

# Space News **ROUNDUP!**

## GT-2 Success Opens Way For Manned Gemini Flights

The way was opened for the first manned Gemini mission when the GT-2 flight went off as scheduled on January 19 from Cape Kennedy, under clear skies on a somewhat cool Florida day.

Liftoff was at 9:03.59 with the Gemini spacecraft reaching a maximum altitude of 98.9 miles on its more than 2,100 mile sub-orbital flight. The spacecraft reached a speed of 16,708.9 miles per hour on the flight that

landed about 25 miles north of its intended target, the USS Lake Champlain.

Christopher C. Kraft Jr., operations director for the flight, called the flight "very successful."

Charles W. Mathews, manager, Gemini Program Office, said the first manned Gemini flight would probably be within the three months following the successful GT-2 flight.

Virgil I. Grissom and John W. Young, the two astronauts who will take the first manned Gemini flight, were extremely pleased with the success of the GT-2 mission.

The recovered spacecraft was returned to Cape Kennedy on January 22.

Recovery of the spacecraft was about one and one-half hours after lift-off. The spacecraft was visually spotted some 25 miles north of the USS Champlain and helicopters from the carrier's HS-5 Squadron were dispatched to the scene with an underwater demolition team to attach a flotation collar to the spacecraft.

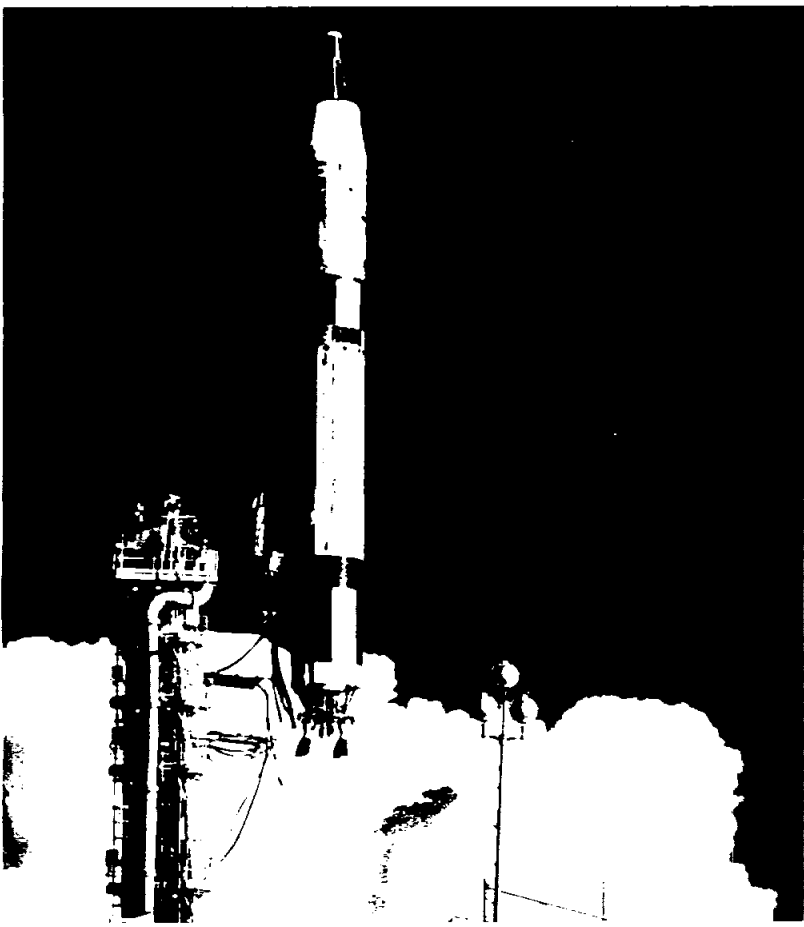
The underwater demolition men also located the R & R (rendezvous and recovery) section of the spacecraft about a half mile east of the spacecraft. The 330 pound section that houses the drogue and main parachutes was brought aboard the carrier by one of the helicopters. The bag of the R & R section that had held the main parachute trailed after the section as it was lowered on the flight deck of the carrier by the helicopter.

Recovery of this section was considered to be sort of a bonus as Kraft put it, because it was expected that the section would not be recovered even though it was lined with buoyant material.

At 10:45 a.m. CST, the GT-2 spacecraft was lifted out of the water by the crew of the Lake Champlain at 16:31.9 North latitude and 49:46.8 West longitude.

The heat shield apparently satisfactorily withstood the terrific heat of the driving re-entry into the earth's atmosphere at over 16,000 miles per hour. All systems from lift-off to re-entry and parachute deploy-

(Continued on Page 2)



GT-2 LIFT-OFF—Off on a flight that paves the way for the manned Gemini missions, the GT-2 systems, from lift-off to landing, performed as planned.

## Spacecraft Cost Plus Fixed Fee Gemini Contract Converted To Cost Plus Incentive Fee

The National Aeronautics and Space Administration approved a contract last Friday, with McDonnell Aircraft Corporation converting the \$712,000,000 Gemini spacecraft contract from a cost plus fixed fee to a cost plus incentive fee.

The contract provides profit incentives for outstanding performance, control of costs, and timely delivery as well as potential profit reductions when performance, cost, and schedule requirements are not met.

Incentive arrangements on cost and performance are integrated to emphasize improved performance and cost reductions in a computed ratio which recognizes the interdependence between cost and technical performance.

In addition to integrated cost/performance arrangements, provisions for rewarding early delivery and penalizing late delivery are also specified.

The incentive formula for this contract provides a strong profit motivation to the contractor to reduce costs, maintain a high level of technical performance, and improve spacecraft delivery schedules.

With the conversion of the Gemini spacecraft contract to an incentive arrangement, all of the major Gemini prime contracts contain incentive provisions. The Space Systems Division of the Air Force had previously negotiated incentive contracts for the modified Titan II-Gemini Launch Vehicle, as well as the Atlas and Agena.

## A Cost Reduction Team You And The President



Cost reduction was the main theme of a recent speech made by President Lyndon B. Johnson. The following extracts from that speech indicate the importance which the President attaches to this program, and what he expects of every Federal employee:

"An unmistakable sign of integrity in Government is a sense of responsibility to the taxpayers. I have said that I believe in the tight fist and the open mind—a tight fist with money and an open mind to the needs of America.

"I want that same state of mind to prevail in every department and every bureau. I expect to find it at every level of responsibility, from Cabinet members down to the newest and youngest recruit.

"When I became President I assigned top priority to efficiency and economy. I pledged that we would root out waste and inefficiency wherever we find it. I believe we have the people's confidence in our sincerity.

"We must continue to earn that confidence. Controlling waste is like bailing a boat—you have to keep at it. I have no intention of easing up on my insistence on getting a dollar of value for each dollar we spend. Economy 'once in a while' is not good enough.

"But we cannot advance if our way is blocked with the debris of inefficiency, obsolescence and waste. We can afford only the essential. Whatever fails to meet that test must be put aside.

"This is why we are closing defense installations that we no longer need. This is why I have ordered every department to install a cost reduction program patterned after the Defense Department example.

"This is why I am prepared to do whatever is necessary to stop spending scarce dollars on programs and services which have outlived their day. We are going to put thrift back in the dictionary.

"As President, I can and will make the major decisions on holding total spending to the rock bottom. But most of the opportunities to increase efficiency and find less costly ways to do business occur in the work you (the Federal employee) do every day.

"I want every supervisor and every employee to continually ask himself two questions: 'What is it costing to do this work? Is there a way to do it as well or better for less money?'"

As director of the Manned Spacecraft Center, I would like to add my own support to the President's words, and ask each MSC employee and supervisor to make cost saving and economy of operation a day-to-day part of his job. We have demonstrated in the past that we have the ability to achieve outstanding management results. If each of us will take the initiative in seeking out ways of practicing economy, I am convinced that the results will be impressive and gratifying.

*Robert R. Gilruth*

Robert R. Gilruth  
Director

Special Ladies Night Planned (see page 2)

# MSC Ladies Night Program Scheduled For February 10

A special "MSC Ladies Night" to acquaint the women employees of the Manned Spacecraft Center with the MSC organization, and the progress and goals of the Gemini and Apollo programs, has been planned for the evening of February 10.

The cafeteria will be open from 4:45 until 6:15 p.m. for those desiring to have their evening meal at the Center.

More than 900 women are employed at MSC and all are invited to attend the special program that will be held in the Building 1 Auditorium beginning at 6:30 p.m.

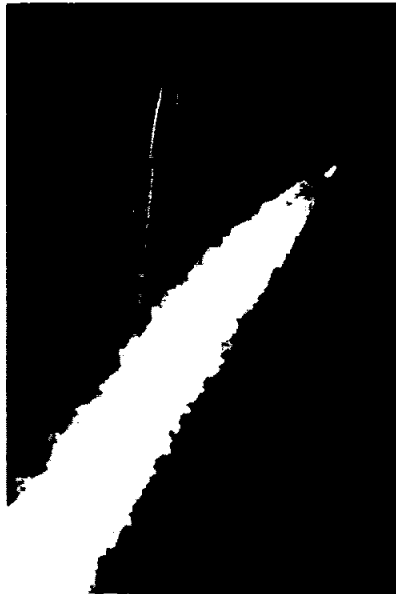
Informal discussions will be presented by George M. Low, deputy director, MSC; Charles W. Mathews, manager, Gemini Program Office; and Dr. Joseph F. Shea, manager, Apollo Spacecraft Program Office; plus a showing of the latest MSC quarterly film report which depicts recent accomplishments

in NASA's manned space flight programs.

Low will discuss the general Center organization, the facilities and purpose; Mathews and Shea will present descriptions of the Gemini and Apollo programs.

Management hopes that the program will provide a greater familiarity for women employees on how and why the Center operates.

Since the number of MSC women employees is about equal to the number of seats in the Auditorium, there may be "standing room only" available for husbands, and their attendance is not encouraged.



WATCHING GT-2—Astronauts Edward H. White II, and James A. McDivitt, prime flight crew for GT-4, watch GT-2 speed through the atmosphere with a photo chase plane in close pursuit, White's comment to McDivitt was, "One more, then it's our turn."



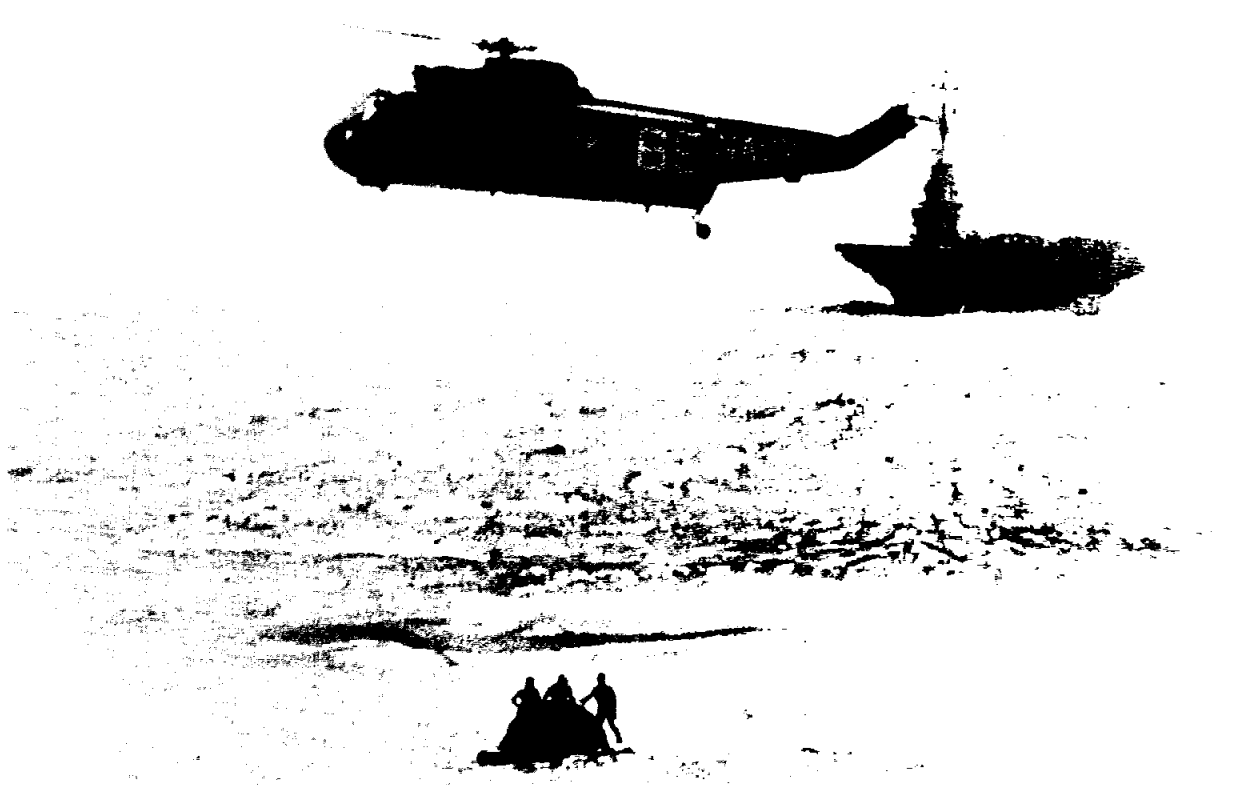
MCC AT CAPE KENNEDY—A tense moment during the GT-2 countdown shows Christopher C. Kraft at the operations director's flight console and Paul Haney, Public Affairs officer behind him, relaying accounts of the countdown progress.



RECOVERY ROOM—Navy recovery people in the recovery room at the Mission Control Center are shown receiving information from the down-range recovery forces.



DURING FLIGHT—Flight controllers and several astronauts watch the consoles and displays during the 19 minute and four second flight of GT-2.



RECOVERY SCENE—While the Navy helicopter hovers over the demolition team that placed the flotation collar around the GT-2 spacecraft, the USS Lake Champlain moves in for the pickup.

## Flight Controllers In Houston Control Center Monitor Data Relayed From Cape Kennedy

A team of flight controllers in the Mission Control Center-Houston electronically looked over the shoulders of the primary flight control team at Cape Kennedy during highly-successful Gemini-Titan 2 mission on January 19.

Nearing completion of equipment installation and checkout, the Houston Control Center monitored flight data relayed from Cape Kennedy to displays and consoles in the Center.

Flight controllers manning the Houston Control Center received familiarization in the operation of consoles, data displays and other flight control equipment.

A major objective was the Center's initial checkout of Real-Time Computer Complex programs for converting telemetered flight information into visual displays using live spacecraft and booster pre-launch and flight data.

These displays, large rear-projection screens in the front portion of the control room and

individual console television monitors, received extensive checkout during the two days of simulated flights and through the actual launch.

Mid-way through the two-man Gemini earth orbital space flight program, all flight control for the nation's manned space flights will shift to the Houston Control Center. Launch operations will remain at Cape Kennedy.

Flight Director for the GT-2 launch monitoring by Houston Control Center was John D. Hodge, chief of the Flight Control Division. Acting as test conductor was Lynwood C. Dunseith of Mission Planning and Analysis Division.

"It is most gratifying to see the MCC-Houston participating in a live test, even though we were only passively monitoring," Hodge said. "The flight control team gained invaluable experience. We are well satisfied with the progress of the Control Center to date, and look forward with con-

fidence to the final checkout phase."

Despite "looking over the shoulders" of the flight control team at Cape Kennedy, the Houston Control Center had an atmosphere of operational seriousness as all flight controllers closely followed the mission through countdown, launch and recovery of the spacecraft.

### GT-2

(Continued from Page 1)  
ment, functioned as planned.

An electrical power failure occurred for 47 seconds in the Mission Control Center some five minutes and 15 seconds after lift-off. The failure, caused by an overloaded circuit, was overcome by engineers in the MCC and did not effect the flight.

Flight controllers manning the Houston Control Center electronically looked over the shoulders of the primary flight control team at Cape Kennedy during the GT-2 flight.



READY FOR PICKUP—The GT-2 spacecraft is shown in the water with the crew that placed the flotation collar around it. Cables are attached and ready to hoist the spacecraft aboard the USS Lake Champlain.



RECOVERY CHIEF — Robert F. Thompson, chief, Landing and Recovery Division, listens to reports from the down-range recovery forces.



NASA GULFSTREAM 2—The Gulfstream, a Grumman built turbo-prop aircraft, is assigned to the Manned Spacecraft Center for administrative purposes. It has a crew of three and seats 12 passengers.

### MSC's Gulfstream Sets 'Record Time' In Flight From Houston To Washington

Three hours and five minutes from Houston to Washington, D. C., while not a record time for jet flight between the two cities, was the flight time for the Manned Spacecraft Center's Grumman Gulfstream turbo-prop aircraft on January 26, which set sort of an unofficial record for the NASA plane.

Normal flight time from take-off to landing is about four hours and 10 minutes, but with the help of a good tail wind and a slack period in the traffic pattern at Washington International Airport the "record time" was possible.

Larry Gaventa, pilot on the flight, said they picked up the tail wind at 25,000 feet and all the way had at least a 60 knot tail wind and sometimes as high as 140 knots.

The Gulfstream with a crew of three and 11 passengers, which included MSC's top management, left Ellington AFB at 5:15 p.m. CST and landed in Washington at 9:20 p.m. EST. Co-pilot on the trip was Roger Davidson, and George Bosworth was the flight engineer.

While assigned to MSC for administrative purposes to carry top level people to management meetings the Gulfstream is also utilized for other purposes such as astronaut geology trips, astronaut Panama jungle training trips and other MSC related activities.

During the period July 1, 1964 to Jan. 1, 1965, the NASA Gulfstream-2 flew over 138,000 miles, or the equivalent of nearly six times around the world at the equator.

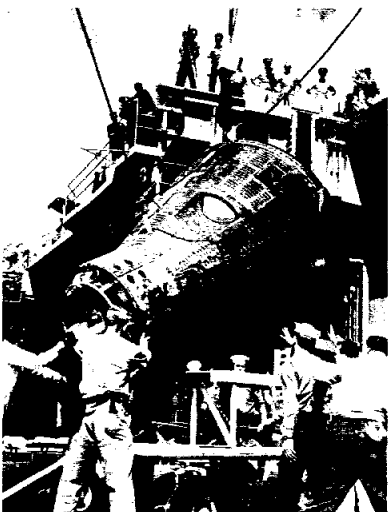
The Gulfstream is assigned to the MSC Aircraft Operations Office at Ellington AFB. Joe Algranti is chief of that office and also pilots the Gulfstream. H. E. Ream and Ken Haugen in the same office, also pilot the aircraft on occasions.



AFTER FLIGHT—The command pilot's hatch of the GT-2 spacecraft is shown opened on the deck of the USS Lake Champlain after recovery. Evidence of the terrific heat experienced on reentry can be seen on the Gemini heat shield.



PRESS CONFERENCE—Christopher C. Kraft Jr., GT-2 operations director, answers reporter's questions at the post-flight press conference at Press Site 2. John W. Young and Virgil I. Grissom, GT-3 prime crew, stand-by to give their views to reporters.



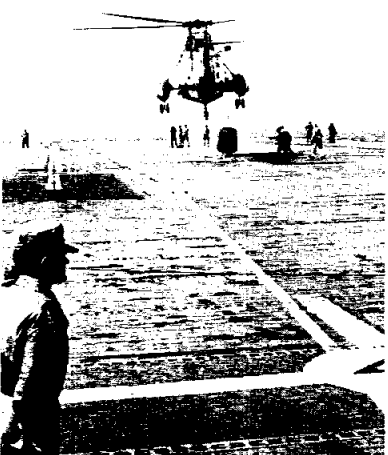
COMING ABOARD — The GT-2 spacecraft is placed on the dolly aboard the USS Lake Champlain.



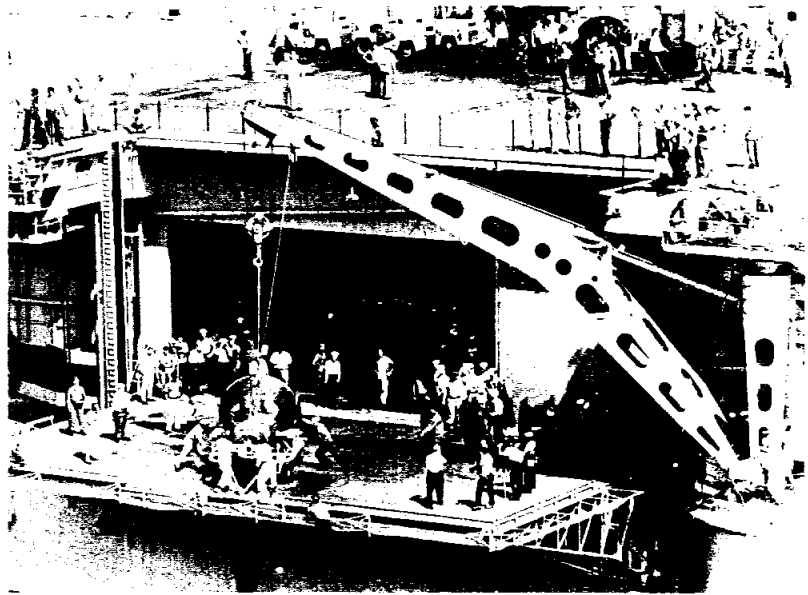
AWAITING RECOVERY—Christopher C. Kraft Jr. and Charles W. Mathews await word of the recovery of the GT-2 spacecraft.



IN THE BLOCKHOUSE—Shown during the early morning hours of the GT-2 countdown in the blockhouse are (l. to r.) Charles W. Mathews, manager, Gemini Program Office; Kenneth S. Kleinknecht, deputy manager, GPO; Dr. Kurt Debus, director, Kennedy Space Center; and G. Merritt Preston, deputy director, Florida Launch Operations.



R AND R SECTION—A Navy helicopter sets the 330 pound rendezvous and recovery section on the flight deck. It was recovered near the GT-2 spacecraft.



USS LAKE CHAMPLAIN — Members of the crew and NASA people aboard the aircraft carrier push the GT-2 spacecraft into place on the special dolly.

# Astronauts Turn Hawaii Island Into

Fifteen astronauts traveled over 4,000 miles west of the Manned Spacecraft Center in January to conduct their seventh and longest geology field trip to date, amid the scenic splendor of the 50th state, Hawaii.

Divided into two classroom groups, the astronauts trekked across the steaming floor of Kilauea Iki and through the rest of the Kilauea caldera, peered into the depths of the Halemaumau fire pit as well as other Hawaiian pit craters, and ascended the snow-pocked slopes of Mauna Loa and Mauna Kea as part of their field training.

Each group spent five days exploring the Big Island's dark basaltic flows, the common volcanic lava of Hawaii.

The first contingent of astronauts arrived in Hawaii January 11, and included: Charles Conrad, senior astronaut, along with Richard F. Gordon, Edwin E. Aldrin, Roger B. Chaffee, Clifton C. Williams, Alan L. Bean, David R. Scott and Donn F. Eisele.

The second group arriving a week later included: senior astronaut Neil A. Armstrong, Elliot M. See, Charles A. Bassett, Walter Cunningham, Michael Collins, Russell L. Sch-

weickart and William A. Anders.

Serving as primary geology instructors in the field were: Dr. Howard Powers, head of the Hawaii Volcano Observatory; Drs. Ted Foss and Keith Richardson, both from the Manned Spacecraft Center; and Drs. Alfred Chidester and Donald Wilhelms from the U. S. Geological Service.

The Hawaiian journey is considered a particularly important addition to the astronauts' earlier geology training, since many scientific observers hold the view that some of the moon's craters were formed by volcanic activity. Because the Hawaiian volcanic flows are of such recent origin, their erosion-free trait may closely resemble that expected on the lunar surface.

The island of Hawaii probably contains the world's best examples of shield volcanoes, those with broad, gentle slopes.

Dr. Powers, the academic host and a gray-headed veteran of more than 20 years study of Hawaii's volcanoes, explained that the field trips were extremely valuable to the astronauts, since they had an opportunity to observe and study well-preserved examples of small fissure eruptions, deep

lava lakes such as Kilauea Iki, and examples of the contrast between hot and colder basalts.

Dr. Powers also said he was "tremendously impressed" by the quality and quantity of the questions thrown at him by the astronaut groups. This is especially true, he added, when it is considered that geology "is just one grain of sand in the bucket of knowledge" they will have to carry on their mission.

Astronaut Donn Eisele properly summed up the viewpoint of the majority of his associates when he said, "This is without a doubt the best and most informative field trip we've ever made."

Although the Hawaiian beaches and vivid, tropical vegetation beckons tourists, the astronaut geology students spent their days chipping and studying rock samples, classifying rough aa and smooth ropy pahoehoe lava flows as to age and composition, and developing an understanding of the geological origins of the Hawaiian landscape. Occasionally they measured crater depths by tossing rocks into them and timing their fall with stop watches.

On their first day the astro-



**PAHOEHOE FLOW**—On the slopes of 13,680 foot Mauna Loa, Dr. Ted Foss explains the formation of the pahoehoe lava flow to Astronauts Roger B. Chaffee and David R. Scott.



**LAVA TREE MOULD**—A lava tree mould in the Lava Tree State Park, caused by a volcanic eruption in 1790, is examined by Astronauts Richard F. Gordon Jr., Charles (Pete) Conrad, and Clifton C. Williams Jr.



**VIEW OF CRATER**—With the aid of a telescope, Astronaut David R. Scott takes a closer look at the floor of the Halemaumau crater.



**PARK HEADQUARTERS**—Dr. Howard Powers, head of the Hawaii Volcano Observatory, presents a briefing on various volcanos as shown on the relief map in the Hawaiian Volcanoes National Park Headquarters. Shown (l. to r.) are Astronauts Alan L. Bean, Charles (Pete) Conrad, Clifton C. Williams Jr., Edwin E. Aldrin Jr., David R. Scott, Richard F. Gordon Jr., Roger B. Chaffee, and partially hidden behind Chaffee, Donn F. Eisele, and Dr. Ted Foss.



**STEAMING FISSURES**—Steam spews from fissures on the crater floor of Hilauea Iki, as Astronaut Charles (Pete) Conrad gets an "open air steam bath" along with Richard F. Gordon, and Donn F. Eisele.

## MSC Clubs Launch 1965 Programs

All MSC clubs are preparing their schedule of activities for 1965. This includes a wide variety of functions which are entertaining and recreational. Here is a list of the groups which are presently operating with their respective club presidents or chairmen and phone numbers. If your interest is not shown, please call H. M. Hughes, Ext. 3761.

Archery.....	Burt Cour-Palais.....	Ext. 7295
Art.....	Eugene Brock.....	Ext. 4788
Barber Shop Quartet.....	Bill Drewes.....	Ext. 4768
Bridge (Duplicate, Party).....	Wayne Brewer.....	Ext. 2276
Camera.....	Ken Cashion.....	Ext. 7673
Charm.....	Suellyn Johnson.....	Ext. 4973
Chess.....	Maynard Weidmann.....	Ext. 2341
Dance.....	Pauline Jones.....	Ext. 4535
Flying.....	Jack Joerns.....	Ext. 4471
Folksong.....	Ken Cashion.....	Ext. 7673
Great Books.....	Marvin Matthews.....	Ext. 3121
Ham Radio.....	Don Wiseman.....	Ext. 4061
Judo.....	Don Bray.....	Ext. 3311
Language.....	Wesley Brenton.....	Ext. 4621
Rod & Gun.....	David Bell.....	Ext. 4771
Sailing.....	Jerry Grayson.....	Ext. 3076
Scuba Diving.....	Wally Graves.....	Ext. 5311
Toastmasters.....	Phil Hamburger.....	Ext. 2765
Water Skiing.....	Don Osgood.....	Ext. 3995

## Amateur Radio Club Announces Training Program For Beginners

The Amateur Radio Club at MSC announces that a training program for beginners is being held at 5:30 p.m., each Thursday in Room 102 of Building 15.

Sessions are oriented to the novice class license and include beginning theory, code and regulations. The classes are open to all MSC employees, including contractors, and their families. The chairman of the training program is Bob Pace Ext. 4711.

The club, just recently organized, is rapidly overcoming its organizational problems and is

well along the way to becoming an operational activity. At a recent meeting, the proposed constitution was read, revised and accepted. The use of Building 336 at EAFB has been granted and radio equipment donated by club members will be used in setting up a basic station. Antennas will be erected in the near future.

The next meeting, open to all those interested in ham radio, will be at 5:30 p.m., February 15, in the executive dining room of the MSC cafeteria. E. L. Chicoine of IESD will discuss VHF techniques.

## Credit Union Announces Dividend, Holds Third Annual Meeting

The Board of Directors of the MSC Federal Credit Union declared a dividend of 4.08 per cent to be paid on all full shares of five dollars that were on deposit as of Dec. 31, 1964, prorated for the number of months the shares had been on deposit.

Quarterly statements showing the payment of the dividend

### Report Personal Property Losses To Security Division

The Security Division at MSC has requested that any personal property found by employees be turned in to the Security office on the first floor of Building 2, Room 159.

Employees are also urged to promptly report the loss or apparent theft of property to the Security office at Ext. 331. This will help in the recovery of the items.

Lost articles waiting to be claimed in Room 159 of Building 2, include a man's raincoat, two men's wristwatches, and two men's school rings. The owners of these articles may claim their property by identifying same.

were mailed last month. Shares deposited by the fifth of the month earn dividends from the first.

Dividends credited as of Dec. 31, 1964 should be included on 1964 income tax returns the board pointed out.

Other action taken by the board included a change in the office hours of the Credit Union. The new hours will be from 10 a.m. to 2:30 p.m., daily except on the Mondays and Tuesdays of the bi-weekly pay periods. On those days the Credit Union will be open until 4:30 p.m.

Board members expressed their hope that the new hours will enable the Credit Union to provide its members with better service.

Members are urged to help save time by mailing payments and deposits to the office. Envelopes will be provided for this purpose.

The third annual meeting of the Credit Union was held the evening of January 26 in the MSC Cafeteria and various reports were presented by the officers and directors concerning the progress of the Credit Union during the past year.

## Art Exhibit Committee Selection Announced

An art exhibit committee at MSC has been selected, it was announced by Eugene Brock, chairman of the proposed exhibit to be held here at the Center.

Serving on the committee with Brock will be Voula Tsitsera, Marilyn Bockting, Caldwell C. Johnson, Bill DerBing, Rene Berglund, and Jim Baynes.

Details of the exhibit will be announced soon.

## Bridge Clubbers Place In Tourney; Winners Named

Duplicate Bridge Club members from MSC were well represented at the Sectional Tournament held at the Rice Hotel the weekend of January 14.

Bob Hodgson was the most consistent winner—placing in every event he entered. Hodgson and Lee Pearson won a section first in the qualifying game of the Open Pair Championships. Bob also had a section fourth with Terry Hodgson in the Milam Pairs, a section third with Wayne Brewer in the Fondren Pairs, and a section fourth with Leona Kempainen in the Brazos Pairs.

Art Manson, playing with his son Skip, really distinguished himself by winning two section firsts, including a second place overall in the Milam Pairs and a tie for fifth/sixth overall in the Brazos Pairs. Art and Skip also had a section third in the Consolation Game on Sunday evening.

Wayne and Elizabeth Brewer won a section fifth in the Brazos Pairs.

North-South winners at the January 12 bridge game were Ray Lynch and B. E. Garst, Jr., and East-West winners were Jean and Charlie Brown. Second place North-South went to Jim and Sharon Raney, with a tie for East-West second—Ed Zeitler and Paul Fitzgerald and Bob Arnett and J. N. LaMarche.

At the January 19 game, Jean and Charlie Brown were first North-South; Wayne and Elizabeth Brewer, second; C. J. Bates and Charles Shoemake, first East-West and Jerry Kelly and John Ryder, second.

The Duplicate Bridge Club is holding its Mixed Pair Championship on February 16.

## Language Group To Form Here

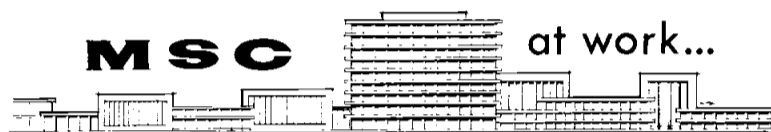
A language group here at the Center is being formed to study Spanish and French and will hold a meeting at 5 p.m., February 10 in the west conference room of the Building 1 Auditorium.

The group plans to obtain club sanction from the Employees Activities Association, a spokesman for the group said.

Instructions in the two languages are not planned to be for college credit, but rather to serve a functional purpose for those who plan to visit in other countries or to communicate with foreign nationals in their native



SSP AWARD—Accepting a NASA Sustained Superior Performance Certificate and cash award is Walter J. Kapryan (left), MSC Resident Manager of the Gemini Program Office at the Kennedy Space Center on Merritt Island. Making the presentation is Gemini Program Manager, C. W. Mathews, Manned Spacecraft Center, Houston, Texas. The award was given to Kapryan for his efforts in the launch preparations of the Gemini spacecraft, coordinating efforts for the Gemini checkout plan, and his outstanding leadership in representing the Program Manager since the Gemini Program has become operational.



HERBERT D. YEATES, physicist/engineer in the Flight Experiment Section of the Flight Crew Support Division, is working on a Gemini optical sighting device which is under modification for use on Gemini flights.

## Aero Club Sets New Meeting Time, Schedules Election Of Club Officers

The next scheduled meeting for the Aero Club at MSC is Monday, February 8, in the Auditorium of Building 30.

The new scheduled time for club meetings will be the 2nd Monday of each month unless announced otherwise.

Nominations for club officers will be in order next meeting so that the club election may be

tongue. The courses will be conversational and cultural in nature and it is hoped, the group spokesman said, that the latest in audio-visual techniques can be implemented to make learning the languages most enjoyable.

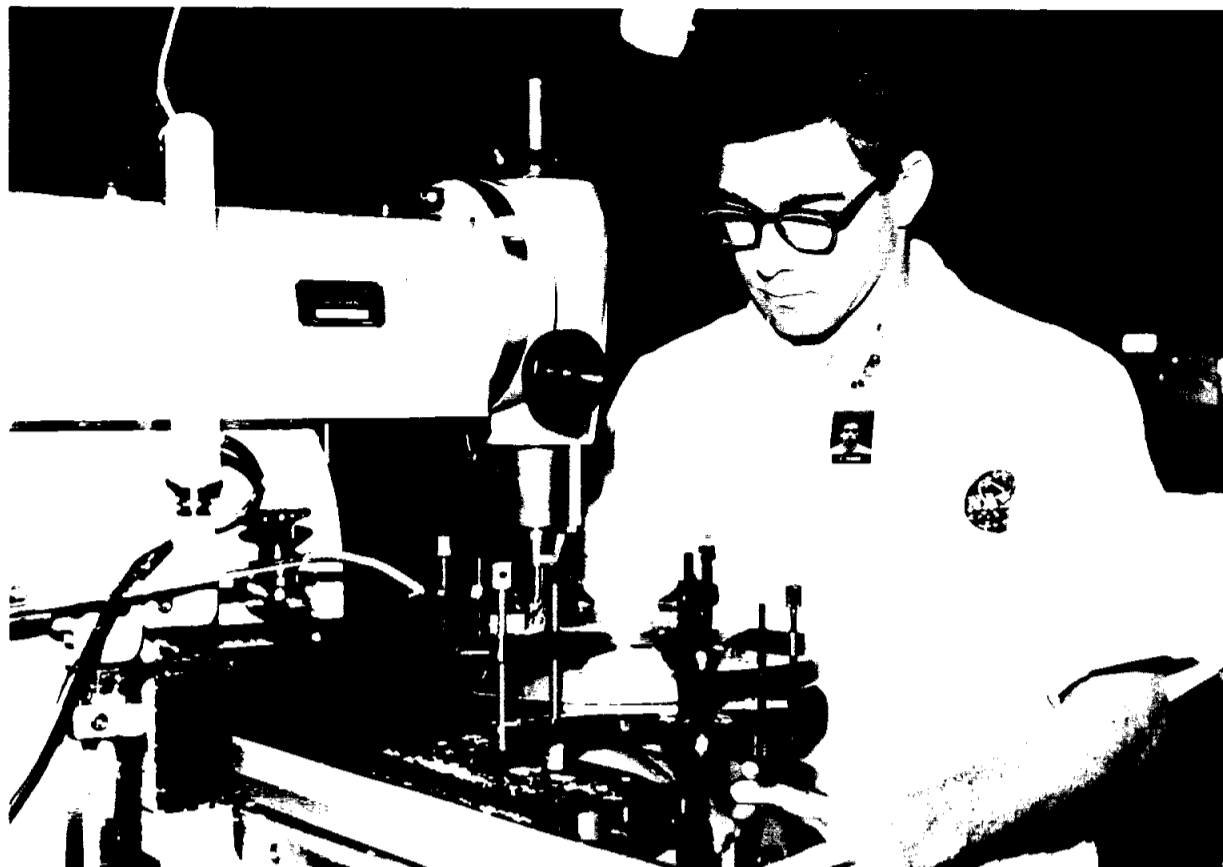
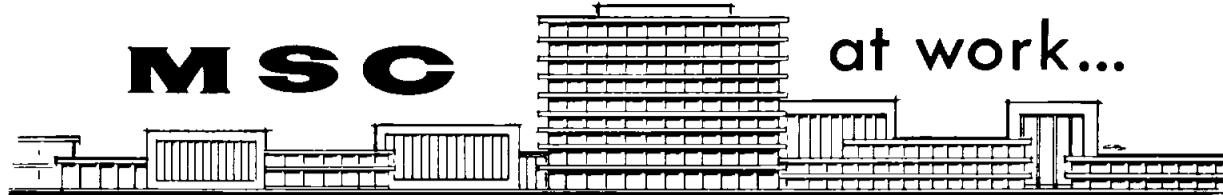
For additional information call Wes Brenton at Ext. 4621.

held March 8. If a member is unable to attend either one of these meetings he may place his nomination with Bill Kuykendall Ext. 3101, sometime preceding the meeting.

The first meeting of the Private Pilots Ground School will also be held February 8, Building 4, second floor conference room, following a brief attendance at the club meeting.

With spring and summer not far off all members are urged to pay their dues as well as to take an active interest in the club's growth and development. Membership cards will be mailed to members. Dues may be paid to R. H. Sutton, Ext. 4303, Building 30, Room 2025.

# MSC at work...



FRED T. SIMON, apprentice machinist, Machine and Assembly Branch, Technical Services Division, using a Deckle milling machine, makes a cut on a neckband latch for a bubble helmet.

## Mobile X-ray Unit Schedule

Numerous MSC employees have requested information on the schedules for the Houston-Harris County TB Association Mobile X-ray Unit. The Association has a number of units that are routinely in operation in prescribed areas so as to make them available to the maximum number of people throughout Houston and Harris County.

The following schedules are closely adhered to and any person interested in getting a chest x-ray may do so at one of the following locations. A 50 cent donation is requested to help provide this service.

Location	Date	Time
Foley's, Lamar at Main:	Mondays	11 a.m. to 8 p.m.
	Tuesdays	10 a.m. to 4 p.m.
	Saturdays	10 a.m. to 4 p.m.
Gulfgate, near flagpole: Sears, Pasadena Store,	First Thursdays	5 p.m. to 8 p.m.
	Second Thursdays	4 p.m. to 8 p.m.
Southmore at S. Shaver: Meyerland Plaza, Center Mall:	Third Thursdays	5 p.m. to 8 p.m.
Sears, 4000 N. Shepherd: Northline Center, Highway 75 at Crosstimbers:	Fourth Thursdays	5 p.m. to 8 p.m.
Fed Mart, Wirt at Hempstead Hwy:	Fifth Thursdays	5 p.m. to 8 p.m.
	First Fridays	5 p.m. to 8 p.m.
Fed Mart, Mykawa at Griggs:	Third Fridays	5 p.m. to 8 p.m.
	Fourth Fridays	1 p.m. to 4 p.m.

Other locations are used from time to time on an irregular basis. These are usually announced in the local newspapers. Additional information may be obtained by calling the MSC Occupational Health Branch, Ext. 4111.

## MSC BOWLING ROUNDUP

MSC MIXED LEAGUE  
Standings as of Jan. 25

TEAM	WON	LOST
Celestials	51 1/2	20 1/2
Virginians	45	27
Alley Cats	45	27
Eight Balls	37	35
Shakers	37	35
Falcons	37	35
Play Mates	34	38
Dusters	33	39
Gutter Nuts	33	39
Chugg-a-Luggs	31	41
Hawks	29 1/2	42 1/2
Goofballs	24	48

High Game Women: Barnes 225, Smith 192, Morris 174.  
High Game Men: McDonald 245, Morris 230, Schmidt, Zwolinski, Sargent, Morgan 221.  
High Series Women: Barnes 575, Morris 452, Gassett 450.  
High Series Men: Sargent 580, Spivey 574, Morris 570.

MIMOSA MEN'S LEAGUE  
First Half Final Standings  
As Of Jan. 21

TEAM	WON	LOST
Fabricators	44	28
Whirlwinds	42 1/2	29 1/2
Pseudonauts	39	33
Turkeys	38	34
Green Giants	37 1/2	34 1/2
Roadrunners	37	35
Alley Oops	36 1/2	35 1/2
Spastics	31 1/2	40 1/2
Sizzlers	29	43
Technics	25	47

High Game: Grimwood 244, Petersen 244, Amason 233.  
High Series: Lee 645, Morgan 629, Whipkey 603.

NASA MIXED LEAGUE  
White Sands Operations  
Standings As of Jan. 7

TEAM	WON	LOST
Three	4	0
Six	3	1
One	3	1
Eight	2 1/2	1 1/2
Seven	1 1/2	2 1/2
Five	1	3
Two	1	3

Four 0 4  
High Game: B. Colston 212, Betty Marion 200, B. Gantz 194.  
High Series: B. Colston 558, J. Winn 549, T. Mateszewski 524.  
High Team Game: Six 772, Three 744, Five 719.  
High Team Series: Six 2143, Eight 2079, Five 2049.

NASA 5 O'CLOCK MON.  
Standings as of Jan. 25

TEAM	WON	LOST
Suppliers	43	25
Foul Five	38	30
Computers	34	34
Hot Shots	33	35
Sombreros	32	36
Alley Gators	24	44

High Game: W. Kutalek 244, M. Cohn 230, H. Erickson 224.  
High Series: E. R. Walker 591, H. Walker 569, B. Calhoun 567.

High Team Game: Computers 880, Foul Five 862, Suppliers 865.  
High Team Series: Suppliers 2411, Hot Shots 2326, Computers 2321.

MSC COUPLES LEAGUE  
Standings as of Jan. 26

TEAM	WON	LOST
Pin Splitters	7	1
Goofballs	6	2
Schplitz	6	2
Alley Cats	6	2
Bltzf	5	3
Wha' Hoppen	4	4
EZ-Go	4	4
Thinkers	3	5
Crickets	3	5
Bowlernauts	2	6
Hi-Ho's	1	7
Sandbaggers	1	7

High Game Women: J. Foster 228, K. Gentile 224.  
High Game Men: J. McBride 242, L. Townsend, D. Kennedy 236.  
High Series Women: J. Foster 564, W. Townsend 510.  
High Series Men: J. Garino 642, B. Jones 628.

## Over 9,400 Attend Employee Open House



OPEN HOUSE VISITOR—One of the many visitors to the MSC Open House, January 16, is shown "trying on" a pair of pressure suit gloves in Crew Systems Division's Building 7. The open house was held for employees and on site contractors and their families. During the day from 8 a.m. to 5 p.m., over 9,400 persons visited various buildings at the Center and most saw the latest Office of Manned Space Flight quarterly report which was shown every half hour in the Auditorium of Building 1.

## Lunarfin's To Conduct Scuba Diving Course

The "Lunarfin's" will conduct a scuba diving training course for all MSC employees, associate contractors, and friends of employees interested in scuba diving, beginning February 4.

Lectures for the course will be held from 7 to 10 p.m., on Tuesdays, in Building 336 at Ellington AFB, and swimming sessions will be held on Thursday nights in an indoor pool at the Tropi-

cana Swimming Club, 5920 Telephone Road.

Teaching the course will be Dick Holt who is a qualified NAUI and Los Angeles County instructor.

A fee of \$21 includes instructor fee, pool fee, and club membership dues. A limited number of diving tanks are available for use as club equipment.

Those interested in taking the course may register by paying \$6 club dues to Jim Peacock, Lunarfin training officer. His telephone extension is 2458.

## Pistol Team Attends Shooting Match

The Rod & Gun Club pistol team lost a shooting match on January 12 to the South Houston Independent Team by 31 points.

Members on the team participating in the shoot and their scores are: Gordon Rysavy 257,

Thomas M. McPherson 250, Willis Mitchell 248, and B. B. Sprague 247, for a total of 1002 points.

The Rod and Gun Club pistol team is open to all MSC employees. For more information call Rysavy at Ext. 4771.

# Giant Geology Classroom

nauts visited the Puna district where they saw the tree moulds in Lava Tree State Park caused by an eruption from the eastern rift of Kilauea in about 1790. They later observed lava flows from the 1955 and 1960 eruptions and journeyed to the easternmost tip of the island, a deserted lighthouse at Cape Kumukahi, which had been amazingly surrounded by the 1960 lava flow, with only a few feet clearance on any side. During the afternoon the astronauts observed the black sand beaches of Kahena and Kaimae which were caused by volcanic eruptions in 1955 and 1950.

The groups hiked across Kilauea Iki, Kilauea Crater and viewed the Halemaumau pit crater and the Thurston Lava Tube on the morning of the second day. Their afternoon was spent looking at pit craters along the Chain of Craters Road. Both groups made a 400 foot almost straight-down climb to the floor of Alae Crater. They began their descent by rope and continued to pick their way through the rocky slopes to the bottom.

The third day began with an airplane ride around the island to get an overall look at its geological features. The groups later attended lecture sessions at the Volcano Observatory where seismology, the use of tilt devices, the swelling of

volcanoes, the island's geology and the differences between normal earthquakes and harmonic tremor were the subjects.

On the fourth and fifth days the astronauts ascended the slopes of Mauna Loa, the world's largest active volcano, and Mauna Kea which stands even taller than Mauna Loa's 13,680 feet. Later they inspected the 1801 lava flows of Hualalai.

The second astronaut group with instructors made their way to the summit of Mauna Loa walking the last mile or so, while the first group traveled some 11,500 feet up the mountainside to a weather observatory. Segments of both classes went to the top of Mauna Kea.

One observer, particularly impressed by the seriousness of astronauts' work in the lava fields, remarked, "They don't view the countryside as you or I. When they look at the curvature of the terrain or examine smoothness of elevation in a crater, they relate themselves to the surface of the moon."

It was also noted that certain Hawaiian terms will probably be used on the surface of the moon. Aa, rough lava; pahoehoe, smooth lava; kepuka, an island in a lava flow; and Pele's hair, fine spun lava . . . to geologists and astronauts studying geology, these have no other names.



**BASALTIC LAVA**—Astronauts David R. Scott and Roger B. Chaffee examine some basaltic lava as Dr. Ted Foss from the Lunar Surface Technology Branch at MSC explains the formation.



**PIT CRATER**—Peering over the edge of a volcanic pit crater along Chain of Craters Road, is Astronaut Edwin E. Aldrin Jr.



**GEOLOGY SESSION**—Dr. Howard Powers, head of the Hawaii Volcano Observatory (back to camera) presents some geology facts to Astronauts (l. to r.) Neil A. Armstrong, Charles A. Bassett II, Elliot M. See Jr., Michael Collins, R. Walter Cunningham, William A. Anders, Russell L. Schweickart, and Ray Zedekar of the MSC Flight Crew Support Division.

## Engineers Explain Cause Of Gt-2 Abort In December's Unsuccessful Launch Attempt

An attempt to launch GT-2 on Dec. 9, 1964 was aborted when a hydraulic system failure caused the launch vehicle's first-stage engines to shut down automatically 1.0021 seconds after ignition.

At that time, indications were that the hydraulic failure initiated a series of events which included abrupt engine gimbaling and switchover to the backup guidance and control system, which caused engine shutdown. In a case like that, the circuitry is such that the booster automatically shuts down and lift off cannot occur on backup guidance.

Investigation showed that the failure resulted from high back pressure in a hydraulic line which broke the aluminum housing of a servovalve. The valve is part of an actuator which regulates the movement of an engine thrust chamber. The actuator is part of the booster's steering devices.

Engineering film revealed that the engines did not gimbal. However, such a signal was produced. The thrust chamber position sensor, which transmits thrust chamber movement signals, is located in a cavity near a tapered extension of the actuator piston rod, which controls thrust chamber movement. When the shaft moves, a plunger is depressed, and thrust chamber movement is recorded.

When the servovalve failed, hydraulic fluid filled the cavity, creating high pressure which depressed the plunger and created an erroneous signal that the thrust chamber had moved. The loss of hydraulic pressure caused the switchover to backup guidance and the resultant automatic engine shutdown. The backup guidance system has a completely independent hydraulic system.

Modifications to prevent a recurrence of such a failure include increasing the thickness

of the servovalve housing from 3/16 to 3/8 of an inch and changing part of the hydraulic system.

To insure against the creation of high back pressure, a force limiter in the hydraulic line has been modified to permit increased fluid flow. The hydraulic line has been rerouted to bypass another device which limits flow for other functions, but is not required for servovalve operation during engine starting. The force limiter serves as a shock absorber.

The modifications are being included in all Gemini launch vehicles.

A small leak in one of the regenerative fuel coolant tubes in the thrust chamber of the GLV-2's No. 2 engine was repaired and the tube was tested successfully prior to launch. The tube was damaged slightly by rapid heating, then cooling during ignition and shutdown.

## X-rays Give Crew Systems 'Inside Look' At Pressure Suit Mobility And Comfort

Manned Spacecraft engineers and medical people in Crew Systems Division are using x-rays to take an "inside look" at pressure suit mobility and comfort.

Through the use of x-ray still photographs and 16mm motion pictures, suit engineers, and design and medical personnel are able to determine what parts of the suits may be hampering mobility and how the situation can be corrected.

Since the astronaut must be able to move outside his vehicle in later Gemini flights, and walk and work on the surface of the moon after the Apollo lunar landing, the pressure suit must allow the subject to move as freely as possible.

The x-ray studies are carried out at the Baylor University School of Medicine in Houston under the direction of Dr. V. P.

Collins and Dr. Zoltan Petran. Test subjects are filmed both unsuited and suited for mobility comparisons, and Atomic Energy Commission standards are followed for x-ray exposure of all subjects. Subjects are volunteer NASA employees who fit the suit being tested and Army officers from a local reserve unit.

Such factors as determination of the eye-heart angle are important in controlling the effects of acceleration. Also, the angular ranges of joint mobility, the suit restrictions on mobility and comparisons between Gemini and Apollo suit mobility are being studied.

Movements which the subjects perform include head nodding and rotation, movements of shoulder, elbow, wrist, hand and thumb-finger opposition. Leg movements concentrate on the hip, knee and ankle.

"A valuable feature of the tests is the immediate feedback it provides to the suit contractor and NASA suit engineers," said Dr. Robert Jones, MSC project director. "We can x-ray the suit in the morning, examine the results, modify the suit, and x-ray it again on the same day to evaluate the modification."

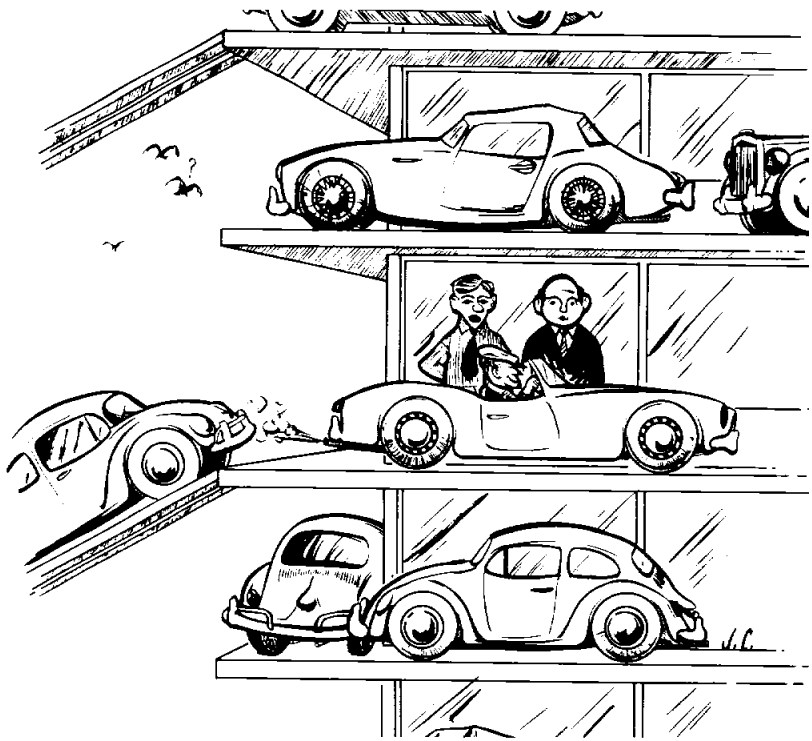


**SUIT X-RAY PICTURES** — Elbow joint of a test subject is shown in this X-ray, wearing an Apollo suit. Pictures are taken to study mobility.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

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Public Affairs Officer . . . . . Paul Haney  
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Staff Photographer . . . . . A. "Pat" Patnesky

## On The Lighter Side



"I THINK THE PARKING COMMITTEE MAY HAVE GONE TOO FAR!"

### Space News Of Five Years Ago

**FEB. 3, 1960**—Simulated weightlessness experiment at USAF Aerospace Medical Laboratory ended, in which Dr. Duane E. Braveline was submerged in a liquid in centrifuge with a 5-g spin, and which demonstrated muscle deterioration without exercise.

**FEB. 4, 1960**—Stanford University scientists reported on successful reflection of radar signals off the sun's corona on April 7, 10, and 12, 1959.

**FEB. 5, 1960**—Final design approval test of the Mercury telemetry equipment was completed, and reliability test of this equipment was completed on Feb. 27, 1960.

—Col. George M. Knauf of the Air Force Surgeon General's office began the compilation of a medical-monitor training program in support of Project Mercury. The aims of this program were to brief the monitors on medical problems in space prior to their participation in support of Mercury flights.

**FEB. 8, 1960**—Tests were started by the Army Ballistic Missile Agency for the mission abort sensing program to be integrated in the Mercury-Redstone phase of Project Mercury.

**FEB. 11, 1960**—X-15 (No. 2) ascended to 86,700 feet in powered flight.

**FEB. 12, 1960**—With Project Mercury about to enter a heavy operational phase, an operations coordination group was established at the Atlantic Missile Range. Christopher C. Kraft Jr. was appointed to head the group.

**FEB. 15, 1960**—Spacecraft battery qualification tests and

landing system and post-landing equipment tests were completed for the Mercury spacecraft.

## Gemini Escape, Recovery Systems Tests Conducted

Three tests involving Gemini spacecraft escape and recovery systems were completed successfully January 28 at El Centro, Calif., although an Air Force jumper testing astronauts' personal parachutes landed with two chutes open instead of one.

If an astronaut ejects from the spacecraft, the action of his ejection seat separating from his body will activate his parachute. In today's test, however, the jumper, CWO Mitch Kanowski of the Air Force's 6511th Test Group had to manually pull a lanyard after jumping from a plane at 6,000 feet. By the time he activated the chute, he had fallen to 4,000 feet, and his reserve parachute, which was preset to that altitude, opened automatically, also.

Kanowski said he was stable during the 2,000-foot free fall and that the personal parachute system "worked beautifully." Two more jumps were scheduled for the following day.

In a test of the Gemini ejection seat, a dummy was ejected from an Air Force F-106 aircraft at an altitude of 14,500 feet, at a speed of Mach .71. NASA Manned Spacecraft Center engineers conducting the test said all objectives were met successfully.

The third test demonstrated the complete Gemini spacecraft recovery system. A spacecraft was dropped from an altitude of 33,000 feet. At 27,000 feet, a

## Welcome Aboard

During the last reporting period, a total of 23 persons joined the Manned Spacecraft Center.

**Procurement and Contracts Division:** David C. Gluck, and Ray E. Hammack.

**Management Analysis Division:** David A. Christiansen.

**Resources Management Division:** Ray D. Kaufmann, and William C. Douglas.

**Flight Crew Support Division:** Antoine F. Smith.

**Crew Systems Division:** Craig L. Fischer, and David L. Hench.

**Instrumentation and Electronic Systems Division:** Junius B. Fox.

**Propulsion & Power Division:** Gadicherla Rao.

**Advanced Spacecraft Technology Division:** Gary E. Graybeal, and Glen H. Murphree.

**Flight Control Division:** William P. Gravett.

**Flight Support Division:** Ledrieu L. Linson.

**Gemini Program Office:** Lyndal D. Malone, and Charles J. Walsh.

**MSC-Florida Operations (Merritt Island, Fla.):** Homer J. Reiter.

**Apollo Spacecraft Program Office:** Pamela M. Andreasen (Downey, Calif.), William A. Higgins, Frederick Kolb, and Harry L. Reynolds.

**White Sands Operations, (Las Cruces, N.M.):** Glenda M. Pickens and William M. Ross.

drogue chute deployed to stabilize the spacecraft, and at 10,600 feet the drogue was cut loose and the main parachute opened. This was the sixth successful test of the complete recovery system. The seventh test is scheduled tomorrow.

The tests are conducted at the Joint Parachute Test Facility at El Centro for the Manned Spacecraft Center.

### Mariner IV Travels 114-Million Miles On Flight To Mars

Mariner IV, launched over two months ago, has traveled nearly 114 million miles along its 325-million-mile path to Mars, the National Aeronautics and Space Administration announced.

At 9 a.m. EST today, the spacecraft was 113,743,123 miles from Earth, moving toward Mars at a speed of 13,911 miles per hour relative to the Earth. Velocity relative to the Sun was 66,027 miles an hour.

Mariner IV will fly by Mars July 14, 1965.

## MSC PERSONALITY

### 'Ted' Hays Has 21 Years Experience In His Field

During the past 21 years Edward L. (Ted) Hays has worked with or been associated with pressure suits, environmental control systems, survival equipment and other flight hardware and continues to do so in his position as assistant chief for engineering in the Manned Spacecraft Center's Crew Systems Division.

He joined NASA and the Space Task Group in July 1961 as Crew Equipment Branch Chief at Langley.

Hays specializes in the fields of research, design and development of crew systems, such as space pressure suits, environmental control systems, survival equipment, support and restraint systems, escape systems, and other crew equipment.

The Crew Systems Division is responsible for the development, test and evaluation of life support systems used in currently approved manned space flight projects.

The division is responsible for establishing and implementing programs to define human tolerance and requirements for spacecraft design, and for conducting medical research programs which culminate in flight medical experiments to validate the acceptability of progressively longer manned space flight missions.

It also serves as associate contractor to the flight projects in providing flight qualified, government furnished equipment such as space suits, bio-instrumentation, survival gear and atmospheric instrumentation.

Hays was born in Verona, Penn., where he attended public schools. He was graduated from the University of Pittsburgh in February 1943 with a BS degree in mechanical engineering.

Following graduation he was employed at the Philadelphia Naval Base as a flight test engineer on catapult and arrested landing problems associated with aircraft carrier operations and armament release hardware.

In the spring of 1944 he became one of the original members of a newly constituted Aero Medical Department and worked with altitude chambers, pressure suits, oxygen equipment and other aircrew safety and survival equipment.

He entered the U. S. Army in 1945 and was assigned to the Aero Medical Laboratory at Wright-Patterson Air Force Base working on pilots' escape systems. In January 1947 he returned to the Navy civil service in the Aero Medical Equipment Lab.

In 1951 he became division superintendent of the Aircrew Equipment Lab and when he left the Navy civil service to join NASA in 1961, he was superintendent of the Safety and Survival Equipment Research and Development Division and assistant technical director of the Air Crew Equipment Lab of the Navy at Philadelphia.

Hays has published numerous papers on life support systems. He is listed in American Men

Of Science and Who's Who in Human Factors of Manned Space Flight. He is a senior member of the American Institute of Aeronautics and Astronautics, and the American



EDWARD L. HAYS

Astronautical Society, and a member of the Life Sciences Committee of the Aerospace Medical Association.

As one of seven members of the Board of Governors of the Gulf Coast Science Foundation, Hays contributes his time toward stimulating science education in the area. The foundation awards scholarships to outstanding science students, sponsors lecture series and scientific seminars.

Hays is author of the chapter on space suits in the recently published book, *Manned Spacecraft: Engineering Design and Operation*, and he has lectured at Rice University, University of Houston, University of Texas, and the George Washington University, as visiting professor speaking on space suits, environmental control systems, physiology consideration of spacecraft life support systems, and survival equipment design.

He also has an extra duty he performs in the community where he lives. One night a month he patrols the streets of Taylor Lake Village in the capacity of a deputy marshal, complete with badge identification and sidearm, providing police protection to the area.

Hays is married to the former Norma Lurwick of Springfield, Penn. and the couple has three children: Susan 17, Ronald 14, and Barbara 7.

His hobbies include outdoor and indoor gardening and he enjoys all types of music from lowest jazz to opera and classics. He and his wife both sing in the choir at the Seabrook Methodist Church where he is also a member of the Official Board of the Church.





PROCUREMENT TRAINING PROGRAM—Members of the training program held for new Procurement and Contracts Division employees receive an explanation of the "Contract Status Report" during one of the training sessions, from Dave W. Lang, division chief, and W. A. Brugger, instructor. Shown (l. to r.) are John Kochner, Judy Eckles, Lang (standing), Brugger, and Terry Heil.

## Cape's Launch Complex 16 To Be Modified For Use As Static Test Stands For Apollo

Launch Complex 16 at Cape Kennedy will be modified to convert the former Titan missile facility into static test stands for the Apollo manned lunar spacecraft, it was announced recently.

Bids for modifications for a test stand for the Apollo Service Module were to have been opened by the Canaveral Dis-

trict, Corps of Engineers, late last month, with work scheduled to start in mid-1965. The Lunar Excursion Module test stands will be ready in mid-1966.

Each of the two existing positions at the complex, built to test and launch the first and second stages of Titan I's and II's, will be modified. The first stage position will be adapted for the Service Module and the second stage test stand for the LEM.

NASA crews are removing launch-designed equipment at the complex to make the necessary static test stand modifications.

Spacecraft models will undergo complete pre-flight checkout, including leak tests, systems tests, engine gimbaling and "hot-fire" tests with gimbaling.

The static tests will also provide an opportunity to check out new ground servicing equipment and acquaint pad personnel with Apollo launch pro-

cedures. Astronaut crews will be present for full system testing of the modules.

Since Titan II vehicles use the same propellants as the two Apollo modules, the basic propellant storage, transfer and loading facilities existing at the complex will be utilized. Mechanical, electrical and structural engineering changes represent the major modifications to be accomplished.

The modified test facility will replace an Apollo static test stand originally planned for the NASA Kennedy Space Center's Merritt Island facility. Officials estimate that the modification of Complex 16 will represent a cost reduction of about 72 per cent under the original \$7 million dollar construction estimate for test stands on Merritt Island.

Three Air Force complexes remain operational for Titan programs at the Cape.

## Procurement Conducts Training Program For New Employees

Examinations and certificates of achievement were given last Friday to 26 new members of the Procurement and Contracts Division after they had completed a 24-hour training program offered by the division.

Dave W. Lang, chief of the Procurement and Contracts Division said the program was designed to give the new employees a detailed knowledge of the entire procurement operations.

Speakers for the program that was presented to the new employees three days each week for four hours beginning January 18, were chosen from among the top members of the division. They presented to the new group their intimate knowl-

edge of procurement philosophy, policies, and procedures.

"It is our plan," Lang said, "to make these newcomers fully acquainted with our organization as soon as possible. By becoming familiar with our overall operation and meeting most of our key members, we anticipate an easy and smooth interface of these people and their predecessors."

As part of the program of getting acquainted, a buffet supper was held at the MSC Cafeteria last Wednesday evening, followed by entertainment in the Auditorium of Building 1. Over 200 members of the division and their guests were present for the occasion.

## Youth Science Congress Regional Finalists To Hold Meeting Here

A group of 17 unusually gifted high school students will visit the NASA Manned Spacecraft Center April 15 and 16 in connection with a science congress which will be hosted by the space agency.

The students will be regional finalists chosen from the thousands who are participating in a nation-wide Youth Science Congress sponsored by the National Science Teacher Association and the National Aeronautics and Space Administration.

MSC participants will come from an eight-state area in the midlands of the United States. While at the Center, they will present scientific papers to a panel of judges who will select three regional winners.

The program is under the direction of MSC's Educational Programs and Services Branch, Public Affairs Office.

In addition to the professional meetings at which they will be reading their own research reports, the science-talented students will visit with NASA engineering personnel in the laboratories and will tour indus-

trial complexes in the Houston area.

A luncheon is scheduled at which an astronaut will be the principal speaker. Later an awards dinner will be held.

This is the second year of NSTA sponsored congresses. It was initiated in order that senior high school students may more thoroughly understand professional requirements in fields of science and technology. The program consists of eight regional events with the winners moving to a national competition at NASA Headquarters in Washington.

## Alan Shepard To Appear On CBS TV Program

Astronaut Alan Shepard is scheduled to appear on a local CBS Reports television program with six young students who will ask him a series of questions on the space program.

The program will be aired at 8 p.m., February 18 on Channel 11 in Houston.



SMALL BUSINESS HEAD VISITS MSC—Small Business Administrator Eugene P. Foley from Washington, and his assistant deputy, Jerry D. Worthy, were recent visitors to MSC. Shown (l. to r.) are Dr. Robert R. Gilruth, director, MSC; Foley; Worthy; and George M. Low, deputy director, MSC.

## Small Business Administrator Foley Attends Briefings With MSC Officials

Eugene P. Foley, Small Business Administrator from Washington, D. C., was here at the Manned Spacecraft Center, January 16 for a series of briefings with Center officials.

Foley, here at the invitation of Dr. Robert R. Gilruth, director, MSC, met with Gilruth; George Low, deputy director; Wesley L. Hjernevik, assistant director for Administration; Dave Lang, chief, Procurement and Contracts Division; H. T. Christman, head of Industry Assistance and Small Business at MSC; and Jim Edwards, assistant in the Small Business Office.

It was pointed out in the briefings that while a nationwide decline has been experienced in small business awards, there has been a steady increase

at the Manned Spacecraft Center.

Small business awards at MSC in FY63 totaled \$12-million, in FY64 the total was \$22-million, and in the first quarter of FY65 the awards totaled about \$6-million.

Indirect participation awards made to small business by major prime contractors of MSC in FY64 was estimated at about \$168-million, it was stated.

Accompanying Foley from Washington was Jerry D. Worthy, assistant deputy in the Small Business Administration. Other Small Business representatives here for the briefings included: Robert L. Pau Jr., regional director, Dallas; Henry A. Schumacher, branch manager, Houston; and Volley Casey, Houston area representative.

# Space News ROUNDUP!

## SECOND FRONT PAGE

### \$12-Million Saved Toward MSC Cost Reduction Goal

A cost reduction goal of \$35-million was set for all areas of the Manned Spacecraft Center for fiscal year 1965, and in the first months \$12-million of that goal had been met.

In the area of construction of facilities, a saving of over \$4.5-million was realized, which is more than the budget amount requested for FY66 construction of facilities.

The major portion of this saving was made possible due to a suggestion by Dr. Robert R. Gilruth, director, MSC, that instead of using the budgeted \$7,873,000 for a static test stand for the Apollo lunar spacecraft at Cape Kennedy, to modify the reserve Titan Launch Complex 16 for static test use. Cost of modifying the Titan launch complex will be \$3,982,900, for a net saving of \$3,890,100.

Charles F. Bingman, chief, Management Analysis Division and MSC Cost Reduction Officer, said, "that while this is an unusually large single saving, many small savings in many different areas can add up to much larger amounts."

Bingman said, nearly everybody at the Center spends government funds in one form or another—be that person a secretary using supplies, or an engineer designing spacecraft hardware.

Savings in other areas the first half of FY65 were \$794,199 in administration and operations, and \$6,708,270 in research and development.

All cost reduction items must go through a validation process, he stated, to assure that the savings is valid and has been put into effect.

A number of cost reduction prospects are now being validated for savings in the second half of FY65. Bingman said that he hopes MSC will reach the \$35-million goal, and with the cooperation of Center

employees it is possible to exceed that goal.

He said one of the goals of the program is to stimulate employees to make a special effort to achieve a better degree of efficiency in performing routine duties.

A series of cost reduction posters is being used at strategic locations throughout the Center to serve as a reminder to employees to think of possible cost saving ideas.

"Cost reduction can also serve as an idea exchange from one division to another," Bingman said.

An idea of how this can work was demonstrated recently. Bingman stated, when the *Roundup* published information about a method IESD had devised for filing information by utilizing a Visual Search Microfilm File, for an annual saving of \$18,853. A person in another division read of the new method and is now taking steps to adapt a similar method for filing information in his area.

Plans are now being formulated to have each division generate a cost reduction plan of its own—geared to its own needs.

A person in each division will be assigned additional duties of coordinating the cost reduction plan, and will be supplied assistance and information from the MSC Cost Reduction Officer.

"A constructive program of working with the people in the various areas and motivating them to find ways and means of contributing cost reduction ideas to management is what we are aiming our sights on," Bingman said.

### MSC: 1.55-Billion

## President Requests \$5.26 Billion For NASA's FY66 Programs

The President's budget request presented to Congress last week for the National Aeronautics and Space Administration for fiscal year 1966, was for \$5,260,000,000 for all its programs.

Of this total \$4,575,900,000 was for research and development, \$74,700,000 for construction of facilities, and \$609,400,000 for administrative operations.

The Manned Spacecraft Center's portion of the overall budget request was \$1,559,000,000. Of this billion and a half dollar request, all but \$94,058,000 is for research and development programs.

Manned space flight areas of NASA requested a total of \$3,249,485,000 for research and development in spacecraft, launch vehicles, and mission support. Of this total, \$1,465,000,000 is programmed for MSC's Gemini and Apollo programs.

Gemini requests include \$122,

700,000 for spacecraft, \$88,600,000 for launch vehicles, and \$30,400,000 for support.

Apollo requests included \$1,118,200,000 for spacecraft, and \$103,700,000 for engine development.

The largest single budget request in the NASA manned space flight area, is \$1,236,500,000 for the Saturn V.

For administrative operations at MSC, \$89,658,000 has been requested, and \$4,400,000 has been requested for construction of facilities.

The authorized strength of MSC for fiscal year 1966 is 4811 people which is the same as was authorized the previous year. At the end of 1964 there were 4,277 persons at MSC, not

including the 500 at Florida Operations which is part of the 4,811 authorized manpower strength.

Construction projects at the Center for FY66 include \$3,600,000 for modifications to the environmental testing laboratory. This includes a 2800 square foot extension to the pumping equipment wing, and a 3300 square foot extension to the refrigeration pumping wing. It also includes a hardline data link between the environmental test laboratory, the Houston Mission Control Center, Central Data Lab, and the Acoustic Lab.

An additional \$800,000 has been programmed for Center Support Facilities to build a 61,000 square foot warehouse, part of which will contain a controlled environment for spare parts storage.

Comparison of the FY65 and the FY66 budgets shows a \$78-million increase at MSC for research and development, \$1.5-million less for administrative operations, and \$21-million less for construction of facilities. The major portion of the construction program at the Center is complete, or now being completed with FY 65 funds.

### Scientist-Astronaut Eligible Applications To Be Reviewed

Over 1500 letters of interest or application were submitted to the Manned Spacecraft Center in the recruiting program for scientist-astronauts that closed Dec. 31, 1964.

The letters are being processed by MSC people and when completed, the names and qualifications of the eligible persons will be sent to NASA headquarters and the National Academy of Science for review.

Approximately 20 to 25 percent of the applicants were considered eligible. From these, 10 to 20 will be chosen to be America's first group of scientist-astronauts.

### GLV-3 Erected On Pad For Manned Gemini Flight

Erection of Gemini Launch Vehicle 3 on Launch Complex 19 at Cape Kennedy (this is the vehicle that is scheduled to place two men into orbit next spring) was completed early last week.

This launch complex is the one from which an unmanned, suborbital Gemini flight was conducted successfully January 19.

The second stage of the GLV-3 was shipped to Cape Kennedy January 21, from the Martin Company plant in Baltimore. The first stage of the vehicle, a modified Air Force Titan II, was shipped January 23.

Normally both stages are transported together in a C-133 aircraft. However, this type aircraft was grounded recently by the Air Force, and GLV-3 was flown to the Cape aboard the Pregnant Guppy, a modified Boeing Stratocruiser which is not capable of handling both stages together.

A detailed evaluation of GT-2 flight data will not be completed for several weeks. If it substantiates preliminary data on the success of the mission, the Gemini Program Office expects GLV-3 and Spacecraft 3 to be mated on the pad

the latter part of February.

In the meantime, both the launch vehicle and the spacecraft will undergo a series of system checkouts and other tests. Spacecraft 3 arrived at the Cape on January 4.

The modified hydraulic actuators for GLV-3 are available and were installed immediately after the launch vehicle was erected on the pad. Installation will be completed in conjunction with activities normally performed at that time. The actuators were modified following the unsuccessful attempt to launch GT-2 on December 9.

GT-3 will be the first manned Gemini Flight. Objectives of the 3-orbit mission are to evaluate operation of spacecraft systems, astronaut procedures, and the operation of the world-wide tracking network. The flight crew consists of Astronauts Virgil I. Grissom and John W. Young.

## Library Of Astronautics Dedicated In Memory Of Astronaut Freeman

The Captain Theodore C. Freeman Library of Astronautics was dedicated January 21, at the Houston Baptist College, in memory of the first American astronaut to die.

Dedication ceremonies included oral tributes by two of Captain Freeman's team-mates, Astronauts Donn F. Eisele, and David R. Scott.

Faith H. Freeman, 10-year old daughter of Freeman, was awarded a scholarship to the college during the ceremonies. Dr. W. H. Hinton, college president, made the presenta-

tion.

Attending the ceremony, in addition to Mrs. Freeman, her daughter, and the parents of Captain and Mrs. Freeman from Delaware and Connecticut respectively, were several hundred Houstonians and representatives of the Manned Spacecraft Center.

The library will contain volumes on aerospace and related fields and will occupy a floor or wing in the new library building at the college.

Anyone wishing to donate books of a technical or semi-

technical nature dealing with aeronautics and astronautics, for use in the Freeman Library, may give the books to any Employees Activities Association representative at the Center.

Last week the EAA sponsored a drive to collect books, and as a continuation of that effort the above method of collecting books was decided upon.

The books collected here at the Center will be presented to the Freeman Library by a MSC representative from time to time.



**FREEMAN MEMORIAL LIBRARY**—The daughter of former astronaut Capt. Theodore C. Freeman, Faith Huntington, is shown with her mother Mrs. Freeman at dedication ceremonies for the Houston Baptist College Freeman Memorial Library of Astronautics. Faith was presented a four-year scholarship to the college at the dedication ceremonies. The plaque Mrs. Freeman is holding will be displayed in the library.