

Lance Missile Presentation



The University of Alabama In Huntsville
Propulsion Research Center
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Lynn and John Troy

- Lynn Troy – UAH B.S. Electrical Engineering 1992
 - 1988 – 2007 Teledyne Brown Engineering / Teledyne Solutions
 - 2007 – 2022 Owner/CEO Troy7
 - 2022 – Present – President Troy7, A Yulista Holding Subsidiary
 - Currently serving on UAH Presidents Advisory, Foundation, and College of Business Advisory Boards
- John Troy – UAH B.S. Mathematics and B.S. Computer Science 1988
 - 1988 – 2007 Teledyne Brown Engineering/ Teledyne Solutions
 - 2007 – 2020 Owner/Chief Scientist Troy7



Lance History

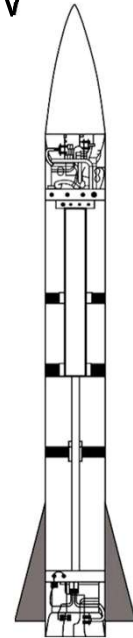
- 1958 - 1961 U.S. Army Requirement to replace the Honest John and Sergeant Missiles
- 1962 Army Missile Command at Redstone Arsenal announced selection of Ling-Temco-Vought (LTV) as Prime Contractor for Missile "B" concept. A Field Artillery Rocket capable of delivering 1,000 lbs Nuclear, Chemical, or Conventional Warhead
- 1963 LTV Awarded Contract to Develop Lance Missile
- 1965 First Successful Test Flight at White Sands Missile Range (WSMR)
- 1973 First Lance Battalion Formed - 1st Battalion 333rd Regiment
- 1992 Last Lance Battalion Stood Down at Fort Sill, OK
- 1995 Lance Became a Target Vehicle for the U.S. Army Space and Missile Defense Command (USASMDC) at Redstone
- 2015 Last Lance Flew as a Target Vehicle at Pacific Missile Range Facility (PMRF) Kauai, HI





Lance Missile Overview

- Bi-Propellant, Pressure Fed, Dual Thrust Chamber, Guided Missile
 - Unsymmetric Dimethyl Hydrazine (UDMH) / Inhibited Red Fuming Nitric Acid (IRFNA) (Hypergolic)
 - Solid Propellant Gas Generator - Nitrocellulose/Nitroglycerin
 - Pressure Regulated Pistons - 1250 \pm 50 psig
 - Wet Start- UDMH Leads IRFNA Into the Combustion Chamber
 - Four Thrust Vector Control Valves On Booster Engine
 - Baffles and Acoustic Cavities in Booster Engine For Combustion Stability
 - Booster Engine Cut-Off Valve
 - Aeromet Guidance with Throttleable Pintle (Thrust = Drag) Sustainer Engine
- Over 500 Missiles Flown
 - Zero Missiles Fired in Warfare
 - Test/Target Flights at WSMR, PMRF, San Nicolas Island, USS Tripoli, Crete



Mass	2,850-3,367 lb (1,293-1,527 kg) depending on warhead
Length	20 ft (6.1 m)
Diameter	22 in (560 mm)
Warhead	1 W70 nuclear or M251 high explosive submunitions
Blast y	1-100 kilotons of TNT



Lance Dual Shot for Patriot Intercept

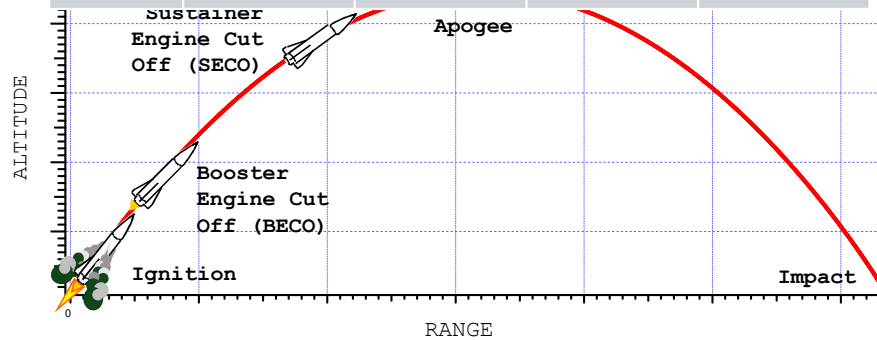
- Launch Site
 - WSMR
 - LER-4 (Lance Extended Range 4)
- Impact Sites
 - Gran Jean
 - Millers Watch
- PATRIOT Launch Site
 - Mine Site
- Both Targets Successfully Intercepted





Typical Lance Trajectory Summary

	Time (s)	Alt (km)	Rng (km)	Vel (m/s)
BECO	5.45	4.83	2.36	1219
Apogee	96.85	44.88	63.1	662.45
Impact	198.55	0	125.6	0



LAUNCH ELEVATION: 54°
LAUNCH AZIMUTH: 185.7°

LAUNCH POINT: LC-94 (Fix Site)
IMPACT POINT: 33.07798, -106.5984

