

For a short time, the Air Force had thousands of nuclear-tipped weapons ready to defend the United States against Soviet bombers.

The Hey Nuclear

Photo courtesy of the National Museum of the US Air Force





Left: The Falcon GAR-11 guided nuclear anti-aircraft missile weighed 50 pounds. Here: An F-106 Delta Dart fires a Genie air-to-air missile over a range.

DOD photo

day of Air Defense

By Christopher J. Bright

For decades, Air Force interceptors sat on strip alert, ready to defend the United States from Soviet bomber attack. Around the clock and across the country, crews were at the ready, able to take flight in minutes toward approaching Soviet aircraft, guided by a web of Air Force radar stations across North America.

Much less remembered, however, are the small nuclear weapons carried both by the interceptors and atop hundreds of long-range Air Force Bomarc surface-to-air missiles. The defenses stemmed from concerns in the aftermath of World War II, where increased bomber speeds and cruising altitudes made destroying an aircraft in flight a daunting task. Anti-aircraft guns were

ineffective, while air-to-air engagement required high-performance interceptors that could locate a target, fly high and fast enough to overtake it, and then sustain an extended fight.

The inadequacy of existing weaponry was accentuated after the USSR detonated a nuclear bomb in August 1949. Given continuing superpower tensions, American leaders became concerned about the prospect of a surprise Soviet bomber attack. While an air raid on American cities or defense facilities would have been damaging in any case, a nuclear attack raised the possibility of even greater destruction and larger numbers of casualties. The perceived need for better American defenses grew.

As early as 1951, the Air Force contemplated developing nuclear anti-

aircraft arms. The destructive force and large blast volumes produced by such weapons potentially reduced the need for pinpoint accuracy and increased the odds of assuredly destroying attacking aircraft. At that time, however, the size and weight of US nuclear explosives made such armament impractical. But, within a few years, startling advances in weapon design and production meant the US developed and obtained large numbers of relatively small, lightweight warheads with advanced safety features.

An Air Force surface-to-air missile had been under design by Boeing and the University of Michigan Aeronautical Research Center since 1950. It was tagged with an awkward name combining the first letters of one originating organization with an acronym for the other. Bomarc was launched vertically by a rocket booster and then propelled by two ramjet engines.

Designated IM-99 (for “interceptor missile”), Bomarc was designed to fly as far as 400 miles at up to 80,000 feet, while receiving guidance information transmitted from various ground points during most of its flight. As Bomarc approached the target, an onboard radar kicked in and concluded the interception.



Fran Frost, a model for a beautician representing Utah in a national hairdressing competition, poses next to a Bomarc replica. The hairdresser who designed Frost's look utilized the "buzz" about the missile as inspiration. Press from the time pointed out that Miss Bomarc's hairstyle suggested that the missile's "nuclear payload" had gone into "super action."

The Joint Air Defense Board "unequivocally recommended" the deployment of atomic air defense weapons in 1953. The Air Force slated the Bomarc to receive a 6.5 kiloton nuclear warhead (about half the size of the bomb dropped on Hiroshima) once the advanced missile's complex development challenges were addressed.

Concerned about what they thought was a growing vulnerability to Soviet bombers, especially after the Soviet Union detonated a thermonuclear device in 1953, American political leaders were unwilling to wait for Bomarc to be

perfected and the Army's shorter-range Nike Hercules missiles to be fielded. Consequently, the Joint Chiefs of Staff authorized the development of the Air Force's Genie (later designated the AIR-2A) unguided air-to-air rocket. Built by Douglas Aircraft, this was a relatively simple weapon, carrying a 1.5-kiloton warhead, roughly one-ninth the size of the bomb dropped on Hiroshima. The Genie could be readied quickly and fitted to specially modified Northrop F-89 Scorpions.

The Air Force declared initial operational capability on Jan. 1, 1957, when a handful of rockets and 15 interceptors capable of carrying them were ready at Wurtsmith Air Force Base in northern Michigan and Hamilton Air Force Base outside of San Francisco. Weeks later, with President Dwight D. Eisenhower's approval, the Pentagon announced it had "begun deployment of nuclear weapons within the United States for air defense

purposes. Nuclear air defense weapons now have been developed which provide by far the most effective form of defense against air attack.

"It is essential to our national security that we incorporate these new weapons into our air defense system," the announcement continued.

As hard as it may be to believe today, the statement was met with widespread approval by major newspapers, elected officials, and others. Indeed, throughout the period that these and other nuclear air defense arms were in the Air Force inventory, they were the subject of few protests and objections. This was the case even when it became known that President Eisenhower (and his successors) authorized or "predelegated" nuclear use authority if operational commanders could not get orders from the senior-most civilian leaders in the hectic period after a bomber attack.

Shot John

In April 1956, Eisenhower signed an "Authorization for the Expenditure of Atomic Weapons in Air Defense." It gave the military advance authority to use nuclear arms in some instances when defending against aerial attack in the United States, such as when an aircraft "commits a hostile act" or one "manifestly hostile in intent."

Air Defense Command's chief, Gen. Earle E. Partridge, accidentally revealed the existence of the policy in a 1957 interview with *US News and World Report*. It caused little stir at the time.

The Air Force was also eager to demonstrate that nuclear air defense arms would not endanger those on the ground because the weapons were of sufficiently small kilotonnage and would be used at high altitudes. Thus, the service arranged with the Atomic Energy Commission to test fire a weapon from a specially outfitted F-89 during a July 1957 nuclear test series at the Nevada Test Site.

Col. Arthur B. Oldfield, ADC's public information officer, recounted later that Partridge instructed him at the time to trumpet Genie's introduction. The general, he said, "wanted the weapons 'out in the open.'" Five ADC officers heard about this assignment and volunteered to stand beneath the Genie blast, dubbed "Shot John."

The Genie was detonated at a designated "air zero"—18,000 feet above the five volunteers and one Air Force photographer. The officers stood next to a hand-lettered "ground zero—population



Five USAF officers in July 1957—all volunteers—react as a Genie nuclear missile is detonated above them in the skies over the Nevada Test Site as part of a USAF effort to get the deployment of nuclear weapons "out in the open."

A Bomarc missile battery near McGuire AFB, N.J. McGuire was the first Bomarc site to be declared operational.



USAF photo courtesy of the National Museum of the US Air Force

five” sign that Oldfield had fashioned from shirt cardboard.

Maj. Norman Bodinger radioed a narration to the operation’s command center. He was interrupted temporarily by the shock wave. After the observers recoiled momentarily, they excitedly shook hands and extended congratulations all around.

This test, almost unimaginable today, garnered considerable favorable news coverage. “They said all they experienced was ‘a sudden rush of air and a clap like thunder,’” reported the *New York Times* the next day. The volunteers “remained on the spot an hour after the detonation, with Geiger counters, and said radioactive fallout was almost undetectable.” *Time* described a “fireball,” which gave way to a “rosy, doughnut-shaped cloud.”

Bodinger and his colleagues were feted at that year’s Air Force Association National Convention, and their participation in Shot John sparked other speaking gigs where they and Oldfield touted the nation’s nuclear air defenses.

By the next year, 268 F-89s had received the necessary wing pylon and fire-control system modifications the Genie required. After the F-101 and F-106 entered the inventory in 1957 and 1959, respectively, they, too, carried the AIR-2A.

Eventually, 31 compounds for about 3,150 of the weapons were constructed at Air Force installations in 20 states, near “alert barns,” where interceptors were kept fueled, armed, and ready for takeoff.

With the exception of the Cuban Missile Crisis, when interceptors fer-

ried the arms to dispersal airfields, interceptors were not allowed to be airborne with the weapons. Protocol required that the first aircraft making contact with unknowns carry conventional arms. Follow-on interceptors would be equipped with nuclear arms.

Pilots and weaponeers trained on simulators and by firing training versions not carrying a nuclear warhead. Ground crews practiced retrieving the arms from storage and quickly loading them on large numbers of fighters. With the F-89, Genies could be relatively easily fastened underwing.

Arming some aircraft was an arduous task, however. The F-101 Voodoo and F-106 Delta Dart carried the MB-1 internally in the fuselage. Fitting the rocket into the tight space took peculiar physical contortions.

All this was done under the strict supervision, rigid training, and stringent standards for which the nuclear Air Force became known. Genie-equipped squadrons were routinely inspected, including during surprise “mass load” drills. Unsatisfactory evaluation could lead to discipline or suspension of a squadron’s combat-ready status. Even an error involving an inert training rocket was considered evidence of a procedural breach. The presumption was that a nuclear Genie might receive the same handling.

In 1958, a year after Genie became operational, Bomarc’s design problems were largely overcome. Workers began construction of the first missile launch sites near Bangor, Maine, and in New Jersey, Long Island, and Cape Cod. These Bomarc sites included above-ground concrete and steel garage-like

missile shelters built in evenly spaced clusters of seven on a 50-acre plot. Each shelter held one Bomarc, affixed to a horizontal launch arm. The shelter roof was to part, and the arm would lift the missile vertically if the time came to fire it.

Once Bomarc site construction was under way, the missile became embroiled in an interservice rivalry and subjected to funding cutbacks.

Newer intelligence estimates placed less emphasis on the prospect of a Soviet bomber attack. This, coupled with the fact the Army’s Nike Hercules was further along on the verge of deployment, led some to suggest Bomarc’s cancellation.

Supporters argued that Soviet bombers remained an existential threat, regardless of the number the USSR put into service. Bomarc advocates also believed a wide-scale deployment would provide defense in depth: Air Force interceptors and the Bomarc could engage attackers as they approached and entered the United States, while the Army’s “point defenses” could handle those that got through.

Ultimately, a compromise was struck. Six additional Bomarc bases were built: in southeastern Virginia; outside of Duluth, Minn.; at Kincheloe Air Force Base on Michigan’s Upper Peninsula; at the Niagara Falls Airport in New York; and two more in Canada.

The McGuire Fire

At the peak of deployment, the US Air Force had about 409 missiles. This was a far cry from the 40 bases (and nearly 5,000 missiles) being contemplated as late as 1957.

In September 1959, the Air Force declared the first Bomarc site operational.

It was in New Jersey, six miles northeast of the facility's namesake, McGuire Air Force Base.

There was soon an accident that drew attention to the facility. In June 1960, a fuel tank ruptured, sparking an enormous fire in one of the missile shelters. Flames enveloped the missile, but its nuclear warhead did not explode. This was a testament to the exacting design standards of the nuclear components, but was still a frightening incident.

No one was injured, although there was a brief scare when an air policeman contacted the local New Jersey state police barracks for assistance.

The trooper taking the call understood the airman to report that "an atomic warhead exploded." The Air Force sergeant later disputed this characterization of his remarks but not before state police officials notified their Trenton headquarters. The Associated Press learned of the alleged nuclear explosion and distributed a news bulletin repeating that description before it quickly issued a second report correcting the earlier announcement.

As the fire was brought under control in the following hours, a specially trained seven-person nuclear response team arrived from New York's Griffiss Air Force Base.

The team joined state and federal public health officials already on-site. Some of the melted warhead's radioactive components had puddled on the shelter floor or were swept along by the runoff from the water airmen used to fight the blaze. Fortunately, spot checks across 66 square miles outside the facility's boundaries found no trace of dispersed radiation.

Once the fire was extinguished, the walls of the affected shelter were painted and a mixture of concrete and asphalt was spread on the floor and across the apron and adjacent soil where the radioactive matter had settled. One official history states that, while "uninformed rumor created considerable anxiety among the civilian population in the McGuire area," the accident "was in reality a minor one."

Nonetheless, it was, according to another history, "perhaps the worst" event involving any of ADC's nuclear weapons.

The McGuire site eventually resumed operations, although the destroyed shelter was fenced off and never rebuilt or rearmed. Environmental monitoring continued, and no dangers were identified.

In 1961, a year after the fire, the final Air Force nuclear air defense weapon entered the inventory. This was a version of the Hughes Falcon guided air-to-air

An Air Force F-101B Voodoo loaded with two non-nuclear Genie missiles on a training mission.



USAF photo courtesy of the National Museum of the US Air Force

missile (GAR-11), which carried a 50-pound one-half kiloton nuclear warhead. Only a few years earlier such small, lightweight weapons were impossible to design and field, but the technology was rapidly advancing.

Gen. Curtis E. LeMay, Air Force Chief of Staff, helped to spur the advent of the GAR-11. Originally, the F-102 was to remain in the inventory only briefly, to be replaced by greater numbers of F-101s and F-106s. When budgetary circumstances changed and it became clear the Delta Dagger would continue in service longer than intended, LeMay sought to give the F-102 its own nuclear weapon, because the aircraft could not carry the Genie.

A Short Heyday

The new weapon for the Delta Dagger ensured the entire ADC fleet was nuclear capable. A guided weapon also offered the possibility of other interception techniques, including a head-on attack.

By early 1965, the Air Force had some 1,900 Falcons, but the heyday of the Genie, Falcon, and Bomarc proved short-lived. As ICBMs came to dominate the Soviet offensive inventory, US anti-aircraft forces began to be cut back. This air defense drawdown occurred during the Vietnam buildup and amidst modernization of the US ICBM force, which also taxed the Air Force's budgets.

The Bomarc was first on the chopping block. By July 1964, less than five years after it became operational, the A version of the missile was withdrawn.

The A models were liquid-fueled and had only a 250-mile range, compared to 500 miles for the B type. Two launching locations were closed.

By October 1972 the bases equipped with longer-range, solid-fueled B versions were shuttered as well, perhaps spurred by the Canadian decision to close their two IM-99B sites. The Canadian action would have left a portion of the US northern border without Bomarc defenses.

In this period, the F-102 was also withdrawn from service. American interceptor forces were being reduced, and since the F-106 was superior, it made sense to first retire the older fighter. The loss of the F-102s consequently lessened the need for the GAR-11. The Air Force removed the atomic air-to-air missile from the arsenal by April 1972.

With fewer nuclear anti-aircraft weapons and presumably less need to employ them, predelegated use authority is believed to have been rescinded about 1976.

The Genie soldiered on, albeit in reduced numbers, for a decade. The F-106 was the only airplane in the inventory that would carry it. As Delta Darts were withdrawn from service, so too were the AIR-2As.

By 1983, 200 Genie rockets remained in Air Force service. The last were phased out by 1986.

For nearly 30 years, the US had fielded one or more types of nuclear-armed anti-aircraft weapons. With the Genie gone, that effort came to a close. ■

Christopher J. Bright is a historian. This article is adapted from his book, Continental Defense in the Eisenhower Era: Nuclear Anti-aircraft Arms and the Cold War, forthcoming in paperback from Palgrave Macmillan. A selection of related declassified documents and other materials can be found at www.ChristopherJohnBright.com.