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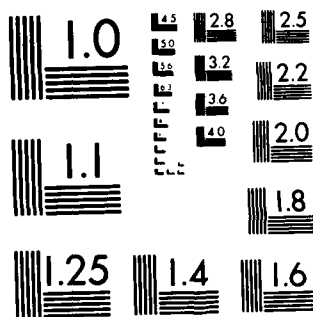
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This report outlines the strategic importance of North Norway to the outcome of any future NATO/Warsaw Pact war on the basis of its location adjacent to the western Soviet heartland, the major Soviet bases on the Kola Peninsula, and the Norwegian Sea. The report presents a scenario for a Soviet amphibious and land force attack upon the region, the object of which would be the control of the main air and naval bases in the region; and it discusses five missions that U.S. A-10 aircraft could perform to support the defense of North Norway. It concludes by recommending that (1) Alaska-based A-10 aircraft be selected to perform these missions because of unique similarities between the environments of North Norway and Alaska and (2) the present training of Alaska-based A-10 pilots be modified to prepare them for these missions. (See also N-2497-AF.)

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R-3439-AF

A-10 Operations and the Battle for North Norway

James G. Terry

January 1988

A Project AIR FORCE report
prepared for the
United States Air Force

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PREFACE

This report examines the potential roles for Alaskan-based A-10 aircraft in the defense of North Norway in the face of a determined attack by the Soviet Union. The development and analysis of models that would allow the quantitative examination of force employment in North Norway are beyond the scope of this work. It is offered with two audiences in mind. The first consists of the commanders and planners of the Alaskan Air Command at Elmendorf Air Force Base near Anchorage, Alaska; the 343rd Tactical Fighter Wing located at Eielson Air Force Base near Fairbanks, Alaska; NATO's Allied Forces North (AFNORTH) Command located in Norway; and the Air Staff, located at the Pentagon. The second audience consists of the pilots of the A-10 aircraft and the forward air controllers stationed at Eielson Air Force Base who will be given the task to "deliver the goods" if the recommendations in this work are adopted.

The author of this work is a Lieutenant Colonel in the U.S. Air Force who was stationed at Eielson Air Force Base and flew A-10 aircraft as an Instructor Pilot and Squadron Operations Officer for three years beginning during the summer of 1982. During the fall of 1984, he was Deputy Commander of a 343rd Tactical Fighter Wing deployment of 12 A-10 aircraft to Andoya Flystasjon, a Royal Norwegian Air Force base located on the northern tip of Vesteralen, an archipelago that lies to the west of Troms in North Norway.

This study documents research performed in the fall and winter of 1985-1986 while the author was assigned as a RAND Research Fellow in Project AIR FORCE at The RAND Corporation. A companion document by the author, *Factors Affecting the Military Environment of North Norway: Its History, International Relations, Physical Characteristics, and Balance of Military Forces*, N-2497-AF, is being published simultaneously. An earlier version of this work appeared in the Proceedings of The Air University Aerospace Power Symposium, "Air Support of The Close-in Battle," held on 9 and 10 March 1987 at Maxwell AFB, Alabama. The work was performed under the project entitled "Concept Development and Project Formulation."

To promote wide distribution of this material and to encourage discussion of the subject matter, the author performed all of the research and writing for this document at the unclassified level. The material was submitted for publication in June 1986.

SUMMARY

North Norway is strategically important, not because of its natural resources (although off-shore oil exploration may soon add natural wealth to the equation), but because of its location. If war began in Europe, North Norway would play a key role because (1) it lies under the strategic approaches to the western Soviet Union from the eastern United States, (2) it lies close to the main Soviet Northern Fleet ballistic missile submarine base and operating areas on the Kola Peninsula and in the Barents Sea, and (3) it dominates the Norwegian Sea, Soviet control of which would threaten the North Atlantic sea lines of communication between the United States and Europe.

To be completely successful, the Soviet Union must win a conventional war in Central Europe before the European NATO Allies either decide to use nuclear weapons or are able to mount a successful conventional defense with the aid of reinforcements from the United States. Soviet doctrine emphasizes the development of forces that possess the firepower and mobility to accomplish a quick victory there. The Soviets have also hedged against the possibility that they will not achieve a quick conventional victory. This has led to the following Soviet strategies in the North:

- Project a naval defense line across the Greenland-Iceland-United Kingdom Gap.
- Preserve ballistic missile submarine sanctuaries in the Barents Sea.
- Erect a forward strategic air defense over North Norway.
- Interdict the North Atlantic sea lines of communication between Europe and the United States.
- In peacetime, achieve and maintain these capabilities to create doubts in Europe about U.S. capability to aid the defense of NATO.

The NATO Allies have responded with their own strategies in the North:

- Mount a credible territorial defense of North Norway with Norwegian national forces.
- Project a forward naval defense line to the North Cape.
- Reinforce North Norway with Allied air and ground units.
- In peacetime, achieve and maintain these capabilities to deter precipitate Soviet action.

The Allies' strategy of establishing a forward naval defense is intertwined with their other two wartime strategies. An effective defense of North Norway in the face of an uncontested Soviet possession of the Norwegian Sea seems problematic, and the ability of the Allies to push the Soviet Navy back beyond the North Cape is questionable if the Soviets seize and use the airfields in North Norway. Likewise, the ability of the West to push reinforcements across a Soviet-controlled Norwegian Sea does not appear promising.

The fate of North Norway is closely tied to the fate of the Norwegian Sea. Each will play an important role in any battle for control of the other. North Norway can be likened to an unsinkable aircraft carrier that dominates the region; victory in the North will depend in large part upon who controls that aircraft carrier.

The assumed **scenario for a Soviet attack** upon North Norway consists of joint air, sea, and land assaults that will probably be organized into four distinct yet almost simultaneous phases:

- Spetsnaz, airborne, heliborne, and tactical air attacks against key radar warning sites, command and control centers, coastal fortifications, and internal lines of communication.
- Combined amphibious and overland assaults into Finnmark from the Pechenga region of the Kola Peninsula to secure the North Cape region and to blind Allied surveillance of Northern Fleet operations.
- Major amphibious assaults into Troms to secure the North Norway air and naval bases.
- Major overland assaults across Finland along the Finnish Wedge from the Kandalaksha region into Troms to create a pincer with the amphibious forces.

The Norwegian Armed Forces are patently defensive in nature. They train and are equipped for missions that are designed to create a credible anti-invasion deterrent, yet not pose a military threat to the Soviet forces on the Kola Peninsula. The Norwegian Army is lightly armed and relies heavily upon reserves to fill out its combat strength. The Norwegian Navy is equipped almost exclusively with vessels designed to operate among the many islands and fjords against amphibious invaders. The preponderance of the Norwegian Air Force's tactical assets, its F-16 units, prepare for the air defense of Norwegian airspace and the engagement of sea-borne invasion forces in coordination with the Norwegian Navy. **To amplify its desire not to antagonize the Soviets, the Norwegian government has also placed prohibitions upon the stationing of foreign troops on Norwegian soil, and it has restricted the types of Allied weapons and maneuvers it will allow in Norway.**

Because the interdiction and close air support missions have been left to Allied air reinforcements, the question of how A-10 aircraft would operate in North Norway arises. Analysis of the nature of the Soviet threat to this region indicates that there are five missions that the A-10 could effectively perform there. Those missions are:

- Amphibious Landing Defense.
- Close Air Support.
- Armed Reconnaissance.
- Fortification Defense.
- Amphibious Landing Support.

The climate, topography, and solar lighting conditions of Alaska closely resemble Norwegian conditions. In addition, a U.S. Air Force A-10 equipped tactical fighter wing is currently stationed in the heart of Interior Alaska at Eielson Air Force Base, near Fairbanks. **This Alaskan unit should be given the mission of supporting the defense of North Norway in the event of a Soviet attack.**

As this A-10 unit prepares for its role in the defense of North Norway, its leaders should consider several issues that directly relate to combat operations in that region.

- Pre- and post-hostilities deployment issues (timing, routes, destinations).
- Base security issues (aircraft shelters, camouflage, personnel security).
- Flying operations issues (manning, personal flying equipment, weather, munitions, forward air controller support).
- Roles and missions issues (anti-invasion mission definition, free fire zone coordination, rules of engagement, contingencies).

The A-10 training that is now being conducted by the Eielson Air Force Base wing should be modified to ensure that the unit is fully prepared to operate in North Norway. This additional training should include:

- Ground training to prepare for the engagement of amphibious ships and specialized vehicles found in the region.
- Tactics review and special training sorties dedicated to the non-close air support missions identified above.
- Exchange visits between the Alaskan A-10 unit and Norwegian, Canadian, U.K., and U.S. Marine units to discuss close air support, anti-invasion defense, fortification defense, and invasion support missions.
- A-10 unit deployments to train directly with the supported ground units in the field, particularly deployments to North Norway.

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The author also wishes to thank Benjamin Lambeth, Felix Kozaczka, and Leslie Harrington (from RAND) and Major Thomas Beil (a former Alaskan A-10 pilot now at HQ AFOTEC/CN) for their help reviewing and editing the final draft.

Special thanks to Blanche Quinlan, whose administrative skills and organizational insights are second to none.

NOTES ON PLACE NAMES

The languages of Scandinavia contain three more letters than the 26 letters in the English alphabet. Within this work, Scandinavian names that do not contain those letters appear as they would in their native languages. Names that contain those three letters—å, æ (ä in Finnish and Swedish) and ø (sometimes written as ö)—are written in this work as follows:

Scandinavian Spelling	English Transliteration
Andøya	Andoya
Bjørnøya	Bjornoya
Bodø	Bodo
Län	Lan
Ørland	Orland
Sodankylä	Sodankylae
Tromsø	Tromso
Værness	Vaerness
Vesterålen	Vesteralen

Russian place names and more common Scandinavian place names (such as Copenhagen) are written in their common English forms. Names of Norwegian fjords have been put into English form. (Varangerfjorden becomes Varanger Fjord, etc.)

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I. INTRODUCTION

No doubt it is true that if war comes it will not be won in the Northern Region. But my belief is and my advice is it could equally be lost there.

General Sir Anthony Farrar-Hockley,
Former Commander-in-Chief,
Allied Forces Northern Europe¹

North Norway is strategically a very important place, not because of vast mineral wealth, rich agricultural production, or concentrations of industrial power, but because of its *location*. This harsh land lies beneath the great circle route between the heartlands of the eastern United States and the western Soviet Union, it is part of the littorals of two very important seas, and it is located next to a very powerful Soviet military complex.

In the event of an East-West war, it is very likely North Norway would be invaded by the Soviet Union. The NATO Allies must prevent this from happening by possessing sufficient strength in the region to deter hostile Soviet action and to defeat such action if that deterrence fails. This report recommends the use of Alaska-based A-10 aircraft in the defense of North Norway as one means of strengthening the NATO response to the Soviet threat.

This report first discusses the strategic importance of North Norway and reviews the Soviet and Allied strategies in the region. It then summarizes the balance of military forces that are in the theater and characterizes how the Soviet Union might attempt to seize North Norway and occupy its bases. Five missions are identified in which A-10 aircraft could participate in the defense of that area. The report identifies issues that would affect A-10 operations in North Norway and recommends specific training for an Alaska-based A-10 unit to prepare for operations there.

¹Farrar-Hockley, 1983, p. 11.

II. STRATEGIC IMPORTANCE OF NORTH NORWAY¹

THE SOVIET VIEW

Soviet Objectives

The presumed Soviet long-term objectives in northern Europe are directly related to their overall national objectives. They desire to use their nation's power to influence the actions of other states to the Soviet Union's benefit while deterring any armed attack on themselves. If war comes, they will quickly and vigorously make every effort to win, but they will also make every effort to avoid the nuclear destruction of their own country. A brief examination of a world globe and a short study of Russian geography will reveal the reasons why the Soviets consider Scandinavia, particularly North Norway, to be so important in the pursuit of their objectives. Figure 1 shows the strategic location of this region.

This important region falls directly under the great circle route connecting the western Soviet Union and the eastern United States. Because many U.S. strategic bombers and cruise missiles are likely to approach or pass through this region in the event of a nuclear war, the Soviets are quite naturally interested in this area as a potential defense zone. A forward defense based on and erected over North Norway would improve the survivability of the Soviet homeland.

North Norway also poses a threat to the credibility of Soviet nuclear deterrence because of its close proximity to the military complex on the Kola Peninsula, which contains many missile-equipped nuclear submarines (SSBNs) and has been described as having "the largest concentration of modern military force anywhere in the world."² The Soviets possess several ice-free ports, but the Northern Fleet, based at Severomorsk,³ is the only one of the four major Soviet fleets that is not faced with the transit of narrow straights every time it sorties. To avoid the consequences of having its boats blockaded in other ports and to take advantage of the Kola's strategic position, the Soviet Navy has assigned 75 percent of its submarines to the Northern Fleet.⁴

Upon the introduction of the newer Soviet Submarine Launched Ballistic Missiles (SLBMs) with intercontinental range capabilities, the Northern Fleet became able to redeploy its SSBNs from the Atlantic Ocean to the Barents Sea and the Arctic Ocean, closer to and under the protection of its bases on the Kola. Allied aircraft and ships operating from bases in North Norway could deny those SSBN sanctuaries to the Soviets, and they also threaten the security of the Northern Fleet's home, which is only 110 km (59 nm) from the USSR/Norwegian border.

If war comes to Central Europe, the Soviets plan for a quick victory. However, they must also be prepared for a longer conflict if they are to avoid ultimate defeat.⁵ The Soviets must therefore sever the sea lines of communication (SLOCs) between the United States and its

¹A companion publication to this report reviews the historical, international relations, physical, and military factors that have influenced the nations of northern Europe. See Terry, 1987.

²Holst, 1985b, p. 204.

³Lewis, 1982, p. 52. The formal name of this fleet is the Northern Red Banner Fleet.

⁴"Northcap, NATO's Dangerous Flank," *Defence Update International*, No. 45, 1984, p. 10.

⁵Vigor, 1982, p. 87.

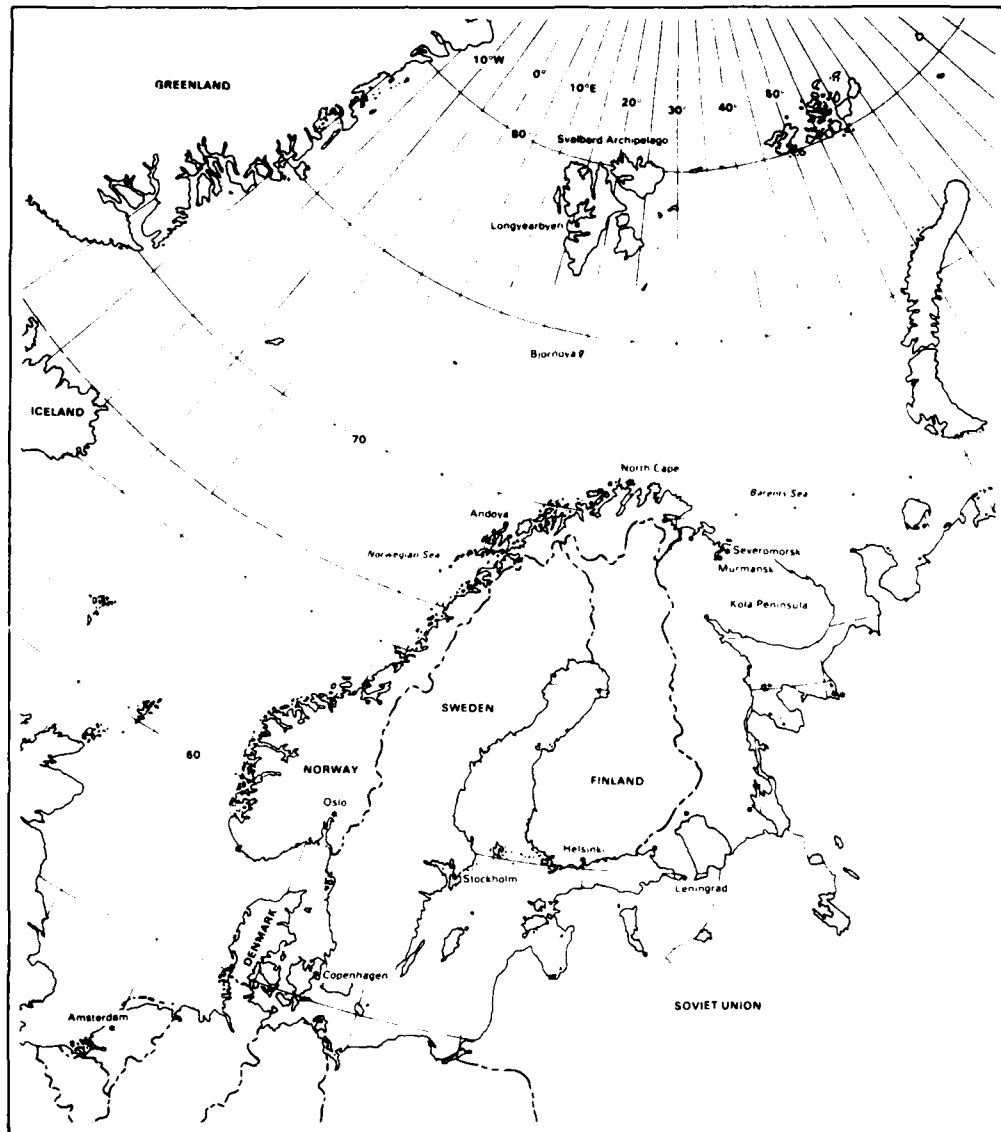


Fig. 1—Strategic location of North Norway

NATO Allies at the outset of any war in Europe. Because 90 percent of the reinforcement and logistics support from the United States will travel by sea, successful Soviet action could be decisive.⁶ NATO units would use the bases in North Norway to intercept the Soviet forces attempting to cut the SLOCs. The Soviets would attempt to capture those same bases for use by Soviet Naval Aviation to support Northern Fleet operations in the region or to attack the Atlantic SLOCs directly from the air.

Despite its proximity to the Soviet Union, Norway has resisted domination by its gigantic neighbor. As part of its contribution to NATO, Norway provides facilities in the North from which intelligence assets monitor and record Soviet radio traffic, telemetry from missile firings, and Northern Fleet submarine and surface exercises and operations.⁷ In addition, Norwegian Air Force P-3B aircraft, based at Andoya on the northern tip of the Vesteralen Islands, provide daily maritime reconnaissance of the Barents Sea. The sole military mission of these aircraft is to prevent Northern Fleet maneuvers from surprising NATO.⁸

Norway and the USSR also compete economically in the North. The Svalbard Archipelago, which lies north of 76° N, has been a continuous source of dispute since Norway was granted sovereignty over it in 1920. Norway's recent extension of its economic zone to 370 km (200 nm), an unresolved dispute with the Soviets over fishing zones, and the promise of offshore oil reserves also focus attention on the economic value of North Norway.

If the Soviets could exert a larger influence upon Norway, they might be able to reduce or eliminate the intelligence gathering and surveillance activities that occur in their backyard, and they could also maneuver for more favorable outcomes of their economic disputes. If the Norwegians were to feel isolated from their NATO Allies, Norway could find itself in a position similar to Finland in its relations with the Soviet Union. The Soviets have not overlooked this possibility and have kept pressure of one kind or another on Norway since the end of World War II.

Soviet Strategy

The Soviets could achieve all of their northern objectives by projecting their naval defense line past the North Cape, through the Norwegian Sea, and astride the Greenland-Iceland-United Kingdom (GIUK) gap. Behind this line the Soviets could erect that strategic defense-in-depth to defend against U.S. strategic bombers and cruise missiles, hide their SSBNs under the ice pack⁹ or in the deep fjords of Norway's west coast,¹⁰ and project their

⁶O'Donnell, 1985, p. 44.

⁷Brenchley, 1982, p. 11.

⁸Sorensen, 1984, p. 62.

⁹The arctic is a particularly good place for submarines to hide because the melting ice creates a salinity differential that causes acoustic refraction, and the ice pack creates a physical barrier and background noise that hamper antisubmarine warfare (ASW) activities. The USSR is the leading operator of submarines under the ice, and they have perfected the "ice pick" technique of resting against the ice and drifting. The new Typhoon class SSBN was probably designed to break through the ice from beneath. Ries, 1984, p. 875.

¹⁰Unidentified submarines, presumably Soviet, have violated Swedish and Norwegian waters numerous times, even after the Soviet Navy was caught red-handed when a Whiskey class boat ran aground in the "Whiskey-on-the-Rocks" incident of 1981. This indicates approval for these operations at the highest level in the Soviet Union. There are many possible reasons for such continued intrusions, including sabotage training or intelligence gathering missions. However, Arkady N. Shevchenko, who is the former aide of Soviet Foreign Minister Gromyko and who defected to the United States in 1978, stated at a news conference in February of 1984 that the Soviets plan to use both Swedish and Norwegian waters as wartime shelter for their submarines, and that these intrusions are designed to survey and chart the Scandinavian coast. Marshall, 1984, p. 8. The deep fjords of the western Norwegian coast are ideal to hide submarines because of their extreme depth, the acoustic layers caused by differential salinity and temperatures, and the complications that arise in performing ASW in an enclosed area. "The Norwegian Navy: Interview with Inspector General," *Navy International*, November 1984, p. 650.

interdiction forces into the North Atlantic to cut the vital Atlantic SLOCs. If their capability to do all this becomes sufficiently credible, the Soviets, without firing a shot, could create doubts in Norway about how that nation should pursue its defense and economic interests.

The Soviets have pursued an armed force build-up in the North that has given them the capability to follow the strategy of forward defense at the GIUK gap. In addition to 40 nuclear missile submarines, over 130 other submarines, 80 major combatant ships (including one aircraft carrier), 120 minor combatant ships, and 100 amphibious and principal auxiliary ships operate from the Kola. Soviet Naval Aviation operates over 300 combat and rotary winged aircraft on the Kola, including 100 fighters and bombers.¹¹

Such a force, supported by ground and other air units also based on or near the Kola Peninsula, places NATO naval units at risk throughout the Norwegian Sea. This force enhances the Soviets' ability to establish defense-in-depth; to protect their population, industrial, and political centers; and to screen their SSBN bases and operating areas. For almost 20 years the Soviet Northern and Baltic Fleets have exercised their capability to establish that line at the GIUK gap. An exercise held in the summer of 1985 involved more than 50 submarines and 100 ships, including the aircraft carrier *Kiev*.¹² Several observers have remarked that the Soviet forces in place on the Kola have already effectively placed Norway behind the front lines.¹³ Allied inability to control those important SLOCs could also have detrimental effects upon the confidence of the other Allies in U.S. ability to reinforce them in a crisis. European doubts could thus create space for the Soviets to drive other wedges between the United States and its NATO Allies.

THE ALLIED VIEW

U.S./NATO Objectives

The U.S. and NATO's long-term objectives in the North are also related directly to their overall national objectives. Because of the nature of western alliances, it would be difficult to list a set of national objectives to which all the NATO members would subscribe without any reservations. Because the situation is more straightforward than in other regions of the world, however, a limited number of general objectives can be compiled to which most NATO signatories would agree. Not surprisingly, this list is the reverse of the Soviet list.

The Allies attempt to maintain sufficient political and economic strength to prevent Soviet peacetime domination and enough military strength to dissuade the Soviets from using armed force to solve disputes. If fighting does break out, the Allies wish also to possess sufficient strength to win the war—or, at the very least, not lose it.¹⁴ Their objectives in the North Norway region must also be viewed within this larger, worldwide context.

To strengthen its own deterrent credibility, the United States must maintain the capability to successfully attack the USSR with all three legs of its nuclear triad. A forward-based Soviet air defense operating from North Norway would threaten the capability of the airborne leg of the triad, and a Soviet ASW capability in the region would threaten the submarine launched cruise missile contribution to it.

¹¹International Institute for Strategic Studies (IISS), 1984, p. 21.

¹²"U.S.-Soviet Collision Course in Seas North of Norway," *Washington Times*, September 16, 1985, p. 2.

¹³Leighton, 1983, p. 117.

¹⁴U.S. military doctrine states that the Armed Forces should possess the capability to "terminate the conflict on terms favorable to the United States." Department of the Army (DA), 1981, p. 4.

Simultaneously, the desire to limit damage during a nuclear exchange means that the United States must conduct effective ASW operations into the Norwegian and Barents Seas, tracking down and destroying Soviet SSBNs before nuclear escalation. Targeting the installations upon the Kola Peninsula would also limit the damage that the Soviet forces based there could inflict upon the United States. These strategic defense capabilities would also further strengthen U.S. deterrence. North Norway air and naval bases are key to these capabilities.

The reinforcement of NATO forces in Central Europe is essential to Allied success if a conventional attack is to be contained without resorting to nuclear weapons. Because such a large amount of material must travel by the Atlantic SLOCs, the United States and NATO must ensure the security of the North Atlantic from the beginning of any conflict. The chances of maintaining the security of the SLOCs will be improved considerably if the Soviet naval forces are denied the Norwegian Sea and contained behind the North Cape-Svalbard line. That line must be anchored in North Norway.

Surprise has always been an important factor in determining the outcome of military operations, and Soviet doctrine has always placed emphasis on surprise and deception. The surveillance facilities operating in North Norway play a key role in preventing either technological or tactical surprise in the area. Even if there were no other important reasons, those facilities are sufficient to make it imperative to the Allies that Norway not feel placed "behind the Soviet lines."

Norwegian Objectives

Norway decided 40 years ago that it would be unable to conduct its affairs without being dominated by the Soviet Union unless it tied itself to the rest of western Europe through NATO. The Norwegians also decided that to maintain regional stability, they should not provoke the Soviets. Since World War II, therefore, Norwegian foreign policy has been characterized by three components—deterrence, reassurance, and insurance—as Norway pursued its goal of maintaining its integrity as a truly independent state.

Norway has relied upon *deterrence* by structuring a defense policy designed to send a clear message to the Soviets that any armed attack would be met by determined resistance from territorial forces, that Allied armed forces would quickly and effectively reinforce Norway and that an attack on North Norway would guarantee a fight with NATO as well. While pursuing the establishment of a credible armed deterrent, Norway has also followed a policy of *reassurance* through confidence building. This policy is designed to demonstrate to the Soviet Union that Norway will not become a threat to its large eastern neighbor and that all Norwegian actions will avoid confrontation in the North. This policy has shaped the structure of the Norwegian armed forces, and it has also led to restrictions on Allied military activities within Norway.¹⁵ Finally, Norway has attempted to maintain the stability of its position

¹⁵These restrictions include the following: (1) No foreign troops may be permanently stationed in Norway. (2) No nuclear or chemical weapons may be stationed in or operated from Norway. (3) No Allied aircraft may operate east of 24° E. (4) No Allied vessels may operate in territorial waters east of 24° E, nor may they enter territorial waters if they have been operating east of 24° E in international waters. (5) No Allied ground maneuvers may take place in Finnmark. (6) All exercises must be small and limited in duration, and they must be announced even if they fall below the thresholds stated in the Helsinki Agreements. The Norwegian government has made it clear that these restrictions could be removed if Norwegian security was threatened. Holst, 1981, p. 23. During September of 1986, Norway refused permission for U.S. F-111 aircraft to land in Norway during a NATO exercise, presumably because those aircraft are nuclear-capable and long range. Gjester and Buchan, 1986, p. 2.

through a policy of *insurance*, which attempts to avoid entanglements in distant conflicts that do not directly affect Norwegian national interests.¹⁶

Allied Strategy

The Allies appear to have settled upon three strategies to obtain their objectives in the Northern Theater: a credible Norwegian territorial defense, rapid and reliable reinforcement by Allied troops, and a forward naval defense designed to bottle up the Soviet Northern Fleet in the Barents Sea and to threaten Soviet bases on the Kola Peninsula.

Norway's defense strategy assumes two important points: (1) Sweden will maintain sufficient armed forces to screen Norway's flank from Soviet attack; and (2) NATO forces, particularly those of Denmark and the Federal Republic of Germany (FRG), will screen Norway's populous South.¹⁷ Because of these assumptions, Norwegian planners have been able to concentrate their defense in North Norway.

Norway has established a small standing army in the North, mainly stationed in the northwestern county of Troms. This force is supported by a large reserve that can be mobilized in the South and quickly deployed, and a Home Guard whose members maintain their weapons at home and who can move into position to secure key locations within hours.¹⁸ Norway's small navy is designed for anti-invasion operations, and its air force combat aircraft are used in air defense or anti-invasion roles. Their forces' equipment, training, and stated doctrine all are selected to present a minimal threat to Soviet interests.¹⁹

In no circumstances could the Norwegians reasonably be considered a match for the Soviet forces in the region. The realistic mission of the Norwegian forces in wartime is not to defeat an attack but to preserve the integrity of their northern bases until Allied help arrives. To accomplish this mission, the Norwegians have created a strong defense complex in Troms, taking advantage of the deep fjords and *rugged mountains* of the area. Norway's defense of Finnmark, the large, open county north of Finnish Lapland and bordering the Soviet Union, will consist of delaying and harassing operations. The main defense will come farther west where the major northern Norwegian bases are located.²⁰

The Allies have designated four ground forces to reinforce North Norway if requested: the Allied Command Europe (ACE) Mobile Force (a multinational command), a United Kingdom Marine Commando Brigade, a U.S. Marine Amphibious Force, and the Canadian Air/Sea Transportable (CAST) Brigade.²¹ However, only the Canadian troops are *exclusively* committed to the defense of Norway. The others would be assigned to Norway by the NATO Supreme Allied Commander in Europe (SACEUR) only after they were released by each national authority and then only if he did not assign them elsewhere.²² Troops from these units exercise regularly in Troms.²³

Norway and the Allies are concerned about getting those reinforcements into position in time. It may take up to 30 days to complete the movement assuming that those forces are not

¹⁶Holst, 1985a, p. 4.

¹⁷Sohlberg, 1980, p. 3.

¹⁸Ingebrigtsen, 1983, pp. 69-70.

¹⁹Holst, 1981a, p. 71. The careful design of Norwegian defense policy to avoid provoking Soviet action seems to have worked. However, past Soviet rhetoric might lead one to believe that the threat to the Soviet Union in the North approaches the level posed by Nazi Germany in 1939.

²⁰Ries, 1984, p. 879.

²¹Various Allied tactical squadrons have also been identified to support the defense of North Norway.

²²Alexander, 1984, pp. 185-186.

delayed by hostile action on the way.²⁴ The Norwegians face the self-imposed dilemma of prohibiting the permanent stationing of foreign troops on Norwegian soil while requiring those same troops to respond quickly in a crisis. A partial solution to this problem was implemented by the prepositioning of heavy equipment, supplies, and munitions in Norway for each Allied unit.²⁵

The third Allied strategy, the establishment of a forward naval defense, is intertwined with the two strategies already discussed; and the success of the other two is highly dependent upon the success of that forward defense. An effective defense of North Norway in the face of an uncontested Soviet possession of the Norwegian Sea seems problematic, and the ability of the Allies to push the Soviet Navy back beyond the North Cape is questionable if the Soviets seize and use northern Norwegian air and naval bases for their own operations. Likewise, the ability of the West to push reinforcements across a Soviet-controlled Norwegian Sea to help defend Norway against an invasion does not appear promising. Strong Allied control of the Norwegian Sea would relieve major pressure on the Atlantic SLOCs, make the successful reinforcement of Norway more credible, and put pressure on the Northern Fleet bases on the Kola, possibly siphoning Soviet resources that might otherwise be used in Central Europe.²⁶

The fate of North Norway is closely tied to the fate of the Norwegian Sea: Each will play an important role in any battle for control of the other. North Norway can be likened to an unsinkable aircraft carrier that can be used by either side to carry the battle to the other.²⁷ The Soviets have spent too much time and effort preparing their forces in the North for them to tolerate the existence of such an aircraft carrier anchored in the perfect spot to counter every one of their actions. Because the Soviets cannot sink it, they must control it. Whoever controls North Norway will win victory in the North.

²⁴Sandli, 1983, p. 72.

²⁵Alexander, 1984, p. 188; Holst, 1982, pp. 32-33.

²⁶Getler, 1982, p. 4.

²⁷N. Orvik, 1972, p. 725.

III. OPPOSING FORCES IN NORTH NORWAY AND ON THE KOLA PENINSULA¹

In contrast to central Europe, which occupies most thinking when an East-West conflict is envisioned, North Norway is a desolate, harsh, isolated place. The unique environment caused by the combination of rugged terrain, high latitudes, and the maritime influence of the Norwegian Sea makes this area particularly difficult for military operations. The great distances involved complicate reinforcement and logistics, while the uncertainties of its variable weather patterns and significant seasonal variations force military planners to make special preparations that are unnecessary in non-arctic theaters of operation.

The whole environment of North Norway favors the power that can quickly establish a preponderance of armed force in the region. The Norwegians cannot establish such a force without reinforcement, so any conflict in the region may become a race between reinforcements as much as a battle between forces. The vast distances that must be overcome during an attack, the vulnerability of the long supply lines that would be required to sustain such an attack, and the dominating position of the bases in Troms make it imperative that the difficult Allied job of holding the area be successful: Regaining North Norway in the face of a strong Soviet occupation would be even more difficult.

SOVIET FORCES

Some have observed that the Soviet ground forces stationed on the Kola Peninsula are not as strong as they might be if it were not for the effects of the so-called Nordic Balance.² Nevertheless, the forces that the Soviets have placed there are still very strong indeed, and they train and are equipped to perform missions that could not be confused with the pure territorial defense of their home bases. Those forces are plainly designed to seize and occupy territory, and that territory is North Norway.³ Table 1 summarizes those forces.

The Soviets gained a lot of experience applying military force in the North during the Winter War (against Finland in 1939-1940) and during World War II. These lessons have been kept alive both to indoctrinate the Soviet people and to motivate and teach new generations of soldiers how to apply their skills in a harsh environment. The Soviets have developed technologies to cope with the arctic conditions faced by their forces, and they have structured their overall force in the North to support their strategy of forward defense.

¹The companion publication provides a detailed examination of Soviet, Allied, and neutral forces that affect the military balance in the North. See Terry, 1987.

²The Nordic Balance is the name given the stable situation in northern Europe since the end of World War II in which the region can be considered a multilayered buffer zone, with Norway, Denmark, Sweden, Finland, and the Soviet Union each showing restraint in its actions. Holst, 1982, p. 12; German, 1982, p. 77.

³German, 1982, p. 77.

Table 1

SUMMARY OF SOVIET FORCES ON OR NEAR THE KOLA PENINSULA
THAT THREATEN NORTH NORWAY

Unit (Location)	Strength
8 Motorized Rifle Divisions (MRDs)	11,931 officers and men (each)
2 Active (Murmansk, Kandalaksha)	285 tanks (each)
6 Reserve (Archangel, 2; Sortavala, 1; Leningrad, 3)	572 APCs (each) ^a
1 Airborne Division (ABD) (Pskov)	6,500 officers and men 31 SPAGs ^b 348 APCs
1 Naval Infantry Brigade (NIB) (Pechenga)	2,035 officers and men 40 tanks 102 APCs supported by 15 amphibious ships
1 <i>Spetsnaz</i> Brigade (attached to the NIB at Pechenga)	1,000 officers and men
Air Defense Aviation (Archangel Air Defense District) ^c	340 aircraft
Naval Aviation (Kola Peninsula)	390 aircraft
Tactical Aviation (Leningrad Military District) ^c	500 aircraft

SOURCE: Terry, 1987.

^aAPC = Armored personnel carrier.^bSPAG = Self-propelled assault gun.^cIncludes the Kola Peninsula.

NORWEGIAN FORCES

By assuming that Sweden will remain a credible military power and that Denmark and the FRG will successfully defend the Baltic approaches, the Norwegians have been able to concentrate their limited resources on the defense of North Norway. The key to Norway's strategy is its ability to mobilize its reserve forces in the South and to move them rapidly north to secure the North Norway bases. Those bases, in turn, will then become key to the reception of the Allied air and land reinforcements. Table 2 summarizes the strength of the Norwegian armed forces. See Fig. 2 for a map of northern Europe.

Because Norway bans the basing of foreign troops on its soil, prepositioning of Allied heavy equipment is the best strategy to provide a credible Allied reinforcement capability. Sealift is too slow and particularly unreliable once hostilities commence, airlift alone cannot handle the large mass of equipment that must be transported, and the overall cost of prepositioning is less than that of buying new aircraft or faster ships.⁴ However, as with other types of deterrence, not only must the reinforcing units be manned and ready to move quickly, but political resolve must also be present. The Soviet Union must be reasonably sure that reinforcements will be requested early enough and will be sent soon enough to make a difference. See Fig. 3 for major Norwegian bases.

⁴Alexander, 1984, p. 187.

Table 2
SUMMARY OF NORWEGIAN FORCES

Service	Strength
Army ^a	41,500 (active) 235,000 (reserve) 90,000 (Home Guard) 170 tanks 31 light aircraft
Air Force	107 fighters (F-16s and F-5s) 51 transports and helicopters
Navy	14 submarines 7 surface combatants 38 fast patrol boats 12 minelayers, minesweepers, and minehunters

SOURCE: Terry, 1987.

^a30,000 Norwegian troops could be in position in North Norway within one week of mobilization.

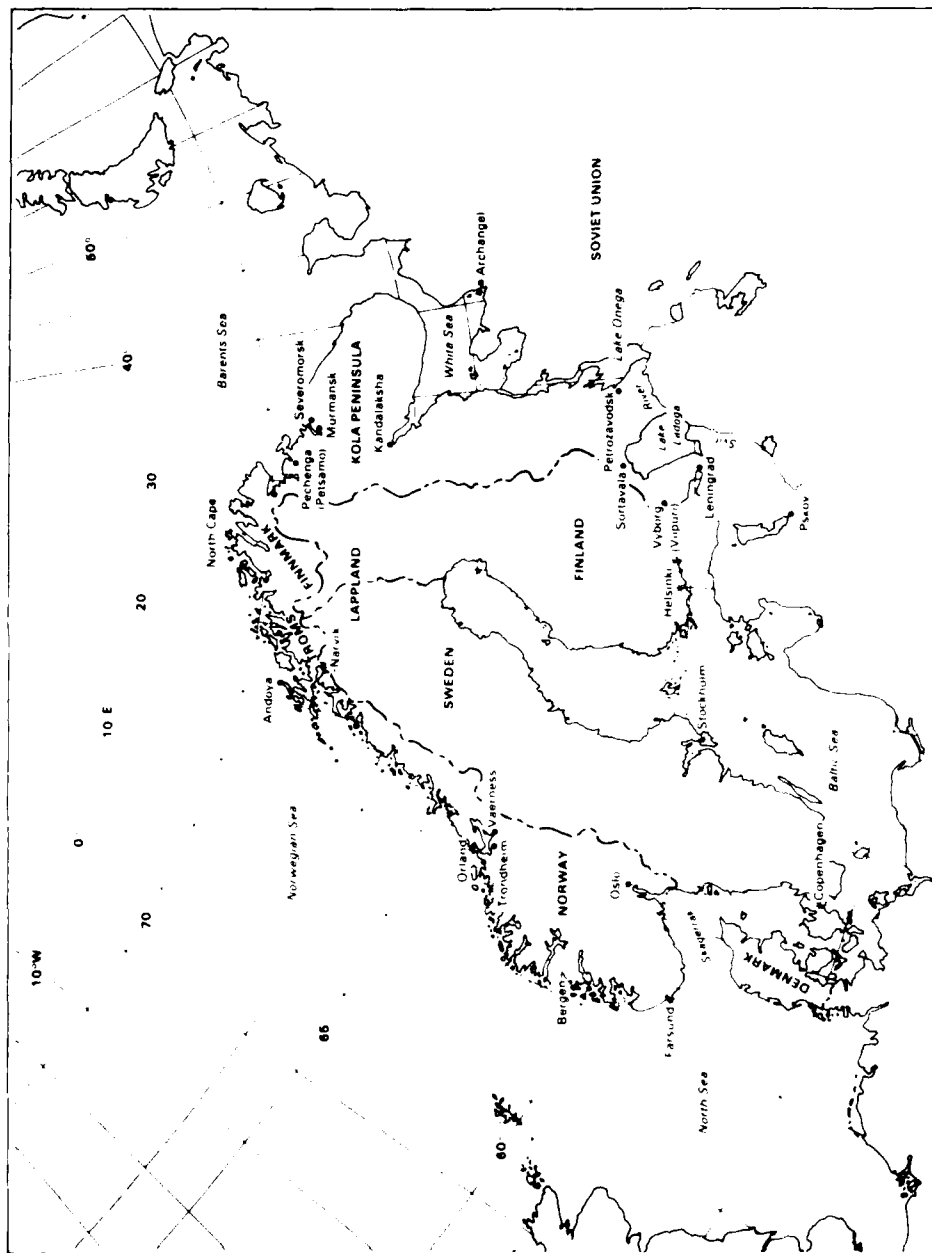


Fig. 2—Northern Europe

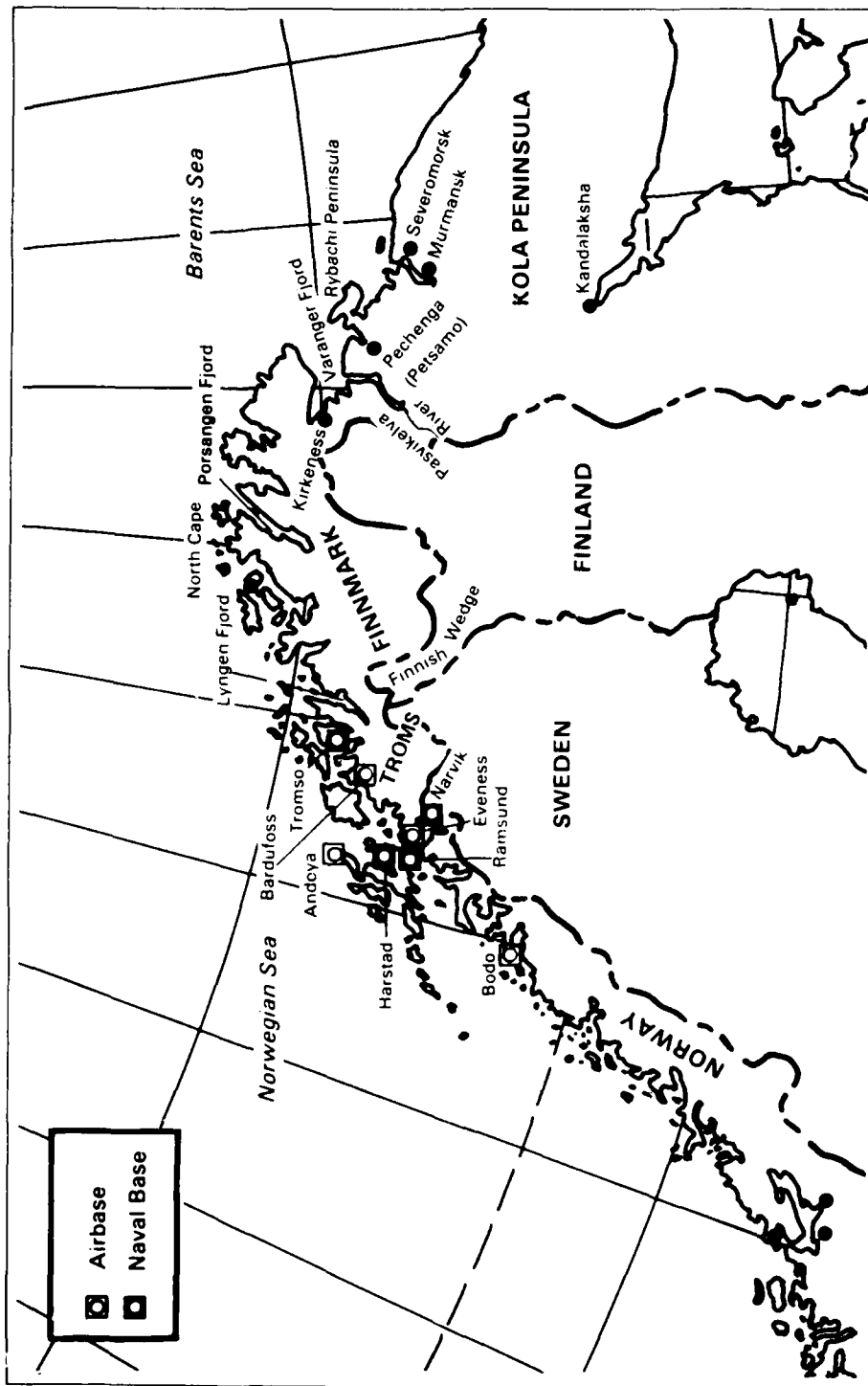


Fig. 3—Major North Norway air and naval bases

IV. THE BATTLE FOR NORTH NORWAY¹

SURPRISE, SHOCK, AND PREEMPTION

Classic Soviet doctrine calls for victory by engineering the political and military collapse of an opponent.² The lessons they learned from the Germans during World War II confirmed certain valuable precepts that the Soviets still apply today. *Blitzkrieg* demonstrated the advantage that shock effect could provide to the attacker, and Germany's 1940 invasion of Denmark and Norway confirmed the value of preemption. The Soviets' own experiences immediately following the start of *Barbarossa* painfully taught them about strategic surprise. Their unexpected and massive invasion of Czechoslovakia in 1968 demonstrated their adoption of these principles.

The Soviets have much to gain from strategic surprise in the North, because that conflict may be decided simply by who can get the dominant force into the area first. Some writers have declared that the Soviet leaders would prefer to start from a peacetime configuration (an "out-of-the-blue" attack), because surprise would allow the attacking forces to move more rapidly; to encounter less resistance; and consequently to require less ammunition, fuel, and other supplies to reach their objectives.³ Such an attack could be launched under the guise of one of the many amphibious exercises that have become routine in the area, or it could be totally unanticipated: Preparations for a major Soviet naval exercise in March of 1984 were undetected.⁴ Other writers believe that the Norwegians have also learned important lessons from World War II and that their defense establishment would be able to mobilize and transport sufficient forces to counter such a surprise attack, particularly because the long distances over which the Soviet forces must travel to occupy Troms would allow ample opportunity for tactical warning.⁵

The chance that the Soviet Union would attack North Norway without also attacking in the central region seems remote, and most observers agree that significant strategic warning would be provided before that major conflict begins. However, the general nature of a Soviet attack on North Norway will not be determined to any great extent by the availability of strategic warning. Although any warning time that becomes available almost certainly will be used to mobilize and deploy forces—and the relative strengths of those forces may be decisive—the geography of the area gives few options on how to achieve the major objective of such an attack.

¹Military forces operating in the North face conditions not found in any other theater of operation. Terry, 1987, discusses the physical environment of North Norway and its effect on military operations today and during World War II.

²Donnelly, 1980, p. 35.

³Vigor, 1982, p. 87.

⁴Ingraham, 1984, p. 70.

⁵Berg, 1980, p. 50.

SCENARIO: THE SOVIET ATTACK⁶

Any attack on North Norway by the Soviet Union would be a joint air, sea, and land assault. Air attacks on the regional air defense system would be initiated with the objective of blinding the warning system and grounding the Norwegian F-16 and F-5 fleets. Airborne or heliborne troops from the *Spetsnaz* brigade at Pechenga and the 76th Guards ABD at Pskov would attack radar warning sites and key coastal fortifications to pave the way for the amphibious forces that would follow. Other *Spetsnaz* teams, either combat swimmers or parachute troops, would occupy key locations along the roads leading to the amphibious landing sites and overland invasion routes to block mobile defense forces from reaching their positions. Farther south, in central and southern Norway, naval bombardments, airstrikes, and *Spetsnaz* raids would be used to cut the single North-South road and to destroy sealift and airlift assets and infrastructures to delay or prevent the movement of mobilizing forces.

The 63d NIB from Pechenga would spearhead several small landings along the north coast of Finnmark, Norway's isolated northeastern county, followed by units of the Murmansk 45th MRD. These landings would support the overland thrust of other 45th units across the Pasvikelva River into Finnmark.⁷ The objectives of this force would be to neutralize Norway's sea surveillance and air defense radar sites, to obtain space to expand the Soviet air defense perimeter to the west, and to establish secure supply lines toward Troms. See Fig. 4 for a scenario of the attack.

One or two larger amphibious landings would be mounted by the 63d NIB into the Troms region, again in advance of 45th MRD units. These landings would not be made across a wide front. Rather, they would be designed to drive quickly inland to link up with the *Spetsnaz* and airborne units previously inserted, then drive toward the major strong points of the region. A naval covering force would stand off the coast in open water, providing naval aviation close air and helicopter transport support. Other naval forces would push into the Norwegian Sea toward the GIUK gap, preventing NATO naval forces from disrupting the operation.

Simultaneously, the 341st MRD would head west from Kandalaksha, across Finnish Lapland, and into the Finnish Wedge, the narrow strip of Finland that lies between Finnmark and northern Sweden. Some units would probably be detached from the major northwestern thrust to turn north into Finnmark and pressure Norwegian strong points from the south, but the bulk of the force would attempt to force the defenses at the base of the Lyngen Fjord, then turn southwest toward Bardufoss. Airborne or heliborne troops would be tasked to secure the flanks of this route ahead of the main line of advance.

The Soviets will keep Finnish forces out of the fight by not directly threatening the heartland of Finland and by making it clear that any attempts to disrupt the Soviet advance would result in the massive use of force against southern Finland. Smaller Soviet units will be deployed to block any Finnish movement north and to secure the supply lines against sabotage or guerrilla activities. At this point there would be no need for the Soviets to enter Swedish territory.

Direct assaults upon the airfields by parachute troops will probably depend upon the Soviets' assessment of the Norwegians' preparation. If the Soviets expect an unalerted defense, then a direct paradrop is likely. Fully manned and ready antiaircraft guns and

⁶This scenario is discussed frequently with only minor variations in several references. Ries, 1984, p. 878; Berg, 1980, p. 50; Meyers, 1979, p. 33; Erickson, 1976, p. 80; Farrar-Hockley, 1982, p. 10; Whitely, 1982, p. 143; Jockel, 1980, p. 23; Seaton, 1981, p. 112.

⁷At one point along the border, the Pasvikelva River flows wholly inside Soviet territory. At this spot a dam has been constructed that happens to be wide enough to drive tanks across. Brenchley, 1982, p. 2; Russell, 1984, p. 62.

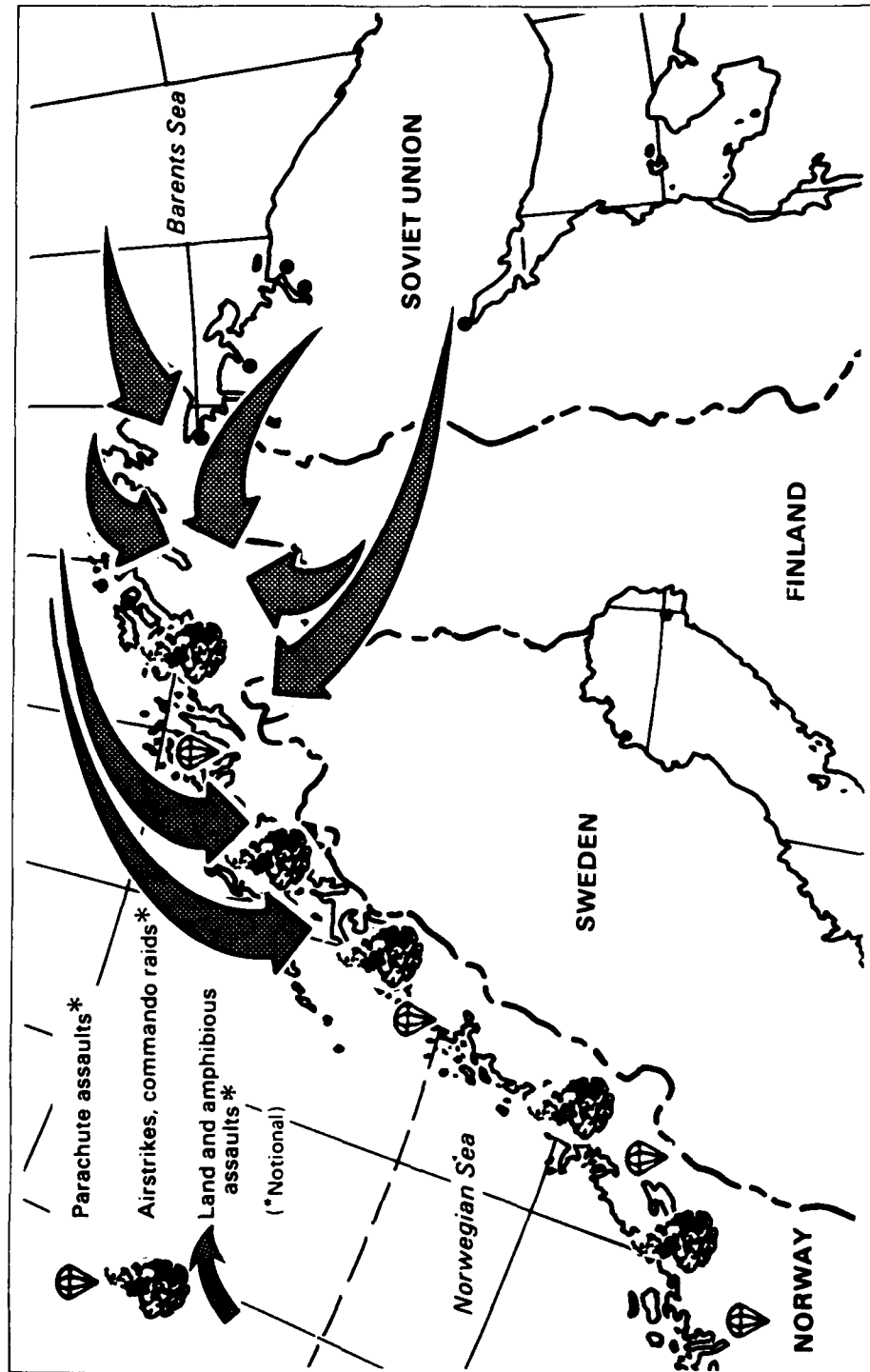


Fig. 4—Scenario: the Soviet attack

missiles could make short work of transport aircraft, however, so in the case of an alerted defense, the airborne forces could be dropped in position nearby, marching overland to their objectives. Such lightly armed units may not be able to capture the North Norway airfields, but they could neutralize them by fire and support the main Soviet attack coming from the fjords or the Wedge.

V. THE ROLE OF A-10 AIRCRAFT IN NORTH NORWAY

Before the Allies select *any* force to aid in the defense of North Norway, they must first consider how that force would fit into the unique political,¹ physical, and military environment of the region. This analysis must consider the effects of such a force on the balance in the region both in peacetime and after hostilities begin. An effective force that could be represented as purely defensive by the Norwegians would have the added benefit of fitting easily into their deterrence-reassurance-insurance defense policy. One of the U.S. Air Force A-10 units, most of which are dedicated almost exclusively to the close air support (CAS) mission in other theaters of operation,² would be a valuable addition to NATO defenses in the North. These aircraft are patently defensive—although they are agile, they lack the speed to become any credible threat to the Kola bases—yet they are equipped with an internally mounted 30 mm gun that would be effective against any Soviet force that threatened North Norway.

There are several missions in addition to CAS in which A-10 aircraft could contribute significantly in North Norway. However, any A-10 unit expected to operate successfully in that theater would require special training to prepare itself to cope with the severe environmental conditions that are present there and to deal with the nontraditional missions that would be required. Unfortunately, there are not many places in the world with environments similar to North Norway.

An examination of Alaska, however, reveals that its environment is more similar to North Norway than any other region in the United States. The year-round operations of an A-10 unit in Alaska's interior would expose its maintenance personnel and pilots to most of the conditions found in the European North: long periods of winter darkness, severe temperature conditions, rugged mountains, expansive forests with limited cultural features, wide expanses of marshy tundra, and continuous summer light. In addition, nearby South central and South east Alaska offer subarctic maritime conditions that are similar to the conditions along the Norwegian Current-dominated coast of Scandinavia.

Since 1982, a U.S. Air Force Tactical Fighter Wing equipped with A-10 aircraft has been stationed in Interior Alaska at Eielson Air Force Base, about 41 km (22 nm) southeast of Fairbanks. Because of the similarities between the physical environments of Scandinavia and Alaska (and after the A-10 pilots completed supplemental training to prepare for the non-CAS missions listed below), this unit would be ideally suited to take on the role of defending North Norway. That role would include the following missions.

MISSION 1: AMPHIBIOUS LANDING DEFENSE

The coastline of North Norway is made up of hundreds of islands, and the mainland is sliced deeply with long, narrow fjords. A landing force placed upon the outer islands or on the tips of the mainland peninsulas formed by the fjords could be easily blocked before it could threaten

¹The companion report discusses the state of international relations in the North. See Terry, 1987.

²CAS requires close coordination between the attacking aircraft and the ground force commander because of the proximity of the aircraft's targets to friendly force positions. Without direct communications, the aircraft may place friendly forces at risk when they deliver their ordnance, or the CAS aircraft may be placed at risk because of other friendly fires being directed into the same area.

the heart of the defense area of Troms. Consequently, the ships of an invading force must sail deeply into the fjords to land their troops closer to their objectives.

It is unlikely that larger combatant ships would closely escort those amphibious ships, because the closed waters of the fjords and sounds would greatly hamper their ability to maneuver if attacked. Instead, those combatants would provide air support and long-range naval gunfire from open waters, and the amphibious ships would be required to go it alone.³ As those ships maneuver near landing beaches or stop to transfer their loads to smaller assault craft, they would be most vulnerable to A-10 attacks.

A-10s could first attack the defensive systems of each amphibious ship with long-range 30 mm cannon fire. After they have silenced the ships' antiaircraft guns and Surface-to-Air Missile (SAM) launchers, they could destroy their cargo. The amphibious ships could probably not be sunk by cannon fire, but the tanks and APCs that are located on deck, the ramp and crane mechanisms that transfer them to the smaller craft, and the assault craft themselves are all excellent targets. The engineering spaces of these ships would also be vulnerable to 30 mm cannon fire. If the invasion forces move onto shore, A-10s could engage them under conventional CAS conditions.

The mountainous nature of North Norway would provide ideal cover for attacking aircraft. The terrain surrounding the narrow Norwegian fjords would degrade an effective SAM defense from either the covering force standing off shore or the self-protection batteries on the amphibious ships. The attacking A-10s could also use the terrain to mask their approach or to disguise coordinated attacks to confuse the ship's antiaircraft gunners. The A-10 aircraft's use of the topography in and around the fjords would be similar to the way A-10s operate in mountainous terrain against land forces.

Soviet fighters might threaten the CAS aircraft that are attacking the invasion forces. However, A-10s will be operating at low altitudes over very rough terrain, well beyond the capability of any Kola-based radars to find them. Those threatening Soviet fighters will be operating at extended ranges from their own bases, and they could be engaged by Allied air defense fighters who will be operating closer to home and under a better radar environment. In addition, because of the roughness of the terrain, well masked A-10s would be difficult targets for those Soviet fighters to acquire and engage even if they employed their new generation fighters with look-down shoot-down capabilities.

MISSION 2: CLOSE AIR SUPPORT

As elements of a Soviet MRD approach the Finnmark-Troms border, they will naturally funnel into the valleys of the region. As they come into contact with the Allied defensive units they will be forced to redeploy from travel formations into attack formations, detaching units to clear the flanks along the mountain ridges while massing to break through in the center. This natural funneling effect will give the advantage to a strong, dug-in defense force, which will be able to use artillery and airpower to engage the invaders. This is the classic CAS scenario, and the A-10s must closely coordinate with the ground commander to ensure an effective operation.

At this point in the overall battle, no front (in the classic Central European sense) will exist. The enemy formations will resemble widely separated fingers, each unable to provide antiaircraft support to parallel forces because of the large distances and steep terrain that will

³These ships are not totally defenseless. Each carries varying numbers of antiaircraft guns and missiles. See Terry, 1987.

intervene between them. Therefore, aircraft will be able to attack each invading column all along its length with less opposition than would be present in a similar situation in the German theater. The SAM and AAA defenses of the MRD units will also be predictably located close to the few roads leading into the area, and the attacking A-10s will have many more opportunities to vary their tactics as they engage the enemy.

The rough mountainous terrain of eastern Troms will provide the supporting A-10 aircraft the same advantage against Soviet fighters and surface-based antiaircraft systems that are present in the Amphibious Landing Defense mission discussed above.

MISSION 3: ARMED RECONNAISSANCE

As the lead elements of the Soviet MRDs are engaged by Allied ground forces along the east edge of Troms, follow-on elements will be moving up from the east across Finnmark and the Finnish Wedge. These forces will be attempting to move quickly to the battle areas in Troms, so they will be generally found along the few roads in the region.

The opposing ground forces in Troms will probably meet only at a few narrow spots, and more CAS sorties may be produced than could be productively employed by the Allied ground forces. In such a case, the additional sorties generated by the A-10 unit may be ordered east of the Troms defense line to conduct armed reconnaissance missions against the follow-on forces: They will search on their own for enemy forces and engage them if they are found.

Unlike the first two scenarios, this mission will put the A-10s at a disadvantage for three reasons. First, the topography of Finnmark is less rugged than that of Troms; and the ability of the aircraft to use terrain features to hide from enemy gunners or fighters or to help with navigation will be limited. Second, the enemy's antiaircraft missile and gun systems will have more opportunity to set up in advantageous, permanent locations, covering the movement of the follow-on forces more effectively than if they were moving along with them. Third, enemy fighters will be closer to their home bases and the A-10s will be farther from theirs. This translates into more enemy fighter opposition over an area less favorable for staying hidden.

A-10s are not normally expected to work deeply "behind the lines." Because of the nature of North Norway, however, a continuous front across the region from the sea to the Swedish border is unlikely. Therefore, there will be many gaps through which the aircraft could safely pass when proceeding on an armed reconnaissance mission. Because of the increased enemy fighter threat, however, closer coordination with friendly air defense fighters will be required.

The Allied ground forces will be greatly aided if the Soviet supply and reinforcement lines can be cut. Because of the smaller numbers of ground units involved than in the Central region, even a few armed reconnaissance sorties could provide high payoffs.

MISSION 4: FORTIFICATION DEFENSE

During the initial portion of any attempted invasion of North Norway, the Soviets can be expected to attempt to eliminate the forts that are located along the approaches to strategically important coastal areas. Rather than employing combatant ships in counterbattery gunfights in narrow fjords, the Soviets are more likely to use *Spetsnaz* teams that will land on or near the forts and engage them with commando style assaults.

A-10s could respond quickly to aid the fort defenders in such an eventuality, particularly if they were standing airborne or ground alert. High explosive incendiary cannon fire from the aircraft could be particularly effective against the soft-skinned helicopters, boats, and personnel that would make up the *Spetsnaz* teams. If a raiding party was to fight its way onto a fort itself, the A-10's cannon could still be used, because the Norwegian artillerymen would be protected inside the reinforced structure.

This is another potentially high payoff mission in North Norway. If the A-10s can help defend coastal forts, those forts would be available to attack Soviet amphibious forces before they arrive in position to land their troops. The leverage created by a few forts successfully engaging amphibious ships would be felt immediately as smaller numbers of invading troops actually reach shore and are forced to attack in the face of less-than-favorable force ratios.

MISSION 5: AMPHIBIOUS LANDING SUPPORT

After hostilities begin in North Norway, Allied amphibious landings may be conducted, either to land reinforcements directly into the battle or to shift forces already in the theater to outflank or cut off Soviet forces. Such landings might also be accomplished to regain North Norway if the initial Soviet invasion succeeds.

A-10 aircraft supporting a friendly amphibious landing could be used to suppress shore defenses, to engage opposing naval craft within the closed coastal waters, and to delay mobile Soviet reserves moving to counter the landing. Once the friendly force was ashore, the A-10s could then be used in the classic CAS role, working closely with the newly established ground commander to aid his advance. The A-10 aircraft would not attack from the open sea; rather, they would use terrain masking techniques to attack enemy forces just as they would in the other missions listed here.

VI. NORTH NORWAY A-10 OPERATIONAL ISSUES

Any A-10 unit that is committed to North Norway must address certain operational issues before it can formulate firm plans to support that theater. A deploying A-10 unit will not be able to resolve all these issues, but they should all be identified and considered at the outset, so that the commanders in the theater can assess the effects of those issues and take the necessary actions.

DEPLOYMENT

Norway must resolve a real dilemma if it is ever faced with the decision of how to respond to serious Soviet provocations against it. Until Norway or one of its neighbors is actually invaded, in which case there would be no question of Norwegian actions provoking the Soviets, it must be able to take actions that will show resolve without raising real (or imagined) Soviet fears. The timing of this decision is also critical. If Norway hesitates, it may be overtaken by events: if Norway acts prematurely, it risks causing the undesirable events it is trying to avoid.

A request for the early deployment of an A-10 squadron to Norway could be viewed as less provocative than a request for faster, longer-range aircraft because the A-10s, which are agile but relatively slow, could not be reasonably considered a threat to Soviet interests on the Kola Peninsula. If Alaskan A-10s are tasked to respond to such a request, they must be prepared to depart on deployment sorties within 24 hours of being notified, and they must follow a direct, over-the-pole flight plan. This route is more risky than the more conservative two-day route that would cross Canada and the North Atlantic because there are no emergency airfields along the way. This routing will also require more aerial tanker sorties because the supporting tankers would also be operating farther from suitable bases. However, the risks and extra costs involved in such routing would be worthwhile if Soviet actions against North Norway were forestalled by an early, nonprovocative show of resolve.

If hostilities have begun, however, the polar route must be reconsidered. The Soviet settlements on the Svalbard Archipelago may be converted to military bases at the outset of a war—the Soviets on the islands outnumber the Norwegians by two to one—and the A-10s, in the company of their refueling aerial tankers, would have to pass dangerously close to the islands' western shores.¹ Also, the approach into Troms itself would be from almost directly north, within range of Kola-based interceptors and over waters frequented by the Northern Fleet. Unless a strong fighter escort could be provided for the last portion of the flight, a more secure, more southerly route may be indicated.

Depending upon the status of the reception bases in North Norway, the A-10s may not even be ordered there initially; instead, they may proceed to bases in central Norway in the vicinity of Trondheim. If the situation in Norway becomes particularly difficult, the A-10s may fly directly to bases in the northern U.K. From these more southern bases they could reconfigure and fly combat missions enroute to their first landings in North Norway.

¹Hegge, 1979, p. 72.

SECURITY

A detailed examination of the security problems at North Norway airfields is beyond the scope of this report, and most of those problems must be addressed by Norwegian and NATO authorities, not deploying units. However, a brief discussion of these issues is appropriate because of their potential effect on any A-10 operations conducted there.

For the aircraft to be effective, they must first survive any threats upon their own bases. This means that aircraft, munitions, fuel, and repair facilities must be sheltered or camouflaged so that they survive attack, and the active air defenses around the base must be effective. Procedures to allow friendly aircraft to come and go without being fired upon must be put in place, and the security of the pilots, maintenance, and support personnel must be assured.²

Shortages of billeting spaces within a secured perimeter may require personnel to sleep and eat in the civilian communities that surround the bases. Deploying units must weigh the potential for commando attacks upon those people, and they must consider the advisability of providing small arms to them for self-protection. The potential for terrorist attacks must also be evaluated during normal peacetime exercises when individuals' awareness of such threats may be reduced.

FLYING OPERATIONS

Manning

Because of the continuous winter nights and summer days in the region, slack times when no operations are planned will be rare. In addition, the smaller number of forces engaged in North Norway will mean that one unit may be required to cover the whole day and will not be able to alternate its operations with another similar unit on a 12-hour shift basis. Any unit deploying to North Norway must therefore review the planning factors that were applied to determine its manning level in each specialty to ensure that the unit can successfully conduct 24-hour operations.

Personal Flying Equipment

When A-10 pilots fly over winter arctic areas, they wear special protective clothing and equipment that is designed to aid in their survival if they must eject from their aircraft and spend an extended period facing the severe climate on the ground. During operations over North Norway in the winter, however, they will be faced with two serious survival problems that cannot be solved simultaneously with the same protective clothing: cold water immersion survival and winter arctic land survival.

The U.S. Air Force does not have an antiexposure (waterproof) suit that provides the cold weather protection required for land survival; and the heavy, layered clothing that is best for land survival will not keep a survivor dry in freezing water. Present equipment is also difficult to don and doff, so that during alert conditions, it must be worn continually. A quick-donning, comfortable, effective antiexposure suit must be acquired that will protect a downed pilot in any part of North Norway in any season.

²The old fighter pilot maxim that "a kill is a kill" would ring especially true if a *Spetsnaz* team were to take out a billet full of pilots.

Weather

The weather in North Norway, particularly during the winter, will have detrimental effects on A-10 operations just as it will on other air and ground operations throughout the theater. If they are selected to go to this region, however, pilots from Alaska will be well prepared for the severe conditions. Their home base experiences of operating from ice and snow covered runways and taxiways will allow them to adapt more quickly. Those pilots will also be familiar with the visual illusions caused by snow and ice and by low sun angles, they will have more practice flying at night and during civil twilight conditions,³ and they will be familiar with changes in their aircraft performance caused by the colder conditions.

Weather patterns may prevent all flying operations in North Norway for several days at a time. The grounded Allied aircraft must be ready to react quickly when clearing conditions arrive so that the enemy ground forces, which may also be slowed or stopped by the same weather, can be engaged from the air before they have time to dig out. The same ice, snow, and arctic temperatures will tend to slow flightline maintenance activities. However, Alaskan seasoned maintenance and support personnel will have developed the techniques to cope with such adverse climatic conditions. They will be able to prepare the aircraft more efficiently than their warm-weather counterparts and enable flight operations to resume more quickly.

Munitions

The A-10 is certified to carry a wide variety of weapons. However, the internal GAU-8 30 mm cannon can provide sufficient firepower to kill all types of combat vehicles that the Soviets field in the Leningrad Military District.⁴ This extremely reliable weapon provides A-10 pilots with a wide measure of tactical flexibility because it can be employed with great accuracy from varied airspeeds, flight path angles, and ranges. A-10 survivability is also improved because exposure to the guns and missiles of the enemy will be reduced; the aircraft will not have to fly over their targets to deliver free-fall ordnance. Because of the differences in vulnerabilities of the weapons fielded by the Soviet forces in the North, each GAU-8 cannon should be loaded with a mix of high explosive incendiary and armor piercing incendiary rounds. This will ensure that each A-10 in the region will be able to accomplish every mission without requiring a reloading of its ammunition.

A decision to arm the A-10s in North Norway only with 30 mm cannon ammunition will result in a simpler logistics support structure, smaller munitions stockpiles, and shorter turn-around times between sorties. Radar jamming pods, chaff bundles, and decoy flares will also be carried for self-protection from radar and heat-seeking threats. Operations conducted at night will require artificial illumination to be most effective. Ground markers placed by friendly forces, illumination flares from other aircraft, or self-illumination parachute flares carried by the A-10s themselves can provide that necessary illumination.

³Civil twilight is defined as the period of time that the sun's zenith distance is less than 96°. United States Naval Observatory, 1984, p. 257. The companion report discusses solar conditions in North Norway in detail. See Terry, 1987.

⁴Petry, 1982, p. 440.

Forward Air Controllers

NATO does not have procedures to allow aircraft to engage targets close to friendly troops safely without effective communication and close coordination with the ground commander. In the German theater, a structure of Air Liaison Officers (ALOs) is overlaid across the ground force structure, so that someone with the proper training and experience to understand CAS operations can relay instructions to the aircraft. The Norwegian Air Force does not perform the CAS mission (concentrating instead on air defense and anti-invasion missions), Norwegian ground forces do not practice the procedures and techniques required to conduct CAS, nor are any ALOs in place in the region.

In addition to the A-10s, Forward Air Controllers (FACs) are assigned to the Tactical Fighter Wing at Eielson AFB. Their sole mission is to provide the coordination and communication needed to conduct CAS operations successfully. These FACs, who are also pilots, fly light observation aircraft and take part in field exercises with army units. The A-10 pilots and the FACs assigned to Eielson AFB spend much of their training time developing the very CAS capability that the Norwegian theater lacks.

To quickly provide the ability in North Norway to conduct safe, effective CAS sorties, Eielson FACs should deploy along with the Eielson A-10 unit. They should bring their own field equipment and radios so that they can join Norwegian and other Allied ground units and immediately begin controlling the same A-10s that they train with throughout the year in Alaska. To facilitate communications, the Eielson units should designate prominent landmarks throughout the region as contact points so that during operations, those points could be quickly encoded and passed between the FAC and the A-10 pilots.

If trained FACs are not available, the CAS aircraft could still provide some support if communications with the ground forces could be established directly. This implies that the coastal fortifications and the Norwegian and Allied ground units should be equipped with A-10-compatible radios. During operations, the frequencies and call-signs of these forts and units, along with compatible authentication tables, must be provided to the aircraft.

ROLES AND MISSIONS

Anti-Invasion Mission

To take part effectively in the defense against amphibious landings, the A-10s that arrive in the theater must be integrated into the overall anti-invasion strategy of the Norwegian Navy and Air Force. Without detailed planning and coordination with the Norwegians, any A-10s that tried to take part could actually become a hindrance. The Norwegians must be made aware of the A-10's abilities in this role, and the Americans must understand the capabilities and employment tactics of the Norwegian submarines, fast patrol boats, and F-16s that will be in the area.

Free-fire Zones

The CAS aircraft that are assigned the armed reconnaissance mission must be given specific locations and times to search to prevent conflicts with other friendly aircraft doing the same mission. These areas must be designated as free-fire zones. To prevent any hesitation or miscalculation, the aircraft must be confident that no civilian or friendly military traffic is in

the area. The Norwegian authorities should have an information program in place to educate the civilian population about the dangers of being on the roads in such situations.

Rules of Engagement and Contingencies

Political constraints will probably exist at the beginning of the conflict in North Norway, particularly concerning national borders, buffer zones, and sanctuaries. The forces that are taking part in those northern operations must be prepared to quickly request the removal or relaxation of such constraints if military necessity dictates, and the commanders and political leaders of the region must be prepared to respond immediately to such requests. The units involved should review the planned Rules of Engagement so that violations of those rules can be avoided and changes can be requested if necessary.

The units designated to support North Norway must not limit their study to Troms and Finnmark. The Soviets could risk crossing Sweden, threatening Narvik or even Trondheim in Central Norway. The FACs must have the ability to move quickly into the region south of Narvik, and the A-10 pilots must have the proper maps and have spent time studying the terrain to be effective. The units deploying into North Norway must also be prepared to withdraw under less-than-ideal conditions to bases farther south in Norway or in the U.K.

VII. TRAINING RECOMMENDATIONS

LOCATION

As long as Norway maintains its ban on the permanent basing of foreign forces on its territory—and there is no reason to believe it would discard a keystone to a policy that it believes has contributed to over 40 years of stability in northern Europe—Allied reinforcing units will continue to prepare to fight in North Norway after visiting there for only short training periods. Clearly, training in the same region that a unit expects to operate in is invaluable, but if that training is limited, the best alternative is to train in conditions that are the most similar to the actual physical environment. Because Alaska resembles North Norway in so many ways, it is the best region to prepare for Norwegian operations outside of Norway itself.¹

The area surrounding Eielson AFB, near Fairbanks in Interior Alaska, includes many topographical features that are similar to those found in North Norway. The Tanana Flats between the Tanana River and the Alaska Range (just west of Eielson AFB), the Minto Flats north of Nenana (93 km, 50 nm, west of the base), and the Yukon Flats between Circle and Fort Yukon (222 km, 120 nm, northeast of the base) are all reminiscent of the areas of tundra and taiga forest in Finnmark. The Salcha, Chena, Shaw, Birch, and other drainage systems that lie northeast, east, and southeast of the base consist of hundreds of square miles of rough terrain similar to that between northeastern Finnmark and the fjords along the transition between Finnmark and Troms. The Alaska Range, which is visible to the south of Eielson AFB, consists of many uplifted, rugged peaks, interspersed with numerous glaciers and ice fields. These mountains are remarkably similar to the extremely rough mountains that surround the fjords in Troms, and, except for the fact that there is no water in the bottoms of the valleys, some areas of the Alaska Range could pass for Norwegian fjords.

Although Eielson AFB lies 185 km (100 nm) south of the Arctic Circle, its lighting and weather conditions closely resemble those of arctic North Norway. Continuous daylight/twilight occurs for almost two months during the summer, and, during the shortest day in winter, the sun is above the horizon for less than four hours.² Long periods of extreme winter temperatures occur in Interior Alaska, too, just as they do in the inland regions of North Norway.

Pilots require continual practice to fly safe, tactically effective missions in mountainous terrain and arctic climatic conditions. The skills and judgment essential for coordinated two-ship tactical teamwork, individual mountain flying, and coping with arctic visual illusions cannot be developed through study alone. Likewise, maintenance and support personnel must also practice techniques for coping with severe temperatures. The skills that the A-10 wing at Eielson AFB develops in the course of the routine generation and flying of A-10 sorties are exactly the skills that an A-10 unit would need to operate effectively in North Norway.

No other A-10 unit in the world operates in an environment so similar to North Norway. The Eielson AFB wing should be given the mission to support the defense of North Norway. To prepare for operations there, that wing should continue its normal training, supplementing

¹The companion Note discusses the physical environment of North Norway in detail. See Terry, 1987.

²The shortest day at Eielson AFB (December 21st) has solar illumination similar to a mid-November day at Bardufoss, Troms.

it with programs that will develop and improve the unique skills that are required for that region. The remainder of this section lists recommended additions to current training to achieve that goal.

GROUND TRAINING

The A-10s in North Norway will encounter environmental conditions, weapons systems, and force compositions that no other A-10s in the world will face. The pilots in Alaska should therefore spend time on the ground studying equipment characteristics, capabilities, and tactics that the forces on both sides in the North will be using.

The pilots should study the ships of the Soviet Northern Fleet—they must know the ships' capabilities and be able to recognize them quickly. They should examine the amphibious ships, particularly, so they can find weaknesses in the ships' antiaircraft defenses and determine their vulnerabilities to 30 mm cannon fire. It is not necessary for the A-10s to sink the amphibious ships to be successful; they need only prevent the off-loading of the invasion force.

Because the A-10 pilots may be flying a portion of their sorties as armed reconnaissance missions without FAC control, they must be skilled at finding and recognizing enemy vehicles in the field. This is particularly important because of the many different Allied forces that will be brought into the region, each with its own nation's equipment. In addition, special snow vehicles are used in the North that are not found in other theaters. To lessen the risk that they attack friendly forces, the Alaskan pilots must study the recognition features and capabilities of all these vehicles.

A wide variety of antiaircraft systems, friendly, enemy, and neutral, are fielded in the North. The A-10 pilots must know the characteristics of each of these systems, some of which are not fielded anywhere else, so that they can design proper tactics to counter them.

FLYING TRAINING

Parts of Interior Alaska appear identical to parts of North Norway, particularly in the mountains. Many valleys and ridges lie under the flying training areas, and the experience the pilots receive flying daily missions among them directly relates to the flying among the fjords and mountains of Norway. The flying training program at Eielson AFB, which concentrates on CAS, must be expanded, however, to prepare for all the missions that will be required in Scandinavia.

Armed reconnaissance training must commence, concentrating upon target acquisition, recognition, and destruction while flying "behind the lines." The tactics of this important mission are designed to keep the A-10 aircraft hidden from enemy fighter and antiaircraft threats while finding and destroying enemy vehicles and must be refined; and the teamwork required from the A-10 flight members must be practiced to ensure that weapons are brought to bear quickly while avoiding needless threat exposure. This training can be conducted among the valleys in the Eielson AFB area, but it should also be conducted in the flat areas that are common in the vicinity to simulate the terrain of Finnmark and the Finnish Wedge. U.S. Army units stationed in Alaska could simulate Soviet units during joint exercises, which would give the A-10s experience against live, maneuvering targets. Also, F-15s and T-33s stationed at Elmendorf AFB, near Anchorage, could simulate Soviet air threats during this training.

A-10s from Eielson AFB should also make frequent flights to South central and South east Alaska to give the pilots experience flying in a maritime environment. Low level flying among the islands and canals (Alaskan "fjords") near the Kodiak Coast Guard Station, south of Anchorage, and the Sitka Coast Guard Station, west of Juneau, would be invaluable. Exercises should be arranged with U.S. and Canadian Navy ships and Coast Guard cutters, which could simulate amphibious ships approaching invasion beaches.

EXCHANGE VISITS

Norwegian Army and coastal fort personnel should be invited to Alaska to observe and practice CAS and fortification defense procedures with flights of A-10s. Training scenarios should be developed to simulate situations expected in Norway so that the tactics the aircraft would use could be demonstrated to the visitors to increase their confidence in air support and to give them practice controlling the aircraft themselves. Key members of the Canadian, U.K., and USMC ground forces that are planning to support Norway should also go to Alaska to receive the same indoctrination and training in A-10 operations.

Members of the Eielson AFB wing should also visit the home bases of these same units to lecture on A-10 tactics and to learn the differences in their operations from normal U.S. Army procedures. Specialized tactics, such as those used by the USMC during amphibious landings, could be discussed, and the A-10 representatives could develop better ways to support the Allied forces in North Norway.

DEPLOYMENTS

Detachments of A-10s from Alaska should deploy to locations in Canada and the "Lower 48" to participate in large-scale training exercises with the Canadian and USMC units that will be involved in the defense of North Norway. Such deployments would polish the procedures and techniques discussed during individual exchange visits between those units and the A-10 unit in Alaska, and the development of joint operations and tactics could be explored. Without a doubt, however, the most valuable training for the pilots in Alaska will occur during periodic deployments to Norway, when the tactics and techniques that are developed earlier can be practiced over the ground that would be involved during combat operations.

Each Norwegian deployment should be scheduled to coincide with ground force exercises to add to the realism and value of the training received. Training would be further enhanced if these deployments could be scheduled to coincide with the deployment of other NATO fighter units. The pilots should fly several navigation training flights into Finnmark and eastern Troms to become familiar with the terrain, and they should practice their armed reconnaissance tactics over the same region. They should also fly at least one sortie along the Swedish border between Trondheim and Narvik to become familiar with that area.

The Alaskan FACs should also deploy during this training. Once in the country, they should join the ground forces and practice CAS with the deployed A-10s. While attached to the Norwegian (or Allied) ground units, the FACs should give key members of each unit practice directing the A-10s over the radio.

The A-10s should practice locating and contacting the coastal forts, and they should also practice providing support to those forts during simulated commando raids. Some sorties should be dedicated to operations with Norwegian F-16s and FPBs, practicing coordinated

anti-invasion tactics. As appropriate, some sorties may also be dedicated to operations with other deployed NATO units. At the end of each sortie, the A-10s could provide training for the Norwegian airfield defense batteries by simulating attacks upon the airfields, and during each approach for landing, they can practice the procedures for safely approaching the airfield without being attacked by friendly antiaircraft fire.

VIII. CONCLUSIONS

There can be little doubt that North Norway is a strategically important region of the world. The outcome of any battle for the Norwegian Sea may depend upon the battle for North Norway, and the results of that battle may turn on NATO's ability to maintain control of the important bases in Troms.

NATO forces faced with a Soviet attack into North Norway could be supported effectively by A-10 aircraft trained and tasked to perform the five missions discussed here. Effective predeployment training coupled with close coordination and cooperation between the supporting A-10 unit and the supported Allied ground units would strengthen the defense of the region. Yet these actions would pose a lower risk of political problems for Norway with either the Soviet Union or the other Nordic states when compared with potential deployments of other tactical air units.

A credible A-10 commitment to Norway also requires that the tasked A-10 unit be able to respond quickly to a Norwegian call for help and begin effective combat operations immediately upon arrival in theater. The Soviet threat may not allow a deploying unit the luxury of learning to operate in the arctic, mountainous environment of North Norway. The learning curve of a unit not currently trained in mountain or severe weather operations could be very costly.

The A-10 wing stationed at Eielson AFB is an ideal choice to assume the mission to help defend that vital region: Alaskan topography closely resembles that of North Norway, and, as the weather and lighting conditions in Troms and Finmark change from summer to winter, those changes occur simultaneously in Interior Alaska. Clearly, the A-10 wing from Alaska would be the best prepared to cope with the environment of North Norway.

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