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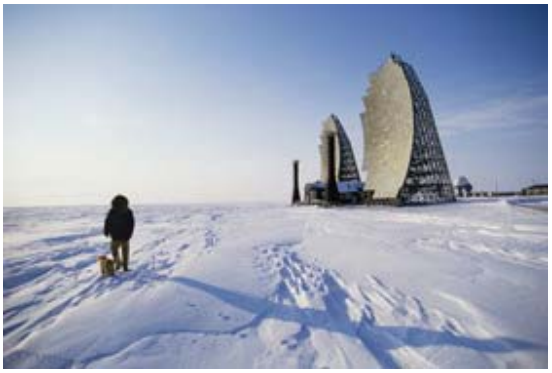
The Dew Line

By Mark Wolverton



A radar station near the northeast corner of Alaska, once part of the front line of the Cold War.
(George Steinmetz/Corbis)

It was North America's first defense against a Soviet attack, and life on it was the Cold War at its coldest.

In the early hours of April 17, 1952, World War III nearly began—although not many people realized it at the time.

The previous afternoon an intelligence source had reported unusual levels of activity at Soviet air bases. Shortly after midnight U.S. Air Defense Command headquarters, in Colorado Springs, got word from Alaska that vapor trails from "bogeys" (unknown aircraft) had been sighted high over the Bering Sea, coming from the direction of the Soviet Union. As shaken generals fretted over the report, another message arrived: Five more bogeys had been sighted off the coast of Maine. It looked as if this might be the real thing—an atomic sneak attack. Commanders ordered a full-scale alert. Fighters were scrambled and Air Force bombers prepared for a retaliatory strike.

And then nothing happened. The vapor trails over Alaska disappeared, along with the supposed enemy bombers. The unknowns over Maine were identified as off-course civilian airliners. Faster than it had begun, the threat vanished.

Although the people of North America slept undisturbed through the incident, it was ice water in the face for the military. It was bad enough that the U.S. defense network had been brought to the brink of war by such flimsy evidence. Much worse, though, was that it had taken 90 minutes for the first report of enemy planes to make its way up the chain of command to those in charge, and even longer to figure out what was actually going on. The mechanisms in place to spot, report, and confirm sightings of unknown aircraft were more suited to the Battle of Britain than the jet age.

How could America tell the difference between a real enemy attack and an apparent one? In the aftermath of the 1952 incident the defense establishment studied this

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question intently, and a big part of the answer turned out to be the Distant Early Warning Line—the DEW Line, for short—a string of radar stations along the very edge of civilization in one of the most desolate, hostile, cold, and empty places on earth.

The DEW Line project began at a gathering of eminent scientists and engineers called the Lincoln Summer Study Group. In the summer of 1952, at the behest of the Air Force, it met at MIT's Lincoln Laboratory (where radar had been invented) to examine air-defense issues. Among the conferees were J. Robert Oppenheimer and I. I. Rabi, both Manhattan Project veterans—men accustomed to thinking big and solving intractable problems.

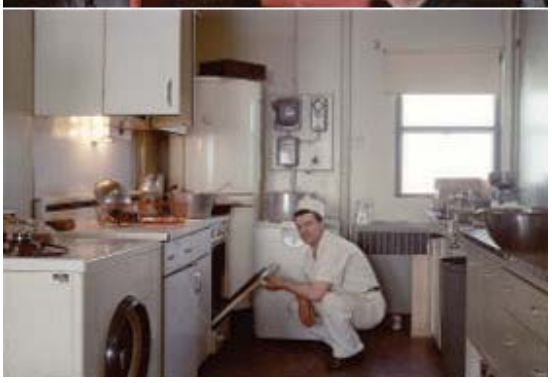
It was elegant and simple in theory. Putting it into practice would be a very different matter.

Even before 1952 the United States had begun to improve its air-defense effort. A postwar radar network called Lashup, deployed around some major cities, was being beefed up, and two radar fences were under construction: the Pine Tree Line, along the U.S.-Canadian border, and the unstaffed Mid-Canada Line, farther north near the fifty-fifth parallel. These were useful against slow-moving propeller-driven planes but inadequate for the jet age. As the Lincoln group pointed out, by the time Soviet jets crossed these thresholds, it would be too late to stop them. Only by detecting intruders earlier could an attack be thwarted.

The Lincoln group also knew that the shortest route for Soviet bombers approaching the United States would be across the North Pole. Such an attack could be detected only by constructing radar stations in the far north, stretching across the top of the Western Hemisphere inside the Arctic Circle from Alaska to Greenland, covering the entire airspace and connected to the United States by reliable communications. Such a network could provide up to four hours' warning to prepare defenses and (it was hoped) evacuate at least some of the populace from target cities.

The concept was approved by President Harry S. Truman in December 1952 as one of his last acts in office. Over the next year it was widely debated in military and civilian circles. The cost was one issue: a projected billion dollars or so. Some doubted that the scheme would work, or that it could prevent a nuclear war even if it did. Still others, thinking back a dozen years to France in World War II, feared a "Maginot Line mentality," in which a defensive barrier would yield a false sense of impregnability. In the end, whatever its imperfections, the benefits of such a radar fence made it indispensable as part of a revamped air-defense system, which would also include improved surveillance on the ground and in the air, advanced communications and computing facilities, and a centralized staff to put all the information together.

It was an elegant and simple idea in theory. In practice it would be an entirely different matter. The problems were daunting. How to get all the equipment up there? What about communications in the unreliable atmospheric conditions of the far north, with its magnetic and electrical anomalies? How well would our radars work? How could we build permanent structures in Arctic conditions?



The unadorned, starkly functional dining room and kitchen at the CAM-D station at Simpson Lake, far north of Hudson Bay, Canada.

To find out, the Defense Department hired the Western Electric Corporation, AT&T's massive subsidiary, to build several experimental stations, one in rural Illinois and the others in Alaska. The success of these tests, combined with the detonation of the first Soviet thermonuclear device in August 1953, convinced the military that the DEW Line was both feasible and necessary. (Political concerns were not a problem; the Canadian government had readily agreed to let the sites be

built as long as the entire cost was borne by the United States.) (Courtesy of Brian Jeffrey)

In December 1954 Western Electric got its orders: Complete the full-fledged DEW Line by July 31, 1957.

The sites would be located above the Arctic Circle, roughly along the sixty-ninth parallel. Much of the land there was *terra incognita*, uninhabited save for widely scattered outposts of nomadic Inuit natives. Temperatures in the region drop as low as 60 degrees below zero Fahrenheit, with 100-mph winds that freeze exposed flesh in seconds while whipping up enough snow to cause whiteouts that reduce visibility to zero. For three months out of the year the sun never rises above the horizon. Except for the brief Arctic summer, the land is frozen and sea-lanes are completely blocked by ice. During the summer months the layer above the permafrost, known as *muskeg*, turns into a mire up to six feet deep.

Siting teams scoured the tundra in small ski planes, marking locations with flags. With only sketchy maps and uninformative aerial photographs to go on, they relied heavily on pilots' knowledge of the region. To be acceptable, a station site had to allow good radar coverage, with no mountains to interfere, reliable communications, and access by air and, if possible, by sea.

After surveyors had settled on five dozen sites, the first construction crews came by aircraft, snowmobile, dogsled, and Caterpillar tractor train. They lived like the Arctic pioneers they were, camping out in tents, working around the clock, eating K rations, and fighting off blizzard conditions, not to mention facing the occasional polar bear.

Building a DEW Line site began with hand shovels and proceeded to bulldozers, with many stops along the way. The first job at each site was to clear enough snow for a primitive airstrip, so that bigger planes carrying heavy equipment could be brought in. It was a maddeningly Sisyphean task. Sometimes the builders would carve out enough of an airstrip for a supply plane to make a tricky landing, unload in a hurry, and take off—just in time for another snowstorm to cover the strip all over again.

After several repetitions of this, a plane big enough to carry a small tractor would finally make it in, allowing the men to clear more snow more rapidly and build a better runway for larger planes with heavier equipment. As a construction manager told *National Geographic*, "The first thing we learned is that you can't fight the Arctic and win. So we decided to roll with the punches."

The delivery of the initial supplies and personnel amounted to the largest commercial airlift ever assembled. Almost 150,000 tons of supplies were carried in 45,000 flights using hundreds of aircraft—everything from four-engine cargo carriers to singleengine bush planes, gathered from the American and Canadian air forces, civilian cargo companies, charter services, and airlines. Comparisons with the Berlin airlift of the previous decade were apt, since many of the DEW Line pilots were veterans of that effort. But conditions on the line proved much more dangerous: Twenty-five men died in plane crashes in a single year.

When the frozen Arctic sea passages began melting in the summer, the DEW Line sealift got under way. During the three years of construction, some 120 ships brought 42,000 tons of steel, millions of gallons of fuel, and many other supplies. Coming from both the Pacific and the Atlantic, these ships plied seaways that until then had seen only kayaks. It was a rush against time; there were only a few short weeks before the waterways would again begin freezing up. The combined sealift and airlift delivered more than half a million tons in total by the time construction was over, rivaling a major military campaign in scope and effort.

Meanwhile, work continued around the clock and around the calendar, with crews tirelessly erecting radar antennas and buildings. For living and working space, designers had developed a prefabricated and insulated module, 28 feet long by 16 feet wide by 10 feet high, that could be connected with other modules like it and was easy to break down into component parts for transport. The rotating radar antennas needed special housing of their own to withstand the harsh conditions. For this purpose, the DEW Line used an unusual structure that had been invented by the architect Buckminster Fuller.

This was the geodesic dome, known on the DEW Line as a *radome*. Its strong, replaceable panels were made of fiberglass-reinforced plastic, a new wonder material that was impervious to the harshest weather but transparent to radio signals. With their innovative structure made up of repeating elements, radomes were easy to transport and assemble, like the housing modules and many other things on the project.

One of the most important necessities on the DEW Line was much more humble:

gravel to cover and smooth out airstrips and roads atop the muskeg. Many construction sites used huge rock-crushing machines to produce it. Gravel was necessary both to insulate the ground, which prevented it from thawing during the warmer months, and to let water through, which kept the surface from turning to mud. Eventually 9.6 million cubic yards of gravel was used on the project.

What could possibly persuade someone to spend a year or more in a frozen wilderness? Money.

Finally, on July 31, 1957, Western Electric turned over to the Air Force the fully operational DEW Line. It was divided into six sectors, approximately 500 miles wide, each containing three different types of station, spaced roughly 80 miles apart. Main stations served as sector headquarters; auxiliary stations were similar but smaller; and intermediate stations were smaller still and staffed with just a handful of personnel. Each station was identified by a three-letter sector designation and a letter or number that indicated its type. FOX-M was the main station of FOX sector (also known as FOX-Main), PIN-2 was an auxiliary station in PIN sector, and LIZ-A was an intermediate site in LIZ sector. There were 7 main, 23 auxiliary, and 29 intermediate stations, along with 3 stations farther south in Canada and Alaska that relayed communications to the lower 48.

A main station was made up of two linear units of 25 module buildings apiece, connected by an enclosed bridge to form an H shape when seen from above. Auxiliary and intermediate stations had only one 25-module unit. The modules were placed end-on to the prevailing winds and mounted above the ground on metal stilts set into holes steam-drilled deep into the permafrost below. The open space between the modules and the ground allowed wind and snow to blow around and past the buildings, reducing wind damage and snowdrifts. Every station had its own airstrip, although the length and capacity varied greatly, making frequent risky landings necessary at some sites.

Upon the handover, the military enlisted another AT&T subsidiary, Federal Electric, to operate and maintain the DEW Line. Although it was under military control, the line was staffed and run chiefly by civilians, with Air Force officers at the main stations. What could possibly have persuaded someone to spend a year or more sitting in prefabricated housing, staring at a radarscope, in the middle of a frozen wilderness?

Brian Jeffrey works on radio equipment at the Pelly Bay station while enjoying a rare luxury, tobacco.
(Courtesy of Brian Jeffrey)

“Money,” says Lynden (“Bucky”) Harris, who signed up for several tours on the DEW Line, working various jobs, including personnel, transportation, and logistics, and eventually managing the entire line. “The money was very attractive.” Workers signed up with Federal Electric for 18 months (with a two-week leave at the halfway point) at $1,000 per month plus a $1,500 bonus at the end of the stint. In the late 1950s those wages rivaled the earnings of doctorate-level engineers and professional baseball players. Better yet, the pay increased markedly with additional tours.

Applicants had to have appropriate experience and expertise, and they had to pass a battery of interviews and tests. “I went for the interview in Los Angeles,” says Mike Shaw, a DEW Line veteran from 1962 to 1964 and 1968 to 1973. “They gave you about 50 tests. We joked for years after that that they had to make sure you were crazy.” After acceptance, all personnel received specialized training. Technician/operators, who would form the backbone of the line, were sent to radar

school in Streator, Illinois. After six to eight weeks they graduated to their new duties as “radicians,” a contraction of *radar operator* and *technician*. Radicians were also trained in first aid, weather observation, and cryptography. Other DEW Liners worked as cooks, mechanics, administrators, and pilots, among other occupations.

Although the Air Force promoted the DEW Line as the most sophisticated defense system ever built, much of its apparatus was hardly advanced. “The radar, for example, which is the most important piece of equipment, was based on 1940s technology,” says Clive Beckmann, an Air Force veteran who joined the DEW Line as a civilian after his discharge in 1964. “It was very similar to radar that I had worked on in the service.” Still, “it had some significant changes, an antenna with far greater gain and some other niceties.” Using the then-current military designation system, the radar’s full name was AN/FPS-19, or FPS-19 for short. Later DEW Line stations in Greenland used an upgrade of FPS-19 known as FPS-30.

FPS-19 could detect aircraft at ranges up to 162 nautical miles in the L band of radar frequencies between 1,000 and 2,000 MHz. It used a rotating dual-antenna system, with two reflectors placed back to back, creating a double lobe of radar energy probing the skies at a high and low angle simultaneously. The X-3 automatic-alert system, developed at MIT, relieved hardworking radicians from the need to keep their eyes glued continuously to the screen. The system set off an audible alarm whenever anything resembling an aircraft entered its field of view.

At intermediate stations, a stationary Doppler (or “fluttar”) radar, FPS-23, transmitted a continuouswave signal to receivers at the main and auxiliary stations on either side, creating an invisible electronic fence. If a low-flying aircraft crossed the fence, it would reflect part of the signal toward the receiver. By comparing the reflected and unreflected signals, the receiver could calculate the intruder’s position and velocity. Unfortunately, FPS-23 did its job a little too well. “Turns out it was much too sensitive,” Beckmann recalls. “Flocks of birds would activate the target alarms, and you never knew when to believe them. So the men just turned them off.”

The biggest technical challenge, bigger than radar, was communication. Here some real advances were made. “When you talk state of the art on the DEW Line, it’s the tropo scatter communications and the iono scatter communications,” says Beckmann. Unlike conventional radio signals, which are blocked by terrain, tropospheric scatter signals bounce off transient layers in the atmosphere, allowing communication beyond the curvature of the earth at far greater distances. Beckmann explains, “These were suspected to be operationally feasible by industry back in the 1940s and maybe even the ’30s, but they’d never been tried practically because there was never a need that justified the cost of implementing new equipment and testing it and whatnot.”

While tropo scatter let DEW Line stations talk amongst themselves, main stations had to be able to communicate with the command authority farther south. This was accomplished with an ionospheric scatter system that bounced signals off the high lower-E layer of the ionosphere for increased range. Another useful innovation was frequency diversity, in which transmitters and receivers operated simultaneously at several varying, closely spaced frequencies with slightly different antenna paths. This system cut down on the signal fading and interference that are endemic to the polar regions, because if electromagnetic conditions made one frequency unusable, another one that was slightly lower or higher would often work.

Other communications equipment was more conventional, says Beckmann. “All the air-to-ground radios and mobile radios were existing stuff that had been around for years. The teletype systems had been around forever; we had technical orders for the maintenance of these systems that were dated back in 1945.”

If the equipment was old, the workers manning it were young, mostly in their twenties and early thirties. A 40-year-old on the DEW Line was definitely an “old man.” The job wasn’t for everyone. “We had situations where people came to the line and stayed only one day and left, because they had not been fully prepared for what they would find,” says Mike Shaw. “We had one guy who got off the airplane, went in the mess hall, sat down for a cup of coffee, listened to people talking, then left on the next flight out.” The flights themselves were often hair-raising. “That was the worst thing, the damn airplanes,” Harris says.

Despite the isolation, life at a DEW Line station was fairly comfortable, with well-heated private rooms, excellent food, modern indoor plumbing, and lots of spare time. DEW Liners enjoyed well-stocked libraries, current magazines and newspapers, and even first-run Hollywood movies. Every station had a PX and a rec room, and many men whiled away their off-duty hours with hobbies. “We did all kinds of things,” says Shaw, “not only a huge amount of reading but … model rockets, shooting rockets off. There were a lot of people stomping around the hills hunting and fishing. I was into

gold prospecting … no luck, but it keeps you busy."

And of course there was gambling—usually friendly and low stakes—and drinking. At first the DEW Line was officially dry, but the company soon realized that Prohibition in the Arctic would be as unrealistic and unenforceable as it had proved in the lower 48 and allowed each man a weekly ration of one six-pack of beer. Most crews pooled that individual ration and opened a station bar. Still, "we really didn't have a big booze problem," says Bucky Harris, calling alcoholics "few and far between."

For hardcore DEW Liners, the appeal was more than monetary. "Those of us that made a career out of the place were those who just loved to look out across the tundra, especially in the spring or fall months, when the ground was all covered with snow and it looked pristine and shining," Beckmann remembers. "You'd look out and you'd view this pristine world and say, 'Man oh man, I could be down there fighting rush-hour traffic, and yet here I am, I'm lucky enough to walk to work, I can look out and see this beautiful sight.'" DEW Line veterans also emphasize the intense camaraderie born of working and living with others in such extreme conditions. "You got to know them like you would your family," Harris says.

Along with politics, religion, women, and fishing, an unending topic of conversation in messrooms was what would happen if the Russians really came. If there was a front line to the Cold War, the DEW Line was it, and DEW Liners couldn't escape the ultimate reason for their presence. "Our goal was, we were going to give the warning," says Shaw. "If we worried about anything, it was that the whole world was going to be destroyed." After they sounded the alarm, their job was over, and there would be nothing more to do.

DEW Liners didn't worry too much about becoming a target themselves. "They're not going to do anything to us," says Harris. "Shoot, that would be dumb. We're, like, 30 men sitting in a hut? They're not going to bomb us. We were all identified as noncombatants. We had locked-up rifles for protection, but we couldn't have defended anything."

Four FPS-177 long-range surveillance-radar arrays undergo testing at Lockheed Martin's Syracuse, New York, facilities, 2003.
(Courtesy of Lockheed Martin)

Nonetheless, the possibility was bandied about. Beckmann says: "One of the things that was also discussed is, well, here we have this radar picket called the DEW Line, what would happen if the Russians earnestly decided to come and drop some bombs on us? Would they possibly send a sub up with assault teams that would take over two or three adjacent DEW Line sites with technicians that could keep things going? To the outside world it would seem like nothing had happened. They would let their bombers come through and not report them to anybody."

Such *Ice Station Zebra* scenarios aside, DEW Liners had enough to worry about in the normal course of their work. A radician usually spent half his shift doing maintenance on the radar and electronics and the other half watching the scope for bogeys. Beckmann explains, "It could be a pressure job, very similar to what FAA controllers would describe: It's the most boring job in the world 98 percent of the time, with 2 percent of the time being sheer terror." If a radician missed an unknown blip on the scope, "it could very well get you on the next plane south with a termination."

Most of the blips the radicians saw were routine and expected. All military and civilian flights had to file flight plans, and NORAD (North American Air Defense Command) kept track of everything in North American airspace. DEW Liners quickly learned the schedules and telltale tracks of all the regular flights that passed through their designated dewizs (DEW Line Identification Zones), so anything unusual stood out immediately. When an unidentified target appeared, the radician had to report it at once while continuing to track it and update its position every few minutes until told to stop. He would also alert other DEW Line sites in his sector to look for the unknown and sometimes would attempt to contact it by radio.

Says Beckmann: "There were usually two guys available, the guy on the scope and the guy working the equipment, and in peak periods when activity was high, you would

call him in and he would do something for you, such as filling in the log and so forth. You got to the burnout point real quickly. There were only so many things you could do, and even two guys would be maxed out if things really started hopping."

Usually such frantic activity didn't last long before the unknown was identified as a lost or off-course friendly aircraft. But once in a while it turned out to be something more ominous. Russian Tu-95 "Bear" bombers, loaded with electronics gear, periodically skirted the borders of North American airspace to eavesdrop on communications and test the radar network. U.S. aircraft did the same along the Soviet border; it was mutually accepted as part of the Cold War chess game. But one day in 1982, during Clive Beckmann's tour at POW-Main, things went a step farther.

Normally, Soviet eavesdropping flights changed course to parallel the borders of North American airspace at a distance of 50 to 100 miles. This time, though, the Bear didn't make the usual respectful veer. After being detected by LIZ-3, the next site west of POW-Main, the Soviet plane appeared on Beckmann's scope as it kept flying toward the Alaskan coast and U.S. airspace. "He showed no inclination to turn left and take up a heading that would parallel the coastline," recalled Beckmann in an account he wrote for *Air Force* magazine. "With each sweep of my radar antenna I could see him drawing ever closer to the coastline." Then Beckmann picked up the tracks of two fighter planes that had scrambled from an Alaskan air base to intercept the intruder.

"A few minutes more and the unthinkable happened!" Beckmann wrote. "The 'Russkie' penetrated the coastline a little south of LIZ-3, blissfully cruising along as though this was something he did every day." Meanwhile, the fighters were closing fast. "If the intercept occurred, it was uncertain whether the fighters would open fire or signal him to lower his gear and follow them to home base for a landing. In either case, a major incident was about to occur and I had a front-row seat to the spectacle. Gazing wide-eyed at my scope, I could feel my pulse pounding."

There were only two possibilities: Either the Tu-95 had made a navigational error in the overcast weather or it was leading the vanguard of an actual enemy attack. The next few seconds were going to tell.

"On the next sweep of my radar antenna, I saw that the Russkie had accomplished a 180-degree turn and was gaining speed … he was hauling butt at over 500 mph away from the approaching fighters." The intrusion was a simple mistake by the Soviet pilot, fortunately realized and corrected in time.

Far more frequent than Soviet Bears were incursions by polar bears, which tended to be attracted to the activity and especially the food of DEW Line stations. A more positive sort of encounter took place between the Americans and the native Inuit people, or, as they were universally known at the time, Eskimos.

The Inuits took the invasion of their homeland in stride and, protected by strict Canadian laws, got along fairly well with the strangers. Although only a few sites were near Inuit villages, remembers Harris, "we had Eskimos at almost every site who worked with us. They got the same pay." Still, he says, "I think we done more harm than good to 'em." Despite the Inuits' friendliness and adaptability, many observers agree that the culture shock and changes wrought upon the Inuit way of life caused by the opening of the Arctic were more negative than positive.

Most of the blips were routine and expected, but once in a while it was something ominous.

As the Cold War extended on into the 1960s and 1970s, it brought changes to the DEW Line. The Cuban Missile Crisis, during which DEW Liners double-teamed on shifts and tensely watched squadrons of Soviet bombers dancing provocatively just outside American airspace, made clear that the real threat in the future would come not from manned bombers but from unmanned ICBMs arcing over the North Pole, against which no defense was possible. Three Ballistic Missile Early Warning System (BMEWS) stations were built in Alaska, Greenland, and England, designed to pick up the first signs of a missile launch. Reconnaissance satellites provided another source of early-warning information.

With these new resources in place, the intermediate DEW Line stations were deemed redundant and shut down in 1964, but the line itself was extended eastward across Greenland and westward into the Aleutian Islands. Meanwhile, life at the bases was changing. Workers were unionized in the mid-1960s, a move that brought higher pay and added benefits—including, a decade later, the most welcome and overdue change: female co-workers.

The strategic rationale of the DEW Line was also evolving. It had originally been intended as an alarm system that would provide precious time to ward off an enemy

bomber attack, though by itself that might not have been enough to save the country. In January 1956 President Dwight D. Eisenhower summarized in his diary the report of a secret committee charged with envisioning the effects of a future nuclear war. Even with warning from the DEW Line, enough Russian bombers would get through to cause "total economic collapse," the government would likely be "wiped out," casualties would be enormous, most of the population would need medical care, and virtually none would get it. "It would literally be a business of digging ourselves out of the ashes, starting again."

On the other hand, wrote Ike, "the damage inflicted by us against the Soviets [would be] roughly three times greater." This was much more than a ghastly consolation. As Robert Everett, a co-inventor of the military-funded Whirlwind computer in the 1940s and 1950s, told the historian Robert Buderi, "We tend to say, 'Well, if we're going to build a defense it has to be perfect—we have to get all the bombers.' But that's not the way the enemy looks at it. The way he looks at it is, 'If the country's got any reasonable capabilities, I'll lose most of my bombers, and I won't be able to carry out my mission, and there'll be too much of the United States left and they'll beat the stuffing out of us—and so maybe I better not do it.'" From this standpoint, even a partially effective system could prevent a nuclear war.

With the advent of ICBMs in the 1960s, though, the DEW Line became little more than a tripwire for the doctrine of Mutual Assured Destruction. Although its radars were practically useless for the detection of missiles, the encroachment of any aircraft upon American airspace would be a sign that an attack might be imminent, a fact that was not lost on the Soviets.

Mike Shaw was on duty at DYE-2 during the Cuban Missile Crisis, and to this day he insists that one reason the Soviets backed down is that "we were there and Russia knew it." An undetected attack from the north to divert attention from Cuba was impossible. In fact, one reason the Soviets had decided to plant missiles in Cuba was that they were aware of the formidable detection systems up north, whereas America's southern underbelly was virtually unguarded.

By 1985 high costs and technical advances led the pentagon to shut down the dew line-almost.

The threat of invasion by manned bombers became completely irrelevant when the Soviets gained strategic parity in the 1970s and 1980s. Nonetheless, the Defense Department kept the DEW Line up and running. "The main rationale was that it would be very advantageous for the Russians to launch an airborne nuclear attack timed to reach their targets right after the ICBMs found their marks," Beckmann explains. "The DEW Line prevented that from happening." Bucky Harris thinks the line was kept going because it opened up the north country for the Canadian government. Another reason was simple bureaucratic inertia. By the late 1960s, Harris says, "it was probably a job-seeking thing more than anything else."

By 1985 increasing costs and continued technological advances had persuaded the Pentagon to ring down the curtain on the DEW Line—almost. The United States and Canada began to transform the line into a mostly automated version called the North Warning System (NWS), replacing the old FPS-19s with new FPS-117 radar. In 1990 the United States turned over the entire operation to the Canadian government, except for a few remaining stations in Greenland and Alaska.

The present-day NWS is more deserted and desolate than the DEW Line ever was. "About every thousand miles they've got a few people at one site," Harris says. "It's all automated. If the radar goes down, the backup system comes right up. They go in every three months and do maintenance on the power plants, change the oil and that kind of stuff, but they just fly in and do a few things and fly out." NWS stations automatically transmit data to overflying satellites, with no radicians needed.

A darker legacy of the DEW Line that surfaced after the handover to Canadian custody was the question of what would be done with the abandoned stations, where almost 40 years of buried waste, PCBs, and other toxic chemicals were leaching into the Arctic environment. Fierce political controversy raged over whether the United States or Canada was responsible for the cleanup and dismantling of the stations. Finally an agreement was reached in 1996, with the United States contributing a modest $100 million toward the cleanup. It remains a sore spot with many Canadians to this day. Meanwhile, proposals have been made to preserve at least one DEW Line station intact as a museum.

The memories of those who lived and worked on the DEW Line tend to focus on the friendships formed in the unique subculture they shared in the far north. "I loved the job right up till the end, when we left in 1990," Beckmann says. "It was an unusual job,

a fascinating job, and a challenging job involved with national defense, which gave you a good feeling." DEW Liners held a small reunion in Las Vegas in 1998, and Harris is trying to organize another one, but it's difficult because of the advanced ages of many vets and their dispersal throughout the world.

They share the satisfaction of a job well done. "It's possible we kept the Cold War cold," says Murray Rosen, another DEW Line veteran. Beckmann sums up: "The fact remains, the DEW Line stood between the Soviet bomber force and the U.S. [and] Canada, and the end result of the Cold War is that the Soviets never came. That has to give all DEW Liners a warm feeling when we think back on those many cold winter nights above the Arctic Circle."

*Mark Wolverton is the author, most recently, of "**Communicating With Deep Space**," in our Spring 2006 issue.*