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# STUDENT ESSAY

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FIELD ARTILLERY OPERATIONS IN THE ARTIC

BY

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USAWC MILITARY STUDIES PROGRAM PAPER

FIELD ARTILLERY OPERATIONS IN THE ARTIC

An Individual Essay

by

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ABSTRACT

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Field Artillery operations in the Arctic, although not new to the U.S. Army, have recently taken on increased importance with the activation of the 6th Infantry Division (Light) in Alaska and the 10th Mountain Division at Ft. Drum, New York. Both divisions train for employment in extreme cold weather. Organization of the field artillery in a low intensity conflict in the far north warrants special consideration. The employment of the field artillery in a battalion task force is the most likely way it can expect to fight. Artillery batteries may be attached to an infantry battalion, but the preferred organization is that they remain as part of the direct support battalion. Both field artillery and maneuver commanders must have the flexibility and breadth of understanding to deploy in task force configuration. In addition to organization, artillery units in the Arctic must take into account the unique requirements for training to include physical training, gunnery skills, maintenance training and cold weather training. Equipment requirements also become a major factor in the formula for success. Recent fielding of equipment such as the Small Unit Support Vehicle, Battery Computer System and Firefinder Radar have been very successful in Arctic operations.



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## FIELD ARTILLERY OPERATIONS IN THE ARTIC

When Clausewitz wrote, "If no one had the right to give his views on military operations, except when he is frozen or faint from heat and thirst, or depressed from privation and fatigue, objective and accurate views would be even rarer than they are," he was reflecting on a lifetime of warfare in Europe.<sup>1</sup> But he could have been talking about Alaska. Only by knowing the bone-aching chill of air-lifting a firing battery at -40° F or the exhaustion of making an occupation in four feet of snow can the Artic soldier appreciate the reality of what is important, what works, and how to make it work. A wind chill of -70° F puts things in perspective. Winter is relentless in its demands on men and equipment - a stern taskmaster, without compassion, and unforgiving of mistakes.

It is in the panorama of mountains, tundra, rivers and glaciers of Alaska that the U.S. Army has stationed their newly activated 6th Infantry Division (Light). Alaska is an expanse of terrain and islands which dwarfs nations in its size. It has a land mass of 365 million acres, of which only 1/20th of one percent is settled and populated. The coast and the Aleutian chain include literally thousands of islands. About 1,800 islands, rocks and reefs are named. It is a land of diversity. The climate varies from extreme cold in the north during the winter months to pleasantly mild further south during the summer. Average temperature in Barrow during March is -16° F. Days of -45° are not uncommon. On the other hand, Anchorage enjoys an average of 58° F during July. Glaciers cover 28,800 square miles in Alaska, and annual precipitation along the coastal mountains is as high as 400 inches.<sup>2</sup>

Alaska develops a soldier who is unique in his ability to operate under the harshest circumstances, and yet maintain an esprit and pride that only comes with having succeeded in the face of adversity. The Arctic soldier is, in many ways, on his own. That is the nature of the north. Clausewitz recognized the effect of such a challenging environment when he said, "The troops national feeling (enthusiasm, fanatical zeal, faith, and general temper) is most apparent in mountain warfare where every man, down to the individual soldier is on his own."<sup>3</sup>

Northern operations are not new to the U.S. Army, or confined to the 6th Infantry Division (Light). The 10th Mountain Division at Ft. Drum, N. Y. is also becoming expert in the art of winter fighting. The U.S. Army has formalized its doctrine for northern operations in a series of field manuals: FM 31-70 (Basic Cold Weather manual); FM 31-71 (Northern Operations); FM 90-6 (Mountain Operations); and, the basic manual on Operations, FM 100-5. The purpose of this paper is to re-look at the details, and explore new perspectives on how to best employ the field artillery in the far north.

#### Artillery Tactics

The arctic is not an area which will host the set-piece land battle of divisional stand-offs. Her terrain and weather are their own barrier to heavy land forces. Alaska has vast oil resources, producing approximately 630,000,000 barrels of oil a year.<sup>4</sup> The pump stations and the pipeline offer an important target to the Soviet Union. Furthermore, the Aleutian Islands offer a strategic focus, especially the U.S. military assets on Shemya and Adak. Today, a battle in the Aleutians would be largely air and

sea, with some probability of low intensity ground combat. It is unlikely that history will repeat itself as in the battle of Attu Island, during World War II, when the U.S. 7th Motorized Division attacked 2,600 Japanese defenders and reduced them to 28 survivors.<sup>5</sup>

The remote and vast geography, weather, and nature of the threat in Alaska dictates a task organization that emphasizes the combined arms task force, rather than brigades on line. In fact, FM 31-71 (Northern Operations) recognizes this requirement, and states, "Normally a light towed artillery battalion will be attached to an infantry brigade employed as a task force."<sup>6</sup> However, rarely can a full brigade size task force expect to deploy in defense of a critical site threatened by a Soviet "speznaz" or special operations team. More likely will be the employment of battalion and company task forces.

The employment of the field artillery in a battalion task force is the cornerstone of task organization for the artillery in the Arctic. It is not a concept which is welcomed by all FA commanders, or even by some maneuver commanders. Nevertheless, it is the most likely way that the Army will fight in the north. Task Force organization requires that an artillery battery deploy with an infantry battalion combined arms team. It may be attached, but the preferred organization is that it remains as part of the direct support FA battalion. In a sense, firing batteries assume a DS mission to infantry battalions, recognizing that this is not a doctrinal mission at the battery level.

Field Artillery commanders must have the flexibility and the breadth of understanding to allow their firing batteries to deploy in task force organizations. Likewise, maneuver commanders must recognize the tremendous



increase in firepower that comes with a howitzer battery. Infantry commanders must also have a solid understanding of combined arms tactics to capitalize on "their" firing battery. In some instances, FA commanders do not want to "hand over" a battery, and infantry commanders do not want the burden of an additional unit. Yet, there is no more formidable and mobile land force in the Arctic than the infantry battalion augmented with field artillery, engineers, signal and aviation.

Cross-country mobility quickly becomes a key to effective tactical operations in the mountains and across the tundra. There is good news and bad news. The good news is that the Army bought the Swedish Small Unit Support Vehicle (SUSV), and has helicopters that can move artillery pieces. The bad news is that the M101A, howitzer doesn't have skis, and helicopters can't do airmobile operations in extreme weather.

The SUSV is a light, non-armored, tracked vehicle capable of traversing deep snow while towing a 105mm howitzer and carrying its crew. Both the infantry and the field artillery in the Arctic now have the SUSV as their prime mover. In fact, the infantry goes to war in the SUSV, either riding or skijoring (skiers towed behind the SUSV). Normally, the infantry will dismount their SUSV and move through mountains and blow-down by snowshoes. Unfortunately, sometimes the howitzers fall behind the battle. Herein lies the challenge to the field artillery commander - the task of staying within the maximum range fan of the 105s. The SUSV can tow the M101A, howitzer without skis, it just takes longer. Essentially the howitzer is dragged through the snow behind the SUSV. It sounds crude, but has worked better in Alaska than a variety of fabricated skis and skids. An option that has been very successful is attaching an engineer bulldozer

to the battery. In one recent winter exercise, this simple remedy made the difference between success and failure for a firing battery in support of a Canadian light infantry battalion task force.

The British Light Howitzer (L119) has proven effective in Arctic tests, and has an available ski package which could solve the problem. Perhaps a lesson should be taken from the light mountain batteries of the Italian Alpini forces, who still operate effectively on the French border with their model 56, 105mm howitzers and mules. A four-gun battery is maneuvered in the mountains by breaking the pieces down and using 48 mules as prime movers.

Rivers pose a formidable barrier to land travel in Alaska. They are sometimes fast and treacherous, and may not be sufficiently frozen for ice bridging until after January. Airmobile operations often become a key to movement for both the artillery and the infantry. However, moving a battery by CH 47 or CH 54 at -40° F into the mountains presents special challenges. Foremost is the need for independent, disciplined leaders in the firing battery who are prepared to operate alone under the harshest conditions. Recall Clausewitz, "...in mountain warfare where every man, down to the individual soldier is on his own." Loads must be planned so that crew and weapon integrity is maintained. Complete survival packages and rations must go in with each crew. Firing capability and ammunition must be spread from the beginning to the end of the displacement. Weather may shut down the move at any moment, and leave whatever is in the mountains on its own for days. Navigation is critical; helicopter pilots cannot just drop loads and depart without knowing they have put the crew and its weapon in the correct location. Daylight hours are short during the

winter. Consequently, many airmobile operations will be made at night, further complicating the displacement. Nevertheless, movement by helicopter is a viable option, as long as some basic principles and common sense are followed. It also takes a few mature leaders who have already been seasoned by the north. The Arctic is not a place where youth and zeal will win out over experience and judgement.

The most viable employment of a field artillery battery in Alaska is to maintain the integrity of the firing battery and avoid a further breakdown into split battery operations or raids. The new TO&E for the light division further reduces the capability of the towed battery for split operations. Although this conservative approach may contradict popular doctrine, and does not offer the glamour of more diverse employment, it recognizes that chopping-up a battery results in a tremendous reduction in its capability to deliver effective fire support. The two-gun raid is colorful, but not very practical in terms of fire-power. Usually, organic mortars are better suited for the raid. Furthermore, splitting a light towed battery in Arctic operations seriously cuts at the structure of leadership which is so essential to success. Logistic support becomes a nightmare for the battery commander. The infantry sometimes begins to believe that artillery batteries can routinely be broken down into independent elements resembling their own sections of crew served weapons.

Security for a light towed artillery battery is not easy. It is virtually impossible for firing battery personnel to provide their own security in the face of a significant threat. Gunners can either shoot for the infantry or shoot for themselves. They cannot do both at the same time effectively. The wise task force commander studies carefully the threat to

his field artillery, and is not reluctant to provide an infantry force for security when the situation dictates. An artillery battery is a formidable bastion of firepower, with tubes lowered and crew-served and individual weapons firing. Sorry will be the enemy who takes lightly the task of assaulting a well-defended artillery battery. However, the cost to the friendly maneuver commander is considerable. When his artillery must stay at 50-100% alert all night and fight for their lives or answer every probe and sapper threat, he has given up timely accurate fire support for his companies.

Security during displacements is paramount to the protection of the artillery. It is essential that the task force commander be provided with detailed intelligence by his staff, regarding the threat along the proposed route. The commander can then determine the best way to organize his forces for the movement. In some instances the FA can do very well with only their organic security assets. In other cases, the threat will require an infantry unit for protection. There is no greater loss in ground combat than when the guns have been lost. Such a defeat takes the heart out of both the artillery and the infantry.

Tactical maneuvers by the infantry in the Arctic pose a special challenge to the field artillery. The maneuver forces may use skis or showshoes. They can break down into small units which move by stealth through difficult terrain and are able to make maximum use of cover and concealment. They camouflage well with the snow, in their white overgarments.

What about the artillery?

Camouflage is critical also for the field artillery battery, because a towed battery is slow to displace rapidly in deep snow when detected by the enemy. White camouflage nets are a required item for winter operations, and should be used to compliment a position which has been carefully chosen for concealment. Firing units provide the best support when they can maneuver sneak along with the infantry, quietly occupying hidden positions in natural cover. They are least favorably used when they begin to collect in open country and are vulnerable to observation, counter-battery and ground assault. The fire support officer, artillery commander and maneuver commander must study in detail the route and probable positions for howitzer units. It is not wise for the infantry task force commander to hurry his companies to the battle with no thought of the artillery.

#### Training

The foundation of effective training for artillery units in the Arctic includes physical training, gunnery skills, maintenance training and cold weather training.

Without soldiers and leaders who are at a high level of physical fitness both in strength and endurance, units will fail on extended operations. Clausewitz focused on this important requirement when he said, "Among the many factors in war that cannot be measured, physical effort is the most important."<sup>7</sup> The Armed Forces Officer states, "When troops lack the coordinated response which comes of long, varied and rigorous exercises, their combat losses will be excessive...."<sup>8</sup> How do you conduct physical training year-around when the winter temperature is sub-zero? The

answer is that a great deal of the time you can go outside for standard PT, just wear layered clothing, wool head and face cover and gloves. Running at -20° F is not uncomfortable, or injurious to your health, as long as you go indoors to cool down. Winter PT on cold, dark mornings builds a special kind of pride, as soldiers and officers pound along, frost building heavily on their face mask and shoulders. Occasionally, surface ice will put a few troops on their backside, but they eventually learn to balance. Foot marches on skis and snowshoes build strength and endurance quickly. There comes a break-point, however, usually at -20° F and high winds when it is better to conduct daily PT indoors.

All else the most important factor by which field artillerymen are judged is their ability to shoot. Everything else is on a list in descending order of importance somewhere under gunnery. Gunnery training must be the cornerstone of a howitzer battalion's training program. The best guide to gunnery training is the Army Training and Evaluation Program (ARTEP). It is designed to give artillery commanders a collective training program which sets standards, identifies strengths and weaknesses, and measures firing performance.<sup>9</sup> Battery tests are essential to provide unit commanders the opportunity to demonstrate the ability of their battery to complete at least 80% of the tasks to standard. Battery tests should be a highlight of the training cycle and given the highest priority for planning and support. Likewise, an external evaluation of the battalion provides the "Superbowl" setting so essential in driving the yearly training program.

Arctic artillery battalions should be administered their ARTEP during the winter, rather than summer months. It is most desirable to evaluate a unit under the weather and terrain which are its specialty.

Maintenance operations in extreme cold are a special challenge. They require knowledgeable leaders, operators and mechanics. Vehicles and equipment not properly serviced according to specifications for extreme cold weather quickly become non-operational. Adequate motor pool facilities in garrison and a maintenance tent with heater in the field allows operators and mechanics to conduct quality maintenance. Battery-level maintenance in the field can be conducted on the move, without a heated tent, but, more extensive work done at the battalion will require protection from the weather.

Unfortunately, time is frequently wasted on operator maintenance in a unit because few soldiers and non-commissioned officers learn proper maintenance procedures. Likewise, many officers do no more than walk around and pretend to spot-check. Effective maintenance training requires operators, sergeants and officers to learn how to physically conduct operator maintenance prescribed in the -10 series of manuals. They must know what special lubricants are required for the cold, procedures for warming engines with swing-fire heaters, and winterization requirements. Everyone has to get a little dirty in the process, not just the young enlisted soldier.

Driver training is an important part of the maintenance program. The chain of command must plan and conduct a training program which qualifies drivers to operate vehicles in all weather, with emphasis on winter conditions. Installation-level licensing programs are not sufficient. The battery commander must direct a continuing schedule of training at the unit

level. Convoys pose special problems in heavy snow and ice, especially for artillery units whose prime movers are towing guns, radars, and trailers which easily jackknife on steep slopes. Iron-tough discipline must be exercised by leaders to maintain the established interval between vehicles, or rear-end collisions are a certainty.

Road-testing of vehicles in garrison can become a high-risk operation during the winter months when roads and trails are hazardous. There is a tremendous temptation to hit the throttle when an inexperienced soldier drives out of the motor pool for a "spin" in a newly repaired SUSV or HUMMV. He must have an experienced driver in the vehicle.

Competent, dedicated mechanics are specialists who have a skill as valuable as any MOS in the unit. Not everyone has the "magic fingers" of a good mechanic, and understands the inner workings of a piece of equipment. Nor does everyone have the manual dexterity to put the pieces back together. Mechanics should be organized so that they can share their abilities with each other during maintenance training classes. A schedule can be established which gives ample preparation time for a mechanic to present a detailed class on one particular aspect of maintenance such as winterization on one type of vehicle.

Individual and unit cold weather indoctrination and refresher training is a key aspect to building a competent cold-weather battalion. U.S. Army publications such as FM 31-70 (Basic Cold Weather Manual) as well as unit SOPs provide guidance on the subjects to be covered. Nevertheless, commanders must ensure that the materiel is presented by knowledgeable and experienced instructors. These are not classes to be assigned for presentation by the new arrival just in from a post in the southern United



States. The instructor needs to have first-hand experience in the proper use of clothing and equipment during extreme cold. Furthermore, he must have the capability to communicate with his audience. There should be special emphasis on ensuring that young leaders understand how to employ cold-weather gear, so that they can supervise their subordinates. Too often, newly arrived leaders believe that survival in the Arctic is a matter of discipline - that if you are physically tough, you can beat the cold without the proper clothing. Beating the cold is a matter of discipline, the kind that demands you make proper use of mittens, arctic boots, layered clothing and a 10-man tent with stove. The kind of misguided discipline that you do not want in a junior leader is that which requires exposure to the elements without protective measures. Hands and feet freeze and drop off at the same rate among exposed soldiers regardless of how often they've been told they're tough.

Yet there is a balance to be struck between operational requirements and individual protection. The development of this balance is achieved during crew drill and battery level training. It is then that the leaders establish how individual protection from the cold will be intertwined with battery operations. Standard procedures are developed, for instance, which require that the battery is laid and ready and crew served weapons are emplaced before tents and stoves go up. The basic requirements for the occupation of a firing position do not change because of weather. The cold cannot be an excuse for batteries which are not ready to carry out their mission. The 1941 field manual, FM 31-15 (Operations in Snow and Extreme Cold), recognized that, "It is a serious mistake to assume that tactical doctrines vary with the thermometer. The doctrines that have won battles at 40° above zero will win them at 40° below."<sup>10</sup>

### Equipment

Basically, artillery operations in the far north do not require a great deal of expensive, unique equipment. The emphasis should be on light, simple items that protect the soldier and accomplish the mission in a low intensity conflict.

Experimental clothing is continually tested in extreme cold at the Army's cold weather test center at Ft. Greely, Alaska. Unfortunately, the newest items of Gortex and lightweight equipment are extremely slow in coming to the soldier. He still sleeps in a feather sleeping bag that gets cold at about -10° F, and wears an unsatisfactory outer garment made of cotton, loosely referred to as a "parka." Civilians who routinely participate in cold-weather and mountain expeditions chuckle and groan at the sight of some of the Army's antiquated clothing. However, some items such as the Artic VB boot almost defy improvement. Generally, though, it is time for the Army to procure and issue cold-weather clothing comparable to what is currently available to civilians "off the shelf."

A classic example of the critical importance of appropriate equipment in cold weather warfare was the battle between Finland and the Soviet Union in November 1939, along the Soviet-Finnish border, where one of the coldest winters on record had begun. The Finns were prepared for combat in snow and subzero temperatures; the Soviets were not. The Finnish soldiers enjoyed the simple comfort of 20-man Artic tents heated by a simple wood-burning stove, while the Russians could only huddle around campfires or dig holes in the snow for shelter. Thousands of Soviets froze to death that winter, and by the end of the winter frostbite cases exceeded a quarter of a million including more than 14,000 amputations.<sup>11</sup>

A comparison of the venerable M101A1 howitzer, currently in Alaska, with the L119 British Light Gun shows that the L119 offers significant advantages. The test crews at Ft. Greely found that because of the one-man direct fire sight, the L119 was far superior to the M101A1 in direct fire. The Basic Issue Items for the L119 include a ski package which enables it to move easily in very deep snow. Additionally, the L119 is more suitable for airmobile operations because it weighs 1,000 lbs. less than the M101A1. However, L119 recoil seals did not function well below -30° F, and it was necessary during test firing at -50° F to heat the nitrogen bottle with a battery blanket to release oil pressure.<sup>12</sup>

Medium and heavy artillery has little place in the Arctic because of obvious limitations in mobility and ammunition handling. Furthermore, the tactical scenario which envisions battalion and company task force operations does not demand heavier artillery. Likewise, the initial version of TACFIRE, which includes a sizable compliment of trailers and auxiliary equipment, would not fare well in the snowy mountains and tundra of Alaska.

The Battery Computer System (BCS) has proven to be a valuable instrument in the Fire Directions Center. Both accuracy and mission time have improved significantly with the BCS. However, as in other artillery units, it is essential that a back-up system be maintained. To date, both the hand-held calculator and manual gunnery systems have worked satisfactorily. Although, the old familiar "charts and darts" are being moth-balled for the more desired calculators.

More than any piece of equipment in Alaska, the SUSV has boosted the capability of both the infantry and the artillery. Life in the field without the SUSV has become nearly unthinkable. Commanders have come to

cherish the over-snow capability the SUSV offers as a prime mover. The SUSV carries a full howitzer section of seven men, their personal gear, compliment of ammunition, and a 10-man tent, as well as towing the howitzer. It can be sling loaded, fully packed at 13,989 lbs. for air-mobile operations by CH 54 or CH 47. By adding a tent extension and upgrading the electrical system to 100 amps, it becomes the fire direction center for the Battery Computer System. At a curb weight of 9,790 lbs. and a maximum towing load of 5,513 lbs, it has also demonstrated its capability as a wire laying vehicle, ambulance, Fire Support vehicle and ammunition carrier.

Recently fielded in Alaska, the Q36 Firefinder Radar has also proven to be well suited for Artic operations. The Q36 is a considerable improvement over the Q4 Radar in overall capability and has handled extreme weather conditions very well. The most important factors in the continued success of the Firefinder is the steady influx of school trained operators, and an aggressive warrant officer who will take the radar to the field for both countermortar operations with the infantry, and gunnery training with the artillery battalion.

#### Summary

Field artillery operations in the Artic are both unique and standard. They must take into account severe cold and difficult terrain, but not at the expense of fundamental tactical principles and basic gunnery skills. Time and effect standards for the delivery of fire remain the same. The challenge to the field artilleryman operating in the far north is to adapt basic, time-proven principles to northern operations.

Warfare in the Arctic demands the type of strong leadership described in FM 100-5, "The highest caliber of leadership is required to assure that all necessary tasks are performed, that security is maintained, and that troops and equipment are protected from the physical effects of extremely low temperatures."<sup>13</sup> Each supervisor from section chief to commander must be capable of operating without the benefit of an ever-present chain of command.

The field artillery can expect to fight in the mountains and tundra of the north as part of a battalion or company-sized combined arms task force. Although the artillery battalion must always train to mass its fires, it must likewise train to support widely dispersed task force operations. Battery commanders should be nearly as close in their relationship to their supported maneuver commander as they are to their artillery commander.

The physical condition of troops operating in extreme cold is paramount to the success of the unit. Artillerymen must have the strength to handle ammunition in deep snow, and the endurance to stay with the battle. Physical training cannot be allowed to deteriorate into only indoor sports activities during winter. The war, when it comes, will not be inside a gym.

Maintenance training and operations must focus on doing those things which keep vehicles operational during the worst weather. Special attention must be given to winterization procedures, and driving skills on snow and ice. Subzero temperatures place heavy demands on men and equipment.

Individual clothing and equipment takes on life and death dimensions for the Arctic soldier. He must be provided with simple, proven items which are light, but give him the protection needed to face combat in the most

severe cold. A compromise on quality may be more costly than any defeat by the enemy.

The Artic artilleryman is a proud, capable gunner who knows his weapon and the frontier which he guards. He respects the tremendous power of the Greatland but is confident in his ability to meet the challenges of weather and terrain to deliver accurate, timely fire in support of the infantry.

## ENDNOTES

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