APOLLO 13 IS GO! See Pages 5-8

"THANK YOU" tour by Apollo 11 commander Neil Armstrong gets underway in the Lobby of Building 14. From left are Eugene Wasielewski, Goddard Associate Director; Ozro M. Covington, Director of Manned Flight Support; Mr. Armstrong, Henry F. Thompson, Deputy Director of Manned Flight Support; and H. William Wood, Chief of the Manned Flight Operations Division.

GODDARD NEWS

April 13, 1970 Vol. 18, No. 1

Astronaut Armstrong Thanks Goddard

A not altogether unfamiliar face was seen making the rounds of Buildings 3 and 14 several weeks ago—Neil Armstrong—in Washington to receive the National Space Club premier award at the annual Goddard Memorial Dinner. Astronaut Armstrong satisfied a long deferred desire to visit the Center and personally thank those in the MSFN and NASCOM for their support during his historic Apollo 11 mission.

A frantic forty-five minutes began at Goddard when Armstrong was met in the Building 14 lobby by Eugene Wasielewski, Associate Director; Ozro Covington, Director of Manned Flight Support; Henry Thompson, Deputy Director of Manned Flight Support; and Bill Wood, Chief of the Manned Flight Operations Division. The group went into the observers area behind the OPSCON where Bill Wood quickly summarized the MSFN activity which takes place in the MSFNOC. On the MSFNOC floor a few minutes later, Armstrong greeted and shook hands with console operators who were present as part of a small simulation taking place. Dale Call, Associate Chief, Manned Flight Operations Division, summarized the simulation exercise and then asked Armstrong if he wished to chat with the remote station personnel via the SCAMA phone.

Armstrong responded with the following SCAMA-wide conversation: "Hello Manned Space Flight Network. This is Apollo 11 'delayed edition' coming to you from Goddard. It is nice to say hello to all of you for once from the ground. On behalf of my Apollo 11 collegues I would like to say that we surely appreciate the magnificant job you all did for us last summer. In our travels around the world we have been able to talk to some of you first hand. We also heard from many of you by mail and wires, and we thank you for all of these good wishes.

"We have found on our trips around the world that people everywhere appreciate the fact that the U.S. was willing to share its program so effectively with them by means of modern communications. I can tell you very sincerely that people of many countries have told me personally that they certainly appreciate not only our technology but also our intent in trying to build a better world through our space experiences. To those of you out there on the network who made all of those electrons go to the right places, at the right time, and not only during Apollo 11, I would like to say thank you."

The group then proceeded to the Network Support Room for a similar round of greetings, introductions and handshaking. Fidel Rul, the network support team chief on duty did the introduction honors.

They moved upstairs to the Real-time Computer Center area where Walt Adams, Jim Donegan, John Morton and other denizens of the whirring tape world discussed the role of their center in the overall manned space flight missions.

Vern Stelter, NASCOM Division Chief, then squired the group through the NASCOM Computer, technical support and SCAMA switchboard areas. Astronaut Armstrong couldn't resist the opportunity to chat briefly with an old friend in Honolulu—the station manager of the MSFN site in Kauai, Hawaii, Mr. Virgil True.

The "walk through" tour concluded with a short chat between the Messrs. Wasielewski, Covington and Thompson. Mr. Wasielewski then made a presentation to Astronaut Armstrong of a small model of the original Robert H. Goddard rocket.

Forty-five minutes after he arrived, Armstrong swooped out of the main gate of Goddard on his way to the memorial dinner – the MSFN people were wreathed in smiles feeling that perhaps the long hours facing them for the upcoming Apollo 13 mission were, well, really not so long.

The publication date of this issue of the Goddard News has been advanced in order that it may bring to Goddard employees the latest-advance information on the forthcoming Apollo 13 mission.

NEIL ARMSTRONG discusses Apollo 11 with some of the men of Goddard's Network Support Team who acted as technical advisors for the mission. From left are Ozro M. Covington, Director of Manned Flight Support; astronaut Armstrong, Fidel Rul, Team Chief; John Stults and Ron Jones, USB Advisors; and Jack Lee, Air-to-Ground Communications Advisor.

SOLAR ECLIPSE: March 7, 1970

It was perhaps the most thoroughly studied solar eclipse in history and the last one of the century for this area. As the Moon's shadow raced from Mexico to Newfoundland, NASA scientists viewed the phenomenon using Mariner-6 in deep space, six Earth orbiting satellites, 35 sounding rockets, and ground-based equipment. Observations concentrated on the effects of the sudden darkness on the Earth's atmosphere and ionosphere, but included studies of the Sun itself.

From orbit, the eclipse was viewed by six Goddard-managed satellites. ATS-3, moved to an orbit at 85° W longitude for the event, photographed the lunar shadow as it passed across the eastern United States and transmitted VHF signals for propagation experiments. Two OSO's gathered data on the sun and its atmosphere, and three U.S./Canadian satellites—Allouettes 1 and 2, and ISIS 1—studied eclipse-caused changes in the ionosphere.

On the ground, NASA activities reached their peak at Wallops Island, Virginia where 32 sounding rockets were launched March 6-8 to carry aloft experiments in meteorology, ionospheric physics, and solar physics. George MacVeigh, Coordinator at Wallops for Goddard's Sounding Rocket Branch, reports that near the period of totality a record 11 rockets were launched in five minutes.

Goddard sounding rocket experimenters included: Ernest Helsenrath, Wendell Smith, John Theon, Dr. Donald F. Heath and Dr. Eugene Maier, meteorology; and Dr. Nelson C. Maynard, Nelson W. Spencer and Larry H. Brace, ionospheric physics.

1:40 p.m.

1:30 p.m.

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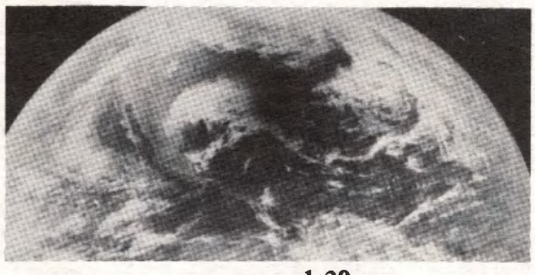
FROM ORBIT. ATS-3, in orbit at 85° W longitude, took this remarkable series of spin-scan pictures of the March 7 eclipse as the Moon's shadow moved from Florida to the North Atlantic.



1:20 p.m.

1:10 p.m.

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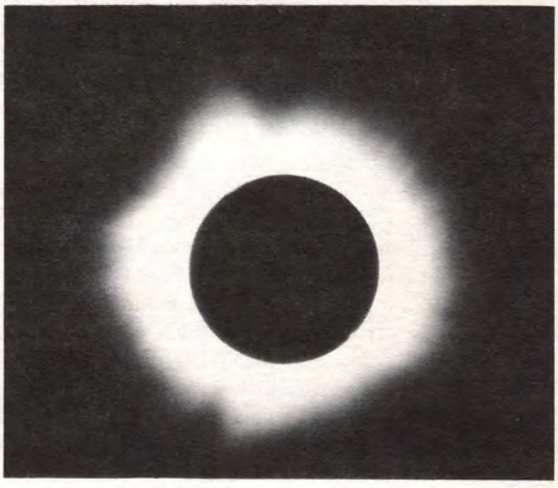
FROM THE GROUND. Curtis McCracken of the Astrophysics Branch (LSS), one of several Goddard astronomers to photograph the eclipse, took this picture during totality from the Dismal Swamp, North Carolina.



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SOUNDING ROCKET BRANCH members who took part in the solar eclipse launches are (from left, kneeling): James R. Lease, Everett M. Worley, Bruce R. Pincus, Milburn D. Andrews, Robert H. Carro, Orville K. Brack, and Maurice A. Nygaard. Standing are: Jack J. Gottlieb, Irven Errera, John E. Doyle, Robert K. Kopsidas, Milton W. Barrett, Thomas W. Collinson, Paulette Behanna, Robert Demorest, John W. Cameron, Steve F. Repas, George E. MacVeigh, Morgan Windsor, Charles G. Stouffer, William A. Russell, George E. Kraft, Donna S. Sykes, M. Douglas Gunter, Ernest F. Sorgnit, Francis L. Beachy, Vernon J. Laurie, and Raymond Stattel.

CHARLES GOODMAN receives his check and plaque from Senator Joseph D. Tydings of Maryland. From left are Dr. John F. Clark, Goddard Director; Senator Tydings, Don C. Hutchison, Goddard Cost Reduction Officer; Mr. Goodman, Richard S. Sade, MFSD Administrative Operations Officer; and Ozro M. Covington, Director of Manned Flight Support.

SCAMA CALL. Senator Tydings phones his congratulations by SCAMA to Victor M. Figueroa, Director of the NASCOM Switching Center, Madrid, Spain. Listening in are (from left) Dr. John F. Clark, Goddard Director; John T. Mengel (back, center), Director of Tracking and Data Systems; and Ozro M. Covington, Director of Manned Flight Support.

Senator Tydings Presents Cost Reduction Awards

Top honors in the Center's Cost Reduction Program went to 14 Goddard employees during a series of special award presentations held March 24, 1970. Here for the occasion was United States Senator Joseph D. Tydings of Maryland who presented the awards and congratulated the men for their outstanding work in reducing government costs.

Recipients of $400 cash awards and commemorative plaques were:

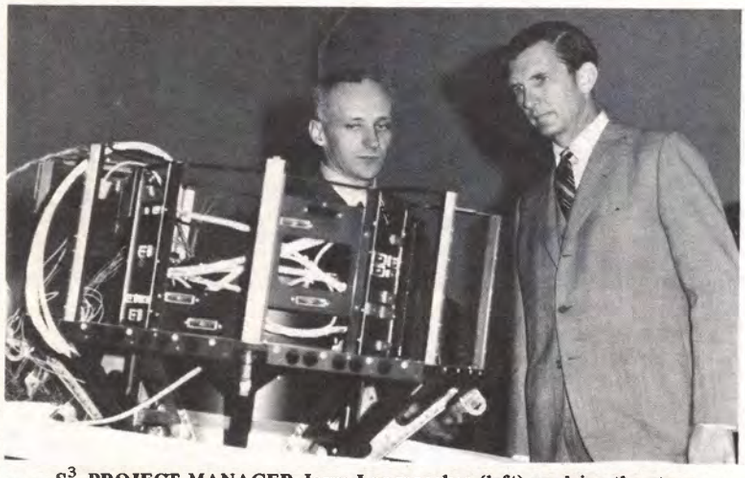
Bill Doles, of the Procurement Division, for nine cost reduction actions associated with the use of computers and computer services.

Charles Goodman, of the NASA Communications Division, and **Victor M. Figueroa**, Station Director at the NASCOM Switching Center in Madrid, Spain, for savings from the development of overseas television circuits for the Apollo program.

Richard Devlin, of the Nimbus Project, for reduced cost in the design of the Nimbus weather satellite.

Ten other individuals received special Certificates of Merit. They were: Ben Goldman, Charles Hardesty, Dick Buckingham, George Cassels, Duane Robertson, Albert Wilhite, Gerald Longanecker, David Klinglesmith, Dr. David Fischel, and Reuben Scholnik.

One highlight of the day came during the NASCOM presentations when Senator Tydings spoke via SCAMA-phone with Victor Figueroa who received notification of his award at the NASCOM switching center in Spain. To close the ceremonies, Dr. John F. Clark, Goddard Director, gave Senator Tydings a model of the world's first liquid fuel rocket developed by Dr. Robert H. Goddard in 1926.



S^3 PROJECT MANAGER Jerry Longanecker (left) explains the structure of the Small Scientific Satellite to Senator Tydings. Mr. Longanecker was one of ten Goddard men to receive a special Cost Reduction Certificate of Merit.

BILL DOLES is congratulated by Senator Tydings while Barbara Doss and Dr. Michael J. Vaccaro, Director of Administration and Management; look on.

Cost Reduction Since 1963

The Cost Reduction Program dates back to December 1963 when President Johnson instructed all government agencies to work toward the reduction of costs within every phase of their operations. At this time, NASA made cost reduction a continuing policy at Headquarters and all field centers with the aim of obtaining the greatest value for dollars spent.

At Goddard the program has been highly successful with the Center consistantly exceeding its yearly goals. In 1969 alone, the annual goal of $14,000,000 was topped by a savings of $15,006,000.

The task of maintaining this cost reduction record is the job of every Goddard employee. Last year, it took 233 men and women to initiate actions that netted $15 million. The savings were earned because each individual took a sharp, imaginative look at his job and came up with improved techniques or actions that resulted in reduced costs in terms of dollars, man-hours or equipment time.

At the end of each quarter of the fiscal year all cost reduction participants receive certificates in recognition of their participation. In addition, special awards are presented each year to those individuals who have performed their cost reduction tasks in a truly outstanding manner. In 1969, 14 men were nominated for these awards using an objective scoring system. Of these, the Cost Reduction Committee found the performance of four to be superior enough for each to receive the cash award and commemorative plaque. The other 10 nominees received special Certificates of Merit.

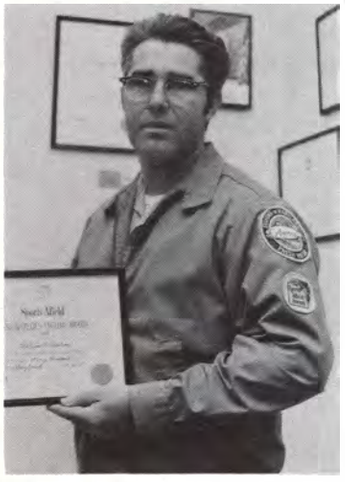
(See Page 4.)

COST REDUCTION ... From Page 3.

CO-WORKERS look on as Ben Goldman receives his Certificate of Merit from the senator. During the day, Senator Tydings moved around the Center to present the awards to each individual where he works.

GEORGE CASSELS (right) receives his Certificate of Merit from Senator Tydings while Richard S. Sade looks on.

Fishing Champ



WILLIAM H. HOPKINS, of the Processor Development Branch (IPD), has received Sports Afield magazine's "Best-in-State" citation. The award consits of a sterling silver insignia and commemorative certificate. Mr. Hopkins won this top award for Maryland by catching a 1 lb. 14 oz. Crappie, the largest taken in the state during 1969. The fish was caught in the Pocomoke River at Shad Landing State Park last March. Sports Afield's state fishing awards program embraces all 50 states. Its purpose is to encourage the catching of fish on sporting tackle, and to give recognition to meritorious catches on a state rather than a national level.

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Patricia Ax, Ext. 4141

Trial Retirement

JOHN KENSINGER (right) receives congratulations from Dr. John F. Clark, Goddard Director, as he becomes the first Goddard employee to try the Center's new trial retirement program on March 20, 1970. Mr. Kensinger is taking advantage of a program which gives employees who are eligible for optional retirement the opportunity to experiment with retirement for one year with annuity and then return to Goddard if he so wishes. This trial period may be used to explore a new career, travel or just relax. If an employee decides to return to Goddard he may return to work at the same grade and salary step he held immediately before retiring.

T&DS Awards

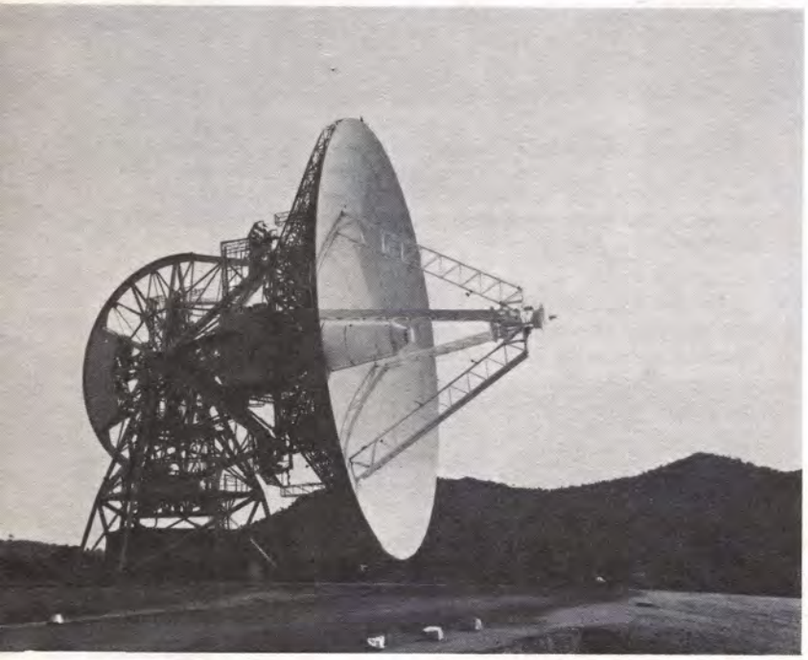
15 YEAR Length of Service Awards were among many awards presented at the Tracking and Data Systems Directorate's semi-annual Honor Awards Ceremony. Receiving the 15 Year Award were (from left): Thomas W. Tunney, Jr., Freda M. Long, Edward Melendey, Joseph J. Eck, Philip S. Kirby, Adolph Goodson, Melvin C. Clark and (not shown) Allen K. Berndt, Nino L. Bonavito, Edward J. Eisele, William M. Hocking, and John B. Martin.

T&DS 10 Year Length of Service Award winners (from left): (seated) Willis Holmes, Jr., Pat M. Mitchell, Morton Foxe, Margaret M. Stubbs, John B. Zegalia, Edward R. Watkins, Jr, Gerald Quigley, (standing) Warren F. Adams, David W. Harris, Dale L. Fahnestock, Bernard Nowotarski, Harry Crispell, Robert H. Adams, Peter O. Minott, Joseph A. Munoz, James J. Lombardo, Paul Davenport, Louis R. Dod, John J. Quann, Clyde H. Freeman, Gary B. Vincent, William P. Barnes, Thomas C. Clemmons, Jr., Robert E. Coady, Thomas E. McGunigal, Robert L. Hermann, William A. Struthers, Dominick E. Santarpia, and C. Curtis Johnson. Not shown are William M. Davenport, Donald A. Kennedy, and Bernard W. McKendree, Jr.

APOLLO 13

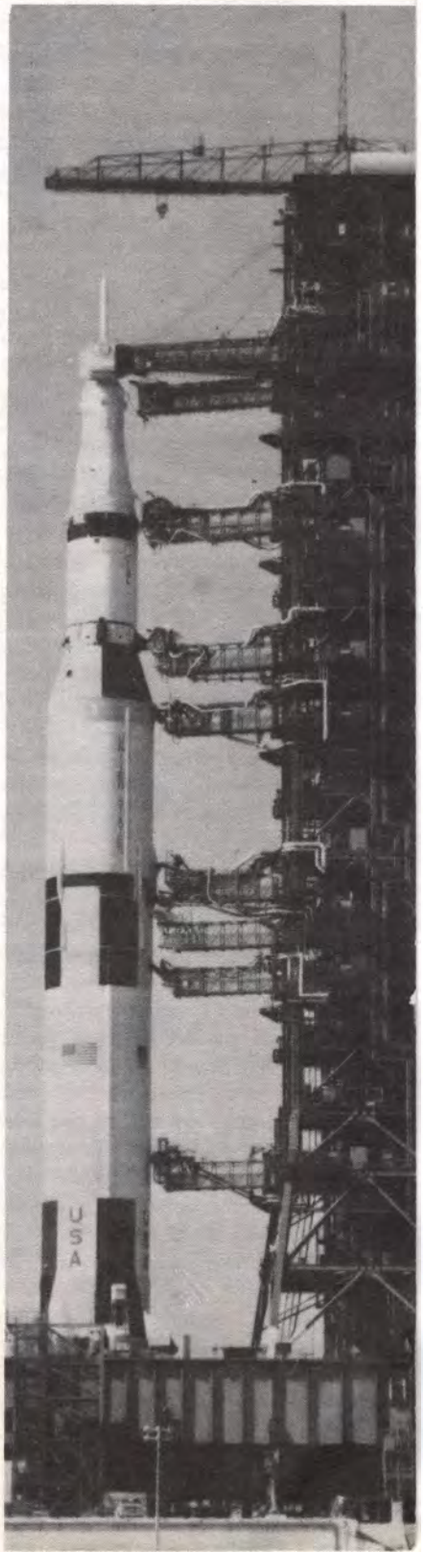
THE APOLLO 13 CREW

ASTRONAUTS WHO will man the Apollo 13 spacecraft are (from left) commander James A. Lovell, Jr.; command module pilot Thomas K. Mattingly, III; and lunar module pilot Fred W. Haise, Jr. Lovell and Haise will land in the LM north of the crater Fra Mauro while Mattingly remains in lunar orbit in the CM.



THE ELECTRONIC LIFELINE

PRIME MSFN STATIONS at Goldstone, California; Madrid, Spain; and Canberra, Australia; will use 85-foot antennas such as this one at Madrid to link the astronauts on the Moon with Earth.



THE LAUNCH VEHICLE

THE 363-FOOT-TALL Apollo/Saturn V is shown on Pad A with the Apollo 13 space vehicle in place near the top.

THE LANDING SITE

FRA MAURO is a flat highland area located at 17° 36' W longitude and 3° 48' S. latitude, approximately 110 miles of the Apollo 12 landing point in the Ocean of Storms. The "X" marks the Apollo 13 landing site.

APOLLO 13 DESTINTION FRA MAURO

Apollo 13, off to the Moon on April 11, is scheduled to explore the rugged Fra Mauro region and return for splashdown on April 21. Goals for this third U.S. lunar landing mission include a stay on the Moon of over 33 hours and the return to Earth of Moon rocks that may be five billion years old.

The Fra Mauro landing site is a hilly upland region north of the crater Fra Mauro. Earlier Apollo missions were to low mare or "sea" areas, with Apollo 11 going to the Sea of Tranquility and Apollo 12 going to the Ocean of Storms.

Crewmen for Apollo 13 are commander James A. Lovell, Jr.; command module pilot Thomas K. Mattingly, III; and lunar module pilot Fred W. Haise, Jr. During the lunar phase of the mission, Mattingly will remain in orbit in the Command Module while Lovell and Haise land for a 33 hour stay which will include two Moon walks to set up scientific equipment and conduct geological investigations.

Primary Apollo 13 objectives are: To perform selenological inspection, survey and sampling of materials in a preselected region of the Fra Mauro formation; to deploy and activate an Apollo Lunar Surface Experiment Package (ALSEP); to develop man's capability to work in the lunar environment; and to obtain photographs of the candidate exploration sites of Censorinus, Davy Rille, and Descartes.

Currently 11 television transmissions are planned to give viewers a glimpse of all phases of the mission.

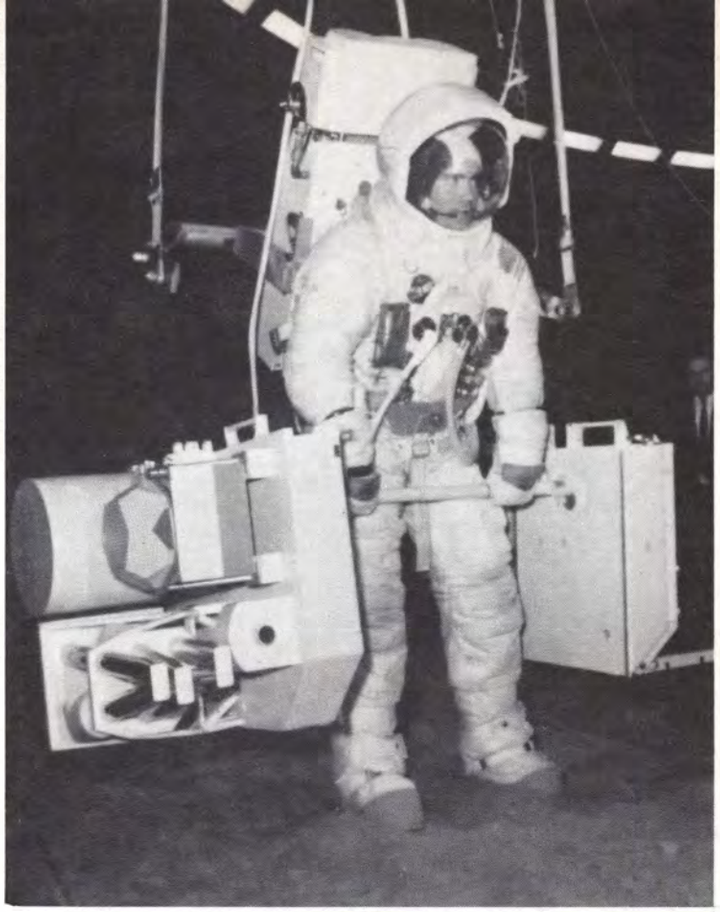
Experiments emplaced at the Fra Mauro site as part of the ALSEP II will gather and relay long-term scientific data to Earth for at least a year on the Moon's physical and environmental properties. Five experiments are contained in the ALSEP: a lunar passive seismometer which will measure and relay meteoroid impacts and moonquakes; a heat flow experiment which will measure the heat flux from the lunar interior to the surface and the conductivity of the surface materials to a depth of about 10 feet; a charged particle lunar environment experiment which will measure protons to determine the effect of the solar wind on the lunar environment; a cold cathode gauge experiment which will measure density and temperature variations in the lunar atmosphere; and a dust detector experiment.

The empty third stage of the Saturn V launch vehicle will be targeted to strike the Moon before the lunar landing, and its impact will be recorded by the seismometer left by the Apollo 12 astronauts last November. The spent lunar module ascent stage, as in Apollo 12, will be directed to impact the Moon after rendezvous and final LM separation to provide a signal to both seismometers.

The Apollo 13 flight profile in general follows those flown by Apollos 11 and 12 with one major exception – lunar orbit insertion and the docked spacecraft will be placed into a 7 x 57 nautical mile lunar orbit by use of the service propulsion system. Lunar module descent propellant is conserved by combining these maneuvers to provide 15 seconds of additional hover time during the landing.

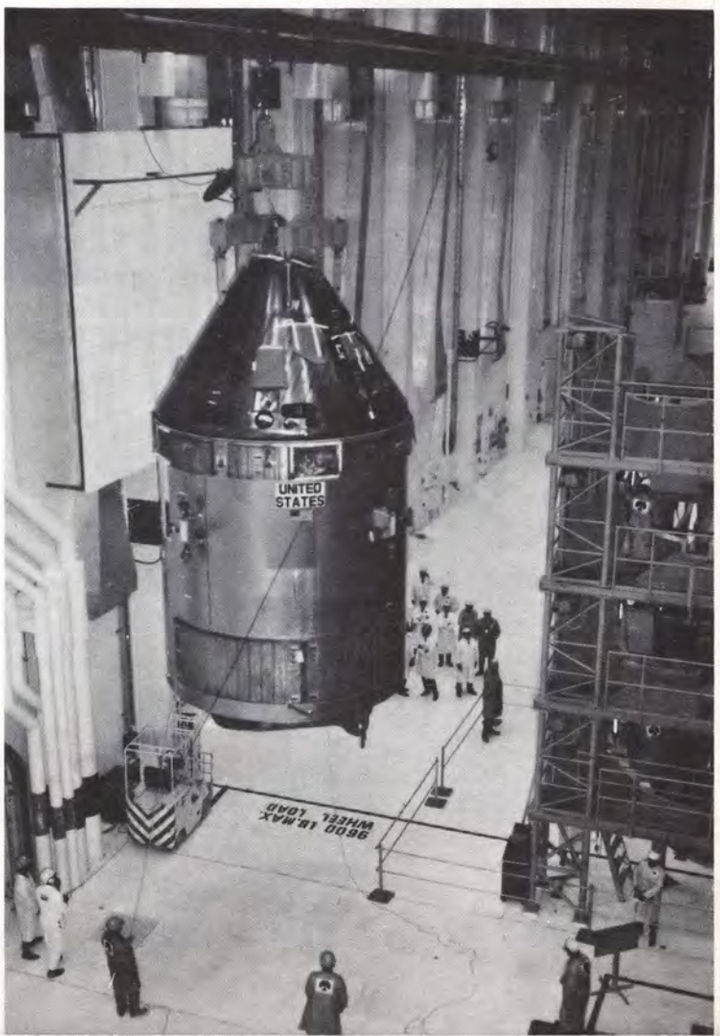
Lunar touchdown is scheduled for 9:55 EST April 15, and the two periods of EVA will be at 2:13 a.m., and 9:58 p.m. EST April 16. At this time, when two spacecraft are separated, call sign for the command module will be "Odyssey" and the lunar module call sign will be "Aquarius." Lunar liftoff is set for 7:22 a.m. April 17.

Apollo 13 will leave lunar orbit at 1:42 p.m. EST April 18 for return to Earth. Splashdown in the mid-Pacific just south of the Equator will be at 3:17 p.m. April 21.



FRED HAISE, lunar module pilot of the Apollo 13 lunar landing mission, takes part in lunar surface simulation training at the Manned Spacecraft Center. Haise is attached to a Six Degrees of Freedom Simulator. Using mock-ups, he simulates traversing with the two subpackages of the Apollo Lunar Surface Experiments Package (ALSEP) via a barbell mode.

THE APOLLO 13 command service module is being moved from the altitude chamber to the work stand at the Kennedy Space Center.



JAMES A. LOVELL, Apollo 13 commander, operates a camera like one that will be used to take pictures during the moon-walk.

APOLLO 13 ASTRONAUTS James A. Lovell (left) and Fred Haise prepare to load and unload equipment from the cabin section of the lunar module with a pulley arrangement.

GODDARD NETWORKS READY

With the approaching launch of Apollo 13, the Manned Space Flight Network (MSFN) has been undergoing extensive testing and training to enhance their mission support capabilities. These vital activities have been under the direction of Network Director Dale Call, and have conformed the three vital links in the "electronic lifeline" – tracking, data acquisition and communications – which will be provided by the 13 tracking stations including the Apollo tracking ship USNS Vanguard and four Apollo Range Instrumented Aircraft.

The coordinated control of the Manned Space Flight Network Operations Center (MSFNOC) is headed by the Network Operations Manager Ray Davis and his Assistant Robert Inscho. Within the confines of the MSFNOC is a Network Support Team comprised of technical representatives and special members providing technical assistance to the Manned Space Flight Network prior to and during the Apollo 13 mission. This special team is headed up by the Team chief Fidel Rul.

Other important organizations providing support to the Network Director are the NASA Communications Network (NASCOM) and the Goddard Real Time Computer Center. The NASCOM Communications Directors for this mission are George Cassels; Robert Plaumann, and Wilmer Rogers. All the Computer and Data Flow Integrated Subsystems (CADFISS) activities involving the command, telemetry, and tracking network interface testing are directed by Walter Adams CADFISS Director, and coordinated by Ray Mazur and Chuck McTavish with the appropriate NST members. The Goddard Real Time Computing System is headed by John Morton, who interfaces with the NST and the supporting stations for reviewing and evaluating real time data during the mission.

Tracking to the Moon and Back

For Apollo 13, the MSF and NASCOM networks will provide continuous and instantaneous contact with the astronauts, launch vehicle, and spacecraft from launch to splashdown. The MSFN will also retrieve data from the experiments left on the lunar surface by the astronauts.

During the mission, 30-foot antennas at all 13 MSFN stations will track the spacecraft from launch to a distance of about 10,000 miles. At this point, 85-foot dishes at three prime sites will take over to provide a continuous link for voice, telemetry and tracking data to the Moon and back. It is these three prime antennas that will maintain contact with the two spacecraft during the lunar phase of the mission.

These 85-foot sites are located about 120 degrees apart near Madrid, Spain; Goldstone, California; and Canberra, Australia. Station Directors are Dan Hunter, Madrid; George Fariss, Goldstone; and Don Gray, Canberra. Additional support will come from the 210-foot antenna system at Goldstone.

Linking the MSFN stations, Goddard and the Houston Mission Control Center (MCC), are the nearly three million circuit miles of communication channels in the NASCOM Network. Using satellites, submarine cables, land lines, microwave systems, and high frequency radio facilities for access links, NASCOM is the link through which all Apollo data must flow to and from Houston MCC and the spacecraft.

The NASCOM control center is located here at Goddard. Regional communications switching centers are in London, Madrid, Canberra, Honolulu, and Guam.

APOLLO 13 MISSION EVENTS

Event	GET	Date	EST
Launch	000:00	April 11	2:13 p.m.*
Earth Orbit Insertion	00:11	11	2:24 p.m.
Translunar Injection	02:35	11	4:48 p.m.
Separation, Docking	03:06	11	5:19 p.m.
Lunar Orbit Insertion	77:25	14	7:38 p.m.
S-IVB Impact	77:46	14	7:59 p.m.
Descent Orbit Insertion	81:45	14	11:58 p.m.
CSM-LM Undocking	99:16	15	5:29 p.m.
LM Descent Initiation	103:31	15	9:44 p.m.
Lunar Touchdown	103:42	15	9:55 p.m.
First EVA Begins	108:16	16	2:29 a.m.
Second Eva Begins	127:58	16	10:11 p.m.
Lunar Liftoff	137:09	17	7:22 a.m.
Docking	140:45	17	10:58 a.m.
LM Ascent Stage Impact	145:00	17	3:13 p.m.
Transearth Injection	167:29	18	1:42 p.m.
Splashdown	241:04	21	3:17 p.m.

*Launch Window Opens

EXPERIMENT PRACTICE. Fred Haise (left) and James Lovell adjust a portion of the heat flow experiment which contains a drill to penetrate 10 feet into the Moon's surface.

APOLLO 13 TV SCHEDULE

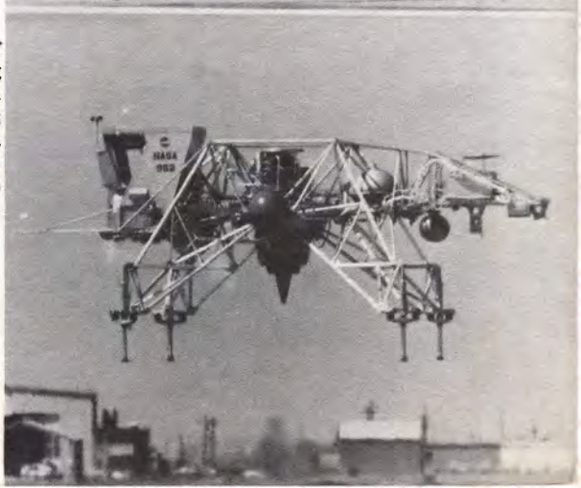
Day	April	EST	GET	Duration	Subject
Sat	11	3:48 p.m.	01:35	7 Min.	Earth*
Sat	11	5:28 p.m.	03:15	1 Hr. 8 Min.	Docking
Sun	12	8:28 p.m.	30:15	30 Min.	Spacecraft Interior
Mon	13	12:13 p.m.	58:00	30 Min.	Interior
Wed	15	2:03 p.m.	95:50	15 Min.	Landing Site
Thu	16	2:23 a.m.	108:10	3 Hrs. 52 Min.	EVA-1
Thu	16	10:03 p.m.	127:50	6 Hrs. 35 Min.	EVA-2
Fri	17	10:36 a.m.	140:23	12 Min.	Docking
Sat	18	12:23 a.m.	166:10	40 Min.	Lunar Surface**
Sat	18	2:13 p.m.	168:00	25 Min.	Lunar Surface**
Mon	20	7:58 p.m.	221:45	15 Min.	Earth & Spacecraft Interior

*Tentative
**Recorded Only

CREWMEN of Apollo 13 leave the command module trainer during water egress training in the Gulf of Mexico. From left are Thomas Mattingly (in hatch, almost obscured by MSC swimmer), Fred Haise (stepping into raft) and James A. Lovell (seated in raft).

ASTRONAUTS James Lovell and Fred Haise carry out a simulation of a lunar traverse at Kilauea, Hawaii. Both crew members of NASA's third team of Moon explorers carry cameras and communications equipment. They maintained contact with men in the roles of spacecraft communicators throughout the traverse.

LLTV FLIGHT. A Lunar Landing Training Vehicle, piloted by James A. Lovell, Jr., undergoes a test flight at Ellington Air Force Base in March. Astronaut Lovell, Apollo 13 commander, used the LLTV to practice lunar landing techniques in preparation for the April mission.



Astronomy Club Members Learn by Doing

ASTRONOMY CLUB MEMBERS gather at the club's observatory at GORF. From left are Robert Watson, Robert Atwood, Karl Peters, Robert Godfrey, Sally Godfrey, Secretary; Victor Laczo, President; Winifred Cameron, and Charles Brown, Vice President. Several active members were not present.

If you have the urge to observe the stars through a telescope or discuss the latest topics in astronomy, the Goddard Astronomy Club welcomes you. The club presently consists of 25 amateur astronomers who meet regularly at noon on the first Wednesday of the month for discussions and also hold informal observation sessions at their observatory located at the Goddard Optical Research Facility (GORF).

Many club members traveled to the eastern shore areas to observe the total solar eclipse of March 7. Recent meetings have included a discussion on how to observe the total eclipse by Dr. Bertran Donn in March and the presentation of slides and film taken of the eclipse by members in April.

At GORF on Fairland Road, the club's observatory includes two telescopes—a 12-inch Newtonian and a 12-inch Cassagrain. Here members observe the constellations, nebulae, star clusters, and the planets and their satellites. An informal meteor watch is often held, and unusual events such as the apparition of a comet and solar and lunar eclipses have been observed.

The Astronomy Club will schedule more observing sessions as the weather gets warmer. Hopefully a public field meet will be scheduled if more people can be found who possess telescopes. For more information on the club's activities call any of the officers: Sally Godfrey, Secretary, Ext. 5098; Charles Brown, Vice President, Ext. 6821; or Victor Laczo, President, Ext. 6683.

Two Goddard Men Win In USCF Chess Tourney

BILL BRYANT (right), Head of MFPAD's Math Analysis Section, won first place in the Novice Section of the 1970 Washington, D.C. Open Chess Tournament sponsored by the United States Chess Federation February 28-March 1 at the Sheraton Park Hotel. His score was 4 wins and 1 draw. Third place winner in the same section was Bruce Bodine, a contract negotiator in Procurement's Network and Data Systems Branch, with 4 wins and 1 loss. This was the first USCF tournament for Mr. Bryant, the second for Mr. Bodine.

Aerospace Workshop Film

PREVIEW. Members of the Prince George's County Board of Education, notable figures in aviation education and members of Goddard's Educational Programs Office (EPO) preview the film "A Workshop in Aerospace Education – Teachers Learn by Doing." The film, produced her by EPO under the direction of Ron Craig of the Photographic Branch, consists of a series of comments by the participants as a background to the events of the aerospace workshop held last summer at the Catherine T. Reed Elementary School in Prince George's County. The workshop was sponsored jointly by the University of Maryland, Goddard, and the Prince George's County Board of Education. Persons at the preview meeting included: Dr. Michael J. Vaccaro, Director of Administration and Management; Elva Bailey, EPO Head; Dr. Carl W. Hassel, recently selected to replace Mr. William Schmidt upon his retirement at the end of this school year as Superintendent of Schools for Prince Georges County. Ferd S. Cardano, Principal of Kenmoor Elementary School and Chairman of the Science Curriculum Committee; Robert J. Shockley, Assistant Superintendent of Schools; William Leslo, County Science Specialist; and Dr. Marv Strickler, Education Director for General Aviation for the Federal Aviation Administration; and Dr. Walter Zaharevitz, Executive Director of the National Aerospace Education Council.

Network Computation Section Is Older Than Goddard

The Computation Division's Network Computation Section, directed by Section Head Edward Watkins, began its work over 11 years ago as the Information Processing Section at the Naval Research Laboratory. In 1958, when many NRL groups were transferred to the new NASA, the section became an important part of the Goddard staff. Then as now, the section's mission was the preprocessing and evaluation of tracking data prior to its use in orbit determination.

In the fulfillment of this mission the Network Computation Section has supported more than 140 launch operations which required tracking data for orbit determination. As a part of its mission the section provides continuous tracking data processing and evaluation for all Tracking and Data Systems supported projects throughout their operational lifetime. It has a preprocessing capability for Minitrack, optical, 40' and 85' dish angle, Goddard range and range rate, ATS range and range rate, C-band radar, and Unified S-Band data. At present NCS receives and processes an average of 500 data messages a day.

A secondary mission of the section is the preparation of predicted acquisition aids for use by supporting stations in acquiring tracking and telemetry data. Preparation of acquisition aids consists of the computer generation of station oriented ephemerides, the selection of appropriate pointing parameters, the formatting of acquisition messages, and the conversion of the messages into a data transfer medium which is acceptable by NASCOM facilities. NCS presently prepares an average of 2100 acquisition messages each operational week. In conjunction with preparing acquisition data, the section provides computer generated scheduling aids to the various project control centers for project scheduling and to the Network Control Center (NETCON) for total STADAN scheduling.

All key computer programs used in the fulfillment of the section missions are written and maintained by the six computer programmers and specialists assigned to the section. Presently NCS has approximately 75 different programs in operation on the IBM 360 computers. These programs perform a wide range of functions including editing, filing, sorting, curve fitting, data smoothing, trajectory tracing, plotting, and real-time data transfer.

The NCS men who do all this work are: Edward Watkins, Section Head; Dan Cannaday, Frank Lombardi, Robert Burgess, Douglas Rose, Robert Everett, Lennie Calhoun, Richard Sevigny, and John Mahoney.

FRANK LOMBARDI (from left), Daniel Cannaday, and Edward Watkins, Head of the Network Computation Section; use graphics terminals to control real-time tracking data processing during a STADAN orbit determination operation.

ROBERT EVERETT (left), and Leonard Calhoun listen as Richard Sevigny explains the magnetic tape data handling facility which is used for recording all incoming STADAN data.

DOUGLAS ROSE (left) and Robert Burgess use a graphics terminal to initiate data processing programs on the IBM 360/95 computer.

JOHN MAHONEY checks the results of recent program tests.

Vitaly Danchenko Honored by DIB

VITALY DANCHENKO, a physicist in the Spacecraft Technology Division, has received a Certificate of Merit from the Dictionary of International Biography, London, for "Distinguished Service on Radiation Effects in Semiconductor Devices." His biography will appear in Volume VI of the dictionary. Mr. Danchenko is also listed in Who's Who in the East; he is a member of the American Physical Society, Phi Kappa Phi and Sigma Pi Sigma honor societies. Since coming to Goddard in 1963 from the University of Maryland, he has been engaged in the investigation of radiation damage in semiconductors and semiconductor devices and is the author of a number of articles on this subject.