

CAPE CANAVERAL AIR FORCE STATION,
LAUNCH COMPLEX 39,

HAER NO. FL-8-11-S-6

SOLID ROCKET BOOSTER DISASSEMBLY & REFURBISHMENT COMPLEX
ROBOT WASH FACILITY

(Hangar AF Complex-Robot Wash Facility)
(John F. Kennedy Space Center)

Cape Canaveral
Brevard County
Florida

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service
Department of Interior
100 Alabama St., SW
Atlanta, Georgia 30303

HISTORIC AMERICAN ENGINEERING RECORD

CAPE CANAVERAL AIR FORCE STATION, LAUNCH COMPLEX 39,
SOLID ROCKET BOOSTER DISASSEMBLY & REFURBISHMENT COMPLEX
ROBOT WASH BUILDING
(Hangar AF Complex - Robot Wash Building)

HAER No. FL-8-11-S-6

Location: Cape Canaveral Air Force Station, Cape Canaveral,
Brevard County, Florida.

USGS Orsino, Florida, Quadrangle, Universal
Transverse Mercator Coordinates: E 540465.24 N
3151325.46 Zone 17, NAD 1983.

Date of Construction: 1987

Present Owner: National Aeronautics and Space Administration (NASA)

Present Use: Solid Rocket Booster Disassembly & Refurbishment

Significance: The Solid Rocket Booster (SRB) Disassembly & Refurbishment Complex contains the Robot Wash Building and eight other facilities that played an essential role in the reusability of the SRBs in the Space Shuttle Program (SSP). The complex is considered eligible for the NRHP as a historic complex in the context of the SSP (1969-2011) under Criterion A for Space Exploration. The Robot Wash Building has achieved exceptional significance within the past 50 years, so Criterion Consideration G also applies. The complex was originally designed or modified to process SRBs, from pre-launch manufacture and assembly to post-launch recovery, disassembly, cleaning, and refurbishment. The complex maintains a high level of integrity.

Report Prepared by: New South Associates, Stone Mountain, Georgia

Date: October 16, 2012

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PART I. HISTORICAL INFORMATION

A. INTRODUCTION

The Robot Wash Building (Building 66320) lies within the SRB Disassembly and Refurbishment Complex, which is located on Hangar Road in the Industrial Area of the Cape Canaveral Air Force Station (CCAFS). The complex's boundaries are defined as the edges of the concrete hardscape that surrounds Hangar AF. The complex contains nine contributing resources, including the Robot Wash Building (8BR2007). The remaining eight contributing resources are Hangar AF (8BR2001), the High Pressure Gas Building (8BR2002), the High Pressure Wash Building (8BR2003), the First Wash Building (8BR2004), the SRB Recovery Slip (8BR2005), the SRB Paint Building (8BR2006), the Thrust Vector Control Deservicing Building (8BR2008), and the Multi-Media Blast Facility (8BR2009).

The complex is a significant historic property for its association with the Space Transportation System (STS), commonly known as the "Space Shuttle." The STS was a unique breakthrough in the history of the U.S. Space Program because it was based on a design that made most of its major components reusable. This model decreased program costs and helped make orbital space flight a routine endeavor. Along with the orbiter spacecraft, the SRBs were two of the Space Shuttle's primary reusable elements, while the external tank (ET) was not reused. The SRBs' reusability was made possible by a number of facilities at Kennedy Space Center (KSC) and CCAFS, including the SRB Disassembly and Refurbishment Complex. The complex is the first place the SRBs were brought after their recovery from sea and where they were disassembled,

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cleaned, and processed before moved to other KSC facilities for buildup and assembly.

B. HISTORICAL CONTEXT

A full historical context for the SRB Disassembly and Refurbishment Complex, as well as a summary of the entire disassembly and refurbishment process, can be found in HAER NO. FL-8-11-S (Hangar AF Complex). A detailed explanation for the portions of that process that occurred in this resource is located in Section III of this document.

C. PHYSICAL HISTORY

1. Date of Construction:

1987

2. Architects/Engineers:

Wolfberg/Alvarez/Taracido & Associates,
Architecture/Engineering/Planning/Interior Design, Miami,
Florida.¹

Wolfberg/Alvarez/Taracido & Associates was founded in 1976 in Miami, Florida. The firm specialized in major projects for NASA, the U.S. Corps of Engineers, the Veterans Administration, and other state and local Government agencies. Over the next decade, the company grew to 150 employees with offices in Miami, Fort Lauderdale, Los Angeles, and Washington, D.C. Today, the firm is known as Wolfberg Alvarez and Partners and provides architectural

¹ Wolfberg/Alvarez/Taracido & Associates, "Robot Operated High Pressure Wash Facility," Kennedy Space Center, Florida. Construction drawings, 1985.

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and engineering design services from its headquarters
in Coral Gables, Florida.

3. Builder/Contractor/Supplier:

Unknown

4. Original Plans and Construction:

The original plans for the Robot Wash Building show that it
retains its original appearance.

5. Alterations and Additions:

None

PART II. STRUCTURAL/DESIGN/EQUIPMENT INFORMATION

A. GENERAL STATEMENT:

1. Character:

The Robot Wash Building is a concrete block building
containing an automated high-pressure spray wash system
used to blast TPS material off of SRB segments.

2. Condition of fabric:

The Robot Wash Building was regularly maintained
throughout its lifespan and does not exhibit any major
signs of neglect or deterioration.

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B. BUILDING DESCRIPTION:

Robot Operated High Pressure Wash Building

The Robot Wash Building was completed in 1987 to house an automated high-pressure water system used to blast TPS material off of the SRB segments. It is located just south of Hangar AF and the High Pressure Gas Building.

Exterior

The main portion of the building is a painted concrete block bay with a flat built-up metal roof, aluminum cornice, and a reinforced concrete foundation. This bay contains the robot wash machine and has a concrete block structural system. It is surrounded on the south and west sides by one-story wraparound portions with steel frame structural systems that are clad in aluminum. The wraparound portion contains a hydraulic pump room on the west side and the control room/tech room/dressing room on the south side. The building dimensions are 34'-0" (H) x 36'-4" (D) x 36'-8" (W).

The east elevation features the robot bay roll-up door, roof-access ladder, and the aluminum clad end of the control room. The north elevation features a pedestrian entrance at ground level. Over this entrance is a rack of ventilation and compression equipment used by the interior wash robot. The south elevation features two ventilation louvers and the south face of the control room with two pedestrian entrances. The west elevation features a metal "lean-to" structure that houses additional ventilation and compression equipment.

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Interior

The interior floor plan of the building includes four rooms: a blast room containing the high-pressure wash robot, a control room, a tech room, and a dressing room. The robot bay has painted concrete block interior walls and a concrete floor with a 16'-0" diameter floor turntable. The ceiling is concrete. There is an observation window between this room and the control room.

The robot includes a single movable arm that can be positioned to wash both the interior and exterior of the SRB segments. It blasts water at 17,500 psi. It travels diagonally across the blast bay on a steel overhead track that is supported by two concrete pillars.

The control room, tech room, and dressing room all have drywall interior walls with suspended and acoustic tile ceilings and tile floors. The spray robot is operated by a computer in the control room. The control room is locked when not in use to prevent unauthorized entry. The pump room has drywall interior walls, an exposed steel structural system ceiling, and a concrete floor. The pump room contains a hydraulic water pump that powers the wash robot. Fluorescent light fixtures provide light throughout the control and pump room interior. The blast room is lit with wall and ceiling-mounted aluminum flood lights.

PART III: OPERATIONS AND PROCESS

A. INTRODUCTION

The primary operations at the Hangar AF Complex involved separating all of the SRB segments, removing their electronic and mechanical components, removing their

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protective TPS finishes, and preparing them for buildup and assembly at the ARF Manufacturing Building/L6-247. The buildings and structures at Hangar AF processed the aft skirts, forward skirts, frustums, TVC systems, MPSS, ETA ring, and a variety of small metal parts contained in each of the segments. The boosters' four SRMs were separated and cleaned at Hangar AF and then shipped to their manufacturer for full refurbishment. Typically, the number of people working at the Hangar AF Complex during the Space Shuttle era was approximately 150 people. It took these workers from two to three weeks to fully process the SRB components from the time of their arrival.

B. SRB SEGMENT PROCESSING

Once they were demated in Hangar AF, the SRB segments were transferred to the High Pressure Wash or the Robot Wash buildings where the TPS was stripped. In the Robot Wash Building, an SRB segment was placed on the in-floor turntable that rotated while the automated high-pressure spray machine (the "robot") moved up and down, left to right, inside and outside to remove the TPS material. The automated robot was controlled by a computer operator in the adjacent control room.

PART IV. SOURCES OF INFORMATION

A. ENGINEERING DRAWINGS AND PLANS

Wolfberg/Alvarez/Taracido & Associates. "Robot Operated High Pressure Wash Facility." Kennedy Space Center, Florida. Construction drawings, 1985.

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B. SECONDARY SOURCES

Deming, Joan, and Patricia Slovinac. *NASA-Wide Survey and Evaluation of Historic Facilities in the Context of the U.S. Space Shuttle Program: Roll-Up Report*. Submitted to the National Aeronautics and Space Administration, Environmental Management Branch. Sarasota, Florida: Archaeological Consultants, Inc. February 2008, revised July 2008.

National Aeronautics and Space Administration (NASA)
NASA Facts: Solid Rocket Boosters. Kennedy Space Center, Florida. IS-2004-09-014-KSC, Revised 2006.

NASA Facts: Solid Rocket Boosters and Post-Launch Processing. Kennedy Space Center, Florida. FS-2004-07-012-KSC (Rev. 2006).

United Space Alliance

"Marine Operations, Revision J." (John F. Kennedy Space Center, n.d.), MO-1.

"Structures Assembly Buildup Operations, Revision J" (John F. Kennedy Space Center, n.d.).

C. INTERVIEWS

Christy, Howard, RPSF Manager, Personal Communication, February 24, 2010.

Morales, Art. George C. Marshall Space Flight Center Office of the Director, Shuttle - ARES Transition Office. Interview with author. September 27, 2011.

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Pappalardo, David. United Space Alliance, TVC
Technician. Interview with author. October 11, 2011.

Price, David. United Space Alliance, Hangar AF Facility
Manager. Interview with the author. October 11, 2011.

D. LIKELY SOURCES NOT YET INVESTIGATED

Research was conducted at KSC using primary and secondary sources. Sources that were not investigated that may contain secondary information include NASA Headquarters and at the offices of the various architects and contractors that constructed the buildings of the Hangar AF Complex.

Additional oral history interviews with other engineers and technicians could also prove useful.

V. PROJECT INFORMATION

NASA determined that the SRB Disassembly & Refurbishment Complex was eligible to the NRHP as a historic district under Criterion A in the area of Space Exploration. The Robot Wash Building was considered a contributing resource to the historic district. This determination was made by NASA's "Shuttle Transition Historic Preservation Working Group" or HPWG, which looked at 335 facilities at thirteen NASA Centers.² As a result of this work, seventy properties were identified as either listed, determined eligible, or were potentially eligible to the National Register. Out of twelve property types identified for NASA's SSP, the SRB Disassembly and Refurbishment Complex was identified as Type 2, which includes Resources Associated with Vehicle Processing

² Deming and Slovinac, *Evaluation of Historic Facilities, Space Shuttle Program*, 5.11.

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Facilities.³ NASA completed this evaluation as the SSP was scheduled for termination in 2011.

A Programmatic Agreement (PA) was developed to document the identified eligible resources and streamline the Section 106 consultation process. Per Section V.A of the PA between NASA, the Advisory Council on Historic Preservation (ACHP), and the Florida State Historic Preservation Officer (SHPO), dated May 2009, and the Statement of Work provided to New South Associates by KSC/InoMedic Health Applications (IHA), as part of the Task Order Contract, dated August 2011, the documentation package for the SRB Disassembly & Refurbishment Complex includes the following items: a written narrative; a series of photographs showing both exterior and interior views using large format negatives; and a selection of existing drawings, which were photographed with large format negatives. This HAER documentation fulfills the recordation requirements of the PA for the historic district.

New South Associates, under contract with IHA, a subcontractor to NASA, conducted the HAER documentation and historic research for this project in September and October 2011. Therefore, NASA is completing HAER documentation of the complex and other KSC properties to record these as they appear and as they existed during the SSP. David Diener served as the project photographer. Julie Coco served as Principal Investigator, while David L. Price served as Project Historian.

In order to complete the project, New South Associates personnel were allowed full access to the facility, under the supervision of Barbara Naylor, KSC Historic Preservation Officer, and Nancy English, Cultural Resources Specialist. Photographs were taken of each building's interior, exterior,

³ Deming and Slovinac, *Evaluation of Historic Facilities, Space Shuttle Program*, 5.11.

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and context. David Price conducted a limited number of oral interviews and otherwise compiled the historic documentation required for the project. The following people were interviewed for this project: David Price, Hangar AF Facility Manager, United Space Alliance; Art Morales, George C. Marshall Space Flight Center, Office of the Director Shuttle - ARES Transition Office; and Dave Pappalardo, United Space Alliance, TVC Technician. Elaine Liston, KSC Archivist, provided a wealth of information from her office in the KSC Headquarters Building.

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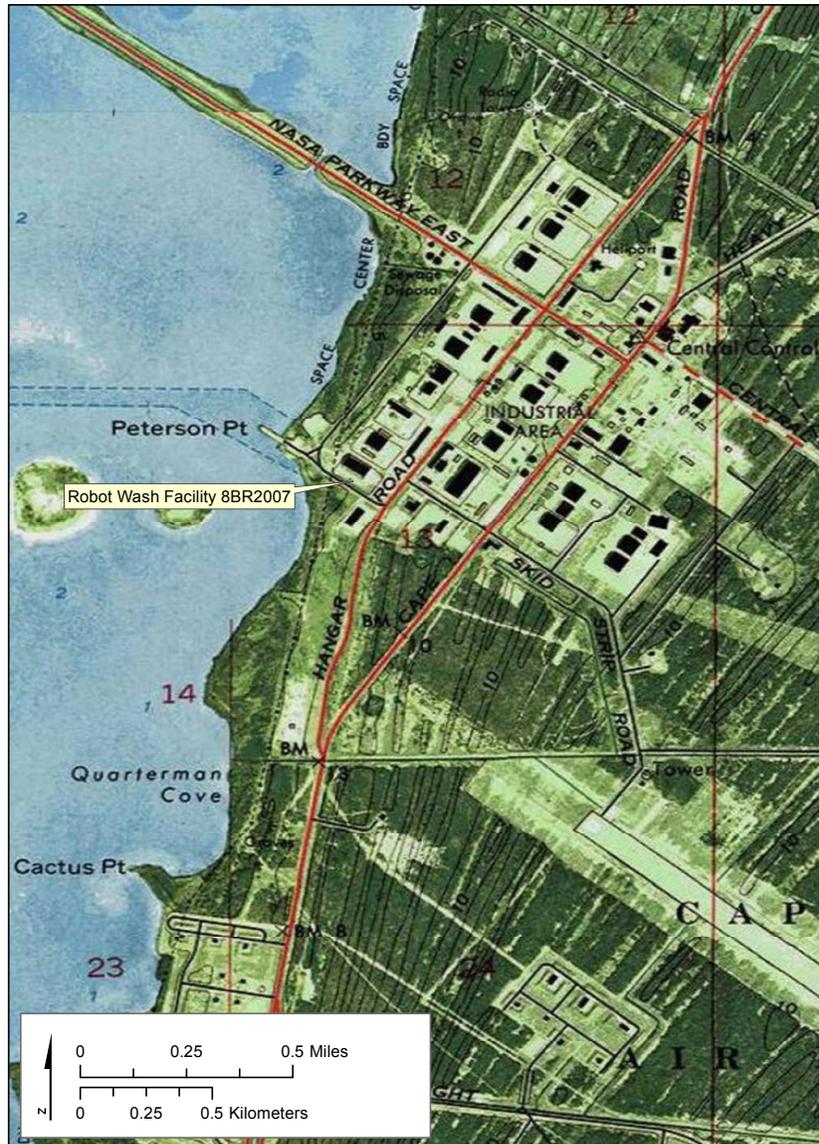


Figure 1. USGS Map Showing the Location of the Robot Wash Building

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Source: ESRI Resource Data, Imagery Layer

Figure 2. Aerial Photograph Showing the Location of the Robot Wash Building

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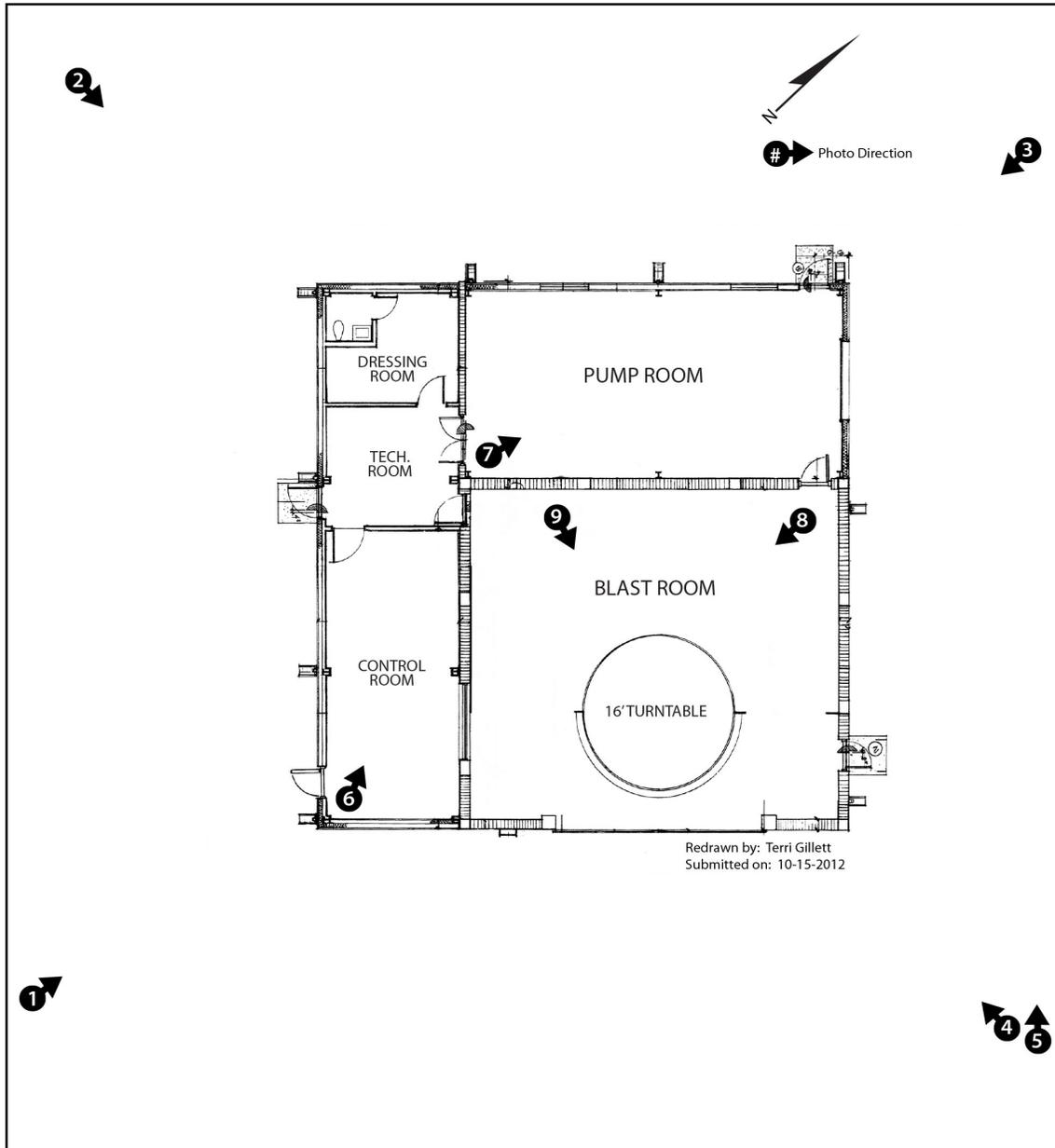


Figure 3. Photograph key for HAER NO. FL-8-11-S-6.