



Historic Resource Study  
Addendum  
August 4, 2011

Former Almaden Air Force Station  
Mt. Umunhum and Mt. Thayer,  
Santa Clara County, CA

Prepared for  
Mid-Peninsula Regional Open Space District  
Los Altos, CA

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## **I. INTRODUCTION**

This Historic Resource Study Addendum has been completed at the request of the Midpeninsula Regional Open Space District. It develops upon Page & Turnbull's "Historic Resource Study: Former Almaden Air Force Station" (9 March 2011), which primarily discusses the context of the Cold War in the U.S. and the statewide network of Cold War-era U.S. Air Force radar stations in California. This addendum examines more closely the local historic context and potential local significance of buildings at the former Almaden Air Force Station (AFS), which is situated at the summits of Mt. Umunhum and Mt. Thayer in Santa Clara County, California.

## **II. HISTORIC CONTEXT: THE COLD WAR IN SANTA CLARA COUNTY (1945 – 1991)**

The following section provides a discussion of other military installations that operated during the Cold War in Santa Clara County. There is also a discussion of microwave, missile, satellite, and computer industries that received government funding to develop military technology. This Historic Context section has been provided in order to evaluate the former Almaden Air Force Station for local significance in the National Register of Historic Places, the California Register of Historical Resources, and the Santa Clara County Historic Resources Inventory.

### **MOFFETT FEDERAL AIRFIELD**

Moffett Federal Airfield, originally called the Sunnyvale Naval Air Station, was first constructed in 1931. More commonly called Moffett Field, the facility is located in northern Mountain View on the east side of U.S. Route 101. From World War II through the Cold War, Moffett Field was the primary military presence in Silicon Valley. It is perhaps best known as the home of Hangar One, which was constructed to contain a dirigible called the USS Macon. During World War II, the base was home for many non-rigid blimps and air balloons.

In the post-war years, Moffett Field became a major Naval Air Transport Service Squadron Center. The base moved into the jet age, extending Moffett Field's landing strips and modifying its hangars. During the Korean Conflict in 1950, Moffett Field housed the first night jet fighter in the service. More support buildings and landing facilities were built during this time period, and the base became popular for testing new aircraft and jet operations. In 1963, Moffett Field became the home of the Navy's first land-based anti-submarine patrol aircraft, the Orion Hunter. These planes operated out of Moffett Field for the next 30 years. During the 1970s, the base became the headquarters of the Commander Patrol Wings, U.S. Pacific Fleet, responsible for patrolling 93 million square miles of

ocean from Alaska to Hawaii. Operations continued until the Navy officially closed Moffett Field in July 1, 1994, and use of the base was transferred to NASA Ames Research Center.<sup>1</sup>



**Figure 1. Bird's eye view of Moffett Field, looking northwest. 15 October 2008.**  
(Source: [http://en.wikipedia.org/wiki/File:Kluft-photo-Moffett-Federal-Airfield-Oct-2008-Img\\_1911.jpg](http://en.wikipedia.org/wiki/File:Kluft-photo-Moffett-Federal-Airfield-Oct-2008-Img_1911.jpg))

In February 1994, the United States Naval Air Station, Sunnyvale was listed as a National Register Historic District by the National Park Service. It is significant at the national level for its association with the expanding coastal defense capabilities of the U.S. Navy and airship technology during the era between 1932 and 1945.<sup>2</sup> Hangar One was determined eligible for nomination to the National Register of Historic Places circa 2001 by the U.S. Navy, in consultation with the California State Historic Preservation Officer. Hangar One was inducted as a Naval Historical Landmark in the early 1950s and as a California Historic Civil Engineering Landmark by the San Francisco Section, American Society of Civil Engineers in May 1975. It is also listed in the Santa Clara County Heritage Resource Inventory.<sup>3</sup> Military contributions during Cold War are outside Moffett Field's defined period of significance.

### ONIZUKA AIR FORCE STATION

Onizuka Air Force Station (AFS) is a former United States Air Force installation in Santa Clara County, just outside the city limits of Sunnyvale. The station was developed on land immediately

<sup>1</sup> "Moffett Field History Tour," NASA Ames Research Center Historic Preservation Office. Website accessed on 13 July 2011 from: <http://historicproperties.arc.nasa.gov/history/history1.html>

<sup>2</sup> "Hangar One (Mountain View, California)," Wikipedia. Website accessed on 13 July 2011 from: [http://en.wikipedia.org/wiki/Hangar\\_One\\_%28Mountain\\_View,\\_California%29](http://en.wikipedia.org/wiki/Hangar_One_%28Mountain_View,_California%29)

<sup>3</sup> Page & Turnbull, "Hangar One, Moffett Field, California: Re-Use Guidelines," Prepared for NASA/Ames Research Center (24 August 2001) 7-8, 13.

south of Moffett Field. The main building, known locally as the “Blue Cube,” is large, pale blue, and windowless. It is surrounded by an array of parabolic dish antennas used for communication with remote tracking stations that control military satellites. Built in 1960 on land purchased from Lockheed, the station was originally known as the Air Force Satellite Test Center. It was later renamed the Air Force Satellite Control Facility and Sunnyvale Air Force Station. In 1986, the base was renamed Onizuka Air Force Base in honor of Lt. Col. Ellison Onizuka, USAF, one of the astronauts who died in the Space Shuttle *Challenger* disaster on 28 January 1986. On 26 January 1994, Onizuka Air Force Base was renamed Onizuka Air Force Station.<sup>4</sup>



**Figure . The “Blue Cube” at Onizuka Air Force Station**  
(Source: [http://en.wikipedia.org/wiki/File:Lockheed%27s\\_%22Blue\\_Cube%22.jpg](http://en.wikipedia.org/wiki/File:Lockheed%27s_%22Blue_Cube%22.jpg))

Onizuka AFS was operated by the 21st Space Operations Squadron, a geographically separated unit (GSU) of the 50th Space Wing. The facility contained Detachment 2 of the Space and Missile Systems Center and a branch of the National Reconnaissance Office.<sup>5</sup> The latter was a classified operation that was created in September 1961 in response to the Soviet launch of Sputnik. Its purpose was overseeing “all satellite and overflight reconnaissance projects whether overt or covert.”<sup>6</sup> It operated at Onizuka AFS from 1961 to 2007. In general, between 1960 and 1970, Onizuka AFS was the exclusive satellite control center for all military satellites, international communications, space operations, space shuttle, and NASA communications. It was the primary

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<sup>4</sup> “Onizuka Air Force Station,” Wikipedia. Website accessed on 15 July 2011 from: [http://en.wikipedia.org/wiki/Onizuka\\_Air\\_Force\\_Station](http://en.wikipedia.org/wiki/Onizuka_Air_Force_Station)

<sup>5</sup> Ibid.

<sup>6</sup> “The NRO,” National Reconnaissance Office, Website accessed on 15 July 2011 from: <http://www.nro.gov/about/nro/index.html>



military communications facility in the U.S., with no other comparable backup facility for 30 years.<sup>7</sup> The AFS closed on 28 July 2010, and operations were moved to the new Ellison Onizuka Satellite Operations Facility at Vandenberg Air Force Base.

Based on its significance as a “mid-century scientific site associated with important geo-political developments during the Cold War,” the former Onizuka AFS was found by historic architecture consultant Frederick Knapp in 2008 to be potentially eligible for the local (City of Sunnyvale) register. The buildings were not age-eligible for listing in the California Register and National Register at the time of evaluation, but were found to possibly qualify under Criterion Consideration G: Properties that have Achieved Significance Within the Past Fifty Years.<sup>8</sup>

## MILITARY –RELATED TECHNOLOGICAL DEVELOPMENT IN SANTA CLARA COUNTY

### Missile, Satellite, and Microwave Technology

During the Cold War and the arms race, the Korean conflict, and the space program, the Department of Defense (DOD) ordered numerous high-technology products from armament factories in California. Many companies established Research and Development (R&D) departments and production facilities in Santa Clara County, where Stanford University provided bright engineers and scientists. These burgeoning companies were largely supported by the DOD’s demand for electronic products.<sup>9</sup>

Examples of such firms are FMC (formerly Food Machinery Corporation), GTE Corporation (formerly General Telephone & Electronics Corporation), Varian Associates, Westinghouse Electronic Corporation, and Lockheed. During the 1960s, FMC built the M113 Armored Personnel Carrier (APC), the Bradley Fighting Vehicle, and the XR311 prototype military vehicle at its former facility in Santa Clara, California.<sup>10</sup> Automatic Electric, a subsidiary of GTE, supplied electronic switching equipment for the DOD’s global communications systems, and GT&E International, another subsidiary of GTE, produced earth-based stations for both foreign and domestic markets. Though GTE had offices in Palo Alto, it also operated offices throughout the country and it is unclear through basic research which production departments were located in Palo Alto. Varian Associates was founded in Palo Alto in 1948, following the invention of a microwave device called

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<sup>7</sup> “City of Sunnyvale Report: Heritage Preservation Commission,” City of Sunnyvale (6 August 2008): 3-4. Website accessed on 15 July 2011 from: <http://sunnyvale.ca.gov/LinkClick.aspx?fileticket=rRYNovK3ux0%3D&tabid=662>

<sup>8</sup> Ibid: 10.

<sup>9</sup> Martin Groger, “Importance of Military Funding,” The Silicon Valley Story. Website accessed on 14 July 2011 from: <http://www.silicon-valley-story.de/sv/militFunding.html>

<sup>10</sup> “FMC Corporation,” Wikipedia. Website accessed on 14 July 2011 from: [http://en.wikipedia.org/wiki/FMC\\_Corporation](http://en.wikipedia.org/wiki/FMC_Corporation)

the klystron at Stanford University by Russell and Sigurd Varian. During the Cold War period, Varian Associates developed vacuum electron tubes, power amplifiers, power supplies, microwave components, electromagnets for satellite communications, and radar and electronic warfare applications.<sup>11</sup> Westinghouse had a plant in Sunnyvale that manufactured launch tubes for Trident submarines beginning ca. 1968. Lockheed opened its R&D department in the Stanford Research Park in 1956 and started Lockheed Missiles and Space Company (LMSC) in Sunnyvale. Between 1959 and 1978, the company manufactured the U.S. Navy's submarine-launched ballistic missiles called UGM-27 Polaris and UCM-73 Poseidon.<sup>12</sup>

Despite using military funding during the Cold War, these technological developments likely took place in various corporations' offices and manufacturing plants, where non-military development and production also occurred. It does not appear that any buildings have been identified in the past as historically significant in relation to this Cold War-era context. Based on this preliminary research, no particular buildings stand out as being significant primarily for this context.

#### Government-Sponsored Computer Technology Development

According to the National Park Service's "Santa Clara County: California's Historic Silicon Valley: A National Register of Historic Places Travel Itinerary,"

America's defense spending during the Cold War Era, when research and development strove to keep abreast of the Soviet Union, helped [develop the hi-tech corridor of Silicon Valley]. After the Soviets launched the first man-made satellite, Sputnik, in 1957, President Eisenhower created the Advance[d] Research Projects Agency, which was part of the Department of Defense, in 1958. After launching the first successful U.S. Satellite, the Advance Research Projects Agency turned its attention to the potential of computers.<sup>13</sup>

The role of federal involvement in computer development is further explained by the Breakthrough Institute's *Case Studies in American Innovation: A New Look at Government Involvement in Technological Innovation*:

From the beginnings of the computer industry, federal and military agencies promoted vital basic research into computing hardware and deployed early computers throughout the government. As economist Vernon Ruttan writes, "The role of the military in driving the development of computer, semiconductor and software technologies cannot be overemphasized. These technologies were, until well into the 1960s, nourished by markets that were almost completely dependent

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<sup>11</sup> "Company Information, History," CPI: Communications & Power Industries. Website accessed on 14 July 2011 from: <http://www.cpii.com/history.cfm>

<sup>12</sup> Andreas Parsch, "Lockheed UCM-73 Poseidon," Directory of U.S. Military Rockets and Missiles, Website accessed on 14 July 2011 from: <http://www.designation-systems.net/dusrm/m-73.html>

<sup>13</sup> "Economic History," Santa Clara County: California's Historic Silicon Valley. National Park Service. Website accessed on 13 July 2011 from: <http://www.nps.gov/nr/travel/santaclara/economic.htm>

on the defense, energy and space industries.” In fact, the ENIAC, the first electronic computer, was built in 1945 to crunch numbers for the Army Ballistics Research Laboratory. In the 1950s, the Army Signal Corps funded research into semiconductors, and weapons labs at the Atomic Energy Commission were the first purchasers of supercomputers, the ancestors of today's desktop PCs. NASA, the Department of Defense, the National Center for Atmosphere Research, and the U.S. Weather Bureau commissioned their own supercomputers soon after. Perhaps most importantly, the Air Force’s SAGE air defense project generated numerous innovations in computing design and production during the early 1950s, including cheap manufacturing of computer memory, communication between computers, and the use of keyboard terminals.

The government was also heavily involved in the development of computer software. Defense agencies funded the basic R&D that led to early computer programs and programming languages. During the 1970s, in fact, defense spending fueled over half of all academic computing research, and grants from the military's Advanced Research Project Agency (ARPA) established the first university computer science programs at MIT, Stanford, Carnegie Mellon and elsewhere. The defense establishment took computing seriously. In 1962, ARPA’s computer research budget exceeded that of all other countries combined; by 1970, its funding had increased fourfold. The Department of Defense was the single largest purchaser of software well into the 1980s, ensuring the consistent market demand that fueled an ever-growing industry.

In addition to producing major computing advances through research funding and direct acquisition, the federal government also cultivated the innovators and engineers of the modern computer industry. Many of the minds behind the groundbreaking work at Xerox’s Palo Alto Research Center (PARC), the famous computer research center, and at corporations like Microsoft and Apple came straight from government agencies...

No less important, however, were the innumerable programmers, system designers, and computer theorists who cut their teeth and honed their skills at ARPA. So many veterans of ARPA and ARPA-supported university programs came to work at Xerox PARC that insiders there jokingly referred to an “ARPA Army.” These numerous veterans of government-funded programs helped Xerox PARC develop the graphical user interface and the Alto, the world's first modern PC, and later scattered to run startup firms like Apple, Microsoft, and Adobe.

Popular myths about the rise of the PC make little mention of the government, but in reality, public funding built the foundations of personal computing. The government’s prescient investments in computer research, hardware and software deployment, and computer science education unleashed a transformative technology and helped build a massive industry from the ground up.<sup>14</sup>

In Santa Clara County, Stanford University and the Stanford Research Institute were provided government funding to develop computer technology through ARPA. The Palo Alto Research

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<sup>14</sup> The Breakthrough Institute, *Case Studies in American Innovation: A New Look at Government Involvement in Technological Innovation* (April 2009). Website accessed on 13 July 2011 from: [http://thebreakthrough.org/blog//2009/04/silicon\\_valley\\_garage\\_or\\_gover-print.html](http://thebreakthrough.org/blog//2009/04/silicon_valley_garage_or_gover-print.html)



Center (PARC), Microsoft, Apple, and Adobe were staffed by early computer engineers who may have originated from government positions. These historic developments likely took place on the Stanford campus and in various fledgling companies' offices, where non-military development also occurred.. It does not appear that any buildings have been identified in the past as historically significant in relation to Cold War-era development. Based on this preliminary research, no particular buildings stand out as being significant primarily for this context.

### III. EVALUATION DISCUSSION

#### THE NATIONAL REGISTER AND CALIFORNIA REGISTER – LOCAL SIGNIFICANCE

The Department of Defense (DOD) created a military presence in Silicon Valley and was influential in the development of the high-tech industry. Based on the historic context described above, the former Onizuka AFS appears to contain the most significant and presumably intact buildings (at the time of historic evaluation) that represent the Cold War era in Santa Clara County, as it had extremely important and highly unique military responsibilities during its period of operation.

The former Almaden Air Force Station operated within this climate of defense spending and technological development. The facility may have been considered locally significant under National Register Criterion A/California Register Criterion 1 (associated with significant events) as the only Cold War-era military radar facility in Santa Clara County. Nevertheless, the historic context of U.S. military influence in Santa Clara County does not alter the fact that the Almaden AFS facility no longer retains integrity. To be considered historic resources eligible for local, state, or national listing, properties must be both historically significant *and* retain sufficient integrity to represent that significance. The buildings at the former Almaden Air Force Station, though constructed in the early years of Cold War-era defense advancement, do not retain sufficient materials, workmanship, feeling, or association to maintain their historic integrity. This includes Building 102 (the Radar Tower), which, though a large and visually identifiable structure from the base of the mountain, does not retain the radar sail or interior mechanics that associate it with its former defense function.

#### LOCAL DESIGNATION

The Santa Clara County Municipal Code's "Article II. Landmark Designation" describes the criteria for listing a property in the local inventory:

##### **Sec. C17-5. Designation criteria.**

For the purposes of this chapter, the Board of Supervisors may designate those historic resources as "landmarks" which meet the following designation criteria:

A. Fifty years or older. If less than 50 years old, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the historic resource and/or the historic resource is a distinctive or important example of its type or style; and

B. Retains historic integrity. If a historic resource was moved to prevent demolition at its former location, it may still be considered eligible if the new location is compatible with the original character of the property; and

C. Meets one or more of the following criteria of significance:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. Associated with the lives of persons important to local, California or national history;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. Yielded or has the potential to yield information important to the pre-history or history of the local area, California, or the nation.

(Ord. No. NS-1100.96, 10-17-06)<sup>15</sup>

Because historic integrity is a crucial component to designation at the local level, the former Almaden Air Force Station was not found eligible for listing in the Santa Clara County Heritage Resource Inventory.

#### **IV. CONCLUSION**

Page & Turnbull's "Historic Resource Study: Former Almaden Air Force Station" (9 March 2011) evaluated the former Almaden Air Force Station for eligibility for listing in the National Register of Historic Places and the California Register of Historical Resources at the national and state-wide level of significance. Because the property did not contain unique facilities or functions within the California network of Cold War-era radar Air Force Stations, it was not found to be historically significant. Other facilities have more intact examples of radars or held a more significant role in the network. Furthermore, due to degradation and alterations to numerous buildings on the property, the Almaden Air Force Station as a whole does not retain integrity as a potential historic district. Likewise, the individual buildings either do not possess individual significance or do not retain sufficient integrity to convey their potential significance.

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<sup>15</sup> "Article II. Landmark Designation," Santa Clara County Code, Santa Clara County Government. Website accessed on 14 July 2011 from: [http://www.sccgov.org/scc\\_ordinance/41702000.HTM](http://www.sccgov.org/scc_ordinance/41702000.HTM)

Based on the local historic context above, the former Onizuka AFS appears to best represent significant military responsibilities in Santa Clara County during the Cold War. Furthermore, the evaluation discussion emphasizes the requirements of significance and integrity at the local level. Neither the former Almaden Air Force Station, nor any of the individual buildings on the property, were found eligible for listing in the National Register or California Register for local significance. The facility and its buildings are also not eligible for local listing in the Santa Clara County Heritage Resource Inventory.

## V. BIBLIOGRAPHY

- “Article II. Landmark Designation,” Santa Clara County Code, Santa Clara County Government. Website accessed on 14 July 2011 from: [http://www.sccgov.org/scc\\_ordinance/41702000.HTM](http://www.sccgov.org/scc_ordinance/41702000.HTM)
- “City of Sunnyvale Report: Heritage Preservation Commission,” City of Sunnyvale (6 August 2008). Website accessed on 15 July 2011 from: <http://sunnyvale.ca.gov/LinkClick.aspx?fileticket=rRYNovK3ux0%3D&tabid=662>
- “Company Information, History,” CPI: Communications & Power Industries. Website accessed on 14 July 2011 from: <http://www.cpii.com/history.cfm>
- “Economic History,” Santa Clara County: California’s Historic Silicon Valley. National Park Service. Website accessed on 13 July 2011 from: <http://www.nps.gov/nr/travel/santaclara/economic.htm>
- “FMC Corporation,” Wikipedia. Website accessed on 14 July 2011 from: [http://en.wikipedia.org/wiki/FMC\\_Corporation](http://en.wikipedia.org/wiki/FMC_Corporation)
- Groger, Martin. “Importance of Military Funding,” The Silicon Valley Story. Website accessed on 14 July 2011 from: <http://www.silicon-valley-story.de/sv/militFunding.html>
- “Hangar One (Mountain View, California),” Wikipedia. Website accessed on 13 July 2011 from: [http://en.wikipedia.org/wiki/Hangar\\_One\\_%28Mountain\\_View,\\_California%29](http://en.wikipedia.org/wiki/Hangar_One_%28Mountain_View,_California%29)
- “Moffett Field History Tour,” NASA Ames Research Center Historic Preservation Office. Website accessed on 13 July 2011 from: <http://historicproperties.arc.nasa.gov/history/history1.html>
- Page & Turnbull, “Hangar One, Moffett Field, California: Re-Use Guidelines,” Prepared for NASA/Ames Research Center (24 August 2001).
- Parsch, Andreas. “Lockheed UCM-73 Poseidon,” Directory of U.S. Military Rockets and Missiles. Website accessed on 14 July 2011 from: <http://www.designation-systems.net/dusrm/m-73.html>

“Onizuka Air Force Station,” Wikipedia. Website accessed on 15 July 2011 from:  
[http://en.wikipedia.org/wiki/Onizuka\\_Air\\_Force\\_Station](http://en.wikipedia.org/wiki/Onizuka_Air_Force_Station)

The Breakthrough Institute, *Case Studies in American Innovation: A New Look at Government Involvement in Technological Innovation* (April 2009). Website accessed on 13 July 2011 from:  
[http://thebreakthrough.org/blog//2009/04/silicon\\_valley\\_garage\\_or\\_gover-print.html](http://thebreakthrough.org/blog//2009/04/silicon_valley_garage_or_gover-print.html)

“The NRO,” National Reconnaissance Office. Website accessed on 15 July 2011 from:  
<http://www.nro.gov/about/nro/index.html>

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