

OFFICIAL GUIDE TO  
**EARTH'S LARGEST  
SPACE EXHIBIT**

ALABAMA  
SPACE & ROCKET  
CENTER



Plan at least two hours for tour  
Cameras welcome

# ENJOY YOUR TOUR OF THE SPACECENTER

Only a privileged few have had the rare opportunity to walk on the moon, but the ever expanding Alabama Space and Rocket Center gives us earthlings this experience under simulated conditions.

The Alabama Space and Rocket Center, Earth's largest space exhibit, is "dedicated by the citizens of Alabama to those Americans who have made it possible for man to walk on the moon and to explore the universe; and to the youth of America who will use the technology of space for the benefit of mankind."

Far more than a museum, the Center is devoted to the advancement and understanding of space exploration, discovery, and rocket development. NASA's Marshall Space Flight Center and the U. S. Army Missile Command are represented jointly with the aerospace and missile industry at this unique space age exhibit. The Center is a self-sustaining facility owned and operated by the State of Alabama. The Center's emphasis is on experience and participation. You can see, handle, operate and learn by doing much of what the Center seeks to tell. The Center LETS YOU BE THE ASTRONAUT as you experience the sights, sounds and sensations of space travel.

For space connoisseurs and ordinary folk alike, it tells the story of this nation's unparalleled leap into space in a fashion that neither baffles nor bores.

Fast becoming the South's most popular tourist attraction, the Space and Rocket Center can be sampled for a few hours by those passing through Huntsville, or savored for days by space buffs who come to study in earnest. It has been called many things by many people—A Space Age Museum, Space Disneyworld, and Showcase of Space. Wernher von Braun, its founder, calls it "the best facility of its kind in the world." It is the pride of Huntsville, Alabama and the whole state, for that matter. The Center houses the world's largest and most complete collection of missile and space equipment ever assembled—and it's still growing.

The Center serves as NASA's Marshall Space Flight Center's Visitor Information Center where visitors may obtain free information about this nation's space program and the Marshall Center's role in space exploration. Bus tours of the Marshall Space Flight Center depart from the Space and Rocket Center daily. The two-hour bus tour takes the visitor on a tour of the world's largest space vehicle test center where you can see close-up the test stands used to perfect the Apollo-Saturn V moon rocket. You can see future space vehicles like the Space Shuttle under development and visit the space simulator where Skylab astronauts train for missions. The bus tour offers you an opportunity to look behind the scenes of this nation's leading space center where tomorrow's space happenings can be previewed today.

This handout contains a brief description of the exhibits with Areas 1-13 indicated and a suggested route to follow. If you have questions, please direct them to the uniformed personnel who are available to assist you.

## AREA 1

The lobby of the Center is the introduction for your visit. NASA's Visitor Information Center located here, offers information about the space program and general visitor information. The Center's Satellite Tracking Station receives and displays weather information directly from an earth orbiting satellite.

The Wernher von Braun Recognition Room containing some of the awards, honorary degrees, and other honors

bestowed on the world's most renowned rocket expert is open for viewing by the public.

A lunar sample returned by the Apollo astronauts from the moon is prominently displayed in this area.

## AREA 2

The theater is the next stop where you will see the Center's feature film "Freedom To Explore." Using stereo sound, multi-image projection techniques and spectacular wide screen display, the 11-minute film traces man's progress from the stone age to the space age. The highly unconventional film has only a few spoken words, relying on sight and sound for its effect. It has won many domestic awards and was selected to represent the United States in film competition abroad. NASA space flight films are shown on a scheduled basis throughout the day. Check the schedule and select the film you would like to see.

## AREA 3

Did you know that the sun is a star and that Mars has an atmosphere that may support some form of life? This is an example of some of the things you will learn about our Solar System in Space Dimensions. After winding through a hallway of introductory information about our Universe, you will find yourself standing on a platform in deep space. All of the stars from the first to the sixth magnitude surround you. Directly in front of you is the Solar System. The nine planets are shown orbiting the sun at different distances. The illusion, created by use of black light and three dimensional models, is so convincing that some fear to look over the edge.

## AREA 4

Do you like to push buttons and pull levers to make things happen? If so, you'll find the do-it-yourself area of the Center to your liking. You can be an astronaut-for-a-day as you learn about the basic principles involved in rocketry and space travel, and the fun part is that you can pick and choose the device that interests you the most.

— Rocket power is at your fingertips as you press a button to start a narration that explains the how and why of rocket engines. As the narration is completed, you receive instructions to fire the engine. 5-4-3-2-1. Ignition! Press the firing command button and you are at the controls of a real, live rocket engine.

—In this area is the Asteroid Flight. You and a friend can race space craft through a simulated asteroid belt. This exhibit points up the hazards experienced by the Pioneer spacecraft. Pioneer navigated through the asteroid belt and the rings of Saturn to send back photographs of the planets.

— Have you ever wondered what a laser beam might look like? The laser exhibit lets you see a laser beam forming a three-dimensional image, or hologram, of a space vehicle.

— Many of the spacecraft now in space are powered by sun absorbing solar cells. The solar energy exhibit lets you see solar cells convert sunlight to operate a motor — just like parts of a spacecraft operating in space.

— Micro-miniaturization, or "mini-size" parts play a major role in space travel. Because of the reduction in size of many electronic components in space vehicles, many new products are now on the market such as a TV set with a two inch screen.

— Check your heart rate on the astronaut heart monitoring system by placing your finger tips on a mini-size transmitter. The signal on the screen is your heart beating.

— Why can't you fly to the moon in an airplane? Try the Action-Reaction exhibit and find out. Press the button which starts a pump that removes most of the air from the vacuum jar. You will notice that the propeller driven motor slows down and stops because there is not enough air in the jar for the propeller to push against. However, you will note that the rocket engine continues to operate because it needs no air to operate. That's why you can't fly to the moon in an airplane.

— Gyroscopes are an important part of a space vehicle's guidance system. The Gyro Chair lets you experience the reaction of a gyro. Take your seat in the simulated spacecraft, move the handle slowly to the left and hold that position. Then move the handle to the right and hold that position. The spinning wheel acts as a gyroscope and as you change its position, it will cause you and the spacecraft to move in the same direction.

#### **AREA 5**

Remember "Miss Baker", the first monkey to survive a successful flight into space? She now lives here with her husband Big George in a specially designed monkeynaut chamber. Miss Baker is the smaller of the two monkeys.

— Techniques used to maneuver a spacecraft in the vacuum of space are illustrated here with the Pitch, Yaw and Roll exhibit. The thrusters react as you push or twist a handle to maneuver the spacecraft. Also shown are air bearings, another form of lubrication used in space vehicles.

— Exotic materials that make up a space vehicle are in this area. You may bend a beam with the touch of your hand and operate a maze of gears lubricated by a new space developed technique.

#### **AREA 6**

The Information Lounge is located on the balcony. The Television-Telephone exhibit lets you talk to and see a friend by way of a new device called the Picturephone. Other exhibits related to space travel are located here.

#### **AREA 7**

The restaurant and rest rooms are located on the basement level in Area 7. You can enjoy a delicious sandwich while taking in the view of the world's largest collection of rockets, missiles and space vehicles.

Climb in the Mercury Spacecraft, press the button and prepare for a simulated ride into space aboard a spacecraft similar to the one flown by Astronaut John Glenn.

#### **AREA 8**

On the far side of the building, you will find how the technology you have learned about is applied in rockets and space flight. Two individuals may play against one another in the Preparedness Game, a missile strategy computer. This involvement exhibit invites you to design your own missile system by making a selection of desirable features being tested in a simulated combat situation.

Missile systems that have been designed to defend the nation from hostile forces are dramatically displayed in a large housing featuring models, slides and narrations.

#### **AREA 9**

The east balcony features the historical story of Rocket Pioneers. The accomplishments and achievements of men like Goddard, Oberth, Toftoy and von Braun are shown along with some of the hardware used in the past.

The story of spacesuit development starting with the Navy flight suit and continuing through early Apollo is displayed. A tribute to the Apollo I astronauts who died in an accident at Cape Kennedy in 1967 is exhibited in this area.

#### **AREA 10**

In the Space Applications area, you will find space suit equipment, an explanation of the manned moon landing mission, an incredibly detailed model of the Saturn V launch vehicle, the story of Skylab and other potential future space missions.

Space scales permit you to check your weight on the planets Earth, Mars and on the Moon. The Satellite Wall exhibit directs your attention to satellites hung in the high bay area through viewing ports aligned with the satellites.

The first international space mission is featured in this area. You are offered the opportunity to maneuver the Apollo spacecraft and attempt to dock with the Russian Soyuz spacecraft.

#### **AREA 11**

America's future in space exhibit features the Space Shuttle, the U.S.'s next major manned space flight program. The animated exhibits are displayed in three dimensional form, in a black lighted space chamber. The benefits derived from space research are displayed in this area.

#### **AREA 12**

The high ceiling atrium in the center of the building features full-size missile and space hardware. You can examine an actual Mercury spacecraft and the Apollo 16 spacecraft "Casper" which flew to the moon in 1972. See the Russian spaceship Vostok. You can climb into the Apollo 11 Quarantine Van, home to the Apollo 11 astronauts for 10 days after their return from the moon. A full-size moon-buggy, like the one driven on the moon by U.S. astronauts, is shown. Full-size mockups of Surveyor, Lunar Orbiter, Mariner, Syncom, Nimbus and the 96-foot long Pegasus Meteoroid Detection satellite hang overhead.

A full-size Apollo Lunar Module, just like the one used to land on the moon, is the center of attraction in this area.

The U.S. Army's famous Huey gunship complete with attached rocket launchers, is dramatically displayed from the ceiling. An assembly of small Army rockets ranging from LOKI of the late 1940's to the Dragon, TOW and Redeye of today are exhibited. Across the hall hangs the bat-like Quick Monoplane built and flown near Huntsville in the early 1900's, about the time of the Wright Brothers' historic flight. The 22 foot diameter Instrument Unit, which is the "brain" of the Saturn V moon rocket, is exhibited nearby.

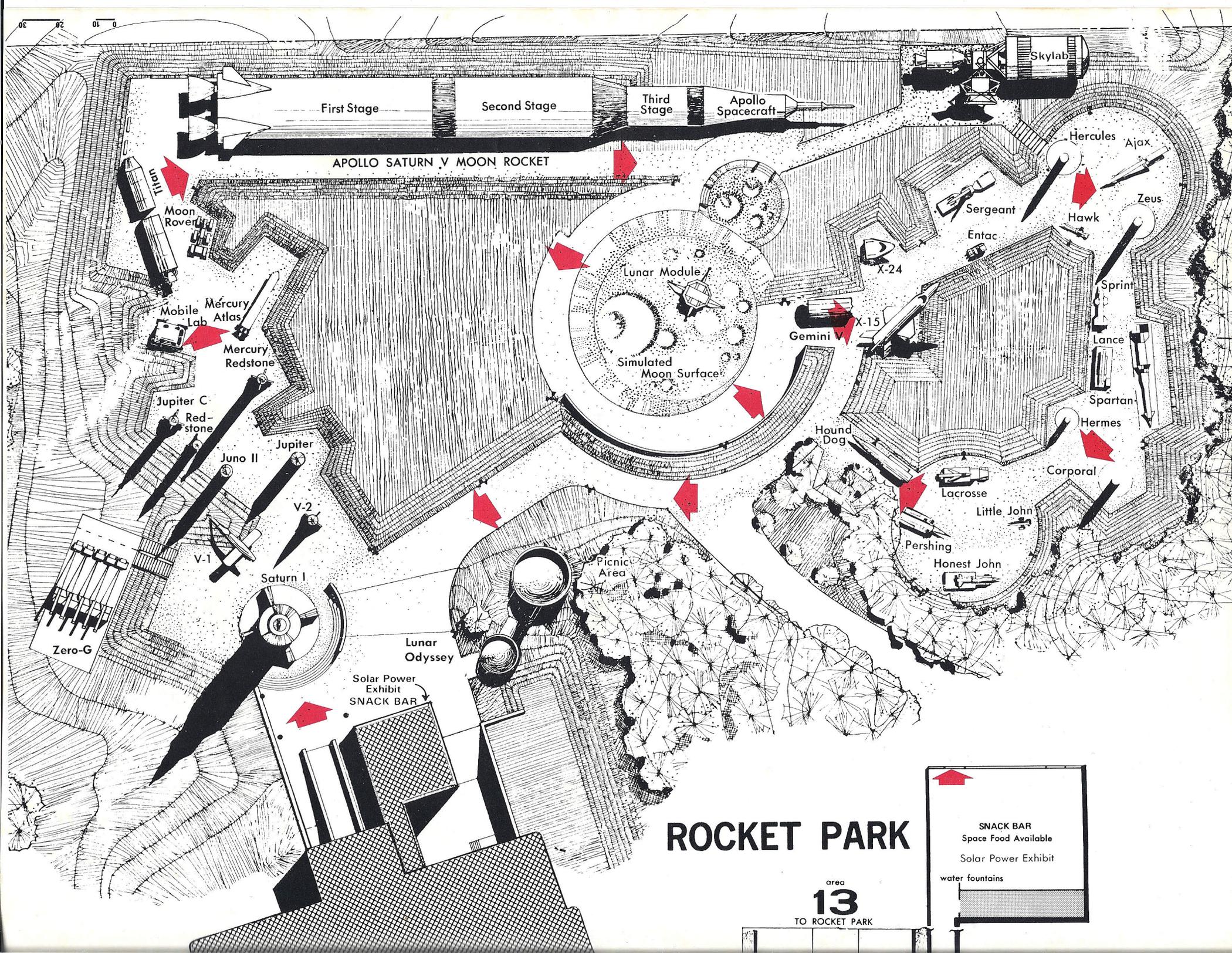
Also featured in Area 12 are demonstrations which are performed by Center personnel throughout the day. One demonstration is the amazing singing flame, discovered while testing rocket engines. Another is the Apollo lunar space suit. This is an actual lunar suit used by the astronauts while training. The different functions of the suit parts are demonstrated. Another demonstration is the zero gravity simulation equipment used by the astronauts and Marshall Space Flight Center engineers to design Skylab tools. Check the schedule for times of these programs.

#### **LUNAR ODYSSEY - Space Flight Simulator**

Lunar Odyssey is located out in the Rocket Park just beside the Snack Bar. The simulated space flight allows you to experience a journey through space and a landing on the moon. A spinning theatre with special effects including stereo sound, motion and still photography and a planetarium star projector combine to present a very realistic space travel experience. Check the schedule for showings.

#### **ZERO GRAVITY - The Weightless Machine**

You can experience the sensation of floating in space on the Space Center's newest attraction, the zero G weightless machine. Buckle up and pushoff, floating like an astronaut through space.



First Stage

Second Stage

Third Stage

Apollo Spacecraft

APOLLO SATURN V MOON ROCKET

Skylab

Hercules

Ajax

Zeus

Sergeant

Hawk

Entac

X-24

Sprint

Lunar Module

Simulated Moon Surface

Gemini

X-15

Lance

Spartan

Hermes

Titan

Moon Rover

Mobile Lab

Mercury Atlas

Mercury Redstone

Jupiter C

Redstone

Jupiter

Juno II

V-2

V-1

Saturn I

Zero-G

Lunar Odyssey

Picnic Area

Solar Power Exhibit  
SNACK BAR

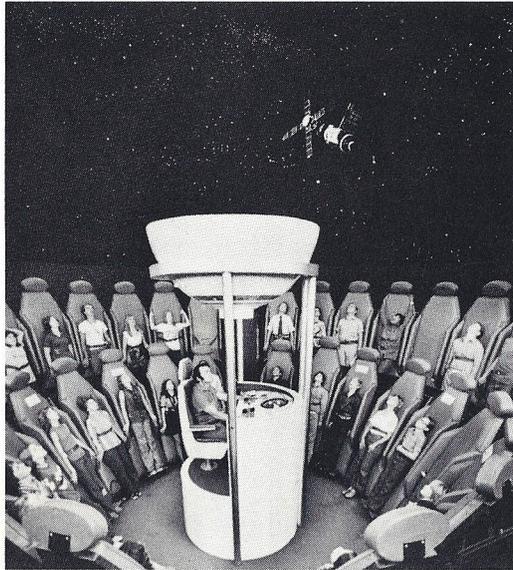
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SNACK BAR  
Space Food Available  
Solar Power Exhibit  
water fountains

# ROCKET PARK

area  
**13**  
TO ROCKET PARK

EXHIBIT BUILDING



LUNAR ODYSSEY FLIES DAILY — CHECK SCHEDULE

# SUGGESTED TOUR OF THE ALABAMA SPACE & ROCKET CENTER

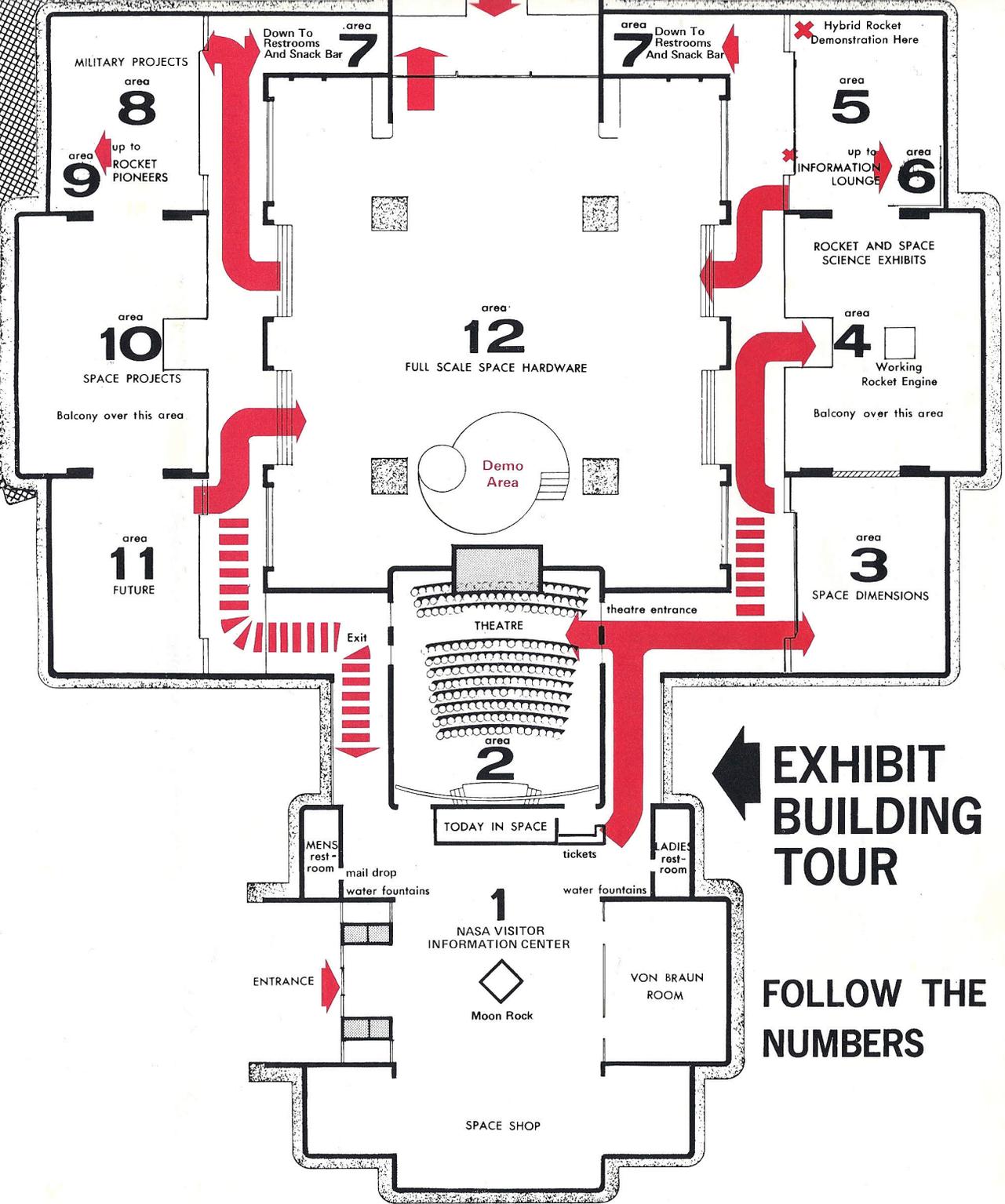


EXHIBIT  
BUILDING  
TOUR

FOLLOW THE  
NUMBERS

# ROCKET PARK

## USE THIS AS YOUR GUIDE WHILE TOURING THE PARK

### 1. SATURN I

Saturn I was the first large space vehicle developed solely for space exploration. It was designed and developed at the Marshall Space Flight Center in Huntsville, Alabama. Saturn I operates at a top speed of 17,000 m.p.h. and can launch 11 tons into orbit. Saturn I launched the first unmanned Apollo spacecraft and three Pegasus satellites for meteoroid detection in space. An updated version of this rocket called Saturn IB launches Skylab astronauts into earth orbit.

### NEW FEATURES

This area is used to feature recent additions that have not yet been given a permanent exhibit placement. Notice the newest exhibits—Lunar Odyssey and the Zero Gravity Machine.

### 2. V-1 BUZZ BOMB

This is the German cruise-type missile called the "Buzz Bomb" because of the unusual sound made by its engine. It is powered by an aero-pulse engine which burns any gasoline-type fuel and produces 900 pounds of thrust. Approximately 20,000 V-1's were launched against England and Belgium during 1944-1945. Over 1200 U. S. built copies, called the JB-2, were tested by the Army and Navy. This missile is exhibited through the courtesy of the Air Force Museum, Dayton, Ohio.

### 3. V-2

The V-2 proved that the basic theories of rocketry were correct. It was first launched on October 3, 1942, at Peenemunde, Germany, and broke all records for height, weight, speed, and range. The V-2 was brought to the United States in 1945 and inaugurated the United States missile program.

### 4. JUPITER

In 1959, the U. S. Army's Jupiter launched two primates named Able and Baker into space. This experiment proved that living creatures could pass through lift-off and reentry and return safely to earth. The Jupiter generates 150,000 pounds of thrust. The celebrated Miss Baker, now retired from the monkeynaut corps and living at the Space and Rocket Center, was a passenger on a Jupiter just like this one.

### 5. JUNO II

Juno II was a modified Jupiter with upper stage added for launching space probes. The Pioneer and Explorer satellites were launched by the U. S. Army's Juno II.

### 6. REDSTONE

This rocket is known as "old reliable" because of the many diverse missions it fulfilled in the early days of the space age. There were three versions of the Redstone; the military, satellite and manned vehicles. This is the military version designed to transport nuclear or conventional warheads at ranges up to 200 miles. Its power plant burns liquid oxygen and an alcohol-water mixture producing 75,000 pounds of thrust.

### 7. JUPITER C

The U. S. Army's second version of Redstone, the Jupiter C, launched the first U. S. satellite, Explorer I, on January 31, 1958.

### 8. MERCURY-REDSTONE

The third version of Redstone was the first of a series of rockets used in the U. S. manned space flights. In May, 1961, a

Mercury-Redstone rocket launched Astronaut Alan B. Shepard on a sub-orbital flight aboard Freedom 7. Thus Shepard became the first U. S. astronaut to ride a rocket.

### 9. MERCURY ATLAS

The Atlas space launch vehicle was originally designed as a weapon and later modified to launch manned and unmanned space hardware in 1962. The Atlas launched John Glenn, the first U. S. astronaut to orbit the earth, into space aboard the Mercury Friendship 7 spacecraft. The Ranger, Surveyor, Lunar Orbiter and Mariner spacecrafts were launched by Atlas.

### 10. MOBILE LABORATORY

This mobile laboratory was initially built as a study of the type of vehicles that might be used to explore the moon's surface. After studies were completed by NASA the lab was used by the Interior Department for direct application in the field of geology.

### 11. MOON BUGGY

This six wheel moon buggy is an early design built to test the possible configuration for a mobile vehicle for exploring the surface of the moon. One important design factor that carried through to the final design used by the Apollo astronauts was the wire wheel.

### 12. TITAN

The U.S. Air Force Titan rocket was developed for defense. Titan II was used by NASA to launch the two-man Gemini spacecraft.

### 13. APOLLO SATURN V MOON ROCKET

First stage—The Apollo Saturn V was designed to transport man to other planets and lift tons of cargo into space. It was used to launch our astronauts to the moon. The first stage is powered by five liquid fuel engines that consume 5,000 gallons of fuel per second producing 160 million horsepower. The first stage is 138 feet long and 33 feet wide. It is transported on the vehicle shown here. During flight the first stage operates for 2½ minutes and shuts down at 40 miles altitude. This stage burns kerosene and liquid oxygen.

Second Stage—The second stage powers the spacecraft to an altitude of 117 miles above the earth at a speed of 15,300 m.p.h. The five J-2 rocket engines generate one million pounds of thrust and burn liquid hydrogen and oxygen. The interstage or connector of the first and second stage has been removed to provide for viewing of the engines.

Third Stage—The third stage increases the spacecraft orbital speed to 17,500 m.p.h. After one orbit it re-ignites to push the spacecraft away from earth at a speed of 25,000 m.p.h. on a path to the moon. This single J-2 engine generates 225,000 pounds thrust. On recent moon flights this stage has been guided to impact the moon in order to record seismographic information. This stage without rocket engine and related components will be converted to living quarters for three astronauts and used as the Skylab space station for missions of 28 and 56 days.

Instrument Unit—The instrument unit serves as the central brain of the total vehicle. This unit is packed with computers and electronic controls designed to maintain a path of flight that will place the astronauts at the required point in space (not shown here—on exhibit in building).

Apollo Spacecraft—The 100,000 lb. Apollo consists of the lunar module, service module, command module and launch

escape system. The Lunar Module not seen here, is stored with its legs folded inside the container directly behind the Apollo Command and Service Modules. The astronauts are in the Command Module for most of the flight, and this is the only part of the Apollo-Saturn vehicle that makes a complete round trip back to earth. The launch escape tower, the most forward part of the rocket, is used in the event of a failure on the pad or just after liftoff. Its rocket motor has a thrust of 150,000 lbs.—twice that of a Redstone rocket.

This Apollo-Saturn V vehicle was used for ground testing here on earth. It has never been in space. However, it is very similar to those moon rockets that have launched astronauts to the moon. Standing on the pad, the vehicle is 363 feet tall, or about the length of a football field, and weighs 3,000 tons fueled and ready for launch. This is the only Apollo-Saturn V moon rocket on public exhibit in the world.

#### **14. SIMULATED MOON SURFACE**

“Here men from the planet Earth first set foot upon the moon July 20, 1969, A. D.” This simulated moon crater features the Apollo Lunar Module used by the astronauts to explore the moon’s surface. The crater was designed and built with the assistance of NASA scientists and astronauts who have explored the lunar surface. It closely resembles the texture of certain areas on the moon.

#### **15. SKYLAB**

This is a full scale exterior mock-up of the Skylab space station. Three crews of three astronauts lived in Skylab while orbiting the earth for a total of 161 days in 1973-74. Part of this mock-up was used by the astronauts during training inside the Neutral Buoyancy Trainer at Marshall Space Flight Center.

#### **16. GEMINI-TITAN V RECOVERED STAGE**

This is the largest piece of a rocket stage ever recovered from a manned flight. This is the forward half of the first stage of the Gemini-Titan launch vehicle. The complete vehicle boosted Astronauts Gordon Cooper and Charles Conrad into earth orbit for an 8 day mission aboard Gemini V on August 21, 1965.

#### **17. X-15 ROCKET PLANE**

The X-15 rocket powered plane made the first manned probes into the lower edges of space. Several X-15 pilots including Neil Armstrong earned “astronaut” rating by flights to an altitude of 50 miles. The X-15 flight program contributed significantly to the Mercury, Gemini, and Apollo projects. The X-15 was carried aloft by a B-52 and released at about 45,000 feet and 500 m.p.h. Its rocket engine then fired for the first 80 to 120 seconds of flight. The remainder of the 10 to 11 minute flight was powerless and ended with a 200 m.p.h. glide, landing on a dry lake bed.

#### **18. X-24 LIFTING BODY**

This is a mock-up of the X-24 rocket powered airplane. The X-24 is carried aloft by a B-52 plane and released at 45,000 ft. The rocket plane climbs to 60,000 ft. after an initial boost from its rocket engine. Afterwards, the pilot glides the vehicle to landing. The X-24 is providing research information for the Space Shuttle rocket plane.

#### **19. ENTAC**

ENTAC is a surface to surface guided missile of French manufacture used in limited numbers by the U.S. Army. No longer in use, it was effective against tanks, armored vehicles and bunkers.

#### **20. SERGEANT**

Sergeant is a Field Artillery Ballistic Missile System that is reliable, rugged, accurate, and mobile. It utilizes an inertial guidance system and solid propellant motor, giving it immunity to known electronic countermeasures.

#### **21. HERCULES**

The Nike Hercules is the United States’ primary high

altitude air defense weapon in operational status. The weapon has successfully killed every winged target ever flown against it.

#### **22. NIKE AJAX**

The Nike Ajax was this country’s first operational Air Defense Guided Missile System. No longer in service use, the Ajax was replaced by the more advanced Nike Hercules system during the 1960’s.

#### **23. NIKE ZEUS**

The Nike Zeus missile, developed by the U.S. Army Missile Command, played a key role in providing the feasibility of an effective ballistic missile defense.

#### **24. HAWK**

Hawk can search out and destroy attacking aircraft. The Hawk Air Defense System is transportable and capable of maintaining a high rate of fire.

#### **25. SPARTAN**

The Army’s largest and most powerful missile, the Spartan is a long-range interceptor for the Safeguard Anti-ballistic Missile System. This missile has three solid propellant stages and is capable of operating outside the earth’s atmosphere.

#### **26. SPRINT**

This sleek anti-ballistic missile is a two stage, short range interceptor and can reach its target within seconds after launch.

#### **27. LANCE**

Lance is a surface to surface ballistic missile which is to provide greater fire support to Army divisions.

#### **28. HERMES**

Hermes began in 1945 as an Army project covering a general program of research and development. This technology led to long range surface to surface and high altitude air defense missiles. The Hermes was designed to carry a heavy warhead to a range of 90 nautical miles.

#### **29. CORPORAL**

The Army Corporal is a surface-to-surface guided liquid fueled missile capable of engaging tactical targets far beyond the range of artillery.

#### **30. HONEST JOHN**

The Army’s Honest John is a simple, free-flight rocket. It is a highly mobile self-propelled launcher and retains the accuracy of standard artillery weapons.

#### **31. LITTLEJOHN**

Littlejohn is one of the Army’s most advanced free-flight rocket systems. It is highly mobile and packs the explosive power of heavy artillery.

#### **32. LACROSSE**

Lacrosse represents one of the Army’s first attempts to obtain extreme accuracy with a surface to surface guided missile. Launched on a ballistic trajectory from a rear area, it could be picked up in flight by a forward observer and then steered directly to its target with radio controlled commands.

#### **33. PERSHING**

Pershing is a two-stage, solid propellant ballistic missile with a selective range capability. It carries a nuclear warhead to a range of 400 miles.

#### **34. HOUND DOG**

The U.S. Air Force Hound Dog is a supersonic, jet propelled, air-surface standoff strategic missile. It is carried in pairs under the wings of B-52 bombers and has a range of 500 miles.

# TOUR NASA

## SEE MARSHALL SPACE FLIGHT CENTER

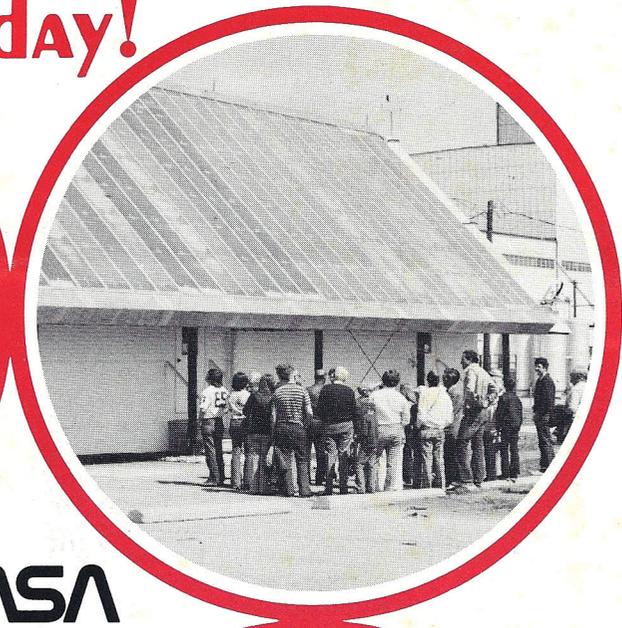
NASA invites you to see the Marshall Space Flight Center, one of the space agency's largest field installations. Tour buses, departing regularly from the Alabama Space and Rocket Center, give you a cross sectional view of the Marshall Center. At several stops, you can leave the bus and enter buildings and test areas of significant historical and current interest.

One of the most impressive stops will be at the Skylab Space Station mock-up which was used during design of the actual space hardware for Skylab. You will be allowed to go inside the mock-up and see how the astronauts lived and worked while in earth orbit.

At other stops you will see the Neutral Buoyancy Simulator where astronauts trained in a huge tank of water to simulate weightlessness, and see the Space Shuttle story about the vehicle which flies to space and then returns to be used again. You can photograph the historic test stands where Saturn rocket engines and entire stages were fired before flights into space and view the "Solar House," a test project to use the Sun's energy for heating and cooling a home on earth.

Be sure to bring your camera and plan two hours for the bus tour.

## HISTORY BEING MADE Today!



**NASA**

National Aeronautics and  
Space Administration

