About the Author

John D. Bennett is a retired law enforcement officer with the City of Honolulu residing in Kaneohe, Oahu, Hawaii. He is married with one child and two grandchildren.

Bennett served in the Air Force from 1957 to 1961 as a radar operator in Washington State and British Columbia, Canada.

He has been a member of the Coast Defense Study Group for twelve years and authored forty-one articles published in the quarterly journal, mainly reporting on Hawaii's coast artillery history, and World War Two garrisons of U.S. Pacific Island possessions, which included airfields.

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HAWAII ARMY NATIONAL GUARD NIKE BATTERIES 1961 - 1970

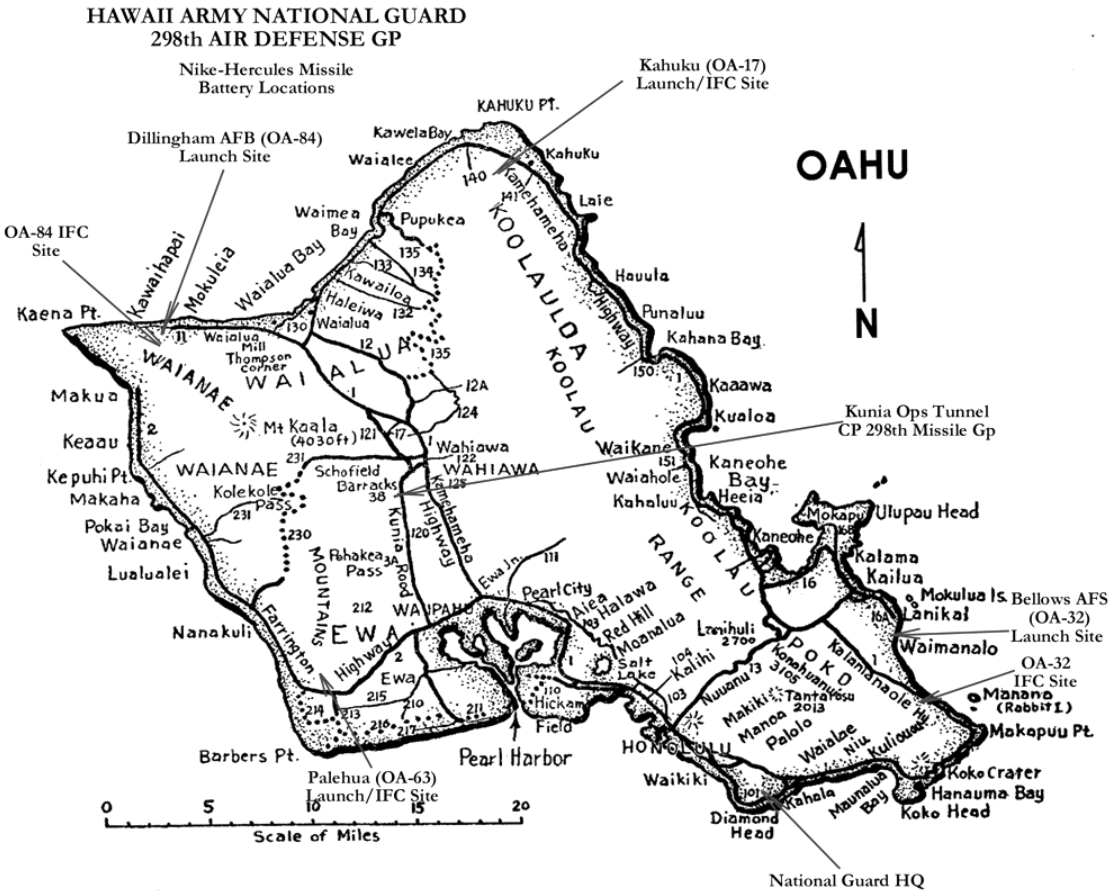
John D. Bennett

5/14/2009

This essay reports on the four Nike-Hercules Missile Batteries that provided antiaircraft defense of Oahu during the Cold War.

TABLE OF CONTENTS

LIST OF FIGURES AND PHOTOS



Oahu Nike-Hercules Missile Deployment

Nike-Hercules (hereafter: Nike) guided missile batteries deployed on Oahu were manned on a full-time basis from January 1961 to March 1970 by citizen-soldiers of the 298th Air Defense Group (ADA Gp.) of the Hawaii Army National Guard (HIARNG) which provided defense against any possible attack by the Soviet Union, or any other aggressor. The Nikes had the dual capability of striking aerial and surface targets providing the Target Tracking Radar (TTR) was able to track the target.

Prior to the guided missile era, the 158th AAA Battalion HIARNG armed with four batteries of 90-mm Anti Aircraft Artillery guns provided antiaircraft defense of Oahu. The battalion's four firing batteries were deployed to Sand Island (two), Fort Barrette (one), and Waianae (one), with battalion headquarters at Fort Ruger.

90 mm Gun. *Photo by Balcer (GNU Free Document License)*

Hawaii was the first State in the Nation to receive the solid fuel powered, nuclear-capable Nike-Hercules missiles. The 298th ADA Gp. Command Post was initially located in a tunnel in Diamond Head, then moved deep underground at the Kunia Facility known as the "underground," a three story, 51,000 square foot "cut and cover" facility built in the Kunia pineapple fields of Oahu during World War Two as an aircraft assembly plant.[1] Hawaii was the only National Guard unit to operate a command post.[2]

The 298th ADA Gp. was made up of two battalions (1st and 2nd). The 1st Battalion consisted of A Battery, a training unit based at Fort Ruger at Diamond Head Crater in the Kapahulu District of Honolulu. B Battery was located at Kahuku, C and D Batteries formed a dual site at Bellows Air Force Station (AFS) at Waimanalo. The 2nd Battalion consisted of A and D batteries, which formed a dual site at Palehua, B Battery, a training battery located at Pearl City, and C Battery at Mokuleia. The unit designators changed continuously.

[1] Historic American Engineering Record; Kahuku Nike Missile Battery OA-17 (Hawaii Nike Missile Site 2), HAER No. HI-69, July 2004, p. 4, prepared by Katherine Slocumb, AIA, Mason Architects, Inc., Honolulu, HI. (Hereafter: HAER No. HI-69.

[2] Ibid.

Authorized strength for each battery included four officers, four warrant officers and eighty-nine enlisted men, which were to man the missiles on a full time basis. The headquarters battery was authorized 16 officers, 5 warrant officers, and 76 enlisted men.[3]

There were four missile launching sites on Oahu: Dillingham Air Force Base in Mokuleia (Kawaihapai); Kahuku Army Training Area near Mt. Kawela.; Bellows Air Force Station at Waimanalo, and Barbers Pt. (Palehua), on the southwestern portion of the Waianae Mountain Range.[4] All four sites were armed as follows:

Site No. /Designator	Location	Missiles	Launchers[5]
1/OA-84	Dillingham AFB	12	12
2/ OA-17	Kahuku	12	12
3 & 4/OA-32	Bellows AFS	24	16
5 & 6/OA-63	Barbers Pt.	24	16

Hawaii guardsmen deployed to the McGregor missile range in NM, north of Ft. Bliss, TX for their annual service practice. The following two years, practice firing was conducted on the ocean side of Dillingham AFB at Kawaihapai; then moved to the Kahuku launcher site (OA-17. A long-distance intercept record was set by the HIARNG during one of the service firing practices.

Sites and Dates of Operation[6]

Site No/Designator	Single or Double Site	Dates of Operation
1/OA-84	Single	January 1961to March 1970.
2/OA-17	Single	January 1961 to March 1970.
3 & 4/OA-32	Double	March 1961to March 1970.
5 & 6/OA-63	Double	January 1961 to March 1970.

The above sites were built by the Army Corps of Engineers, Honolulu District. Bellows Air Force Station was selected in 1959 to construct two Hercules batteries as it was federally-owned land. Opposition was strongly voiced by then Governor William F. Quinn as the site was at a one of the best

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3 Ibid, p.5.

4 OA-84's location was popularly known as being at Mokuleia; the area has reverted to its ancient Hawaiian name of Kawaihapai, the sub-district to the west of Mokuleia.

5 John C. Lonnquest and David Winkler, "To Defend and Deter: The Legacy of the United States Cold War Missile Program," p. 481; excerpts online. <http://www.redstone.army.mil/history/nikesite/nikeherc.html>, accessed March 6, 2009. Author's note: the site is oftentimes referred to as Barbers Point, when in fact the launcher area is approximately 4.7 miles NNW of Barbers Pt. (now known by its original name of Kalaeloa) the launcher site is located at Waimanalo Gulch (not to be confused with Waimanalo on the east shore) at Palehua in the ancient Hawaiian ahupua'a (land division) of Honouliuli located in the Ewa District..

6 Ed Thelen, "Locations of Former Nike Missile Sites."< http://ed-thielen.org/loc-h.htm>, accessed March 31, 2005. Author's note: The Oahu Nike sites were referred to as Sites 1 through 6, also by the "OA" designators. Author's note: Single sites were manned by one missile battery; double sites by two.

swimming beaches on the island. Construction proceeded in spite of the Governor's objections.[7] The launching facilities were built some 133 yards south of Runway12/30.

The remaining batteries were authorized for construction by the Chief of Engineers. The Honolulu District Engineer was prepared to advertise bids for the construction of batteries at Barber's Point (Palehua) and Dillingham. The fourth site was first planned to be built at the abandoned World War II airfield at Kahuku, but later changed to the mountains above the airfield at Mt. Kawela due to radio interference.[8] Contracts were awarded in January 1960. The first site to be completed was at Barber's Point (Palehua), a dual-launcher location.[9]

Typical HIARNG Nike-Hercules Missile Battery

Each Nike battery included an Integrated Fire Control (IFC) Platoon and a Launcher Platoon that was divided about 1/3 to 2/3 with the greater portion of guardsmen assigned to the Launcher Platoon. The IFC Platoon was located at a separate location from the launching sites, and included their own administration and barracks/mess hall buildings, and emergency power units. The Battery Commander was stationed with the IFC Platoon.

Launcher Platoons were made up of three sections, manned by a crew chief plus eight to ten crewmen each. The sections were responsible for maintaining and preparing four missiles for launching. The platoon also included an assembly section whose duties were to unpack the missile in the assembly building, where they were tested.

After the missile had been checked out, it was transported to the warhead building for installation of the motor and warhead. All transportation between buildings was done on a special dolly. All lifting was done on a manually operated A Frame.

The warhead building included an overhead manually operated hoist (none of the handling equipment was powered by motors). The warhead building was typically surrounded on three sides by an earth berm. Each section of the missile had its own lifting beam, engineered for balance and strength. Special bolts were screwed onto the part of the missile to be lifted, and then torqued to specifications. Routinely, all torque wrenches were sent to a depot for calibration.

The fully assembled missile with its attached warhead was then taken to a launch pad towed by a specially tested and inspected all-terrain forklift. The solid-propellant booster had been previously placed on the launcher, where it was mated to the missile body. At times, a 5-ton wrecker was used to tow the missile from the warhead building to the launcher site. All transport vehicles were equipped with spark arresters, and their brakes had to be mechanically good. Of prime importance was protection from static electricity.

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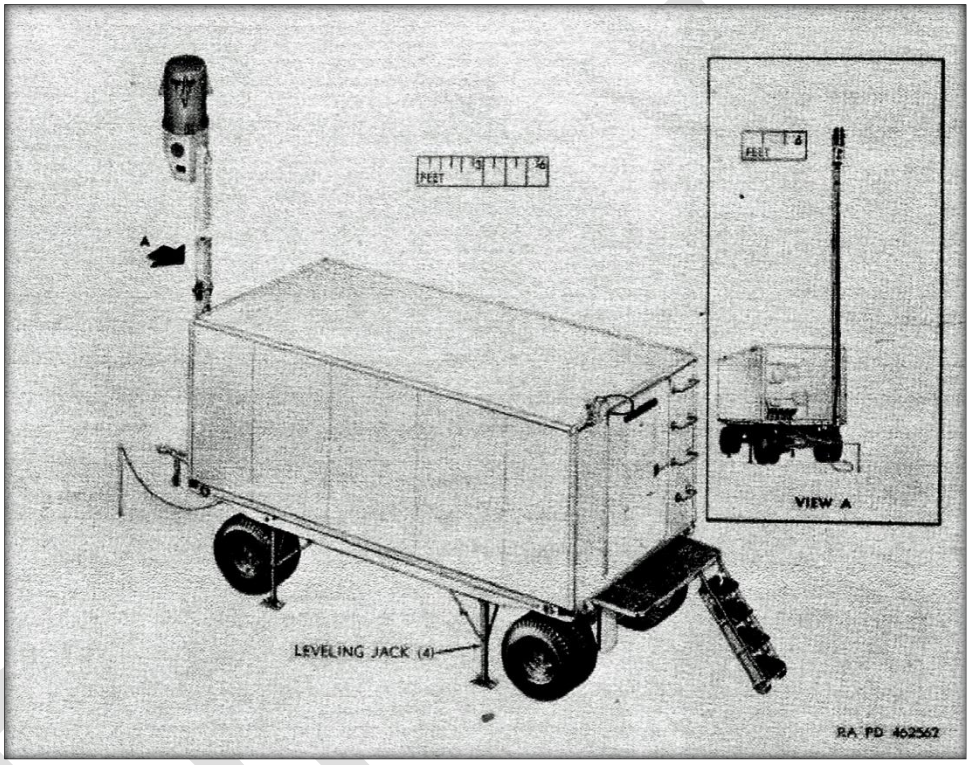
7 HAER No. HI-69, p. 5.

8 Ibid, p. 6.

9 Ibid.

A Launcher Control Trailer (LCT) was located at each launcher site. It was used to communicate between the IFC and Launcher areas. The trailer at OA-63L had its wheels removed and placed atop timber cribbing. Situated nearby to the LCT was a 30 KW frequency converter that supplied 400 cycle power.[10]

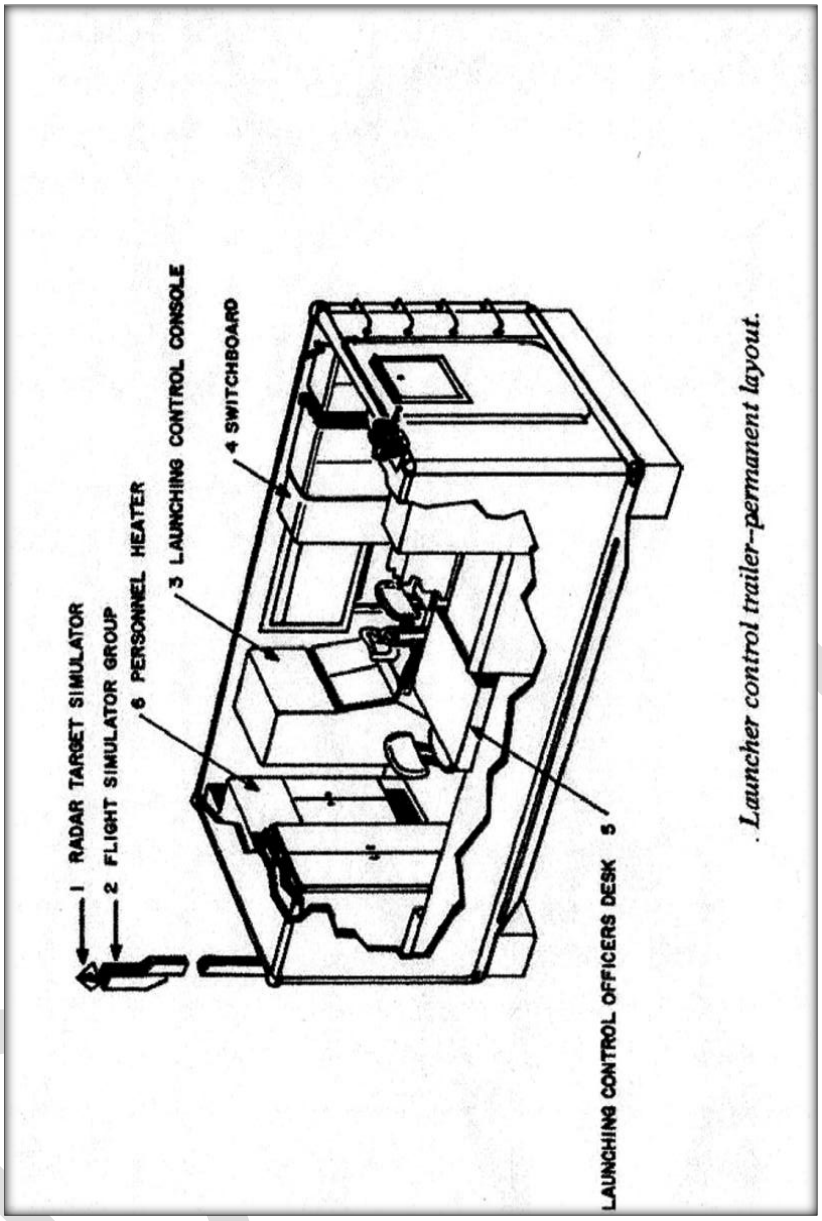
A storage tank was located near at the launcher are that held ethylene oxide, a caustic, foul smelling fuel used to power an auxiliary power supply (APS) that furnished hydraulics to power the missile's flaps; the APS were converted to electrical motors powered by hi-tech batteries.[11].



Launcher Control Trailer. *Internet*

[10] E-mail letter to author on March 4, 2009 from unnamed source who served at the OA-63 launcher area.

[11] Ibid.



Launcher Control Trailer, wheels removed. *Internet*

Standby Power

Emergency power at all launcher sites) was provided by Cummins V-12 diesel-powered generators that provided 60 cycle power. Each generator was about 6-feet high, rated at 150 KW each. Double sites (OA-32 and OA-63) were equipped with three Cummins diesel-generators. Radiators for the generators were situated outside the generator building, cooled by electric fans.

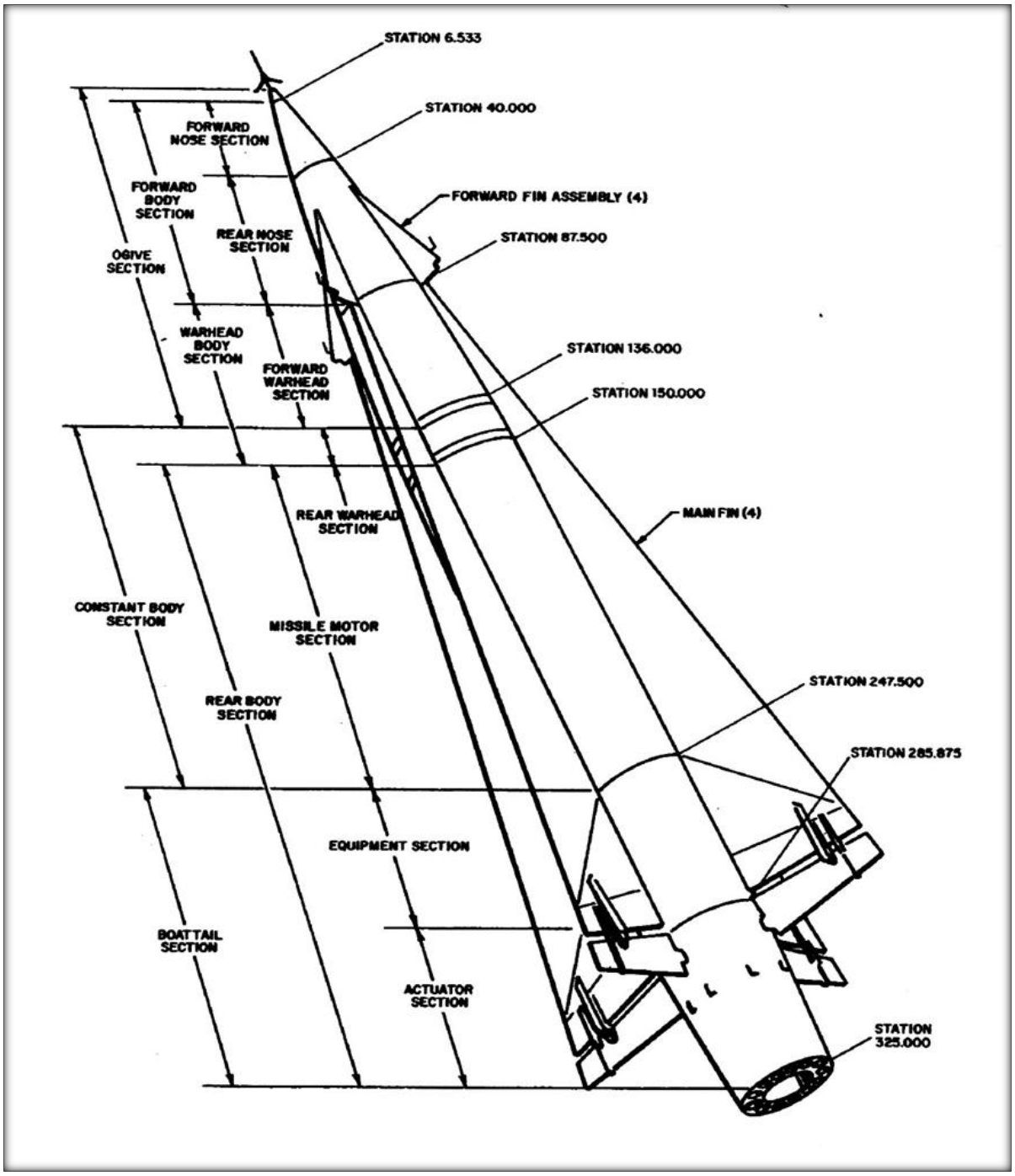
Power for the missile launchers was provided by a 60 KW frequency convertor that put out 400 cycles, which was located near the launcher pads and powered four launchers apiece. The mess hall, administration building and barracks were powered by 60-cycle commercial power supplied by the Hawaiian Electric Company or stand-by emergency power.

Initially, all IFC sites were equipped with three diesel-powered 60 KW generators, when sites were converted to HIPARs, larger generators were installed. It is not clear as to the specific make or rated power outage.

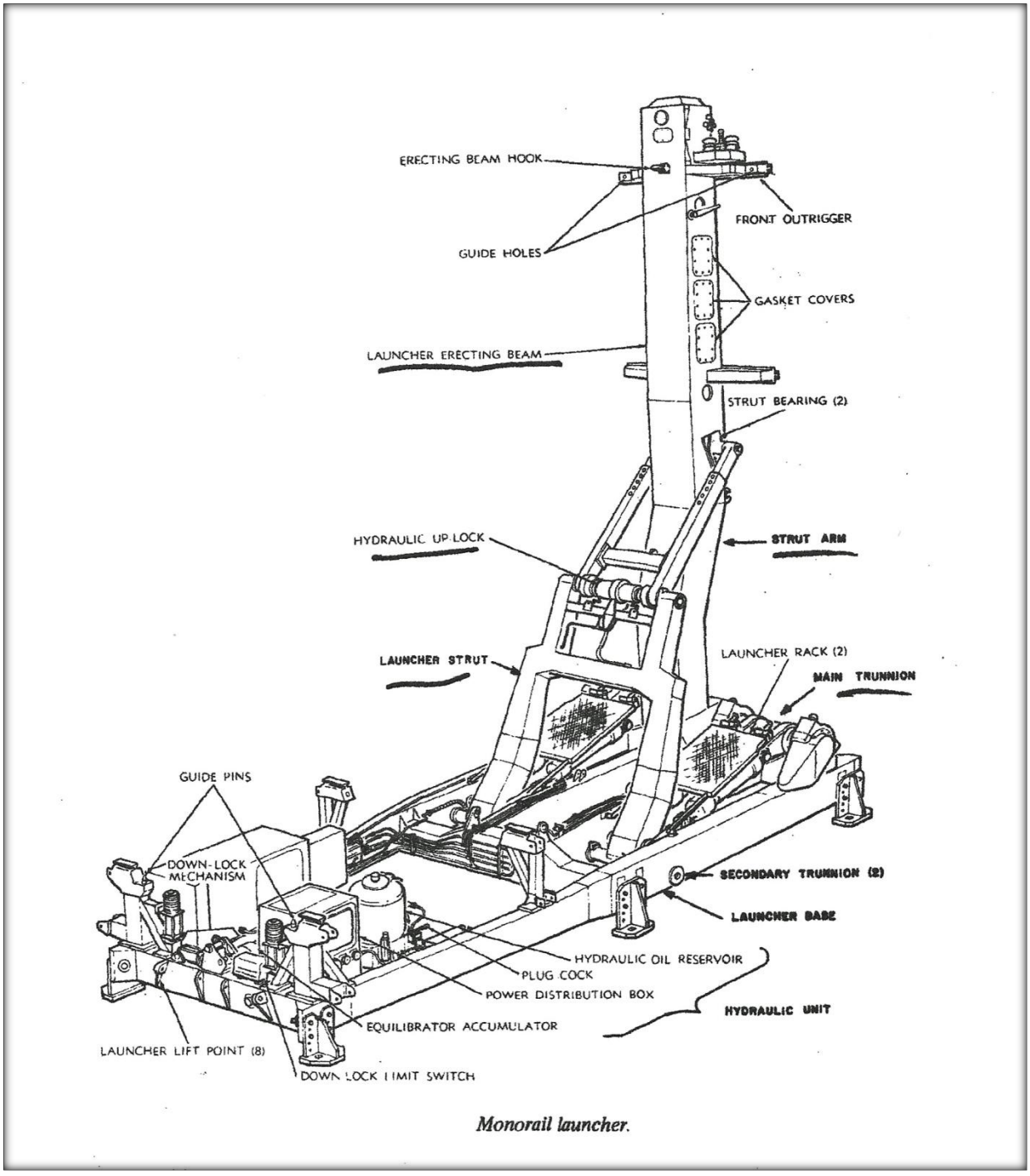
Specifications for the Nike-Hercules Missile[12]

Length:	26 ft. 10 in. (w/o booster)
Wingspan:	6 ft 2 in. (W/o booster)
Diameter:	21 in.
Weight (w/o booster):	10,710 lb
Speed:	Mach 3.65 (2,707 mph)
Ceiling:	150,000 ft.
Range:	88 mi.
Propulsion:	Booster: Hercules M-42 solid-fueled rocket cluster (4x M5E1 *Nike* boosters), 978 kN (220,000 lb total)
Sustainer:	Thiokol M30 solid-fuel rocket; 44.4 kN (10,000 lb)
Warhead:	M17 blast fragmentation or W-31 nuclear 2 kT & 40 kT)

[12] Sources: "Nike Hercules (SAM-N-25) (MIM-14/14B); Technical Specifications," <http://redstone.army.mil/history/nikesite/nikeherc.html>, accessed March 6, 2009. Andrew Parsch, "Directory of U.S. Military Rockets and Missiles, MIM-14; Western Electric SAM-A-25/M6MIM-14 Nike Hercules. <http://www.designation_systems.net/dusrm/m-14.html>, accessed March 10, 2009.



Nike-Hercules missile. *Internet*

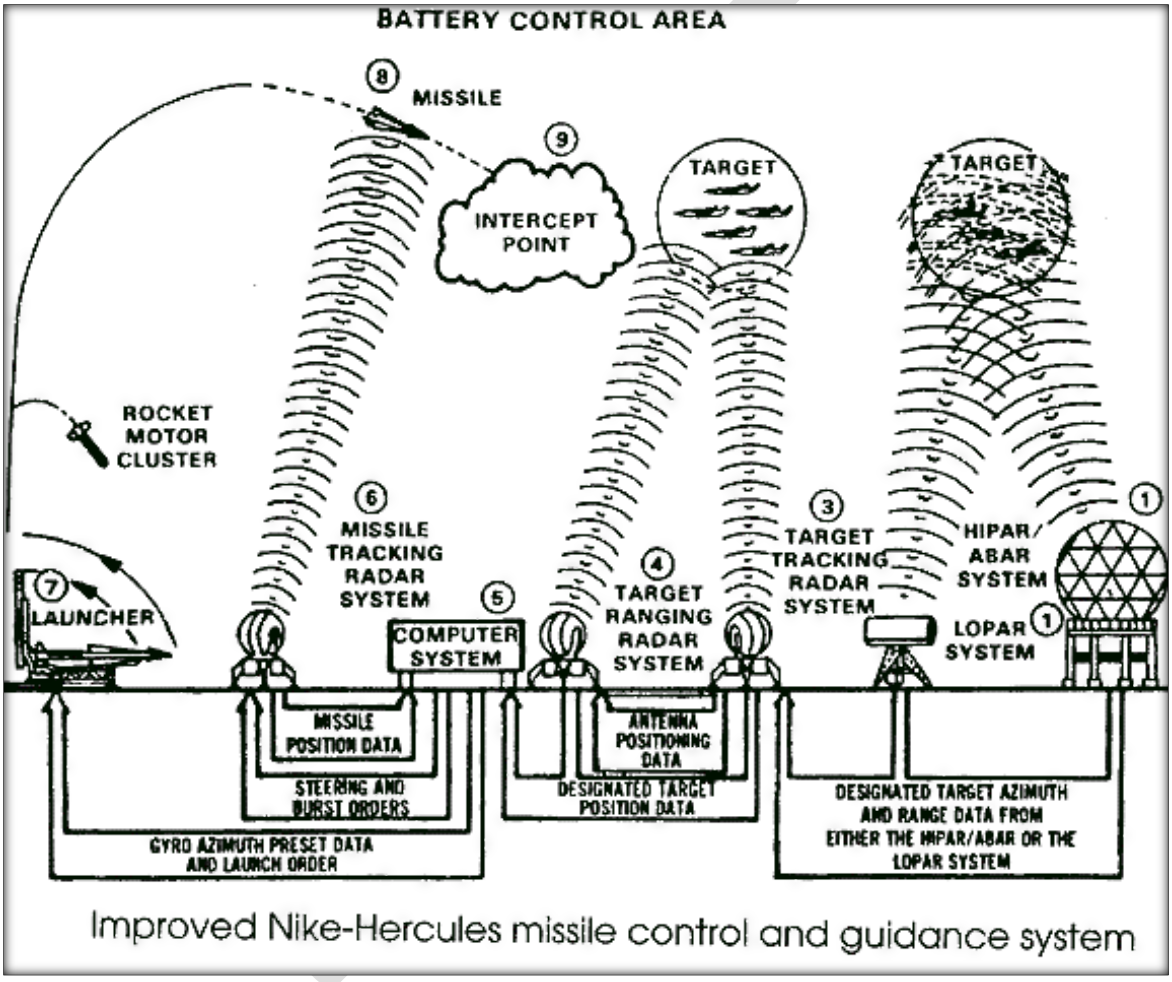


Nike Monorail Launcher. *Internet*

Nike launchers on Oahu were located on the surface, and were the monorail type elevated by hydraulics. Each missile was covered by a protective cocoon to protect it from the elements, and inflated by a huge blower. The pressure was just enough to keep it away from the missile. Each

launcher was equipped with rails and supports on its side in case the missile needed checking, it would be rolled to the side off the launcher for inspection.

During an alert, a crewman would pull a ripcord and the cocoon would deflate and fall away from the missile. The missile was elevated to the firing position. The missile's hydraulic systems were initially powered by a small gas turbine engine, which was later replaced by a battery-powered electric motor.



How the system worked. *Internet*

Integrated Fire Control

The Air Defense Control Center (ADCC) manned by Hawaii Air National Guard personnel, located at Wheeler Air Force Base in Wahiawa coordinated with the HIARNG ADA Group CP in the Kunia facility adjacent to the air base, whereby a specific battery was designated to destroy a target declared hostile.

Friendly aircraft were identified by their Identification Friend or Foe (IFF) transponder or by flight plan on file at the Honolulu Air Route Traffic Control Center (ARTCC) manned by the Civil Aeronautics Authority (CAA) until August 1958 when it became the Federal Aviation Agency (FAA).

Each battery had its own control area known as the Integrated Fire Control or IFC course which consisted of the following: the acquisition radars, Alternate Acquisition Radar (AAR) with either the AN/MPQ-69, 71, or 75 models: Other radars included target tracking (TTR), target ranging (TRR), missile tracking (MRR) and possibly a low powered acquisition radar (LOPAR). Target and missile data was transmitted to a computer at the IFC SITE.[13] Two sites are known to have been equipped with HIPAR, OA-17 (Kahuku) and OA-63 (Barbers Point). It is not clear if the remaining two sites were so equipped.

The IFC site's function was to detect, acquire and track the target; furnish essential data to the battery control officer for determining when a missile should be fired; track the missile during flight: and issue steering and burst orders to the missile.[14]

The Battery Commander (control officer) made the decision as to the type of mission, and warhead to be used (high explosive [HE] or nuclear): supervised selection of the target to be engaged; and issued orders to ready the missile for firing and to fire the missile.[15] After firing, the solid-propellant booster rocket fell back to earth/ocean after "burn out."

IFC Site Locations

- OA-84C: Northeastern Waianae Range above Kawaihapai (Site 1).
- OA-17C: Mt. Kawela (Site 2).
- OA-32C: Southeastern portion of the Koolau Range at Kamehame Ridge above Waimanalo (Sites 3 & 4).
- OA-63C: Puu Manawahua (Site 5) southwestern portion of the Waianae Range. Palehua (Site 6).[16]

[13] "Introduction to the Nike Hercules Missile and Launching Area," MMS Subcourse No. 151, n.d., p. 1. <http://www.nikemissile.org/MMS-151-Ch01.pdf>, accessed March 6, 2009.

[14] Ibid.

[15] Ibid.

[16] Hq, U.S. Army, Hawaii, Office of the Engineer Map, "Installation of Floodlights for Nike Control Sites 17, 32 & 45, 63 & 78 & 84, Project Location Plan Nike Control Sites 63 & 78, Puu Manawahua, Oahu, Hawaii, File No. E-1783, 19 Feb. '69. Map depicts two control sites, Control Site 78 (lower elevation) and Control Site 63 (atop crest of Puu Manawahua). It appears that the double launcher sites carried two different site designators in 1969, e.g. OA-32 & 45 (Bellows AFB) and OA-63 & 78 (Barbers Pt. [Palehua]) which were later on consolidated into one site designator.

Site Coordinates

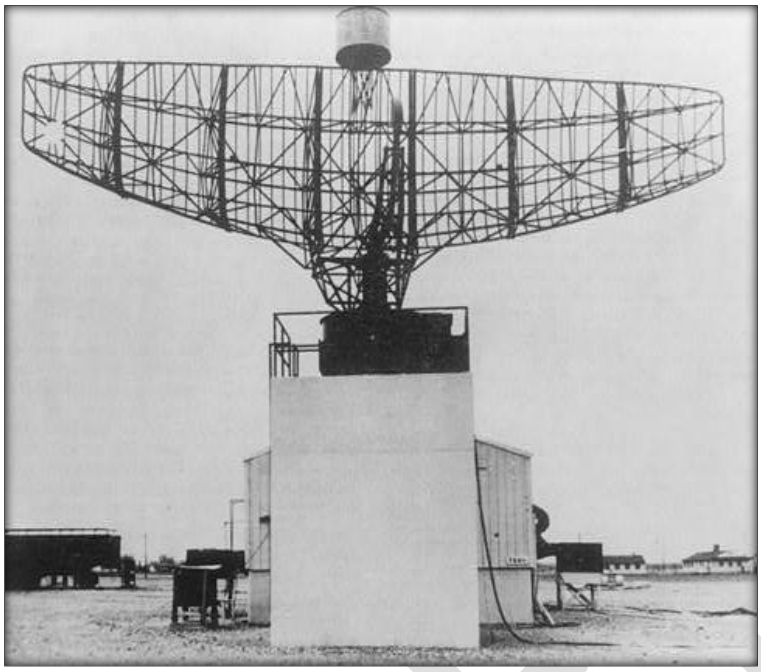
Designator	Latitude	Longitude	Elevation
OA-84C*	21.546039N	158.195120W	1999 ft
OA-84L**	21.576940N	158.195024W	3 ft
OA-17C*	21.664083N	157.000601W	1042 ft
OA-17L**	21.664513N	157.981958W	571 ft
	21.667204N	157.985213W	576 ft (Admin/Bks)
OA-32C*	21.319219N	157.677549W	1102 ft (Admin/Bks)
	21.320432N	157.681662W	1321 ft (IFC radars)
OA-32L**	21.348521N	157.707888W	3 ft
OA-63C*	21.377189N	158.112152W	1692 ft
	21.385972N	158.105122W	2367 ft
OA-63L**	21.364302N	158.112674W	1051 ft
	21.368460N	158.108677W	1328 ft (Admin/Bks)

* IFC Area.
** Launcher Area.
+ OA-63C acquisition radar located atop Puu Manawahua, above IFC area.
Source: Google Earth.

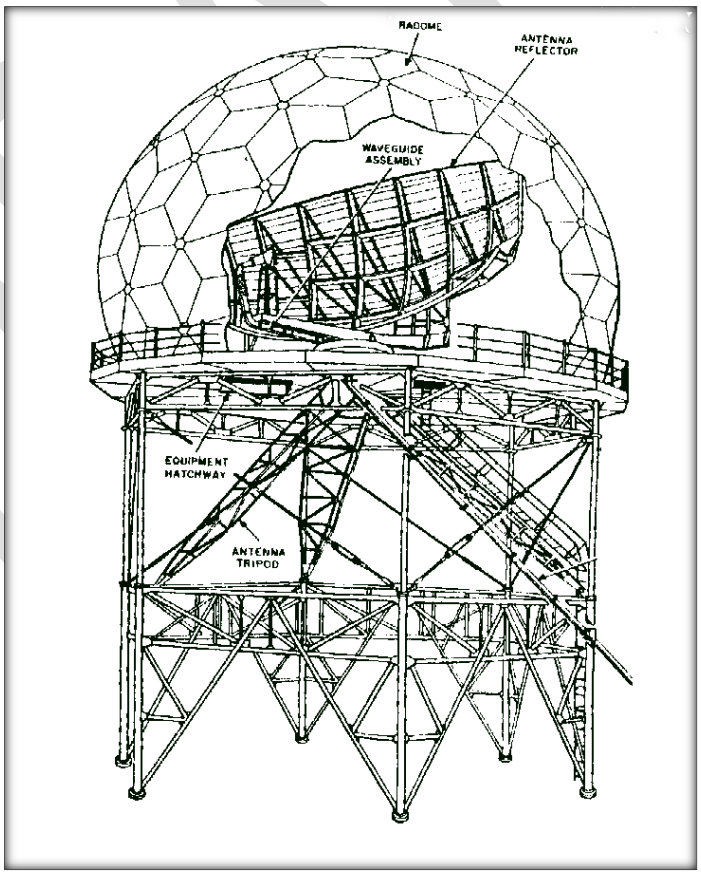
Linear Distances between Control and Launcher Areas

Designator	Distance in Yards	Compass Point
OA-84	3,726	S
OA-17	2,054	W
OA-32	4,500	SE
OA-63	1,554	N

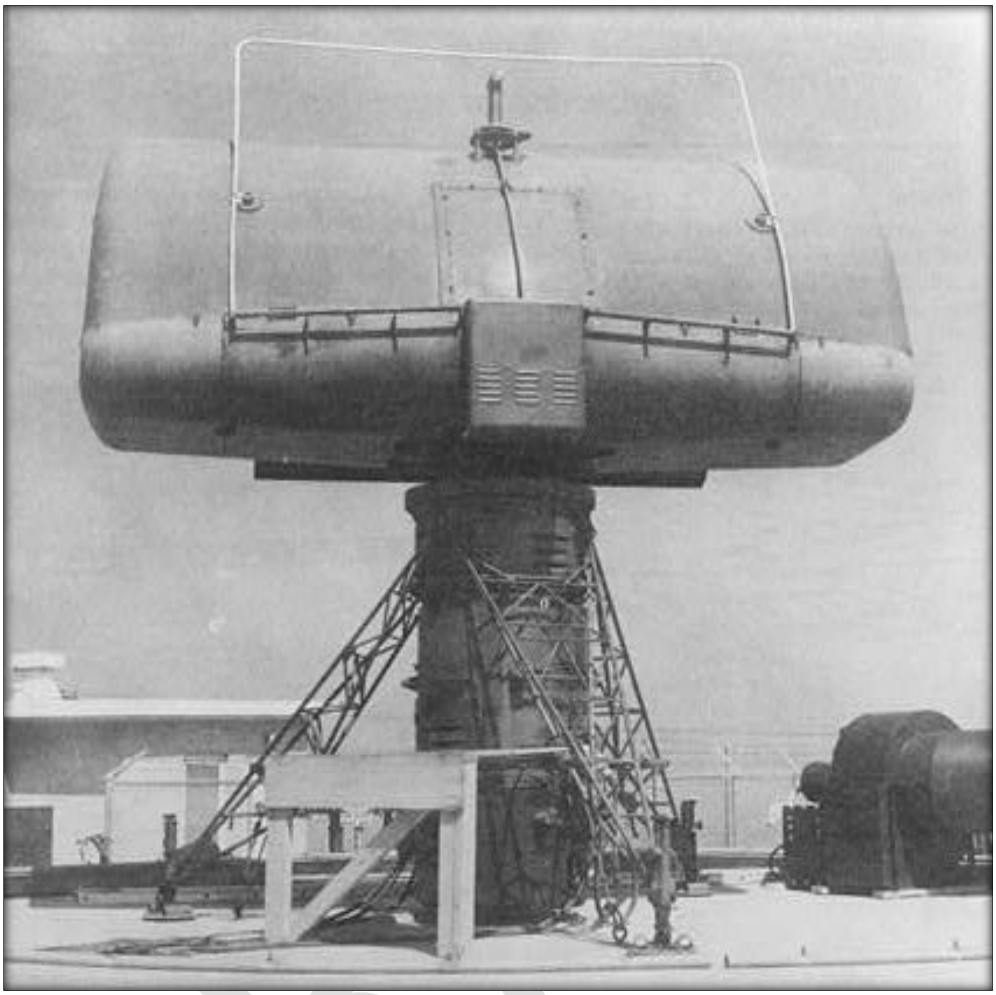
Source: Google Earth. All distances are approximate.



Alternate Acquisition Radar (AAR.) *FM 44-82*



High Powered Acquisition Radar (HIPAR), antenna, tower and protected bubble. *Internet*



Low Powered Acquisition Radar (LOPAR). *FM 44-32*

Support Buildings

The author received information that both double launcher sites (OA-32 and 63) included two administrative and two barracks/mess hall buildings; as they were manned by platoons from two separate batteries.

The following structures have been identified at the four Oahu Nike sites by archival material, Internet Website, or recently by satellite imagery:

OA-84
Satellite imagery using "Google Earth" ©2009 Google™ of the Control Area shows three buildings thought to be administration, mess hall/barracks and generator and five other structures that appear to have been towers for the radars. No sign of any buildings at the Launcher Area, six launcher berms are visible.

OA-17
The Control Area included the following: Sentry Box, flag pole, Administration Building, one 18-man Barracks/Mess hall, Generator Building, inter-connecting corridor, HIPAR Tower, HIPAR Building, ARR Tower and circular pads for the TTR, TRR, and MTR. The Administrative Area included: Administration Building, 22-Man Barracks/Mess hall, and Pump House. The Launcher Area included the following buildings: Missile Assembly and Test, Generator, and Warhead, two Guard Towers and one Sentry Box, and Water Tank Site.[17]

OA-32
Google Earth shows the Administrative area with four buildings, two are identified as a Barracks/Mess hall, Administrative Building; the remaining two have not been identified by the author. The Control Area reveals approximately 11 structures including generator building and several antenna towers or platforms.

Two structures are visible on Google Earth at the launcher site, which appear to be the warhead assembly and test, and generator buildings. The launcher berms are visible.

OA-63
Ed Thelen described the upper Control Site 5 (1328') as having the following: sentry box, EM Barracks/Mess hall, Administration Building, Flag Pole, Generator Building, HIPAR Building and Antenna, TTR Tower, MTR Tower, ACR Tower, TRR Tower, and Inter-Connecting Corridor.[18]

Thelen reported that Control Site 6 contained 4.23 acres, and included the following structures: an 18 man barracks/mess hall, administrative, sentry box, flag pole, engine generator and frequency charger, inter-connecting corridor, and concrete pads for TTR, MTR, ACR, and RCT. A separate parcel (.86 acre) north of the site included a concrete pad for the Bore Sight Mast.[19]

Structures at Launcher Sites 5 & 6 included two security watch towers, missile assembly and test, warhead, generator and the same launcher layout as OA-32L. Twelve launcher berms are visible on Google Earth. Administrative Area for the launcher site included two administration buildings, two 22-men barracks/mess hall buildings, sentry shed and flag pole.[20]

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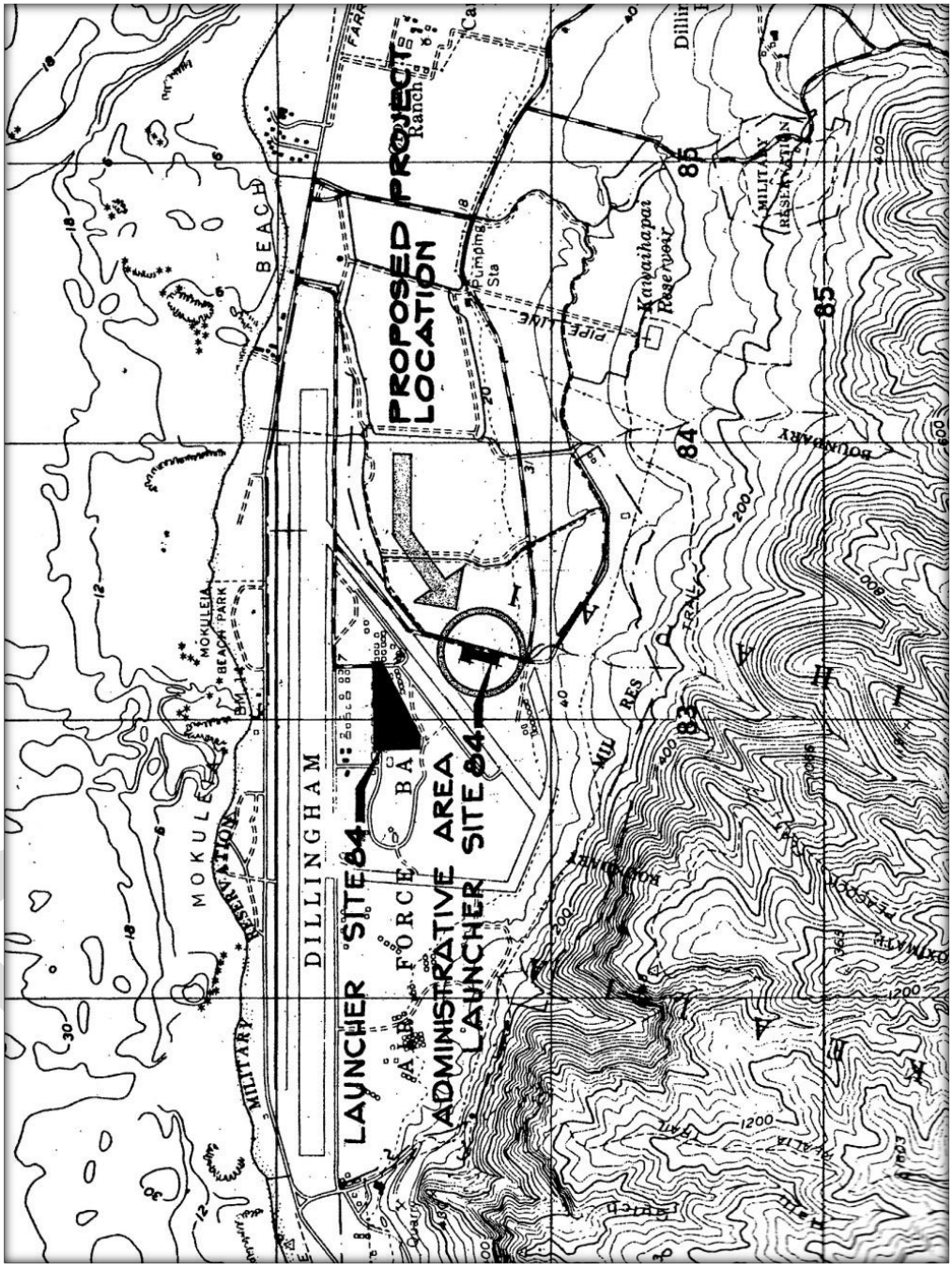
17 HAER No. HI-69, p. 12-13.

18 "Locations of Former Nike Missile Sites (text), Hawaii." <http://ed-thelen.org/loc-h.html>, accessed March 4, 2009

19 Ibid.

20 Ibid.

OA-84 (Dillingham AFB/Waianae Mt. Range

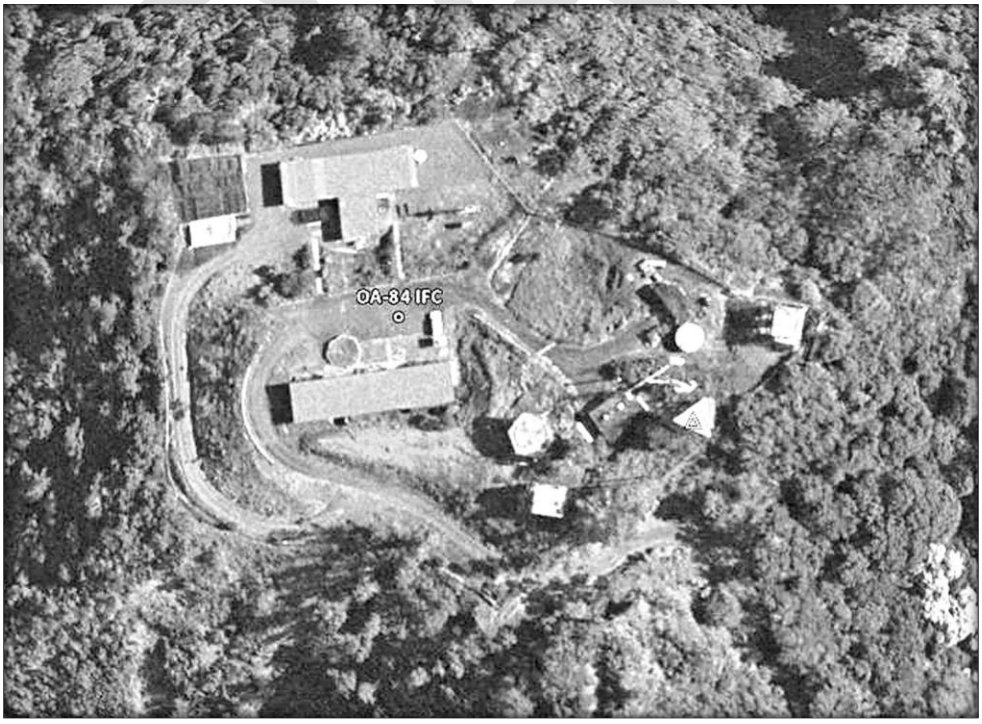


Proposed location for gasoline dispensing system at Site OA-84L.
Office of the Engineer, Hqs U.S. Army, File No. E-1792, 15 Feb. '65

Nike-Hercules at OA-84L, Dillingham Air Force Base, Kawaihapai.
U.S. Army Redstone Arsenal Photograph

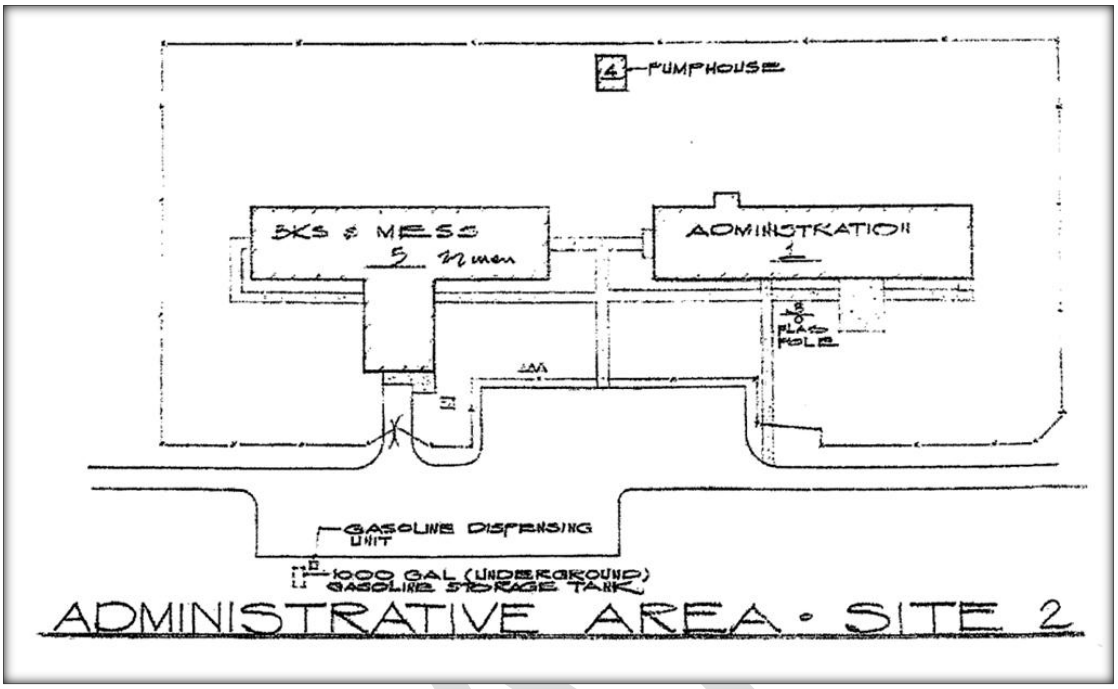
OA-84L Launcher Site, *Courtesy of Google Earth.*

Former IFC site (OA-84C) above Dillingham A.F.B., Kawaihapai.
Left, administration building; Right, barracks/mess hall. *Internet*

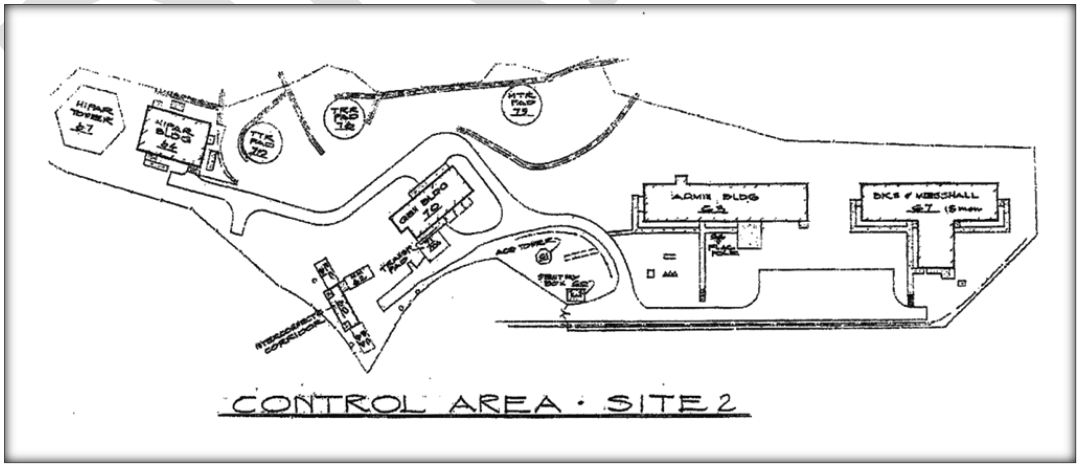


OA-84C's radar antennae platform towers and miscellaneous support buildings.
Courtesy of "Google Earth" ©2009 Google™

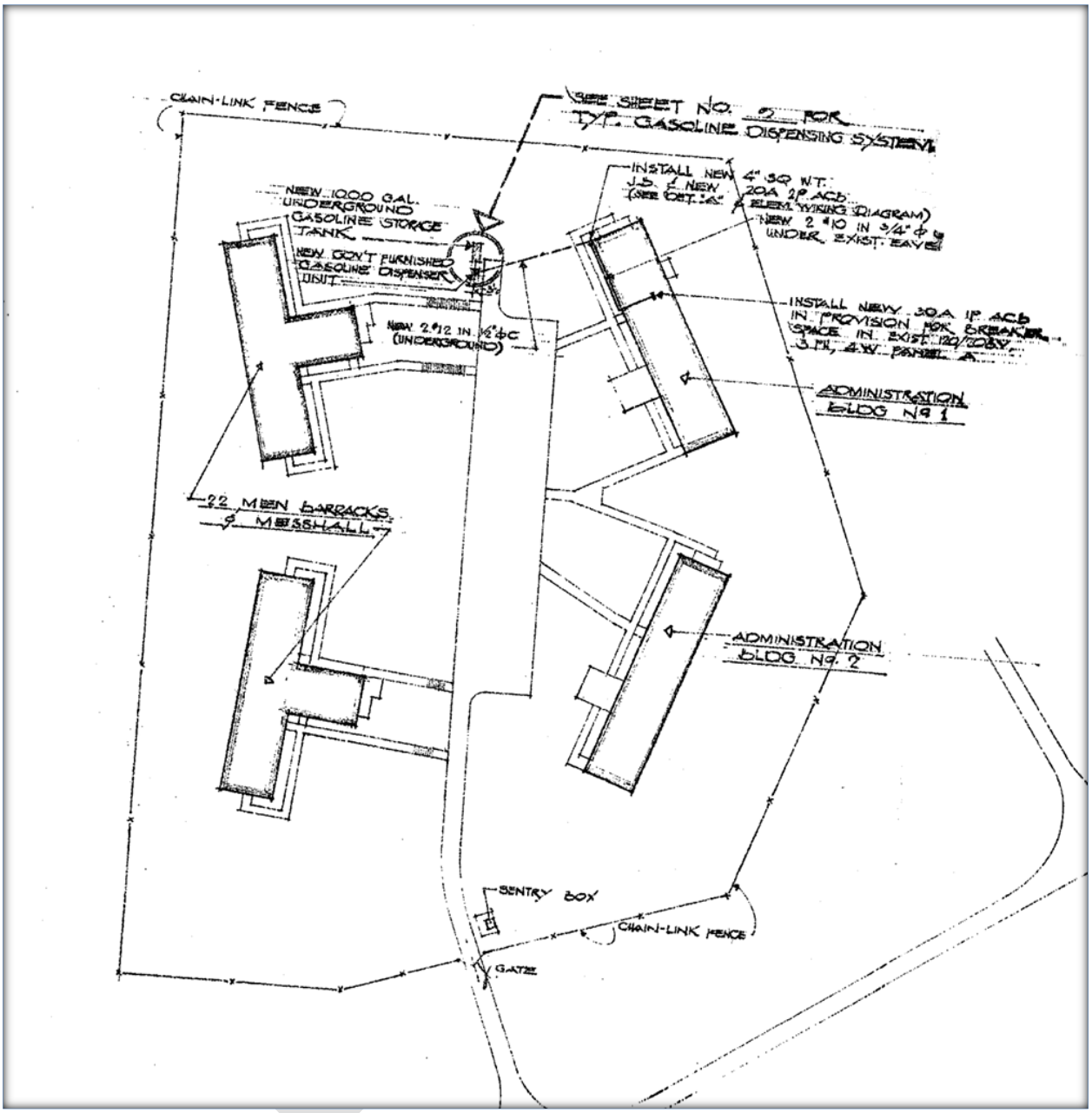
OA-17 (Kahuku/Mt. Kawela)



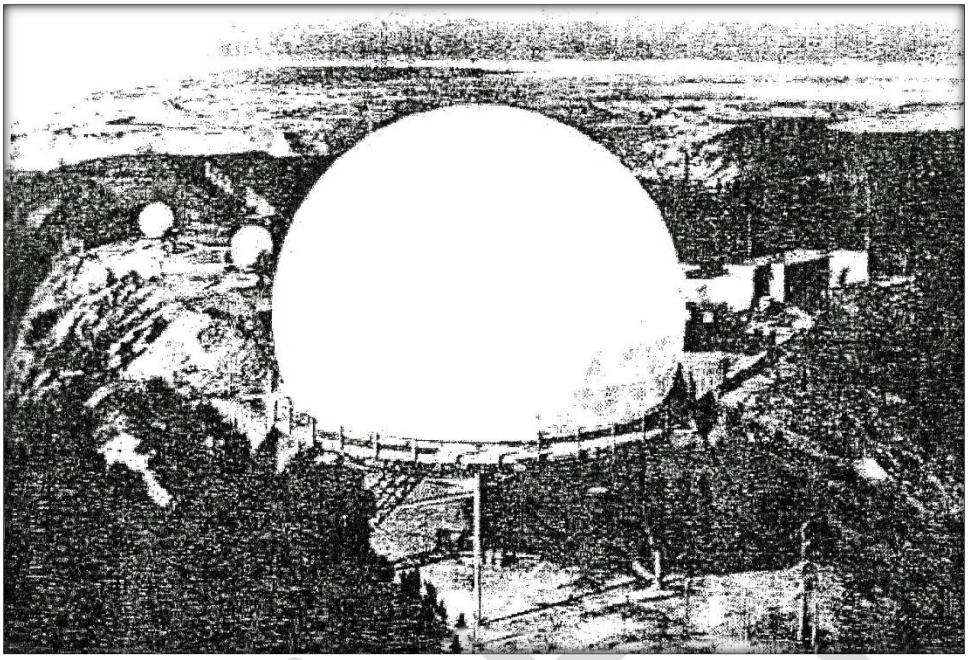
OA-17L. Barracks/Mess hall and Administration buildings. *HAER No. HI-69*



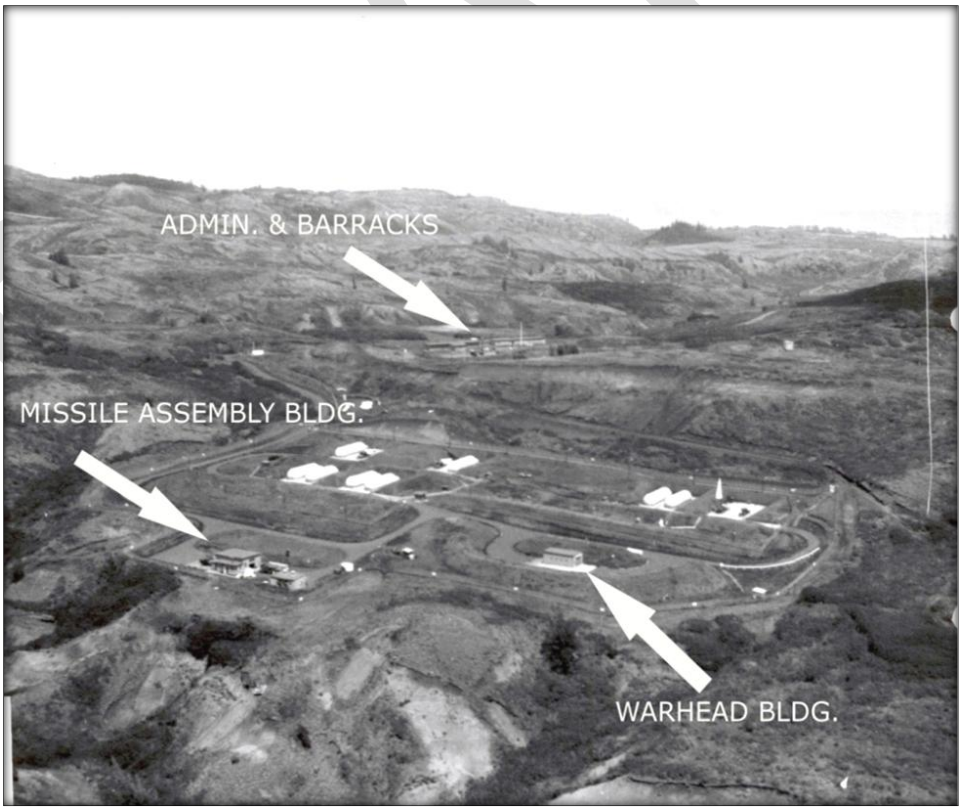
OA-17C. Control Area.
HAER No. HI-69



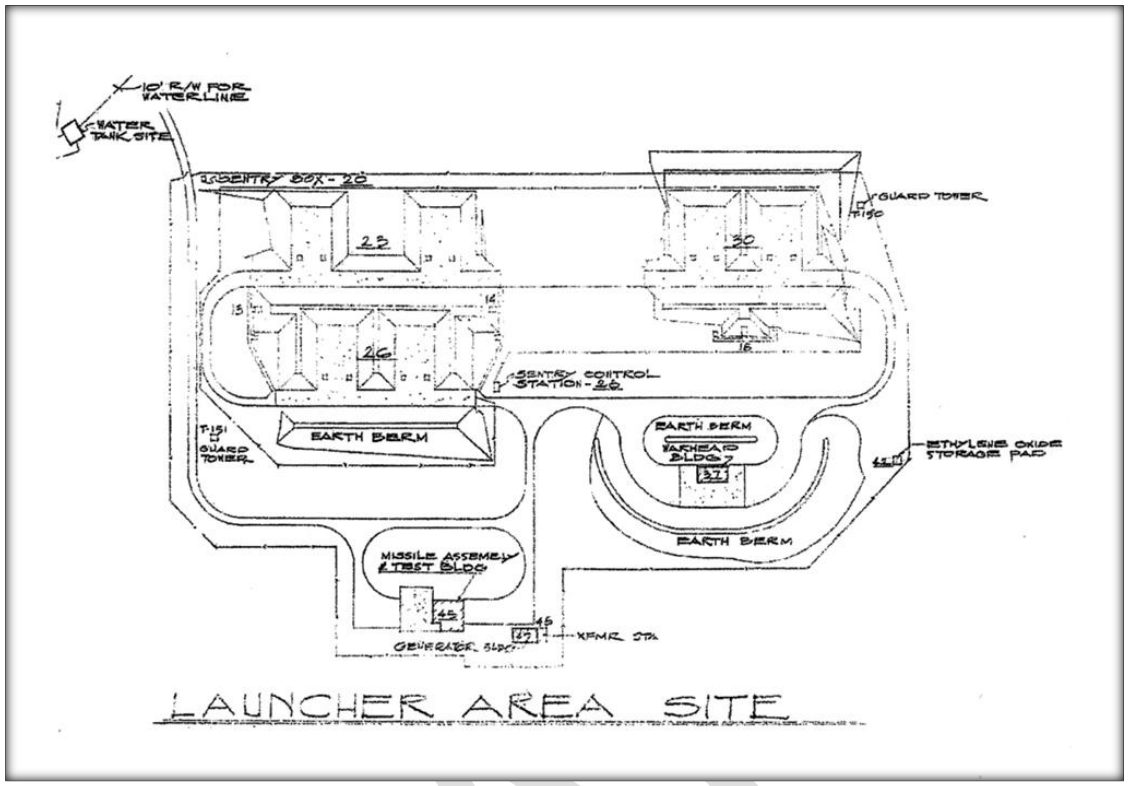
OA-63L. Launcher Site's Administrative Area. File No. E-1791,
Office of Engineer, Hqs U.S. Army Hawaii, 15 Feb. 1969



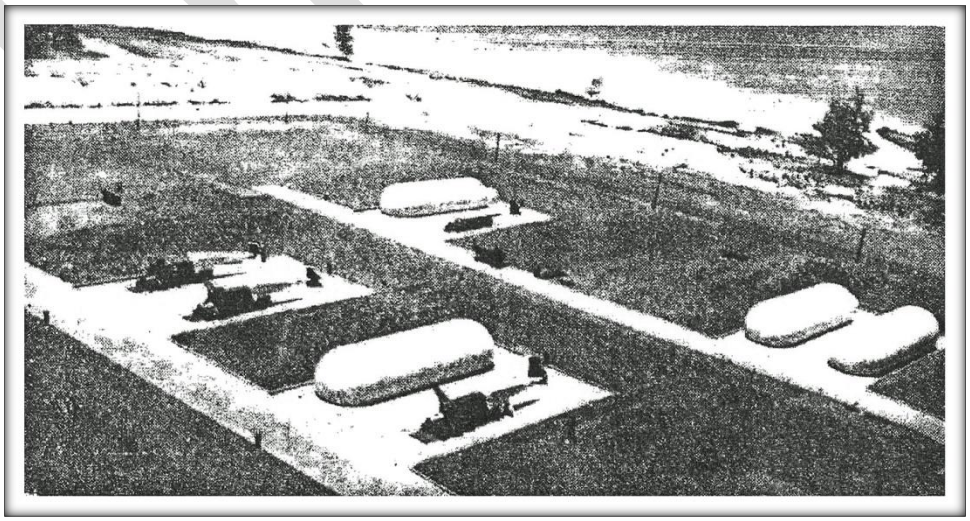
OA-17C's HIPAR atop Mt. Kawela. *HAER No. HI-69*



OA-17L. Administration/Barracks and Launcher Area. One missile in the ready position on the right, Other missiles covered by cocoons. *Courtesy of David Cox, U.S. Army Garrison of Hawaii (annotations by author)*

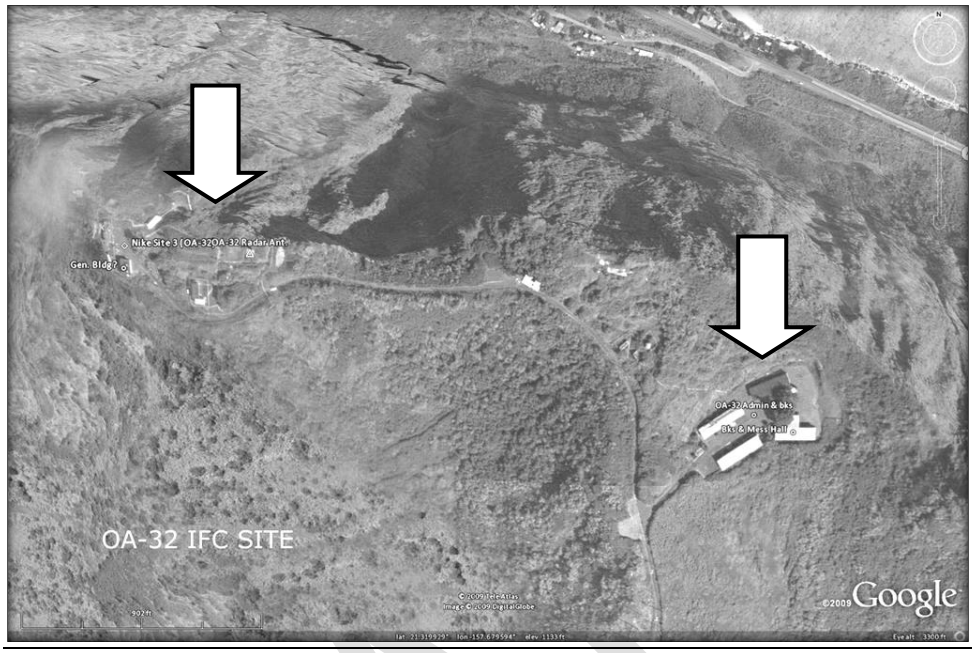


OA-17L Launcher Area. *HAER No. HI-69*

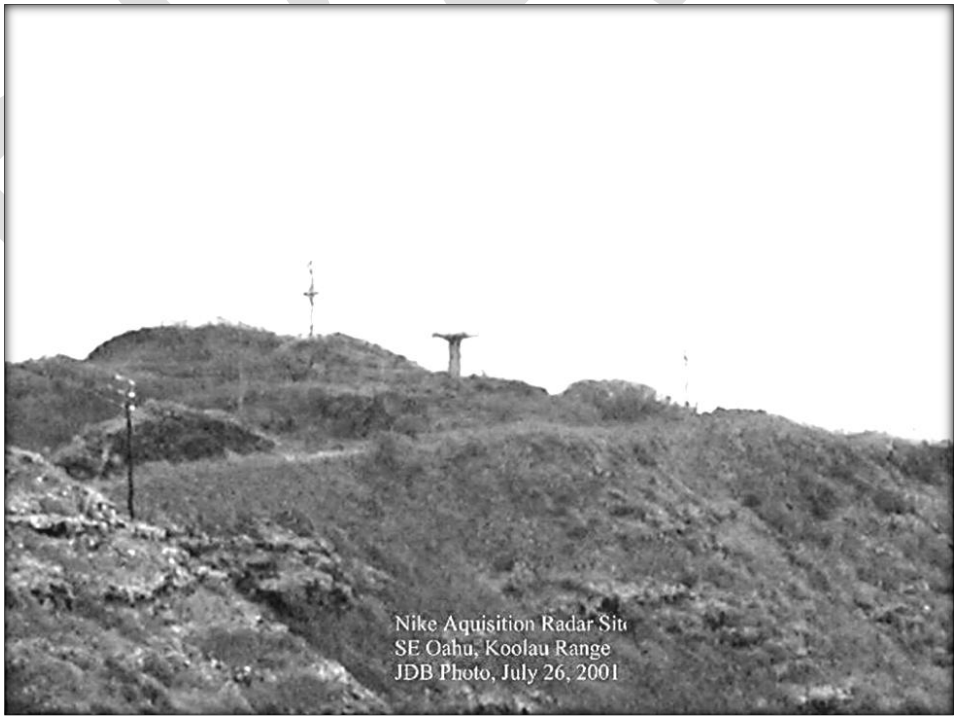


OA-17L. Three missiles shown in the standby position, four covered by cocoons.
HAER No. HI-69

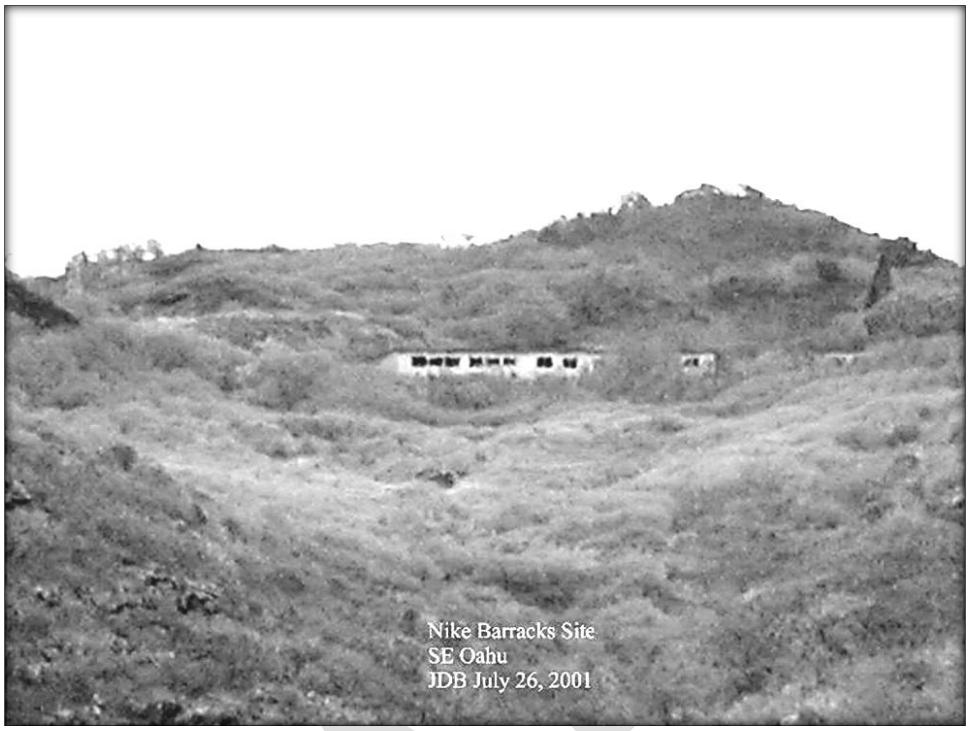
OA-32 (Bellows/Kamehame Ridge)



OA-32C. Located atop Kamehame Ridge of the Koolau Mountain Range. Left arrow points to Control Area, right arrow indicates the administration and barracks/mess hall buildings. *Google Earth*

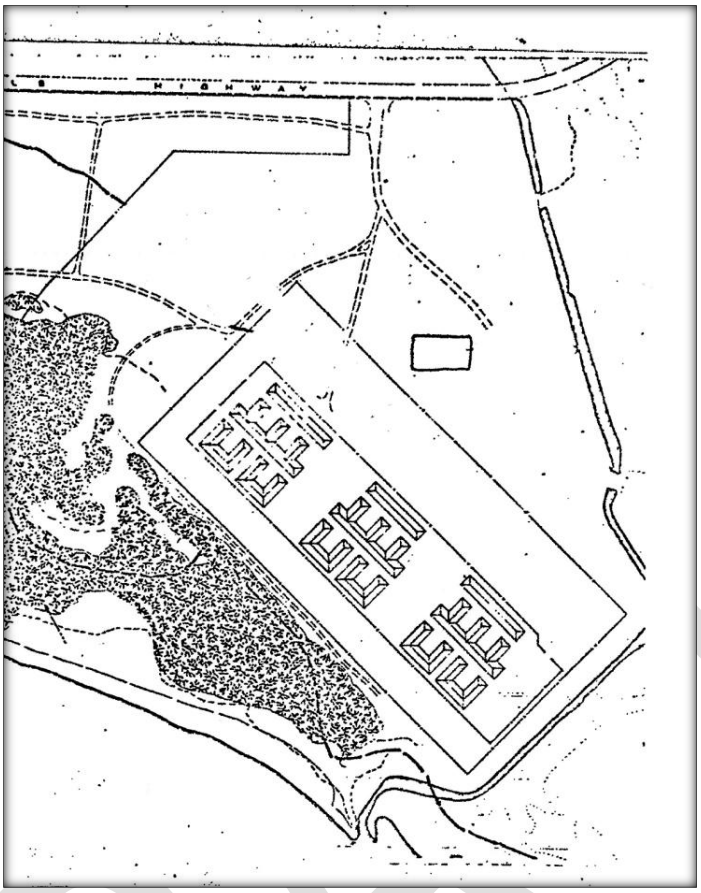


OA-32C. IFC Area at Kamehame Ridge. *Author, 2001*

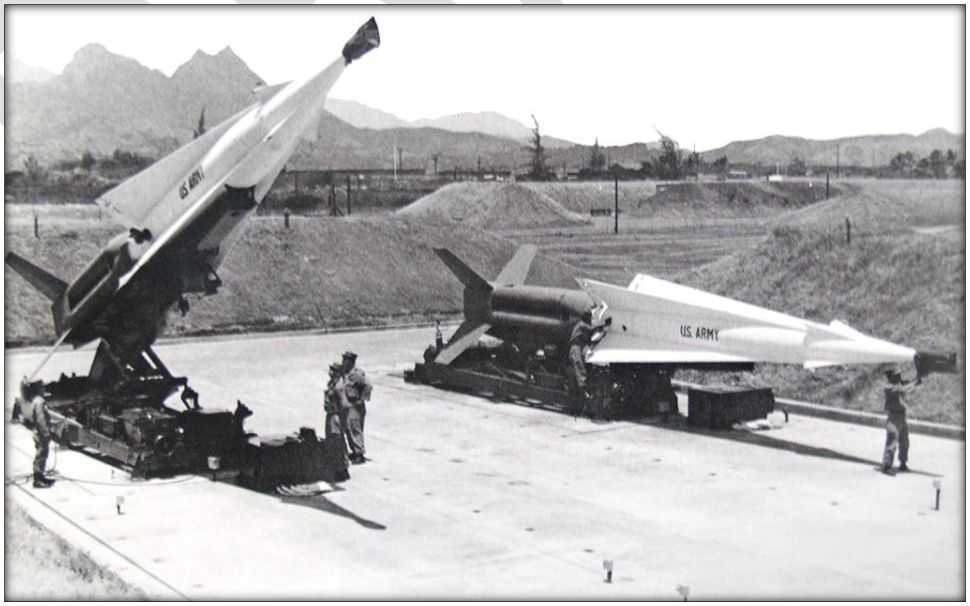


OA-32C. Barracks and administration buildings located to the right of the IFC Area.
Author, 2001

OA-32L. Launcher Area at the former Bellows Air Force Station, Waimanalo.
Google Earth

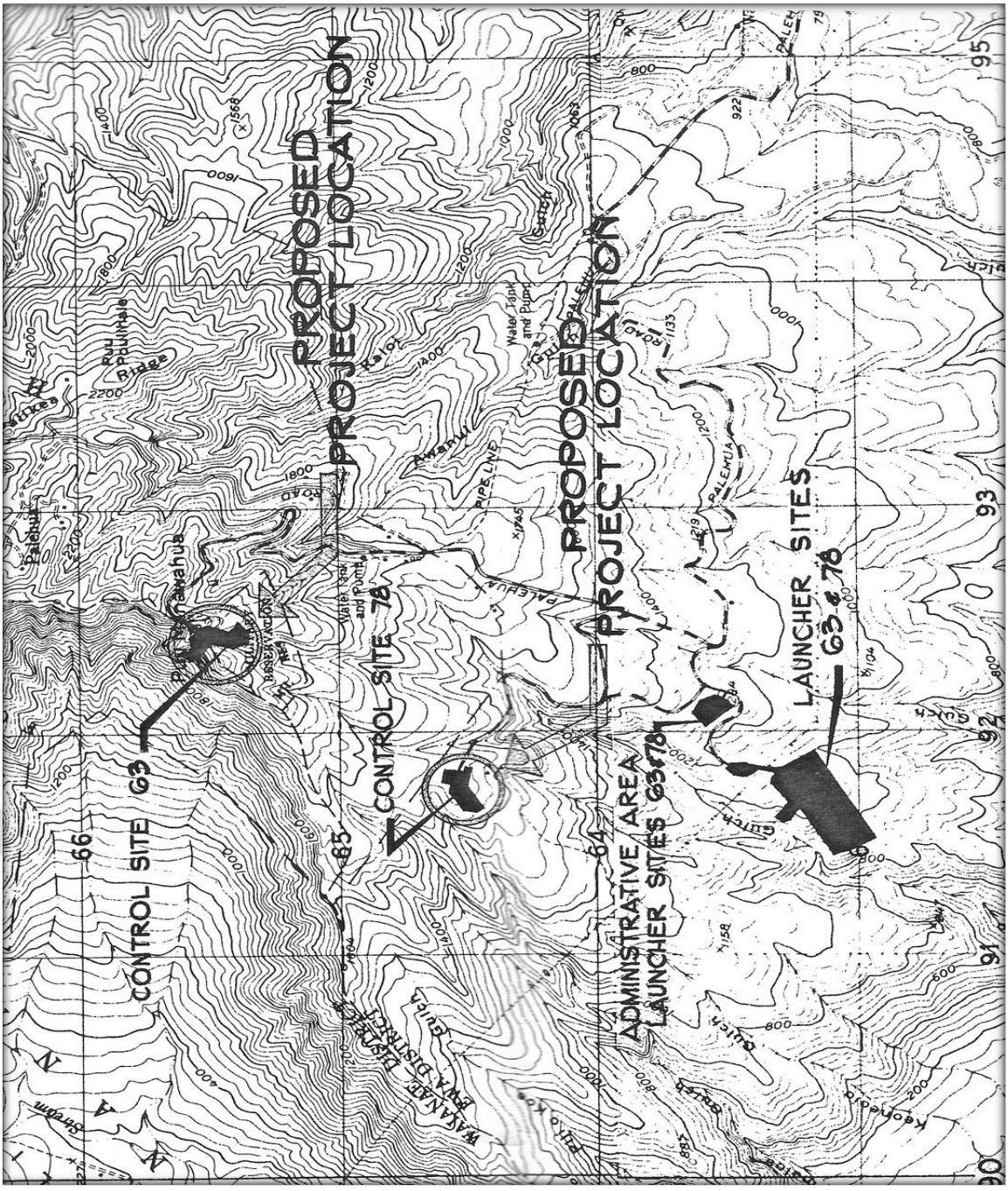


OA-32L Launcher Area. *Author's Collection*



Nike-Hercules missiles on launchers at Bellows Air Force Station. *HIARNG*

OA-63 (Palehua/Puu Manawahua)

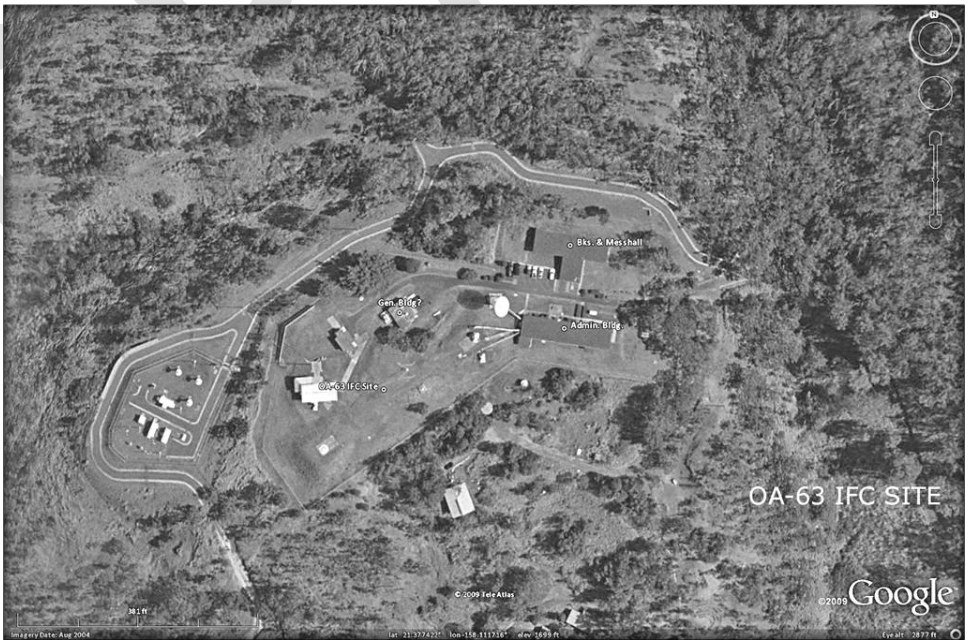


Proposed locations for floodlights at Sites OA-63 and 78.
Office of the Engineer, Hqs U.S. Army Hawaii, File No. E-1783, 15 Feb '65

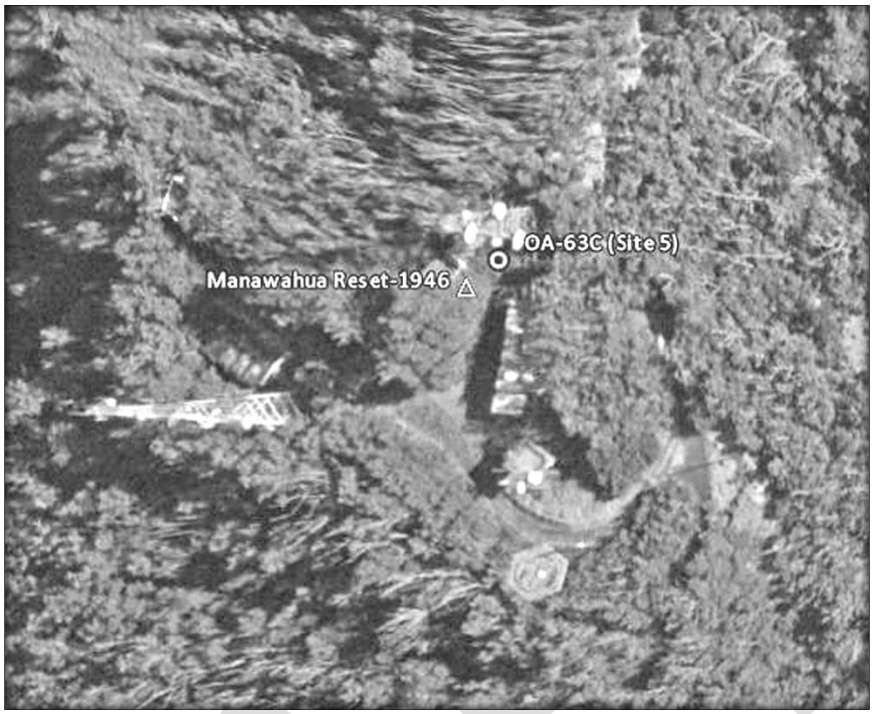
OA-63L. Launcher and Administrative Areas at Palehua, Waianae Mountain Range.
Left arrow points to the launcher area and right arrow to the administration and barracks site.
Google Earth

OA-63L. Launcher site showing the twenty-four launcher pads. *Google Earth*

OA-63L. Administrative and Barracks Area. *Google Earth*



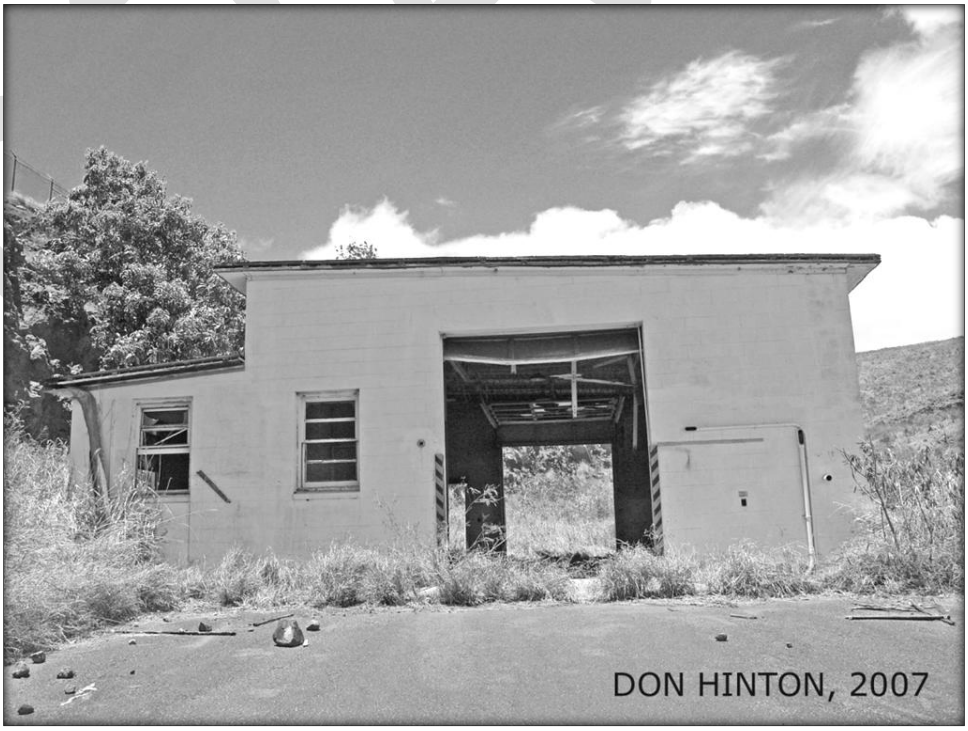
OA-63C Site 6. Now the Palehua Solar Observatory operated by the U.S. Air Force. *Google Earth*



OA-63C (Site 6), Puu Manawahua. *Google Earth*

Gate that leads to OA-63L's administration and launcher sites in 2007.
Don Hinton, copyright pending (all photographs used with permission)

Barracks/Mess hall at OA-63L Launcher Area, near launcher site. *Don Hinton*



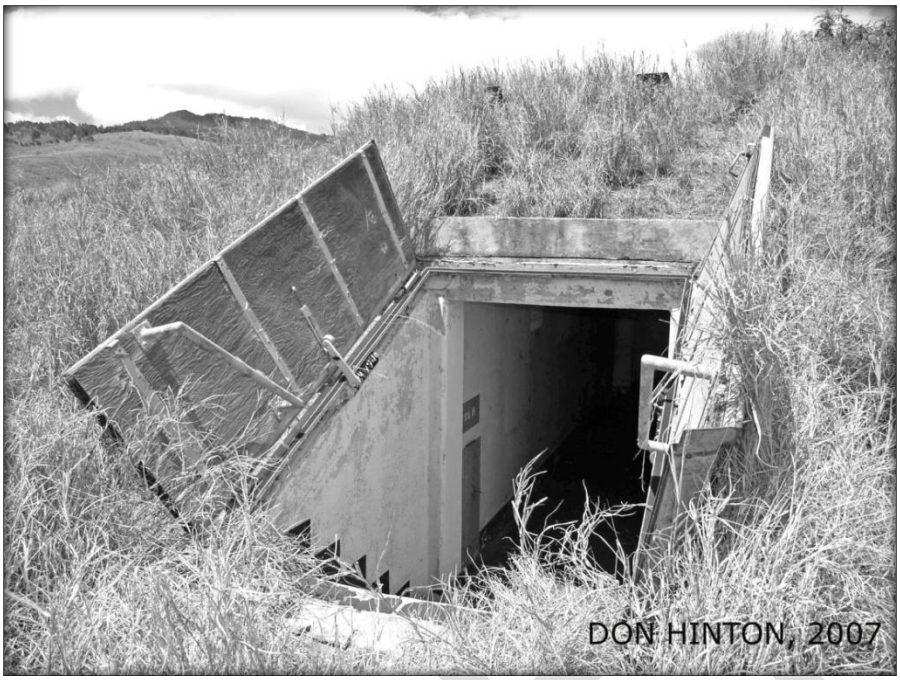
Missile Assembly and Test Building at OA-63L. *Don Hinton*

Interior of Missile Assembly and Test Building at sOA-63L. *Don Hinton*

Warhead Assembly Building at OA-63L. *Don Hinton*

Interior of the Warhead Assembly Building at OA-63L showing overhead trolley to lift warheads. *Don Hinton*

Generator Building near OA-63L launcher site. *Don Hinton*



Double doors to underground launch control-bunker at OA-63L
Where missile men assembled prior to firing. *Don Hinton*

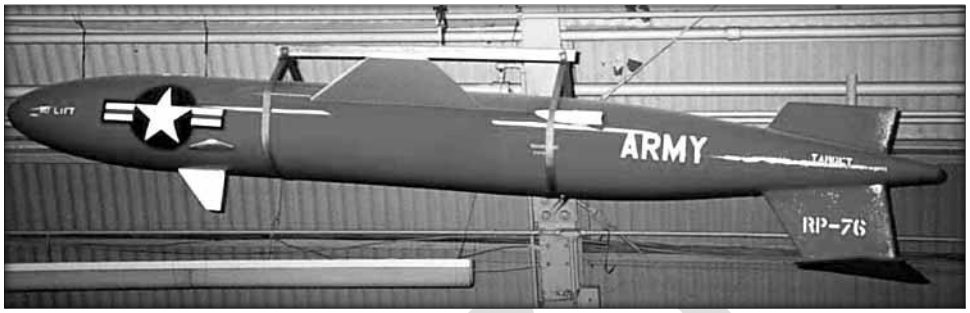
Emergency escape hatch from the underground control-bunker at OA-63L. *Don Hinton*

Launcher pads at OA-63L. *Don Hinton*

OA-63L. Note earth berm surrounding pads.
Don Hinton

Radio-Controlled Target Drones

Northrup RP-76 rocket-propelled radio-controlled targets launched from aircraft off the Island of Kauai functioned as targets for the Nike missile batteries. The RP-76 was usually painted overall bright red. The target drone was usually launched from an air force F-89D Scorpion.



Northrup RP-76 Target Drone. *Internet*

Specifications for the RP-76[21]

Manufacturer:	Northrup Corp., Ventura Division, CA.
Propulsion:	Solid-propellant rocket engine w/twin thrust nozzles canted 15 degrees outboard in the horizontal plane.
Tracking:	RP-76A used a Northrup RPTA-1 tracking aid system. Smoke generating and night light kits were used for visual tracking.
Span:	5 ft. 0 in.
Length:	9 ft. 6.2 in.
Height:	1 ft 6.2 in.
Empty Weight:	197 lbs.
Launch Weight:	301 lbs.
Ceiling:	Over 72,000 ft.
Endurance:	23 min. (including 14 min. of gliding)
Acquisition Range In S-Band:	110,000 yd.
Tracking Radar Range in X-Band:	73,000 yd.

[21] "Northrup RP-76 Target Drone. <http://www.wmof.com/rp76.htm>, accessed March 14, 2009.

Concluding Remarks

The Nike-Hercules missile program manned by the HIARNG was short lived, but provided the Island of Oahu's military and civilian complex with a deterrent against any attacks by Soviet Long-Range bombers along with the Hawaii Air National Guardsmen who manned the fighter-interceptor aircraft of the 199th Fighter-Interceptor Squadron based at Hickam Air Force Base, and two Aircraft Control & Warning (AC&W) Squadrons: the 150th AC&W Sq., based at Kokee, Kauai, and the 109th AC&W Sq. based at Koko Crater, then relocated to Wheeler Army Airfield with the search and height finder antennas placed on Mt. Kaala on Oahu.

Extant Structures

- **OA-84**
  The launcher site at Dillingham Airfield is in a state of abandonment, whereas the IFC site in the Waianae Mountain Range is used by the State Department of Land and Natural Resources Division of Forestry and Wildlife as a nature study camp for youth, and arboretum of native plants. The ridge top also houses police and other communications relay antennae.

- **OA-17**
  Of the four Oahu Nike-Hercules sites, OA-17 is the only one that is most intact due to its location in the Schofield Barracks Kahuku Training Area. As a result, the site was entered in the Historic American Engineering Record (HAER) as No. HI-69. The launcher and administrative site is located in a combined arms training area. The IFC site atop Mt. Kawela is used by the army; the Honolulu Police Department has microwave receiver antennae on site.

- **OA-32**
  The IFC site atop Kamehame Ridge is leased to the FAA and subleased to the Navy, Honolulu Police Department, and commercial communication businesses for microwave relay antennae; the ridge top administration area is used for a youth program known as "Winners Camp." The non-profit organization sponsors leadership skills and personal responsibility to island teenagers during a week-long program. The administrative and barracks/mess hall buildings have received a coat of paint and some sprucing up. The property is owned by the Kamehameha Schools formerly Bishop Estate, who have leased the site for 40 years at no cost.

  The launcher site at Bellows Marine Corps Training Area is in an abandoned state. Two buildings remain, believed to be the Missile Warhead and Test, and Generator buildings.

- **OA-63**
  The launcher and administrative areas are abandoned although extant structures run the gamut from good to poor condition.

  The former IFC (Site 5) atop Puu Manawahua houses a number of microwave communications business including a facility for the Honolulu Police Department. The HIPAR building, HIPAR antenna mounting tower and former generator room are extant. The State of Hawaii owns the site at Puu Manawahua (Site No. 5); the U.S. Department of

Defense occupies the former IFC Site (No. 5) at Palehua. It is believed that both IFC Sites 5 and 6 were consolidated into one, Site 5. Former IFC (Site 6) is occupied by the U.S. Air Force as a solar observatory in good condition.

Acknowledgements

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_____, "Installation of Gasoline Dispensing Systems for Nike Launcher Sites 17, 32 & 45, 63 & 78, & 84, Typical Elec. Plan and Det'ls Nike Launcher Sites 63 & 78," Puu Manawahua, Ewa, Oahu, Hawaii, File No. E-179115 Feb '69.

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