

# Northrop Snarks

By: Jack Waid

Is there a linkage between jets and missiles? Yes, there is, and it is in the engine technology! The linkage specifically begins with the Allison J33 turbojet engine, originally installed in the Lockheed F-80, and is woven together through the *Snark* glide missile system which incorporated jet engine and nuclear technologies leading the United States into the post WWII nuclear age.

The evolution of missile technology after World War II allowed missiles to be suitable for an increasingly



Allison J33 Engine

wide range of missions, specifically to carry a nuclear payload. In August 1945, the Army Air Forces (AAF) established a requirement for a 600 mph, 5,000-mile-range missile, with a 2,000-pound warhead. (The warhead/payload requirement was veiled in secrecy, this due to the secretive nature surrounding nuclear weapons.)

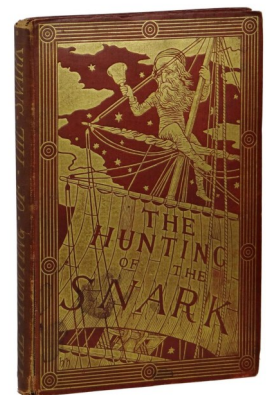
In response, Northrop developed the MX-775A (DoD designation)/N-25 (Northrop designation) - Northrop *Snark*, which is today considered an antecedent of our contemporary ICBM arsenal.



Lockheed F-80 *Shooting Star*

Within the early post WWII Cold War environment, the US sought to guard itself against, “a nuclear Pearl Harbor;” meaning a surprise nuclear attack on the United States or its allies. If a guided missile could be merged with a nuclear payload, this delivery system could pave the way for deterrence and non-conventional combat. With a nuclear payload the missile had to be very reliable, or better stated, zero acceptable failure. Additionally, the first generation of the American cruise missiles was to perform nuclear strikes.

In January 1946, Northrop submitted their proposal for a subsonic, air-breathing, pilotless, turbojet-powered, 3,000-mile range missile. Its range fell short by two thousand miles; however, the design was otherwise sound and in March Northrop received one-year research and study contract for a subsonic and supersonic missile. The contracts requested a range between 1,500 to 5,000 statute miles and a 5,000-pound payload. Jack Northrop and the Northrop Company submitted design plans and specifications for the formerly named, MX-775A *Snark*, later known as the N-25 *Snark*. Jack Northrop nicknamed the Snark based on the poem, “The Hunting of the Snark,” by Lewis Carroll (Carroll blends the two words snake and shark to get Snark).

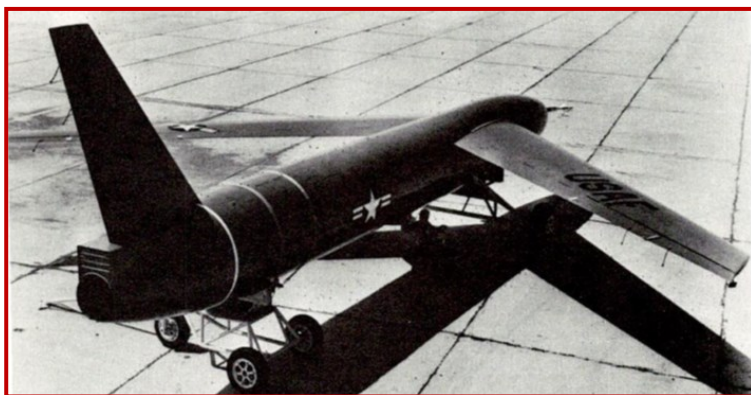


One of the early covers for Lewis Carroll's book

# HISTORY

IN TWO

The 1946 Christmas budget reductions deleted the subsonic *Snark* from the AAF missile program; however, Jack Northrop personally contacted General Carl A. Spaatz, Commanding General of the Army Air Forces, and promised development of the *Snark* in two and one-half years, at an average production cost of \$80,000 each with a 5,000-mile range and a 5,000-unit production run. Before the end of 1947 the USAF reconstituted the *Snark* program... now with modified specification from the original August 1945 requirements. Specifically, to deliver a nuclear warhead.



**Northrop N-25 *Snark*. Flight speed over Mach .8, powered by the Allison J33 engine.**

The first of 10 authorized test flights by Air Materiel Command occurred in March 1949. By July 1949, General Joseph T. McNarney, who had served as the Military Governor of occupied Germany, at this time serving his first assignment as a General in the newly formed United States Air Force. His first assignment was as the commander of Air Materiel Command at Wright-Patterson AFB, OH. He stated the *Snark* was America's most promising missile project. The newer version of the *Snark* was designated the N-25 (There were other scaled up "Northrop *Snarks*," the Northrop N-69A to the Northrop N-69E and SM-62.).

The *Snark* was powered by the Allison J33 turbojet engine. This engine pushed the N-25 to a speed of Mach .85 (with a maximum speed of Mach .9) and to a range of 1,550 statute miles.

**Specifications for the N-25:** Wingspan: 42.5 ft Length: 51.9 - Launch Weight: 28,000 lbs - Powerplant: Allison J33-A-31 turbojet engine.

Numerous problems with the N-25 became apparent in December 1950, once testing began at Holloman AFB, NM. The *Snark* flew in a nose high flying position, this due to the lack of horizontal stabilizers. This was common for many of Northrop's designs. Instead of using the normal conventional control surfaces such as ailerons, the *Snark* depended on elevons (a combination of elevators and ailerons).



**Northrop designated the enlarged *Snark*, N-69. Note the "saw tooth" leading edge and straight trailing edge on both the wing and the shadow of missile N-3268.**

To meet the toughest challenges for the program, guidance over the proposed intercontinental distances, Northrop proposed an inertial navigation system monitored by stellar navigation with Northrop accomplishing the first daylight (ground) test of this stellar device in January 1948.

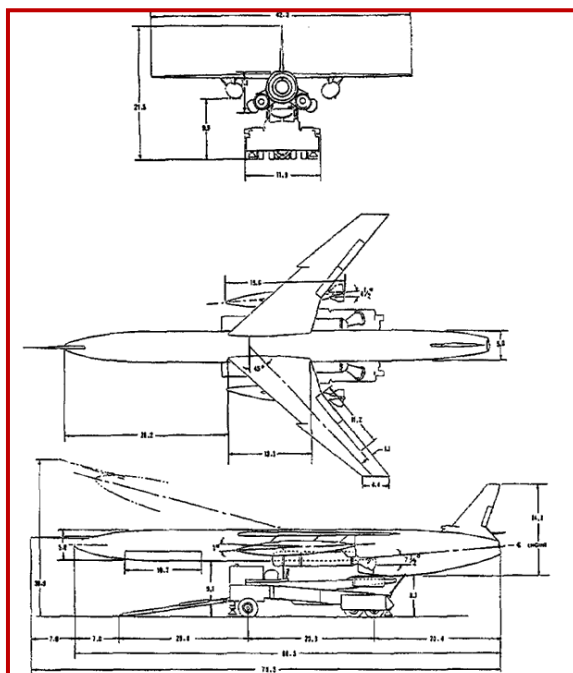
For the latter parts of the 1940s, the United States had the only known nuclear weapons. This changed in 1949, when a WB-29, *The Lonesome Polecat* (*Lady of the Lake* at Eielson AFB, AK), discovered the atomic particles of an atomic cloud created by the first successful Soviet detonation of an atomic bomb.



**Snark in flight**

By the early 1950s, the US was developing three distinct classes of ballistic missiles for the newly formed United States Air Force nuclear arsenal: tactical with a range under 500 miles, intermediate-range at 1,500 miles, lastly strategic or intercontinental-range with a range in excess of 1,500 miles. Earlier missiles for the Air Force were armed with W5 nuclear fission warheads; derived from a Mark 5 nuclear bomb. The Mark 5 was introduced in 1952 and the W5 in 1954. Both remained operational units until 1963. For comparison *Fat Man* had a yield 21 kilotons, while the W5 yielded a blast equivalent to 100 to 120 kilotons of dynamite.

In June 1950, the Air Force increased *Snark* requirements to include a supersonic dash at the end of the 5,500 nautical miles, a payload of 7,000 lbs (later reduced to 6,250 lbs), and a Circular Error Probable (CEP) of 1,500 ft. Though the Air Force's increased performance requirements invalidated the N-25, the first successful flight was in April 1951. Later tests, with the newly developed Northrop *Snark* N-69 variants, resulted in multiple failures as well. Further, the *Snark* was plagued with guidance and control problems. So many *Snarks* crashed during testing, the waters around Cape Canaveral, Florida, were said to be unfit for swimming because they were "*Snark* infested."



**Line drawing of *Snark* missile mounted on its mobile launcher.**



On 30 October 1953, President Dwight D. Eisenhower formally approved the following sentence as part of a statement of his basic national security policy of the United States: "In the event of hostilities, the US will consider nuclear weapons to be as available for use as other munitions."

**N-25 in flight. Although the first two N-25s crashed, the missile's overall flight record was very good. (Northrop)**



In conclusion, issues aside, the Air Force began to incorporate *Snark* variants into the inventory, and by March 1957, Headquarters Air Force had selected Presque Isle, Maine as the first operational *Snark* base. By January 1959, the Air Force activated the 702nd Strategic Missile Wing (702 SMW) at Presque Isle. After taking office in 1961 President John F. Kennedy scrapped the *Snark* Project and the 702 SMW was inactivated on 25 June 1961. Lastly, the Wings and the service of the *Snark* may very well rank among the shortest in the Air Force's history however, the *Snark* is an antecedent of our contemporary ICBM arsenal.

ADDITIONAL READING:

“To Defend and Deter, The Legacy of the United States Cold War Missile Program,” By John C. Lonquest and David F. Winkler and “The Evolution of the Cruise Missile,” By Kenneth P. Werrell



702nd Strategic Missile Wing emblem



An aerial view of the six *Snark* assembly and checkout buildings at Presque Isle AFB, Maine. In front of each building are two circular launch pads



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