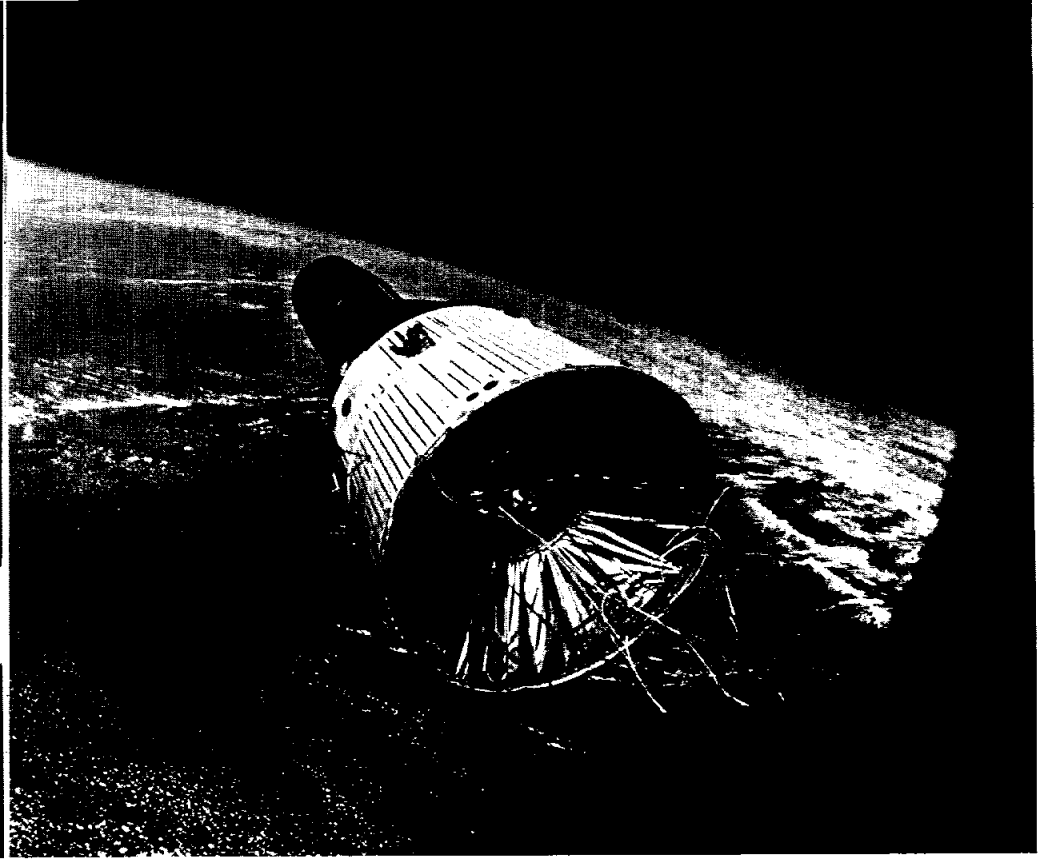


ANOTHER SPACE FIRST— Gemini VII spacecraft, on its eleventh day in earth orbit, was joined by Gemini VI 161 nm above the Western Pacific for the world's first rendezvous of two spacecraft. In the photo at left, the radiometric sensors protruding through apertures in the adapter and the



horizon scanners just forward of the letters "United States" can clearly be seen. At right, the Gemini VII as seen from aft trails strips of the adapter/booster shaped charge separation device behind the gold-colored plastic equipment adapter cover.

Management Roles Assigned For Apollo Applications Work

NASA Headquarters has announced management assignments in the Apollo Applications area among the Manned Space Flight Field Center Organizations.

Exploiting the technology developed for the Apollo manned lunar landing program can greatly increase the capability for man to perform scientific, engineering and technological experiments in space.

Saturn IB vehicles are capable of launching modified Apollo spacecraft into low earth orbital missions for 45 to 90 days. With the Saturn V vehicle, earth-synchronous orbital missions at 22,500 statute miles altitude for up to 45 days, moon orbital missions of 28 days and 14-day moon surface missions can be accomplished.

The basic Apollo launch vehicle-spacecraft configuration has the capability for 14-day earth orbital missions, four to six days in moon orbit, and 24 to 36 hours on the moon.

The effort is being directed by the Saturn/Apollo Applications Program Office, Office of Manned Space Flight, NASA Headquarters. This will include mission planning assignment of missions and experiments, and overall management of the work assigned to the centers.

MSC will be responsible for development and procurement of all standard and modified spacecraft (command, service and lunar excursion modules), astronaut activities, flight operations and integration of experiments in the command and service modules.

NASA's Marshall Space Flight Center, Huntsville, Ala., will be responsible for development and procurement of launch vehicles, integration of experiments into the LEM, Saturn Instrument Units and S-IVB

stages (top stages of both Saturn IB and Saturn V vehicles).

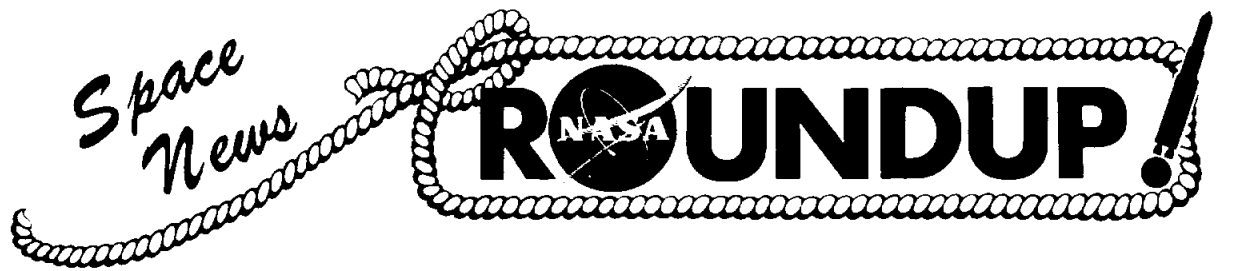
NASA's Kennedy Space Center, Fla., will assemble, check out and launch Apollo applications space vehicles and their associated payloads.

Proposals for possible Apollo applications experiments are expected to be submitted by the world scientific community, industry, other government agencies and from the entire NASA organization. After evaluation of proposals by the appropriate NASA offices and approval by the Manned Space Flight Experiments Board, experiments would be assigned for implementation in the flight program. Apollo Applications experiments would be grouped into compatible mission payloads. Factors considered in grouping include

(Continued on page 2)



JUBILATION— American flags appeared from nowhere atop consoles in Mission Control and smoke from victory cigars drifted toward the ceiling following the first space rendezvous in history. Flight Director Christopher C. Kraft, left, Astronaut L. Gordon Cooper and Center Director Dr. Robert Gilruth are shown at the flight director console celebrating the rendezvous of Gemini VII and VI.



VOL. 5 NO. 5 MANNED SPACECRAFT CENTER, HOUSTON, TEXAS DECEMBER 23, 1965

NOMINAL ALL THE WAY—

First Rendezvous, 14-Day Duration, Climax Successful Gemini VII/VI

A double-header Gemini spaceflight, bringing home to the nation the first space rendezvous and the longest duration flight, ended successfully Saturday with the splashdown of Gemini VII in the West Atlantic prime recovery zone.

Gemini VII splashed down after 330 hours and 35 minutes and 206 revolutions—five hours and 25 minutes short of an even

14 days in space for crewmen Frank Borman and Jim Lovell.

The solitude of their two-week mission was broken for several hours when on December 15-16 they were joined in orbit by Gemini VI in history's first space rendezvous. Following rendezvous, both spacecraft kept station with each other for photography and radiometric measurements. Photos taken in space of Gemini VI by Wally Schirra and Tom Stafford from Gemini VI appear on this page and on page 8. (See pages 4-5 for pictorial spread on the Gemini VII/VI mission.)

Crews of both spacecraft appeared to be in good physical condition following their recovery aboard the USS *Wasp*. The crew of Gemini VI has hoisted aboard the *Wasp* in the spacecraft, while the crew of Gemini VII elected to be taken from the spacecraft by helicopter to the recovery vessel.

Gemini VII retrofire was on the nominal time provided by the Retrofire Officer in Mission Control—7:28 am CST over the Pacific near the Canton Island voice remoting station. All other post-retro events — beginning and end of blackout, drogue deploy, main chute and splash down—occurred within seconds of the times predicted on the ground.

Gemini VII had remained in an almost circular 161 nm orbit since the circularization maneuver made in preparation for rendezvous with Gemini VI.

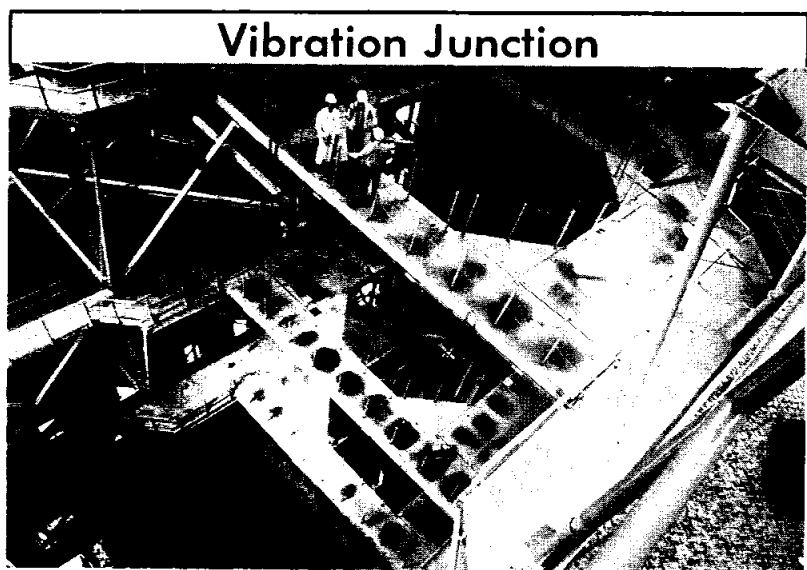
Space history was written December 15 when two of the nation's Gemini spacecraft rendezvoused in orbit over the Southwest Pacific and flew formation for several hours. The dual Gemini VII/VI rendezvous mission included another first—four men in space flight at one time.

Astronauts Wally Schirra and Tom Stafford lifted off aboard Gemini VI from Launch Complex 19 at 7:37 am CST on the morning of the Gemini VII's eleventh day in orbit. Five hours and 55 minutes later, Gemini VI overhauled Gemini VII in its 161-nm circular orbit and closed to within 6 to 10 feet of the spacecraft, close enough to see Gemini VII crewmen Frank Borman and Jim Lovell through the hatch windows.

Accurate Maneuvering

Intercept and rendezvous followed a series of phasing and height adjust maneuvers using Spacecraft VI's OAMS thrusters following insertion at 17,538 mph into an orbit with a perigee of 87 nm and an apogee of 140 nm. During the first stateside

(Continued on Page 2)



KING-SIZE SHAKER—The relative size of the three men standing on an upper level of the Saturn V vibration test stand at Marshall Space Flight Center gives an idea of the immensity of the facility. The first 365-foot three-stage Saturn V will go into the stand early next year for shake tests.

'Twas the Night Before . . .

by Joseph F. Shea

*'Twas the night before launching and all through the Center
Everyone wondered how soon they'd reenter.*

*The spacecraft atop of the Saturn stood bare
In hopes that the last black box spare was soon there.*

*The ASPO's were nested all snug in their beds
Convinced that we finally had beat the Reds.*

*And Max in his kerchief and I in my cap
Had just lengthened stride as we hit the last lap.*

*Next morning at dawn the bird rose with a clatter,
We still were on schedule, trend charts did not matter.*

*The end of the decade had come like a flash;
We'd spent nineteen billion and still had some cash.*

*The moon was the quest on which we spent that dough
Apollo was finally all systems go.*

*To the eyes of the world the launch came through clear,
We never start missions in any rain, dear.*

*The Saturn 1C boosted lively and quick,
The tower and cover came off nice and slick.*

*Second stage, third stage and when orbit came,
We whistled and shouted and called them by name.*

*Now CM, Now SM, please don't need no fixin
On LEM, On S-1VB, old engine keep mixin.*

*From the Center in Houston we sent out the call
The systems are working, so dash away y'all.*

*They took leave of earth orbit, in a hurry to fly,
Through the great lunar obstacle course in the sky.*

*Docking was easy, on course they now flew
With a bay full of space and experiments too.*

*The sextant from twinkling stars got the proof
The instrument unit had worked without goof.*

*After three days the spacecraft was going around
The moon in an orbit oer the sight we were bound.*

*The hatches were opened and two guys crawled through,
To find the LEM systems were working like new.*

*The LEM moved away, there was no turning back,
The guidance computer confirmed the right track.*

*The engine worked well, the bell glowed like a cherry,
The touchdown was gentle, the crew shook, not very.*

*The systems checked out, for a day we are go,
But the surface looks soft like new driven snow.*

*They opened the hatch with their hearts in their teeth,
And found the dust thin with good hard rock beneath.*

*It was a broad place in a round little valley,
That looked like a great place for spacecraft to rally.*

*Each experiment carried on LEM's lower shelf,
Had to be set up to run by itself.*

*That done, in the moon's g one leaped over his head,
Got tired, complained that the LEM had no bed.*

*They spoke not a word as they did the hard work,
Packing up moon rocks for some scientist's quirk.*

*With cargo aboard, the front hatch they did close,
When the CM's in sight, the ascent stage rose.*

*Rendezvous done, the SM proved a good missile,
As back home they flew, their beards by now bristle.*

*And I heard them exclaim as they finished the flight,
We never were worried, ASPO did the job right.*

Successful Gemini VII/VI

(Continued from Page 1)

pass, a posigrade height adjust maneuver of 14 fps raised apogee by some seven miles.

At two hours, 18 minutes a 60.8 posigrade phasing maneuver was made, and 24 minutes later a slight wedge-angle plane difference between the two spacecraft orbits was taken out by a 31.7 fps out-of-plane burn to the south.

"Boy, that's a bunch," commented Gemini VI Command Pilot Schirra when he blipped the OAMS for a "tweaking" height adjust maneuver of only .8 fps during the second stateside pass.

A posigrade maneuver of 42.5 fps at three hours, 47 minutes placed Gemini VI in a co-elliptical orbit 15 miles beneath the orbit of Gemini VII.

Terminal phase initiation maneuver was made at about a 33 nm trailing distance along the line of sight toward Spacecraft VII. Lock-on by the Gemini VI rendezvous radar to Gemini VII's L-Band transponder had occurred when the trailing distance was some 248 nm.

The accuracy with which the Gemini VI crew made the rendezvous maneuvers passed up to them by flight controllers in Mission Control Center-Houston was apparent from the lack of "residuals," or feet-per-second left to burn, displayed on the spacecraft incremental velocity indicator following each thruster burn.

Overcame Adversity

At a post-launch press conference at Kennedy Space Center, Gemini Program Office Manager Charles Mathews made the following statement:

"It seems to me that the activities over the last two months merely typify the spirit of American people in general—it's the stick-to-itiveness and stubbornness that overcomes adversity. Flexibility where people generate new plans to accomplish the same things when their initial plans don't work out and it's so nice to see with this type of evidence a team that was as dedicated and worked so hard.

"People get the feeling after a few successful operations, that this is everyday activity and easy to do. I'm here to tell you that these things aren't easy to do. The folks work night and day to

overcome these problems and get these vehicles ready to launch. They work night and day, but at the same time, they're in a position of extra care which results in these very nominal types of operations once we lift these birds off.

"I'm very thankful for the Gemini team. I fully expect in our other work as it comes along in Apollo that there will be problems, but it seems to me that we'll have the same type of group gathered around and they'll be working just as hard and making continued progress."

Stay Aboard Spacecraft

From liftoff to splash, Gemini VI flight duration was 25 hours 51 minutes 43 seconds. Retrofire occurred near Canton Island in the Pacific prior to spacecraft daylight at 8:53 am CST for a target point in the West Atlantic Recovery Zone at 23°36' N by 67°50' W. Splash at 9:29 am CST, after normal reentry, drogue and main chute sequence, was 2 nm downrange beyond and 12 nm to the right of the target point.

Within an hour—at 1032 am CST—Gemini VI with the crew aboard was hoisted aboard the prime recovery vessel USS *Wasp*. Schirra and Stafford egressed two minutes later and walked down a Navy red-carpet reception line of Atlantic Fleet officials and NASA medical and recovery specialists before being cloistered in the *Wasp's* sick bay for post-flight medical exams.

Eighth Day Attempt

An attempt to launch Gemini VI on the morning of the eighth day of Gemini VII's elapsed time, December 12, was unsuccessful because of engine shutdown at 1.17 seconds after ignition.

The spacecraft and launch vehicle countdown had gone without a hitch, including a built-in 25-minute hold at T-3 minutes as an allowance for delays in the count and to phase Gemini VI insertion with Gemini VII's pass over the Cape. Gemini VII would have been 1015 nm downrange at Gemini VI insertion. Rendezvous of the two spacecraft was nominally to have been at 5 hours 40 minutes Gemini VI elapsed time in the fourth revolution between the island of Borneo and the Philippine Islands.

Engine shutdown of the Gemini VI launch vehicle was explained at a scrub press conference at Kennedy Space Center by Maj. Gen. Ben I. Funk, commander, Air Force Space Systems Division, who said, "The launch of Gemini VI was scrubbed due to the engines receiving a command to shut down from the malfunction detection system. A pull-away disconnect malfunction gave a premature liftoff signal prior to programmer start, and since this was not a normal sequence, the malfunction detection system operated normally and shut down the engines. Engine start and shutdown were both normal. In effect, you might say that we had a flight readiness firing. There's no history of this type of shutdown before."

Adding to the General's comments, G. Merritt Preston, KSC Deputy Director for Launch Operations, said, "There was nothing wrong with the flight hardware. When the plug dropped, this was a sensor which gave a false indication and caused the shutdown. If Gemini VI had lifted off, I'm confident that we would have had a successful flight. The plug is a sort of shorting plug which allows current to flow to a relay. When the plug is pulled, the relay closes and starts the programmer in the bird. During the last three minutes we check all the critical circuits to make sure they are working; if they are not, they shut the engine down. This is a part of the malfunction detection system, and it was only the detecting system that failed—not the actual programmer."

After pad crews had safed the launch vehicle, the erector was raised and the Gemini VI crew egressed and returned to the crew ready area at Pad 16. Work immediately began on readying the Gemini Launch Vehicle for a second launch attempt—fuel and oxidizer tank purging, installation of new pre-valves on the second stage, and checkout of the first stage engines and associated systems.

A second condition that would have caused engine shutdown prior to liftoff bolts being blown was discovered the day following the launch attempt. A plastic dust over had been inadvertently left in an oxidizer inlet port on the first-stage gas generator which partially restricted oxidizer flow to the generator. The gas generator was cleaned, reassembled and installed on the launch vehicle the same night.

Changes Announced In Health Benefits

Minor benefit changes will be made in many of the health benefit plans, and some will increase their premium rates for the contract term which begins in January 1966. To inform you of the changes, if any, in your plan, the Civil Service Commission has prepared pamphlet BRI 41-117, entitled *Information About Plan Changes Effective January 1966*, which is being distributed. Check the information in the pamphlet regarding your plan to see if it has any changes, and, if so, in what respect. Keep the BRI 41-117 with your brochure.

If the rates of your plan are being increased, the effective date for the increased deductions from your salary will be January 2, 1966. Rate increases are needed in some plans primarily because of increasing costs of medical care and higher utilization of medical services by employees and their family members.

The next open season for changing enrollment has not been scheduled. It will be announced and held before February 15, 1968.

Apollo Applications

(Continued from Page 1)

power, volume, weight, shape, environmental control, spacecraft modifications, installation and accessibility requirements, operation of the equipment and crew time to accomplish the experiment. Typically, experiments would be grouped for astronomy missions, life science missions, physical science missions, space operations and technology missions, or lunar missions.

Plans are underway that would permit beginning Apollo Applications missions as soon as the Saturn IB vehicles and spacecraft are no longer needed for the Project Apollo lunar landing program.

A Key to Responsibility



KEY TO THE KINGDOM—A symbol of having "arrived" in the business world is owning a key to the executive washroom; in the flight operations world, it's owning a key to the Flight Director's console in Mission Control Center. Blue Team Flight Director John Hodge, left, passes an oversize symbolic flight director key to Red Team Flight Director Christopher C. Kraft at an MSC shift change during the Gemini VII/VI mission.

One-of-a-kind Docking Target May Be Built for Gemini VIII

An alternate rendezvous and docking target vehicle will be developed for the Gemini VIII mission, should modification and revalidation of the Agena vehicle not be completed in time for the scheduled launching of that flight in the second quarter of 1966.

Designated the Augmented Target Docking Adapter (ATDA), it will be available as a backup for other Gemini missions if it is not used on Gemini VIII. Unlike the Agena, it will have no propulsion for maneuvering in space.

Dr. George E. Mueller, Associate Administrator for Manned Space Flight and Acting Director, Gemini Program, said he is confident the Agena will be

modified and flight qualified in time to support the Gemini VIII through Gemini XII rendezvous and docking missions.

"The ATDA development is a modest contingency measure not a change in the program," he said.

The ATDA will be made up of existing qualified Gemini hardware and launched by a standard Atlas launch vehicle. Only one will be built. Equipment to be used in the ATDA is:

1. Agena Nose Shroud
2. Target Docking Adapter
3. Gemini Reentry Control Section (RCS)
4. Gemini Orbital Attitude and Maneuvering Electronics
5. Gemini Digital Command System
6. Gemini electrical system components
7. Agena/Atlas Adapter

The only new equipment to be developed is shell structure to house the components. The ATDA will weigh about 2400 pounds at launch and about 1700 pounds in orbit.

The ATDA would be launched directly into a 185-mile circular orbit. It will be equipped with an automatic rate stabilization system. Thrusters in the RCS will be used to control its attitude.

The ATDA will be built by the McDonnell Aircraft Corp. under a supplemental agreement to the Gemini contract. General Dynamics, Convair Div. and Space Systems Division, USAF, will serve as integration contractors. Guidance and reference trajectories will be furnished by Thompson-Ramo Woolridge. Total costs are expected to be less than \$1 million.

Agena engine testing is continuing at Bell Aerosystems Co., Niagara Falls, N. Y., and facilities at the Arnold Engineering Development Center, (AEDC), Tullahoma, Tenn. are being readied rapidly for complete engine revalidation under simulated high altitude conditions.

It is expected that the Agena engine will be delivered to AEDC late this month.

Clear Lake Jaycees Plant Live Fir Tree At Center Entrance

A Christmas tree lighting ceremony was conducted by the Clear Lake Junior Chamber of Commerce at MSC Sunday, December 19.

The tree is a 24-foot live fir tree which the Clear Lake Jaycees planted in early December near the entrance to the Center.

Taking part in the lighting ceremony was the Clear Creek School a capella choir and brass section directed by John Kreuse. Also present was Astronaut Edward H. White II and other representatives from MSC. White lighted the tree, assisted by George Gonzales from the Houston County Boys Home and Buddy Williams from the Boy's Harbor in LaPorte.

Special guests for the ceremonies included boys from the two homes above. The tree lighting ceremony was open to the public.

Bill Clifford, president of the Jaycee Chapter, took part in the ceremonies along with other Jaycee members.

NASA, Brazil Approve Sounding Rocket Pact

A cooperative Brazilian-United States sounding rocket project to obtain meteorological information will go forward under an agreement signed Nov. 15, 1965.

The project provides for cooperation in obtaining wind, temperature and other meteorological information between 40 and 100 kilometers by rocket soundings using the acoustic grenade technique. The experiments will be conducted from the Brazilian launch range at Natal.

The agreement, in the form of a memorandum of understanding, has been signed by representatives of the *Comissao Nacional de Atividades Espaciais* (CNAE) of Brazil and NASA. The agreement is the third to be concluded between CNAE and NASA during 1965.

Under the agreement, CNAE will prepare the launch range, assemble and launch the sounding rocket vehicles and assist in the conduct of the experiments. NASA will provide up to 12 Nike-Cajun vehicles with payloads, make available on loan a tracking and sound-ranging system and train CNAE personnel in data acquisition and in the operation and maintenance of the equipment on loan.

There is to be no exchange of funds. All scientific results of the experiments will be made available to the world scientific community.

Women Cagers Meet

The MSC Women's Basketball League will meet at 5 pm in the Cafeteria December 29 to form teams and plan a schedule for play to begin January 7.

All women employees interested in participating should plan to attend. Charlotte Maltese, Ext. 2365, has additional details.

Space Medicine Pioneer Killed In Aircraft Crash

Dr. W. Randolph Lovelace II, Director of Medicine for the NASA Office of Manned Space Flight, was killed December 12 when his twin-engine aircraft failed to clear a mountain peak of Independence Pass, south of Aspen, Colo.

With Dr. Lovelace in the aircraft was his wife, Mary, and the pilot Milton Brown. Both were also killed.

Dr. Lovelace had been Director of Medicine since 1964, but recently has submitted his resignation because of the press of other work in the aerospace medicine field.

He was president of the Lovelace Foundation in Albuquerque which he helped found in 1947. Lovelace had formerly been chief of surgery at Mayo Clinic and has served in the Air Force during World War II, receiving the Distinguished Flying Cross and the Legion of Merit.

MSC Director Dr. Robert Gilruth, commenting on Dr. Lovelace's death, said, "One of the very first things I did when



A PLACE IN THE SUN—Test subject Robert Piljay stands under the direct solar radiation simulation rays in the Space Environment Simulation Laboratory's December 10 manned test of vacuum Chamber B. The chamber was pumped down to an equivalent altitude of 300,000 feet and thermal extremes were simulated during the test.

Manned Tests of Chamber B Include Temperature Extremes

The first man-rating test for the 35-foot diameter vacuum

chamber at MSC's Space Environment Simulation Laboratory was conducted successfully December 10 as test crewman Bob Piljay spent approximately 11 minutes at an altitude of 300,000 feet.

Piljay entered the chamber at 3:15 pm CST, and after a check-out of the environmental system which supplied him with oxygen, he walked to the center of the chamber and into the full glare of the solar radiation lamps.

Chamber B is one of two chambers in Building 32 which will be used for test and check-out of space equipment in vacuum and extreme high and low temperature conditions encountered in space. Chamber A, 120 feet tall, 65 feet in diameter, is undergoing acceptance testing now.

The main objective of the man-rating test was a demonstration of the vacuum and thermal systems of the chamber with a suited man in the loop.

The walls of the chamber were cooled with liquid nitrogen to simulate the heat-sink of space, and reached temperatures approximately -270°F . The solar lamps produced heating in $+270^{\circ}\text{F}$ region.

Test director for the test was James H. Chappee of the Space Environment Simulation Laboratory, and medical monitoring was by Dr. W. R. Hawkins of the Center Medical Office.

organizing the Mercury Project back in 1958 was to ask Randy Lovelace to come work with us. He has been of tremendous help all through the Mercury, Gemini and Apollo programs, and it is with very, very great regret that we get this news that he has lost his life. He has made many contributions to both the space program and to other aircraft programs."

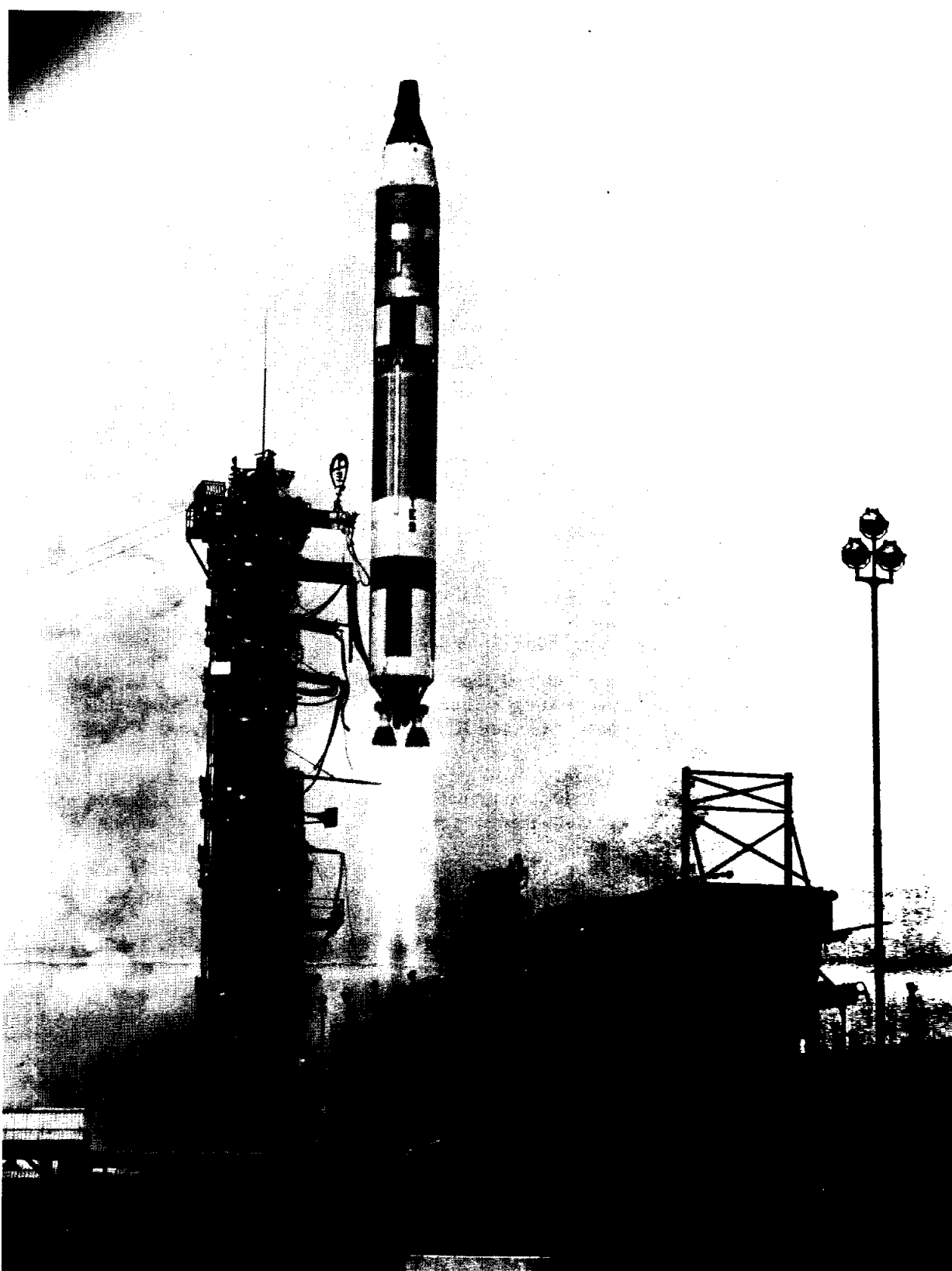
Dr. Charles A. Berry, MSC Chief of Medical Programs, said, "He has been an idol of mine ever since I got into the space program, into aerospace medicine. He's been tied to almost every great event that has ever happened in aerospace medicine, and I am sure that he would have felt a very great part, and a deep personal feeling on what was going on in this particular flight, this combination of flights today. (Gemini VII/VI) And I think we are all going to miss him."

The Lovelaces are survived by three daughters, Mrs. Christine Sellman, Sharon Lovelace and Jacqueline Lovelace.

Gemini VII/VI Mission As Seen From The Ground



OVER THE SILL—The camera takes a wide-eyed look at the pre-ingress activities in the White Room at Launch Complex 19 as Frank Borman and Jim Lovell, wearing lightweight pressure suits, prepare to board Gemini VII for a record-breaking 14 days in space.



LIFTOFF INTO HISTORY—From the time Gemini VI lifted off Pad 19 at 1:30 pm CST December 4 until splashdown 330 hours and 35 minutes later at 8:05 am CST December 18, spaceflight records were broken and the first space rendezvous was accomplished.



WATCHING DADDY LEAVE FOR WORK—Frank Borman's two sons, Frederick and Edwin, and Mrs. Borman watch the launch of Gemini VII through binoculars.



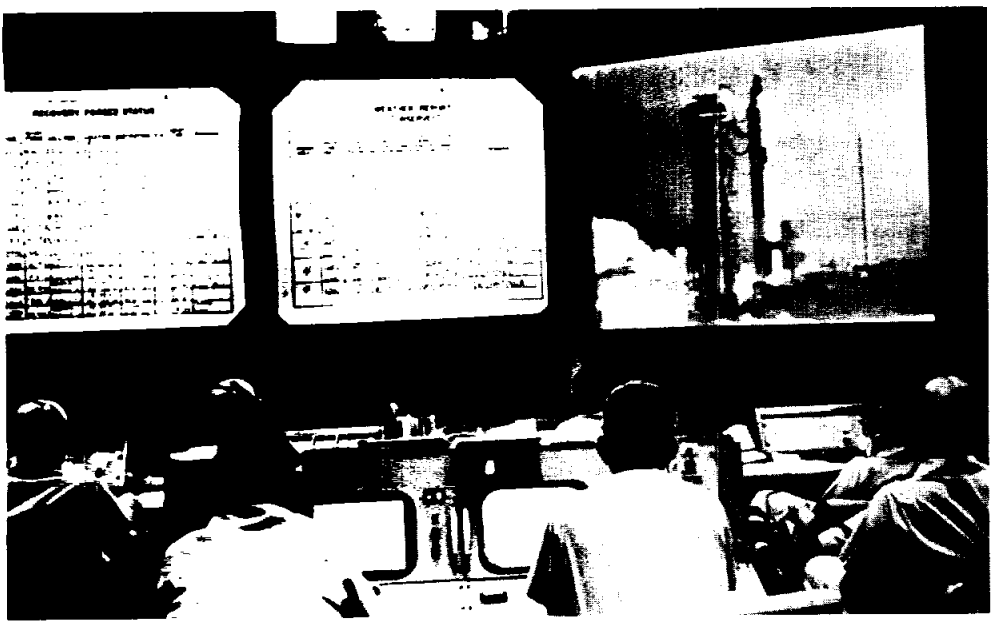
SCORCH CHECK—Damage to Launch Complex 19 from the Gemini VII launch was minimal, and the Gemini VI launch vehicle was erected atop the same structure early the following morning.

ALL SYSTEMS GO—Flight controllers in Mission Control-Houston stand by to take ground control of the Gemini VII mission at the time of liftoff. Three teams of flight controllers monitored spacecraft systems status and crew condition throughout both Gemini missions.

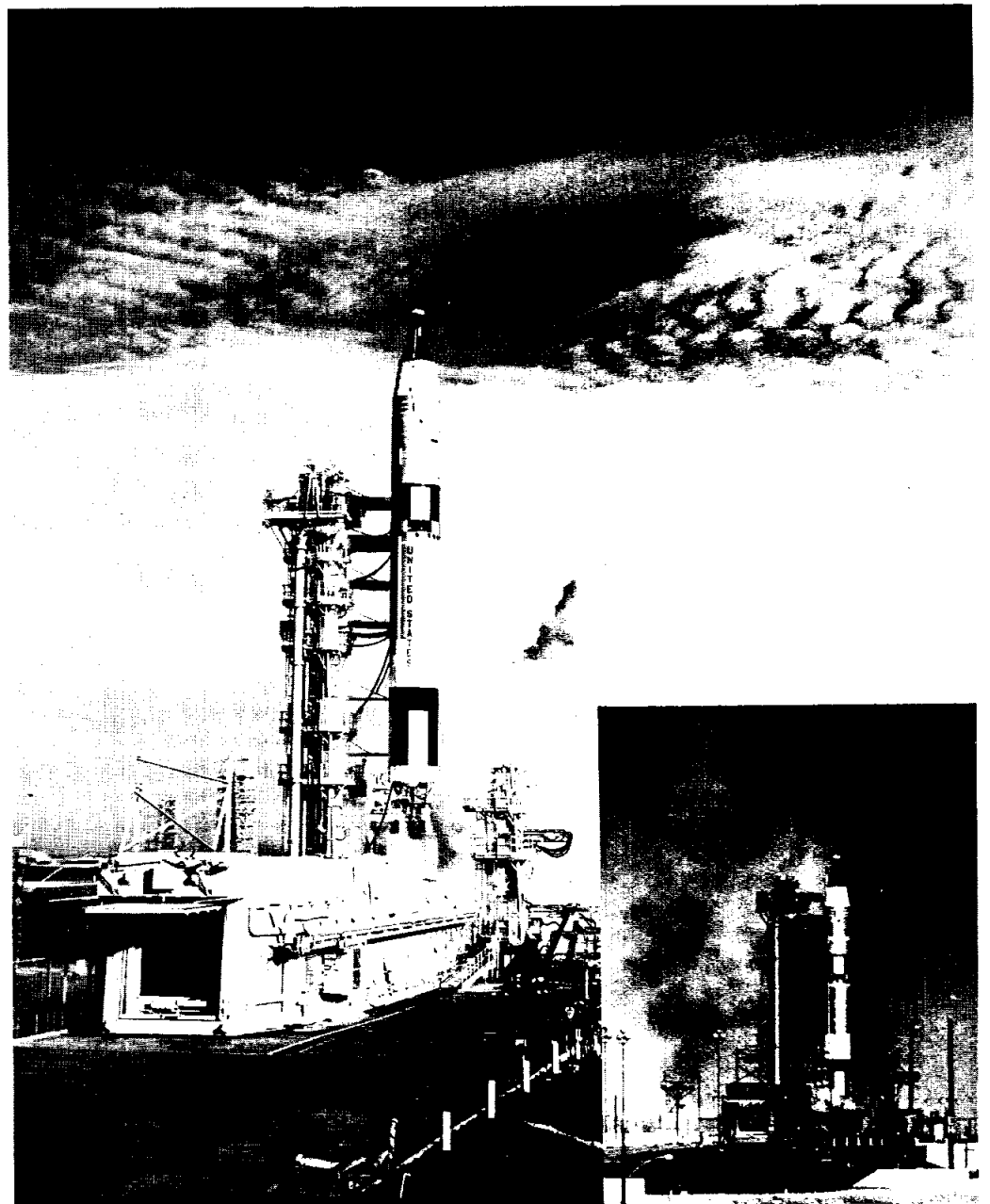


BON VOYAGE—Wally Schirra and Tom Stafford mount the ramp leading to the Pad 19 elevator and to their successful launch of December 15. Inset shows a dejected Gemini VI crew walking back down the same ramp December 12 following a launch attempt in which engine shutdown occurred at 1.17 seconds after ignition.

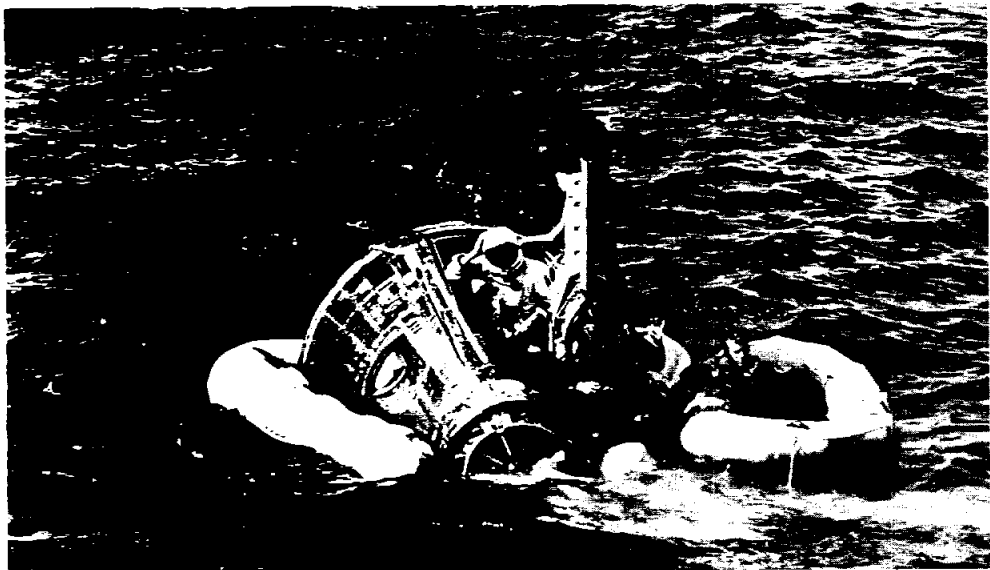
PRELUDE TO LAUNCH—Gemini VI crewmen Schirra and Stafford prepare to cross the hatch sills of their spacecraft in the white room of Launch Complex 19.



RECOVERY WATCH—NASA and Department of Defense recovery coordinators in the Recovery Control Room at Mission Control Center-Houston focus their attention toward a projected TV image of the Gemini VI launch.



IF FIRST NOT SUCCEED . . .—Gemini VI lifts off into a mackerel sky after a perfect no-holds countdown. Inset shows the Gemini VI still standing on the pad following engine shutdown in the December 12 launch attempt.



PERFECT ENDING—Weather and sea conditions in the West Atlantic Recovery Zone could not have been better for the Gemini VI recovery. Here, Wally Schirra stands up in the cockpit after Navy swimmers completed attaching the Gemini floatation collar. Schirra and Stafford stayed aboard the spacecraft until it had been hoisted onto one of the Wasp's aircraft elevators.

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Director Dr. Robert R. Gilruth
 Public Affairs Officer Paul Haney
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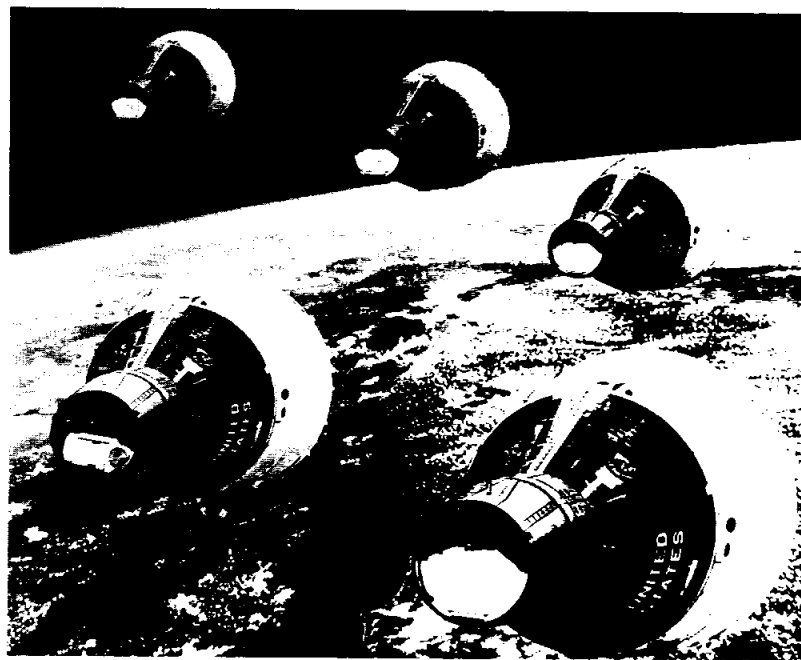
SPACE QUOTES

GEMINI VII POST-RECOVERY PRESS CONFERENCE, MSC, December 18, 1965.

Dr. Robert Gilruth: "I'd like to start by saying it has been a fabulous year for manned space flight and then I would like to say quickly that the status of the men on the carrier, Borman and Lovell is great, and Dr. Berry will give you more particulars on that. As you know, it was a perfect reentry and Mr. Kraft will give you particulars on that as well as the particulars on the whole operation here. I would just like to say that everyone did a fabulous job and I would like to single out one group that hasn't been mentioned much that we depend on greatly that did their usual fabulous job, and that is Goddard, and Chris will give you more on that too. You all realize that this year, since March we have put 10 men into orbit and brought them back. And we have accomplished the major part of the Gemini space objectives at this point in the program. The long duration, which was a major objective, some of us didn't really think that you could go 8 or 14 days in that spacecraft and we have just seen it done and we have seen the men return in good shape with all their tasks done, all the tasks that they could possibly do on the flight. We have seen EVA this year in Gemini, and we have seen rendezvous. We have seen controlled reentry demonstrated, the controlled reentry technique that is so important to Apollo, and we have seen accomplished a whole raft of scientific experiments. I am just tremendously proud of the accomplishment of this total American Team."

Charles W. Mathews: "I'm very proud of the participants in this program. As you know, the one aspect that occurred in October resulted in an extremely fine recovery of the program. We actually, in a 6-weeks period, launched GT-7 and then after some additional difficulty, launched GT-6 in time to make, what I feel was pretty much a story-book flight. Again, I want to emphasize that these operations are not easy, even when they go well, they are difficult and everyone involved has to do their utmost in order to assure that the vehicles are developed, and that they are prepared, and then controlled in flight to do this kind of job. Again I want to single out the launch team down at the Cape, both the booster and the spacecraft launch teams, that did such a marvelous job in the preparation activities for this rather enormous mission. This is the first time, of course, that we have had two spacecraft in the air together, and this was the first time that 4 men have been up into space at the same time. I think that the Flight Operations themselves have really shown that they've come of age; that the manner in which we do react to the few problems that do occur shows a working together, a team work operation that I've not seen anyplace at anytime. The business of the controlled re-entry, of course this is something that we have been working on all through

On The Lighter Side



I'm all for short turn-around time on the pad, but this is ridiculous!

Out Of Texas' Past . . .

(EDITOR'S NOTE: To acquaint MSC employees with the rich historical background of the Galveston Bay area, and of Texas in general, a series of historical articles prepared by the Historical and Library Services Branch will appear in the Roundup.)

"The only history worth reading," wrote John Ruskin, "is that written at the time of which it treats, the history of what was done and seen, heard out of the mouths of the men who did and saw."

Lacking space to debate that premise, *Out of Texas' Past* will concede it and suggest further that history is contained not alone in archives, but as well in the folklore of a nation or a region, in its legends, hearsays, anecdotes, tall tales, vocabularies, colloquialisms and speech habits.

For example, if an inquisitive present-day historian were doing spadework for a history of Houston, he might wonder why all the fireplugs in the city are painted orange and black, and not red, as the MSC fireplugs are.

If he persevered in his researches he might learn that this is because a now-departed water commissioner named James H. B. House was a graduate of Princeton University. How long the city may perpetuate this unique tribute to the late Mr. House's alma mater is, of course, a question for some future historian. Perhaps for some future Pavlov.

In an age of sedulous conformity, it is still possible to observe other ways in which Houston and Houstonians cultivate social habits that set them somewhat apart from most if not all other urban cultures. In Houston, for instance, many oldtime residents:

1. Still speak of the city's wards, calling them by number, although they no longer exist.

2. Cling to the belief that Buffalo Bayou was named for a four-legged animal, when actually it was named for a fish.

3. Signal right turns by forming the letter C with the left arm and jabbing the air above the car roof with a right-pointing forefinger.

4. Consider it unmanly to carry an umbrella.

5. Stripe plateglass windows with gummed paper tape during hurricane alerts.

6. Order half-cups of coffee.

7. Burn leaves in street gutters.

8. Drop the H sound in Humble meaning a town or an oil company, but retain it in humble meaning unproud.

9. Pronounce bayou "BY-oh," instead of "by-YOU," as Louisianans do.

10. Pronounce the word mayor "mare."

11. Say "whisky" instead of "cheese" when being photographed.

Intrigued by the Ruskin thesis in the light of MSC's profound cultural impact on the Galvez Bay area, *Out of Texas' Past* has assigned ourself the opera of compiling two aids for present and future historians:

1. A dictionary of spaces. This is not to be a formal lexicon of technological terms like NASA's new "Dictionary of Technical Terms for Aerospace." It will be an informal catalog of assorted figures of speech, slang, colloquialisms, lingo, jargon, neologisms and peculiar usages of familiar words as employed in the space industry.

Examples: Lase, mode, deboost, interface (both noun and verb), grand tour, suboptimize, lurain, klunge (or is it kluge?), glitch (or is it glitsch?).

2. The second opus would be an anthology of authentic narratives of incidents in and related to the space program, each conscientiously labeled as to whether it is factual, fact-based or purely imaginative. Examples:

Factual: What the range safety director was heard to exclaim just before he pushed the destruct button.

Fact-based: What the pilot really said at the point in the communications transcript where the long ellipsis occurs.

Imaginative: The popular one about the kosmonautka marooned on Luna.

Needless to say, any and all contributions will be gratefully received. Just send to *Out of Texas' Past*, AP-6, MSC, Houston. Confidences meticulously respected.



Space News Of Five Years Ago

Dec. 23, 1960 — Goddard Space Flight Center scientists Robert Jastrow and Robert Bryant reported that atmospheric drag acting on ECHO I during the severe solar storm of November 12, was increased by about a factor of two. Scientists had previously noted the rise and fall of the density of the upper atmosphere, and the heating effect of a solar flare had been noted on the orbit of SPUTNIK III in 1959.

Dec. 27, 1960—EXPLORER VIII ceased transmitting ionospheric measurement data acquired in 20,866,706 miles and 694.3 orbits, which produced more than 700 miles of magnetic tape since launch on November 3.

Dec. 29, 1960 — Dr. T. Keith Glennan offered his resignation as Administrator of NASA, to be effective January 20, 1961.

1960 — NASA launching record for the year: 22 major space flight attempts, over two-third of which were fully successful.

Jan. 3, 1961—The Space Task Group, charged by NASA to conduct Project Mercury and other manned space flight programs, officially became a separate NASA field element directly under NASA Headquarters. Prior to this time, the Space Task Group was organized under the Goddard Space Flight Center and was administratively supported by the Langley Research Center. As of this date, the personnel strength of Space Task Group was 667.

Jan. 4, 1961—Ablation model test with electric arc attained 4,000°F for 105 seconds at Langley Research Center, one of a series of tests begun in September 1960.

the program; and now we have demonstrated it twice and this is so very important for the future missions where the re-entries occur over much longer ranges. I feel that everyone that participated in the endeavor can take just pride. I feel that we'll be looking forward to the future flights. I do also want to point out that, with the combination of these flights, practically all of the major objectives of the program have already been achieved."

Christopher C. Kraft: "The first thing I'd like to say is that I'm proud to be an American today; and I'm sure all of you are, also. The crew performance today and all through the 14 days has certainly been terrific, both on the part of the 7 and 6 crew. I don't think many people appreciate the fact that without the Manned Spaceflight Network, we would be completely unable to do our job; that the communications that those people supply; the data gathering, the reduction of the data at remote sites; the performance of the remote communications, I'm sure many times you heard us going through the stations at Kano and Tananarive and that in itself is a miraculous job, to be able to talk to the space-

craft while it is over Africa as if it were over top of the Mission Control Center here in Houston. Those are jobs which are really fabulous; I don't think those people ever get enough credit for the tremendous job that they do, providing the data for us to do our job with. The performance of both of the spacecraft in this flight has been superb; I've used that word before, but it is the absolute truth. In particular, I'd like to single out the performance of the fuel cells on Spacecraft 7. It was just a real pleasure to have worked with those cells. They got us all the power and the support we needed to keep those men up there for as long as we did. Certainly the performance of the systems on Spacecraft 6, the radar and the computer and its platform, and the way in which the men used them, was just fabulous. The Control Center here at Houston, in its programming, the way it gave us information to be able to see a spacecraft appear over Carnarvon, Australia and 50 seconds later to read out digital information that comes directly down from the radio signals of that spacecraft on a TV tube here at Houston is also in my opinion, a miracle."

Santa's Helpers



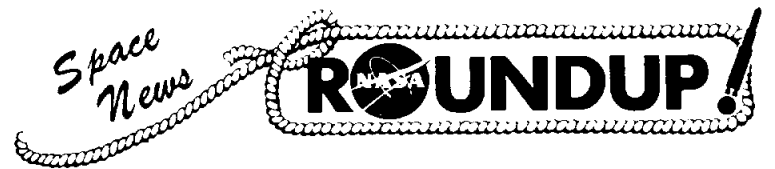
THE LINE UP—The Astronettes put some zing into the December 10 MSC Christmas Party at Sylvan Beach pavilion with their dance routines. Left to right, are Sandra Burdsall, Karla Garnuch, Suellen Johnson, Gayle Porter, Sharon Brennan, Pat McBride, Helen Gregory and Charlotte Maltese.

MSC Artists Open Small-scale Louvre

Creativity turned loose by MSC employees in their leisure time is tangibly displayed in the Employee Activities Association sponsored MSC Winter Art Exhibit in the west corridor of the Building 1 Auditorium.

Exhibited through January 3, the entries include art pieces in oil, mosaic, watercolor, charcoal, gauche, tempera monochrome and other media.

The exhibit is open weekdays for employees from 8:30 am to 5 pm, and for the public each Sunday from 1 pm to 5 pm.



MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

EMPLOYEE NEWS

1965-66 MSC/Ellington AFB Basketball League

All games played at the Ellington AFB Gymnasium

American Division		National Division	
Team No.	Name	Team No.	Name
1.	747th Rams	10.	Air Nat'l Guard
2.	Guidance and Control	11.	Tech Svcs Div
3.	Coast Guard	12.	AV Corp
4.	MPAD-Gunners	13.	G.E.
5.	Grasshoppers	14.	FCD
6.	FSD	15.	Phileo
7.	ASPO	16.	Univac
8.	2103rd Comm Sqdn	17.	Prop & Power Div
9.	ASTD-Lone Stars	18.	IBM

Schedule for January 3-6

	Jan. 3	Jan. 4	Jan. 5	Jan. 6
6:30 p.m.	1 vs 4	6 vs 8	2 vs 3	5 vs 9
8:00 p.m.	13 vs 10	17 vs 15	11 vs 12	18 vs 14

Scores through December 16 (Team No./score)

Dec. 6: 4/67, 8/45; 12/60, 14/44.	Dec. 13: 17/39, 16/58; 6 vs 7 postponed.
Dec. 7: 5/61, 7/38; 18/94, 16/37.	Dec. 14: 10/39, 14/50; 4/70, 9/59.
Dec. 8: 3/37, 9/56; 10/47, 15/63.	Dec. 15: 18/65, 15/51; 5/59, 8/52.
Dec. 9: 2/40, 1/69; 11/12, 13/78.	Dec. 16: 13 vs 12 postponed; 1/53, 3/91.

Team standings

Team	American Division		National Division	
	Won	Lost	Team	Won Lost
3, 4, 5	3	0	18	3 0
1	1	1	12	2 0
9	1	2	13	1 0
2, 6	0	1	14, 16	2 1
7	0	2	15	1 2
8	0	3	11, 17	0 2
			10	0 3

MSC BOWLING ROUNDUP

MIMOSA MEN'S LEAGUE

Standings as of December 16

TEAM	WON	LOST
Chizzlers	10	2
Alley Oops	9	3
Green Giants	8 1/2	3 1/2
Road Runners	7	5
Whirlwinds	6	6
Foul Five	6	6
Technics	5 1/2	6 1/2
Agitators	5	7
Fabricators	2	10
Goobers	1	11

High Game: B. Graham 273, G. Amason 266.

High Series: G. Amason 701, B. Harris 701.

High Team Game: Whirlwinds 1108, Alley Oops 1105.

High Team Series: Chizzlers 3138, Alley Oops 3085.

MSC 5 O'CLOCK MONDAY MIXED LEAGUE

Standings as of December 13

TEAM	WON	LOST
Pacesetters	26	18
McH's	25	19
Bombers	24	20
Pot Shots	22	22
Hi-Hopes	18	26
Thirids	17	27

High Game Women: T. Bordeaux 193, B. Henderson 192.

High Game Men: E. R. Walker 229, H. Erickson 220.

High Series Women: D. Ride-nour 506, T. Bordeaux 478.

High Series Men: H. Erickson 592, E. R. Walker. 583.

Club Proposed For Unattached

Plans are afoot to establish—or perhaps more properly, re-establish—the Singleton Club for unmarried type MSC employees, provided enough interest in such a group is shown.

Activities that have been suggested for the Club include a get-acquainted party, an old-fashioned winter hayride and a summer party.

Interested singletons call Ar-minta Yanez, Ext. 7771. Married types need not apply.

Bumper-Riding Drivers Cause of 13% of All Auto Smashups

(Part of a continuing series on driving, home and job safety by the MSC Safety Office.)

Tailgating is fast becoming one of the nastiest words in a driver's vocabulary—and for good reason. It is predicted that over 6500 people will lose their lives in accidents involving tailgating. National Safety Council figures indicate that tailgating causes 13 per cent of all smashups.

What is this thing—tailgating—that is causing so much havoc on our highways? Tailgating is the practice of not leaving enough room between yourself and the car in front of you to stop or avoid hitting him in case of an emergency.

Many people, without realizing it endanger their own and their passengers' lives needlessly by engaging in this practice. A following-distance guide to use for city driving is a car length for each 10 miles per hour of speed. An average car length is 17 feet, about 1 1/2 to the city block.

On the freeway, one length for 10 miles per hour is not enough and the National Safety Council is currently recommending at least two and one-half car lengths for each ten miles per hour at expressway speeds in good weather, double this figure for bad weather. The reasoning behind this is that at 50 miles per hour, four times the stopping distance is needed than at 25 miles per hour. Above 50 miles per hour, the stopping distance increases proportionally. Even the newer cars don't stop on a dime.

Research conducted by a major oil company indicates that the average stopping distance at 65 miles per hour, of 52 makes and models, is 182 feet after the brakes have been applied. These vehicles were mechanically perfect, the road conditions were excellent and the weather fine.

Actually, you can't stop this fast on the highways, your reaction time—3/4 of a second if you are average—will allow you to travel 142 feet at 65 miles per hour. This is the time before you perceive and react to trouble ahead and begin to stop.

Most of today's automobiles have automatic transmissions with wide brake pedals. This is conducive to using your left foot for braking. Tests have proven that a trained person can save three-tenths of a second by using his left foot. This practice should be used very judiciously, though, since many cars still have manual transmissions. Should you be driving one of these and after practicing left foot braking, during an emergency stop you could automatically hit the clutch, anticipating the vehicle to stop. Hence, your reaction time could be extended until you are too late to stop and are involved in a smashup.

Like most other problems, tailgating is a two-ended stick: there are those who do the tailgating and those who are tailgated. Both of these people are asking for trouble.

To prevent being tailgated, keep moving at the speed of the traffic. This speed should be attained as quickly and safely as

possible. When anyone behind you is forced to slow down quickly or change lanes, you may start a chain reaction accident. Hesitation and uncertainty on the highway is an invitation to a tailgating disaster.

Once you have entered traffic and committed yourself, blend with the traffic by driving the same speed as traffic is moving and keep it flowing. When all cars move on a road at the same speed, safely spaced, no one is likely to get hurt. The difference in speeds of two vehicles is far more dangerous than the actual speed that they are traveling with regard to tailgating.

With today's overcrowded streets, traffic normally flows bumper to bumper and when a person attempts to keep recommended distances, one eager-beaver after another will shoe-horn into the space forcing a slow down. If you are safety minded, the natural tendency will be to slow and keep your distance. To do so, you are creating more danger than you are avoiding.

One national casualty company recommends forgetting the following distance rules until better traffic control devices or methods solve this problem and to keep yourself alive by increasing your driving alertness and always leaving yourself an out.

Driving alertness has many facets, your eyesight, reactions and co-ordination are just a few. You should have your eyes checked frequently for both far and near-sightedness; buy and wear, if required, any prescribed

glasses when you drive. Not being able to see where you are going is certainly asking for trouble.

Your reactions and co-ordination are quickly affected by both medications and alcohol. If you are taking any medication that makes you drowsy or sluggish, don't drive. Research has proven that very little alcohol is necessary to impair your driving. Also, if you are taking medication and drink—the combination of the two can team up to really

put you out of business.

Whenever you drive, always keep alert as possible. Keep your eyes moving and look for places to land if you are forced off the road. You should be ready always to swerve right or left as required to miss something on or beside the road. A car can be pulled out of the ditch and washed much easier than it can be sent into the body shop to iron out the wrinkles put there by an accident.

Activity Kingpins



NEW EAA PANEL—Outgoing and holdover MSC Employee Activities Association officers line up for recognition at the MSC Christmas Party. Hold-over officers, left to right, are Dave Mullins, vice-president athletics; Joyce Lowe, vice-president youth activities; Bill Creasy, vice-president facilities, and Phil Hamburger, president. Continuing to right, outgoing officers are Mary Sylvia, vice-president center socials; Mervin Hughes, vice-president clubs; Phoncille DeVore, vice-president publicity; Rex Bauerlein, executive vice president, and (not shown) Rita Sommer, secretary.

No Room in the Inn

WALKING SLOWLY AHEAD of the small donkey he led, the tall bearded man in the rough-woven garment of a carpenter knew that he must soon find lodging for the approaching night. For the slight woman seated on the donkey was nearing her time for childbirth, and the bleak hills surrounding the caravan trail were not a suitable place for a child to be born.

Darkness had begun to creep down the ravines to the edges of the trail as the travelers saw the lamps and fires of a small village in the distance. Man and donkey quickened their pace at the prospect of rest and shelter for the oncoming night.

Other travelers and traders had taken all the rooms in the single small inn of the village. As the carpenter turned doubtfully to seek other lodgings in the small village, the innkeeper noticed that the woman appeared weary from the long journey, and that the hour of birth was near. He called to the carpenter and told him that

he might stay in the inn's stable, bedded down among the animals of the guests.

Such was the beginning almost 2000 years ago of the life of a man whose influence upon mankind has continued to grow. The proud kings and the humble shepherds knew when they saw the infant lying in the rude stable that this was the Man whose coming had been prophesied.

Today, Christians all over the earth observe the birth of Christ each year at the time most nearly reckoned, through the many changes in calendar systems, to be His approximate birth date.

Most of these observances of Christ's birth have retained the significance of a holy day as begun by the early Church. But unfortunately, there has been some drift away from the original concept of Christmas. We now worry about whether So-and-so will like our gift, or whether our bills on January 1 can be covered by our bank account.

Beginning often as early as August, we are reminded that there are so-many shopping days until Christmas, that such-and-such appliance would make the family

happiest on Christmas, or that the "real Christmas spirit" may be found in a fifth of Colonel Shaw's Bourbon. Quite often in typographic economy Christmas becomes "Xmas."

The overemphasis of commercialism during the Christmas season has the unfortunate effect of causing many persons to dread Christmas instead of looking forward to it as a time for being with friends and family, and for pausing to consider the real significance of the day. A superficial veneer of carnival-like materialism has clouded the true purpose and meaning of Christmas.

To his credit, the average American in spite of commercialism is able to appreciate the spiritual values of Christmas while still following the folk-customs of our culture—the Christmas tree, Santa Claus, children's stockings hung up and other attendant fixtures of the season.

One should remind himself that Christmas is not the birthday of Santa Claus, nor is it for the anticipation of expensive gifts, but an observance of the birth of Jesus Christ.

'A FABULOUS MISSION'—

Which Is Most Complex, Man Or Guidance System?

The satisfactions of the completely successful Gemini VII/VI missions brought on some good-natured repartee between two principals at the post-recovery press conference.

Gemini Spacecraft Program Office Manager Charles W. Mathews had commented to newsmen at the Gemini News Center that "the guidance and control system aboard this spacecraft is perhaps the most complex system we have on-board the spacecraft—a very important tool in the rendezvous operation as well as this controlled reentry."

Center Medical Programs Chief Dr. Charles A. Berry laughingly took issue with Mathews' statement. Said Berry, "I'd like to disagree a little bit with Chuck here. He said the most complex system aboard that spacecraft was the guidance and control, and I don't agree

with that. I think there were two other people on there who are pretty complex systems, as man always is. And, I think that that guidance and control system, combined with those men has given us a fabulous mission."

Dr. Berry, in commenting on the apparent physical condition of the Gemini VII crew, said, "I don't think I have any words that could really express the feelings that I have today about this particular mission—the tremendous feeling that there is of, first, relief, and the feeling that we really do have two men back having spent 14 days in that spacecraft and in good condition. And they really look, at the present time, to be in very good condition, even beyond what we could have hoped."

"I think we all had—our group in particular—had some very high hopes for this. I think they've been proving, to this point in time, to be very true."

Sink the Army



ORBITAL FOOTBALL PLUG—Gemini VI pilot Tom Stafford got in his licks early for the 1966 Army-Navy football game when he held a card saying "Beat Army" up to the window for the Gemini VII crew to see during the VII/VI rendezvous.

Gemini VIII, Agena Hardware Tests Continue On Schedule

Preparations for the launch of Gemini VIII, scheduled for the first quarter of 1966, are proceeding on schedule at various NASA and contractor facilities.

Gemini Spacecraft VIII this week was in early stages of acceptance review at McDonnell Aircraft Corp., St. Louis. Shipment of the spacecraft and Gemini Launch Vehicle VIII to Kennedy Space Center is expected to take place the first week in January.

Modifications to the Agena rendezvous vehicle primary propulsion system, made after the October 25 failure of the Gemini VI Agena to orbit, will be tested in February in the vacuum chamber at the USAF Arnold Engineering Development Center, Tullahoma, Tenn. Starts, shutdowns and restarts of a test article Agena primary pro-

pulsion system will be run at simulated altitudes up to 300,000 feet.

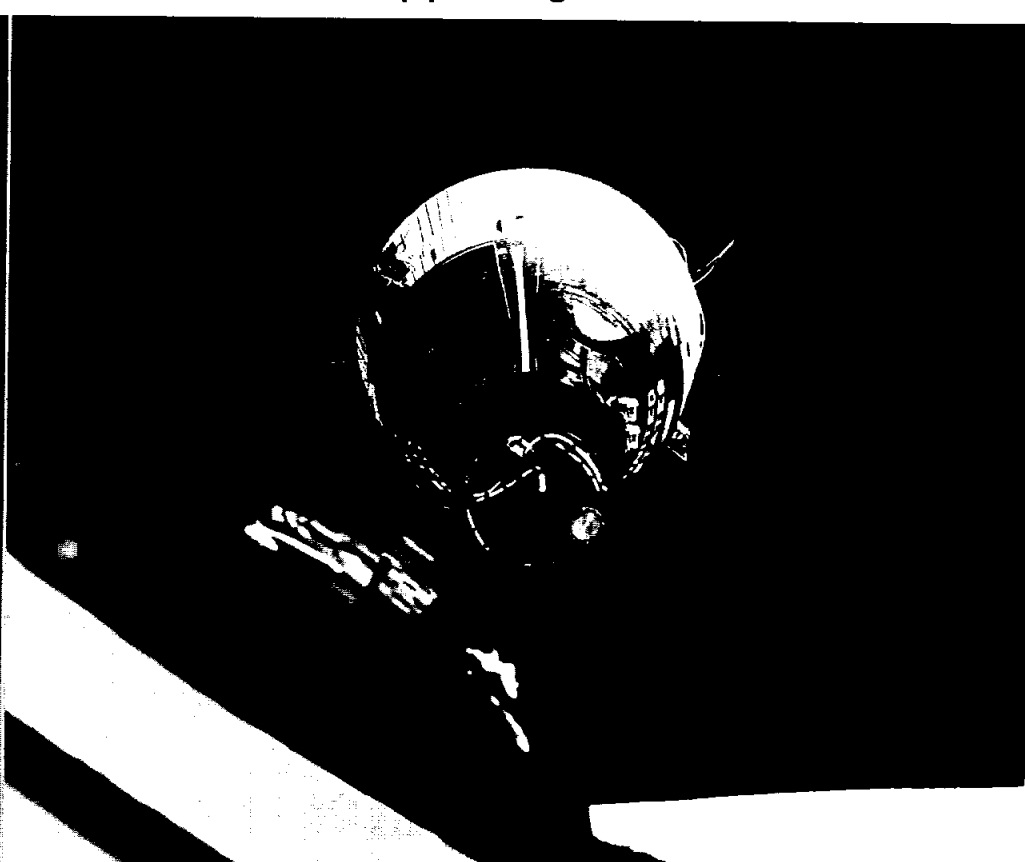
A second test of the Gemini VIII Extravehicular Gemini Mobility Unit (EGMU) was run this week in the Crew Systems Division 20-foot vacuum chamber in Building 7. Test subject Vernon Dugan used the EGMU back pack for a 90-minute run in a vacuum exceeding 110,000 feet equivalent altitude and with chamber walls chilled to -300° F. EGMU oxygen supply was fed to Dugan at high rate.

Also tested was the Gemini VIII hand-held maneuvering unit, which was fired for a total of 40 five-second bursts. Gemini VIII prime pilot David Scott will use the unit during his full orbit of EVA during the two-day rendezvous mission.

What Rendezvous Looks Like Up Where It's Happening



PORTRAIT OF A SPACEFLIGHT—Gemini VII poses for a profile portrait, left, while Wally Schirra and Tom Stafford in Gemini VI make an out-of-plane fly-around. Exceptionally sharp detail becomes even more sharp in the contrasty undiffused light of space. At right, Frank Borman and Jim Lovell fly nose-to-nose with Gemini VI while still and motion pictures are



made by both crews. In the motion pictures, the oscillations of the horizon scanner mirrors were quite visible. The circle on the lower right quadrant of Gemini VII's Rendezvous and Recovery Section is the L-Band transponder antenna used for interrogation by Gemini VI's radar.