

# Space News **ROUNDUP!**

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MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

SEPTEMBER 18, 1963

## Parasail Flights By Astronauts Is Part Of Gemini Preparation

In preparation for the two-man Gemini spaceflights, training of MSC's 16 astronauts in the techniques of parachute landings on land and water got under way at Ellington AFB last week.

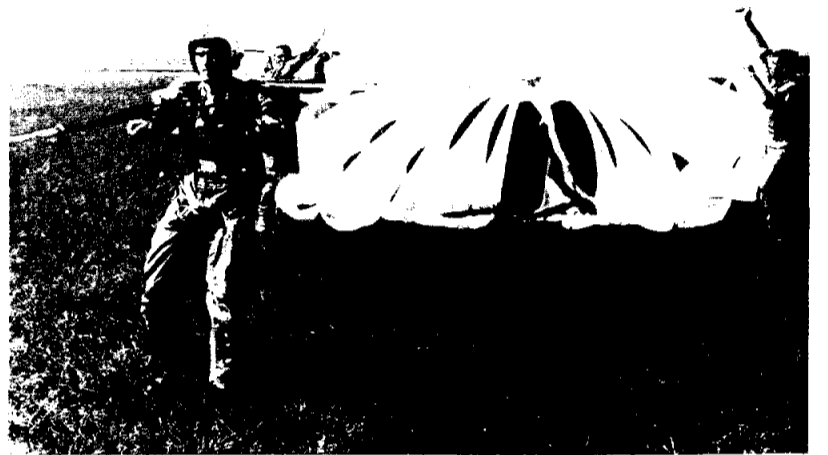
The training is designed to instruct the astronauts in making safe parachute landings in the event of a low-altitude abort--under 60,000 feet--during a Gemini launch. In such an abort, the pilots would be ejected from the spacecraft and descend by individual parachute.

With a firm grip on the harness and two men holding the opened chute, the astronaut starts to run as the truck on the other end of a 600-foot tow line pulls him along. . . . taking a few long strides he is airborne and soars to 400 feet in seconds. The astronaut is

(Continued on page 3)



**OFF AND UP**—Astronaut James A. Lovell Jr. becomes airborne as he is towed on a 600-foot line behind a truck. He reached an altitude of about 400 feet.



**TAUT LINE**—Astronaut Frank Borman prepares to break into a run as the tow line becomes taut. After a few long strides he is airborne and gains altitude rapidly.

## MSC 'Site' Three-Fourths Complete First Move Scheduled Next Month

Construction of the NASA Manned Spacecraft Center at Clear Lake is 75 per cent complete, Center officials said last week, and the first large personnel move is scheduled for October.

Approximately 100 persons from the Logistics Division will move into the Center Support Office

building and the Warehouse and Shops building. Completion dates for the two structures are September 29, and the move will be about October 1. The division includes transportation and supply personnel.

Logistics employees presently occupy space at Ellington Air Force Base. The offices they vacate will be occupied by personnel who are still assigned to the now-concluded Mercury program.

Next on schedule for completion will be the Central Data Office. This is the first of the functional buildings directly related to space exploration. It will be turned over by the contractor in November.

The building is a two story structure containing more than 60,000 square feet of space. The data center consists of digital and analog machine rooms, service areas, fireproof storage and offices. It will house personnel and equipment from the Computation and Data Reduction Division.

The group presently is occupying space at the University of Houston.

Major move from the 14 temporary offices in the Houston area will take place between February 28

and March 23, 1964. At that time, over 2,000 employees, equipment, furniture and office supplies will be relocated. MSC will completely occupy the Clear Lake facility by July 1, 1964.

The Center is being constructed in three major phases. Phase one included site preparation, the water wells, drainage ditches and roads. Phase two includes service structures necessary to support the space flight program. These are the water treatment plant, a 138 KV electrical substation, a fire station and a heating and air conditioning plant.

Phase three includes the research and development laboratories, test chambers, technical service shops and administration building.

Work in phase one is complete, according to James E. Creel, chief of the Systems and Acceptance Section, Facilities Division; Phase two construction is more than 80 per cent finished and Phase three is better than 60 per cent complete.

By July 1964, about \$147,000,000 worth of construction will have been completed or underway.



**PREPARING FOR TAKEOFF**—Astronaut James A. Lovell Jr. is given an assist in adjusting the parasail harness as he prepares for towed flight.

## Two Groups Hear Talks By Williams

Speaking to members of the New Orleans Chamber of Commerce this past week, Walter C. Williams, deputy director for Mission Requirements and Flight Operations at MSC, told the group of the background work now going on in the Gemini and Apollo programs.

Pointing out that although the time period prior to the actual launches of the manned spacecraft is rather unspectacular, it is no indication of the amount of work and development progress that is taking place.

He told them of the new landing techniques that are being tested and perfected and of the extensive testing

(Continued on page 3)

## \$7,658,000 Apollo Contract Is Signed For Guidance System

A definitive contract, valued at \$7,658,000, for guidance and navigation equipment for the Apollo Spacecraft Command and Service Module was signed recently with the Kollsman Instrument Corporation of Elmhurst, N.Y.

The contract with Kollsman Instrument is for the optical subsystem, a map and data viewer and related ground support equipment which are necessary to the performance of the spacecraft's guidance and navigation system.

Under separate contract, the Massachusetts Institute of Technology is responsible for design of the guidance and navigation system. The Raytheon Company of Sudbury, Mass. is providing the onboard com-

puter and AC Spark Plug, Division of General Motors in Milwaukee, Wisc. is to assemble the unit.

The optical subsystem consists of a scanning telescope and sextant which will enable astronauts to make visual celestial sightings during their space journey. The map and data viewer will provide the astronauts with instantaneous navigational information and filmed data

(Continued on page 3)

# Space Program Special Needs Provided By Technical Services

Most everyone has seen models and full scale mock-ups of spacecraft, launch vehicles and related hardware used for displays and/or testing here at Manned Spacecraft Center....have you ever wondered where and how they came into being?

A large percentage of these items are the results of the labors of skilled technicians in the shops of MSC's Technical Services Division with Jack A. Kinzler, chief of the division, and David L. McCraw, assistant chief.

The division started at Langley in 1958 with seven people, a band saw, drill press and a burning table as their first equipment.

Since that humble beginning the division has grown to include over 100 skilled technicians and office personnel and the equipment that gives them the capabilities of building the most complicated models and mechanisms imaginable.

As Westley H. Brenton, technical assistant put it, "We build anything and as time goes by, we are call-

ed upon to build more and more intricate items for use in the space program. Sometimes we receive requests to build things that are mechanically impossible to build and those are about the only things we don't build."

The shops of the Technical Services Division moved to MSC in Houston from Langley, beginning in November 1961 and the move was completed in the summer of 1962.

One of the first major jobs to be performed by Technical Services was the instrumentation and preparation for launch of the MA-1 spacecraft in 1959 and in this job they were assisted by technical people from Cape Canaveral.

The division comprises

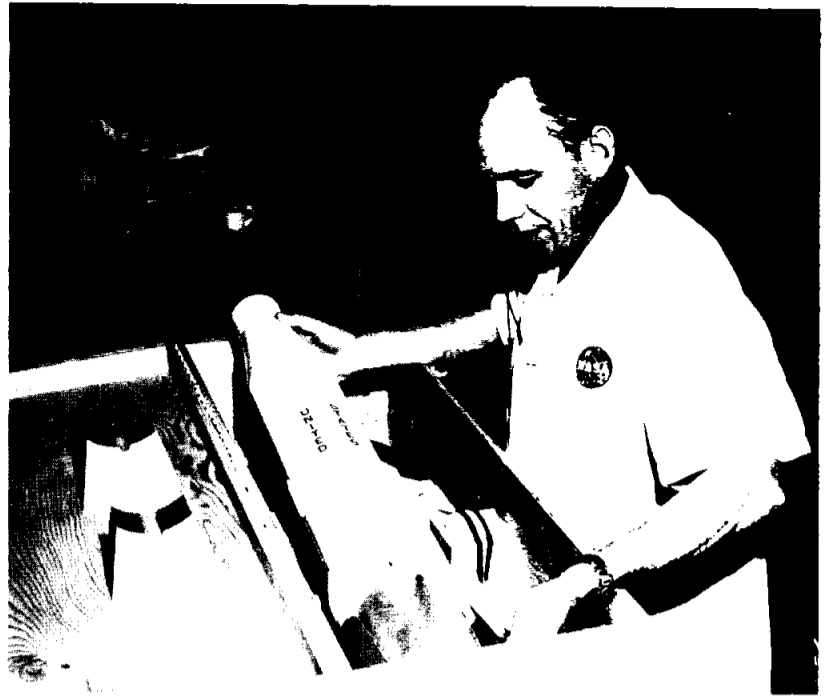
eight branches and is located at two sites here. The shops and parts of other branches are in the Canada Dry Building and the division offices along with the testing branch are located at Ellington AFB.

Branches and their heads are Field Test, Edward Carpenter; Model and Plastics, Charles Tucker; Electronics Branch, Bill Prine; Machine and Assembly Branch, Orrin Wobig; Sheet Metal and Welding, James Warren; Planning and Scheduling, J. Howard Allison; Mechanical Maintenance Branch, Morris Wolfe; and Design and Drafting Branch, Paul Marchal.

One of the proud accomplishments of the shops is the full scale Lunar Excursion Module mockup developed and built here in November 1962 in the short period of only six days. Starting from scratch with plans being drawn as they worked on the model and having only an artists conception of what the finished product was to look like, the module was ready in record time.

Models in metal, wood and plastic are constantly being built for evaluation studies, wind tunnel tests, displays and for actual use in the spacecrafts under development at the time.

Some of the past developments of the Technical Services Division include the heat shield cable fittings for the Mercury spacecraft (developed from the basic



**READY FOR SHIPPING**—Placing a completed model of a disassembled Mercury-Atlas in the shipping case is Julian D. Rumby, model maker.

idea), the CO<sub>2</sub> trigger mechanism for the astronaut life vest inflation and the momentum wheel (a manual control device for moving and positioning the spacecraft in space in the event of fuel exhaustion).

Other developments built by the division are the astronaut training swing, MSC's first wind tunnel, control handles in the spacecraft, the gas operated antenna for the spacecraft and then cutters for the pickup helicopter to use to cut the antenna which then permits close range hook-ups when lifting the craft out of the water.

A special left handed camera one-hand-operation to shoot picture, advance film and recock the shutter was developed and built by Technical Services for John Glenn to use in his flight.

The first actual flight

model of the Mercury spacecraft conception was built at Langley by Technical Services and was used in several shots from Wallops Island and recovered each time. The model is still around.

The Sarah Beacon, a British made receiver-transmitter was tested and evaluated by Technical Services and used for communications between the spacecraft and the recovery craft.

Special developments on the Mercury spacecraft by the division include a recoverable "A" Can by lining it with a special floatation material, a recoverable escape hatch by using a special retention wire, an insertion port slide for aiding the astronaut's entry into the spacecraft, parachute packing crates

(Continued on page 3)



**MODEL IN METAL**—Cecil Jackson, metal model maker attaches a model of the LEM to the inertial reference model which he built in the Technical Services shops. The model was constructed for demonstration purposes in the Spacecraft Technology Division.



**MODIFYING APOLLO MODEL**—Jim O'Neill, metal model maker, modifies a model of the Apollo spacecraft to receive the escape tower. The model is to be used in wind tunnel tests. O'Neill also built the model of the centrifuge that is to be constructed at Clear Lake.



**PARASAIL MODEL**—John W. Heckler, experimental model maker in the plastics branch, disassembles the composite mould used in making a detailed scale model of the parasail. The model will have opening and closing louvers that are used to control descent and direction of the spacecraft by the astronaut.

## Apollo

(Continued from page 1)

which will be available for ready reference during all phases of the flight.

MSC selected Kollsman to develop the optical subsystem for Apollo on May 28, 1962 after an industry competition. Since that time the company has been working under a letter contract and \$3,700,000 of the total amount has been funded. The newly signed contract calls for delivery of all hardware to AC Spark Plug by Aug. 1, 1964.

Work on the optical subsystem will be done at Kollsman's Syosett, N. Y. plant.

The Apollo lunar program is designed to land an astronaut team on the moon and return them to earth. Space flight hardware consists of three major items: The Command Module, Service Module and Lunar Excursion Module (LEM).

The Command Module will be designed to carry three space pilots to the vicinity of the moon. The Service Module will contain the propulsion system and equipment to support the Command Module.

As the spacecraft approaches the moon, two of the Apollo team members will enter the LEM, detach themselves from the craft and descend in the LEM to the moon for surface exploration.

The lunar landing is to be accomplished before the

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for the 63 foot chutes and the press to pressure pack them into a cannister shape and a special hook for recovery of the spacecraft after impact.

Other accomplishments of the division are full scale wooden mockups of the Apollo spacecraft and the Lunar Excursion Module. They are now in the process of constructing a modified version of the LEM.

They even have what they call the Do-Nothing-Machine. It is a one-twelfth



APOLLO IN WOOD—Ian Paton, model maker, turns a balsa wood model of the Apollo spacecraft on the lathe. The model is being made for flight recovery tests.

## Parasail

(Continued from page 1)

towed in flight by the truck at about 35 m. p. h.

This is the takeoff procedure being followed by the 16 astronauts in the parachute glide tests using a specially designed 24-foot diameter parasail canopy. The canopy is designed to obtain maximum safety in the training activities.

Once they are at the maximum altitude the tow line is released from the truck and the astronaut receives a jolt very similar to that of a parachute opening. He then releases the tow line from his harness and glides slowly to an easy landing.

For the water descents a powerboat will do the towing and the astronauts will wear Gemini-type pressure suits and wear Gemini personal equipment to permit training for procedures in making safe landings with parachutes in the event of ejection from the spacecraft.

The training will include ground school lectures and the astronauts will spend a day at the U. S. Naval School of Preflight, Pensacola, Fla., in water survival training.

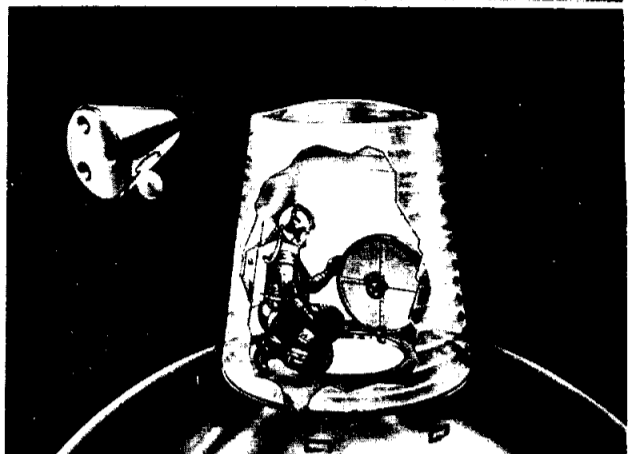
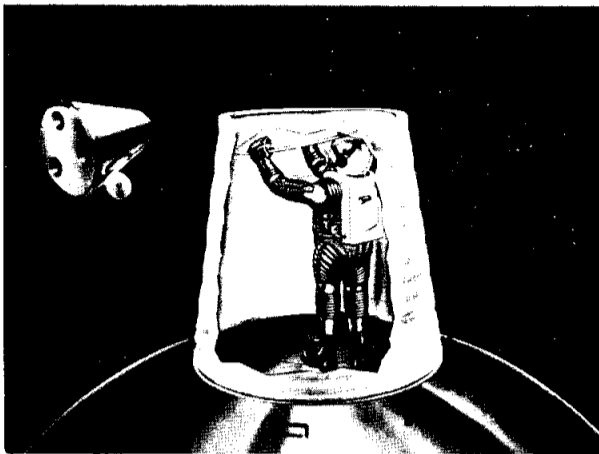
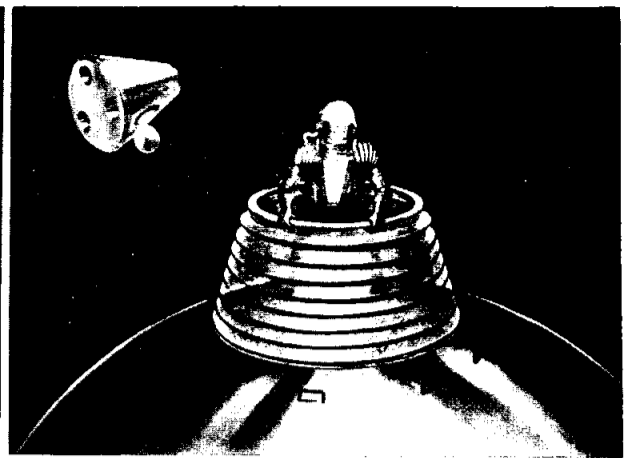
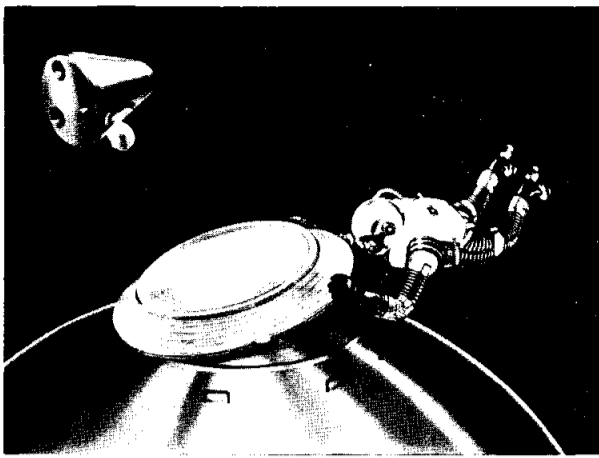
The training will be conducted over a period of several weeks to permit all the astronauts to participate in all phases.

end of the decade under the space program outlined by President Kennedy.

scale model of an Apollo simulator trainer that tumbles 360 degrees on each of three axes. The unit was built for evaluation studies.

Technical Services along with Engineering, developed and built the air bearing system for the Alpha trainer.

In addition to all this they still find time to support the Public Affairs Office in repairing and maintaining exhibits, lending technical support for setting up and maintaining displays on the road and even building the crates to transport the exhibits.



ASTRONAUTS "PAL"—An astronaut of the future will need a "pal" in space, not only for occasional assistance in performing assigned tasks but especially during emergencies which can arise during the coupling and assembly of orbiting spacecraft. According to the Lockheed Missiles & Space Company, the astronaut's best "pal" will not be another astronaut, but a PAL—portable air lock—which will enable a crewman to enter or leave a spacecraft through an emergency hatch, without decompressing the vehicle. An artist's concept of the collapsible, 35-pound air lock depicts its use. It could have direct application for the next series of manned vehicles, including Gemini and Apollo.

## Astronauts Best 'PAL' In Space Could Be A Portable Air Lock

The astronaut of the future will need a "pal" in space, not only for occasional assistance in performing assigned tasks but especially during emergencies which can arise during the coupling and assembly of orbiting spacecraft.

The "pal" recommended by John Zozak, design specialist, of Lockheed Missiles & Space Company, Sunnyvale, Calif., however, is not another astronaut. Instead, it is a collapsible, 35-pound portable air lock

### Williams

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to prove the escape systems of the spacecraft.

In conclusion he told the Chamber members that, "If all goes well, the Apollo program will climax sometime before the end of this decade with a manned flight to the moon and a moon landing, breaking the chains that have bound us to this Earth for untold centuries, and fulfilling an ambition that is as old as man himself."

Later in the week, Williams went to Monterrey, Mexico to speak during the U. S. Mexican Cultural Week, part of the month-long independence celebration of the Mexican government.

There he spoke on "Mexico and the Mercury Program," with emphasis on the important communications part played by the Guaymas tracking station during spaceflight. He noted that four of the original seven astronauts have visited Guaymas during one flight or another.

made of flexible filament-wound material, lined with gas-tight butyl rubber.

At a recent symposium on space rendezvous, rescue and recovery—sponsored by the American Astronautical Society and the Air Force Flight Test Center—Zozak recommended the portable air lock concept as an integral part of spacecraft for manned Earth-orbiting and interplanetary missions.

The more complex spacecraft of the future, he said, will be multiple-launched in units of compact packages, and then joined into operational form while in Earth orbit. This will require orbital rendezvous, coupling of several modules, and subsequent assembly into spacecraft.

Since most of the modules will be fully pressurized at launch -- so they will be ready for immediate occupancy -- the problem will be to assemble and join the large pressure vessels into fully-operational configurations. Also, this must be done quickly, with a high degree of reliability and a minimum loss of pressure, so there will be little change in the internal atmosphere, he said.

At this point, the astronaut's "PAL" -- the portable air lock -- becomes all-important. Several emergency situations could arise which would prevent a

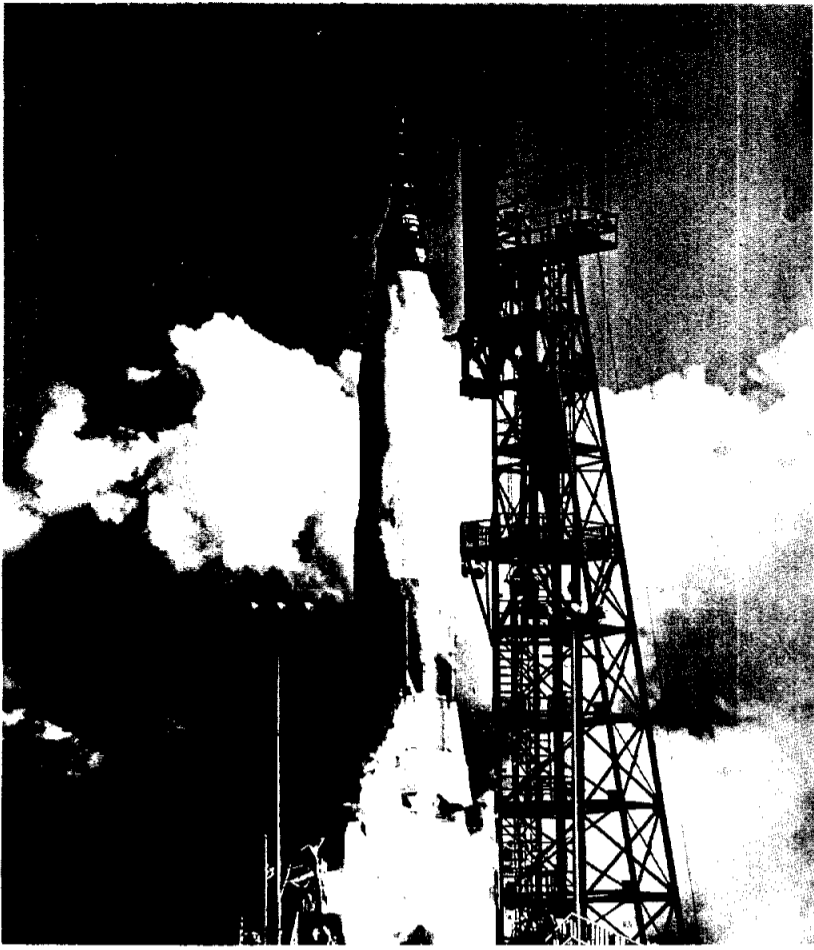
crew from transferring through the regular air lock into the spacecraft. The air lock and coupling mechanism, for example, may have been damaged by collision, or one of the two hatches in the lock may have been jammed or damaged.

Use of the portable air lock concept, however, would enable crewmen to enter through an emergency hatch. Additionally, the PAL could be installed permanently in the spacecraft as an emergency air lock. Also, it could be used as a coupling device to attach a shuttle vehicle to the spacecraft. And, for the next series of Gemini and Apollo vehicles, it could have direct application.

Currently, the Gemini spacecraft has an access panel at each side for entry and exit, and the Apollo spacecraft has both a main air lock and side panels.

Use of the PAL concept offers a full-size, emergency air lock, weighing two-thirds less than an equivalent size rigid metal air lock. PAL does not add to the length of the spacecraft or interfere with its internal volume. Fully inflated for emergency use, the portable air lock would be about seven feet in height, with a four-foot diameter at the top, and a four-to-six-foot diameter base.

## Space Systems Division Directs Air Fo



ALL SYSTEMS "GO" as a specially constructed United States Air Force Atlas boosts Lt. Col. John Glenn and his NASA Mercury space capsule into orbit from Cape Canaveral, Fla.

From his headquarters near the heart of the Nation's aerospace industry in Southern California, Maj. Gen. Ben I. Funk, Commander, Space Systems Division, Air Force Systems Command, holds the management reins for the Air Force's participation in the Nation's space effort.

This command stretches across the nation to Cape Canaveral, Fla. It goes north to include Vandenberg Air Force Base, Calif., the Satellite Control Facility, Sunnyvale, Calif., and on to Kodiak, Alaska. It extends west and east into the Pacific and Atlantic oceans. Space Systems Division brings together under one direction the acquisition, launch, track, control and recovery of those activities which make up the Nation's military space capability.

These activities are directed toward giving the Air Force the capability of

routine space flight based on a solid foundation of scientific research. But going beyond this in-house need, the Division also has the responsibility for directing the Air Force's cooperation with our other military services and with the National Aeronautics and Space Administration.

This cooperation is best exemplified in the launching of the U.S. Navy's navigation satellites, the Tiro weather satellite, the Canadian Topside Sounder satellite (Alouette), and the providing of boosters for NASA's Ranger and Mariner space probes as well as acquiring, man-rating and launching the boosters used for the Mercury Astronauts.

This cooperation with NASA is continuing in the current Gemini program. Air Force military and civilian scientists are working with the aerospace industry to modify the Titan II missile for a space launch vehicle. At SSD headquarters other groups from both the military and Aerospace Corporation, which furnishes SSD technical assistance, are working with the problems associated with launching the Agena target vehicle which will rendezvous with the two-man Gemini vehicle out in space.

In its own work SSD is concerned with a program from initial idea to finished product. The current Ti-

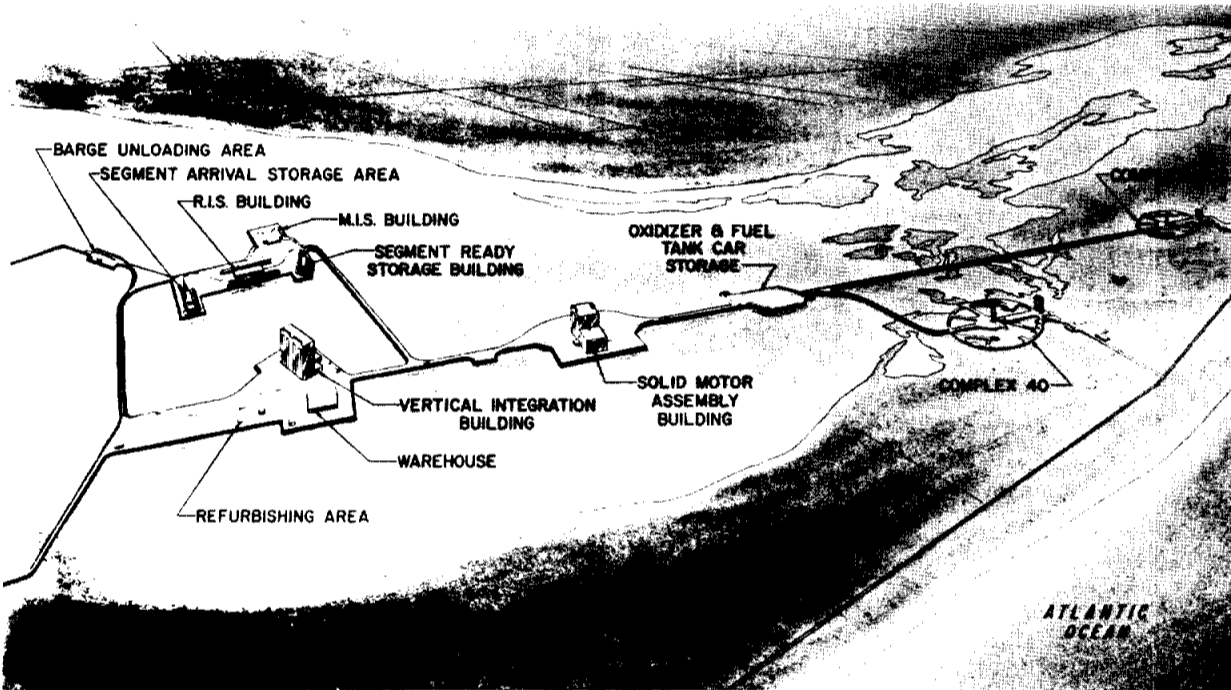
tan III program illustrates how this concept works.

It began with an idea--a requirement for a more powerful standard launch vehicle which SSD could utilize both for its own Air Force space requirements and for launching larger and more complex satellites in its cooperative work with other space agencies.

This idea was developed into a proposal by SSD and Aerospace teams, and, after DOD approval, became program 624A under the direction of Brig. Gen. Joseph S. Bleymaier.

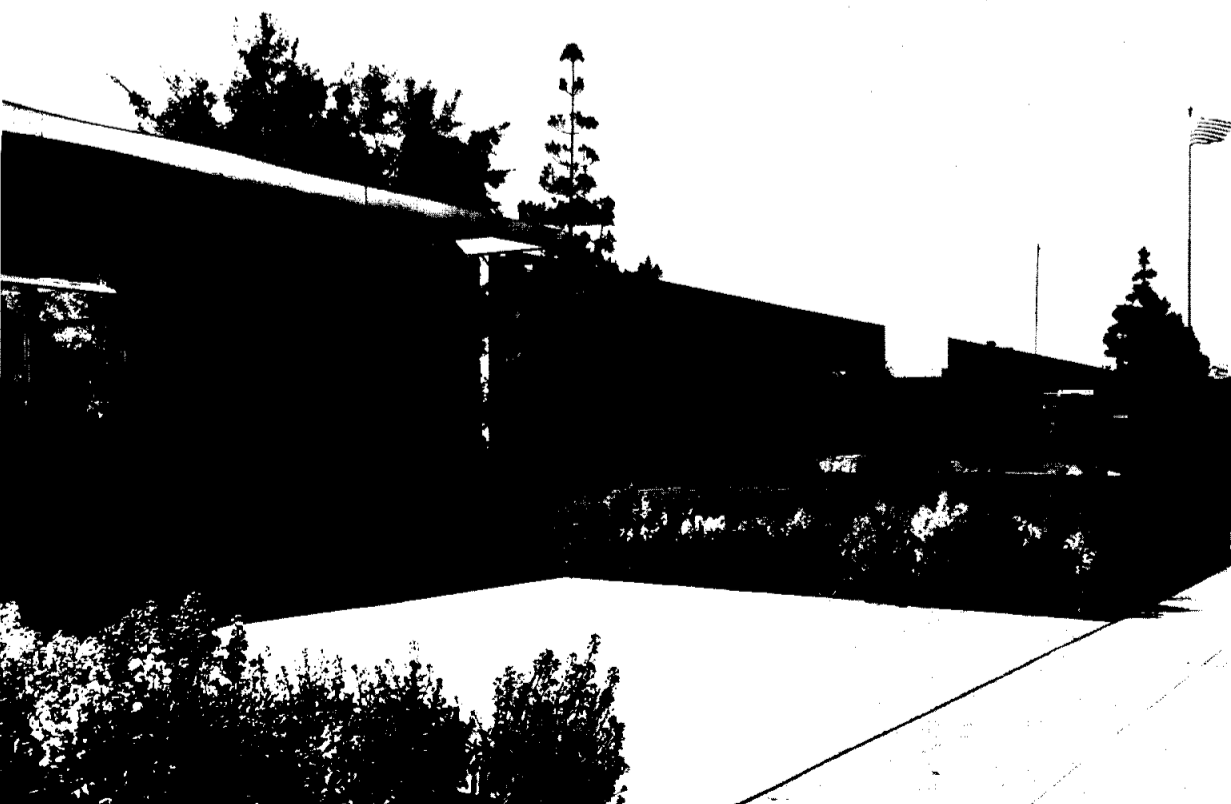
The SSD concept here was more than just increasing motor size. The idea evolved in the "think shops" of SSD was aimed at designing the first real space launch vehicle in the United States. Previously our vehicles were modified from ballistic missiles.

The SSD team envisioned Titan III in terms of modern management. Today breakdown, transport, reassemble, checkout and launch of a space probe is extremely time consuming and ties up launch pads for weeks. The concept that came out of the design-management phase of Titan III was for an assembly line which would transport the vehicle through successive stages of assembly and then straight on to the pad for loading of the liquid core motor and immediate firing.



CAPE LAUNCH COMPLEX—This artist's concept depicts the Air Force integrated-transfer-launch (ITL) complex to be constructed at Cape Canaveral as part of the Air Force TITAN III Standardized Space Launch System.

Editor's Note: This is the thirteenth in a series of articles designed to acquaint MSC personnel with the Center's team members, those who make MSC spacecraft, their launch vehicles and associated equipment. The material on these two pages was furnished by the Public Information Office, Space Systems Division.



SSD HEADQUARTERS—From its headquarters in Los Angeles, California, the Air Force Space Systems Division directs a world wide network of space activities. SSD has launched over 90% of the Nation's satellites and space probes.



THE MAN BEHIND the Air Force Mercury Pilot Safety Program is Lt. Col. Charles L. Gandy Jr., Mercury Launch Vehicle Director for Air Force Space Systems Division, Los Angeles, Calif. A veteran Air Force test pilot, and research and development specialist, Colonel Gandy heads the team of Air Force officers and Aerospace Corporation Scientists and engineers who provide technical direction and systems integration for the Mercury Atlas booster.



The four cordial and capable MSC secretaries presented in this issue of the Roundup are assigned to the Office of Director and to the Deputy Director for Development and Programs.

Goldie B. Marks, left, secretary to Raymond L. Zavasky, executive assistant and Donald T. Gregory, technical assistant, has worked in the Office of Director since December 1962. Prior to that time she was assigned to the Logistics and Supply Branch at Ellington Field.

She came to MSC in July of 1962 soon after spending three years at Tachikawa Air Base, Japan where her husband, a technical sergeant in the Air Force, was stationed. Her husband, Clarence Marks is now retired after 21 years of military service.

Born in Wann, Okla., Goldie, attended high school in El Dorado, Kan. and the Tulsa Business College, Tulsa, Okla.

In her leisure time she enjoys gardening, playing her electronic piano and reading.

Annette B. Lackland, right, an assistant secretary in the Office of Director, came to MSC in January of this year. She and her husband, Sam D. Lackland, had just returned from Europe when she joined the NASA staff. Annette had lived for three years in England and Germany where her husband was assigned in the Air Force.

A native of Mineral Wells, Tex., she was graduated from Texas Christian University in 1959 with a bachelor of science degree in commerce. She lists reading, playing the piano and bicycle riding with her husband as her most enjoyable pastimes.

Joanne F. Hale, lower left, secretary to Dr. Robert B. Voas, assistant for Human Factors and Mr. Phillip T. Hamburger, assistant for Congressional Relations, joined the Office of Director in October 1962.

Born in Houston, she attended the Incarnate Word High School and has been attending the University of Houston in the evenings since 1960. She is majoring in office administration.

Joanne is married to Bobby L. Hale, who is a chemical engineer for a Houston firm.

Fishing is her favorite sport and pastime, especially gulf and deep sea fishing.

Fay Shaver, lower right, is a stenographer in the office of Mr. James C. Elms, deputy director for Development and Programs. A relatively new employee, Faye has been with MSC since April and speaks of her work with sincere enthusiasm.

She was born in Houston and soon after being graduated from La Porte High School she went to work in the underwriting department for an insurance company in Houston.

In 1961 she returned to school and attended San Jacinto Junior College. She has an avid interest in traveling and languages and is presently studying Spanish.

Faye is married to Bill Shaver, a Houston city policeman and the couple has two children, Bobby, 6 and Janet, 3.



### Mercury Club To Hold Luau At Patrick Saturday Night

The Mercury Club will have an Hawaiian Luau Saturday night at the Patrick Air Force Base Officers Club at poolside. The affair will start at 7 p. m. and last until 1 a. m. Swimming will be optional.

Cost to club members will be \$2 and non-members will be charged \$2.50. These charges include the buffet dinner but not refreshments. The buffet will be served, beginning at 7:45 p. m., and will feature french fried shrimp, barbe-

cued ribs, egg rolls, chicken almondine, rolls, butter and coffee. There will be fresh fruit baskets on all tables.

Dancing will start at 9 p. m. The committee in charge of the affair—Jeri Yannotta, Lola Morrow and Henri Kent—advise Hawaiian dress.

Due to space limitations, a maximum number of 300 persons may attend. No tickets will be sold at the door and no person can buy more than two tickets.

### Picnic For MSC Families Scheduled For October 12

A Center-wide picnic with Western style barbecue, pony rides for the children, an all star NASA softball game and other entertainment, is scheduled for all MSC personnel and their families on October 12.

The picnic, with activities beginning at 12 noon and serving of food at 2 p. m., will be held in the Galveston County Park, off Highway 3, near League City.

Phonille DeVore, promotion chairman, said,

"the park is beautiful with lots of trees, picnic tables, a pavilion in case of rain and a playground for the children."

Tickets for the picnic will be available from General Assembly District Representatives of MSC. More details will be announced later.

#### FIVE YEARS OLD

The National Aeronautics and Space Administration will be five years old on October 1, 1963.



## MSC United Fund Goal, Team Captains Announced

The first meeting of team captains for Manned Spacecraft Center's United Fund Drive was held recently and a general orientation on the plans and methods to be used in achieving the goal of \$35,609 for MSC was presented.

The once-a-year appeal for 67 national and local agencies will begin its campaign October 1 and continue through November 8.

Team captains and the sections they are to contact are as follows: Tony Yeater, F & C Building; Marvin Matthews, Audit and Legal; Bill Wagoner, Program Analysis and Evaluation; Bob Gordon, Public Affairs; Ned Logan, Astronaut Activities; Burney Goodwin, Personnel; Kay Walker, Procurement & Contracts; Joe Pirtle, Security; Lynn McMillion, Financial Management; Tom Brahm, Photographic; Ed Campagna, Facilities and Paul Marchal, Technical Services.

Additional team captains include: Joe Davis, Office Services; Bernice Slaught-ter, Logistics; Charles

Grant, Technical Information; Ronald Mercer and Robert Dittman, Spacecraft Technology; Lewis Lee, Crew Systems; Alfred Ligriani, Systems Evaluation and Development; W. I. Craig, Space Environment; Henry Clements, Flight Operations; Lee Nichols, Flight Crew Operations; H. Mervin Hughes, Ground Systems; Carl Watkins and Harold Ferrere, Instrumentation and Electronic Systems Division; John Shoosmith, Computation and Data Reduction; Bill Kelly, Mercury Project; Robert Fricke, Gemini project; and W. Kemble Johnson and Robert J. Bailey, Apollo.

Donald T. Gregory is the NASA section chairman and Paul M. Sturtevant is vice chairman. Another meeting of the team captains will be held prior to the opening of the fund drive.

The 1964 UF goal for Harris County is \$6,501,106.

## New Accident Ins. Plan Is Offered NASA Employees

The NASA Employees Benefit Association has announced a new Travel Accident Group Insurance plan exclusively for NASA employees. Any full-time employee not serving under a temporary-limited appointment is eligible to join the plan.

Briefly, here is what the Travel Accident Group Insurance plan offers: In the event of death resulting from accidental bodily injury sustained during an official business trip, provided death occurs within 180 days after the injury, the beneficiary will receive either \$100,000 or \$50,000, depending on the amount of insurance selected. This amount is payable in addition to any benefits to which an employee may be entitled under the NASA Group Life Insurance Plan.

W. Kemble Johnson, president of the MSC chapter of the Association, said, "The cost of this worthwhile insurance is amazingly low. For \$50 a year an employee may obtain \$100,000 of protection, or \$50,000 of coverage for only \$25 a year. You would have to pay far more to get comparable coverage on an individual basis."

Enrollment cards and additional information about the NASA Travel Accident Group Insurance plan are being distributed through division offices. Interested employees should enroll now since NASA is required to secure 1500 enrollments in order to make this plan effective on October 1.

## Federal Employee Health Insurance Enrollment Open

The Civil Service Commission has announced that all employees enrolled in plans offered under the Federal Employees Health Benefits Program will have an opportunity to change their enrollment during the open season scheduled for Oct. 1 through Oct. 15, 1963. Eligible employees who are not enrolled will be able to enroll during this open season.

Changes enrolled employees may make are: Change from one plan to another. Change from one option to another option in the same or a different plan. Change from self only to self and family, or the reverse.

In cooperation with the insurance carriers, the Civil Service Commission has rewritten all the brochures describing the health benefits plans which participate in this program, because most of them have changed benefits or rates or both.

Before Oct. 1, 1963, the Personnel Division will distribute to each eligible employee an open season instruction pamphlet and brochures of the two Government-wide plans. Members of employee organizations which sponsor health benefits plans will receive brochures of the organization's plan through the mail directly from the Civil Service Commission.



**NEW MSF HEAD**—Dr. George E. Mueller is sworn in as Deputy Associate Administrator for Manned Space Flight for NASA, by Dr. Hugh L. Dryden, NASA's Deputy Administrator. The ceremony took place at NASA Headquarters in Washington on September 3.

## New Tracking Stations Scheduled 'Down-Under'

In preparation for Project Gemini, new spacecraft tracking antennas are to be installed in Australia along with a new Deep Space Network station and both will be operated under amendments to the original agreement signed February 26, 1960.

The 1960 agreement established stations at Murchison and Woomera for the purpose of supporting the NASA program of space exploration.

A scale model of the 85-foot diameter spacecraft tracking antenna to be installed "down-under" was presented recently to Australian Ambassador Sir Howard Beale by Dr. Hugh L. Dryden, deputy administrator of the National Aeronautics and Space Administration.

The presentation symbolizes equipment to be operated at new tracking stations near Carnarvon and Canberra.

Accepting the model antenna from Dr. Dryden at NASA Headquarters, Ambassador Beale said it would become part of a permanent exhibit on space at the Australian Embassy in Washington.

The model was presented during a demonstration of tracking facilities and techniques by Edmond C. Buckley, director of NASA's Office of Tracking and Data Acquisition, who has responsibility for installation and operation of equipment going to NASA sites in Australia and elsewhere.

"Australia is geographically vital for tracking in the Southern Hemisphere," Buckley said. "For that reason many American spacecraft projects are dependent on the Australian tracking stations and the excellent technical assistance provided by Australia in their operation."

Buckley explained that the station at Carnarvon will be especially important be-

cause most of the United States spacecraft launched from Cape Canaveral pass close enough to the west coast of Australia to be tracked from that site.

Carnarvon is almost diagonally opposite to Cape Canaveral, Buckley explained. Carnarvon lies at 25 degrees south latitude while Cape Canaveral on the other side of the world is at 28 degrees north latitude. From the Cape the spacecraft heads southeast, crosses the equator, then swings on a northern curve up the Indian Ocean and toward the Pacific. Regardless of the azimuth angle of launch, the satellite passes within range of Carnarvon.

While the new station is being installed at Carnarvon in preparation for Project Gemini, the station will also monitor unmanned scientific satellites.

Basic equipment to be installed at the Carnarvon station will be a 30-foot diameter antenna associated with an FPQ-6 radar of high precision type, a double 14-foot diameter S-band circular parabolic antenna for sending and receiving, and two UHF single transmitting and receiving antennas. For the Gemini project there will be a dual command system of ground-to-air voice communication.

The antenna presented recently is a scale model of basic equipment for the new station at Canberra. This station will be a member of the Deep Space Network which tracks spacecraft on explorations to the Moon and beyond to

## NASA Honors Holmes For Job Well Done

The National Aeronautics and Space Administration has presented D. Brainerd Holmes, the former director of its manned space flight program, with the NASA medal for Outstanding Leadership.

James E. Webb, NASA Administrator, made the presentation to Mr. Holmes recently at a ceremony in NASA Headquarters. Many of the officials who had worked closely with Mr. Holmes were present.

In presenting the leadership medal, Mr. Webb emphasized the major role Mr. Holmes exercised in marshalling the Nation's resources to accomplish the President's objective of manned lunar landing and return within this decade.

The citation accompanying the award reads as follows: "for his outstanding leadership of the Manned Space Flight Program during the formative period of Project Apollo and for his imaginative and energetic leadership in forging a manned space flight organization dedicated to advancing the United States toward the goal of pre-eminence in space."

Mr. Holmes' successor is Dr. George E. Mueller, former vice president for research and development of Space Technology Laboratories, Los Angeles.

## Science And Technology Radio News Program Changes Time, Station

A radio program familiar to many at MSC, "A Digest of Latest News in Science and Technology" and currently heard on KPRC at 7:50 each morning is changing times and stations.

Beginning the first part of October the program will be on the air at 7:45 a. m. on KPRH.

the planets.

The new parabolic antenna is designed to provide extremely powerful transmission for command control and delicate receiving equipment to pick up weak signals from spacecraft millions of miles away. Improvements include high frequency S-band operation and a sensitive maser amplifier.

The Deep Space Network which Canberra now joins is the group which tracked Mariner II 54 million miles from Earth on its voyage toward Venus and on to orbit the Sun, a total distance of 225 million miles of flight through space. Other Deep Space Network stations are located at Woomera; Johannesburg, South Africa; and Goldstone, Calif.

# Space-NASA Cooperative Space Efforts

This concept requires design of entirely new support facilities. These are being built concurrently with development of the vehicle and its motors. SSD's Deputy for Civil Engineering is managing the program.

The vehicle frame and its motors are in development under industrial contracts which are also monitored by SSD. Recently General Funk pressed the firing button for the first test of the solid fuel rocket motor which is being designed to be used in tandem to supplement the liquid core motor for the basic Titan III concept.

The motor produced more than a million pounds of thrust. The success of this test, which General Funk called "the first major milestone in the development of our first true military space launch system," was proof that the concept of Titan III was sound.

People play an important part in all the Division's activities. Currently SSD headquarters has a manpower force of over 700 officers and nearly 200 airmen. Also working with the Air Force are over 700 professional civil service employees. In addition, Aerospace Corporation, with more than 4,000 employees, provides SSD with technical, scientific and engineering direction.

These people work with a budget of approximately \$1.3 billion (Fiscal Year 1963) and conduct business through more than 300 prime and associate contractors with some 80 companies conducting business in 19 states. This close working relationship between the planners and the builders of space launch systems is what has enabled SSD to develop these programs in such record time.

Currently the line-up of

space launch vehicles under SSD management includes five standard space boosters for a multitude of launch assignments.

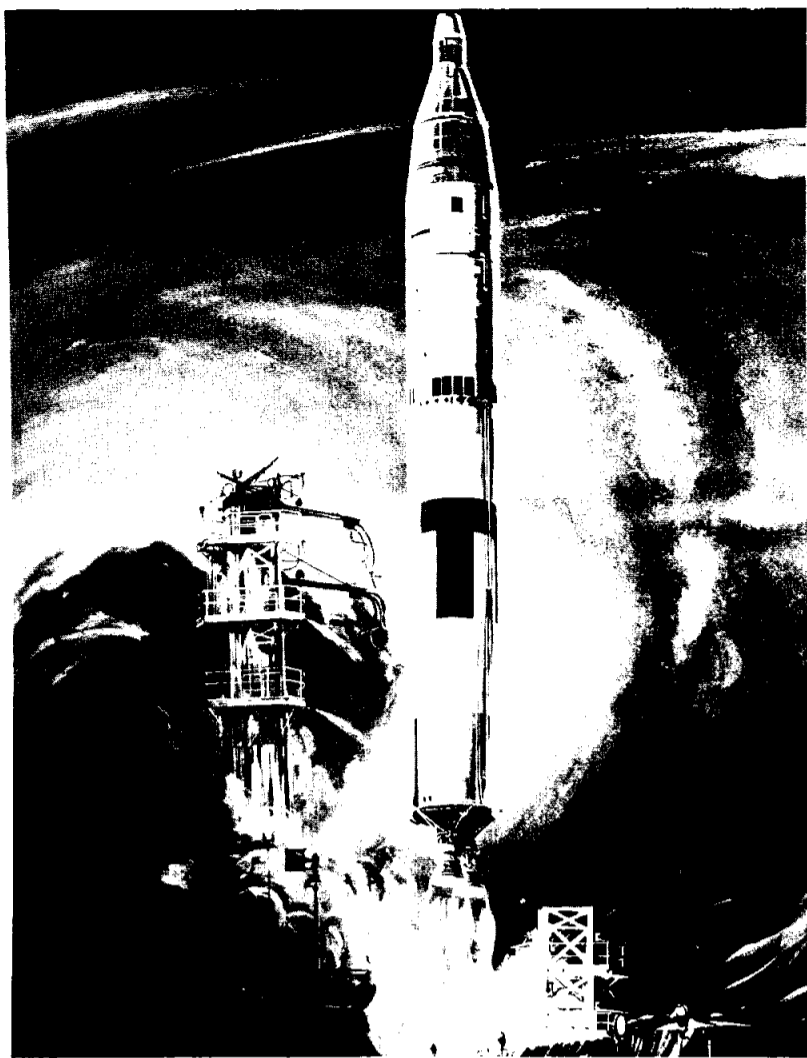
The NASA/DOD Scout, and the Air Force Thor and Atlas space boosters are in wide use today. The Titan II modifications for Gemini are progressing, and Titan III will produce more than 2,000,000 pounds of thrust at liftoff. Dyna Soar has already been announced as a project for the Titan III-C system and others will be announced later.

During the past year many significant achievements have been chalked up as a result of SSD's efforts in space. Space Systems Division using an Atlas Agena combination launched the Mariner II space probe for the National Aeronau-

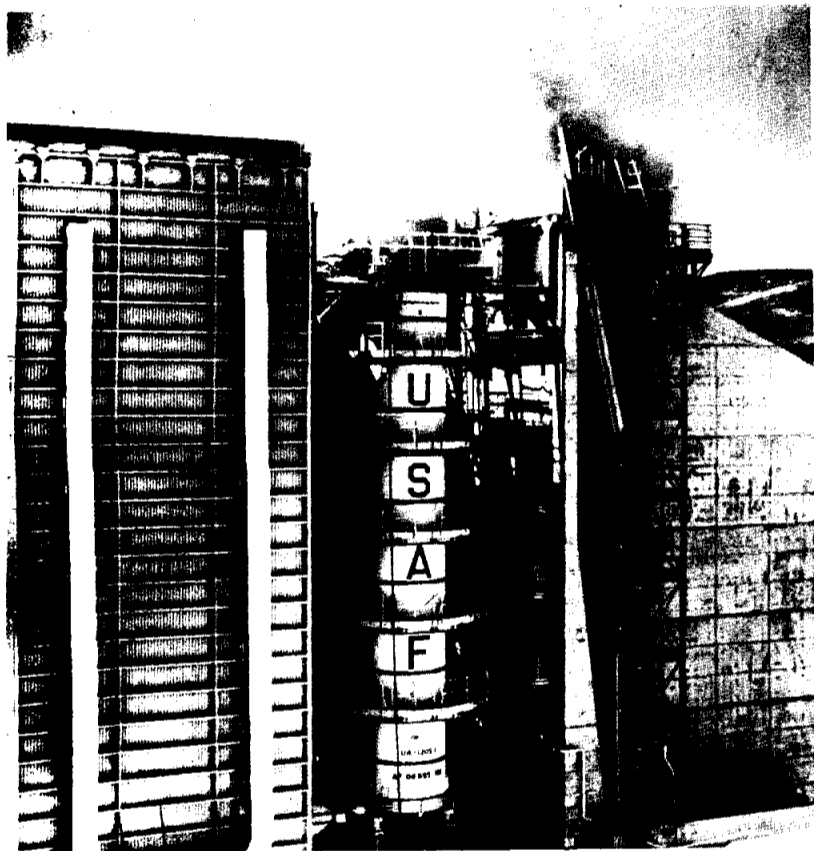
tics and Space Administration. Mariner II was the world's first successful interplanetary space flight. Agena was the upper stage or orbiting launch platform from which Mariner was given its final boost into space.

The Air Force Agena also serves as an orbiting satellite. It was the world's first satellite to be placed in a polar orbit. Since its development in February 1959, Agena has accounted for more than half of all U.S. space vehicles placed in earth orbit or sent on interplanetary trajectories and half of the world total.

With more than 100 launchings to date, the Agena supports more than 80 percent of all Air Force space programs, and a significant percentage of the civilian space efforts.



**BLAST OFF**—A modified Air Force Titan II launch vehicle blasts off from its pad at Cape Canaveral in this artist's concept of a launching of the two-man National Aeronautics and Space Administration Gemini Spacecraft. Initial launchings are scheduled in the 1963-64 time period. Gemini will be this nation's first manned project to test rendezvous and docking and is envisioned as a major advance in manned space flight between the Mercury program and project Apollo, in which a 3-man capsule will be rocketed to the moon.



**SOLID-PROPELLANT ROCKET TESTED**—Exhaust flames leap 200 feet from the nozzle of a 250-ton solid-propellant rocket motor in a static test at the Coyote, Calif. test site of United Technology Center. The motor, the largest solid-propellant rocket ever fired, produced a peak thrust of 1 million pounds. Two of the 75-foot tall rockets will make up the first stage of the Air Force Titan III-C space booster.



**MAJ. GEN. BEN I. FUNK**  
Commander, Space Systems Division  
Air Force Systems Command



**BRIG. GEN. JOSEPH J. CODY JR.**  
Vice Commander, Space Systems  
Div. Air Force Systems Command



**NEW LAUNCH FACILITY**—1st Lt. Donald W. Pearson monitors construction of a new launch facility at Vandenberg AFB. SSD's 6595th Aerospace Test Wing at Vandenberg is responsible for both Space Division's space launches on the West Coast and for test launches for Ballistic Systems Division's missiles.



**SSD CONTROL ROOM**—The control room in the SSD Satellite Control Facility of the 6594th Aerospace Test Wing, Sunnyvale, Calif., coordinates information from a world-wide series of tracking stations and directs control of Air Force Satellites in space. A highly efficient communications system permits many operations to be made in "real time."

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Editor ..... Milton E. Reim

## On The Lighter Side

This week The Lighter Side takes us on a little trip back in time (some 460 odd years).

### NEW ROUTE TO CATHAY--STEP BY STEP

While it is well known that Columbus made a vain appeal to the senate of his native state of Genoa (as well as to the King of Portugal, to Henry III of England, and to the Dukes of Medina Sedonia and Medina Celi), it was not until very recently that the full official Genoan Senate reply came to light.

It was discovered, along with other of his early documents and letters, in a monastery library in southeastern Spain and perhaps sheds some light upon why Spain, rather than Italy, was the dominant maritime and colonial power in the 16th century. A translation of the letter follows:

To : Cristobal Columbo  
From: The Senate of Genoa

We the Senate of Genoa thank you, dear countryman, sea captain, geographer, and adventurer, for your presentation before us of an ambitious plan to open a new sea route to Cathay. Being most impressed, but untutored in the technical arts, we assembled a committee of the finest academic minds in our own and neighboring states to examine and review your proposal and make recommendations upon our course of action. We are most pleased with their intellectual insight and broad understanding of the problems.

Signor Alfonso Chiochia, Physical Metaphysician, Genoa State University (GSU): "We must first study the oceans, their depths, temperatures, currents, tides, wind velocities, weather, and most particularly the recently discovered inner and outer dragon belts, and, of course, the effect of the edge of the world upon all the previous items."

Dr. Vittoria C. Vincenzo, chairman, Department of Mechanical Arts, Venice Institute of Technology (VIT): "Vehicle and propulsion systems should be examined and the optimum selected for the mission. A careful comparison must be made of manned oar vs. sail propulsion and thought given to the development of advanced concepts such as might be based upon Hero's water vapour engine or Archimedes' screw. As for the vehicle itself, in addition to the many structural and hydrodynamic calculations, one must weigh the use of a single large ship against the suggested three of standard size."

Signor Carlos Fiorento, Professor of Occult Science, The University of Genoa at La Spezia (UGLS): "One must develop techniques of astrogation, that is, selecting one's course by consultation with the stars and planets. Alternatively, one might consider using the newly developed lodestone, though this suffers from unreliability, inaccuracies, and is yet untested under the expected environmental conditions. Arrangements should be made for communication among the vehicles or with the base, and work proceed with flags, lanterns, mirrors, and notes in bottles."

Herr Dr. Franz von Schulte, Professor at Large, Medicine and Life Science, The University of Leipzig, visiting the Geonese Bureau of Research (Savona): "Such a voyage requires considerable advance in our understanding and controlling the various humours which afflict the human body and spirit. One obvious case is the prevention or cure of scurvy. In general, one must determine sound dietary regimens and devise techniques to provide for the sanitary necessities over long periods at sea. These range from obtaining fresh water from salt to concocting a variety of interesting fish recipes. This latter brings us closer to problems of the spiritual humour, involving long periods of loneliness and/or mal de mer with the possibility of group dynamic interactions leading to mutiny, for example."

The committee included representatives from the church (Msgr. Donella), the government (Minister De Stortzo), and the Bureau of Finance (Signor Barratta). These eminent gentlemen discoursed at great length up-

## WELCOME ABOARD

All 16 new employees to join the MSC staff during the period of August 26 through September 3 were assigned in Houston.

SYSTEMS EVALUATION AND DEVELOPMENT DIVISION: Claude D. West Sr., Vicent A. Pardo, George D. Wydrick, Bernard J. Rosenbaum and William A. Silvey.

FLIGHT CREW OPERATIONS DIVISION: Eva G. Kleinjan, Jerome A. Bell, Lynn M. Mobley, Mary J. Bothwell and Arthur G. Nolting.

SPACE ENVIRONMENT DIVISION: Patrick E. Laferty and Ted H. Foss.

COMPUTATION AND DATA REDUCTION DIVISION: Henry L. Butler.

FLIGHT OPERATIONS DIVISION: Edward J. Kenyon.

SPACECRAFT TECHNOLOGY DIVISION: Mark B. Nolan and Thomas H. McAdams.

on the theological and political aspects of such a project, and Signor Barratta most wisely pointed out that one must compare the development and operational costs of improving the well-established Polo overland route. Indeed, he observed that one could pave the entire route with Florentine tile for the price of one round trip sea voyage. Nevertheless, these are prosperous times and the enthusiasm of the scientific members of the committee was undampened. Thus their recommendations were as follows:

1. Study programs be initiated to solve the aforementioned problems.
2. When they are solved, a series of unmanned, instrumented vehicles be sent to Cathay, the final ones carrying animals and instructions for setting them upon the return route.
3. Finally, establish an academy for instructing captains in creative leadership (because, though you have conceived the trip, you are unlikely to possess that exact mixture of attributes required for this demanding position) and for training crews in favorable dynamic group response.

We feel you will be quite pleased with the output of this progressive, forward looking committee of profound scholars. Incidentally, there was one additional member of the committee, a rather rash and impetuous young mechanical engineer, lately of Florence, who was sent in place of the ailing Dr. Taglatti of the University of Milan. Though he came highly recommended, he showed his immaturity and poor judgment by advocating the voyage itself be initiated immediately. Investigation proved him to be quite eccentric (he talks of flying machines and fancies himself an artist), and he was therefore dismissed from the committee. He is the illegitimate son of a Florentine notary and takes his name from the place of his birth, Vinci, Leonardo being his given name, should you desire to contact him.

Most respectfully yours,  
Salvatore Paello  
Secretary of the Senate  
The Sovereign State of Genoa

Thus Columbus continued in his search for a sponsor until he was at last successful, at least in starting his voyage. It had been pointed out that the problem of trade with China (especially for Spain) is yet to be solved. Should another Columbus appear, what would we say to him?

Ralph S. Cooper

This interesting document was brought to the attention of the missile/space industry recently by Ralph S. Cooper of Los Alamos Scientific Laboratory. The "historic" paper, with Mr. Cooper's comments, was reproduced in the form of an office memorandum on the subject of "Scientific Review Committee."

Reprinted courtesy MISSILES AND ROCKETS

## MSC PERSONALITY

### Graves Duties Important Part Of Manned Space Missions

Assistant Director for Information and Control Systems is another way of saying George Barry Graves who in this position is responsible for the Instrumentation and Data Systems Division and the Computation and Data Reduction Division.

In addition to management of all operational elements under his office, he serves as the main point of contact for the establishment of in-house operational support for the development and maintenance of the flight control center for manned space missions. He has been on the MSC staff since October 1962.

Born in Augusta, Ga., Graves attended Peabody High School in Trenton, Tenn. He was graduated from Alabama Polytechnic Institute (Auburn University) in 1946 with a BS degree in electrical engineering.

He joined the Langley Research Center in October

of 1946 as an electrical engineer in the research division. While in this division he developed several systems which were the first of their type.

In 1956, Graves was appointed head of the Telemetry Component Development Section. When the NASA Langley Research



GEORGE BARRY GRAVES

Center was given the responsibility for the construction of the Mercury world-wide tracking and ground instrumentation systems in December

1959, he was named head of the Navigation and Communication Research Branch and the Tracking and Ground Instrumentation Unit for Project Mercury ground stations. In this position, he guided the electronic design of the world-wide Mercury range.

Graves was appointed assistant chief of the Instrument Research Division in March 1961.

He was awarded a Sloan Fellowship in executive development at Massachusetts Institute of Technology and spent 12 months in resident study at MIT where he received his MS degree in industrial management in June 1962.

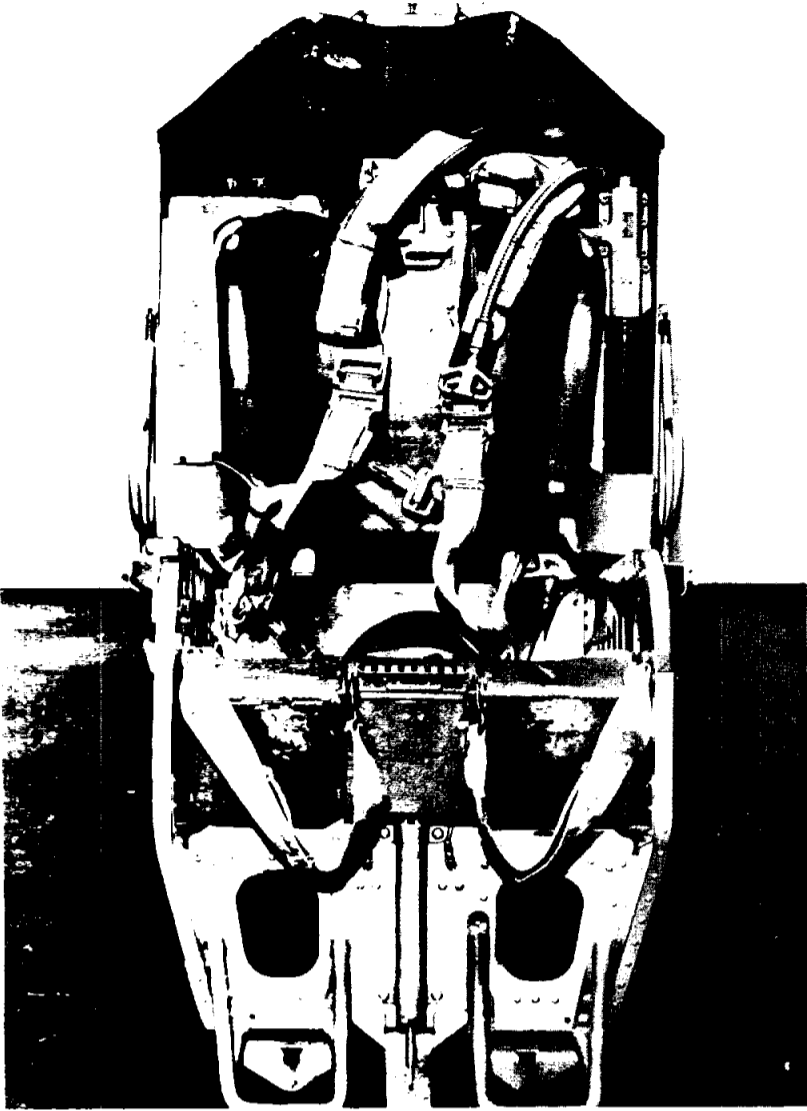
In October 1962, Graves was presented an outstanding Leadership Medal by NASA in Washington. He was honored for his role in the establishment of the world-wide Mercury tracking and ground instrumentation network.

His hobbies include a serious game of badminton and he and his entire family enjoy boating.

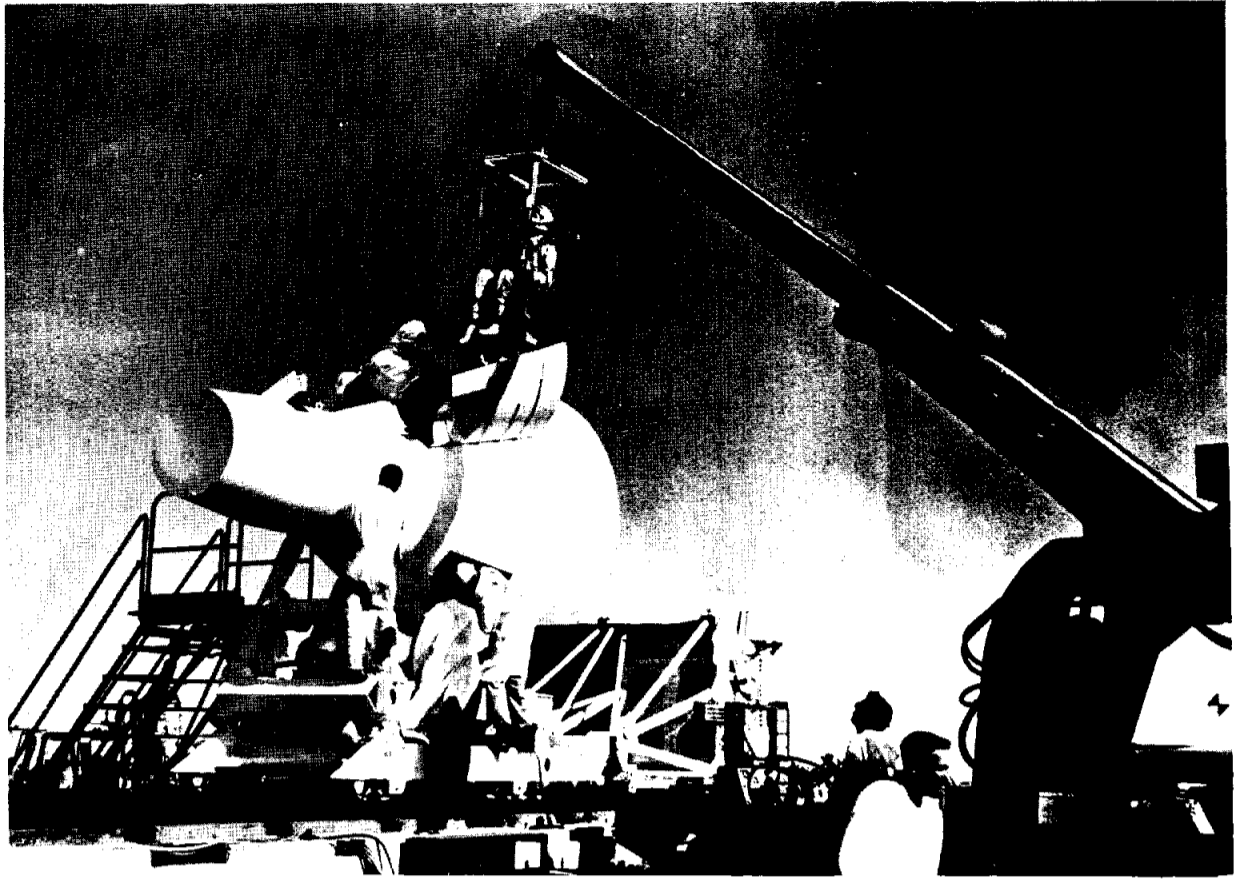
Married to the former Mary Ann Vick of Pensacola, Fla., the couple and their three children, Catherine 14, Kenneth 11, and Laura 8, reside in Houston.



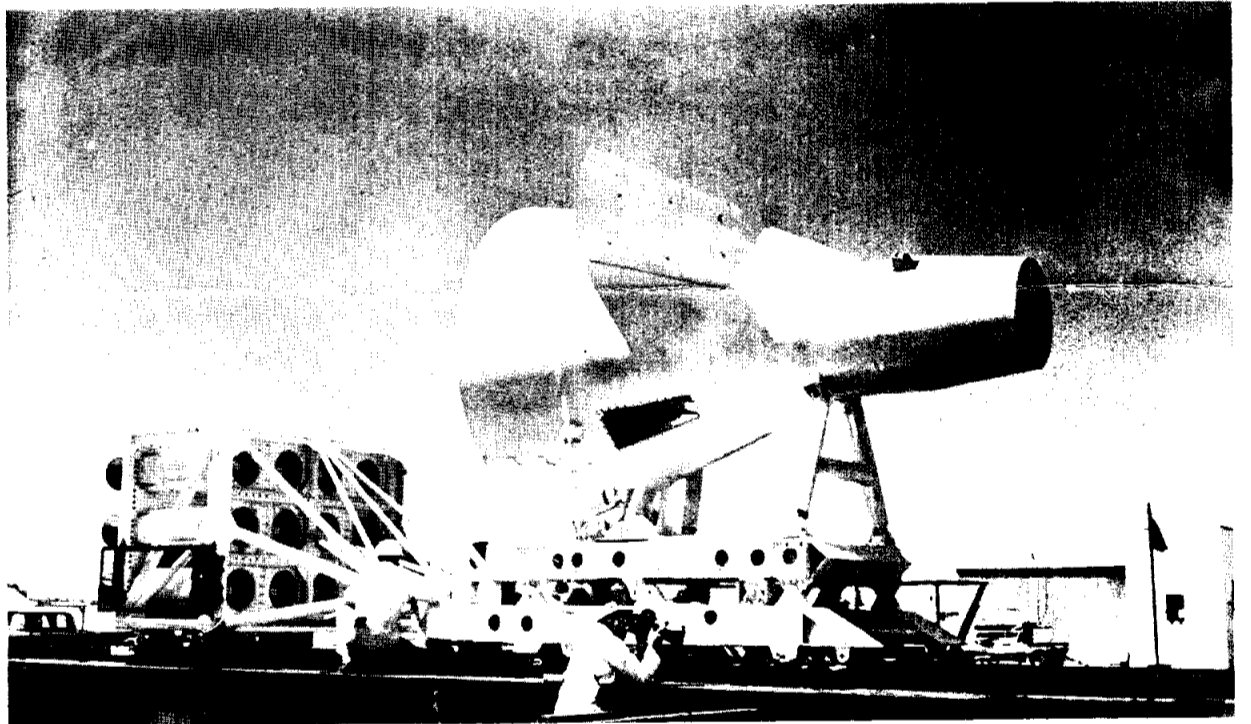
GEMINI EJECTION SEAT



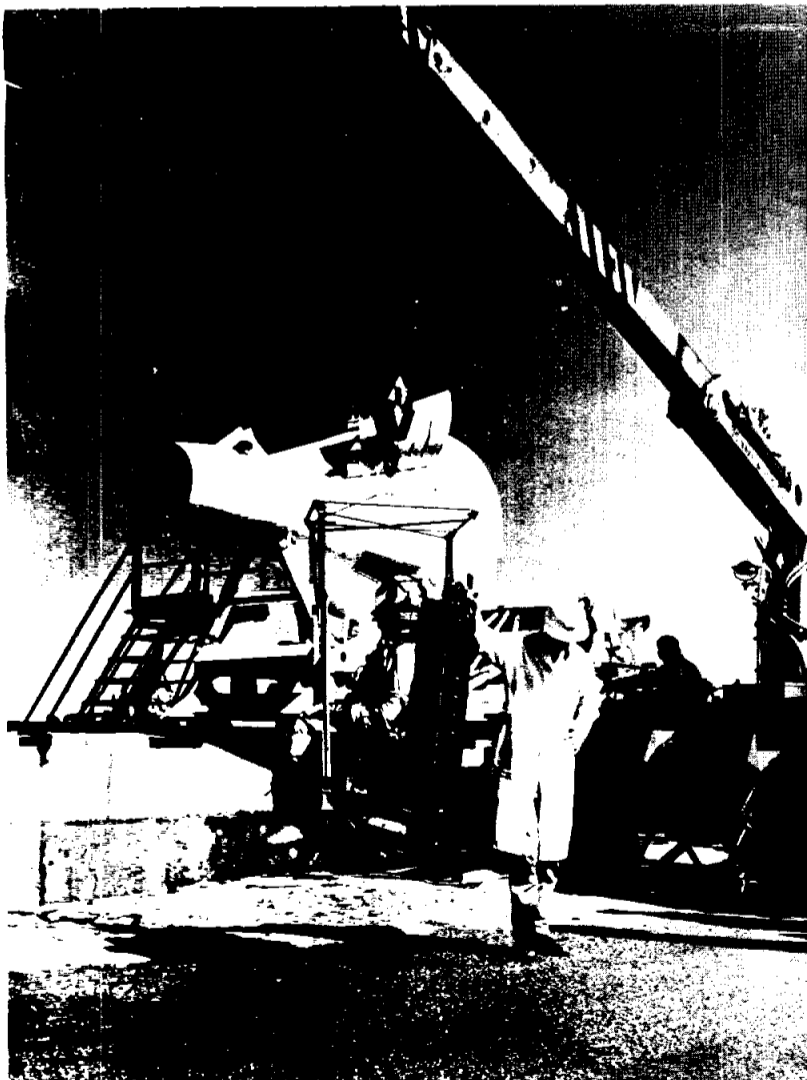
LOADING EJECTION SEAT INTO GEMINI



GETTING READY FOR HIGH SPEED SLED RIDE



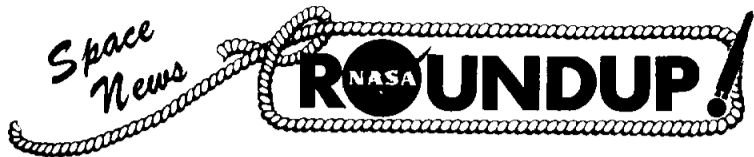
MANIKIN STRAPPED IN SEAT



EJECTED MANIKIN LANDS SAFELY



GEMINI EJECTION SEAT--Tests continue at China Lake, Calif. in the checkout phase of the high-speed ejection in the Gemini program. The seat, which is much like those used in present day high performance aircraft, will be used primarily for emergency escape during launch or recovery phases and will replace the launch escape tower. Manikins are placed in ejection seats and inserted into the mockup Gemini spacecraft mounted on the rocket sled. The ejection tests are made at high speeds from the sled, the parachute opens and the manikin lands safely in the desert.



## SECOND FRONT PAGE

### California Firm Gets Bid For MSC's Centrifuge

The centrifuge for Manned Spacecraft Center's Clear Lake Site came a step closer to reality with an Oakland, Calif. firm offering the apparent low base bid of \$2,421,480.

Submitting the low bid was the Rucker Company, a firm which has built a national reputation for constructing centrifuges.

R. A. Cotter, manager of the systems division of the Rucker firm, said that the company has "built well

over 100 centrifuges and of these 40 were large ones."

The firm's most recent job was at the U. S. School of Aerospace Medicine, Brooks AFB, San Antonio.

"The one to be built here will have a much more sophisticated electronics system and a more powerful motor," Cotter said.

Westinghouse has already been awarded a \$949,000 contract to build the motor for the centrifuge.

Contractors will be asked to bid soon on the Flight Acceleration Facility in which the centrifuge will be located. The facility is expected to be completed by late 1965.

The Rucker Company's bid on the centrifuge was almost \$2 million less than the government estimate of \$4,345,480 for the job.

pointed out the factors that limit the time of transfer in pressurized suit and the means for increasing the allowable transfer time.

Belasco also talked about the techniques of transferring men which differ according to the distance involved. For distances less than 100 feet manual devices such as lines, poles, or tunnels will suffice. For greater distances a powered propulsion system will be necessary.

### In Space Transfer Of Crew Members Poses Problems

The problems of crew transfer from vehicle to vehicle in the weightless environment of space were told to those attending the Space Rendezvous, Rescue, and Recovery Symposium recently at Air Force Flight Test Center, Edwards AFB, Calif.

Norman Belasco, head of advanced technology in the Crew Systems Division of NASA's Manned Spacecraft Center, said that there are two primary problems in transferring men from one space vehicle to another or between compartments of a single vehicle.

He classified the problems as maneuverability, locomotion, and propulsion, and protection and support during the transfer. He

### Hjornevik Speaks To Illinois Bankers On Apollo Program

Speaking on "The Apollo Program", Wesley Hjornevik, Assistant Director for Administration at Manned Spacecraft Center, addressed a group of approximately 300 central Illinois bankers during Bankers Day at Decatur, Ill. recently.

He pointed up the importance of the Apollo program in that it provides the United States with a clearly defined goal; a goal that is a challenge to this nation's strength and technical ability, but feasible and achievable within this decade.

Hjornevik presented the bankers with a resume of the development of the program and explained the various steps to be performed and the hardware that will be required to achieve the goal of putting men on the moon before the end of this decade.



VISITING GENERAL—Gen. Adriel Williams, right, new commander of the Hq. Air Rescue Service, Orlando AFB, Orlando, Fla., meets with Dr. Robert R. Gilruth, director MSC, Walter C. Williams, deputy director and Robert F. Thompson, left, assistant chief for Operational Support. General Williams was here for an orientation and briefing on the upcoming space programs that will involve support from his group.

### Lunar Orbiter Photographic Missions To Screen Areas For 'Soft-Landers'

A project to send a series of five instrumented spacecraft on close-range lunar photographic missions by 1966 was announced recently by the National Aeronautics and Space Administration.

The prime project objective is to secure topographic data regarding the lunar surface. These are necessary for the selection and confirmation of landing sites for Apollo manned lunar landing missions and will greatly extend our scientific understanding of the Moon.

The lunar orbiter will team with the Ranger hard lunar landing spacecraft and the Surveyor soft-lander in blazing the way for the Apollo manned lunar landing mission.

Requests for proposals from aerospace firms capable of prime contractor mission management were issued by NASA's Langley Research Center, Hampton, Va.

The lunar orbiter photographic project will be under the overall direction of NASA's Office of Space Sciences with project management the responsibility of Langley.

Atlas-Agena launch vehicles, capable of placing slightly more than 800 pounds into lunar orbit, will be launched from Cape Canaveral, Fla., with the photo-reconnaissance spacecraft.

The proposal request asks for design of a spacecraft capable of obtaining its pictures from an altitude of not closer than 22 miles above the surface of the Moon. From that range, a camera system capable of making high resolution photographs of the lunar surface will gather the information required. At somewhat higher altitudes, the system will make medium resolution pictures. These pictures can be concentrated in selected areas or may be distributed to sample many separate lunar regions.

According to present plans, medium resolution photographs are needed to make an initial screening of the lunar surface to avoid landing Surveyor soft-landers in areas clearly unsuitable for landing the Apollo Lunar Excursion Module. A segment of the lunar surface about 15,000 square miles in extent is to be covered by the medium resolution pictures.

High resolution pictures will be taken over potential LEM landing areas where Surveyors have been landed to make detailed topographic and surface material studies. As a design target, NASA is asking for a high resolution camera system capable of detecting lunar features about the size of a small sports car. It will be required to identify nearly flat areas 25 feet square—the area

needed for a LEM landing.

The request for proposals states that the pictures acquired by the orbiting spacecraft will be transmitted by a telemetry system for reconstruction by receiving stations on Earth. Tracking and data gathering for the project will be accomplished by the NASA Deep Space Network (DSN) and the Space Flight Operations Facility (SFOF), both operated by the Jet Propulsion Laboratory, Pasadena, Calif.

Tracking data from the orbiter over a period of time will provide information on the shape of the Moon and its mass distribution.

In addition to the five flight spacecraft called for by the request proposals, the contractor selected will be asked to provide at least three additional spacecraft for tests prior to flight.

Industrial firms interested in bidding on the project have until October 4 to file detailed proposals with the Langley Research Center. A NASA Source Evaluation Board will evaluate the proposals from a technical and business management point of view.

### Douglas Study To Determine Needs Of Mars Round-Trip

NASA has signed a contract with Douglas Aircraft Co., to find out what 10 men would need on a successful three-year expedition to Mars, a round-trip of 300 million miles.

The study will include analyses of the most favorable calendar dates for takeoff and landing, the amount of cargo that will be possible and necessary, and the choice of trajectory or route.

### Cooper, Mercury Teammates Honored By AF Association

Astronaut L. Gordon Cooper, flight pioneer Benjamin D. Foulois and the Air Force team that discovered the Soviet missiles in Cuba received top awards of the Air Force Association last week in Washington.

At the honors night program marking the end of the organization's annual convention, Cooper, an Air Force major, received the David C. Schilling trophy for the year's most significant aerospace achievement in the field of flight, for his 22-orbit Mercury mission of last May.

Citations of honor awarded along with that to Foulois, included the following members of the Mercury team: Lt. Col. Charles L. Gandy, Jr., Space Systems Command, Los Angeles, who was checkout officer for the project Mercury At-

las booster; Lt. Col. William K. Douglas, Atlantic Missile Test Center, Patrick AFB, Fla., flight surgeon and personal physician for the Mercury astronauts.

Also receiving citations were Lt. Col. Stanley C. White, Aerospace Medical Division, Brooks AFB, Tex., for service as chief Project Mercury life support systems; Col. John R. Mullady, launch control officer for Project Mercury; and Lt. Col. John A. (Shorty) Powers, who was spokesman for the astronauts during the Mercury program.