

**United States Department of the Interior  
National Park Service**

**National Register of Historic Places  
Inventory—Nomination Form**

For NPS use only

received

date entered

See instructions in *How to Complete National Register Forms*  
Type all entries—complete applicable sections

**1. Name**

historic Neutral Buoyancy Space Simulator

and/or common Neutral Buoyancy Space Simulator

**2. Location**

street & number George C. Marshall Space Flight Center \_\_\_\_\_ not for publication

city, town Huntsville \_\_\_\_\_ vicinity of \_\_\_\_\_ congressional district \_\_\_\_\_

state Alabama code 01 county Madison code 089

**3. Classification**

<b>Category</b>	<b>Ownership</b>	<b>Status</b>	<b>Present Use</b>	
___ district	<input checked="" type="checkbox"/> public	___ occupied	___ agriculture	___ museum
___ building(s)	___ private	___ unoccupied	___ commercial	___ park
<input checked="" type="checkbox"/> structure	___ both	___ work in progress	___ educational	___ private residence
___ site	<b>Public Acquisition</b>	<b>Accessible</b>	___ entertainment	___ religious
___ object	___ in process	<input checked="" type="checkbox"/> yes: restricted	<input checked="" type="checkbox"/> government	<input checked="" type="checkbox"/> scientific
	___ being considered	___ yes: unrestricted	___ industrial	___ transportation
		___ no	___ military	<input checked="" type="checkbox"/> other: Space

Exploration

**4. Owner of Property**

name National Aeronautics and Space Administration (NASA)

street & number

city, town Washington \_\_\_\_\_ vicinity of \_\_\_\_\_ state D.C. 20546

**5. Location of Legal Description**

courthouse, registry of deeds, etc. National Aeronautics and Space Administration (NASA)

street & number Real Property Management Office Code NXG

city, town Washington \_\_\_\_\_ state D.C. 20546

**6. Representation in Existing Surveys**

title Historic Properties Report (Draft) has this property been determined eligible? \_\_\_ yes \_\_\_ no

date July 1983 \_\_\_x federal \_\_\_ state \_\_\_ county \_\_\_ local

depository for survey records U.S. Army Redstone Arsenal

city, town Huntsville \_\_\_\_\_ state Alabama

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## 7. Description

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**Condition**

excellent  
 good  
 fair

deteriorated  
 ruins  
 unexposed

**Check one**

unaltered  
 altered

**Check one**

original site  
 moved    date \_\_\_\_\_

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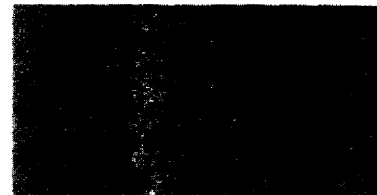
**Describe the present and original (if known) physical appearance**

The Neutral Buoyancy Simulator is in Building 4705 at the Marshall Space Flight Center in Huntsville, Alabama. A large water tank, 75 feet in diameter and 40 feet deep is the heart of the simulator. The water within the simulator is temperature controlled, continuously recirculated, and filtered. There are four observation levels with portholes to view activities within the simulator. An elevator serves all four observation levels. Special systems are integrated into the tank for underwater audio and video, pressure-suit environmental control, and emergency rescue and treatment. Life support is simultaneously provided by these systems for up to four pressure-suited subjects. Additional systems include data acquisition and recording, underwater lighting, special underwater pneumatic and electrical power operations of motor, valves, controls, and indicators that are required for high fidelity, and functional engineering mockups and trainers.

Adjacent to the Neutral Buoyancy Simulator is a completely equipped test control area for directing, controlling, and monitoring simulation activities in the Neutral Buoyancy Simulator. An annex contains the operating crew dressing and shower area.<sup>1</sup>

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Footnotes

1. George C. Marshall Space Flight Center Master Plan (Washington, D.C.: National Aeronautics and Space Administration, 1980), p.31.

# 8. Significance

<b>Period</b>	<b>Areas of Significance—Check and justify below</b>			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> art	<input checked="" type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> humanitarian
<input type="checkbox"/> 1800-1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> theater
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input type="checkbox"/> transportation
		<input type="checkbox"/> invention		<input checked="" type="checkbox"/> other (specify) Space Exploration
<b>Specific dates</b>	1955-Present	<b>Builder/Architect</b>	U.S. Army, NASA	

**Statement of Significance (In one paragraph)**

The Neutral Buoyancy Simulator was constructed in 1955 by the Army at the Redstone Arsenal. It was designed to provide a simulated zero-gravity environment in which engineers, designers, and astronauts could perform, for extended periods of time, the various phases of research needed to gain first hand knowledge concerning design and operation problems associated with working in the zero-gravity environment of space. Because of this capability to support research and testing of operational techniques and materials needed to successfully performed manned space missions the Neutral Buoyancy Simulator contributed significantly to the American manned space program especially Projects Gemini, Apollo, Skylab, and the Space Shuttle. The Neutral Buoyancy Simulator is a facility that is unique within the NASA inventory of training facilities. Until the mid-1970s, when an additional facility was constructed at the Johnson Space Flight Center to support the Space Shuttle Program, this facility was the only test facility that allowed astronauts to become familiar with the dynamics of body motion under weightless conditions.

The Neutral Buoyancy Simulator is on the NASA public tour of the Marshall Space Flight Center and is interpreted to the public.

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Bibliography

Brooks, Courtney G., Grimwood, James M., and Swenson, Loyd S. Chariots for Apollo: A History of Manned Lunar Spacecraft. Washington, D.C.: National Aeronautics and Space Administration, 1979.

Draft Historic Properties Report Redstone Arsenal, Alabama with the George C. Marshall Space Flight Center. Silver Spring, Maryland: Building Technology Incorporated, 1983.

Master Plan George C. Marshall Space Flight Center. Washington, D.C.: National Aeronautics and Space Administration, 1980.

Technical Facilities Catalog Vol. 111. Washington, D.C.: National Aeronautics and Space Administration, 1974.

# 9. Major Bibliographical References

See continuation sheets

# 10. Geographical Data

Acreeage of nominated property Less than 1 acre

Quadrangle name Madison

Quadrangle scale 1:24,000

### UMT References

A 

1	6	5	2	9	5	0	0	3	8	3	4	5	0	0
Zone		Easting				Northing								

B 

Zone		Easting				Northing								

C 

Zone		Easting				Northing								

D 

Zone		Easting				Northing								

E 

Zone		Easting				Northing								

F 

Zone		Easting				Northing								

G 

Zone		Easting				Northing								

H 

Zone		Easting				Northing								

### Verbal boundary description and justification

The boundary of the Neutral Buoyancy Simulator is defined by the outside perimeter of Building 4705 at the Marshall Space Flight Center

### List all states and counties for properties overlapping state or county boundaries

state code county code

state code county code

# 11. Form Prepared By

name/title Harry A. Butowsky

organization National Park Service date May 15, 1984

street & number Division of History telephone (202) 343-8168

city or town Washington, D.D. 20240 state

# 12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

national  state  local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature

title date

For NPS use only

I hereby certify that this property is included in the National Register

date

Keeper of the National Register

Attest: date