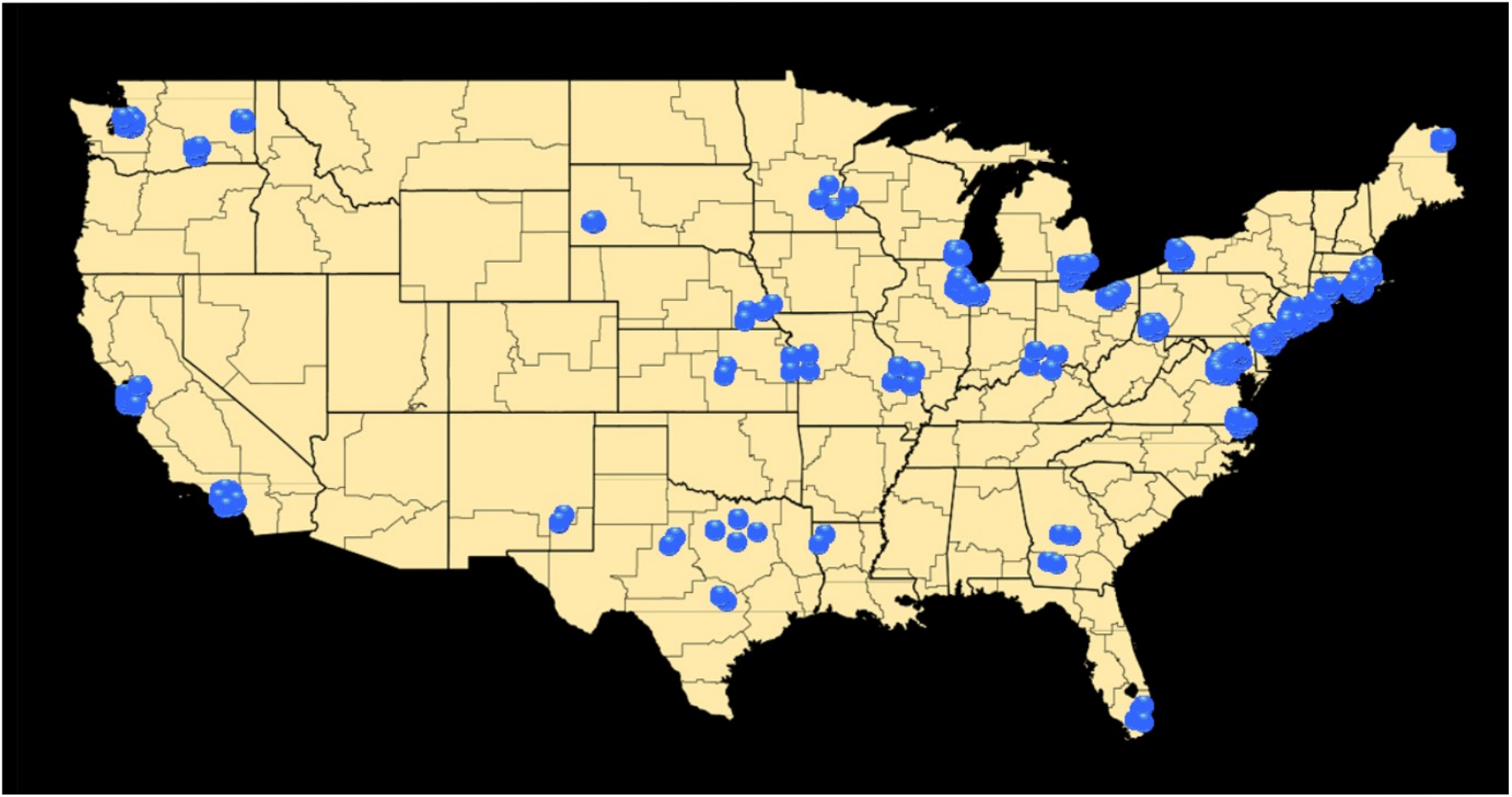
Nike Missile Systems 1945-1974

Douglas Ikemi, July 2025

Introduction

- MIM-3 Nike Ajax served from 1954-1970
  - SAM: 20,000-60,000 ft.
  - Replaced 120mm M1 guns and Skysweepers, etc.
  - 265 batteries defending major cities and bases
  - Point defense system, supplementing interceptors
  - US Army, developed by Bell Labs and Douglas Aircraft
- MIM-14 Nike Hercules served from 1958-1974, 1979 (foreign)
  - Ceiling of 100,000 feet.
  - Nuclear armed
  - Eventually developed anti-missile capability
  - Ground-to-ground capability



Locations of US Army Nike Missile Sites within the Continental United States

Source:Bwmoll3 - Own work, Wikipedia

History

- 1944 Lieutenant Jacob Schaefer submitted memorandum proposing radar guided ground launched rocket for intercepting manned bombers.
- Johns Hopkins Advanced Physics Lab study on air defense
- 1950 Army activated ARAACOM, the Army Antiaircraft Command, subject to Air Force operational command.
- 1951 Nike intercepts target drone.
- 1953 first deployment of Nike-Ajax.
- 1957 NORAD, ARAACOM becomes ARADCOM
- 1958 Nike-Hercules deployment.

Nike-Ajax

- Solid fuel booster derived rom Navy Bumblebee; related to RIM-2 Terrier.
- Sustainer liquid fueled with JP-4/RFNA
- 3 HE war heads
- 2,259 lbm, 32.6’, $19,300 (1958, x11 for current $)
- 30.7 mile range, Mach 2.3
- Flight time 1 min., rate of fire 1/min.
- Command Guidance System
- Rapidly became obsolete with advent of better bombers and missiles.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Guidance (IFC)

- Guidance systems were on the ground, not in the missile
- 3 radar systems required in the Integrated Fire Control (IFC) area
  - Acquisition radar (ACQR) provided pointing data to the
  - Target tracking radar (TTR)
  - Missile tracking radar (MTR)
- Data processing equipment compared signals from TTR and MTR to generate guidance commands for the missile.
- Missile was detonated on command
- Only one missile could be commanded at a time.

Magazine and Launcher, (L)

- Standard battery consisted of 3 underground magazines, each with 4 launchers.
  - Variations in numbers, as well as aboveground SAC variations and special Greenland magazines.
- Elevator brought missiles up one by one, fired one by one, repeat.
  - Labor intensive.
- Magazine size 42’x63’ and 49’x 60’
- 1953 first deployment of Nike-Ajax.
- Standard load around 30 missiles.
- Underground magazine protected the surroundings from the missiles.

Nike-Hercules

- 4 Ajax Solid fuel boosters
- Sustainer solid fueled
- 1 HE fragmentation warhead or 1 W-7 followed by W-31 (2, 20, 40 kt)
- 10,711 lbm, 39.8’, $55,200 (1958)
- 96.3 mile range, Mach 3.65
- Flight time 1-2 min., rate of fire 2/min.
- Command Guidance System
- Capable against bombers and missiles.
- Upgraded HIPAR radar


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The Competition: CIM-10 BOMARC

- Air Force wanted their own missile, 1959-1972
- Ramjet powered with rocket booster
- 1 HE warhead or 1 W-40 (7-10kt)
- 15,500 lbm, 46.6’
- 430 mile range, Mach 2.5, 100,000’ ceiling.
- 8 sites in the US plus 2 in Canada (52 planned)
- Ground controlled with active seeker for terminal guidance with proximity fuse
- Capable against bombers


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Nike-Zeus ABM

- Never Deployed, cancelled 1963 due to changing threats
- Anti-ICBM specifically, wide area defense
- 24,200 lbm, 50’ 2”, >Mach 4, 260 mile range
- Command guidance, W50 warhead, 400kT
- Entire Zeus base built on Kwajalein for testing
- Anti-satellite version
- Very powerful Zeus Acquisition Radar (ZAR), 460 nm range
  - Passed data to Zeus Discrimination Radar, All Target Processor, etc


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NIKE ZEUS

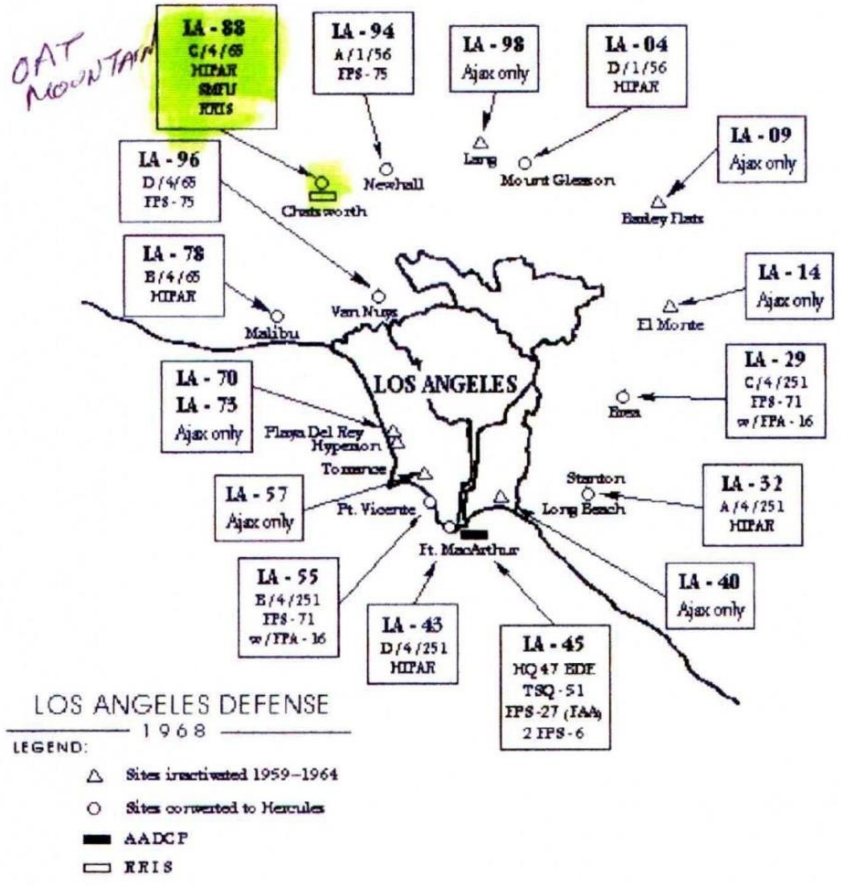
Successors

- Sounding rockets
- Nike Zeus evolved into the Zeus EX, Spartan, W71 (5mT) X-ray warhead
- Nike-X heavy ABM system but fallout shelters cheaper
  - ARPA, Prim-Read theory, cost-exchange ratio
  - Phased array radar, Sprint missiles, (Martin Marietta, derived from Boeing HIBEX)
  - Decluttering (atmospheric filtering)
  - Lightweight version with Zeus EX (x-rays), Small City Defense radars
- Sentinel, wide area, light ABM system, cancelled 1969
  - Spartan and Sprint
- Safeguard (lightweight Sentinel)
  - North Dakota site active from 10/1/1975 to 2/10/1976

References

- Rings of Supersonic Steel by Mark Morgan and Mike Berhow, Hole in the Head, 2010
- The Last Missile Site, Stephen Haller and John Martini, Hole in the Head, 2010
- Nuclear Birds in the Everglades, Charles Carter, I Publications, 2017
- US Strategic and Defensive Missile Systems, 1950-2004, Mike Berhow, Osprey 2005
- Nikemissile.org
  - Nike Historical Society has been closed but website is still up.
- Numerous Wikipedia articles.
- Future reading
  - The Cold War Defense of the United States, John Bronson, McFarland & Co., 2019

Nike Sites of the Los Angeles Defense Area

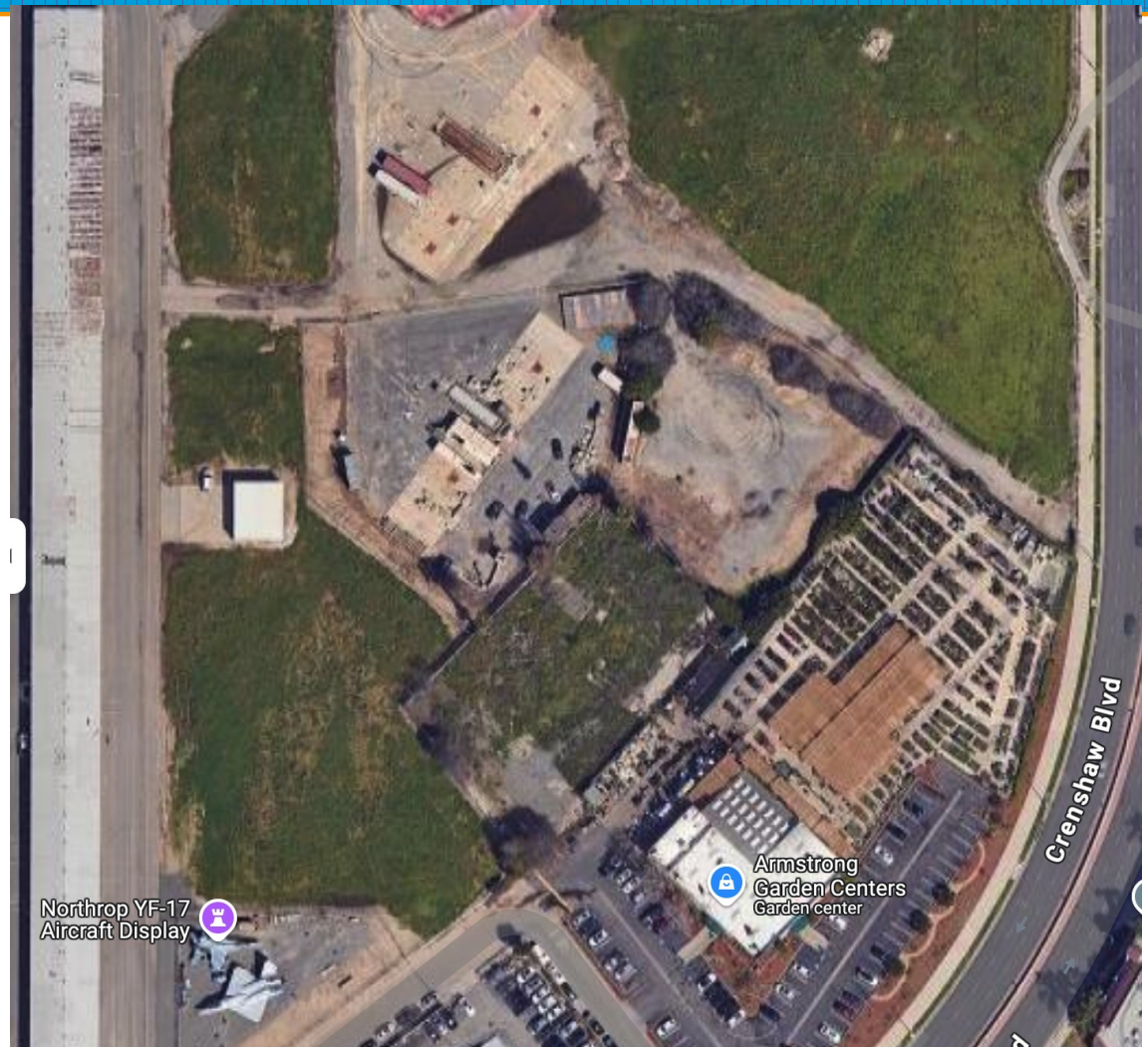


https://nikemissile.org/LA88/Chs/la88Chs.shtml

Legacy sites

- SF88L, best preserved launch site, working elevator and erector, radar trailers
  - Golden Gate National Recreation Area
  - Open houses
  - My photos at http://ikemi.info/Graphics2018/NikeMissile2018/index.html
- NY-56 at Fort Hancock, Sandy Hook, NJ
- HM-69 in Everglades National Park
- LA area
  - Torrance Airport magazines
  - White Point LA-43-L magazines
    - http://ikemi.info/Graphics2020/WhitePoint2020/index.htm
  - LA-43 C at the Marine exchange
  - Rancho Palos Verdes City Hall plus magazines in maintenance yard
  - Hopkins Wilderness Park, Redondo beach. Command center
  - Nike Hill, only guard shack remains.
    - http://ikemi.info/Graphics2021/NikeHill2021/index.htm
  - LA-96 C San Vicente Mountain Park.

SF88L



Torrance Airport

LA-43C near Friendship Bell