

United States Department of the Interior
National Park Service

For NPS use only

National Register of Historic Places
Inventory—Nomination Form

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street & number George C. Marshall Space Flight Center not for publication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

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

depository for survey records U.S. Army Redstone Arsenal

city, town Huntsville state Alabama

7. Description

Condition

excellent
 good
 fair

deteriorated
 ruins
 unexposed

Check one

unaltered
 altered

Check one

original site
 moved date _____

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.¹

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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

Period	Areas of Significance—Check and justify below			
<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/ humanitarian
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> art	<input checked="" type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> theater
<input type="checkbox"/> 1800-1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> transportation
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input checked="" type="checkbox"/> other (specify) Space Exploration
		<input type="checkbox"/> invention		

Specific dates 1955-Present **Builder/Architect** 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

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 _____