

Space News ROUNDUP!

More Astronauts To Be Picked Soon

Civilian Pilots Are Eligible Says Webb

Plans for selection of a second group of from five to 10 astronauts will be announced within the next few weeks, NASA Administrator James E. Webb said last week.

Anyone with the right qualifications and experience, including a number of hours logged in jet aircraft, can apply for the astronaut jobs. This would include civilians as well as members of the military. Webb said, however, that he doubted any women would qualify.

Age limit for the new astronauts will probably be somewhat lower this time; Webb has indicated that 35 might be the top limit. Astronaut John H. Glenn, Jr., oldest of the present group of seven, is 40.

All of the present group are military men with test pilot experience.

Webb said the second group of astronauts also must be persons with extensive flying experience in jet aircraft, preferably in experimental test work. Although women have not been officially excluded from applying, Webb said he did not believe there were many women with the required test-flight experience.

"I do not think that we will be anxious to put a woman or any other person of particular race or creed into orbit just for the purpose of putting them there," he said.

Interviewed last Wednesday night on television, Astronaut Glen was asked, "We hear a number of women want to get into the program. What have you to say to this?"

Grinning, Glenn replied, "Yeah, how about that?" and added, "I doubt very much if the women test pilots we know have sufficient time logged in jet aircraft."

The administrator said he expects the U. S. will get a man to the moon at the same time or earlier than the Russians. But even if the American gets there second, he said, the U. S. effort will have been "well worth while in results gained" from space exploration.

Another point made in the announcement was that Cape Canaveral will be kept as a permanent launching site for space shots. While there are difficulties with the Florida location, Webb said, other potential sites present even greater problems.



How To Get Away From It All — Civilians May Apply For New Astronaut Team

NASA Requests Proposals For Preliminary Nova Design

NASA last week requested proposals from industry for a detailed systems definition and preliminary design of the Nova launch vehicle. The Nova is the vehicle that may be used for a direct earth-to-moon flight in Project Apollo if the presently contemplated rendezvous-in-space method is discarded. Nova's first flight is expected in the 1966-67 period.

Fifteen firms were invited to submit proposals to NASA's Marshall Space Flight Center by April 26. The contract will be awarded in May, according to present plans.

Nova is the largest rocket presently planned by NASA, eight times as big as the Saturn rocket and capable of placing more than 200 tons in earth orbit or sending more than 75 tons on an earth-escape trajectory. Nova will thus be able to perform manned lunar landings with the Apollo spacecraft in direct flights from earth.

Two companies will be chosen for a parallel, coordinated approach to the problem. During the six-month period of the contract, selected firms will hold joint meetings with NASA so that a final, unified Nova plan will be developed. The fifteen companies are asked to make a cost-sharing proposal stating to what extent each is prepared to fund the study. NASA will commit about \$700,000 to each of the firms selected.

Proposals have been requested from Aerojet General Corp., Bell Aircraft Co., Boeing Co., Chrysler

Corp., Douglas Aircraft Co., Ford Motor Co., General Dynamics/Astronautics, Grumman Aircraft Engineering Co., Ling-Temco-Vaught, Inc., Lockheed Aircraft Corp., Martin Marietta Corp., McDonnell Aircraft Corp., North American Aviation, Inc., Northrop Corp., and Republic Aviation Corp.

Requests for bids are being offered to firms having a capability of participating in follow-on hardware development.

Conceptual studies to date indicate Nova will be 45 to 50 feet in diameter and will stand about 500 feet high without the Apollo spacecraft. The Nova first stage will develop about 12 million pounds thrust using F-1 oxygen-kerosene engines. Minimum lift-off weight of the vehicle will be about 5,000 tons.

The Nova second stage will use multiple M-1 engines—a 1.2 million pound thrust liquid hydrogen-liquid oxygen engine for which a contractor was recently selected.

The third stage will probably be powered by a J-2 engine.

The two contractors will be

Fifteen Hundred Will Attend MA-6 Results Conference

Some 1500 representatives of foreign embassies, universities and colleges, industrial organizations, Congress, space science boards and the President's Scientific Advisory Committee will hear a presentation team from NASA deliver MSC's "Report on Results of the First Manned Orbital Space Flight" in Washington, D. C. Friday.

The all-day session will be held in the Departmental Auditorium beginning at 9:30 a.m. and will include oral condensations of 13 papers and four appendices, copies of which will be given out at the conference.

General chairman for the session is Dr. Hugh L. Dryden, deputy administrator of NASA, who will

deliver introductory remarks. The opening statement will be given by D. Brainerd Holmes, NASA's director of manned space flight.

The morning session will be devoted to a summary of the Mercury Program. Flight operations chief Chris Kraft and other members of his staff will present a paper on operational requirements and plans. Others included are "Spacecraft and Spacecraft Systems," Kenneth S. Kleinknecht, W. M. Bland; "Life Support System and Biochemical Instrumentation," Dr. S. C. White; "Launch Vehicle System," G. Merritt Preston, B. Porter Brown; and "Spacecraft Preparation and Checkout," G. Merritt Preston and J. J. Williams. A fifteen minute discussion period will follow.

The afternoon session begins at 1 p.m. and is devoted to the flight results.

"Flight Control and Flight Plan" will be presented by C. C. Kraft; "Recovery" by R. F. Thompson; "Preflight Preparation and Results of Postflight Medical Examinations," by Dr. W. K. Douglas; "Physiological Responses of the

SPACE NEWS ROUNDUP MOVES TO HOUSTON
This issue of Space News Roundup, Number 12, is the last to be printed at Hampton, Va., by Dudley Printers. After the mailing is completed, the staff will "silently steal away" to Houston, Tex., and all subsequent issues will be printed there. Until further notice the mailing address will be: Space News Roundup, Public Affairs Office, Farnsworth Chambers Building, Manned Spacecraft Center, Houston 1, Tex.

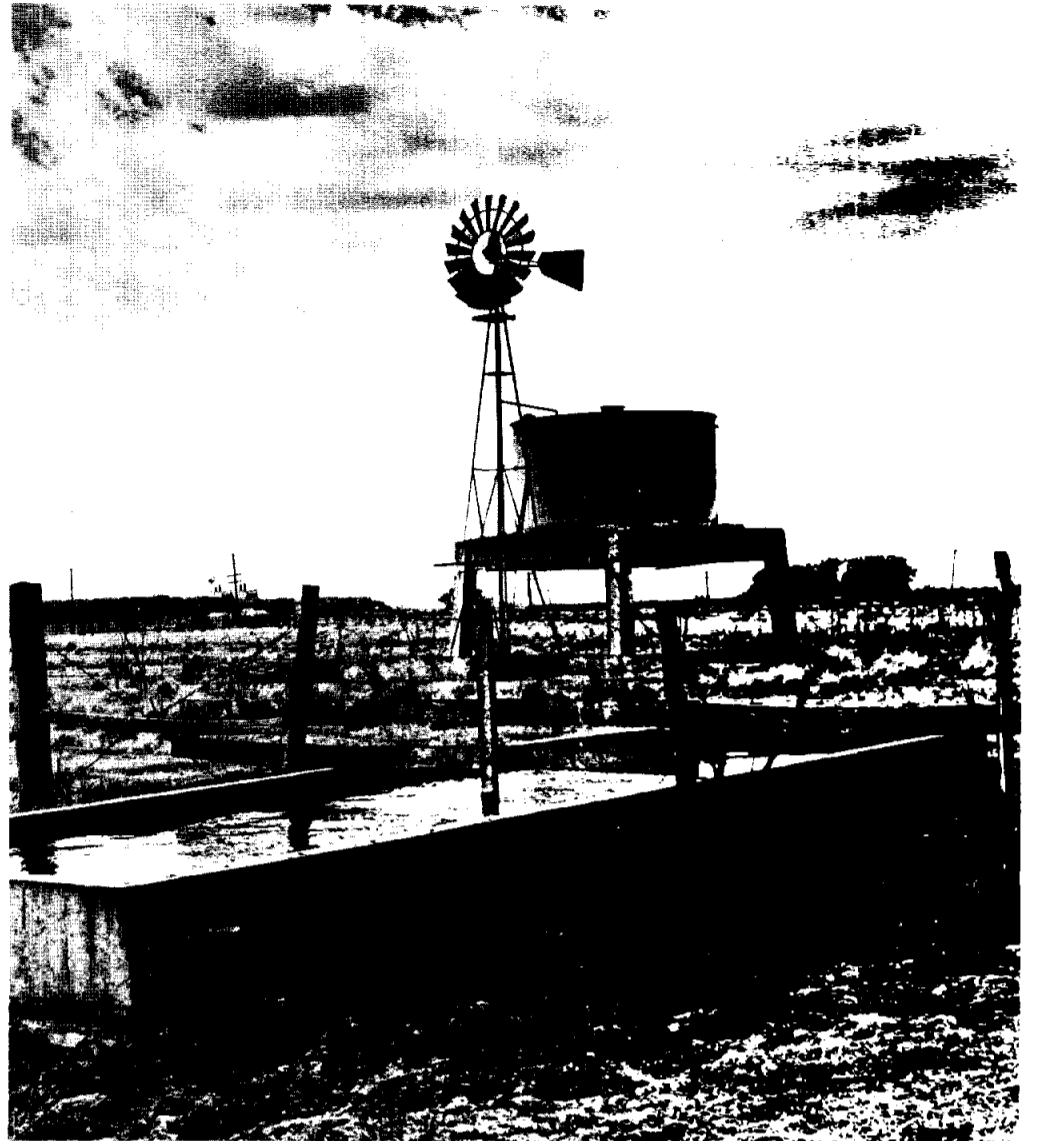
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NOW ...



AN ABANDONED SHACK, its door inviting an errant wind to the emptiness inside, sheds shabby patches of corrugated tin onto the surrounding weeds and dreams of better days, when an old ear will give way to a new.



A LONELY WINDMILL squeaks plaintively above this watering trough where cattle no longer come to drink, and the unruffled water reflects nothing but the hot sunset of a Texas day. These structures stand now on the new MSC site at Clear Lake.

... AND LATER



THIS IS THE FUTURE, expressed in the long, low lines of the Auditorium-Display Building, to be built at Clear Lake by Brown and Root, Inc. of Houston, with Charles Luckman Associates, Los Angeles, as master planners and associated architects Brooks and Barr, Harin C. Moore, MacKie and Kamrath and Wirtz, Calhoun, Tungate and Jackson.



ARCHITECT'S CONCEPTION OF THE 11 to 14-story Project Management Building for NASA's Manned Spacecraft Center shows a glass-and-steel honeycomb facade, and low foundations is front of the building, monument to an age when man looks up for his future instead of out across the flat landscape.

Gemini Flights May Begin Next Year

(Continued from page 3)

will be replaced with a "Rogallo Wing," an inflatable and steerable device with a wing-spread of about 45 feet, which looks like a bat's wing. Astronauts will control the landing of this vehicle, using a runner skid and two outriggers for stability. The landing will be horizontal and similar to that of the X-15 aircraft. Extensive testing of this wing is well underway.

Other innovations to be used in the Gemini spacecraft will include docking equipment to aid the astronauts to dock on the target, the use of fuel cells powered by hydrogen and oxygen to supply electrical power for the systems, and translational rocket engines for terminal and docking phases.

The Gemini craft is scheduled to be launched by a modified Titan II launch vehicle, constructed by the Martin-Marietta Corporation. Titan II was selected because of simplified operation and greater thrust. It contains storable hypergolic propellants, permitting much shorter countdown than presently needed in the Mercury-Atlas program. Shorter countdowns are necessary because of the close schedule which must be followed in order to successfully complete the rendezvous mission. Titan II was first launched January 16 and was successful in every way.

The rendezvous target for the Gemini craft will be the Agena, similar to vehicles used in Ranger and Discoverer projects, and made by Lockheed Aircraft Corporation. The Agena will be launched into earth orbit by an Atlas launch vehicle.

Ground tracking stations will determine the optimum launch time for the Gemini craft, about a day after Agena has been put into orbit. Launch timing and mid-course corrections will place the manned spacecraft in close proximity to the Agena.

The Gemini craft will orbit between 87 and 150 nautical miles up. There should be launchings about every 60 to 90 days after tests start.

A new pressure suit development program is underway in connection with Gemini. One version has removable arms and legs for astronaut comfort and exercise within spacecraft. Later in the program, it is possible that the crew will perform exercises outside the craft while in orbit, but this will require the development of an "extra-vehicular" suit.

Preliminary cost estimates for the Gemini Program including about a dozen spacecraft, Atlas-Agena and Titan II vehicles, run approximately \$500 million.

For post-Gemini, work has been underway for the past two years in the Apollo Program. A small team of Manned Spacecraft Center engineers was set up at that time to define the project mission and to develop working guidelines for its conduct. All of the NASA Research and Space Flight Centers and resources, as well as industrial teams, have been brought into the program to assure a solid technical base.

Axel T. Mattson Gets New Post

(Continued from page 8)

ferences.

In February 1957, Mattson was appointed a member of a scientific group to make a special study and technical evaluation for the research and development of a United Kingdom aircraft for the Mutual Weapons Development Program. In March 1958 he presented a series of lectures in support of European activities of the North Atlantic Treaty Organization's Advisory Group for Aeronautical Research and Development (AGARD) at the Training Center for Experimental Aerodynamics in Brussels, Belgium. Both assignments were at the request of the Department of Defense.

Mattson is an Associate Fellow of the Institute of the Aerospace Sciences and past chairman of the Hampton Roads Section of the IAS. He recently received a Distinguished Service Award for his IAS activities while he was section chairman. At the 1960 annual meeting of the IAS in New York City, he was elected for a two-year term to the IAS Council representing the Eastern Region.

Mattson is a member of the Vestry and Sunday School Superintendent of Grace Episcopal Church, Yorktown, Virginia. He is a member of Williamsburg Country Club, Hampton Elks Club, Hampton Roads Power Squadron, and Langley Rod and Gun Club.

He is married to the former Ann Merfeld of Cascade, Iowa. They have three children—Linda, John, and Susan—and reside at Hornsbyville, Virginia.



A TRIO OF ASTRONAUTS faced the public last Wednesday for a televised press conference in Houston. The conference came after the announcement that plans for choosing five to 10 more astronauts will be forthcoming in the near future. Astronaut John Glenn (center) told newsmen he "doubts very much" if there are any women test pilots with sufficient experience to be included. At left is Astronaut Virgil I. "Gus" Grissom, and at right, Astronaut Donald K. "Deke" Slayton.

Liquid-Hydrogen Fueled 'Centaur' Is Ready For Firing At Cape Canaveral Friday

The long-delayed maiden flight of the Centaur rocket, a high-energy vehicle assigned a major role in the U. S. space program, is scheduled for Friday.

The flight has been held up nearly a year primarily because of problems in developing an upper-stage propulsion system employing liquid hydrogen.

A modified Atlas with 567,000 pounds of thrust is the Centaur first stage. The upper stage has two liquid hydrogen engines with

total thrust of 30,000 pounds. This combination is capable of putting 8,500-pound payloads in earth orbit, sending 2,500 pounds to the moon or 1,500 pounds to the vicinity of Mars or Venus.

Centaur is expected to fill a gap between Agena B and the huge Saturn class boosters now under development. It also serves as a test for liquid hydrogen, which also will be used to power upper stages of Saturn and the later Nova rocket.

The initial Centaur flight is designed to last only 15 minutes with the rocket reaching an altitude of 300 miles and falling in the Atlantic 1,175 miles away. No payload will be carried.

Scientists are most interested in how the hydrogen behaves in weightlessness.

The vehicle will be heavily and uniquely instrumented, to provide maximum information on the performance of both stages and the behavior of liquid hydrogen in a gravity-free state.

The reaction of the hydrogen—whether it curls into a ball, vaporizes or sticks to the sides of the fuel tank—will lay the ground-work for future Centaur research flights, seven of which are planned before useful payloads are placed atop the rocket.

1500 Attend

(Continued from page 1)

Astronaut," by Dr. C. P. Laughlin, and "Astronaut Preparation" by M. Scott Carpenter.

Following a 15 minute recess, "Astronaut Performance" will be given by W. J. North and M. I. Johnson; and "Astronaut's Flight Report," including films, by John H. Glenn, Jr. A short discussion period will then precede a summary of results by George M. Low, director of spacecraft and flight missions, for NASA, and the adjournment by Dr. Dryden, about 4 p.m.

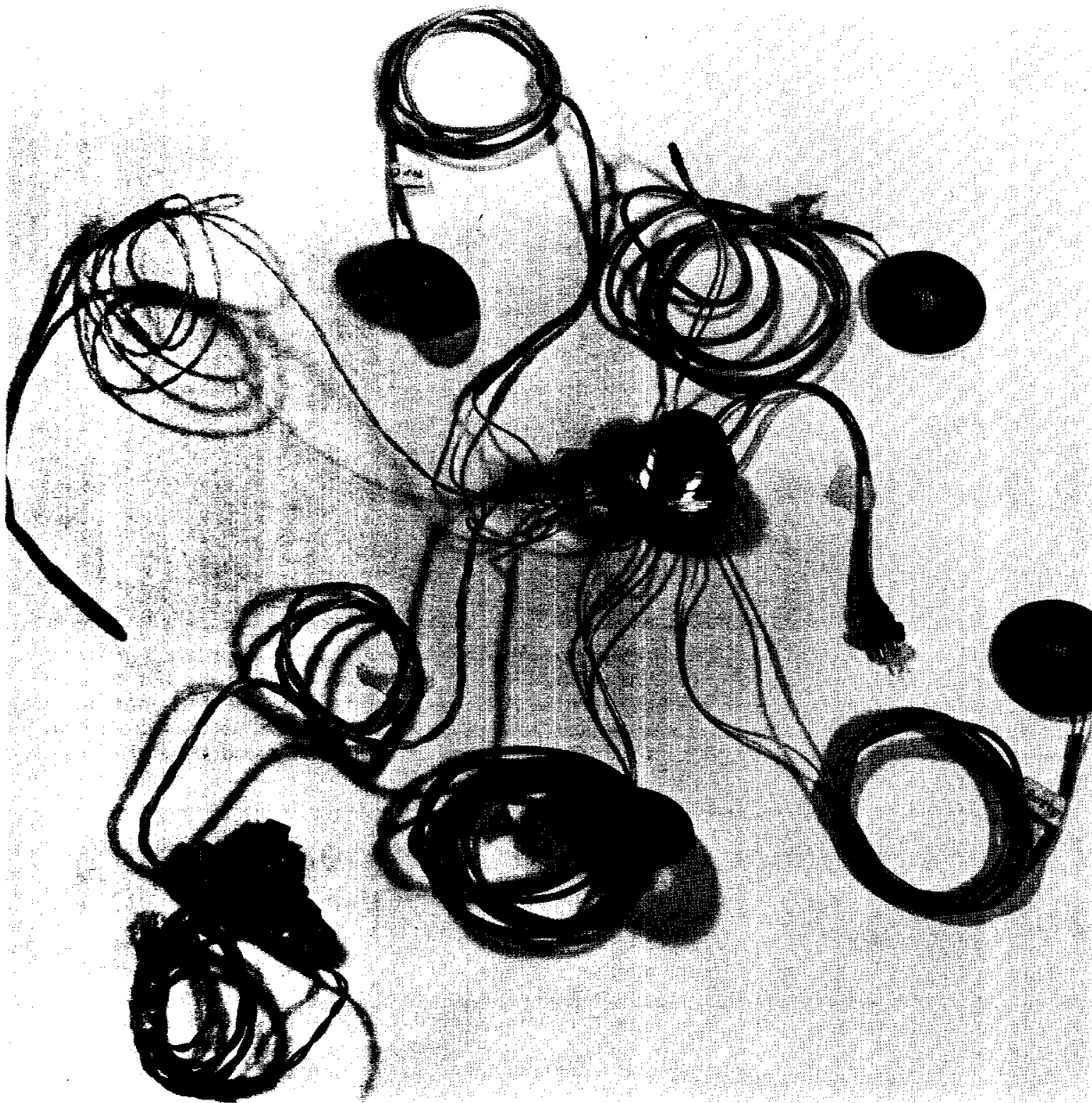
Oral rehearsals for the papers to be presented were held last Friday and the Activities Building Auditorium, Langley Research Center.

Slide projection and 16 mm movies will be presented at the technical conference to illustrate the presentations.

The four appendices included in the printed report are "Air-Ground Communications of the MA-6 Flight," "Description of the MA-6 Astronomical, Meteorological and Terrestrial Observations," "Report on the MA-6 Flight in the Field of Space Science," and "Mercury Network Performance Summary for MA-6."



AN OLD PILOT AND A YOUNG ONE shook hands last week as Professor Antonio Ambrosini, a 72-year-old Rome University law professor and World War I pilot, presented Astronaut Alan B. Shepard, Jr., with a gold medal from the International Association for Man-In-Space. Ambrosini, a special Italian delegate to the UN Committee on Peaceful Uses of Outer Space, told Shepard he would be "delighted to accompany you on a second space flight" and said he didn't consider 72 too old for space travel.

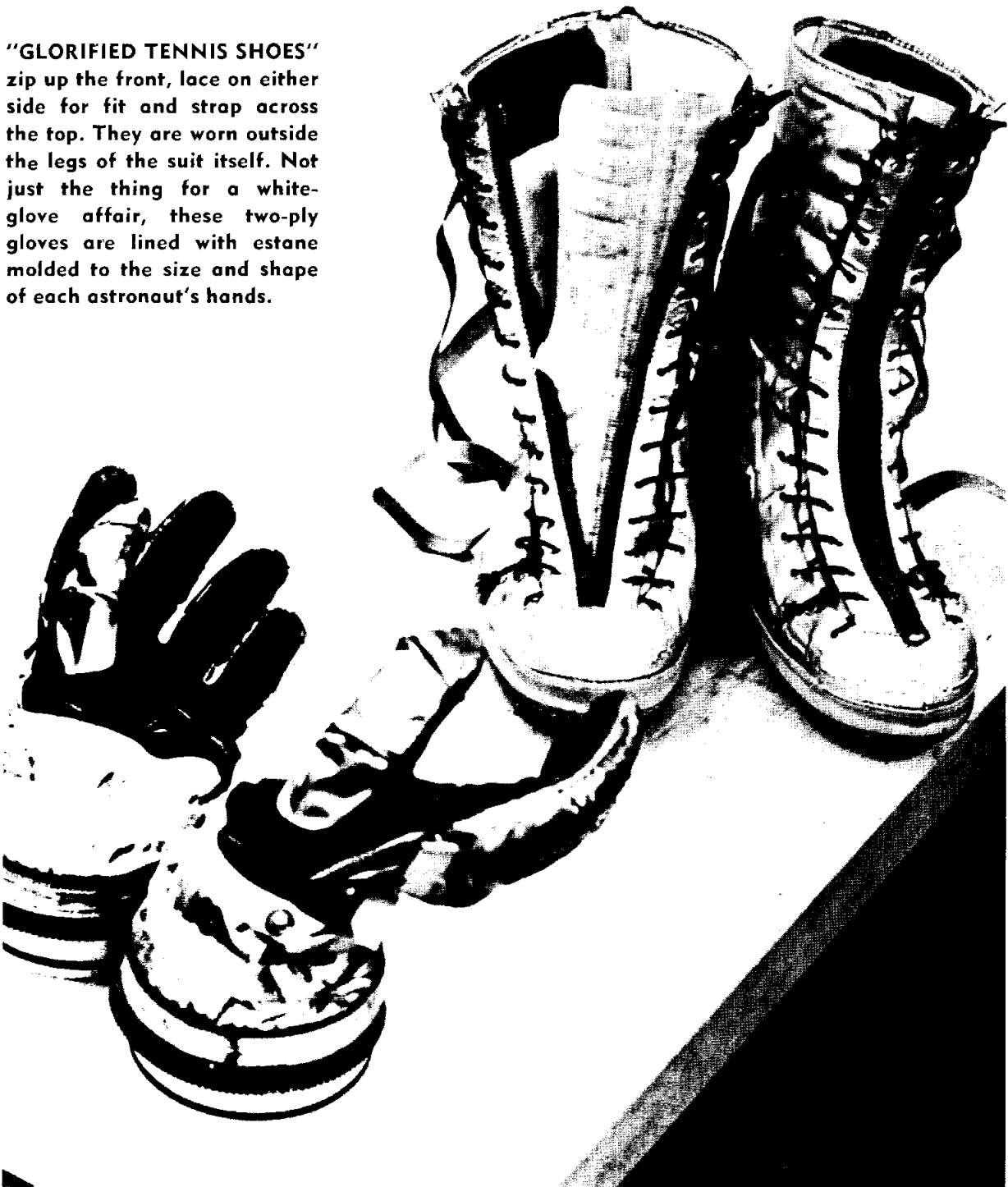


THE SENSORS which measure the astronaut's heartbeat, pulse, breathing and other body functions are each connected to a central "patch" which exits the suit just above the right knee.



DRESSED FOR SPACE, astronaut M. Scott Carpenter checks out various instruments, takes notes. The entire suit, including helmet, boots, and various

"GLORIFIED TENNIS SHOES" zip up the front, lace on either side for fit and strap across the top. They are worn outside the legs of the suit itself. Not just the thing for a white-glove affair, these two-ply gloves are lined with estane molded to the size and shape of each astronaut's hands.



'Dresser Of Astronaut Problems Of What

"One-piece suits, ultra-modern cut, well-ventilated, guaranteed against high temperatures, one pair of pants each, \$15,000 and up. See Joe Schmitt, Dresser of Astronauts."

You will never see that ad in print, but it's more accurate than some that you have seen.

And Joe Schmitt, whose official title is "pressure suit technician" knows as much about this particular item of haberdashery as anyone in the business. He's the man in charge of the constant testing and adjustment which the suit undergoes before each flight.

To understand some of his problems, take a look at the complete ensemble. The suit is a two-layer affair, made by B. F. Goodrich Co. of Akron, Ohio. The glossy silver color which shows up in pictures is an aluminized material which reflects heat, and is woven into the nylon fabric of the outer layer. The inner layer is neoprene rubber. Suit fittings are stainless steel or aluminum.

The helmet which tops the suit has a fiberglass outer shell and a "Lombard liner," made of styrofoam with a thin coating of sponge rubber cemented to a kid leather lining. The helmets are made from molds of each astronaut's head, taken three days after a haircut. That's why Astronaut John Glenn was making continuous trips to the barbershop during the several days of the MA-6 flight. A plexiglass visor completes the helmet.

The boots, which Schmitt and his

staff call "glorified tennis shoes," are secured with a zipper, two sets of laces and three straps. The gloves have an inner ply made of a plastic called estane. The outer layer is nylon, with the palm area impregnated with neoprene rubber.

The primary function of the whole thing is to withstand pressure—five pounds to the square inch, although the factory tests suits at seven and a half pounds just for good measure. The most oft-recurring problem, therefore, is leakage which must be no higher than 250 cubic centimeters per minute. And one of the most critical points of leakage is the seal around the clear plexiglass visor.

"One of our regular tests is to inflate the visor seal bladder and then disconnect the hose and let it stand overnight," Schmitt explained. It should remain inflated that long." Zippers on the suit itself and the stitching around them for another set of headaches. "When we're looking for a specific point of a leak," we rub a sort of liquid soap around the visor seal and any other suspected opening." Escaping air will then blow bubbles in the mixture, neatly pinpointing the leak.

Checks which must run on the suits, particularly when they are being used in training and might be subject to damage, are myriad. The two microphones and two sets of earphones in each helmet must be given a communications check. The visor must be found clear and free of scratches. The suit must be



nts of his pressure suit as Dr. William K. Douglas, astronaut physicist, weighs less than 20 pounds.

ts' Discusses Many ne Wears In Space

turned inside out and each seam given a careful visual inspection before pressure checks. Fifteen feet of ventilation tubing inside the suit must be inspected. Blood pressure and bio-instruments, which measure the astronaut's pulse rate, heartbeat, respiration, etc. during the flight, must be checked.

Wire from these fitting used to exit the suit at the stomach, but it was found they presented a less of a problem if they came out above the right knee.

All suit zippers are opened and the surfaces between the outer and inner layers inspected for snags and small holes.

"One problem in particular that cropped up with Glenn's suit was the left wrist bearing seal. It had a high leak rate at low pressure. We found it had been installed backwards."

The wrist bearings themselves were installed when astronauts found it too difficult to perform necessary wrist and hand movements in the fully-inflated pressure suit without them.

Other changes have come about as the result of constant testing. Insulation between the inner and outer suit has been dispensed with. The communications "pigtailed" in the helmet have gone through four different designs. Small lights have been installed on the first two fingers of the gloves, with a battery pack on the back of the hand, to partially eliminate the need for holding a flashlight.

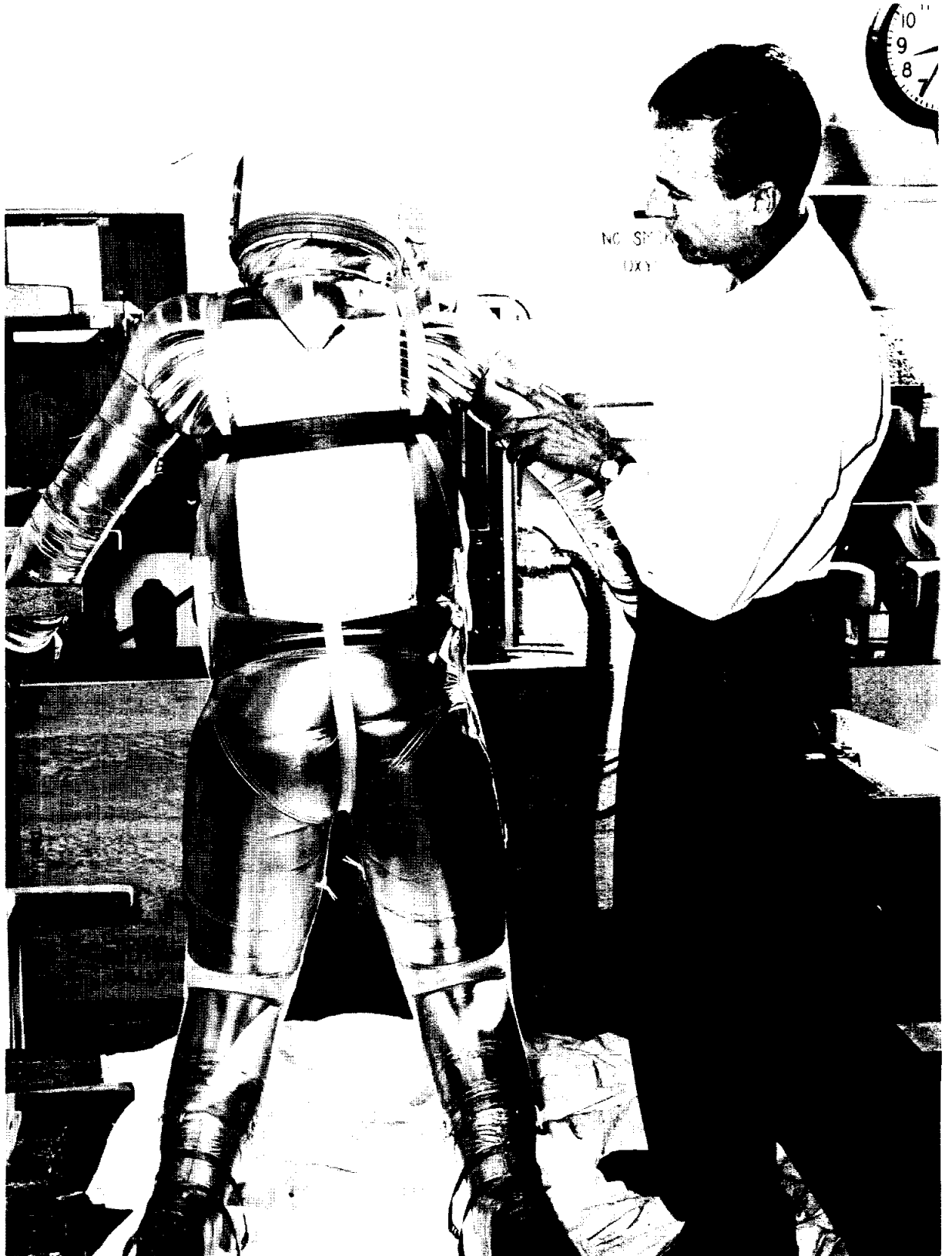
The bulky blood pressure fitting around the upper arm presented a

leakage problem, leading to the development of a smaller fitting. "Even now it takes a delicate adjustment to stop the leakage," says Schmitt.

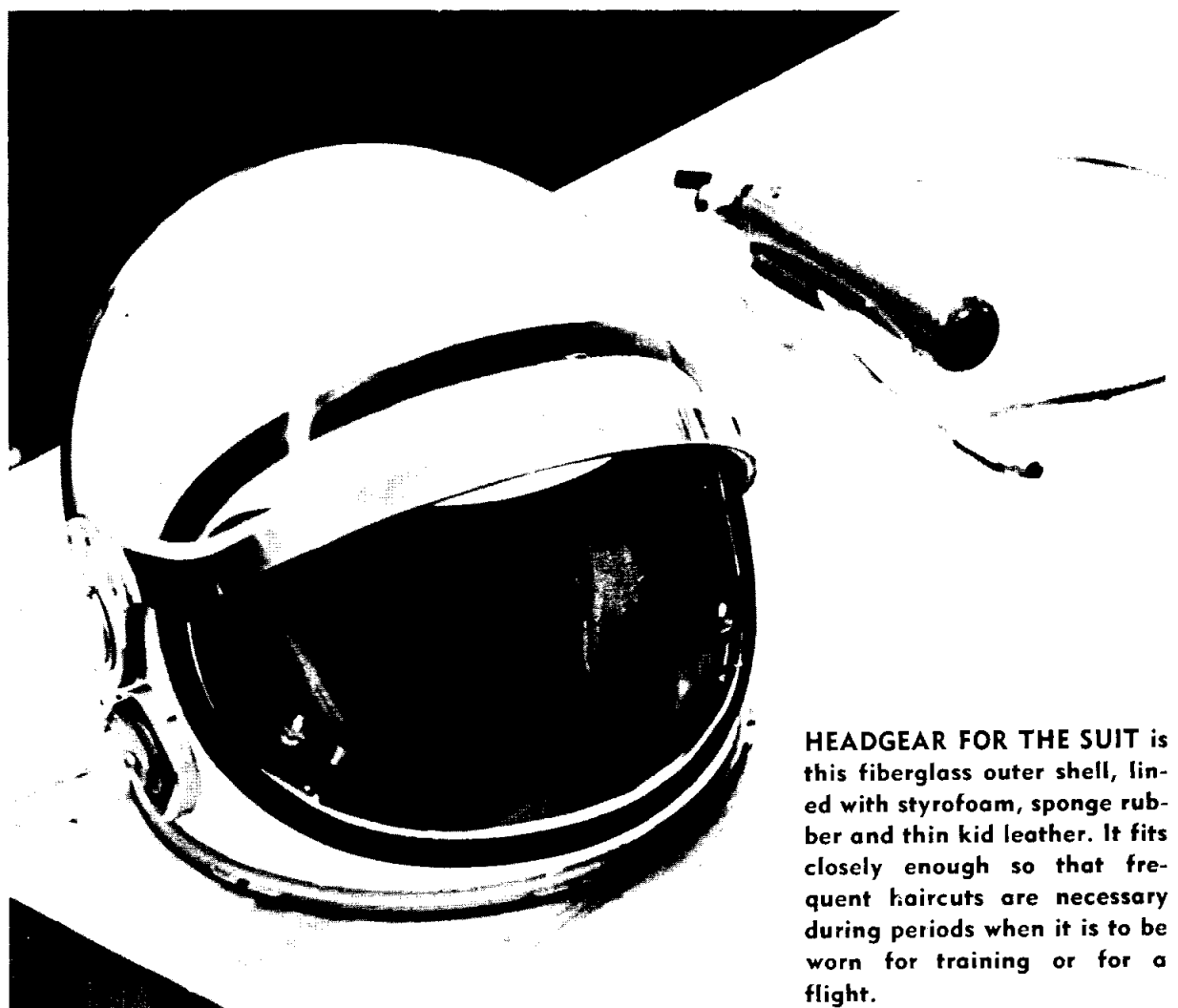
The gloves, both bulky and leaky at first, used to zipper on. They now fit onto the sleeves of the suit with a twist lock and are formed from impressions made of each astronaut's hands dipped into neoprene rubber. From these molds the estane liner is cast.

"We've gone through many small changes to increase the mobility of the suit, especially around the shoulders," added Schmitt. "And of course there are a number of accessories that we add from time to time according to the preference of the astronaut. For instance, he can have two wrist mirrors, a flat one and a parabolic mirror, to assist in reading the instruments behind his head.

"And there are other changes contemplated. The Mercury suit, which is an adaptation of the Navy's Mark IV pressure suit, has a long zipper slanting from one shoulder to the opposite hip. Counting the underwear (a set of white "long johns") boots, helmet, gloves and suit, it takes about 20 minutes to dress the astronaut. The suit planned for Project Gemini will have a horseshoe-shaped zipper running from one shoulder down to the stomach and back up to the other shoulder. It should make dressing easier."



SUIT TECHNICIAN JOE SCHMITT runs a pressure check on a fully inflated "space suit," which looks occupied as it bulges under five pounds pressure per square inch. The shiny silver surface is aluminized fabric woven into the outer ply of nylon.



HEADGEAR FOR THE SUIT is this fiberglass outer shell, lined with styrofoam, sponge rubber and thin kid leather. It fits closely enough so that frequent haircuts are necessary during periods when it is to be worn for training or for a flight.

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On The Lighter Side

It could only happen in Texas!

Seems that Stuart Clarke, Grace Wynn, and Bill Parker were among those attending a recent luncheon sponsored by the San Jacinto State Bank. Also attending but as a guest of Gene Alexander, vice president of the First Pasadena State Bank, was Kemble Johnson. Alexander was making the big pitch to get Johnson to use the services of his institution.

A highlight of the affair was the award of three door prizes—the first prize, a \$25 savings account. The winner, naturally, was Kemble Johnson.

* * * *

Editor's Note: The following story is taken from the March 27 issue of the Washington Post.

Another "John Glenn" ran into re-entry problems with a new "space capsule" Sunday and spent about two hours 75 feet high in an Arlington oak tree. But Fire Company 6 saved the day.

The space capsule is the invention of Roger Moskey, 11, of 5421 N. 24th st., Arlington. It is a silver-painted cardboard milk carton lined with cotton.

"John Glenn," the passenger, is Roger's white mouse, which had been in training for a week after it won a fitness test with another mouse.

The launching—of a kite to which the "Alpha I Mouse Ship" was appended—was flawless, Roger said yesterday.

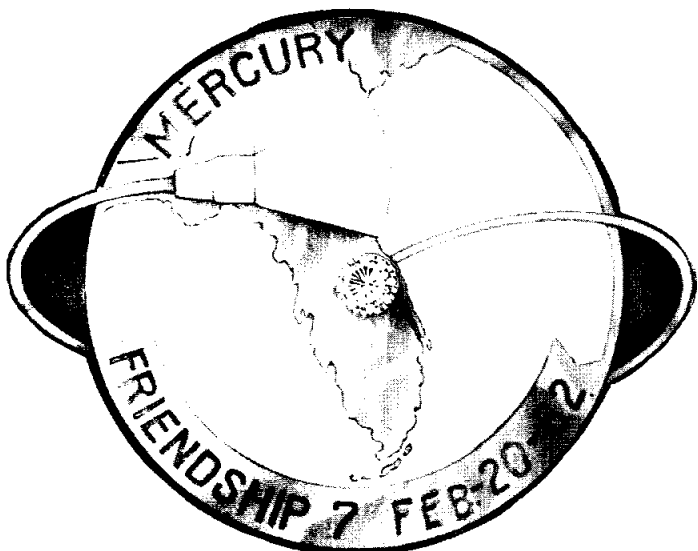
But a moderate breeze snagged the kite, capsule and all, on a tree down range from the launching site (a parking lot in the 5400 block of Lee Hwy.).

Launching technicians (Roger and his father, Thomas A. Moskey Jr.) went to see Arlington Fire Department Chief William J. Beiswanger.

The chief said the fire department does not ordinarily rescue mice from trees, but since Company 6 was returning from a fire drill, an aerial ladder truck was asked to stop by the oak.

Roger, an A science student in the sixth grade of Robert E. Lee Elementary School, said he wanted to find out how a high kite flight would affect a mouse.

Weather permitting, mousetronaut John Glenn will make a second flight next Sunday.



AN MA-6 LAPEL PIN has been designed by an artist at Cape Canaveral for purchase by those who participated in the orbital flight activities. The pin may be ordered through the Mercury Social Club, Hangar "S", Port Canaveral, Fla. The price is \$2 without the ruby, \$3.25 with the ruby.

EDITORIAL EXCERPTS

MARRIAGE MADE IN HEAVEN
NEWSWEEK
April 2, 1962

A few months ago, any notion of co-operation between the United States and the Soviet Union in the exploration of outer space was just another starry-eyed dream that was hopelessly entangled in earthy disagreements. Since then, however, the Russians have ended their two-year boycott of the United States outer-space committee, and President Kennedy and Premier Khrushchev have exchanged detailed proposals for a series of joint projects.

The buoyant mood may be only temporary. It may, as Khrushchev hinted in his letter, peter out over the agonizing issues of disarmament. It may collapse because of the enormous complexities that beset it. But the fact remains that this week at United Nations headquarters in New York, Dr. Hugh L. Dryden, deputy administrator of the National Aeronautics and Space Administration, and Gen. A. A. Blagonravov, who occupies roughly the same position in the Soviet Union, are to meet and try to turn the high hopes into concrete action.

"We will probably emphasize relatively clean-cut projects," one U. S. official said last week, "that don't involve flying my satellite on your booster, or witnessing each other's launchings."

The most utilitarian proposals mentioned by President Kennedy and Khrushchev in their exchange involved weather-patrol satellites and space communications stations.

As far as communications are concerned, the U. S. is already engaged in a program of international cooperation. There are agreements with Britain, France, West Germany, Brazil, and Japan to build ground stations.

If the U. S. has accomplished so much, then who needs the Russians? "We could set up a worldwide communications net without them," said one American U. N. delegate. "But it's easier and more efficient with them—and it's cheaper."

Cost sharing, however, may be the easy issue compared with some other problems. For one, if the Russians steadfastly refuse to permit arms-control inspection teams on their soil, why then would they agree to the exchange of satellite-tracking teams? The Soviet Union has grievances, too. Soviet U. N. delegate Platon Morozov last week stated pointedly that the Soviet Union "on the basis of mutuality," explains the purpose of each launching. The U. S. publicizes its satellite launchings, but has carefully withheld all details of its Samos "spy-in-the-sky" satellite.

WELCOME ABOARD

Only seven new personnel joined MSC during the two weeks March 13-26, since most personnel are now coming in at Houston. A list of new Houston personnel beginning March 1 will be run in the next issue of the Space News Roundup.

Technical Services: James H. Lee and Bruce W. Sprague.

MSC PERSONALITY

Special Assistant Paul E. Purser Has Long Research Background

More than 18 years of experience with Langley Research Center and Space Task Group, of which he was one of the original members, brought to Paul E. Purser his appointment as Special Assistant to the Director of STG on Nov. 5, 1958. Purser had been, prior to his appointment, Special Assistant to the Associate Director of NASA's Langley Center and head of the High Temperature Branch of that center's Applied Materials and Physics Division, then called the Pilotless Aircraft Research Division.

The 43-year-old native of Amite, Louisiana, attended Southeastern Louisiana College and graduated from Louisiana State University in 1939 with a BS in aeronautical engineering.

He worked briefly for the Glenn L. Martin Company in Baltimore



PAUL E. PURSER

before joining the Langley science staff in October of the same year.

An authority in the fields of aerodynamic heating, drag, stability, control, loads and general aerodynamics, Purser is one of the pioneers in the use of free-flying rocket models as research instruments. He contributed to the development of new techniques involving instrumental models launched from Wallops Island, Va., and together with Maxime A. Faget, Assistant Director for Research and Development, conceived the Little Joe Launch Vehicle system. This is a solid propellant, single-stage booster used for testing the escape system of the Mercury spacecraft.

As a result of his experience at Wallops Island, Purser was selected in 1957 to deliver a technical paper in Holland for the Advisory Group for Aeronautical Research and Development of the North Atlantic Treaty Organization (NATO). He discussed the facilities and techniques used there to study aerodynamic heating and the characteristics of various materials for airplanes, missiles and spacecraft.

In addition, Purser is the author

of some 60 technical papers published by NASA. He has served as a member of the Picatinny Arsenal Fin-Stabilized Ammunition Committee and the NASA Research Advisory Committee on Structures. He was an alternate NASA member of a special advisory group on the Navy Polaris missile.

One of the original members of the Manned Spacecraft Center, then called the Space Task Group, Purser has contributed many years of research and development to the space program. He worked on related problems during the latter days of the National Advisory Committee on Aeronautics and the infant days of NASA.

He is responsible for much of the detailed technical administration of MSC, and serves as Acting Director of the Center in the absence of the director and the associate director, making final decisions on technical matters.

Purser exercises a primary role in Projects Mercury, Gemini and Apollo by consulting with the director and assistant directors on a wide variety of subjects and tasks involving technical problems, long range planning and test programs.

Married to the former Charlotte King of New Orleans, Purser has two daughters, 19-year-old Mary and 12-year-old Margaret.

HOUSTON TRANSFERS

Thirty Manned Spacecraft Center employees completed the move to Houston, Texas during the two weeks between March 13 and 26, including MSC Director Robert R. Gilruth and Special Assistant to the Director Paul E. Purser.

Others were:

Space Physics Division: John E. Dornbach.

Assistant Director for Administration: Wesley L. Hjernevik.

Procurement and Supply Office: Helen S. Gregory.

Public Affairs Office: Geraldine A. Armstrong.

Life Systems Division: James W. McBarron.

Supply Office: Bernard Broughton, George Mallios, Curtis Collins, and Thomas J. Porter.

Personnel Office: Stanley H. Goldstein, and Kenneth I. Jeffries.

Systems Evaluation and Development Division: Aleck C. Bond, Joseph N. Kotanchik and James K. Hinson.

Spacecraft Research Division: George C. Guthrie, and John S. Llewellyn.

Technical Services: Charles L. Bailey, Charles M. Tucker and Troy L. Williams.

Administrative Services Office: Robert S. Adams and Nicholas Jakir.

Gemini Project Office: James T. Rose.

Financial Management Office: Jeanne B. Gaster, Sylvia H. Harris, Kenneth Irwin, Ester C. Kiel, Mary H. Roane and Amelia A. Cole.

Williams Tells D. C. Aero Club Of Manned Space Progress

MSC's Associate Director Walter C. Williams addressed the Aero Club in Washington, D. C., Mar. 27 and told the group "I am convinced that today we have the technical capacity, the skills, the imagination and the resources—and the management capability, to meet our space goals on schedule. If we maintain these things, with the continued backing of the nation—and the answering conviction of the American public that the job can and will be done, we can assure you that it will."

Rather than dwell on the recent MA-6 flight which he referred to as well-published, Williams reviewed the progress and the achievements of the manned space program since its inception and spelled out the plans for the follow-on projects, Gemini and Apollo.

He quoted a statement by MSC Director Robert R. Gilruth at a postflight press conference "We have reached the end of the beginning." Williams said that he thought that what he was really saying was that although Mercury's first specification flight had been carried out successfully, we had hardly scratched the surface in our investigation of the potential of space flight for the extension of man's scientific knowledge.

Summarizing the Mercury achievements he said the following had been accomplished.

- We have developed and expanded our program managements capability.
- We have directed the de-

velopment and flight tests of the free world's first manned spacecraft.

- We have directed the development and are using an earth-circling network for tracking, data gathering and flight control.

- We have trained and integrated into the missions a pool of trained space pilots—representing a resource upon which we will build as we move into our two-and-three man missions.

- We have drawn up and carried out a broadly based flight program, involving the development of new launch facilities, capabilities and operational procedures. Our flight program to date has included 24 Mercury spacecrafts in almost as many kinds of tests.

- Finally we have developed and expanded industrial know-how and capacity for design and manufacture of the very complex spacecraft and its systems. All of this experience and capacity is in being now, and provides an integral component of our national ability to move forward in pace with the momentum of our technology. And it is being applied now, concurrent with growth and progress in Project Mercury, to our new and more advanced programs, Project Gemini and Project Apollo.

Williams said that in conducting these advanced programs the step-by-step flight development philosophy which ably guided the Mercury program would be stressed.

40 Million Viewers Set Record Watching Glenn Orbital Flight

Eight out of ten American families who own TV sets watched the elaborate three-network coverage of Astronaut John Glenn's orbital flight Feb. 20, and the average viewer followed the events for over five hours.

This daytime audience record was announced by Nielsen Television Index last week when the survey firm reported nearly 40 million American television homes were watching.

The average home viewed five hours and 15-minutes of the 10-hour telecast. In comparison to other major three-network news coverage, the Glenn telecast was seen in more homes than either the Democratic or Republican National Conventions, and roughly equaled the audience to the four presidential "Great Debates."

The network coverage began at 6:30 a.m. and ended at 4:30 p.m., being carried on 455 of the 520 U. S. commercial TV stations.

Only 10 percent of the viewers watched the very beginning of the broadcast, but the audience built rapidly so that by 9:47 a.m., when "Friendship 7" and its Atlas rocket lifted from the launching pad, more than half the viewers in the nation were at their sets. The audience continued to build slowly into the afternoon to a high of 52.5 percent between the hours of 2 and 3 p.m. when re-entry began. At 3:01 p.m., after the capsule was picked up, the audience tapered off again, and after Glenn was taken out of the capsule, dropped to 42 percent for the remainder of the program.

Nova Design

(Continued from page 1)

selected to develop a detailed set of criteria and model specifications for the complete Nova vehicle, supported by a detailed preliminary design; define a manufacturing plan, including test methods and equipment requirements; find a method of getting acceptable reliability at the earliest feasible date, since in a rocket of this size there can be few research flights; define a testing program; describe the method of transportation and equipment necessary; and develop a schedule, funding and management plan for the overall program.

LAND ACQUISITION

Land acquisition for the Nova project has moved into high gear with the completion of purchases in Area 1, on Merritt Island, Fla. and the deadline for the completion of Area 2 by June 30.

Some 1,200 pieces of property have been bought in Areas 1 and 2. Area 1 has been evacuated except for three or four families living there on a day-to-day basis, which are hardship cases.

The government will execute a lease for two years with the 60-day cancellation clause included. There is a possibility that the lease period may be extended beyond July 1, 1964.

Area 3, consisting of all the rest of Merritt Island north and some six selections south of Orsino is expected to be acquired by July 30, 1963.



HERR JOSEF SCHRANZ, Bavarian tavern keeper, displays his wood-carved mask of Lt. Col. John H. Glenn, Jr. In the background are masks of other famous people including President Kennedy and DeGaulle.

Wood-Carver Sends Mask Of Glenn To The Astronaut

"To the bravest man in the world," is the inscription on a card which accompanies a rare "portraet-maske" that was shipped from Bavaria to be presented to America's famous astronaut, Lt. Col. John H. Glenn, Jr.

This inscription and the gift comes from an energetic and artistic woodcarver who resides in the picturesque Alpine village of Murnau, Herr Josef Schranz. He is the owner of the Bahnhofsgaststatten, a restaurant and beer tavern situated in the local railroad station.

Herr Schranz is the only person in the world who makes the "portraet-maske." They are woodcarved caricature masks of famous people which take on a lifelike appearance when worn by anyone. Wood-

carving is the tavern keeper's hobby.

He never sells his masks nor has he given one to a well-known personality before.

The mask was initially delivered to Lt. Col. Hugh W. Brady, commander of Kimbro Kaserene in Murnau. Elements of the U. S. Army School, Europe, are located at the kaserene. The kaserene's executive officer, Maj. Hobart E. Dewey, arranged for shipment of the mask to Cape Canaveral.

In the tavern keeper's collection are striking likenesses of many heads of government including Presidents Kennedy and DeGaulle, England's venerable Winston Churchill and the late Pulitzer Prize winning author, Ernest Hem-

mingway. Herr Schranz also has a mask of Konrad Adenauer and the late Dag Hammarskold, among others. These masks cannot be purchased.

His collection hangs in a second floor hallway over the tavern and adjacent to the family living quarters.

While the woodcarver's outward appearance suggests a happy-go-lucky attitude, he is inwardly very serious about his work. He spent nine days and nights carving the likeness of Col. Glenn. It is cut from a block of Cembra Pine which he estimates to be from 1,000 to 1,500 year old. He imports this timber from Austria.

The artist used a newspaper photograph as a model for his work. The mask has depth in the facial features, and is only an eighth of an inch thick in most places. It weighs slightly more than the papier mache type. Herr Schranz used 50 wood cutting tools out of an assortment of 160 that he owns.

Explaining the reason for making the carving and giving it to Col. Glenn, he said, "When I read about the big victory brought to the free world by Col. Glenn, I began to wonder how I could make a contribution to this great hero. I decided this is the least I can do for the man who has done so much for the free world."

The artist is married to an attractive and pleasant woman who has borne him three daughters, now of school age. He does his carving while tending his newsstand, which faces the main entrance of the railroad station.

Summing up his pleasure in making such objects, he said, "To me, wood is a live thing of nature. When Col. Glenn's mask is worn it will also be alive and live forever as a tribute to this great man."

He concluded wistfully, "A part of my heart is lying in that mask."

Explorer IX Brings In Added Information On Atmosphere

New information to confirm existing theories about the earth's upper atmosphere has been provided by Explorer IX, the first satellite launched from NASA's Wallops Island station.

The satellite is a 12-foot diameter plastic and aluminum foil balloon, painted with white polka dots. Its orbit is very sensitive to the resistance of the rare atmosphere at altitudes of several hundred miles—100 times more sensitive than other satellites.

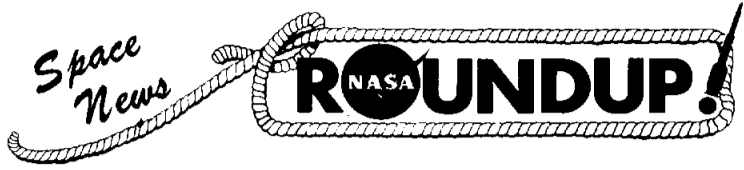
Launched in February of 1961, it was the first satellite put into orbit by an all-solid propellant vehicle, and the first such purely civilian scientific project using civilian facilities. The path it follows varies between 1600 and 400 miles up.

Analysing orbital changes, scientists have determined that the atmosphere at 420 miles altitude is about 40 million-million times as thin as the atmosphere at sea

level. This is about 10 times lower than the density values computed in 1959 on the basis of observation of earlier satellites, at the time of maximum activity in the sun. Scientists have established that the decrease results from a decrease in solar activity since 1958 and '59, as the sun approaches the minimum in its 11-year cycle.

The level of solar activity varies not only over the 11-year solar cycle but from day to day over a 27-day rotational period of the sun. Changes in the measured density of the air now clearly show correlation with this cycle and with occasional violent solar disturbances that cause magnetic storms all over the earth.

The satellite is expected to have an orbital life of two more years. As it spirals down it will provide additional information on the density of atmosphere as low as 100 miles.



SECOND FRONT PAGE

Speed Of Light Sets Top Limit For Space Travel, Say Scientists

MSFC—If man is ever able to travel at the speed of light, he could get to the sun in eight minutes flat. But the late Albert Einstein theorized that man cannot hope to travel that fast. Scientists at the NASA Marshall Space Flight Center, who are much concerned with speed agree. Light travels 186,000 miles a second. The best speed man has made so far is about 17,500 miles per hour. Lt. Col. John Glenn traveled at that speed on three orbits of the earth this year. Russian cosmonauts traveled at about the same speed.

Man-made objects have traveled faster. The United States frequently sends probes which leave the earth with an escape velocity of about 25,000 miles per hour. They slow down in near space due to the continuous pull of the earth's gravity, but once the gravity field has been overcome, the speed remains relatively constant.

Pioneer IV, which orbited the sun, sped past the moon 40 hours after it left the earth. Ranger II, which was intended for the moon but missed, went into orbit around the sun also.

The Marshall Center, which makes giant space vehicle boosters for the parent National Aeronautics and Space Administration, is concentrating on vehicles to lift tons of payload at generally the speeds previously attained.

No propulsion system on the drawing board today is capable of carrying man even close to the speed of light. Engineers say it is "out of the question." They follow through by adding, "Nothing we know of has exceeded the speed of light."

This supports a basic Einstein theory that nothing can exceed light.

Man has, however, made terrific advances in speed in the last 100 years.

Ironically enough, a horse held the speed record for many centuries.

A three-year-old oat burner could do upwards of 35 miles per hour with a little prodding, for short periods.

When Christopher Columbus discovered America, the horse was the fastest "vehicle" in the world.

Paul Revere made his famous ride in the 18th century on the fastest transportation up to that time—still a horse.

But man broke the oat barrier in 1830 with the appearance of the steam locomotive.

In 1900, Casey Jones was killed when a train stopped on the track ahead of his. Prior to applying the brakes, Casey was doing 85 miles per hour.

From that time to the present space age, man has been steadily forging ahead with speed—trying to cram more travel into a lifetime.

The first military airplanes purchased in 1910 had contract specifications calling for a speed of "at least 40 miles per hour." By 1914, planes were going 100 miles per hour and during World War II,

some fighter planes were going 470 miles an hour.

So, in less than 100 years man pushed speed from the 35-mile per hour horse to 470 in an airplane.

Speed records soared with the advent of the space age. The first American satellite, launched in January 1958, has traveled close to 600 million miles around the earth and is still going. It is expected to orbit about two more years.

Man remains in the infant stages as far as the speed of light. In space, speed is still referred to in miles per hour rather than minutes, to say nothing of thousands of miles per second.

But man can some day travel to virtually all planets in the solar system in a lifetime. The fact that travel at the speed of light is impossible poses no space age problems for practical purposes.

Axel T. Mattson Gets New Post

Recently appointed Research Assistant for Manned Spacecraft Projects was Axel T. Mattson, former assistant chief of the Full-Scale Research Division at Langley Research Center.

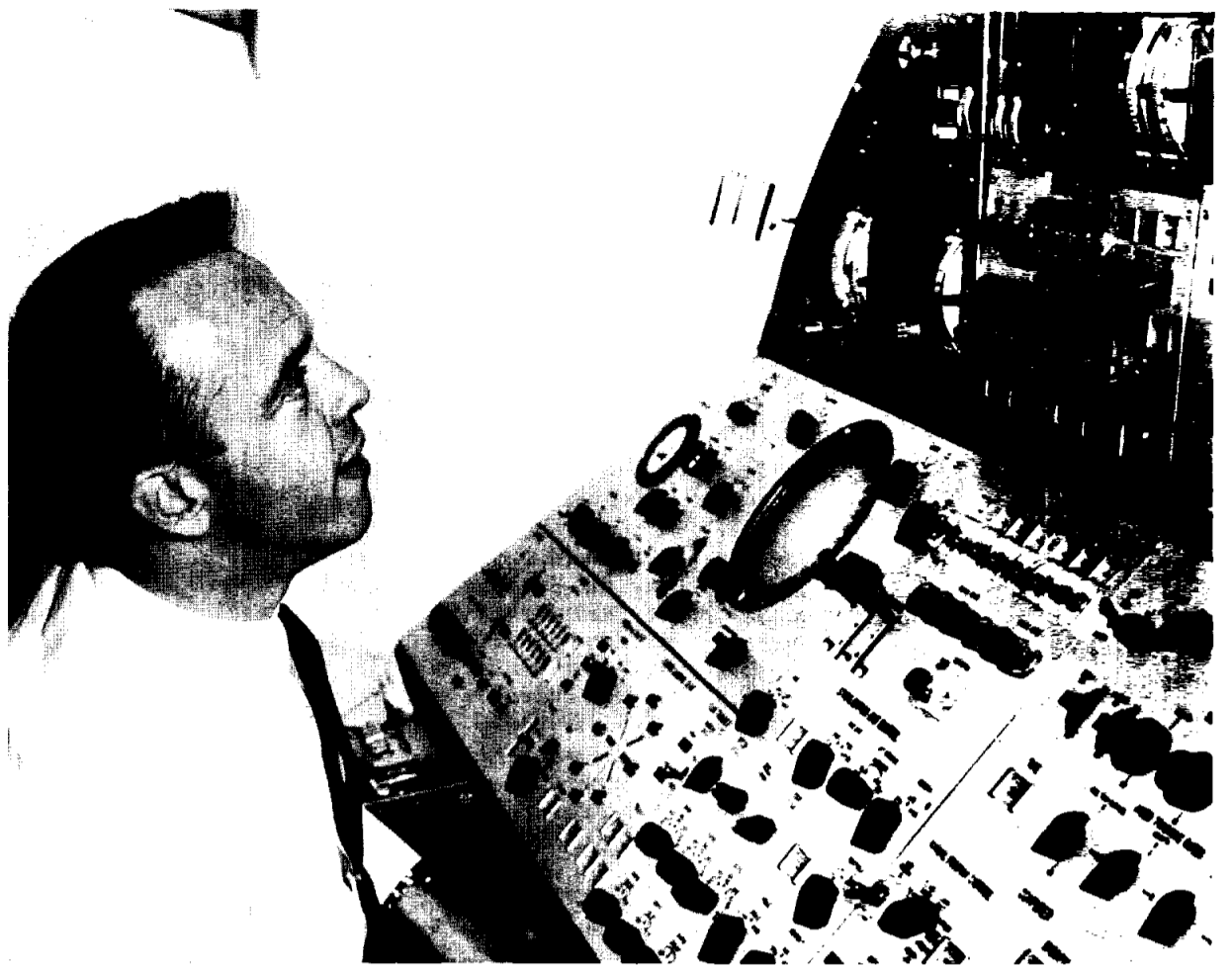
A native of East Hampton, Long Island, the 45-year-old Mattson joined the Langley research staff in April, 1941, after receiving his Bachelor of Science Degree in Mechanical Engineering from North Carolina State College. First assigned to the 8-foot high-speed tunnel, he was appointed head of that facility in April 1947. During this period he was also the scientist in charge of construction of the 8-foot-transonic pressure tunnel and was one of the Langley Research Center associates of John Stack in the development of the world's first transonic wind tunnel.

In recognition of this accomplishment, Stack and his associates won the Collier Trophy for 1951. In September 1955 Mattson was appointed head of the 8-Foot Transonic Tunnels Branch.

Appointed to his position in the Full-Scale Research Division in January 1959, Mattson has responsibility for research conducted in four branches of the division. This research covers subsonic, transonic, supersonic, and hypersonic speed ranges, directed toward the development of aircraft, missiles, and spacecraft.

Mattson has been author or co-author of several NASA technical publications and has presented a number of papers at technical con-

(Continued on page 3)



"SOMEDAY . . .", Astronaut Alan B. Shepard, Jr., seems to be thinking as he surveys the astronaut control panel of the Martin Lunar Mission Simulator. The simulator is located at the Martin-Marietta Corp. plant in Baltimore, Md., which Shepard was visiting.

Details Of Gemini Released; Flights May Begin Next Year

Approved in late 1961 to bridge the gap between the Mercury and Apollo programs, MSC's Project Gemini is a two-man orbital and rendezvous program which will utilize the current seven astronauts as senior pilots. Project Gemini will reach the test-flight stage, according to present estimates, in 1963-64.

Additional crew members may serve as co-pilots for Gemini since they should be completely trained in time for such flights.

Main objectives of the two-man spacecraft will be to provide an early means of experimenting with orbital flights of a week or more which will provide a basis for study of how man functions under prolonged weightlessness, and to carry out manned rendezvous and docking techniques with an Agena target already in orbit.

Gemini will also provide pilot training for future long duration flights circling the moon and lunar landing missions. Later on it will provide supply and crew transfer, maintenance and rescue facilities.

The preliminary program will include, according to present plans, an unmanned orbital flight of one day, a manned orbital flight of the same duration, and two manned orbital flights of from seven to 14 days each. Starting about the fifth mission, rendezvous and docking flights will be made.

The Gemini spacecraft, essentially identical in shape to the Mercury but weighing about twice as much, will be some 20 per cent larger with 50 per cent more volume. In late 1961 NASA awarded the spacecraft contract to McDonnell Aircraft Corporation, St. Louis, Mo., manufacturer of the present Mercury vehicle, as the prime contractor.

The Gemini Project is particular-

ly important to manned space flight because orbital rendezvous is one of the methods under consideration for carrying out later Project Apollo lunar-landing and earth-return missions. For such a mission the lunar spacecraft and propulsion devices would be mated to an earth-escape vehicle after the latter was in orbit around the earth. Then, after a systems check-out, the lunar vehicle would launch from earth-orbit to the moon.

The other possibility for landing manned spacecraft upon the moon is a direct earth-to-moon flight using the multi-million-pound thrust Nova launch vehicle.

Both of these methods will be explored in order to meet the national goal of manned lunar landings before the end of this decade.

For the preliminary rendezvous missions, the target vehicle, an Agena, will be boosted into circular orbit about 150 nautical miles up by an Atlas one day prior to the Gemini spacecraft launch. The Agena will be launched from Cape Canaveral, and placed in orbit with the first burn of its primary propulsion system.

The next day the Gemini spacecraft will be launched into an elliptical orbit by a modified Titan II launch vehicle. The pilot will be active in the terminal phase, using radar to close on his target before he visually observes it. A back-up capability of a closed loop system is also being developed for the initial rendezvous mission. This system will automatically compute velocity impulses for the pilot to fire manually at the appropriate times to close on the target to within one-half mile. At that time the pilot will take over to begin the docking phase. This will be accomplished by using the space-

craft propulsion system, with the pilot controlling contact. Adjustments in the Agena's path will be made from earth, and it will be equipped with a flashing light for optical tracking.

Experience with Project Mercury will enable scientists and engineers to improve the Gemini's design in several ways.

For one thing, they anticipate less difficulty and less loss of time in pre-launch checkout. The small volume of the Mercury required "stacking" of components, one upon another, so that long checkout periods are presently required, particularly in the event of systems failure. In the new design, many of the flight systems will be placed outside the crew space and major components will be arranged in easily-removed, replaceable shelves, thereby reducing maintenance and checkout times.

Improved data-gathering techniques are being devised. It has been tedious to reduce and evaluate the enormous quantity of flight data recorded on each Mercury flight. For follow-on programs, engineers will use equipment which will print data only for periods of flight during which systems operations and events occur out of the planned limits for the mission. Full flight information will continue to come in to the ground from the spacecraft by telemetry.

On the outside, the two-man craft will look much like the Mercury craft, except that the 16-foot escape tower will not be used. Ejection seats will be built into the vehicle to provide crew members with a means of escape during powered flights or descent.

The 63-foot ringsail parachute used with the Mercury spacecraft

(Continued on page 3)