James F. DeMuth, Engineering and Development; Dennis L. Goeddel, Flight Operations; Mildred L. Wilkes, Skylab Program Office; James R. Miller, MSC-Downey; Herbert L. Yarbrough, Reliability and Quality Assurance; William A. Parkan, Science and Applications; and Donald D. Kingsbury, White Sands.

On Saturday the honorees will tour the Cape and attend a reception in their honor. The highlight of their trip will be the launch of Apollo 14 on Sunday.

Herbert Yarbrough was selected for his work on the ALSEP Acceptance Test Procedures definition and control activities. Clifton Rogillio was cited for establishing the maintenance and inspection cycles for portions of the Lunar Landing Training Vehicle.

Donald Kingsbury devised and implemented a series of tests at White Sands to determine the reactivity of spacecraft materials when immersed in propellants.

'Copter Crash Board Announced

A five-man board was named earlier this week by MSC Director Robert R. Gilruth to investigate the January 23rd crash of a NASA helicopter piloted by Astronaut Eugene A. Cernan.

Astronaut James A. Lovell, Jr., will be board chairman. Other members of the investigating team will be Conway H. Roberts, Aviation Safety Officer at MSC; Harold E. Ream, Senior MSC Pilot; Dick M. Lucas, Chief of

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The need for the tests arose as a result of the emergency during Apollo 13.

All those selected were nominated on the basis of their contributions to the success of their organizations and the Apollo program over the past year.

A number of MSC contractors also participate in the Manned Space Flight Awareness program.

NASA Seeks Experimenters For Skylab

NASA is requesting potential experimenters in the U.S. and abroad to submit proposals by April for investigations involving analysis of data to be acquired from the Earth Resources Experiment Package (EREP), scheduled to fly on Skylab in late 1972.

Data gathered from the flight will be used in assessing the value and direct applications of space observations in such areas as agriculture, geology, forestry, hydrology, oceanography, and cartography.

EREP objectives are to extend use of sensors beyond the capability of automated spacecraft; use man to observe discriminate, and select appropriate areas for study; and to provide an early source of unique research data for analysis.

Two automated Earth Resources Technology Satellites (ARTS) are being developed for launchings in 1972 and 1973. Operation of ERTS, EREP, and instrumented aircraft will be coordinated to investigate the effects of altitude variation and spectral coverage in observations of ground test sites.

A pre-proposal briefing for potential EREP and ERTS investigators will be held at Goddard in Greenbelt, Maryland, February 2-5.

U.S. proposals should be addressed to the Office of University Affairs, Code Y, National Aeronautics and Space Administration, Washington, D.C. 20546.



HAPPY FANS MEET A STAR—Entertainer Tiny Tim, wearing an Apollo 14 patch on his jacket, visited MSC last week. Mr. Tim ("Tiny" to those who know him well) is an enthusiastic supporter of the Space Program. He is pictured here with Mary Chandler (left) of the Public Affairs Office and Mary Tucker, an STC contractor employee.

COMSAT To Take Part In Apollo 14 Lunar Mission

The commercial communications satellites of INTELSAT, International Telecommunications Satellite Consortium, will play an integral role in the NASA communications network (NASCOM) during the flight of Apollo 14, and in bringing news of the flight to millions throughout the world via the satellites and earth stations constituting the global communications system.

The Consortium, which jointly owns the satellites, is made up of 77 nations, and Communications Satellite Corporation (COMSAT) acts as manager.

Voice and data communications between the Apollo spacecraft and MSC's Mission Control Center will be relayed through Goddard's NASCOM Switching Center in Greenbelt, Maryland, and through various communications facilities including the INTELSAT III satellites over the Atlantic and Pacific Oceans.

Telecasts from the lunar surface will be transmitted to the NASA earth stations at Goldstone, California; Honeysuckle Creek, Australia; and to Madrid, Spain. The transmissions to Goldstone will be sent directly to Houston.

The transmissions to Honeysuckle will go to Sydney and then to the Australian earth station at Moree for relay via the Pacific INTELSAT III to the COMSAT-operated earth station at Jamesburg, California, and on to Houston.

Transmission received at Madrid will be relayed to the Spanish earth station at Buitrago and over the Atlantic INTELSAT III to the COMSAT-operated station at Etam, West Virginia and on to Houston.

Telecasts of the Pacific Ocean splashdown will originate aboard the prime recovery ship U.S.S. New Orleans for relay via Pacific satellite to Jamesburg, California,

and then on to the TV network pool in New York City for further U.S. and worldwide distribution.

The following is a list of dates and times for TV coverage of major activities. Central Standard Time (CST) is given.

Sunday 31 January
2:23 p.m. Liftoff
5:28 p.m. Transportation and Docking
Wednesday 3 February
4:08 a.m. Transfer from CSM to LM
Thursday 4 February
7:23 p.m. Fra Mauro Landing Site (from CSM)
Friday 5 February
7:03 a.m. First EVA
Saturday 6 February
3:54 a.m. Second EVA
5:28 a.m. Second EVA
8:24 a.m. Second EVA
2:14 p.m. Rendezvous
2:39 p.m. Docking
Sunday 7 February
6:53 p.m. Inflight Demonstration
Tuesday 9 February
3:01 p.m. Splashdown

Withholding Statements Are Clarified

Many MSC employees have evidenced concern with the fact that their 1970 Federal income tax withholding statements reflect a 27-pay period work year.

Bertha Corbett of the Financial Management Division explains that once every seven years, the Government's regular 26-pay period year "catches us with us." Here's how it works.

In year one (of seven years), the 26th pay period ends on December 30; you receive your check one week later in the new year. You have received a total of 25 checks in the first year, and one day is left over (26 pay periods x 14 days = 364 days, or one day short of a year).

In years two through six, you receive 26 paychecks with one day left over in each year except for Leap Year, in which two days remain.

In the seventh year, you receive 27 checks, making up for the one paycheck short in year one and the week that has accrued since the first year.

Federal income tax is payable on all income received by an individual during the calendar year. The last paycheck for 1970 was dated December 31, 1970, the day before a legal holiday. That check was the 27th for 1970 and therefore reportable by the Financial Management Division as income subject to Federal income tax withholding.

been registered here at MSC. They represent the U.S., Mexico, Japan, England, Canada, Yugoslavia, France, and the Netherlands.

The number of newsmen at MSC is expected to reach approximately 700, the number who were here for coverage of Apollo 13.

Appropriate Office Attire Defined

Those MSC employees who have inquired whether pantsuits are appropriate apparel for office wear may be interested in the following article reprinted from the NASA Headquarters Weekly Bulletin of January 18.

"This office has received several inquiries on whether or not pantsuits may be worn by women in Headquarters offices.

It is considered unnecessary and inappropriate to establish any uniform dress criteria. However, the following guidelines on what is NOT appropriate office attire are suggested. These guidelines are recommended by personnel and fashion experts and have ap-

peared in several metropolitan newspapers:

Jeans and pants patterned after jeans, stretch pants or pants that are too tight-fitting, tops that resemble T-shirts, slacks and sweaters, pantsuits that resemble pajamas; pantsuits made of dressy evening fabrics such as velvet, satin and crepe; extra-long fringed vests, skirts and Indian-style jackets; new fashions such as the short shorts and mini-pantsuits being shown for spring wear; knickers, jump suits, bib overalls and gaucho pants."

Newsmen Gather For Moon Shot

At press time, over 1,900 news media representatives had been accredited at NASA Headquarters to cover the launch and flight of Apollo 14.

Of this number, over 200 represent foreign newspapers, magazines, radio and TV stations in 23 countries.

The total press accreditation is expected to exceed 2,000 by liftoff. This compares with the 1,795 newsmen accredited for Apollo 13 and the record number of 3,497 for the flight of Apollo 11.

By Wednesday afternoon 168 news media representatives had



MSC Director Dr. Robert R. Gilruth (right) and Dr. Michael B. Duke (center) of the Lunar and Earth Sciences Division join Dr. Alexander P. Vinogradov, vice-president of the Russian Academy of Sciences, in viewing samples of lunar rock at MSC's Lunar Receiving Laboratory. Dr. Vinogradov was in Houston to attend the second annual Apollo Lunar Science Conference

Conference Findings Revealed

Scientists from the United States and 95 foreign countries recently met at the Albert Thomas Convention Center for a four-day Second Annual Lunar Science Conference. Close to 800 were in attendance.

Under discussion were the findings based on the study of lunar samples brought back by the Apollo 11 and Apollo 12 crews.

Dr. Paul Gast, Chief of the Lunar and Earth Sciences Division, stated one of the single most important findings of the conference. "Things which were puzzles last year (at the First Lunar Science Conference) have now been resolved and turned to our advantage. Particularly, some of the seemingly contradictory characteristics of the soil and underlying rock have indicated that much of the soil comes from

other lunar areas, perhaps the highlands, and thus have given a clue to the age and composition of the highlands."

He also stated that parts taken from Surveyor III and returned to earth by the Apollo 12 crew have been of major scientific import.

"Study of glass surfaces returned from Surveyor have provided essential calibration of the flux of heavy particles coming from the sun."

Lang To Retire

Dave W. Lang, Director of Program Control and Contracts, is retiring on January 31 after 25 years of Government service.

Prior to his appointment as Director in January 1968, he had served as Chief of the Procurement and Contracts Division since 1961, the year he came to MSC.

Lang has accepted a position with Grumman Aircraft Corporation at Bethpage, New York. He will enter his new job on February 1.

AFGE To Hold Dinner-Dance

Mr. John F. Griner, National President of the American Federation of Government Employees (AFGE), will address members of the MSC chapter of AFGE, Local 2284, and their guests at a dinner-dance on Friday February 26 in the Grand Ballroom of the Astroworld Hotel. Mr. Griner represents over 600,000 Federal employees.

The occasion celebrates the recent elections held here in which the AFGE won exclusive rights to represent MSC employees in negotiations with management on employee-employer relations.

Tickets are available to all MSC employees from any officer or area representative of the local chapter. For additional information, contact Harry Kline, x4564.

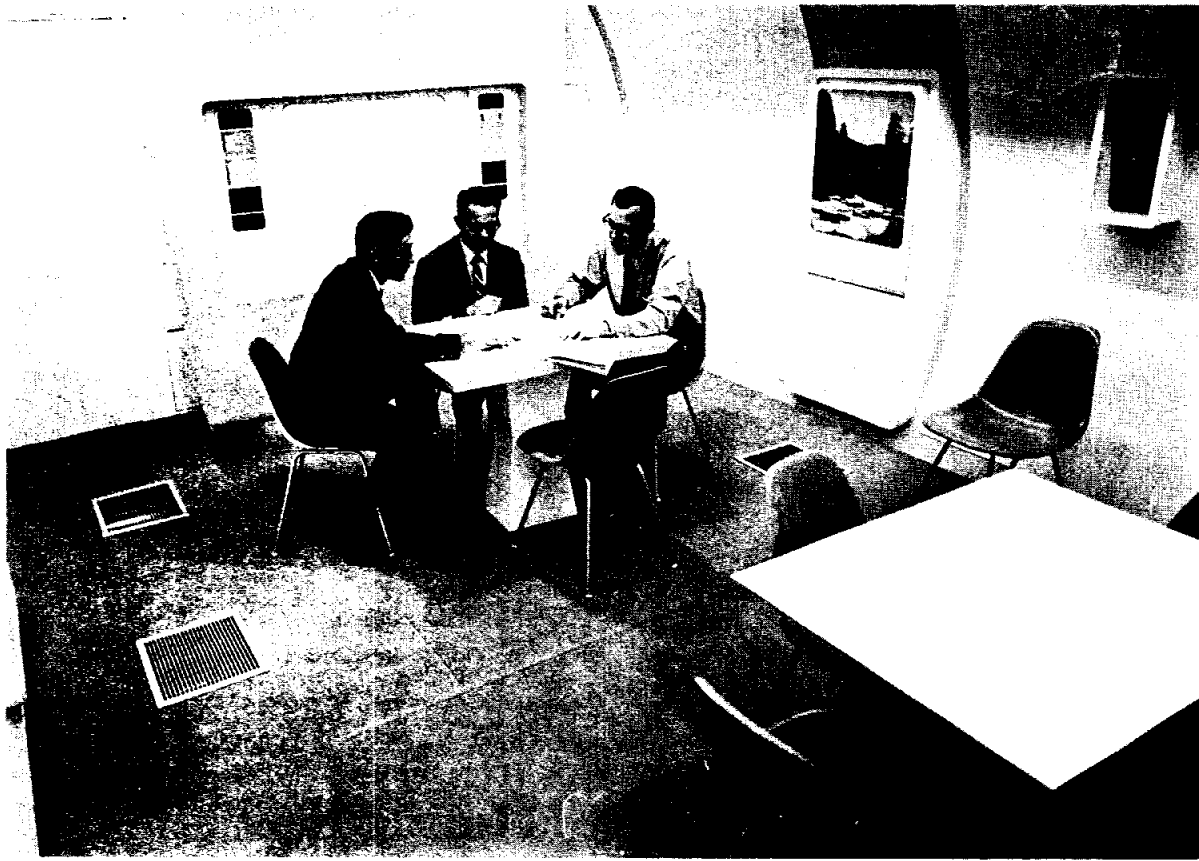
ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON TEXAS

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Staff Photographer.....A. "Pat" Patnesky



WARDROOM OF MODULAR SPACE STATION MOCKUP—Three of the designer/builders of the mockup are shown as they discuss plans for the interior design of future spacecraft. The engineers are (l. to r.) Maynard Dalton, project engineer for the Space Station module; Gordon Rysavy, Chief of the Habitability Technology Section; and Clarence Council. Behind the men is a screen which may be used for slides, viewgraphs, or movies during conferences or recreation periods. The panels on either side of the screen list menu items from which crew members may pre-select their meals. Behind the screen are the galley and scullery which are separated by a hallway. The picture panel at the right of the men folds out into a table. To the right of the picture is a window from which crewmen may gaze at the "good earth."

Modular Space Station Mockup Is Unveiled By Habitability Technology Engineers

Many people have known the pride of accomplishment in constructing a model airplane, auto, or boat. The engineers of the Habitability Technology Section within the Spacecraft Design Office know regularly the fulfillment of assembling a model. However, this work not only involves building the model, or mockup, but designing concepts for it, too. And their finished products are full size!

The Section, which has been in operation for a year, most recently completed a 14 by 29 foot mockup of the Modular Space Station — one which could be taken into Earth orbit in the bay of a space plane.

Maynard Dalton, project engineer, explains that the purpose of the mockups is "to support habitability concepts and to analyze interior arrangements of the space craft." To evaluate the layouts and livability of the space "house" is the unique function of this Section.

Plywood was originally used as building material for the mockups. More recently, however, styrofoam with lightweight cardboard facings has been utilized with great success. This new material, commonly called fomecor, can be easily shaped with a knife and fastened with glue or tape.

Dalton estimates that because of the relative ease in both construction and modification of a fomecor structure, building takes less than half the time of constructing a mockup with plywood. Shortened time affords dollar savings as well.

The Space Station module, which took approximately seven

weeks to design and construct, is compartmentalized lengthwise into three areas. Overhead is the utilities easement which will contain the airconditioning ductwork, wiring, and some storage space. The activities deck is the area in which the crew will work. The storage - support system deck will house primary storage and subsystems which support the module.

The mockup, located in Building 13, houses the wardroom, kitchen facilities and a personal hygiene unit.

The 12 by 15 foot wardroom will serve as a dining room, conference room, movie theater, recreation area and chapel (that's right, a chapel), among other uses. There are two windows which will allow crew members to stargaze at leisure. Floating ceilings give the illusion of greater space than is actually available. The walls will be decorated with pictures of "earthly" scenes to give the crewmen a feeling of being "at home."

Economy minded mockup builders discovered that jigsaw puzzles were less expensive than pictures of equivalent size, so interior walls feature puzzles depicting a farm scene, a rustic New England setting, and a view of the Grand Canyon.

The kitchen is separated into the galley, or food preparation area, and the scullery, clean up area. The two sections are physically separate to avoid contamination of food should spillage occur during the clean-up process.

Visitors from Headquarters, other NASA centers, and the European Scientific Research Or-

ganization (ESRO) recently viewed the Space Station mockup and were briefed by Caldwell C. Johnson and Allen J. Louviere on the design and construction process and features of the module.

"Moon" Viewers

A number of MSC employees recently enjoyed a trip to "The Moon." In this instance, Jones Hall was the destination—not the lunar surface.

Carl Orff's opera "The Moon" was part of an operatic double feature presented by the Houston Grand Opera Association in what was billed as "NASA Night at the Opera." The second feature was Leoncavallo's classic "Pagliacci."

"The Moon," a fantasy about four men who steal the moon only to have it reclaimed by St. Peter after their deaths, was sung in English. Special visual effects were provided by the MSC. A lunar rock was on exhibit in the lobby during the performances.

Copter Crash

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MSC's Aircraft Maintenance and Quality Assurance Branch; and Astronaut Alan L. Bean.

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

Cernan, who is commander of the Apollo 14 backup crew, escaped from the crash with minor injuries.

Dunseith Named By Commission As Flemming Semi-Finalist

Lynwood C. Dunseith, recently named as Assistant Director for Computation and Flight Support in the Flight Operations Directorate, has been selected by the Arthur S. Flemming Awards Commission as one of the twenty semi-finalists for the 1971 Flemming ward.

This award is given annually to ten outstanding young men in the Federal Government. Nominees must be under 40 years of age.

Previous MSC winners of the Flemming Award include Dr. Christopher C. Kraft, Deputy Director, 1964; Dr. Maxime Faget, Director of Engineering and Development, 1959; and Eugene F. Kranz, Chief, Flight Control Division, 1969.

Mr. Dunseith began his career at Lewis Research Center in

1957. He joined the Space Task Group in 1959 and worked on development of the real-time support computer program for Project Mercury. He was named Chief of the Flight Support Division in January 1967 and continued to serve in that capacity until his reassignment in December 1970.



Museum Announces Exhibit

The Houston Museum of Fine Arts has announced the January 30 opening of a "Touch Me" exhibition, designed especially for the blind, whose only knowledge and appreciation of art works come through the sense of touch. However, all adults and children will enjoy the unusual experience

of recognition of different textures and shapes through physical contact.

Works of metal, glass, wood, stone, textile, and ceramic by a number of noted artists will be featured.

The exhibition closes on March 7.

Children's Xmas Party — 1970



IS ALL THAT CANDY FOR US, DAD?—Dave Bell, past president of the Employees Activities Association, aided by his daughter Terri and son Scott is shown filling Christmas stockings with candies and fruit, later received by eager youngsters at the EAA Children's Christmas Party.



WHO'S THAT FELLOW WITH THE BEARD?—Santa Claus (Bud Foster of the Apollo Test Division in very convincing disguise) was on hand to greet all the children. In this case, Brent Hayes, son of Ron Hayes, new president of the EAA, is the young man looking a bit dubiously at Santa. Cadet Don, star of a local kiddie TV show, and Sergeant Garnett of the Houston Police Department entertained the children and their parents.