



# NIKE HERCULES MISSILE



## WARHEAD SECTION



## \*Warhead Section\*

### Warhead installation (T45 or W31);

The warhead section would be mated to the rear body section, and then the forward body section mounted to the warhead section. Circuitry tests (Go-NoGo) were performed, when it passed, the missile was moved to the LA (Launch Area) for final configuration.

### T45

The T45 is a 625 lbs. Blast-Fragmentation type warhead that produced a focused burst of approximately 20,000 cubical, 140 grain steel fragments arranged in both single and double layers around the 625 lbs. high explosive charge that contained a booster charge in its center. The detonation process would channel through the M30A1 safety and arming device (armed by the force of acceleration), then igniting the two M38 Explosive Harnesses that directly ignited the warhead booster charge which in turn detonates the warhead charge

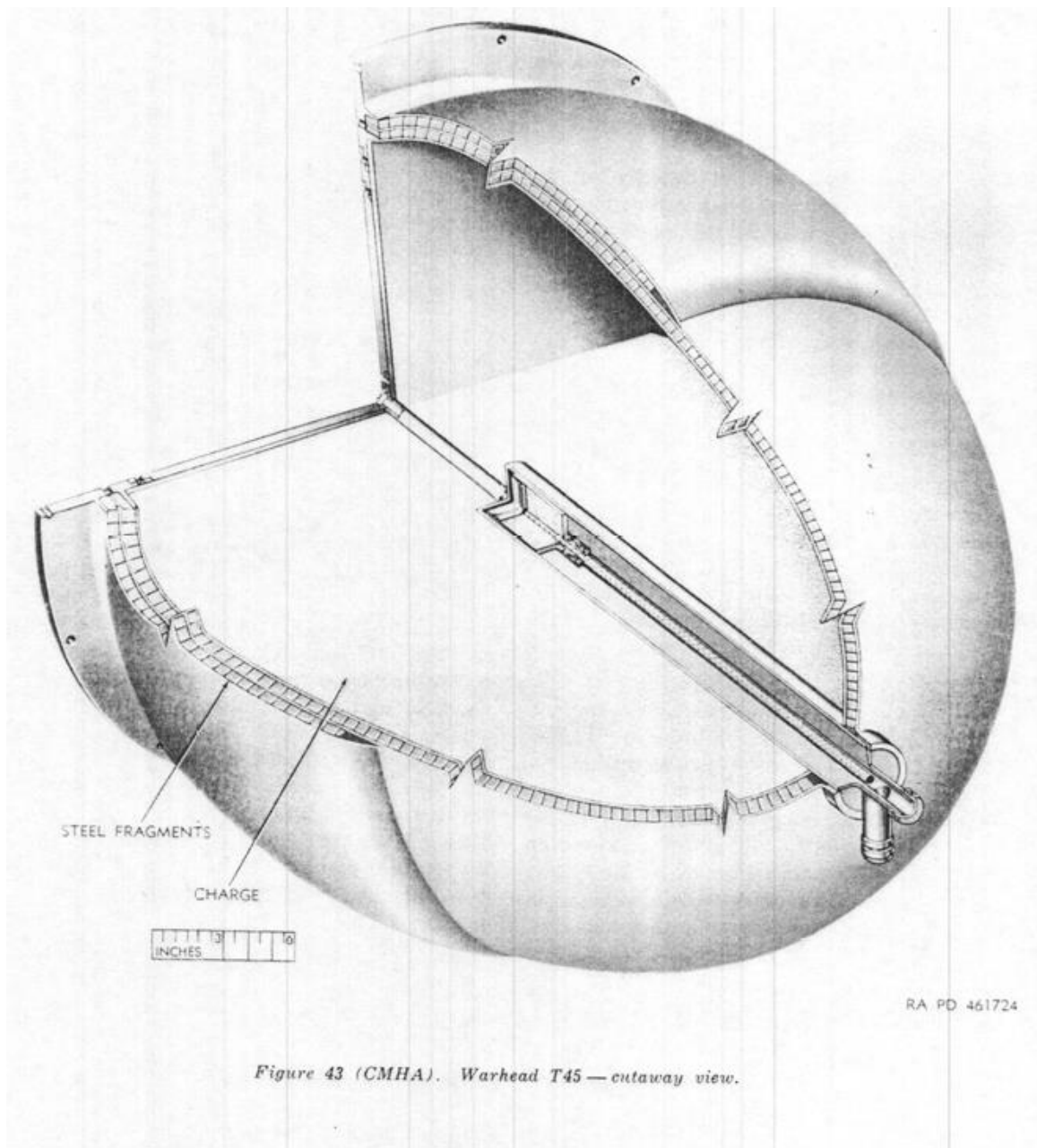
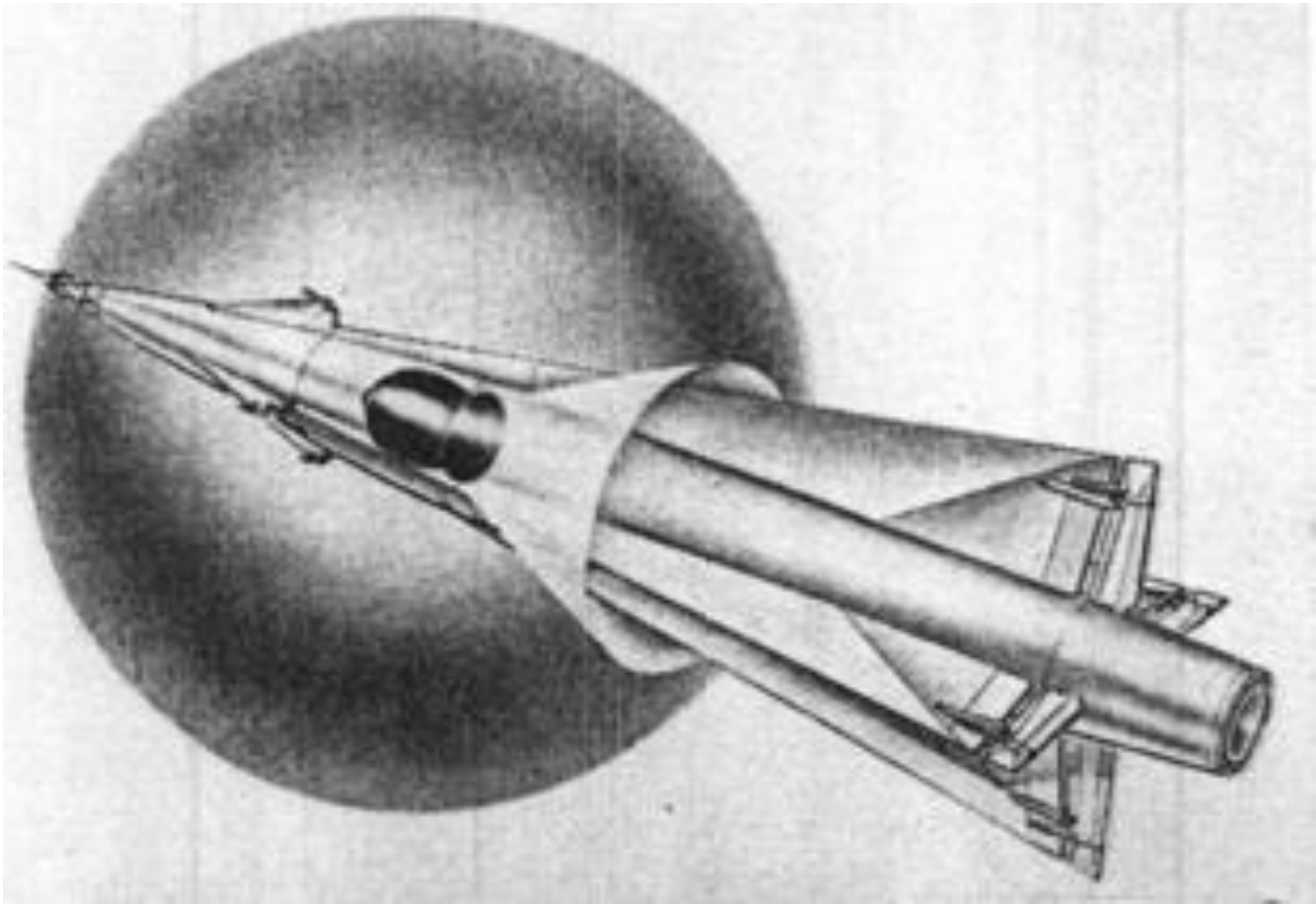


Figure 43 (CMHA). Warhead T45 — cutaway view.

The blast pattern is almost spherical with a conical dead zone at the rear.



### **W31**

With the W-31 boosted fission nuclear warhead safeguarding was paramount. Before un-packaging, the building was secure and an entry control point established at one of the doors. The two man rule was in effect from this point on. The 2 person rule requires a minimum of two people of equal knowledge are allowed access, which is designed to prevent accidental or malicious launch or sabotage of nuclear weapons by a single individual.

with the W-31 in the M409 Container, the rear body section, and forward body section now secure in the building, Personnel would now be allowed to enter the building using the two-man rule. The M409 would be checked for inner atmosphere and physical conditions, then opened. using the H36 handling beam, the warhead is lifted off of the internal cradle, and aligned on the rear body section for mating. The warhead circuitry and barometric switches would be tested, then the forward body would be mounted. Final Go-NoGo tests where performed and the missile was ready to be escorted to the LA for booster mating and placing in the magazine.

Note: in the continental United States (CONUS) common deployment was only one T45 per pit, the other five where W31s.

# 🔥 Nuclear Warheads 🔥

**W-7 Warhead (dial-a-yield, *Selectable at Theatre Level*) Multipurpose warhead.** Was considered for the Nike Hercules SAM missile warhead 225 mods for the Hercules were produced, but never fielded (W-7-X1/X2); 7 yields, 4 mods. The Nike Hercules W-7 was canceled in 1956.

**W-31 Warhead (Selectable Yield, *selected at Ordinance Depot Level in CONUS*)** Multipurpose boosted fission warhead. The W-31 was produced for the Nike Hercules SAM from 1958 until 1961, eventually retired world-wide in 1989, 2550 were produced.

**Yields;** the Nike Hercules SAM, used 2 W-31 mods, allowing an option of 3 yields:

**W-31 Mod 0, Y2** 20KT

**W-31 Mod 2, Y1** 2 KT, this was not used here in the U.S.

**W-31 Mod 2, Y2** 40Kt, Fusion-boosted mod2

**Side Note;** The W-31 used in the 1962 Operation Tightrope test at Johnson Island (on video) was a 12KT W-31 mod 1 normally used as an ADM.

**ARADCOM** informed the Defense Nuclear Agency of what yields they required to complete their mission. DARCOM Depots such as the former Seneca Army Depot then constructed the required W-31 warhead sections, and installed the PAL device.

**The PAL (Permissive Action Link) device** for this system was inserted into the SAFE/ARM receptacle then locked with a secure combination, rendering the weapon inert. If someone tried to remove the device forcibly the W-31 would no longer function. PAL Devices would be uninstalled/installed directly to the warhead by a special team of soldiers (PAL Team) 24 hours a day.

The completed weapon was then transported to the Launch area here in America under heavy guard in its M409 container.

Then here in the **Warhead Assembly Building** it was mated to the missile and tested again, once assembled the missile was taken to the launcher area and mated with its booster.

No additional warheads were stored on site. If a warhead was damaged or fails a stockpile reliability inspection, an air mission would be arranged and a new W-31 would be brought to site to replace the one in question. The questionable W-31 was flown back to depot.

## 🔥Additional Warhead Info🔥

**W-31 Warhead (Selectable Yield)** Multipurpose boosted fission warhead.

Yields; 1, 2, 12, 20, or 40 Kt Weight (lb.) 900 – 945. Length; 39 - 39.3 Width 28 - 29; 30 in. Applications; **Honest John SSM**, Nike Hercules SAM, **ADM (Atomic Demolition Munitions)**; Versions used: **Honest John: W-31 Mod 0, 3**; Nike-Hercules: **W-31 Mod 0, 2**; ADM: **Mk-31 Mod 1**; 4 yields stockpiled in CONUS: **2 for Nike-Hercules (20 and 40 Kt)**, **3 for Honest John (2, 20, and 40 Kt)** Nike Hercules: manufactured 10/58 - 12/61, retired 7/67 - 9/89, 2550 produced.

**W-31 Mod 0; Y1: 1kt\*, Y2: 20 kt (M-22)** Fixed yeild at **Ordinance Depot** Level.

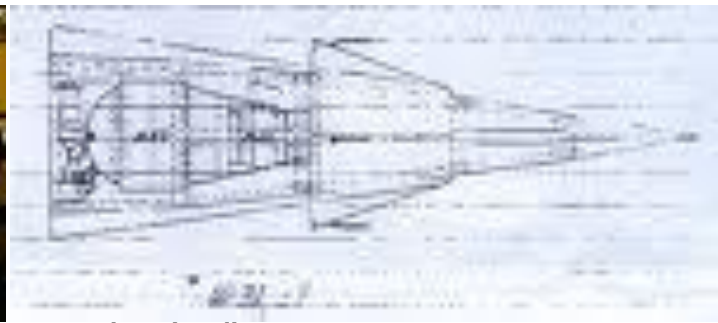
*\*Not used with the Nike program*

**W-31: Mod 2; Y1: 02 kt (M-97)\*\*, Y2: 40 kt (M-23)** *Selectable at Ordinance Unit Level.*

*\*\*Used overseas primarily for Surface to Surface role.*

**W-31 Mod 1;** Y1: 12 kt except for test at Johnson Island 1962. *ADM Only, Not used in the Nike Hercules.*

**W-31: Mod 3;** 40 kt *only used with the Honest John System.*



W-7, and Proposed mating diagram.

**W-7 Warhead (dial-a-yield)** **Selectable at Theatre Level Multipurpose warhead.**

Yields; 8, 19, 22, 30, 31,& 61 Kt Weight (lb.) 900 - 1,100; 970 (W-7-X1 / X2); 983 (Betty)  
Length; 54.8 - 56 Width 30 - 30.5 in. Applications; **BOAR air-surface rocket**, the **Corporal (M-2)** and **Honest John (M-3)** ballistic missiles, **ADM**, **Betty Mk 90 ASW depth bomb**, **Nike Hercules SAM missile warhead (W-7-X1/X2); 7 yields, 4 mods**; Corporal yield 2-40 Kt (several options), ADM yield low (90 T?), Betty yield 32 Kt. W-7 warhead manufacture begun 12/53;  
BOAR: stockpiled 1956 - 1963, 225 produced; Corporal: stockpiled 1955 - 1965, 300 produced; Honest John: stockpiled 1954 - 1960, 300 produced; ADM: stockpiled 1955-1963, 300 produced; Betty: stockpiled 6/55 - 1960, 225 produced; **Nike Hercules: canceled 1956**

**Fusion-boosted fission weapons** improve on the implosion design. The high temperature and pressure environment at the center of an exploding fission weapon compresses and heats a mixture of tritium and deuterium gas (heavy isotopes of hydrogen). The hydrogen fuses to form helium and free neutrons. The energy release from fusion reactions is relatively negligible, but each neutron starts a new fission chain reaction, greatly reducing the amount of fissile material that would otherwise be wasted. Boosting can more than double the weapon's fission energy release.

**W-31 Yield & Designation:** 2 kt (M-97)      20 kt (M-22)      40 kt (M-23)

# REAR COVER



## NIKE HERCULES MISSILE



## WARHEAD SECTION



## PLEASE TURN OVER



Western Electric

### References:

[Redstone Arsenal Historical Information Website  
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<http://www.designation-systems.net/dusrm/index.html>  
[ed@ed-thelen.org](mailto:ed@ed-thelen.org)  
[webmaster@nikeordnance.com](mailto:webmaster@nikeordnance.com)

### AUTHOR:

Clinton Crane, 55G  
Nuclear Weapons Maintenance Specialist  
SEAD, ARDEC  
NPS, Volunteer in Parks/GOGA & PORE

# REAR COVER