

## "BIG JOE", LEWIS' PART IN THE PROJECT MERCURY STORY

Before man is boosted into orbital flight, a progressive series of testing must be done. For months the Project Mercury group has been conducting tests on air drops, escape systems, impact and recovery.

Continuing in the progression will be flights of test vehicles to varying altitudes. Mounted on the nose of four clustered Sergeant missiles will be "Little Joe". Other shots will be with Redstone and Jupiter.

### "BIG JOE"

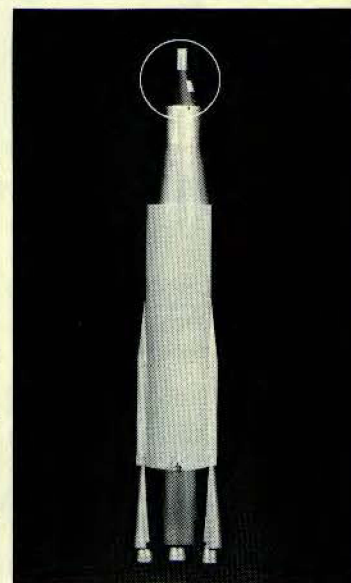
"Big Joe will be a full-scale, highly instrumented, unmanned test vehicle, boosted into orbital flight by an Atlas-D missile.

What is being done at Lewis Research Center in the Project Mercury program? It is the job of control and instrumentation of "Big Joe".

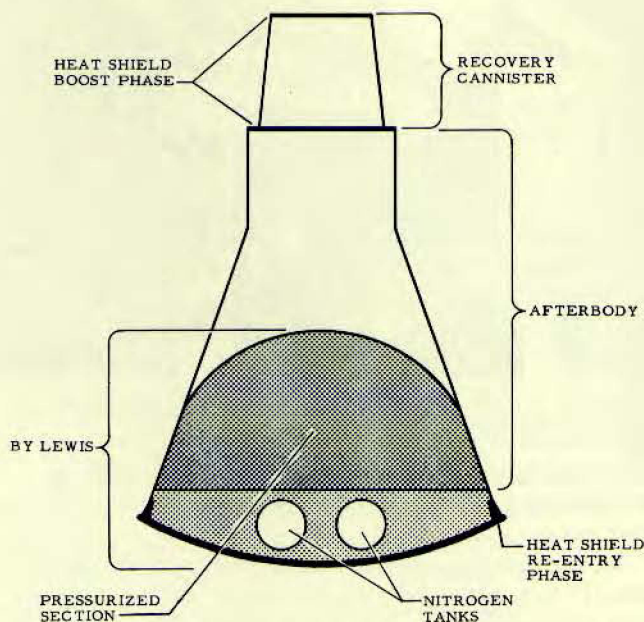
Why is this test vehicle so important? Before a manned space capsule can be built and launched, much information must be obtained concerning the performance of the heat shield, the temperatures of and within the capsule, and the attitude stability and controllability of an unmanned capsule.

These are responsibilities assigned to Lewis.

Two test vehicles are being built. The lower half of the capsule, containing the entire pressurized section, is being fabricated in the Lewis sheetmetal and machine shops. The afterbody and recovery cannister are being built at Langley. General Electric Co. is fabricating the heat shield. All parts, when completed, will be shipped to Lewis where they will be assembled into the fully instrumented test vehicle that is to be launched on the nose of the Atlas-D at Cape Canaveral.



"BIG JOE" (circled)  
as it will look on  
nose of Atlas-D.



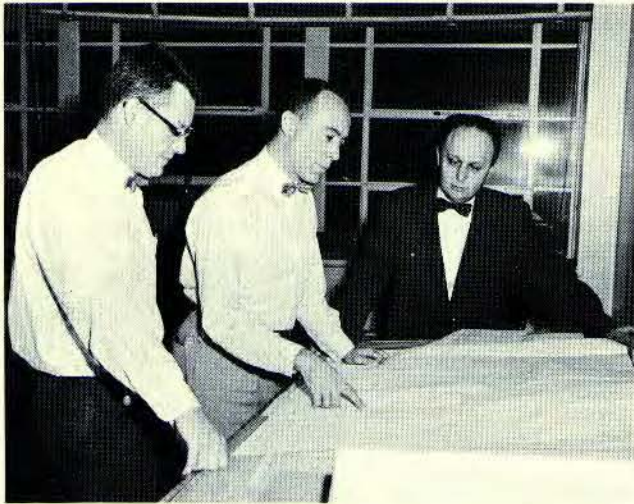
SCHEMATIC DRAWING of the flight test vehicle. The dotted area, including the pressurized section, is being developed and fabricated at Lewis.

A special "over-the-top" launching will be executed for "Big Joe" tests, covering a total maximum time of 25 minutes from launch to splash on the Atlantic Missile Range. This will simulate, in a short distance and period of time, the re-entry speed and trajectory. The Atlas will take the test vehicle in a 70 to 80 mile ascent, then nose over into proper trajectory toward the Earth. At a programmed point the test vehicle will separate from the Atlas, afterbody first. Before re-entry it must be turned over to place the heat shield in proper position.

Data obtained from these unmanned tests will be utilized in the final construction of the manned space capsules by McDonnell Aircraft Corporation of St. Louis, Mo.

Two groups at Lewis are working on Project Mercury's "Big Joe". G. Merritt Preston, formerly Flight Problems Branch Chief is the





LEWIS CONTROLS MEN, (1 to r), Carl Wentworth, Warren Plohr and Harold Gold discuss the problems.

gas from four tanks beneath the floor. Within this area will be the autopilot, a combination of gyros, acceleration switches control relays and amplifiers that will activate individual jets for attitude control.

The autopilot equipment must do three things: (1) rotate the vehicle and hold proper attitude for re-entry into the atmosphere (2) sense entry into the atmosphere and provide damping control and a steady roll rate through peak heating phase of re-entry; and (3) turn itself off after maximum "g" loads to provide uncontrolled vehicle stability data.

Calibrating the equipment on a rig in the Controls Branch's Analog Computer section at the 8x6 Supersonic Wind Tunnel is H. Warren Plohr, assisted by Ronald J. Blaha and Donald A. Petrash.

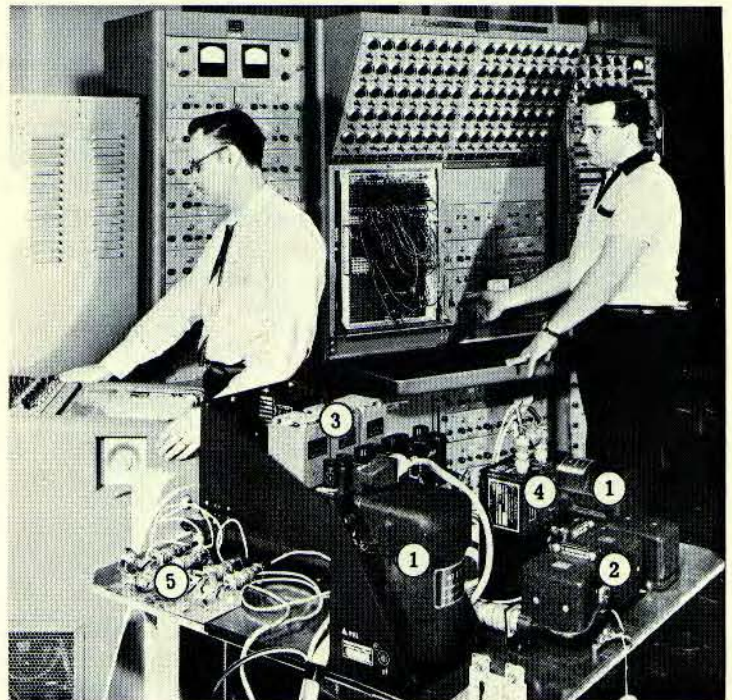
A capsule "mock-up" is being assembled in the Altitude Wind Tunnel to check hardware installation. Testing of the "mock-up" and later the flight capsule, will be performed in the Multiple Axis Space Test Inertia Facility (MASTIF) now in final construction in the AWT vacuum chamber. The MASTIF is a three-axis gimbal rig. Here all flight attitudes can be simulated. Handling installation of hardware of

project's deputy chief of operations at Langley. Under his supervision is the newly designated Lewis Division Space Task Group, headed by Scott H. Simpkinson whose job is to direct the fabrication, instrumentation and launching of the two unmanned test vehicles.

Another Lewis group, headed by John Sanders and project engineer Harold Gold, is designing, developing, building and testing the attitude controls of the two vehicles.

## ATTITUDE CONTROLS

The controls of the six-foot-diameter stainless steel and Inconel test vehicle will be mounted on the capsule floor. Near the vehicle's periphery are eight reaction jets connected to a ring that feeds nitrogen



FLIGHT TEST FIXTURE: Basil Kluchnik (left) and Ronald Kiessling at the recorder and computer console, part of the analog computer equipment used to simulate flight control performance.

In the foreground is the autopilot equipment with (1) two attitude and (2) three rate gyros used in positioning and stabilizing the vehicle. Number (3) is power supply, (4) the acceleration switches used in programming, and (5) are lights which indicate the operation of the control jets.





LEWIS SPACE TASK MEN, Jake Moser (standing) and Scotty Simpkinson check instrumentation plans.

the air around the antennas, primary data will be recorded during blackout and re-transmitted by a third RF link.

Each of fifty-two thermocouples on the head shield will relay data once every one-and-a-half seconds. On another channel in a similar manner fifty-two temperatures of the recovery cannister and afterbody cone will be recorded. In this way direct heat transfer will be measured. Pressure and accelerometer data will cover exit, re-entry and impact. Noise where the pilot's head would be in a manned space capsule, as well as noise outside the vehicle, will be picked up by three microphones and recorded on tape. Other recorders will be on board to provide a back-up recording of all data in case of gaps in the telemetering. Instruments will constantly monitor the gyro signals of the test vehicle. Valves to the eight control jets will be monitored to see that proper signals are being received and acted upon. Other signals to be monitored will be drogue chute development, and impact. The conical afterbody of the vehicle, being fabricated at Langley, will contain six flush antennas for the tracking beacons and telemetry.

Data will be taken off tape and converted to analog form in the Lewis Flight Research telemetry ground station in the Hangar, land-lined to Instrument Research Division for digitizing and editing, then fed on land-lines to the 10x10 SWT for computing on the Remington Rand 1103.

In charge of all onboard instrumentation, including telemetry and tape recording of data, is Jacob C. Mosher, assisted

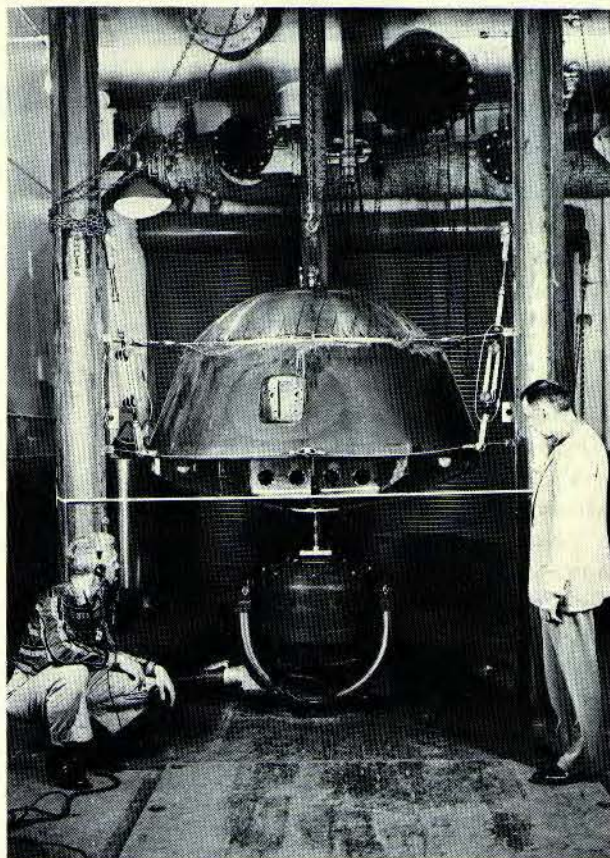
the capsule and test equipment are Robert R. Miller, Louis E. Corpas, Phil S. Ross and Frank J. Stenger.

Over 100 Lewis engineers and technicians are working on this part of the project.

## INSTRUMENTATION

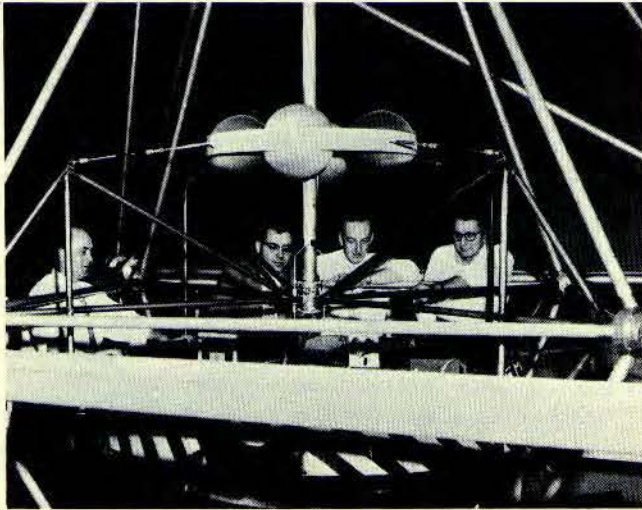
Experienced in radar tracking and telemetering of free flight missiles in conjunction with Pilotless Aircraft Research Division (PARD) at Wallops Island, Simpkinson's group is a "natural" to handle Mercury instrumentation.

The re-entry story will be told by instruments. Thirty-two continuous channels of data will be sent back from the vehicle by two links, in the standard FM telemetry band. Because of temporary telemeter blackout due ionization of



SHAKE TEST preparations in High Energy Fuels Laboratory are checked by William Lauten of Langley and Marty Eiband. These tests determine the structural capability of the vehicle to withstand vibration levels it will encounter in flight. Shake tests also determine that all systems function properly.





MOCK-UP in MASTIF is inspected by (l to r) Phil Ross, Lou Corpas, Pete Wanhainen, Bob Miller.

Gilkey. Andy was responsible for the Mercury capsule design.

Former Lewis men now assigned to the Langley Division Space Task Group are Milan Krasnican, Glynn Lunney, Leonard Rabb and Kenneth Weston. Krasnican is in Flight Component section, Lunney in Space Mechanics, and Rabb and Weston in Heat Transfer. John Disher is now at Headquarters, working with George Low, Chief of Manned Space Flight Program.

Now at Langley as technical advisor for the Bio-Medical Group is former Lewis Flight Safety section, Gerard J. Pesman.

When the test vehicles are ready to leave Lewis, Ed Gough and his pilots will handle the job of transporting them to Cape Canaveral for launching.

There are fifty-five scientists and engineers in the Lewis Division Space Task Group. All the divisions will, upon completion of facilities, be housed at Goddard Space Flight Center. The NASA Space Task Group is headed by Robert R. Gilruth, assisted by Charles J. Donlon. Project engineer for the "Big Joe" shot is Alec Bond of Langley.

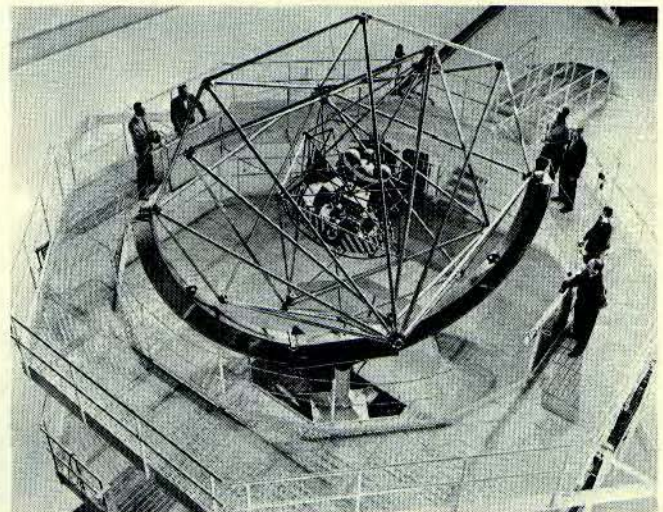
These are some of the Lewis people working on the project. Others, such as expeditors, mechanics, purchasing agents, sheetmetal workers and all supporting personnel in many branches, are also contributing their efforts and talents to the project.

The story of man in space is a big one - and it's just beginning.

by Michael Wedding. A. Martin Eiband coordinates the fabrication, handling and mechanical details involved in the launching of the first test vehicle. Dugald O. Black will handle coordination for the second test vehicle. Assisting is John Janckaitis. Frank A. Maruna is in charge of instrument building.

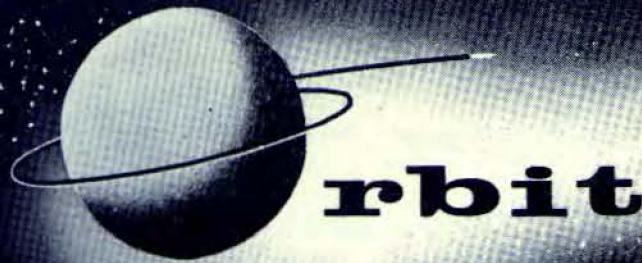
Elmer H. Buller is now stationed at the Air Force Missile Test Center, Patrick AFB, Florida, working with Melvin Gough, Director of NASA activities at the Cape. Buller is assisting in coordinating the range for all Project Mercury shots. Cliff Haight is assigned the task of liaison with instrument vendors in the Florida area.

Commuters to Langley are Andre J. Meyer, assistant chief of Engineering and Contract Division of Space Task Group, assisted by William Nesbitt and John



MASTIF: The capsule mock-up is mounted on the inner of the three cages giving the vehicle complete freedom of motion about all axes with extremely low drag and body friction in a near vacuum environment. It is therefore possible to have the vehicle perform all maneuvers in MASTIF that the flight vehicle will be required to perform between the time it leaves the Atlas booster and re-enters the atmosphere.





Vol. XVII

Cleveland, Ohio, September 25, 1959

No. 20

## CONGRESS PASSES HEALTH BILL

The house has passed our health program bill and it is almost a certainty that the president will affix his signature before the October 1 deadline.

It is too early at this date to determine what the bill will provide specifically when it becomes law. However, it is certain that basic and catastrophic health protection will be offered all government employees on the basis of four available plans.

The all-important dollar contribution will be made half from the employee and the balance from the government. Also, for the first time the employee's share will be handled via payroll deduction.

Enrollment in any of the four plans will be accepted without physical examination and, upon separation from the government, employees may convert their coverage to a private plan.

Orbit will carry more specific and detailed information relative to the health program when such becomes available.

## IT WAS LIKE THIS AT CANAVERAL

We learned early last week that the "Big Joe" launching at Cape Canaveral had been exceedingly successful in spite of booster troubles. During its 1400 miles journey down the Atlantic Missile Range at a height of greater than 100 miles, the Space Capsule re-entered the earth's atmosphere at about 14,000 m.p.h., and was recovered by picket line ships. During its historic flight the capsule registered a high temperature of 100 degrees F. which meant an easy capability to support human life . . . . Here are facts concerning our "Big Joe" launching on September 9, 1959 which have not seen print anywhere. The story of Big Joe is the story of the men who helped design and build it. How do these men feel as they sit in the Block House or Central Control Building at Cape Canaveral, following the launching and the flight of Big Joe? Some of our Lewis men were interviewed after their return from the Cape. Here are their comments:

Harold Gold (Attitude Controls project engineer): "For me the most exciting period during the launching of the Big Joe capsule began at the end of the countdown and ended five minutes later when telemeter signals indicated that the attitude control system was in operation. At T minus 30 seconds I could see the umbilical cable fall away on the television screen in the block house. The meter on our control panel swung to zero. After months of testing the attitude control system was finally operating independently of us. We had made our last check. Moments later we heard and felt the roar of the engines. The capsule was on its way. We turned to the clock and watched

the seconds count off. At T plus four minutes all eyes turned to the telemeter panel. Finally the meters on the panel deflected. The control system was on and our hopes were high for a successful flight."

Scott Simpkinson (Space Task Group in charge of fabrication, instrumentation and launching of Big Joe): "One of the most revealing items was the increase of our "Countdown" from three double-spaced pages to a book of forty-three pages which took seven hours and forty minutes to accomplish. The Cape cooperation is really shown by the fact that this countdown was printed by the Martin Co.

(Continued on page 3)







## CANAVERAL

(Continued from page 1)

at the Titan Hangar on the third shift, just three days prior to launch.

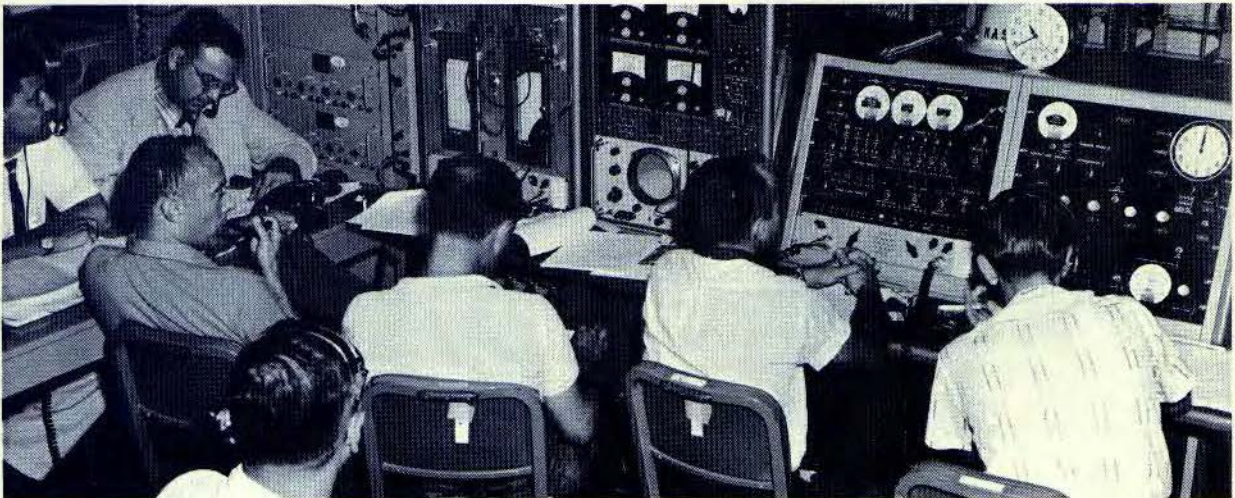
The outstanding thing throughout the entire nine months of preparation, right to the final countdown, was the ever-present determination of the NASA crew from Cleveland to have a perfect shot in spite of the back-breaking schedule and seemingly insurmountable obstacles which kept looming in front of them."

H. Warren Plohr (Lewis Controls engineer): "It was about 6 a.m., more than three hours after the launching of Big Joe. Initial data showing the Atlas hadn't operated as well as expected had left us disconsolate and weary. Suddenly Alec Bond, Langley Big Joe project engineer, received a call from down range and he started to shout: 'They found it! They found it! JUG WUMP. JUG WUMP.' Jug Wump was code meaning the recovery

plane crew were looking right at the capsule - not just seeing dye marker in the water, but there it is, the capsule itself! Happy pandamonium reigned in Central Control."

Jacob C. Moser (Space Task Group, in charge of all onboard instrumentation): "Our instrumentation system measured and recorded 160 quantities, 26 continuous and 134 sampled. The system included three transmitters and four tape recorders. Our microphone records sound weird - really from 'outer space.' Complete success of such a monumental effort came through the sweat and blood of the finest bunch of instrumentation people in the business."

G. Merritt Preston (Space Task Group, deputy chief of Big Joe project): "The success of the mission proves the capability of Lewis people involved in the operation."



Blockhouse Scene: Waiting during countdown of Big Joe are l to r: G. Merritt Preston, Scott Simpkinson, H. Warren Plohr, Harold Gold, Hap Johnson and Jacob Moser. Seated in the foreground is Alec Bond.

# 25 From Lewis Lab to Build Man Capsule

Twenty-five Cleveland scientists will have a major responsibility for actually putting a man into space.

This group has been transferred by the National Aeronautic and Space Administration to Cape Canaveral, Fla., from the Lewis Research Center here.

For six weeks they were in Canaveral working on the test firing of the man capsule last Wednesday. Now they are preparing to leave Cleveland permanently.

Their work was explained yesterday by G. Merritt Preston, assistant operations chief for Project Mercury, who has been commuting between Canaveral and Berea for a year.

The task of the Cleveland group will be to put the space capsule together and make sure it functions properly during the countdown.

Actually, 40 persons had this responsibility, but 25 were Clevelanders. Their group leader is Scott Simpkinson of the Lewis lab.

So complete is the Cleveland transfer that even Miss Emily Ertle, a secretary, has been sent to Florida.

Preston said the Cleveland group is the only large working unit that was transplanted for the project. It was selected, he explained, because of its experience in crash fire projects and missile firings.

Since 1945, Lewis personnel

experimented in maintaining instrument contact with airplanes that were being crashed to determine why they caught fire.

Simultaneously, in other operations, the local scientists experimented by firing missiles from moving airplanes.

Preston, who was flight research chief at Lewis during this time, said the only difference between the earlier research and Mercury was the scale of the project.

"We needed people trained to throw something away," he said. "Once you let go of this beast, you just don't have it anymore. We needed the Cleveland group because we had to make sure once we let go of it, it was going to work."

Average age of the Cleveland group is between 35 and 40, and average working time with the group for each man is 15 years.

Preston, 43, a native of Athens, O., praised the esprit de corps of the Cleveland contingent. "It's tremendous," he beamed. "They work 20 hours a day."

He singled out as key men on the team Martin Eiband, capsule engineer, Frank Maruna, in charge of electronics, Frank Crichton, mechanical technician chief, and Jacob Moser, head of instrumentation.

Clevelanders transferred to Canaveral in addition to those mentioned are Donald Woods, Jack Campbell, Warren Plohr, Harold Gold, Don Wilfert, Charles Heckelmoser, Robert Sorg, Vern Fisher, Michael

Wedding, Joseph Bender, Elmer Karberg, Robert Carlson, Armand Sanvido, Frank Bechtel, Edward Cudlin, Joseph Bobik,

Dugald Black, Arthur Busch, William Meyer, William Denman, John Janokaitis and Howard Roe.

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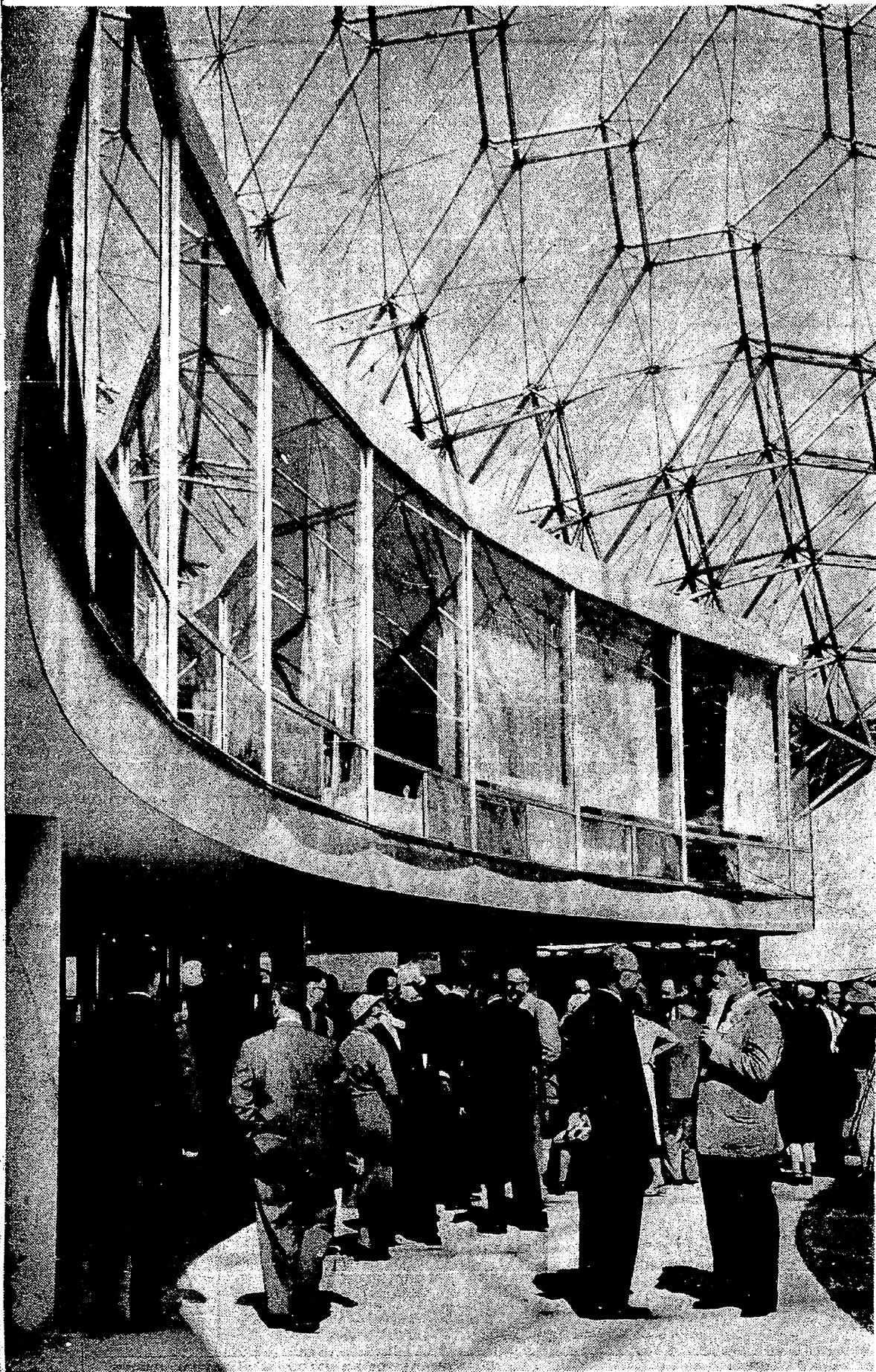
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Sgt. Anthony Wareing Charles W. Woodhams  
Welcoming the first Congo volunteer.  
Plain Dealer Photo (Edward J. Soltes)

## Congo Refugee Joins Army, Aims at Peace

By EMERSON L. BATDORFF

Charles W. Woodhams, who got chased out of The Congo in July, leaving all his worldly goods behind, took a retaliatory step yesterday.

He joined the U.S. Army.

"As far as I can tell, an army is the only way to bring peace to The Congo," said tall, blond Woodhams.

He was born in Mombasa 24 years ago, the son of Dr. and Mrs. R. C. Woodhams, medical missionaries, and spent most of his life in The Congo. His father lives in Cleveland at 1830 E. 101st Street, which is why the younger Woodhams came here to join the Army.

### Whites Buy Protection

"Whites had to buy a \$10 membership in a political party and carry the card to keep from being beaten up," Woodhams said.

He displayed his membership in Movement National Congolais, stamped with the name P. Lumumba.

"If you had this card maybe you wouldn't get beaten up," he said. "Maybe you would, too."

### Natives Offer Help

He said he left behind a logging business, two trucks, a car and a house when he fled the country at dawn the morning of July 17. He was guilty of being white.

"If you were white your word

wasn't good anymore," he explained.

He said natives of several outlying tribes with whom he had contact told him not to leave and they would protect him.

"But they are pretty far away," he said.

What the Army might have in mind for him in relation to his return to The Congo is not known.

### Takes Language Tests

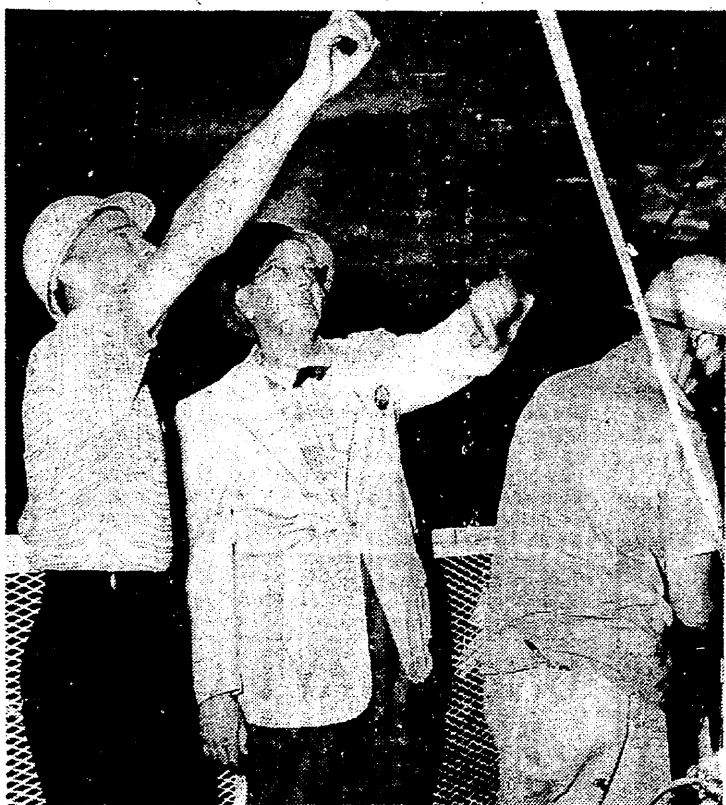
In addition to English he speaks French, Kikunda (a Congo trade language) and Kibila (a Congo tribal language). People who had been in the Army feared he might be sent to Alaska as a clerk-typist.

Not so, said Sgt. Anthony Wareing of the recruiting station.

"He is being given tests to see if his language proficiency can be used," said the sergeant. Woodhams was all for drawing a rifle and joining a Congo Expeditionary Force immediately. But there isn't one he can join.

## Dome Dedicated

The dedication day throng at the American Society for Metals headquarters in Novelty, Geauga County. The structure is a geodesic dome.  
Plain Dealer Photo (Ray Matjasic)



Alan B. Shepard Jr. S. H. Simpkinson E. H. Karberg

Preparing for a missile shot at Cape Canaveral are Shepard, one of the seven U.S. astronauts, and two Clevelanders from the Lewis Research Center. They are standing some 100 feet above the ground on a missile tower.

By WILSON HIRSCHFELD

Plain Dealer Staff Writer

CAPE CANAVERAL—In this scrub palm country along the Atlantic coast of central Florida transplanted Cleveland research scientists work at near- fever-pitch day and night on a mission of getting an American in space.

More than 50 researchers, engineers and technicians from Cleveland's Lewis Research Center are close to the delicately-ticking heart of Project Mercury, which they hope will have an astronaut in orbit before long.

But if the first Yank up there finds a Russian welcoming committee, it would come as no surprise to the Project Mercury people.

They even joke that when the U.S. astronaut takes a first

look around he may find a thatched-roof Soviet space cottage, complete with four bearded Cossacks quaffing vodka.

### Serious Business

But that's only a joke. The business here is deadly serious. "If we don't beat the Russians, it's not because we're not trying," says one Lewis lab scientist who ought to know.

He is G. Merritt Preston, who came down to the cape from Cleveland to assume responsibility for getting the man-carrying space capsule and its missile ready for the historic moment of lift-off.

"Maximum intensity is being given this project," says Preston, speaking from 21 years' background with the National Aeronautics and Space Administration.

"It is a crash effort we are making. I have seen many projects being pushed, but never one as much as this, even in wartime."

Preston and many of his colleagues are working up to 70 and 80 hours a week to close in on Boris, the sputnik man, who had so great a head start in the astral Olympic Games.

The Clevelanders who have moved to Canaveral dominate the NASA role in the space race.

They and others still at the Lewis Research Center were the ones who gave birth to the Project Mercury space capsule, a chunk of hardware affectionately known as "Big Joe."

### Reluctant to Come

Many of them longtime residents of Greater Cleveland, they were reluctant to give up

their homes for Canaveral-in-the-Middle-of-Nowhere.

The move was a fast one, made after an overnight decision. The Project Mercury cadre came to Florida and left their families behind.

Air commuting back to Cleveland was little avail in restoring family relationships. One by one, the families followed the breadwinners. Homes in Cleveland went up for sale. Some are still waiting for buyers.

The adventure of being at the hub of the space age race has worn thin for many here at Canaveral.

"The glamor's gone," Preston says.

As is immediately evident, life in the small satellite towns around Cape Canaveral is not to be mistaken for Cleveland. "We miss the metropolitan area, its educational and enter-

tainment facilities, its cultural activities," says Preston.

"We miss the availability of so many stores where you can go and buy most anything you're looking for."

The Cleveland-to-Canaveral switch has meant more outdoor living for the NASA employees and their families.

### Snakes Are Headache

As with most northerners who are new residents here, the Cleveland contingent is somewhat touchy about snakes.

Just 10 years ago Canaveral was an open, sprawling wilderness area. Today many of the housing developments that ring the area are no more than one hop, one skip and one jump from dense palmetto brush growth.

Accordingly, one keeps an eye

peeled for snakes down here in much the same manner as Clevelanders look for autos when crossing a busy street.

This is one of the worries troubling the NASA colony, particularly the families with small children.

### Rattler in Closet

Preston is having a house built on the Indian River at the mouth of the Banana River, not far from the Atlantic.

A workman in the house recently opened a closet and was met by a rattlesnake.

So it is not difficult to understand why the wives of some of the Lewis people abhor being at Canaveral. To placate the Florida Chamber of Commerce, let it be said that many of the wives already are real boosters for this state.



Where  
76 Escaped

NEW YORK—This is the wreckage of the American Airlines Electra turboprop airliner which crashed and burned while landing at LaGuardia Airport. The plane's 70 passengers and crew of six escaped death, although several persons required hospitalization.  
AP Wirephoto

## Yale Men, Mayors' Sons, Ponder Life, Politics

By NORMAN MELNICK

Two Yale men, not typical and not atypical, as they would insist, took up two spaces yesterday in a corner of the Plain Dealer cafeteria. It was unlike George and Harry's restaurant-bar in New Haven, but it served well enough.

As young intellectuals, concerned and yet unconcerned about their future places in society, they discussed areas of human experience and thought.

Richard Frank Celeste, 22, "It's ironic. Celebrezze made a really excellent speech (on the 'Future of Cleveland'), genuine tears flowing—the whole bit—while one of Cleveland's show-places (the Theatrical Grill) was burning down."

William Vaughan Stapleton, 23 (on whom he preferred, Nixon or Kennedy): "It's a tossup between two evils. I really couldn't say right now. I suppose I should get it over all at once and vote Democratic."

### Paths Part Tomorrow

The sons of two mayors, Wilson G. Stapleton of Shaker Heights and Frank P. Celeste of Lakewood, Vaughan and Dick were meeting for the first time since May, when they last

basted a few ideas at George and Harry's.

Tomorrow morning Vaughan and his wife, Jacqueline Joan, return to New Haven for his senior year at Yale, where he is a Scholar of the House. Three days later Dick motors to New York, where he embarks on the liner United States for England and Oxford University. He is a Rhodes scholar.

A Carnegie teaching fellow last year at Yale, where he also was a Scholar of the House in his senior year (1958-1959), Dick maintains an open mind on a career. At the moment these possibilities intrigue him: politics, government service, teaching, law and foreign correspondence.

### Points Toward Culture

Vaughan is emphatic. "My life's work," he says, "will be an interrelated program of anthropology, sociology and psychology—the whole realm of human culture and behavior."

After Yale he and his wife plan to make their permanent home in Israel. Joan would take an advanced degree at the Hebrew University. Her husband would do research there and in Africa and India, "using Israel as my base of operations."



Richard F. Celeste W. Vaughan Stapleton

Down from George and Harry's.

Plain Dealer Photo (Edward J. Soltes)



Night firing of a National Aeronautics and Space Administration missile at Cape Canaveral.



Don M. Corcoran A. M. Eiband

These engineers from Cleveland's Lewis Research Center are shown inserting an "umbilical plug" into a Project Mercury space capsule atop a missile at Cape Canaveral. They are on the 11th deck of the missile gantry.

## Clevelanders Lead in U.S. Effort to Put Man Into Space

By WILSON HIRSCHFELD

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As with most northerners who are new residents here, the Cleveland contingent is somewhat touchy about snakes.

Just 10 years ago Canaveral was an open, sprawling wilderness area. Today many of the housing developments that ring the area are no more than one hop, one skip and one jump from dense palmetto brush growth.

Accordingly, one keeps an eye



