NPS Form 10-900
(Oct. 1990)

1638

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DEC - 7 1999

NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by Marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPA Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Launch Complex 39: Pad A

other names/site number 8BR1686

2. Location

street & number NASA, John F. Kennedy Space Center __not for publication

city or town Kennedy Space Center __vicinity

state Florida code FL county Brevard code 009 zip code 32899

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this __X__ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property __X__ meets ____ does not meet the National Register criteria. I recommend that this property be considered significant __X__ nationally ____ statewide ___ locally. (____ See continuation sheet for additional comments.)

Kenneth N. Kumor, NASA Federal Preservation Officer; Nov. 19, 1999
Signature of certifying official/Title Date

National Aeronautics and Space Administration
State of Federal agency and bureau

In my opinion, the property __X__ meets ____ does not meet the National Register criteria. (____ See continuation sheet for additional comments.)

Signature of certifying official/Title 8/20/98 Date

Florida State Historic Preservation Office, Division of Historical Resources
State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:

__X__ entered in the National Register.
___ See continuation sheet.
___ determined eligible for the National Register.
___ See continuation sheet.
___ determined not eligible for the National Register.
___ removed from the National Register.
___ other, (explain:)_____

Signature of the Keeper — Date of Action: 1/21/2000

5. Classification

Ownership of Property (Check as many boxes as apply.)

__ private
__ public-local
__ public-State
X public-Federal

Category of Property (Check only one box.)

__ building(s)
X district
__ site
__ structure
__ object

Number of Resources within Property (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
9	30	buildings
0	0	sites
15	9	structures
0	0	objects
24	39	Total*

*See Section 5, pages 1-4.

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)
John F. Kennedy Space Center

Number of contributing resources previously listed in the National Register
not previously enumerated

6. Function or Use

Historic Functions
(Enter categories from instructions.)
instructions.)
TRANSPORTATION: air-related
DEFENSE: aerospace facility

Current Functions
(Enter categories from
TRANSPORTATION: air-related
DEFENSE: aerospace facility

7. Description

Architectural Classification
(Enter categories from instructions.)
OTHER: No Style

Materials
(Enter categories from instructions.)
foundation CONCRETE
walls CONCRETE
roofs
other METAL: steel, CONCRETE
other

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)

Launch Complex 39: Pad A — Brevard, FL
Name of Property — County and State

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualify the property for National Register Listing.)

_X_ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.

__ **B** Property is associated with the lives of persons significant in our past.

_X_ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

__ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

__ **A** owned by a religious institution or used for religious purposes.
__ **B** removed from its original locations.
__ **C** a birthplace or grave.
__ **D** a cemetery.
__ **E** a reconstructed building, object or structure.
__ **F** a commemorative property.
_X_ **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

OTHER: SPACE EXPLORATION ENGINEERING

Period of Significance
1965-1975

Significant Dates
1965

Significant Person
(Complete if Criterion B is marked above.)
N/A

Cultural Affiliation
N/A

Architect/Builder
Bendix-Boeing

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):
__ preliminary determination of individual listing (36 CFR 67) has been requested
_X_ previously listed in the National Register
__ previously determined eligible by the National Register
__ designated a National Historic Landmark
__ recorded by Historic American Buildings Survey # _____
___ recorded by Historic American Engineering Record # _____

Primary location of additional data:
__ State Historic Preservation Office
__ Other State agency
_X_ Federal agency
__ Local government
__ University
__ Other
Name of repository:
NASA: Kennedy Space Center

Launch Complex 39: Pad A — Brevard, FL
Name of Property — County and State

10. Geographical Data

Acreage of Property approximately 160 acres

UTM Reference
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
1	See continuation sheet.			3			
2				4			

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Daniel Delahaye and Kimberly Hinder, Architectural Historians
organization Archaeological Consultants, Inc. date August 1996
street & number P.O. Box 5103 telephone (941)925-9906
city or town Sarasota state FL zip code 34277

Additional Documentation

Submit the following items with the completed form:
Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items
(Check with the SHPO or FPO for any additional items.)

Property Owner
(Complete this item at the request of SHPO or FPO.)
name
street & number telephone
city or town state zip code

Launch Complex 39 Pad A District: List of Contributing Resources.			
FACILITY #	**FACILITY NAME**	**YEAR BUILT**	**PROPERTY TYPE**
J8-1462	High Pressure GH2 Facility	1968	Structure
J8-1502	LOX Facility	1968	Structure
J8-1503	Operations Support Building A-1	1966	Building
J8-1512	Camera Pad No. 1	1966	Structure
J8-1513	LH2 Facility	1966	Structure
J8-1553	Electrical Equipment Building No. 2 (LOX)	1965	Building
J8-1554	Camera Pad No. 6	1965	Structure
J8-1563	Electrical Equipment Building No. 2 (RP-1)	1965	Building
J8-1564	Foam Building	1965	Building
J8-1565	Pump House (RP-1)	1964	Structure
J8-1613	RP-1 Facility	1965	Structure
J8-1614	Operations Support Building A-2	1966	Building
J8-1659	Compressed Air Building	1965	Building
J8-1703	Slidewire Termination Facility	1965	Structure
J8-1705	Sewage Treatment Plant No. 5	1965	Structure
J8-1705A	Sewage Lift Station	1965	Structure
J8-1705B	Sewage Equipment Building	1965	Building
J8-1707	Water Chiller Building	1968	Building
J8-1708	Launch Pad 39A	1965	Structure
J8-1714	Camera Pad No. 2	1965	Structure
J8-1753	Remote Air Intake Building	1965	Building
J8-1858	Azimuth Alignment Station	1965	Structure
J8-1956	Camera Pad No. 4	1965	Structure
J8-1961	Camera Pad No. 3	1965	Structure

Launch Complex 39 Pad A District: List of Non-Contributing Resources.			
FACILITY #	**FACILITY NAME**	**YEAR BUILT**	**PROPERTY TYPE**
J8-1610	Water Tank	1980	Structure
J8-1611	Flarestack	1985	Structure
J8-1659A	Equipment Shelter	1995	Structure
J8-1708A	Temp. Bldg. No. 1 (TR1-377 thru -395)	1981	Building
J8-1708B	Temp. Bldg. No. 2 (TR1-396 thru -407)	1981	Building
J8-1708C	Temp. Bldg. No. 3 (TR1-459 thru -468)	1981	Building
J8-1708D	Temp. Bldg. No. 4 (TR1-411 thru -414)	1981	Building
J8-1708E	Temp. Bldg. No. 5 (TR1-409 and -410)	1981	Building
J8-1708F	Temp. Bldg. No. 6 (TR1-561 and -562)	1983	Building
J8-1708G	Temp. Bldg. No. 7 (TR1-563 and -564)	1983	Building
J8-1708H	Rain Shelter	1985	Structure
J8-1708I	Temp. Bldg. No. 69 (TR1-492 thru -498, -500, -504)	1982	Building
J8-1708J	Hazardous Waste Storage Building/Portable	--	Building
J8-1708K	Hazardous Waste Storage Building/Portable	--	Building
J8-1768	Environmental Control and Life Support	1995	Structure
J8-1811	Electrical Equipment Building No. 3 (Oxidizer)	1979	Building
J8-1856	Electrical Equipment Building No. 3 (Fuel)	1979	Building
J8-1862	Hypergol Oxidizer Facility	1979	Structure
J8-1862A	Storage Building	1996	Building
J8-1906	Hypergol Fuel Facility	1979	Structure
J8-1906A	Storage Building	1996	Building
J8-1959A	Rain Shelter	1985	Structure
J8-1959B	Rain Shelter	1985	Structure
TR1-376	King's Custom	1981	Building
TR1-408	Touchton (Boxcar)	1980	Building
TR1-427	Southern	1981	Building

Launch Complex 39 Pad A District: List of Non-Contributing Resources.			
FACILITY #	**FACILITY NAME**	**YEAR BUILT**	**PROPERTY TYPE**
TR1-428	Southern	1981	Building
TR1-434	Triple "A" Custom	1978	Building
TR1-435	Triple "A" Custom	1978	Building
TR1-475	Touchton (Boxcar)	1982	Building
TR1-476	Touchton (Boxcar)	1982	Building
TR1-501	Boxcar	1982	Building
TR1-510	Boxcar	1982	Building
TR1-611	Boxcar	1983	Building
TR1-612	T&R Custom	1979	Building
TR1-613	T&R Custom	1982	Building
TR1-614	T&R Custom	1982	Building
TR1-707	King's Custom	1985	Building
TR1-714	King's Custom	1984	Building

References

National Aeronautics and Space Administration (NASA)
1992 Master Plan: John F. Kennedy Space Center (Volume I). October.

1995 Facility Utilization Charts: NASA Facilities at KSC, CCAFS, and PAFB. July 1.

1996 NASA/KSC Quarterly Real Property Report. September 30.

Narrative Description
Launch Complex 39: Pad A

Year Built: Pad A-1965
Functional Name: Missile Launch Complex (No. 39A)
Apollo Era Technological Areas Supported: Saturn V Vehicle Launch Facility
Space Shuttle Era Technological Areas Supported: Space Shuttle Launch Facility

Summary

The basic configuration of Launch Pad A is octagonal, covering roughly .25 mi^2. The hardstand in the center of Pad A measures 390 by 325 feet and is composed of 68,000 yd^3 of concrete. At the top of the pad, the elevation is approximately 40 ft above the surrounding grade and 48 ft above sea level. Service roads at the perimeter of Launch Pad A provide access to propellant facilities, camera sites, and other support equipment. During the Apollo era, concrete and steel support piers were built-up from the hardstand to support the Mobile Launcher and Arming Tower (Butowsky 1981:54; Anon 1994:32; NASA 1967:10-15).

Pad A has been extensively modified to accommodate Space Shuttle launches. For the Shuttle program, a Launch Umbilical Tower (LUT) was reduced in height and permanently affixed to the Launch Pad. It is now known as the Fixed Service Structure (FSS). The Rotating Service Structure (RSS), was created during the Shuttle era and attached to the FSS on the Pad in order to provide protection to the Orbiter and access to the Cargo Bay for installation and servicing of Payloads. Other changes to the Pad include the modification of existing and construction of new Flame Deflectors; construction of Payload Rooms attached to the Service Access Tower; and modifications and additions to propellant piping and storage, various electrical systems, and operational intercom and television systems (Butowsky 1981:55; Anon 1994:32; NASA 1967:10-15).

Despite these major changes, Pad A, as a whole, has substantially retained its integrity of design, materials, workmanship, feeling, setting, location, and association. Although not all structures at Launch Pad 39-A are considered significant, all structures within and immediately adjacent to the Perimeter Road are considered to be within the district boundaries. The district of LC-39: Pad A extends approximately 100 ft outward and parallel to the service road at the perimeter of the installation (Section 11, Page 3). Twenty-four contributing and 39 noncontributing resources are located within this boundary (Section 5, Pages 1-3).

Description of Selected Contributing Resources

Launch Pad 39A (Facility #J8-1708) is comprised of the Fixed Service Structure (FSS) and Rotating Service Structure (RSS), in addition to a Flame Trench and Deflector System, Sound Suppression Water System, Weather Protection System, and Pad Terminal Connection Room.

Cited in the original NRHP nomination are the Mobile Service Structure (MSS) and the three Launch Umbilical Towers (LUTs). The MSS is no longer extant, and thus, has been deleted from the amended NRHP nomination. The three LUTs were drastically modified to serve the needs of the Space Shuttle program. Major modifications consisted of removing each Umbilical Tower from its two-story steel Launch Platform (now Mobile Launcher Platform). Two of the Umbilical Towers were modified by the removal of select tower arms, the 25 ton Hammerhead Crane, and lower work platforms. These two Towers were affixed (one each) to the built-up portion of each Pad where they are known as Fixed Service Structures (FSSs). The third Tower, from which launched the first successful lunar landing mission, was disassembled and removed to a site in the Industrial Area. Several portions of this Tower, including select Platforms and the Hammerhead Crane, have been relocated on KSC grounds and refurbished as part of an interpretive exhibit at the Apollo/Saturn V Center. Major modifications to the three two-story steel Launch Platforms (now Mobile Launcher Platforms) included relocating holddown points and exhaust holes on the Platform and removing or modifying systems in order to stack and carry Space Shuttles. Each major LUT component (the Fixed Service Structures and the Mobile Launcher Platforms) has undergone a transition in use requiring modification of their Apollo era configuration and, thus, their integrity is no longer intact. Therefore, the LUT components are not included individually in the amended nominations. However, the two Towers, which are now FSSs at Launch Pads A and B, are contributing to the two districts. The FSSs are now considered as part of the built-up part of each launch pad (the hardstand) and are labeled with Facility number J8-1708 for Launch Pad A and J7-337 for Launch Pad B. Because the hardstand has maintained a substantial amount of its integrity to communicate its historic function which was vital to the Apollo mission, the combined unit consisting of the FSS and the hardstand is considered a contributing part of the district at Launch Pad A (Butowsky 1981:54-55; NASA n.d.:26; NASA 1974:9-87).

The FSS, formerly part of the LUT, is 347 ft from the pad surface to the top of the 80-ft lightning mast. It has three service arms. The Orbiter Access Arm, located at the 147-ft level, provides personnel access to the crew compartment which is extended until 7 minutes, 24 seconds before a launch as the emergency escape route. The External Tank (ET) Hydrogen Vent Umbilical and Intertank Access Arm, at the 167-ft level, provide access to the tank, hydrogen venting, and mating of ET umbilicals to the pad. The External Tank Gaseous Oxygen Vent Arm, between the 207-ft and 227-ft levels, is used to

heat the ET's liquid oxygen vent system to prevent ice formation (Anon 1994:33-34). It is retracted at 2 minutes, 30 seconds, before launch.

The RSS is a movable, gantry-like structure attached to the FSS that contains the Payload Changeout Room (PCR) which is used for supporting and servicing payloads. The RSS is 189 ft high from the Pad with five levels of access platforms and rotates 120 degrees on the track to mate the PCR with the Orbiter. The PCR functions as an airlock by maintaining the controlled environment required when payloads are inserted into or removed from the Orbiter. The PCR is used to service horizontally installed payloads as well as those payloads which will be installed vertically into the Orbiter at the Pad. The RSS encloses three sides of the PCR as it moves from its retracted position and extended position. The RSS vertical axis is on the west side of the Flame Trench. The PCR provides protected access to portions of the Orbiter and the Payload Bay (Jordan 1994:4-21; Millner 1993:2.1-3.1; Anon 1994:33-34). The RSS also includes the Orbiter Midbody Umbilical Unit through which liquid oxygen and liquid hydrogen for fuel cells feed, and the Hypergolic Umbilical System, which carries hypergolic fuel and oxidizer, helium and nitrogen service lines from the FSS to the Shuttle. Other Apollo-era facilities at Pad A provide power, water, sewerage, heating, and communications.

A Flame Trench and Deflector System protects the Launch Vehicle and Mobile Launch Platform in a cutout below the launch vehicle. The Trench consists of concrete and refractory brick, and is 42 ft deep, 450 ft long, and 58 ft wide. The Deflector System consists of an inverted V-shaped steel structure and two movable Deflectors for the Solid Rocket Boosters (SRBs).

A Sound Suppression Water System consists of a tank 290 ft high, with a capacity of 300,000 gal. Up to another 100,000 gal of water are contained in underground pipes. At 16 seconds before liftoff, water begins flowing to six 12 ft high MLP nozzles called "rainbirds." This system protects the Orbiter and payloads from damage by reflected acoustical energy during liftoff. At peak flow the tank can drop 900,000 gal per minute 9 seconds after liftoff. Acoustical level on the hardstand is reduced to about 180 decibels (Anon 1994:32-33).

The Weather Protection System protects the Orbiter tiles from rain, hail and wind-blown debris. The system includes metal sliding doors between the Orbiter and the ET, connected to the FSS and RSS, which protect the Orbiter's lower portion; an inflatable seal shielding the top of the Orbiter, extending from the PCR; and a series of bifold metal doors which fold out from the PCR to cover the side areas between the ET and Orbiter (Anon 1994:36).

The Pad Terminal Connection Room is a reinforced concrete room located below ground to the west of the hardstand. Its equipment links the Shuttle, the

Mobile Launcher Platform (MLP) and Pad with the Launch Processing System in the Launch Control Center.

Propellant storage facilities include tanks for liquid oxygen, liquid hydrogen, and high pressure gas (J8-1462). The 900,000 gal liquid oxygen (LOX) facility (J8-1502), located in the northwest corner of Pad A, holds liquid oxygen at less than minus 298 degrees F. A 850,000 gal liquid hydrogen (LH2) tank (J8-1513), located in the northeast corner, contains liquid hydrogen at minus 423 degrees F. Supply lines for liquid oxygen, liquid hydrogen, RP-1, and high-pressure gas storage and supply facilities have undergone minor relocation to accomodate the needs of the Space Shuttle program.

The Slidewire Termination Facility (J8-1703) provides emergency egress for personnel until the final 30 seconds of countdown. This system includes baskets suspended from seven slidewires extending from the FSS to the landing zone, with bunker, 1200 ft to the west.

Five Camera Pads (J8-1512, -1714, -1961, -1956, and -1554) cover launches from different positions around the launch pad perimeter.

**Narrative Statement of Significance
Launch Complex 39: Pad A**

Summary

Launch Complex 39: Pad A contributes to the Historic Cultural Resources of the John F. Kennedy Space Center, Florida, under the historical context Apollo Program 1961-1975 and each of its three subcontexts under property type F.3, Launch Operation Facilities. It is significant at the national level under NRHP Criterion A in the area of space exploration in the twentieth century. Pad A is also significant under Criterion C under engineering. Because Pad A has achieved significance within the past 50 years and is of exceptional importance in the areas of space exploration and engineering, Criteria Consideration G applies. Its primary purpose was to serve as a fixed base from which to launch Saturn vehicles into space during the Apollo era. It currently performs the same function by facilitating the launch of the Space Shuttle.

Significance

The new technologies and new rockets of the Apollo program required more room and stronger facilities than what existed at the neighboring Cape Canaveral Air Station. To accommodate the programmatic requirements of the Apollo program, new Launch Pads were planned. Pad A was the first constructed and saw the first Saturn V launch and the first launch from LC-39 on November 9, 1967, with Apollo 4. Pad A also served the Apollo 11 mission in July 1969 when astronauts Armstrong, Aldrin, and Collins landed on the moon and thus accomplished the Apollo mission. LC-39 Pads A and B combined were the site of 17 Saturn V or Saturn 1B manned and unmanned launches in the Apollo, Skylab and Apollo-Soyuz Test Project programs and continue to be the site of all Space Shuttle launches (Anon 1994:32, 86-88).

Launch Pad A was constructed in 1965 by Bendix-Boeing as one of only two sites able to successfully launch manned lunar missions. Pad A was specially constructed to withstand the weight of the Saturn V rockets and later modified for the weight and additional heat and sound of the Space Shuttle. It, therefore, is significant as an engineering and design masterpiece (NASA 1967:10/15-16).

Bibliography
Launch Complex 39: Pad A

Anon.
1994 Facts: John F. Kennedy Space Center.

Butowsky, Dr. Harry A.
1981 Reconnaissance Survey: Man in Space. U.S. Department of the Interior, National Park Service, Washington, D.C. November.

Jordan, Ric
1994 Launch Site Accommodations Handbook for Payloads (K-STSM-14.1-REVI-LSAH, Revision I). November.

Millner, Jeffrey E.
1993 Payload Accommodations at the Rotating Service Structure (K-STSM-14.1.10, Revision D).

National Aeronautics and Space Administration
1966 Master Plan: John F. Kennedy Space Center.

1967 Technical Facilities Catalog Volume II [NHB 8800.5 (II)]. March.

1974 Technical Facilities Catalog Volume II [NHB 8800.5A (II)]. October.

1995 Facility Utilization Charts: NASA Facilities at KSC, CCAFS, and PAFB. July 1.

UTM Reference
Launch Complex 39: Pad A

1	17	538240	3164720	6	17	538950	3164030
2	17	538480	3164860	7	17	538870	3164030
3	17	538870	3164860	8	17	538480	3164030
4	17	539120	3164720	9	17	538420	3164080
5	17	539120	3164430	10	17	538240	3164430

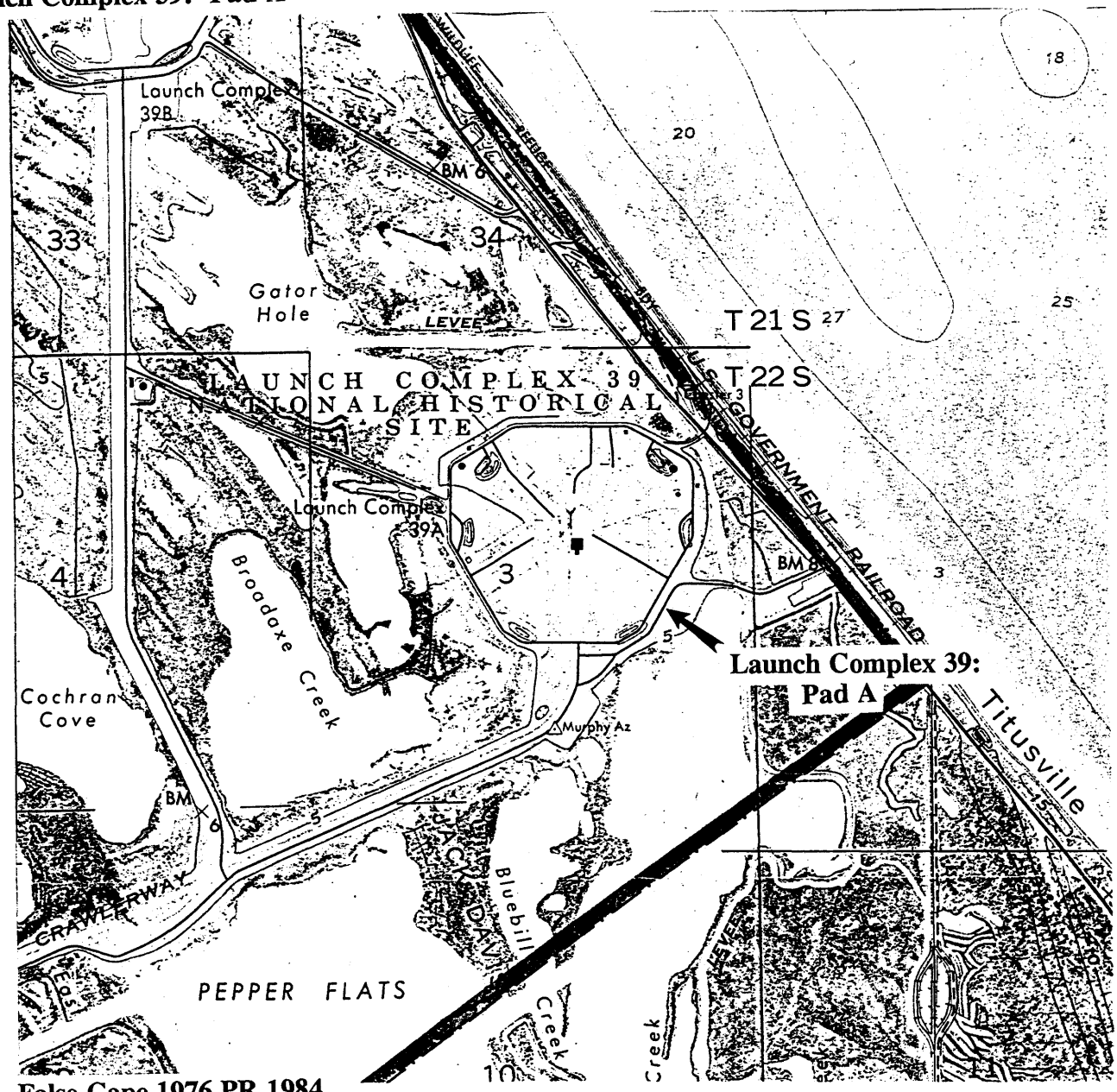
Verbal Boundary Description

The boundary of the site extends approximately 100 ft outward and parallel to the perimeter service road of Launch Pad A.

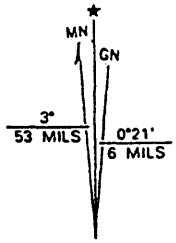
Boundary Justification

The boundary consists of the existing launch pad facilities historically associated with the Apollo program at the Kennedy Space Center.

USGS Map
Launch Complex 39: Pad A



False Cape 1976 PR 1984

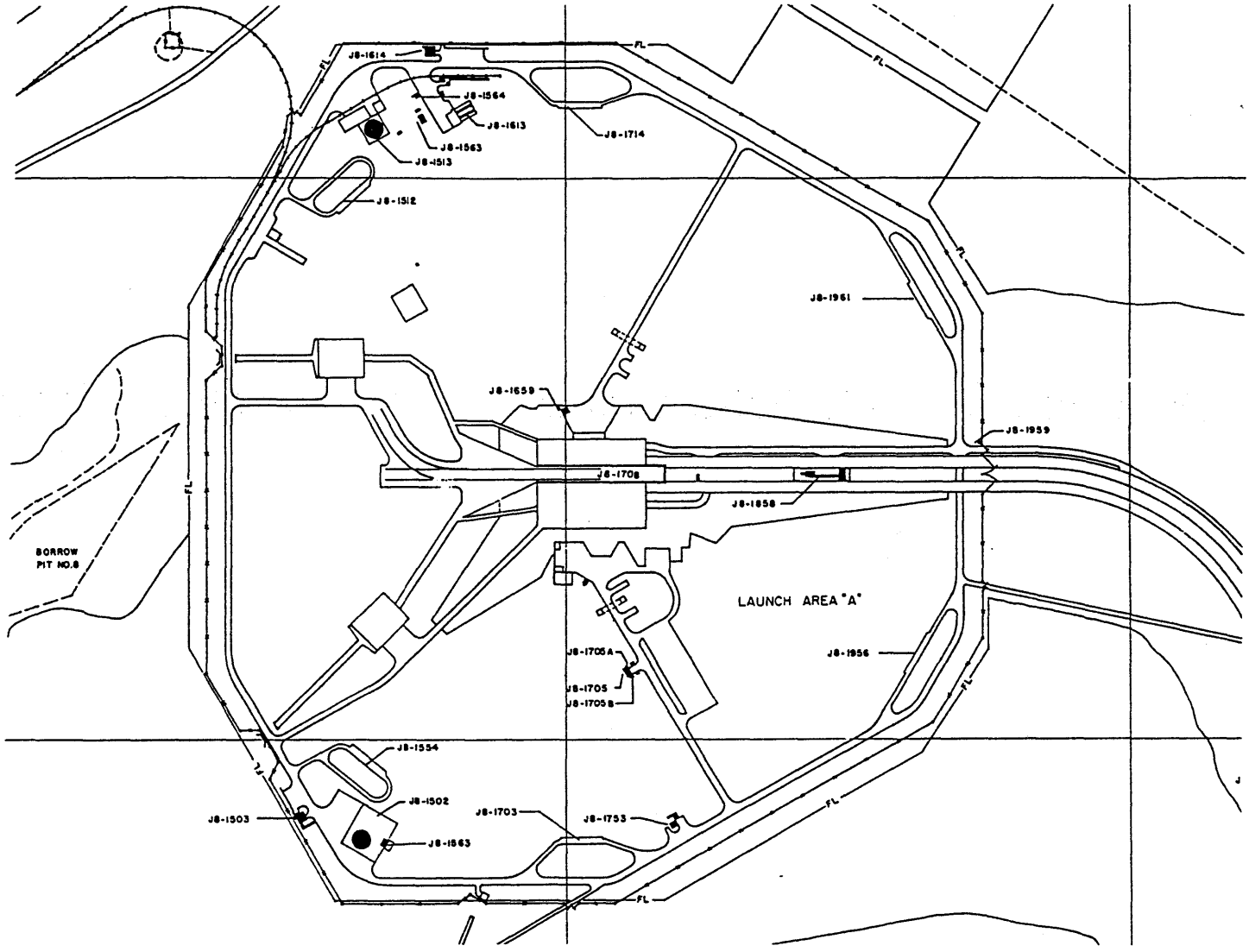


UTM GRID AND 1988 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

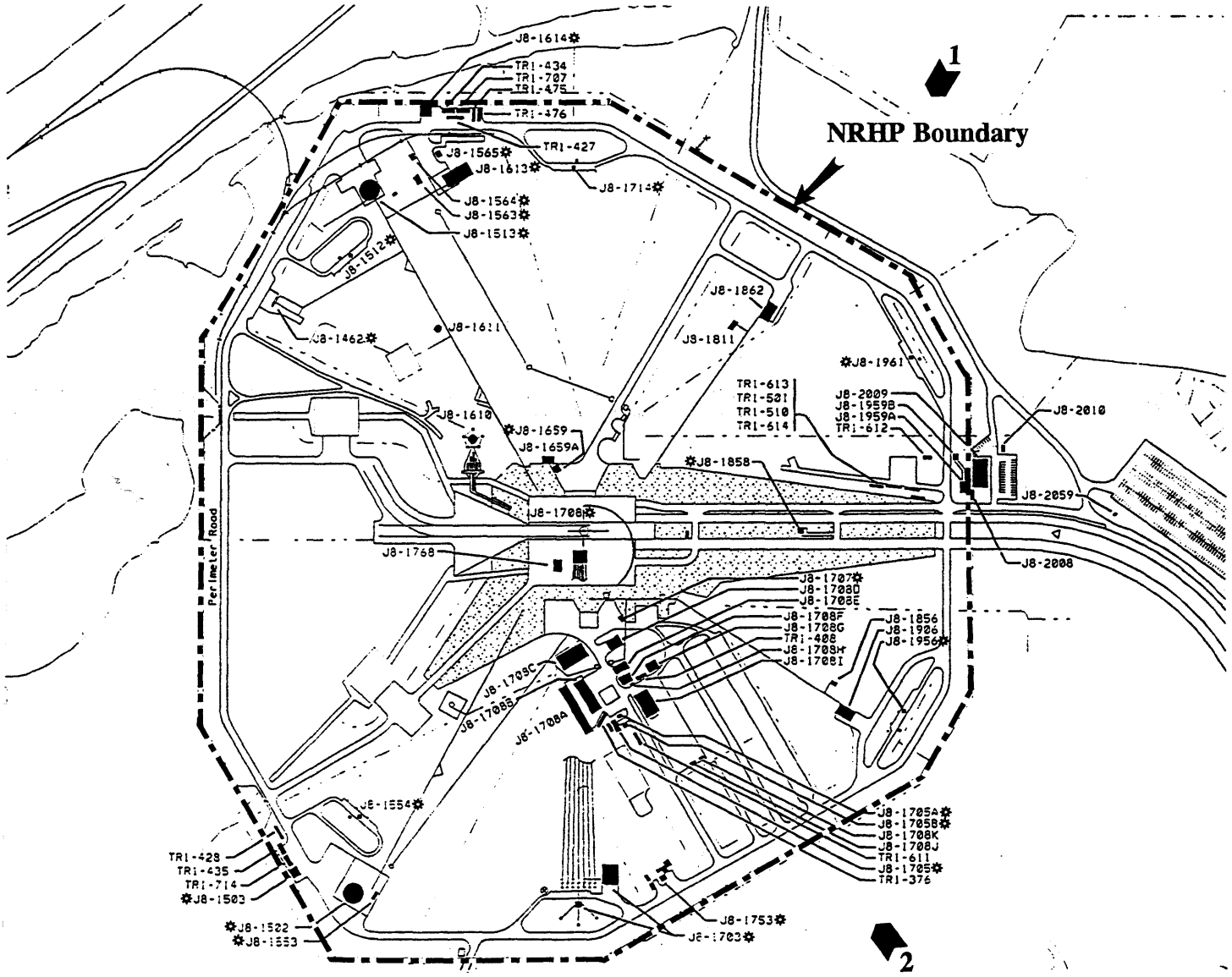
1 .5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000
FEET
1 .5 0 KILOMETERS 1 2
1000 0 METERS 1000 2000

Site Plan
Launch Complex 39: Pad A (1966)



Source: NASA Master Plan, Sheet No. E2-A, 1966.

Site Plan
Launch Complex 39: Pad A (1995)



 # = photo number and direction

*** = Contributing resource**

Source: NASA Facility Utilization Charts, Chart C, July 1, 1995.

List of Photographs
Launch Complex 39: Pad A

1. Launch Complex 39: Pad A
2. Brevard County, Florida
3. Kennedy Space Center
4. July 1966
5. Kennedy Space Center
6. Pad A aerial, looking north (KSC-6C-6962)
7. 1 of 2

1. Launch Complex 39: Pad A
2. Brevard County, Florida
3. Kennedy Space Center
4. August 1992
5. Kennedy Space Center
6. Pad A aerial, looking northeast (KSC-392C-4280.94)
7. 2 of 2