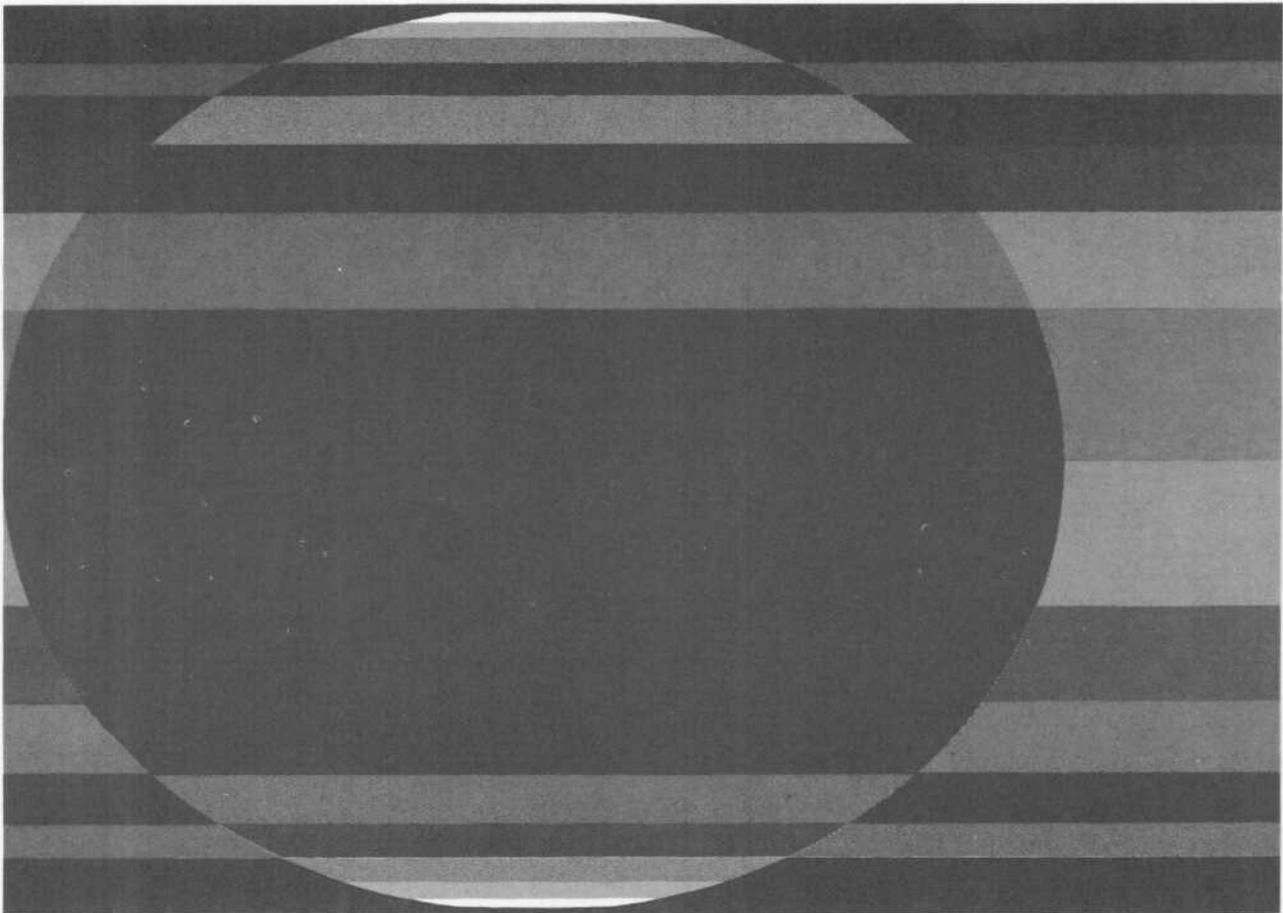


BACKGROUND PAPER

# Strengthening NATO: Pomcus and other Approaches

February 1979



STRENGTHENING NATO:  
**POMCUS** AND OTHER APPROACHES

The Congress of the United States  
Congressional Budget Office



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PREFACE

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**As** the Congress debates the First Concurrent Resolution on the Budget for Fiscal Year 1980, the President's commitment to increase defense spending by 3 percent per year will be one of the most important **issues**. This commitment **reflects** an agreement by the NATO countries to strengthen the alliance.

As part of that agreement, the United **States has** pledged to increase the amount of U.S. equipment pre-positioned in Europe, in order to accelerate the arrival of U.S. reinforcements in the event of *a* Warsaw Pact attack. Such a step has significant political and long-term budgetary **implications**. In response to a request from the Senate Budget Committee, this paper examines the current military balance in Europe, describes the **proposed pre-positioning** program and two other **ways** in which NATO's conventional defenses could be **strengthened**, and estimates the **long-term costs** of pre-positioning more equipment in Europe.

This paper was prepared by Pat Hillier of the National Security and International Affairs Division of the Congressional Budget Office, under the supervision of David S.C. Chu. The author gratefully acknowledges the preliminary work of Robert **Kleinbaum** and the contribution of Edward Swoboda of CBO's Budget Analysis Division, who prepared the cost estimates. Helpful comments on earlier drafts were provided by Ted Parker of the Rand Corporation, and by Damian **Kulash**, Andrew Hamilton, Dov Zakheim, John **Hamre**, and Nancy Swope of the CBO staff. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with the Congressional Budget Office.) Marion F. **Houstoun** edited the **manuscript**; Connie Leonard prepared the paper for publication.

Alice M. **Rivlin**  
Director

February 1979



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SUMMARY

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NATO has two strategic disadvantages **vis-a-vis** the Warsaw Pact. First, the Pact would have a head start on mobilization because of the defensive nature of the alliance. Second, NATO would not be able to match the Pact's buildup because one-third of its reinforcements during the first four months after mobilization would come from the United **States**.

As the Pact has improved its capability to exploit these advantages, the United States has responded by improving its **reinforcement** capability. In particular, a program known as POMCUS (pre-positioned materiel configured to unit sets) was developed to reduce U.S. response time to a Pact attack. POMCUS **pre-positions** the equipment for **U.S.-based** divisions (and support units) in the U.S. sectors of NATO's Central Region. 1/ This reduces NATO's strategic deployment problem because only the personnel of POMCUS units need to be transported to Europe in time of war. A "2+10" POMCUS **package--pre-positioned** equipment for one armored and one mechanized division plus 10 support **units--was** first used in response to the 1961 Berlin crisis. This program was expanded in 1968, when the U.S. **balance-of-payments** problem led to the return of two-thirds of the First Infantry Division from Germany to the United States.

CURRENT NATO VULNERABILITIES: THE PACT/NATO FORCE RATIO AND NORTHAG

During the last decade, however, NATO has not kept pace with the Warsaw Pact's modernization and expansion of its forces.

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1/ NATO's Central Region includes the countries of West Germany, the Netherlands, **Luxembourg**, Belgium, and France. This region, which would be the focal point of a Pact/NATO war, is divided into two **zones**: NORTHAG (Northern Army Group) and **CENTAG** (Central Army **Group**). U.S. forces are responsible for defending two corps sectors in CENTAG. West German forces defend the other two CENTAG sectors and one sector in NORTHAG. Belgian, British, and Dutch forces each defend one corps sector in NORTHAG.

Not only are Warsaw Pact forces superior to NATO's in many areas, but they are also large enough and positioned in such a way as to capitalize on their basic advantages. Hence it is possible that the Pact forces could attack, after only two weeks of mobilization, with an overall force ratio as great as 1.8:1 over NATO. That ratio would permit a 7.4:1 ratio at the point of main attack, while maintaining a 1:1 ratio in other sectors of the Central Region. That situation could present the NATO defenders with **severe** problems.

If the Warsaw Pact were to direct the main attack through the north German part of NATO's Central Region (**NORTHAG**), which provides a more favorable terrain to the attacker as well as a direct route to NATO's supply lines, it would encounter the weakest part of NATO's defense. West German, British, Dutch, and Belgian forces defend that critical region, and coordinating the efforts of such a multinational force would be difficult. Moreover, those forces are not as modern, as **mechanized**, or as heavily armed as the Warsaw Pact forces that they are likely to face. Non-U.S. NATO forces must increase their firepower by **13 percent--in** terms of a standard firepower **score--to** make their manpower as productive as the Warsaw Pact's manpower. Additionally, forces in NORTHAG are scarce, and it would be difficult to form a mobile reserve that could be used to counter Warsaw Pact **penetrations**. This would make it difficult to maintain the integrity of the defense.

#### POMCUS AND OTHER PLANS TO STRENGTHEN NATO

To strengthen NATO, each NATO ally has pledged to increase defense spending by 3 percent a year and to make certain force **improvements**, as specified in NATO's 1978 Long-Term Defense Program (LTDP). Such efforts are certain to be beneficial, but published accounts of the LTDP are too vague to allow an estimate of its effect on the overall balance of forces. The one commitment that is specific enough to be evaluated is the U.S. plan to pre-position three additional division sets of equipment in NORTHAG. This plan, announced in the Department of Defense (DoD) budget request for fiscal year 1979, calls for one POMCUS set to be in place by the end of 1980 and the last two by 1982. The Congress has approved the funding for the first set, and Germany has located the necessary storage sites. NATO is currently surveying sites for the remaining two sets, and the Administration is expected to request funding for them in either the fiscal year 1981 or 1982 budget request.

COST AND EFFECTS OF THE DoD POMCUS PLAN

The DoD plan could cost \$2.6 billion for investment and operations during fiscal years 1980-1984. Although only limited funds are included in the fiscal year 1980 budget, if the Congress were to wait until submission of the fiscal year 1981 budget to debate the program, its ability to influence the direction of the program could be severely limited. In addition, this plan represents a key element in U.S. efforts to strengthen NATO. Hence, this effort, and the associated pledge to achieve 3 percent real growth in the U.S. defense budget, are central to the fiscal year 1980 debate on national security **expenditures.**

The combination of pre-positioning the first division set of POMCUS equipment and the **U.S.** strategic airlift improvements planned for the next **several** years would reduce the overall force ratio from 1.8:1 to 1.5:1 after 14 days of Warsaw Pact mobilization, a major improvement. With the addition of the two remaining division sets of POMCUS equipment, the Pact/NATO ratio would drop to **1.44:1.** To the extent that NATO considers a 1.44:1 overall force ratio to be acceptable, the non-U.S. NATO allies may find it difficult to justify the defense expenditures that would enable them to compensate for their current firepower deficiency and modernize their forces at the same rate as the Warsaw **Pact.**

The DoD POMCUS proposal could also reduce the readiness of U.S. forces, or keep it from improving, because the war reserve **stockpiles** in the United **States--the** source of POMCUS **equipment--** are insufficient to support the **program. 2/** To meet the emplacement schedule, the Army would have to withdraw some items of equipment both from Reserve Component units and from the active divisions that would deploy to the pre-positioned equipment. In some other cases, it would be necessary to divert equipment. There is no indication of when DoD's procurement programs would be able to correct the readiness problems that could result from the withdrawal of this equipment.

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2/ Two sets of equipment are required for each division in **POMCUS**; one is pre-positioned in Europe, and another is used in the United States for training.

ALTERNATIVE, U.S. OPTIONS FOR STRENGTHENING NATO

The major question confronting the alliance is how to correct NATO's current shortage of combat capability in the first four weeks after mobilization while also matching future Warsaw Pact **modernization**. This study estimates the costs and benefits of three alternatives that would each reduce the **Pact/NATO** force ratio to 1.44:1 within 10 days of a NATO mobilization, on the assumption that NATO's defense expenditure targets are **sufficient** to match any further modernization of Warsaw Pact forces. Options I and II would give the non-U.S. NATO allies more responsibility for correcting the balance than would the DoD POMCUS proposal. Option III is identical to the DoD proposal, except that it includes full funding of the program, to preclude any detrimental effects on the readiness of U.S. forces. Under all three **alternatives**, the United States would complete pre-positioning of the first set of equipment in northern Germany as now **planned**.

Option I; Non-U.S. NATO Forces Increase Their Firepower by 13 Percent

Under this alternative, the non-U.S. NATO allies would increase their firepower by 13 percent. This option requires replacing old equipment, changing light artillery for heavy, and increasing the amount of artillery. The United States would ensure that all POMCUS units would be available in Europe within 10 days of **mobilization**. Only the first division set of equipment would be **pre-positioned** in NORTHAG. Given these **improvements**, an overall force ratio of 1.44:1 could be achieved within 10 days of NATO's mobilization. By strengthening the allied forces, which would be the first to meet a surprise attack, this option would significantly reduce NATO's vulnerability to a surprise attack.

The cost of the U.S. portion of this option would be \$0.6 billion, which might be partially funded by the European allies. The funds that DoD currently has earmarked in the five-year program for fiscal years 1981-1985 for pre-positioning two more sets of POMCUS equipment could be used to improve the capability of U.S. forces, and there would be no need to withdraw equipment from units. Thus, Option I would not impair U.S. force readiness. The additional cost of this option to the other NATO allies cannot be estimated because the amount of improvement already in their defense budgets and in their 3 percent real growth is not known.

This option would involve a change in the United States' commitment to NATO under the **Long-Term** Defense Program, which might adversely affect the other NATO allies' willingness to modernize their forces.

Option II; Non-U.S. NATO Forces Increase Their Firepower by 10 Percent; United States Stations Two More Brigades in Germany

Under this alternative, the non-U.S. NATO allies would increase their capabilities relative to the Warsaw Pact by 10 percent. The United States would pre-position one division set of POMCUS equipment in northern Germany, ensure that POMCUS units would be available within 10 days of mobilization, and move to northern Germany two U.S. brigades together with the necessary fire support and logistics support. Moving the two brigades of the First Infantry Division would vacate Fort Riley, Kansas, which could then be used to house the Second Infantry Division, when it is withdrawn from Korea.

Option II would achieve the same force ratio and the same reduced vulnerability to a surprise attack as Option I, but would do so through additional efforts of both the United States and the other NATO allies. The readiness of U.S. forces would not be adversely affected. The cost of the U.S. portion of this option would be \$1.6 billion, which might be partially funded by the European allies. The cost of the non-U.S. NATO portion cannot be estimated, again because the degree of modernization already in the allies' budgets and in future budget plans is unknown.

Option II could leave the United States open to criticism for failing to comply fully with the Long-Term Defense Program.

Option III; The United States Pre-Positions Two More Division Sets of Equipment in Northern Germany

Under this alternative, the United States would complete pre-positioning the division set of equipment programmed for 1980, it would pre-position two more sets by the end of 1982, and it would ensure that units would be delivered to all of the POMCUS sites within 10 days of mobilization.

Unlike Options I and II, this approach would not reduce NATO's vulnerability to a surprise or extremely short-warning attack, but it would achieve the force ratio objective of 1.44:1 by 10 days after NATO mobilization. If the allies' current defense budgets and the 3 percent real growth in those budgets is enough to achieve a greater rate of modernization than the Warsaw Pact, then the allies' firepower deficit would eventually be eliminated. However, if the allies' current plans do not meet that objective, this alternative might remove the incentive for them to correct their current firepower deficit.

This alternative differs from the current POMCUS proposal in that funds are specifically provided to buy enough equipment to ensure that there would be no need to withdraw or divert equipment from units. The \$2.6 billion cost of this option would be partially funded by the European allies. This option would not impair U.S. force readiness in the mid-1980s.

#### FINAL CONSIDERATIONS

In sum, in the event of a Warsaw Pact invasion, the current balance of forces is unfavorable for 30 days after mobilization. To change that balance, NATO must improve its forces at a greater rate than the Warsaw Pact, or U.S. reinforcements must arrive sooner, or both.

Further, the non-U.S. NATO forces are not as firepower-intensive as the Warsaw Pact. If they were, the Pact/NATO force balance would reach an acceptable level within 10 days of a NATO mobilization, without the United States pre-positioning two more division sets of equipment.

Are the allies' plans to increase defense expenditures by 3 percent per year in real terms sufficient to achieve comparability with the Pact's current combat capability? Unfortunately, what is publicly known about the allied contribution to the NATO Long-Term Defense Program is too vague to estimate its effect on the force balance. Moreover, some of the real growth may be needed just to match further modernization by the Warsaw Pact. It is clear, however, that the need for pre-positioning additional U.S. equipment is closely linked both to Warsaw Pact modernization and to the actions of the NATO allies. And those factors will affect not only the need for POMCUS, but also the wider debate over 3 percent real growth for defense.

BACKGROUND

The defense of Europe holds a dominant position in establishing U.S. defense policies and in fashioning the capabilities of U.S. conventional forces. Although war between the North Atlantic Treaty Organization (NATO) and the Warsaw Pact may be unlikely, the political stakes in Europe are quite high. In peacetime, weak conventional forces could put NATO at a disadvantage; in wartime, they could force early resort to nuclear **weapons.**

NATO has certain vulnerabilities that the numerically superior Warsaw Pact could exploit. In particular, NATO takes longer than the Warsaw Pact to reach its full combat potential because one-third of its forces come from the United States. A sudden and intense Warsaw Pact attack would therefore strike NATO before much of its forces could be available. Further, NATO's weakest defenses are in the north German plain, where the terrain is the most favorable for an attack. **Thus,** the Pact: could take advantage of the strategic initiative that the defensive nature of the NATO alliance gives them by choosing to make their main effort against that weak region. Not only would this avenue of attack offer the easiest route of advance, but a successful attack of this sort would sever NATO's supply lines, which could quickly unravel the entire NATO **defense.**

NATO's problem is to reduce its vulnerabilities while simultaneously keeping pace with whatever improvements the Warsaw Pact makes in its conventional forces. To reduce its weaknesses, NATO could improve the quality of its immediately available forces for defense of the northern region, increase the rate of arrival of U.S. **reinforcements,** or use some combination of these two measures. In theory, any one of these could produce the same military result, but they differ in how the burden of defense is shared between the United States and the other NATO allies.

The United States is committed to strengthening NATO. The Department of Defense (DoD) budget for fiscal year 1980 grows largely because of this commitment, and the thrust of new or

expanded programs is likely to be in the direction of improving capabilities to defend Europe. Discussions of the new or expanded programs would be more effective if they occurred in the context of a particular program's contribution to the elimination of a current NATO **vulnerability**.

This paper analyzes NATO's **vulnerabilities** and reviews the alternatives for buttressing defense of the alliance. The remainder of this chapter describes the role of the United States in NATO and summarizes the most recent proposal for increasing U.S. participation in order to help reduce NATO's present vulnerabilities.

#### DEFENSE OF NATO'S CENTRAL REGION AND THE U.S. CONTRIBUTION TO NATO GROUND FORCES

The organization of NATO's defensive forces in the Central Region, where any war is likely to be focused, is shown in Figure 1. NATO's Central Region includes the territory west of the East German border, extending north from Austria and Switzerland to the English Channel, and the countries of West Germany, the Netherlands, Luxembourg, Belgium, and France.

Two army groups defend the Central Region: the Northern Army Group (**NORTHAG**) and the Central Army Group (**CENTAG**). These two zones have been subdivided into corps sectors defended by U.S., German, British, Belgian, and Dutch forces. West German forces are responsible for defending three national corps sectors (two in CENTAG and one in NORTHAG); U.S. forces are responsible for two corps sectors located in CENTAG; and Dutch, British, and Belgian forces, one sector each in NORTHAG.

The United States maintains four divisions, four brigades, and two armored cavalry regiments in West Germany to support its NATO obligations. One brigade is stationed in Berlin, another is in NORTHAG, and the remainder of the U.S. forces are stationed in CENTAG. 1/ Should a major conflict erupt in central Europe, these troops would be reinforced by 11 active divisions,

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1/ A division contains about 16,000 men organized into three brigades, plus support elements. See Appendix A for a definition of division, brigade, regiment, and other units.

Figure 1.  
Corps Sectors of Military Responsibility in NATO's Central Region



SOURCE: Adapted from Richard Lawrence and Jeffrey Record, *U.S. Force Structure in NATO* (Washington, D.C.: The Brookings Institution, 1974), p. 31 and also from U.S. Army materials.

a/ NORTHAG (Northern Army Group) and CENTAG (Central Army Group) are the two subdivisions of NATO forces in West Germany. The line dividing the two runs from Belgium through West Germany, just south of Bonn, and into East Germany.

eight National Guard divisions, and more than 20 National Guard brigades stationed in the United States. 2/ The personnel and equipment of eight of the active divisions would be transported to Germany by a combination of airlift and sealift. The personnel of the three remaining active divisions, plus an armored cavalry regiment, would be airlifted to Germany, where equipment and ammunition has been stored for them. 3/ Upon arrival, the troops would draw their equipment and ammunition from the storage sites and move to their combat positions. **Thus,** those three divisions and the armored cavalry regiment can be said to constitute the "leading edge" of U.S. **reinforcements.** The National Guard divisions and brigades would deploy as soon as they were ready and air or sea transportation was available to move them.

The program governing the storage of equipment in Europe for **U.S.-based** troops that would deploy there in time of war is known as **POMCUS** (pre-positioned materiel configured to unit **sets**). DoD began the POMCUS program after the Berlin crisis in 1961, when it became apparent that the United States could not move forces to Europe quickly enough to counter Soviet moves. A decision was made to store the equipment for two divisions (plus 10 support units) in the CENTAG region, thus lessening the strategic deployment problem by requiring that only the personnel of those units be transported to Europe in time of war. Response time would thereby be reduced and flexibility enhanced. This first POMCUS package became known as the "2+10" package.

The POMCUS program was expanded in 1968, when the U.S. **balance-of-payments** problem necessitated the return of two-thirds of the First Infantry Division from Germany to the United States. To assure the NATO allies that the withdrawal did not imply a slackening of the U.S. commitment to NATO, additional equipment was pre-positioned in Europe in order to support the quick return of the division in time of war. Annual exercises, called REFORGER (Return of Forces to **Germany**), were

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2/ U.S. Department of Defense, Annual Report, Fiscal Year 1980, p. 141.

3/ Ibid., p. 196.

also begun to provide a regular testing of the ability of the United States to reinforce Europe during a crisis. 4/

More recently, the Department of Defense has modified POMCUS by:

- o Withdrawing equipment from POMCUS stocks to supply two new U.S. brigades stationed in West Germany. These ~~troops--~~**Brigades 75 and 76--were** moved to Germany after passage of the Nunn amendment to the fiscal year 1975 defense authorization bill; 5/
- o Adding equipment for support units assisting in the operation of the supply line (MRLOGAEUR); 6/
- o Adding the equipment for the additional medical units required by the high level of casualties anticipated in the early stages of a war with the Warsaw Pact.

The current **composition** of POMCUS is summarized in Table 1.

#### DoD'S NEW PROGRAM

In its budget request for fiscal year 1979, DoD announced a plan to add three new division sets of equipment to POMCUS--one to be in place in fiscal year 1980; the remaining two, by the end of fiscal year 1982. The plan also calls for the addition of equipment for 43,000 support personnel. Partial funding for pre-positioning the first additional POMCUS division set was included in the defense budget approved by the Congress

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4/ The Posture of Military Airlift, Hearings before the Research and Development Subcommittee, House Committee on Armed Services, 94:1 (November 1975), pp. 584-586.

5/ *Ibid.*, p. 587. The Nunn amendment required DoD to reduce support manpower in Europe by 18,000 personnel. The law permitted DoD to replace the support units with combat personnel. Some of the personnel were replaced by two brigades (Brigades 75 and 76) that the Army moved to Europe.

6/ MRLOGAEUR stands for Minimum Required Logistic Augmentation Europe.

for fiscal year 1979. Funds for the remaining two division sets are expected to be requested in the President's budget for fiscal year 1981.

TABLE 1. CURRENT COMPOSITION OF POMCUS

Package	Units
2+10	2 Divisions 10 Miscellaneous Nondivisional Units
REFORGER	1st Infantry Division (Mechanized) 3rd Armored Cavalry Regiment 74 Miscellaneous Nondivisional Units
MRLOGAEUR	36 Miscellaneous Combat Support Units
Medical Augmentation	28 Medical Units

DoD's new program was prompted by a perceived need to strengthen defenses in northern Germany through more rapid U.S. **reinforcement**. Current **U.S.** responsibilities in northern Germany are limited to stationing a brigade there in peacetime and planning for the probable wartime employment of a corps-sized force, assembled from the **stream** of U.S. reinforcements arriving in Europe after **mobilization**. This new program would introduce a fully supported corps within 10 days after mobilization to help defend **NORTHAG**. The program is one of the U.S. contributions to the long-term improvement of NATO's defenses, as formalized in the NATO **Long-Term** Defense Program (LIDP). 7/ If the program is completed, U.S. responsibilities in NATO would include defense of two corps sectors in **CENTAG** and provision of three divisions within 10 days of mobilization to reinforce allied forces permanently stationed in NORTHAG.

7/ U.S. Department of Defense, Annual Report. Fiscal Year 1980, p. 212.

The United States also contributes significant quantities of air power to NATO. In fact, U.S. air forces would probably be the first U.S. reinforcements to arrive in Europe. Although such forces make a substantial contribution to the defense of NATO and would affect the ground battle in the event of a Pact attack, there is no method available at the moment for including those effects in an analysis of the ground forces balance. Therefore, this paper, which seeks to analyze ground forces, can only acknowledge that air forces (both Warsaw Pact and NATO) could affect the battle.

#### PURPOSE OF THIS STUDY

The DoD **proposal--with** its expansion of U.S. defense responsibilities in Western Europe, **multiyear funding requirements**, and significant international political **considerations--is** developing considerable momentum. If the Congress waits until fiscal year 1980 to debate this program, it could confront an irreversible commitment. In addition, the DoD plan is a key element in the United States' support for NATO. 8/ That support, and the associated pledge to 3 percent real growth in the defense budget, are central to the fiscal year 1980 debate on national security **expenditures.**

This study analyzes the current military balance in Western Europe and NATO's resulting need for more rapid **reinforcement**, identifies the costs and benefits of the DoD plan, and evaluates several alternatives to it that the Congress might wish to

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8/ U.S. Department of Defense, Annual Report, Fiscal Year 1980, Executive Summary, p. 22:

"As a result of the NATO Summits in May, 1977 and 1978, we have endorsed both a goal of three percent real annual increase in the defense outlays of the NATO countries, and an ambitious Long-Term Defense Program for the Alliance. We are already taking steps to preposition more equipment and stocks so as to reduce the deployment times of our reinforcements to NATO. We are also improving our long-range airlift and otherwise seeking to increase our worldwide mobility. To continue **with** these programs, we will need additional resources."

consider. Chapter II discusses NATO's need for quick reinforcement and explains why the lack of a significant reserve force for NORTHAG constitutes an important vulnerability, exploitable by the Warsaw Pact. It also identifies the elements of NATO's defenses that could be strengthened to reduce that vulnerability. Chapter III estimates the total cost of DoD's POMCUS proposal and discusses its effect on the strength of NORTHAG. Chapter IV identifies two alternatives to the DoD program. Chapter V summarizes some of the key considerations in the debate.

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CHAPTER II. THE UNFAVORABLE WARSAW PACT/NATO FORCE RATIO AND  
NORTHAG VULNERABILITIES

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This chapter reviews the current military balance in Europe, which shows NATO's vulnerability to a sudden and intense Warsaw Pact attack. In addition to identifying an overall force ratio goal that could give NATO confidence in its conventional defense capability, the chapter also provides a summary overview of the British, Dutch, Belgian, and German forces that defend the NORTHAG sector, where NATO's defenses are the weakest. Lastly, the chapter identifies three fundamental defense strategies that could be used to strengthen NATO.

THE UNFAVORABLE THEATER FORCE RATIO

The Pact's Numerical Superiority

In recent years, the Warsaw Pact has made major investments in conventional weapons for its ground forces. Although the manpower in its standing armies is just slightly larger than NATO's, the Pact has more tanks (2.7:1), more armored vehicles for infantry (1.2:1), and more artillery (2.2:1). <sup>1/</sup> Thus, the Warsaw Pact can field a stronger force than NATO. Whether this advantage would be decisive in the outcome of a conflict depends on many **unquantifiable** factors, such as the quality of the officer corps, troop morale and fighting **capabilities**, weather, and simple luck. These factors have unpredictable effects on a battle. But with numerical superiority, the Warsaw Pact is better able to cope

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<sup>1/</sup> Derived from The Military Balance, 1978-1979 (London: **International Institute for Strategic Studies**, 1978). The Warsaw Pact forces counted include Czechoslovakia, the German Democratic Republic (GDR), Poland, and that **part** of Soviet forces not allocated to the Sino-Soviet border. NATO includes Belgium, Britain, Canada, Denmark, France, the Federal Republic of Germany (FRG), the Netherlands, and that part of U.S. forces not allocated to the South Korea commitment.

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with the unpredictable effects of those factors while simultaneously complicating NATO's defensive task. Just how NATO's defense **could** be affected by the superior Warsaw Pact forces is investigated later in this chapter.

#### The Pact's Strategic Advantage Over Time

More important than overall superiority is the advantage the Warsaw Pact gains from being on the Continent. While 33 percent of NATO's forces would have to be transported overseas to Europe from the United States, the Warsaw Pact could take advantage of multiple overland routes to assemble its forces quickly, creating the opportunity for a quick, decisive victory. The Pact's early force advantage could reach 2:1 shortly after it mobilizes. Its advantage would erode to 1.4:1 by 24 days after its mobilization, when the U.S. REFORGER and 2+10 units would have arrived. (Appendix B shows the change in the force ratio over time.) The situation after four weeks is less clear, however. If the Warsaw Pact committed none of its central reserve and shifted none of its forces from the Sino-Soviet border or from the northern and southern part of the Soviet Union, and if some of the U.S. National Guard units could be ready for combat, the force ratio by about 120 days after mobilization would drop to **1.2:1**.

If the Warsaw Pact could capitalize on its superiority in the first two weeks after mobilization and attack with 100 percent **effectiveness**, NATO would find it difficult to counter the main attack. To demonstrate the problem, consider a hypothetical case in which NATO forces are distributed evenly among its corps sectors. The Warsaw Pact, with a 1.8:1 overall advantage 10 days after NATO mobilizes, could concentrate its reserves against a single NATO corps to achieve a 7.4:1 ratio while maintaining a 1:1 ratio in other corps sectors to discourage NATO from shifting forces to meet the attack. To counter this option, NATO would have to shift forces from other corps sectors to reduce the force ratio in the main attack sector to below **3:1**. 2/ In this **example**, NATO would have to shift forces from at

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2/ A force ratio of 3:1 or less in a corps sector where forces are defending is considered acceptable. See Department of the Army, Army Field Manual 100-5 (July 1976), p. 5-3.

least three other corps sectors, accepting an unfavorable force ratio of at least 2:1 in those sectors. This move would reduce the Pact advantage in the main attack sector to about 3:1, which would be satisfactory if the Warsaw Pact had not achieved a breakthrough before the **reinforcements** arrived. In this case, however, the sum of NATO's reaction time plus the time that would be required to move forces from all three corps could easily exceed the time the Warsaw Pact would need to penetrate the defenses.

On the other hand, the Warsaw **Pact's** force includes Category II and III divisions, which are not fully manned in peacetime. If these divisions were not 100 percent ready at the start of a war, then the Warsaw Pact's overall advantage would be close to 1.5:1 and NATO's problem would be less severe. Under these conditions, the Warsaw Pact could achieve a 5:1 ratio in the main attack sector, but NATO could counter by shifting forces from only two corps sectors, thus reducing the force ratio in the main attack sector to 2.5:1, as contrasted with the 3:1 ratio in the previous example. In this case, the sum of reaction time and movement time could be considerably less than the above example, especially if the reinforcements were shifted from the corps sectors adjacent to the main attack sector. 3/

The above discussion shows that NATO's defense becomes more manageable as the overall force ratio declines. The following section more closely examines the relationship between the overall force ratio and **NATO's** management of the defense. A hypothetical example is presented, which illustrates this relationship.

#### A POSSIBLE FORCE RATIO GOAL FOR NATO

The examples discussed below suggest that NATO could feel confident with an overall force ratio of less than 1.44:1, that ratios between 1.44:1 and 1.62:1 could allow unfavorable

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3/ The details of the analysis supporting these two examples is found in Appendix C.

conditions to develop, and that force ratios exceeding 1.62:1 would be **intolerable.** 4/

Figure 2 shows how the number of NATO corps to be thinned out varies with the Pact/NATO overall force ratio. If the theater-wide force ratio were between 1.25:1 and 1.44:1, then a 3:1 ratio **in** the main attack sector could be achieved by shifting forces from only one corps sector, which would seem to be manageable for NATO. NATO would have to draw upon two corps sectors for reinforcements if the overall ratio exceeded 1.44:1. This situation would be manageable if the main attack did not strike a flank corps, thereby enabling reinforcements to be drawn from two adjacent corps. Under those conditions, reaction time should be the same as the case in which reinforcements are needed from only one corps. On the **other hand**, if a flank corps were struck, half of NATO's counterattack force would have to come from a corps not adjacent to the main attack sector, and reaction time would equal that of the case in which reinforcements are drawn from three corps sectors. The likelihood of a successful counterattack would then be low. If the theater force ratio exceeded **1.62:1**, reinforcements from three or more corps would be **needed**, and the time required to assemble them could exceed the time available.

#### Could the Pact Exploit Its Early Advantage?

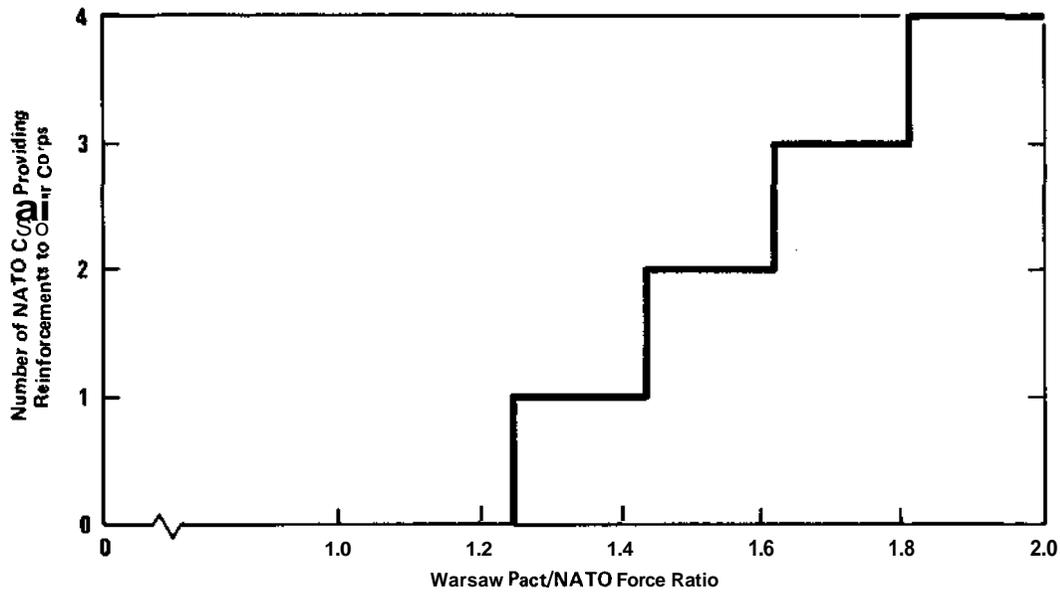
A decade ago, DoD considered it unlikely that the Warsaw Pact could capitalize on its potential early advantage; **however**, changing conditions have led DoD to modify that assessment. The Soviets have expanded their presence in Eastern Europe by adding

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4/ U.S. Department of Defense, Annual Report, Fiscal Years 1976 and 1977, p. III-15:

"Third, certain **ratios--whether** we are talking about manpower, manpower in maneuver battalions, firepower scores, or weapons effects **indicators--** should not be allowed to favor an attacker by too great a margin. For example, if an attacker could achieve a favorable overall ratio of perhaps 1.5:1 in several of these respects, he could embark on such large local concentrations that the defender would find it difficult to prevent one or more **breakthroughs.**"

Figure 2.  
 Impact of Theater Force Ratios on Number of NATO Corps  
 Providing Reinforcements to Other Corps in the Event of a  
 Warsaw Pact Invasion<sup>a</sup>



<sup>a</sup> The NATO objective is to achieve a 3:1 Pact/NATO force ratio in the corps sector where the main Pact attack occurs while maintaining at least 2:1 in the other corps sectors. Although a 3:1 ratio is technically acceptable in the other corps sectors, in practice it may create a condition in the thinned-out corps where there is insufficient force to cover the corps frontage. If so, even the relatively small Warsaw Pact forces in those corps might penetrate and disrupt the flow of NATO's reinforcements to the main attack sector. Consequently, this analysis concentrates on the somewhat safer assumption that 2:1 is the acceptable ratio.

150,000 men to their Warsaw Pact forces. This includes the 70,000 men in five divisions deployed in 1968 to **Czechoslovakia**. 5/ They have also strengthened the divisions of the Group Soviet Forces Germany (GSFG) by adding 1,000 men to each tank division and 1,500 to each motorized rifle division. 6/ These changes have reduced the number of ground forces that would have to be moved to support an attack, thus increasing the **Pact's** ability to launch an attack with little warning.

In addition to expanding the size of the Warsaw Pact forces, the Soviets have undertaken a substantial equipment modernization program. About 50 percent of the GSFG tank fleet has been supplied with the T62 tank (possibly somewhat less effective than the U.S. M60). 7/ The more modern T64 (probably slightly superior to the M60) and the newest Soviet tank, the T72, have been issued to the Group Soviet Forces Germany. The combined assets are estimated to total 2,000 tanks. 8/ The Pact's towed artillery has been replaced or augmented by more survivable, mobile, armored self-propelled artillery. The sophisticated armored fighting vehicles, air defense weapons, attack helicopters, and antitank guided missiles that have been added to GSFG divisions also contribute to increased combat **effectiveness**. 9/ This strengthening of the GSFG divisions through modernization has further reduced the need to move large forces from the Soviet Union to support an early Pact attack.

If the Warsaw Pact were to continue to modernize and expand its forces and NATO were to take no action to improve its forces, then the force ratios would worsen. The Warsaw Pact now has the initiative in this area, and the extent to which it presses

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5/ Department of Defense **Appropriations**, Fiscal Year 1979, Hearings before the Senate Committee on **Appropriations**, 95:2 (February and March 1978), p. 60.

6/ *Ibid.*, p. 61.

7/ "Soviets Double T64s in GDR," *International Defense Review*, No. 5 (1978), p. 668.

8/ *Ibid.*

9/ Department of Defense **Appropriations**, Fiscal Year 1979, Hearings, p. 61.

its advantage **will** determine in large measure what NATO must do during the next five years to keep the military balance from **deteriorating**.

#### FORCES AVAILABLE TO NATO

The countries that defend NATO's Central Region provide forces that could be thought of in two categories: those needed to defend the corps sectors and those held in reserve to be used by the Supreme Allied Commander to counter Warsaw Pact **penetrations**. In the first category, one would find almost all of the British, Dutch, Belgian, and German active-duty forces as well as most of the reserve components of all but the German forces. The **U.S.** forces stationed in Germany, and possibly some of the early arriving **reinforcements**, would also be in this category. **Thus**, the bulk of the immediately available forces are British, Dutch, Belgian, and German.

#### The Current Non-U.S. NATO Firepower Deficiency

In creating their national forces, the non-U.S. NATO **allies--** who are responsible for the defense of most corps sectors in NATO's Central **Region--seem** to generate less firepower per man than the Warsaw **Pact**. If the armies of the **non-U.S.** NATO allies are compared with the Warsaw Pact armies that would face NATO within two to three weeks after mobilization, **some** interesting differences can be noted. Although non-U.S. NATO has only slightly less manpower in its standing armies than the Pact, and both non-U.S. NATO and the Warsaw Pact have substantial pools of trained reservists, non-U.S. NATO would put only a little more than half as many men in divisions after mobilization as would the Pact. If non-U.S. NATO had a larger inventory of **tanks**, artillery, and armored infantry vehicles, this might be a reflection of a doctrine to maintain a sustainable force. As things stand now, however, this disparity reflects the Warsaw Pact's heavy investment in materiel combined with its offensive doctrine calling for maximum surge firepower as opposed to long-term sustained firepower. 10/

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10/ "Firepower" as used here includes all weapons, regardless of **size**, that would be employed against the opposing force.

For many years it has been said that NATO has relied on superior technology to offset the Warsaw Pact's quantitative superiority. If that were **true**, one would expect the **Pact/non-U.S. NATO force ratio**, when measured in armored division equivalents (an indication of firepower capability), to be equal to or better than the ratio of manpower in divisions. Such is not the case, however. The ratio of armored division equivalents is 13 percent more favorable to the **Pact**. 11/

Looking at the relationship between U.S. active-duty forces and the Warsaw Pact threat, a different picture emerges. The ratio of active-duty ground forces manpower is about 2.5:1 favoring the Warsaw Pact. The ratio of manpower in divisions is **3.7:1**, also favoring the Pact. The armored division equivalent ratio is 14 percent lower (3.2:1), which shows that U.S. manpower is more productive in terms of firepower than Warsaw Pact **manpower**. 12/

The above analysis demonstrates that the allied forces, which would have to absorb the brunt of a Warsaw Pact assault, are outmanned and outgunned. This problem is particularly severe in **NORTHAG**. Later sections more closely examine the **NORTHAG** defenses in order to identify the specific problems that contribute to the 13 percent deficiency in the firepower of the non-U.S. NATO **allies**.

#### Available Reserves

The United States provides 27 percent of NATO's peacetime ground force capability (as measured in armored division equivalents) and 43 percent of its wartime capability. 13/ In the

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11/ The actual ratios are 1.97:1 for manpower in divisions and 2.23:1 for armored division equivalents, both favoring the Warsaw **Pact**.

12/ Appendix D shows how the **U.S.** and non-U.S. ratios were calculated.

13/ Derived from U.S. Department of Defense, A Report to Congress on U.S. Conventional Reinforcements for NATO (June 1976), p. **IV-3**. Measured at approximately 110 days after mobilization and does not include the combat power of the National Guard divisions or most of the National Guard brigades.

event of a Pact attack, not all of the U.S. reinforcements would be needed to defend the two U.S. corps sectors in CENTAG; those that would not be needed in CENTAG would fall into the second **category--forces** to be used by the Supreme Allied Commander to counter Pact penetrations of NATO defenses. French forces, assuming that they were made available to NATO, could likewise be used as **reinforcements** in allied sectors, since they are assigned no corps sector to defend. 14/ As discussed later in this chapter, the six German home defense groups, now being equipped with tanks, artillery, and armored personnel carriers, would be suited for a reserve role, provided that Germany released them to NATO.

The following sections more closely examine **NATO's** weaknesses in order to identify which aspects of the defense could be targeted for improvement. Most of **NATO's** current problems occur in the **NORTHAG** region.

#### NORTHAG VULNERABILITIES

In addition to its tactical and geographical advantages, the Warsaw Pact would have the strategic initiative, by virtue of the defensive nature of the NATO alliance. Thus, Pact forces could choose to strike NATO where its defenses were weakest and the terrain most favorable to an attack: across the north German plain in the **NORTHAG** region. Not only are **NATO's** weakest defenses located in that region, but the terrain there is relatively flat and open, favoring a swift advance of Pact armored forces and complicating NATO defenses. Moreover, a successful Pact attack across the north German plain into the Benelux countries could sever the transportation routes used to deliver supplies and ammunition to U.S. and German forces further south in CENTAG.

Four nations are responsible for defending the critical **NORTHAG** region, and coordination problems are likely to **arise**, which could complicate the defense of that region. Furthermore, those problems could be compounded by several other factors. First, the British, Dutch, and Belgian forces defending **NORTHAG**

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14/ The French have two divisions stationed in Germany and three divisions stationed near the French-German border. Although these forces are not technically part of NATO, it seems reasonable to count on their being made available.



are stationed well to the rear of their corps sectors during peacetime. Moreover, about half of their wartime strength would come from reserve components that would not be available until completion of **mobilization**. In addition, **NORTHAG** lacks sufficient forces to form a reserve with which to counterattack Pact **penetrations**. Finally, as discussed below, the allied defenders in each corps sector of **NORTHAG** would be outgunned by the Warsaw Pact attacking formations.

#### Dutch Corps 15/

The Dutch **corps'** defense depends heavily on **NATO's** having two to four days of warning of an attack so that the two active Dutch divisions could be brought to full strength and moved to their corps sector in Germany. Although the Dutch are modernizing their forces, major deficiencies remain in tanks, infantry fighting vehicles/infantry carriers, and artillery, which would limit their **effectiveness** against Warsaw Pact forces.

Only one Dutch brigade is stationed in the Federal Republic of Germany; the other five active brigades are stationed in the Netherlands. The six active brigades are organized into two divisions. Each division has one-third of its wartime combat power in the reserve component. A third division is comprised entirely of reservists.

Half of the 800 Dutch tanks are **Centurions**--a tank designed at the end of World War II that is now **obsolete**--and half are Leopard **Is**--a basically sound tank that will require some improvements if it is to remain competitive through the 1980s. The Dutch recognize the need to replace their Centurion tanks. They are closely watching the development of the Leopard II and **XM-1**, and may choose one of them as a replacement for the Centurion.

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15/ The description of the Dutch corps is a synthesis of information gathered from The Military Balance 1978-1979; Jane's Weapon Systems 1978; Government of the **Netherlands**, "Policy Report: of the 1979 Defense Budget (1978; **processed**); Ministry of Defence, The Netherlands 1974 Defence (July 1974; processed); and an interview with an **official** of the Netherlands Army Military Attache Office, Embassy of the Netherlands.

The 15 infantry battalions of the three Dutch divisions are all mechanized. Obsolete French infantry fighting vehicles in four of the battalions are being replaced by new infantry fighting vehicles produced by the Food Machinery Corporation (FMC), the U.S. manufacturer of the M-113 armored personnel carrier, which is standard equipment in the U.S. Army. This program will be completed in 1979. The remaining 11 battalions are mounted in Dutch-built wheeled armored personnel carriers, which might not be able to keep up with tank formations proceeding cross country.

The artillery battalions supporting each brigade are self-propelled. The battalions that support mechanized brigades use light 105mm howitzers, which the United States and Germany consider to be too light for such a **role**, as do the Dutch. It is likely that these weapons will be replaced, but a program to do so has not yet been developed. The Dutch army is not equipped with multiple rocket launchers, an effective weapon for increasing firepower per man, and apparently does not intend to introduce such a weapon.

Antitank units are located at the battalion and brigade levels. The antitank platoons in each battalion have the U.S. wire-guided TOW **system**, an effective system but vulnerable because it lacks armor protection. The antitank companies in each brigade have **AMX-13s--a** French-built light tank with a 105mm gun, possibly equipped with a laser **rangefinder--and** TOW systems. The U.S. Dragon medium antitank weapon is being purchased to supplement the unguided antitank weapons in each **company**.

#### German Corps 16/

The German army has just embarked on an ambitious reorganization that will **significantly** strengthen its forces by the mid-1980s. The Leopard II (120mm gun) will replace its **M-48A2s**,

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16/ This description of the German corps is a synthesis of information gathered from the Military Balance 1978-1979; Jane's Weapon Systems 1978; Federal Republic of Germany Ministry of Defence, White Paper 1975/1976, The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces (Bonn: January 1976); and from an interview with an official of the Military Attache Office, Embassy of the Federal Republic of Germany.

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which now constitute 36 percent (1,342 tanks) of the German tank fleet. The remaining 2,437 German tanks are Leopard **Is**. The **M-48s** will be upgunned to 105mm and issued to the six home defense groups and the six heavy Jager regiments, newly organized in the territorial army. Some of the **M-113** armored personnel carriers will be replaced by the **MARDER** infantry fighting vehicle. The M-113s will then be issued to the home defense **groups**. Both the home defense groups and the Jager regiments will receive the 105mm howitzers that will be replaced by 155mm howitzers in the active force.

The new organization will have 17 (as compared with 12) tank brigades and 16 mechanized infantry brigades (as compared with 12 mechanized infantry and six Jager **brigades**). This will increase the tank strength of the active German army by 30 percent. The new organization calls for an expansion of antitank missile systems in the brigades from 545 old systems to more than 2,500 of the new technology TOW, HOT, and MILAN systems. Another major addition will be an attack helicopter regiment with 100 HOT-equipped helicopters for each of the three German corps.

In sum, once the modernization program is completed in the mid- to late 1980s, the West German active army will be much stronger: according to German plans, the home defense groups will be strong enough to counter Warsaw Pact **penetrations**, and the heavy Jager regiments will be strong enough to counter airborne or helicopter-landed assaults.

#### The British Corps 17/

The major weaknesses of the British corps appear to be its rather low peacetime strength, a lack of mechanized or armored **reinforcements**, obsolete armored personnel carriers, inadequate 105mm howitzers, and a low density of artillery in **general**.

In peacetime, the corps has a strength of 55,000 men, organized into four small armored divisions, one independent infantry

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17/ This description of the British Corps was derived from information obtained from The Military Balance, 1978-1979; Jane's Weapon Systems 1978; British Secretary of State for Defence, Statement on the Defence Estimates 1978 (London: February 1978); and an interview with an official of the Military Attache Office, Embassy of Great Britain.

brigade, and artillery units. After mobilization, the corps would expand to a strength of about 120,000, with the addition of brigade-sized infantry units from the reserve components. The effective peacetime strength of the corps is really less than 55,000 because nine infantry battalions (50 percent of the infantry strength) are on temporary duty in Northern Ireland. It would take 72 hours for these battalions to be transported to northern Germany. 18/

The British army has 900 Chieftain main battle tanks, which were developed in the 1950s and entered service in the early 1960s. The tank's turret is designed to give the crew good survivability and mounts a 120 mm gun. Some studies show that the Chieftain would kill four Warsaw Pact tanks for every Chieftain lost. 19/ The major problem with the tank is its poor engine. With engine improvements, the tank could remain competitive well into the late 1980s.

The British mechanized infantry and artillery are not nearly so well armed to counter Warsaw Pact forces. Their current armored personnel carrier became standard equipment in 1964. It has no capability to destroy Warsaw Pact armored personnel carriers or infantry fighting vehicles, and the infantry cannot fight while mounted. The mainstay of the artillery is the self-propelled Abbot 105mm howitzer, which is used to provide direct support to the maneuver battalions. The British have concluded that this weapon is too light to support armored and mechanized units, and they will probably replace it with a new self-propelled 155mm howitzer, which is currently under development. With only 0.270 artillery pieces per tank and no multiple rocket launchers or heavy mortars, British units have considerably less artillery to support armored and mechanized forces than do U.S. units (0.52 per tank) and German units (0.31 per tank; 0.61 when heavy mortars and multiple rocket launchers are counted).

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18/ Ministry of Defence, Public Relations Staff, NATO--The British Contribution to Allied Defence (London: April 1978), p. 11.

19/ "Soviets Double T64s in GDR," International Defense Review, No. 5 (1978), p. 668.

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British antitank weapons consist primarily of the wire-guided **Swingfire** missile, which, unlike the TOW, HOT, or MILAN systems, is not automatically guided to the target. Considerable skill is needed to hit targets with the Swingfire; thus, many hours must be devoted to training Swingfire gunners. This could be a major disadvantage if Swingfire gunners sustained heavy casualties in a war. To complement Swingfire and increase the antitank capability of mechanized infantry, the new Milan **shoulder-fired**, wire-guided, medium-range antitank weapon will soon be added to the force.

### The Belgian Corps 20/

Overall, the Belgian corps is weak. With only two divisions to defend the Belgian sector, there do not appear to be sufficient forces to cover the front and form a mobile reserve force to counterattack penetrations. The mechanized infantry is equipped with obsolete antitank weapons and personnel carriers. The motorized infantry that constitutes one-third of the combat power of a division would have difficulty defending against mechanized Warsaw Pact forces. Finally, the preponderance of light artillery and obsolescence of a significant portion of the heavier artillery would severely restrict the effectiveness of Belgian supporting fire.

The Belgian corps has a peacetime strength of 34,000 stationed in Germany. The principal combat elements are four brigades (one armored, three mechanized **infantry**), which are organized into two divisions. After **mobilization**, a mechanized infantry brigade and a motorized infantry brigade would reinforce the **corps**, bringing each division to a strength of three brigades. Additional combat troops and logistics elements would also join the corps, bringing it to a total wartime strength of 62,000.

The active-duty brigades are equipped with Leopard *I* tanks, which will probably need to be upgraded to remain competitive through the late 1980s. The reserve component tank units have

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20/ This description was developed from information contained in The Military Balance 1978-1979; Jane's Weapon Systems 1978; Belgian Ministry of Defense, The National Defense White Paper. 1977; DMS Market Intelligence Report. (Greenwich, Connecticut: DMS Inc., 1978; processed).

M-47 tanks, the same model used by the U.S. Army in the Korean conflict. The tank's 90mm gun would be of questionable effectiveness against Warsaw Pact armored forces. The shape of the tank hull and turret does not appear to be sloped enough to give the crew good **survivability**. There are some indications that the M-47 will be replaced by the Leopard I. Mechanized infantry formations are equipped with M-75 armored personnel carriers, manufactured by FMC in the early 1950s, and with the French-built AMX-56, developed in the early 1950s. Both vehicles are obsolete. The AMX-56 is being replaced by the Irish-designed Timoney BDX armored personnel carrier. Evidence of the capabilities of this vehicle is not yet available. Whatever its **capabilities**, with an initial procurement of only 124 vehicles, it will take a long time to improve the overall capability of the armored personnel carrier fleet, which now numbers more than **1,200 vehicles**.

As is the case with the Dutch and British forces, the Belgian army relies on the 105mm howitzer to support its brigades. (Fifty-six percent of all Belgian artillery is 105mm.) In the Belgian case, the inadequacy of the artillery itself is aggravated by the artillery-attenuating effects of the forests and hills that characterize the terrain in the Belgian sector. The artillery density of 0.54 artillery pieces per tank compares favorably with the U.S. Army's 0.57, but it is not as high as the West German army's 0.61. **Nevertheless**, significant parts of the Belgian artillery are severely outmoded: 38 percent of the 155mm self-propelled artillery was built in the mid-1950s, and it is extremely vulnerable because it lacks overhead protection. Multiple rocket launchers could significantly enhance Belgian artillery.

Antitank weapons include the ENTAC (a first-generation French system, which the operator must guide to the **target**), Swingfire (an improved British system), MILAN (a short-range system that is automatically **guided**), and the JPK antitank 90mm **gun**. The ENTAC is obsolete, and the JPK is almost **so**. 21/

#### The Need for a NORTHAG Mobile Reserve

To counter a Warsaw Pact attack, a key element in NORTHAG's defense would be the effective employment of a **strong, mobile**

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21/ The German army plans to phase out the JPK during the 1980s.

reserve force. At present, it would not be easy to form such a reserve. The forces that might be available soon after mobilization for that mission would have two other claimants: CENTAG and SACEUR reserves. <sup>22/</sup> Thus, in order to create a reserve force large enough to counter a Pact penetration, the NORTHAG commander would probably have to thin out his forward defenses until a significant number of U.S. reinforcements had arrived (sometime between M+14 and M+30 days).

#### HOW TO IMPROVE CONDITIONS—A NATO PROBLEM

The Warsaw Pact is clearly capable of mounting an attack with little warning, and one can only assume that it would attempt to use that capability to exploit a NATO weakness. The fundamental weakness of the NORTHAG sector provides such an opportunity; thus, it jeopardizes NATO's forward defense strategy.

Significant improvements in NATO's forward defense require a coordinated, comprehensive NATO program. To develop such a program, one must know which elements of the defense can be changed. How one would combine them to develop a NATO program depends in large measure on how one believes the defense burden should be shared among the NATO countries. Three fundamental design strategies for strengthening NATO are described below.

- o Strategy I--Strengthen NORTHAG Defenders. Measures to strengthen NORTHAG forces would include moving forces further forward in their sectors, modernizing their equipment, and mechanizing light infantry units in both the active and reserve components. Such measures would have to be ambitious enough to compensate for existing deficiencies and to keep pace with future Warsaw Pact improvements.
- o Strategy II--Increase the Rate of U.S. Reinforcement. Stationing more U.S. forces in Europe, expanding the POMCUS program (the DoD proposal), and buying more strategic airlift would be the principal ways of increasing the rate of U.S. reinforcements to NATO.

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<sup>22/</sup> SACEUR (Supreme Allied Commander Europe) is the senior military commander in Europe.

- o Strategy III--Form a Reserve Force. This strategy would not reduce the overall force ratio; it would simply buy time for the arrival of U.S. **reinforcements**. Several alternatives could be considered for forming a **SACEUR** reserve. First, the forces defending the least likely route of attack could be thinned **out**. **Second**, the German home defense groups could be used to form a reserve. Third, the U.S. REFORGER and 2+10 divisions could be **used**. Lastly, French forces could be used if they were made available after a NATO **mobilization**.

#### CONCLUSIONS

The Warsaw Pact apparently could capitalize on its advantages by attacking NATO before most U.S. **reinforcements** arrived. Moreover, the Pact could exploit its strategic initiative by concentrating its attack against the weak **NORTHAG** sector, where a successful Pact attack could undermine NATO's entire conventional defense.

This chapter has described the design strategies that could be combined to form a comprehensive program of improvements in NATO's defenses. Chapter III describes the DoD plan to expand the **POMCUS** program, discusses its contribution to the NATO **Long-Term** Defense Program (LTDP), and estimates its cost.



THE DoD POMCUS PLAN FOR STRENGTHENING NORTHAG

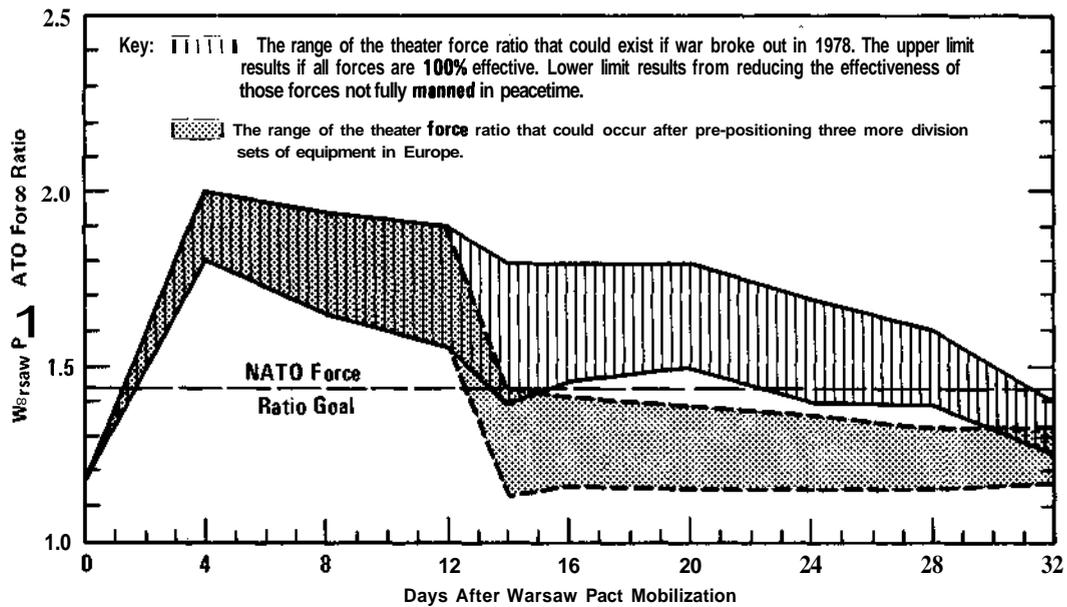
Current DoD plans for Improving U.S. forces committed to NATO call for the creation of a three-division corps force to be deployed as a Northern Army Group mobile reserve. To be effective, the corps would have to be in position soon after mobilization, preferably before war broke out. Because these troops would be deployed far from the existing logistical network in southern Germany, a separate logistics system (including about 43,000 personnel) would have to be provided for them in NORTHAG.

In order to have the corps and its supporting logistics network in position early, DoD plans to pre-position equipment for the three divisions and their support units at several POMCUS storage sites to be constructed in NORTHAG. In addition, a small planning group (including approximately 77 personnel) would be permanently stationed in NORTHAG, to plan and coordinate the arrival of the corps and its tactical employment.

The impact of the POMCUS program can be estimated by adjusting the fiscal year 1978 force deployment as though the new pre-positioned equipment were already in place and then calculating the new force ratio. This ratio would be an estimate of the 1983 conditions after the new equipment had been pre-positioned, on the assumption that NATO and Warsaw Pact force modernization and expansion programs proceed at the same rate. Figure 3 compares the new force ratio for the first 30 days after a Warsaw Pact mobilization with the current 1978 force ratio. The DoD plan achieves the force ratio goal suggested in Chapter II, which would significantly improve NATO's chances for success. Moreover, pre-positioning the equipment in NORTHAG better positions SACEUR's forces to counter penetrations that could occur in that weak sector, which should further reduce the Pact's confidence in the success of a conventional attack.

The DoD plan to pre-position three more division sets of equipment in Europe is included in NATO's Long-Term Defense Program. Recognizing that the Warsaw Pact's improved conventional capabilities were outstripping NATO's and that the alliance needed strengthening, NATO heads of state met in May

Figure 3.  
Impact of DoD Plan on the Theater Force Ratio



1977 and agreed to increase real defense spending by 3 percent a year, 1/ and to develop a long-term plan of improvements. In May

1/ The base from which the 3 percent would be measured is the subject of considerable debate and will not be discussed in this paper. However, it is useful to know approximately how much money a 3 percent increase would represent for each country. Using the defense expenditures shown in The Military Balance 1978-1979 as a base, the following real program increases would be expected:

<u>Country</u>	<u>Program Increases (in millions of dollars)</u>
Belgium	55 (real growth in 1978)
Britain	391 (real growth in 1978)
Germany	518 (real growth in 1978)
Netherlands	126 (real growth in 1978)
United States	3,456 (real growth in fiscal year 1980 outlays)

1978, a plan, now known as the NATO Long-Term Defense Program (LTDP), was presented to and approved by the heads of state. The essential elements of that plan are summarized in Appendix E.

It is not clear how much the LTDP will affect the military balance in Europe. Published reports are vague about how extensively the allies will modernize their forces; there seem to be no commitments to buy enough equipment to form more units in the reserve components or to mechanize light infantry. (The German force improvement plans detailed in Chapter II were implemented subsequent to approval of the LTDP.) Moreover, in contrast to the POMCUS plan, some elements in the program, such as improved electronic warfare and chemical warfare capabilities, are difficult to quantify and are generally not included in quantitative assessments of force balance--hence they would cause no change in standard measures of the military balance, even though their effects might be significant.

A disadvantage of the DoD POMCUS plan is that it would achieve NATO's force ratio goal without correcting the allies' firepower deficiencies, which could make it difficult for the allies to justify the additional defense spending needed to make up their deficit and keep pace with the Warsaw Pact modernization. Increasing POMCUS is, however, only one of several ways to improve the force balance. Moreover, as discussed later in this chapter, if NATO had only 5 to 10 days of mobilization before an attack, options other than increasing POMCUS might be more effective.

## COSTS OF THE DoD PROPOSAL

### Primary Costs

The primary costs of the POMCUS proposal are those associated with establishing storage sites and **emplacing** and maintaining equipment. These costs can be subdivided into the following categories:

- o Site construction,
- o Transportation charges (for moving equipment to Europe),
- o Operation and maintenance, and

- o Procurement (flexible-barrier shelters and stress-tension shelters) . 2/

Site construction costs are likely to be shared by the United States and NATO. Barrier fences and controlled humidity warehouses probably would be built with **NATO** infrastructure funds. 3/ Maintenance shops and living quarters at **POMCUS** sites do not now qualify for infrastructure funding. The Army has requested that NATO change its criteria to make these facilities eligible for infrastructure funding, but until such a change is effected, the United States would either have to pay these costs or do without the facilities.

The Army plans to use controlled humidity warehouses and flexible-barrier shelters to store equipment at the new POMCUS sites. Flexible-barrier shelters do not now qualify for infrastructure funding, so the United States must pay for them. The estimated life of the shelters is about eight years, and the Army plans to start replacing them with controlled humidity warehouses in 1983 or 1984. At that time, NATO infrastructure funds might be available to pay for the warehouses.

DoD states that its POMCUS proposal would require no **additional** equipment procurement. 4/ Theoretically, equipment to be pre-positioned would be borrowed from war reserve stocks that would be bought whether or not the POMCUS program was expanded. It is possible, however, that several factors could combine to create pressure to expand procurement programs. These factors are discussed in the following section.

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2/ Flexible-barrier shelters are plastic bags custom-made to encase one piece of equipment in a controlled humidity environment. Bags are made for even the largest items, such as **tanks**. Stress-tension shelters are tent-like structures that provide a controlled humidity environment for one or more items of equipment.

3/ The NATO infrastructure fund is established by annual contributions from member nations and is used to build facilities needed for defense. The United States provides 22 percent of the infrastructure **fund**.

4/ **U.S.** Department of **Defense**, Annual Report. Fiscal Year 1979, p. 232.

## Follow-On Costs

The DoD program could have adverse effects not now foreseen, or the adverse effects currently predicted could be more severe than envisioned. In either instance, the cost of the DoD proposal would increase. For the purposes of this study, such costs are called follow-on costs. This section identifies several problem areas that could increase the cost of the DoD proposal.

**Equipment.** The Army maintains two sets of equipment for each division in POMCUS--one pre-positioned in Europe and another used in the United States for training purposes. In theory, one set is bought for the unit and the other is borrowed from the war reserve stockpile, to be returned after mobilization when the unit draws its pre-positioned equipment. In practice, the war reserve stockpile is insufficient to meet this demand. Consequently, the equipment must be borrowed from the only other available source--the active and Reserve Component units. In the past, the Army has taken equipment solely from the Reserve Components, but meeting the full requirement of NORTHAG POMCUS would leave them at less than half of their authorized level of armored personnel carriers and some truck lines. The Army does not want to take these units below 50 percent of their authorized level of equipment; consequently, the active divisions that would use the pre-positioned equipment will not be provided full sets of equipment for training in the United States. The Army has not yet determined all of the implications of this decision. Preliminary analyses indicate that it may be necessary to withdraw M-113 armored personnel carriers from mechanized infantry units and that current shortages of five-ton trucks would be exacerbated. According to these same analyses, even these measures will leave the second and third division sets of equipment to be pre-positioned short of requirements. CBO estimates that the shortage could be as great as 20 percent.

Although units now train with less than a full set of equipment, the new POMCUS program would make the shortages worse. Training difficulties in the active POMCUS divisions could develop because of the shortage of armored personnel carriers, trucks, and other less visible, but nonetheless important, equipment. Some officials believe that these problems would not become severe enough to nullify the benefits of POMCUS, even though they would grow somewhat in the near future. This may be a fair assessment at this time, but experience may prove otherwise. Withdrawing



equipment from the Reserve Components could aggravate the recruiting and training problems already being encountered. In fact, if the impact were too severe, it might not be possible to withdraw the equipment. In that case, the Army probably would be hard pressed to meet the pre-positioning schedule without procuring more equipment than now programmed.

The 20 percent deficiency that could occur in the last two **division** sets being pre-positioned in NORTHAG could also lead to larger procurement requests in the early 1980s. It could be argued that, having expended the effort to pre-position the first 80 percent, it would make little sense to delay the remaining 20 percent until the late 1980s, when the currently planned procurement program would probably make up the difference.

War Reserve Stocks and Ammunition. Because the three new **POMCUS** divisions would be in theater earlier than under existing reinforcement plans, more war reserve equipment and ammunition would be needed to support them. Therefore, more of those stocks would have to be procured and pre-positioned in Europe. If procurement programs were not expanded in the 1980s, the Army would have to reduce **CENTAG** stocks in order to provide some war reserves for NORTHAG.

NORTHAG Support Structure. Until 1977, when a U.S. brigade was moved to NORTHAG, the United States did not formally participate in the defense of NORTHAG and had no reason to maintain a logistics base there. DoD's plan to commit three **POMCUS** divisions to NORTHAG changes that situation considerably and creates the possibility of even greater increases in the program's cost.

The **POMCUS** divisions are likely to be in combat very soon after their arrival, and will need medical support, ammunition, fuel, maintenance assistance, and other logistical support almost immediately. The logistics units included in the NORTHAG **POMCUS** package (43,000 personnel) are designed to provide that support. But without an existing logistics base on which to build, the first week or two after deployment would be spent in establishing such a base. During that period, support for the divisions would be difficult to provide.

The ideal solution would be to have a small logistics base in NORTHAG in peacetime that could be quickly expanded by using the logistics units in **POMCUS**. The logistics system could then be immediately responsive to the needs of the divisions. Although this alternative is not now part of DoD's NORTHAG **POMCUS**

proposal, the problem is real and the Congress can expect that sooner or later DoD will want to move in that direction. CBO estimates the cost of providing a skeleton peacetime support base to be \$640 million, which includes the addition of 12,500 military personnel to the Europe-deployed strength.

Costs Through Fiscal Year 1984

Table 2 shows CBO's estimate of the cost of the DoD POMCUS program through fiscal year 1984. The estimate includes the cost of programs CBO considers as probable additions, even though they are not part of the current DoD plan. Some costs might be deferrable beyond 1984, but not if the full benefit of the DoD proposal is to be realized when the **pre-positioning** is completed.

TABLE 2. ESTIMATED COST OF **PRE-POSITIONING** THREE DIVISION SETS OF EQUIPMENT: IN MILLIONS OF FISCAL YEAR 1980 DOLLARS a/

Item	Cost
<b>Primary Costs</b>	
Operations	300
Construction of POMCUS sites	400 <u>b/</u>
Procurement of flexible-barrier shelters	40
Transportation and spare parts	200
<b>Follow-On Costs</b>	
Equipment to fill last 20 percent of POMCUS	360
Increased support structure in <b>NORTHAG</b> (12,500 personnel)	640
War reserve stocks	<u>580</u>
Total	2,520

a/ Includes direct U.S. funding, NATO infrastructure funding, and host nation support.

b/ Construction of POMCUS sites (excluding maintenance shops and living quarters) will be funded through the NATO infrastructure **fund**.

The costs after fiscal year 1984 would be about \$100 million a year for operation and maintenance of POMCUS and the war reserves. A one-time cost of possibly \$150 million for replacing the flexible-barrier shelters with controlled humidity warehouses should be expected, although the NATO infrastructure fund would probably pay for that expense.

#### CONCLUSIONS

Although the DoD POMCUS plan is part of the overall NATO **Long-Term** Defense Program to improve alliance defenses, implementation of the U.S. program could make it more difficult for the other allies to justify the expense of correcting the major deficiencies in their forces while also matching Warsaw Pact modernization. The U.S. program also might cause training problems in the near term, and it could exert considerable pressure for larger procurement programs in the mid-1980s. **Thus,** the Congress may wish to explore alternative ways of strengthening NATO before present U.S. plans become irrevocable commitments.

Chapter IV discusses three alternative comprehensive NATO plans to strengthen **NORTHAG** defenses. The level of U.S. responsibility varies with each alternative.

THE NEED TO IMPROVE THE OVERALL FORCE RATIO AND STRENGTHEN NORTHAG

The notion that the Warsaw Pact would have the strategic initiative, combined with the fact that it could get its forces to the battle faster than NATO, has important implications for the design of NATO's conventional defenses. Because NATO can know neither where nor when an attack might come, its corps sectors should be uniform in strength. **Additionally**, it should have enough forces to form a mobile reserve that could move to reinforce whichever corps sectors the Warsaw Pact main attack struck. Chapter II showed that NATO's corps sectors are not now uniform in strength and that there are not enough forces available to form a reserve quickly after **mobilization**. Chapter II also suggested that if NATO could design its forces to achieve a 1.44:1 overall force ratio within 10 days of mobilization, then combat capability should be sufficient to conduct a successful conventional defense. Three force design strategies were identified, two of which would lead directly to the objective force ratio. The third strategy would simply buy the time needed for the majority of **U.S.** reinforcements to arrive.

This chapter discusses the strengths and weaknesses of each design strategy and develops alternative options for strengthening NATO by using the design strategies in different **ways**.

AVAILABLE DESIGN STRATEGIES

Strategy I--Strengthen NORTHAG Defenders

Options included in this strategy are moving peacetime stations closer to wartime defensive positions, modernizing equipment, and mechanizing more units. Changing peacetime locations for the entire force in NORTHAG is probably unworkable. It might, however, be practical to move more Dutch forces into Germany, which would somewhat reduce the Dutch corps sector's vulnerability to a no-warning attack.

The non-U.S. NATO allies could improve the overall force ratio by increasing the capability of their forces and by providing more combat units. To increase their force capability, the

allies could modernize and mechanize their units. Vintage tanks could be replaced with newer **ones**; armored personnel carriers could be replaced by armored fighting vehicles; medium artillery (155mm howitzers) could replace light artillery (105mm howitzers); artillery densities could be brought up to those of U.S. forces; and second-generation antitank weapons (TOW, Dragon, HOT, Milan) could replace first-generation weapons. A modernization program such as this would release equipment that could be used either to mechanize existing reserve component units or to form new mechanized units manned with the abundant reserve manpower available in each country. Table 3 shows the allies' potential for increased **mechanization**.

TABLE 3. POTENTIAL FOR INCREASED MECHANIZATION OF ALLIED FORCES

West Germany	Belgium	The Netherlands	Britain
3 Light Infantry Brigades	1 <b>Paracommando</b> Regiment	1 Reconnaissance Battalion	9 Armored Reconnaissance Regiments
	3 Reconnaissance Battalions	1 Independent Infantry Brigade	15 Infantry Battalions
	2 Motorized Infantry Battalions		

SOURCE: The Military Balance 1978-1979 (International Institute for Strategic Studies: **London**), pp. 19-28.

**Strategy II--Increase the Rate of U.S. Reinforcement**

This strategy is relevant only to situations in which warning time is short. Longer-warning times (say, 60 to 90 days) would give the **United** States enough time to transport the bulk of its forces to Europe before war broke out. Two options for improving U.S. combat readiness will be **discussed**: stationing more forces in Europe and increasing the size of POMCUS. A

third option, buying more **airlift**, could also be considered but will not be explored in detail because of its prohibitive cost. (One DoD analysis shows that **POMCUS** delivers units 11 to 12 times as fast as an air fleet of equal cost.)

The United States could choose to station more forces in Europe as a way of improving NATO's **ability** to respond to a Pact attack that came with extremely short warning. As noted earlier, Warsaw Pact forces are assumed to be increasingly capable of launching an attack with **little** warning. To the extent that they could conceal their preliminary preparations or confuse allied commanders about their intentions, the likelihood of an attack with **little** warning would be increased. In such a **circumstance**, NATO's situation would be the same as if there had been no warning.

Either the First Infantry Division (mechanized) or the Second Armored Division could be stationed in Germany without reducing the United States' capability to react to contingencies that might develop in other parts of the world. The domestic and international political response to such a move is unknown, however, and falls beyond the scope of this study. A related **consideration--also beyond the scope of this study--is** the impact that more forward deployments would have on the Mutual and Balanced Force Reduction (**MBFR**) negotiations.

On a **one-for-one basis**, POMCUS is less expensive than stationing units in Europe, but its **effectiveness** is more dependent on warning time. Although both **forward-deployed** units and POMCUS stocks would be vulnerable to a Pact air attack that was launched with **little** or no warning, forward-deployed units would be better able to disperse their equipment before a second attack could be launched. Too few personnel are at the POMCUS sites to disperse equipment as quickly, and follow-on attacks might find equipment **still** in warehouses and POMCUS personnel exposed. Even so, the Warsaw Pact would have to concentrate a significant portion of its air attack assets against POMCUS in order to do any real harm. Since vehicles are stored without fuel and ammunition, there is **little likelihood** that an attack would cause secondary explosions or fires. Consequently, only **direct hits** with bombs would damage armored vehicles. Trucks and trailers could be damaged by near misses, but they would not necessarily be made useless. **Thus**, it appears that the Warsaw Pact would have to conduct a heavy, sustained attack in order to neutralize POMCUS.

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The Pact could reduce the **effectiveness** of the **POMCUS** reinforcement option with attacks on higher priority targets or with attacks against the soft links in the transportation network that would be used by reinforcing units. For example, attacks on NATO airfields in the early days of an air war could delay the arrival of U.S. **reinforcements**, thus disrupting the entire POMCUS process. If aircraft transporting **U.S.** troops to Germany had to be diverted to alternate air fields, possibly in France, the troops' arrival at the POMCUS storage sites would be delayed **significantly**. This could give a significant advantage to attacking Warsaw Pact forces. **Thus**, in the case of a surprise attack, forward deployment is the more effective reinforcement option.

CBO estimates that with five days' warning time, a significant portion of the POMCUS stocks could be distributed to arriving troops, provided that a decision to deploy **U.S.** units was made shortly after the warning was received. With 10 days' warning, all stocks could be **issued**. 1/ **Thus**, POMCUS is likely to be the most cost-effective alternative in scenarios with warning times greater than **five days**.

#### Strategy III--Form a Reserve Force

This strategy includes two options for forming a reserve in **NORTHAG**; the options could be used independently or in combination. The first alternative would be to form a reserve force by using the six West German home defense groups and the **U.S.** division whose equipment will be in **NORTHAG** POMCUS by the end of fiscal year 1980. Since it would take perhaps a week to mobilize the home defense groups and move them to **NORTHAG**, this solution has low utility in no-warning scenarios. 2/ The second option would be to make use of the two French divisions stationed in Germany and the three in France. With adequate warning time (say, a week or so), the French divisions could take over a corps

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1/ U.S. Department of Defense, Annual Report, Fiscal Year 1979. p. 7.

2/ Federal Minister of Defense, White Paper **1975/1976**, The Security of the Federal Republic of Germany and the Development of the Federal Armed Forces (Bonn: January **1976**), p. 89.

sector in **CENTAG** now assigned to West Germany. The German corps could then be moved to **NORTHAG**, where it would assume control of the **U.S. POMCUS** division and form a **NORTHAG** reserve. In short-warning scenarios, the French forces could move directly to **NORTHAG** and act as the reserve force. This solution would be somewhat more difficult for the French to sustain. It must be remembered that French forces are no longer officially committed to NATO's defense, and any option for the use of their forces assumes that France would make its divisions available quickly after mobilization.

#### ALTERNATIVE U.S. OPTIONS

Using the three strategies described above and the following **criteria**,

- o The force ratio should be kept below 1.44:1 after NATO **M+10**,
- o The initial defense in all corps sectors should be uniformly strong,

three equally effective options for the United States are described in this section. The alternatives are examples of the directions in which the United States could move to satisfy its security interests in NATO.

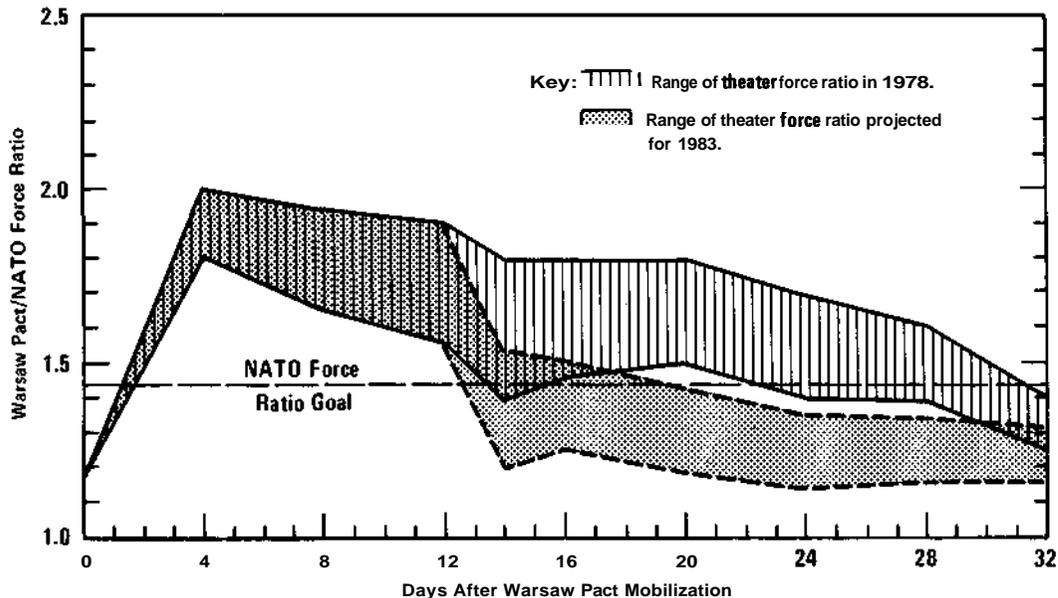
Each option assumes successful completion of the program to pre-position one division set of equipment in **NORTHAG** in fiscal year 1980, improved readiness of the **REFORGER** and **2+10** units, and completion of any airlift improvement that might be needed to ensure that the **REFORGER** and **2+10** units could arrive within 10 days of NATO mobilization. In addition, it is assumed that NATO and the Warsaw Pact will modernize at the same rate during the period 1980-1984. Figure 4 shows how much these programs would improve the overall force ratio by fiscal year 1983.

#### Option I--Non-U.S. NATO Increases Firepower by 13 Percent

In this alternative, the non-U.S. NATO allies would improve their firepower capabilities by 13 percent over their fiscal year 1978 position. The allies' increased strength, the one U.S.



Figure 4.  
Theater Force Ratio Improvement Projected for Fiscal Year 1983<sup>a</sup>



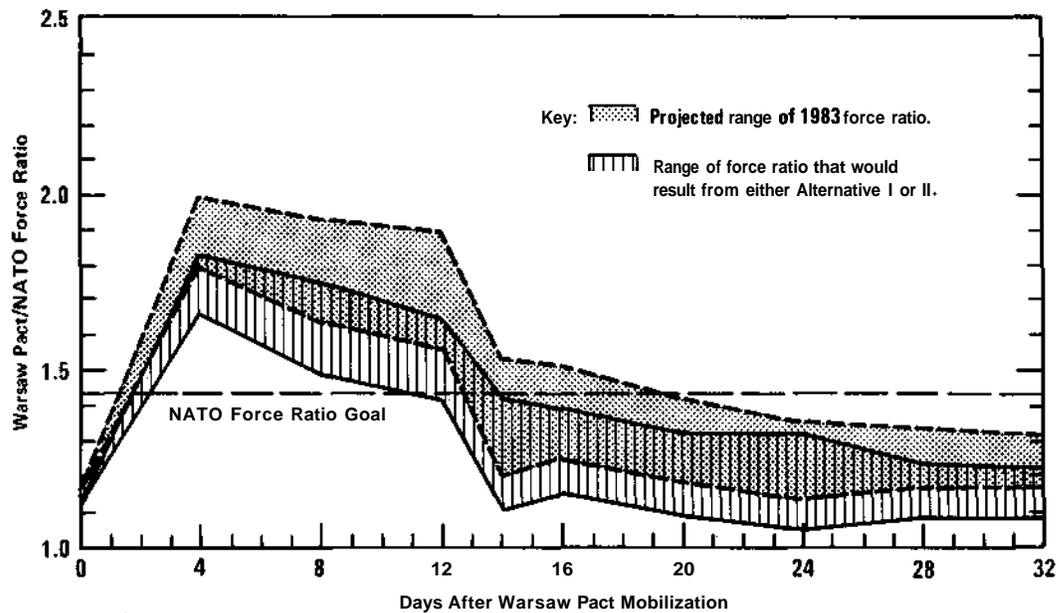
<sup>a</sup> Assumes completion of programs necessary to ensure that REFORGER, 2 + 10, and one division for NORTHAG could be in Europe within 10 days of NATO mobilization, and that NATO and Warsaw Pact modernize at the same rate.

division pre-positioned in NORTHAG, the stronger German home defense groups, and the French forces would be available to form mobile reserves.

Under this option, the 13 percent improvement in the non-U.S. NATO allies would achieve the 1.44:1 overall force ratio objective. Such improvement would also significantly strengthen the peacetime force and reduce NATO's vulnerability to a no-warning attack (see Figure 5).

How much each ally would have to improve its forces cannot be calculated. It is also not possible to determine how much improvement is planned as part of the NATO Long-Term Defense Program. Thus it is not clear whether this alternative would demand more or less of the allies. Another complication is that, while making up the deficit, the allies would also have to match the Pact's rate of modernization, as would the United States.

Figure 5.  
 Comparison of Alternatives I and II Force Ratio  
 with the Projected Fiscal Year 1983 Force Ratio



Nevertheless, on the basis of Chapter II's analysis of the deficiencies in each corps, it is possible to estimate that the allies would need to achieve the following, just to erase the firepower deficit:

- o One hundred percent of tank fleet **equivalent** to or better than either the M-60A1 or the Leopard I;
- o Fifty percent of all infantry-type units equipped with armored fighting vehicles, and the remainder with vehicles equivalent to the **U.S. M-113** armored personnel carrier (the 50 percent split is strictly **arbitrary**);
- o Artillery densities equal to U.S. forces, and 105mm **howitzers** replaced by 155mm howitzers;
- o All first-generation antitank guided weapons replaced by second-generation systems.

It should be remembered that although **this** option emphasizes non-U.S. NATO **improvements**, the United States would still pre-position one division set of equipment in **NORTHAG** and ensure the delivery to Europe of all **POMCUS** units within 10 days after mobilization. Both of these help to achieve an overall theater level force ratio of 1.44:1. (The force ratio curves projected for fiscal year 1983 shown in Figure 5 include these **programs.**)

A major disadvantage of this alternative is that the United States would be proposing that the allies substitute a 13 percent increase in their firepower for the second and third additional division sets of equipment promised by the United States in the LTDP. Whether the allies would be willing to eliminate the 13 percent deficit as well as match the Warsaw Pact modernization is **unknown.**

Option II--Non-U.S. NATO Increases Firepower by 10 Percent; The United States Stations Two More Brigades in Germany

This option would move to Germany the two brigades of the First Infantry Division stationed in the United States plus an appropriate amount of fire support and logistical support. The allies would increase their firepower capability by 10 percent over their fiscal year 1978 level.

Both Options I and II would **significantly** reduce NATO's vulnerability to a no-warning attack. Option II would produce the same force ratio over time as Option I (see Figure 5), but at greater cost to the United States and less to the other allies. Under this alternative, **NORTHAG** would have a two-division U.S. **corps.** The 10 percent improvement in allied **firepower** should do a lot to make corps sectors uniformly strong.

The effective cost of this alternative for the United States could be reduced by stationing the Second Infantry Division at Fort **Riley**, Kansas, the post vacated by the movement of the First Infantry Division to Europe. A stationing plan of this kind would avoid the construction costs of preparing another location for the Second Infantry Division.

Under this alternative, there would be no need to withdraw or divert equipment from active-duty or Reserve Component units. Thus, readiness of all U.S. units would probably improve, relative to the current DoD proposal.

The substitution of a 10 percent increase in allied firepower and forward deployment of two U.S. brigades for the last two sets of U.S. pre-positioned equipment might be criticized on the ground that the United States would thereby fail to meet its LTDP commitment. On the other hand, some would argue that increased deployments represent a greater commitment than **pre-positioning equipment**.

### Option III--The United States Pre-Positions the Second and Third Additional Division Sets of Equipment

Under this alternative, the United States would pre-position two more division sets of equipment in **NORTHAG**. Non-U.S. NATO would match Warsaw Pact modernization rates but would not make up its current firepower deficit.

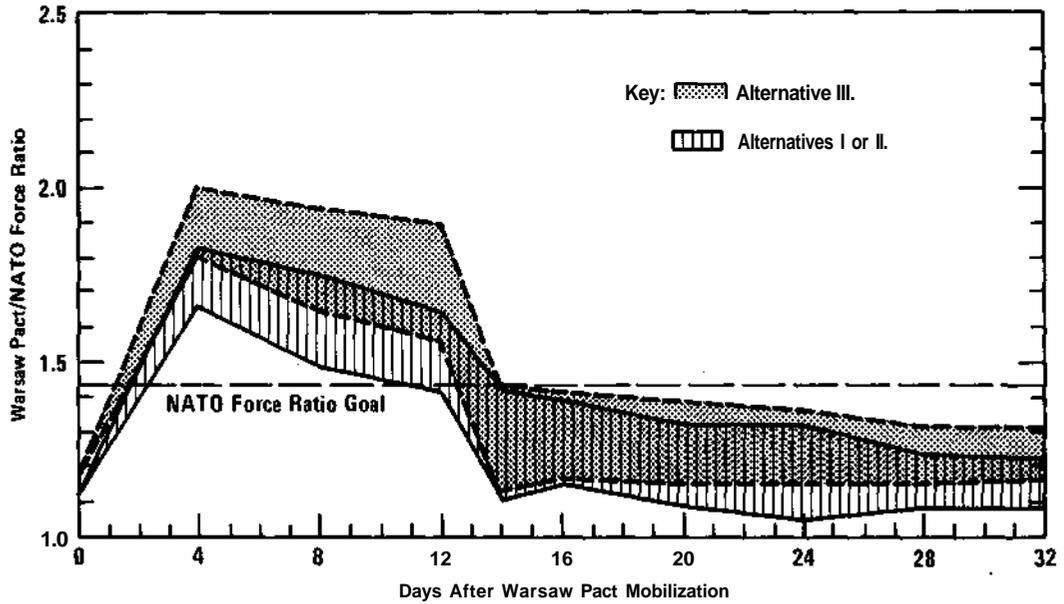
Option III would provide a strong three-division U.S. corps for a *NORTHAG* reserve. As noted in Chapter III, this substantial addition to *NORTHAG* would have the same effect as uniformly strengthening the initial defense of its corps sectors without further effort by the allies. To preclude a reduction in the readiness of U.S. units stationed in the United States, this option would procure all necessary equipment to execute the plan.

Figure 6 shows that the **effectiveness** of Option III is virtually the same as the effectiveness of Options I and II. The **effectiveness** of this option would, however, depend on NATO's detecting a Warsaw Pact mobilization and promptly mobilizing its own forces. If there were a failure in either area, so that U.S. personnel were moving to **POMCUS** sites after the war broke out, then Option III could be significantly less effective than either Options I or II because of the probable disruption of the flow of **reinforcements**. The U.S. costs of Option III are almost 60 percent more than the costs of Option II.

### SUMMARY

All three options would achieve the theater force ratio goal of 1.44:1 after 10 days of NATO **mobilization**. Options I and II would increase the strength of the peacetime force as well as the postmobilization force; therefore, they would reduce the risks associated with a no-warning attack. Options I and II would entail substantial improvement in the allies' forces. Insufficient evidence is available to estimate how much the

Figure 6.  
Comparison of Alternatives I, II, and III



NATO LTDP would contribute to the needed improvement; **thus, it is** not possible to estimate the additional burden to the allies of reducing their force deficit and matching the Warsaw Pact modernization rate. Option III is the most expensive for the United States. The U.S. cost of Option II could be reduced by 21 percent if the Second Infantry Division were stationed at Fort **Riley**, Kansas after it is withdrawn from Korea. Table 4 summarizes the costs of the options.

TABLE 4. COST COMPARISON OF U.S. OPTIONS, FISCAL YEARS 1980-1984: IN MILLIONS OF FISCAL YEAR 1980 DOLLARS a/

	Option I (Allies Increase Firepower by 13 Percent)	Option II (U.S. Deploys One Division to Germany; Allies Increase Firepower by 10 Percent)	Option III United States Pre-Positions 2nd and 3rd Additional Sets of Equipment)
Operations	140	300	350
Construction	—	790	400
Procurement of Flexible- Barrier Shelters	15	15	40
Transportation and Spare Parts	50	95	200
Equipment to Fill POMCUS	—	—	360
Increased Support for NORTHAG	220	425	640
War Reserves	190	390	580
Savings	—	-430 <u>b/</u>	—
Total	615 <u>c/</u>	1,585	2,570

a/ Includes direct U.S. funding, NATO infrastructure funding, and host nation support only for the U.S. portion of each alternative. The cost of the allies' action cannot be determined.

b/ This option assumes that the First Infantry Division is deployed to Europe, leaving Fort **Riley**, Kansas, vacant. If the Second Infantry Division were stationed there, there would be a cost avoidance of at least \$430 million, which is taken as a savings. The costs of stationing the Second Infantry Division range from \$430 to \$810 million, depending on what location is chosen.

c/ Cost to the United States to complete the pre-positioning of the first division set of equipment, which will be in NORTHAG by 1980.



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## CHAPTER V. FINAL CONSIDERATIONS

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NATO can expect to face an unfavorable balance of forces for at least 30 days after a decision to mobilize; hence, the alliance cannot be confident of its ability to conduct a conventional defense of Europe. This lack of confidence could have a negative effect in any political confrontation between NATO and the Warsaw Pact. The imbalance is not new; it has been developing for a long time. Moreover, it cannot be easily or quickly changed. Continued aggressive force modernization and expansion by the Warsaw Pact could considerably increase the burden of NATO efforts to change the balance.

Because no NATO corps sector should be weaker than any other, the organization of NATO's defense into national corps sectors implies that any effort to improve the force balance be a coordinated, comprehensive program. That does not mean that all countries must be equally strong; rather, it implies that there should be no asymmetries among the corps sectors that a Warsaw Pact attack could exploit.

Such asymmetries exist today, and it is not at all clear that the NATO countries are committed to eliminating them while at the same time matching Warsaw Pact modernization and expansion. The Long-Term Defense Program commits NATO to improve its forces, but too little information is available on the allied force improvement plans to permit a complete evaluation of them. Additionally, the United States' promise to pre-position three division sets of equipment in NORTHAG would make such a substantial improvement in the overall force balance that it could make it difficult for the Dutch, British, and **Belgians--** who have the greatest force **deficiencies--to** achieve a net increase in their capability vis-a-vis the Warsaw Pact.

Because the Warsaw Pact modernization and force expansion rate plays such a significant role in determining what NATO has to do to improve the overall force balance, it might be possible to restrain the future growth of NATO defense budgets by negotiating with the Warsaw Pact limits to modernization and force expansion. A logical forum for such negotiations would be the ongoing Mutual Balanced Force Reduction talks in **Vienna.**

From the perspective of the Congress, therefore, budgetary decisions concerning NATO's defense are related to two sets of issues. The first is the rate at which the Warsaw Pact continues to expand and modernize its forces. The second involves actions by the Europeans to redress the firepower gap between their forces and those of the Warsaw Pact. Assessment of both steps is central to decisions concerning the **pre-positioning** of additional U.S. equipment, as well as to the broader decisions concerning fulfillment of the pledge of 3 percent real growth in defense **expenditures.**

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A P P E N D I X E S

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APPENDIX A. GLOSSARY OF MILITARY UNITS

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Maneuver Platoon

The smallest standard fighting formation commanded by a commissioned officer. A tank platoon has about 20 personnel and 5 **tanks**; a mechanized **infantry** platoon has about 40 **personnel**, divided into 3 squads of 11 men each, plus a headquarters element. Each squad is mounted in an armored personnel carrier.

Maneuver Company

The next largest standard fighting formation commanded by a **commissioned** officer. It consists of three maneuver platoons and support elements. Its strength varies from about 90 personnel and 17 tanks in a tank company to about 150 personnel and 9 infantry carriers in a mechanized infantry company.

Maneuver Battalion

A maneuver battalion consists of three maneuver companies; a company-sized element, to provide mortar and antitank fire support to the maneuver **companies**; and another company-sized element **for** command and control, maintenance support, medical support, food service, and supply. A tank battalion has about 550 personnel and 54 tanks. A mechanized infantry battalion has about 800 **personnel**.

Brigade

A command and control unit capable of controlling up to five maneuver battalions. Three or four battalions are normally assigned to **it**. A "mechanized" brigade has more mechanized infantry battalions than tank battalions.

Division

The standard elements of a division include command and control units; artillery battalions (500-600 personnel **each**);



aviation elements; an engineer battalion (approximately 900 personnel); several other battalion-sized units that can provide medical, maintenance, supply, and other types of support; and three brigade **headquarters**. Maneuver battalions are assigned to a division on the basis of the division's probable missions; as few as 6 or as many as 15 maneuver battalions could be assigned to a division. The missions of a division also determine the mix of tank battalions and mechanized infantry battalions. Armored divisions stationed in Europe have six tank battalions and five mechanized infantry battalions. Mechanized infantry divisions in Europe have six mechanized infantry battalions and five tank **battalions**.

### Corps

This is a command and control unit that is staffed and equipped to control from two to five divisions. Artillery battalions, **communications** units, supply, medical, maintenance, engineer, and other support organizations are assigned to the corps to provide the added support structure each division needs to fight.

### Armored Cavalry

Armored cavalry units accomplish a variety of missions, including reconnaissance and counter-reconnaissance operations. To maintain some of the cavalry tradition, armored cavalry units have different labels than standard units, as shown below:

#### Standard Unit

Platoon  
Company  
Battalion  
Brigade

#### Armored Cavalry Unit

Platoon  
Troop  
Squadron  
Regiment

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APPENDIX B. DERIVATION OF FORCE RATIOS

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The chart shown below was taken from page iv of A Report to Congress on U.S. Conventional Reinforcements for NATO, prepared by the Office of the Secretary of Defense in June 1976. Adding a scale, adjusting the buildup curves to show the latest estimates, and making the assumptions detailed below enables one to read force units by time period from the chart, which can be converted to force ratios (see Table B-1, which also shows the force ratio measured by manpower in **divisions**). Table B-2 provides the data estimating how the NATO buildup could change as the amount of pre-positioned equipment increases. Table B-3 provides the buildup data for Options I and II.

Figure 7.  
Comparison of Land Forces (Center Region)

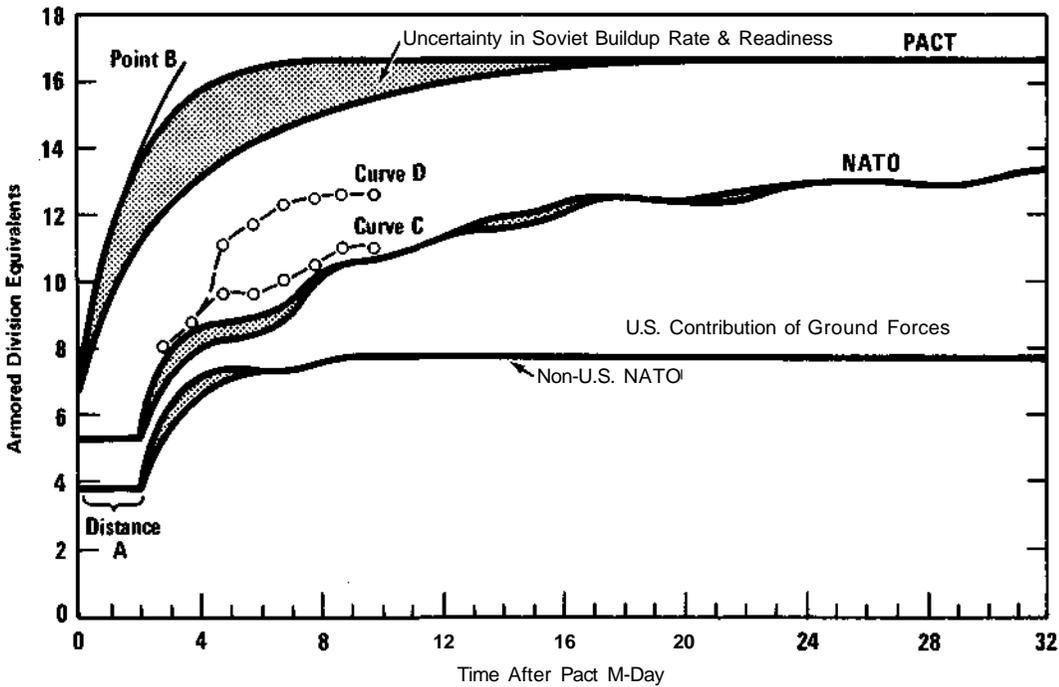


TABLE B-1. 1978 WARSAW PACT/NATO FORCE RATIOS

Time		Warsaw Pact/NATO Force Ratio			
Pact	NATO	Armored Division Equivalents			Manpower in Divisions
		a/	b/	c/	c/ d/
M-Day		1.2			1.4
M+4	M-Day	1.8-2.0			1.5
M+7	M+3	1.7-1.8			1.5
M+8	M+4	1.6-1.9			
M+12	M+8	1.6-1.9			
M+14	M+10	1.4-1.8			1.6-1.7
M+16	M+12	1.5-1.8			
M+20	M+16	1.5-1.8			
M+21	M+17				1.4-1.5
M+24	M+20	1.4-1.7			
M+28	M+24	1.4-1.6			1.4-1.5
M+32	M+28	1.2-1.4			

a/ Derived from U.S. Department of Defense, A Report to Congress on U.S. Conventional Reinforcements for NATO (June 1976), p. **IV-3**. See Appendix B for details.

b/ Armored division equivalents is a standard measure of combat potential used by the Department of Defense. It is developed by a scheme that gives a score to all weapons on the basis of their laboratory-tested capability, weighs that score judgmentally based on the weapon's relationship to other weapons on the battlefield, and sums the weighted values of all weapons in the force. The total score is then divided by the weapons score for a standard U.S. armored division to yield the armored division equivalent.

c/ In order to generate sufficient forces to launch an attack, the Warsaw Pact would have to use Category II and III divisions, whose readiness may not be at 100 percent at the time of attack. This creates some uncertainty about the quality of the threat.

d/ Original work done by Lucas Fischer, Defending the Central Front: The Balance of Forces. Adelphi Paper No. 127 (London: International Institute for Strategic Studies, Autumn 1976), was based on a seven-day lag between Warsaw Pact and NATO mobilization. This analysis adjusts his work in two ways. First, the time between a Warsaw Pact and NATO mobilization is reduced to **four days**. Second, Fischer estimated that the REFORGER and 2+10 POMCUS units would not be available for combat until NATO M+21. Secretary of Defense Brown, on the other hand, has specified that allied forces could be augmented by one or two U.S. divisions by NATO M+10. (See U.S. Department of Defense, Annual Report, Fiscal Year 1979, p. 38.) Thus, this analysis assumes that one unit is available for combat by M+12 and the other two are phased in between M +12 and M+21.

TABLE B-2. ESTIMATE OF CHANGE IN NATO BUILDUP a/

Time	Force Units					Warsaw Pact/NATO Force Ratio		
	Warsaw Pact	Non-U.S. NATO	U.S.			1978	1983 <u>b/</u>	1983' <u>c/</u>
			1978	1983 <u>b/</u>	1983' <u>c/</u>			
Pact M-Day	6.5	4.0	1.5	1.5	1.5	1.18	1.18	1.18
M+4	10-11	4.0	1.5	1.5	1.5	1.82-2.00	1.82-2.00	1.82-2.00
M+8	11.5-15.5	5.5-6.5	1.5	1.5	1.5	1.64-1.94	1.64-1.94	1.64-1.94
M+12	12.5-16.0	6.5-7.25	1.5	1.5	1.5	1.56-1.83	1.56-1.83	1.56-1.83
M+14	12.75-16.75	7.0-7.25	2.1	3.6	4.4	1.40-1.79	1.20-1.54	1.12-1.44
M+16	13.25-16.75	7.0-7.5	2.1	3.6	4.4	1.46-1.74	1.25-1.51	1.16-1.41
M+20	13.75-16.75	7.5	2.1	4.2	4.6	1.43-1.74	1.18-1.43	1.14-1.38
M+24	14.00-16.75	7.5	2.5	4.8	4.8	1.40-1.68	1.14-1.36	1.14-1.36
M+28	14.50-16.75	7.5	2.5	5.0	5.2	1.45-1.68	1.16-1.34	1.16-1.32
M+32	14.75-16.75	7.5	3.0	5.2	5.2	1.40-1.60	1.16-1.32	1.16-1.32

NOTE: The table is constructed under the premise that the only change in the forces between 1978 and 1983 is the increased **POMCUS**. In reality, all forces are undergoing modernization and expansion that will cause the absolute value of the force units to change. However, if all forces improve at the same rate, the force ratios would be unchanged by the modernization and expansion. Therefore, this analysis assumes that NATO matches Warsaw Pact modernization and expansion, which allows identification of the impact of POMCUS changes.

a/ NATO lags Warsaw Pact by four **days**.

b/ The 1983 column assumes the REFORGER and 2+10 units and only one **NORTHAG** division arrive by Pact M+14 (NATO **M+10**).

c/ The 1983' column assumes the REFORGER and 2+10 units and three **NORTHAG** divisions arrive by Pact M+14 (NATO **M+10**), as proposed in the DoD POMCUS plan.

TABLE B-3. **BUILDUP** DATA FOR OPTIONS a/

Time	NATO Force Units						Force Ratio		
	Non-U.S.			U.S.			Option I	Option II	Option III
	Option I	Option II	Option III	Option I	Option II	Option III			
Pact M-Day	4.52	4.32	4.0	1.5	1.7	1.5	1.08	1.08	1.18
M+4	4.52	4.32	4.0	1.5	1.7	1.5	1.66-1.83	1.66-1.83	1.82-2.00
M+8	6.22-7.35	6.02-7.15	5.5-6.50	1.5	1.7	1.5	1.49-1.75	1.49-1.75	1.64-1.94
M+12	7.35-8.19	7.15-7.99	6.5-7.25	1.5	1.7	1.5	1.41-1.65	1.41-1.65	1.56-1.83
M+14	7.91-8.19	7.71-7.99	7.0-7.25	3.6	3.8	4.4	1.11-1.42	1.11-1.42	1.12-1.44
M+16	7.91-8.48	7.71-8.28	7.0-7.50	3.6	3.8	4.4	1.15-1.39	1.15-1.39	1.16-1.41
M+20	8.48	8.28	7.5	4.2	4.4	4.6	1.08-1.32	1.08-1.32	1.14-1.38
M+24	8.48	8.28	7.5	4.8	5.0	4.8	1.05-1.32	1.05-1.32	1.14-1.36
M+28	8.48	8.28	7.5	5.0	5.0	5.2	1.08-1.24	1.08-1.24	1.16-1.32
M+32	8.48	8.28	7.5	5.2	5.2	5.2	1.08-1.22	1.08-1.22	1.16-1.32

a/ Warsaw Pact force units for all options are same as those presented in Table B-1.

### Assumptions and Adjustments

The DoD report specifies that NATO mobilization lags behind the Warsaw Pact's, but does not state by how much; however, analysts have used a 23/30 scenario (a seven-day NATO lag) for nearly a decade. 1/ Assuming that the 23/30 scenario was used to build the chart, then distance A equals seven **days**, which allows the time scale to be converted to days after Warsaw Pact **mobilization**.

Adjusting the Warsaw Pact buildup to the predominant view that 86 to 90 divisions would be available within 14 days of Pact mobilization produces point B. 2/

Adjusting the NATO buildup for the earlier availability of U.S. divisions, announced by Secretary Brown in DoD's posture statement for fiscal year 1979, produces curve C.

### Estimates

DoD's fiscal year 1979 posture statement also states that, by 1983, the United States would be able to deploy five divisions within 10 days of **mobilization**. Curve D is an estimate of the improved buildup.

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1/ Congressional Budget Office, Assessing the NATO/Warsaw Pact Military Balance, Budget Issue Paper for Fiscal Year 1979 (December 1977), p. 21.

2/ See Lucas Fischer, Defending the Central Front; The Balance of Forces, Adelphi Paper No. 127 (London: International Institute for Strategic Studies, Autumn 1976), p. 23.



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APPENDIX C. ANALYSIS OF IMPACT OF UNFAVORABLE FORCE RATIOS

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**Assume:**

- o NATO forces are **Initially** distributed evenly among the corps sectors;
- o The Warsaw Pact/NATO force ratio in all but the main attack sector is 1:1;
- o NATO can successfully defend against 3:1 in the main attack sector;
- o NATO would accept a 2:1 ratio in non-main attack sectors.

Let:

- x = NATO's strength;
- y = Warsaw Pact's strength;
- z = The number of corps sectors (eight for this **analysis**).

Then:

$$\frac{x}{z} = \text{NATO strength in all sectors at start of war and Warsaw Pact strength in non-main attack sectors;}$$
$$y - x\left(1 - \frac{1}{z}\right) = \text{Warsaw Pact strength in main attack sector;}$$
$$\left(\frac{zy}{x} - z\right) + 1 = \text{Force ratio in main attack sector.}$$

The number of corps that would have to send reinforcements to achieve a 3:1 ratio in the main attack sector is then found by:

$$\left[ \frac{y - x \left(1 - \frac{1}{z}\right)}{3} - \frac{x}{z} \right] \div \frac{x}{2z}$$

Which simplifies to:

$$\frac{2zy}{3x} - \frac{2z}{3} - 1 \frac{1}{3}$$

Substituting  $z = 8,$

the equation becomes:

$$5.333 \left( \frac{y}{x} \right) - 6.666 = \text{Number of corps involved.}$$

Figure 2 was constructed using the above formula and assumptions.

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APPENDIX D. CALCULATION OF WARSAW PACT/NATO FORCE RATIOS:  
MANPOWER IN DIVISIONS AND FIREPOWER

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Warsaw Pact

Manpower in divisions at 35 days after mobilization =  
934,000. 1/

Armored division equivalent force units (firepower) = 16.75  
(see Appendix B).

Non-U.S. NATO

Manpower = 474,000. 2/

Armored division equivalent force units (firepower) = 7.5  
(see Appendix B).

United States

Active division manpower:  
(15 division equivalents + 3 ACRs + 6th ACCB) x 16,000 = 261,328.

Estimate active armored division equivalent force units  
(firepower) = 5.25.

Force Ratios

Manpower

$$\text{Warsaw Pact/Non-U.S. NATO} = \frac{934,000}{474,000} = 1.97$$

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1/ See Lucas Fischer, Defending the Central Front; The Balance of Forces, Adelphi Paper No. 127 (London: International Institute for Strategic Studies, Autumn 1976), p. 23.

2/ Ibid.

$$\text{Warsaw Pact/U.S.} = \frac{934,000}{261,328} = 3.57$$

Firepower

$$\text{Warsaw Pact/Non-U.S. NATO} = \frac{16.75}{7.5} = 2.23$$

$$\text{Warsaw Pact/U.S.} = \frac{16.75}{5.25} = 3.19$$

Improved Readiness

- o Increased national holdings of **tanks**, anti-armor weapons, missiles, armed helicopters, and air-to-surface weapons;
- o Purchase of protective equipment against chemical warfare;
- o Pursuit of cooperative and coordinated development of next-generation anti-armor weapons and a common family of air-to-surface weapons.

Reinforcement

- o Accelerate the movement of significant fighting units to **forward areas**;
- o **Pre-position** the equipment for three heavy U S. divisions;
- o Some allies will modify civil aircraft to carry equipment that cannot be **pre-positioned**;
- o Improved amphibious lift for British and Dutch marines.

Reserve Mobilization

- o Bring national reserve forces up to NATO standards and improve readiness of certain reserve formations;
- o A number of European countries will consider providing more reserve brigades.

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1/ Summary of information contained in U.S. Department of Defense, Annual Report, Fiscal Year 1980, pp. 211-14.

#### Maritime Posture

- o Improved command and control;
- o Improved **air defense for naval units;**
- o Better antimissile defense for naval units;
- o Greater mine warfare **capabilities.**

#### Air Defense

- o Improved **ability to identify hostile aircraft and control NATO's own aircraft;**
- o Improve **fighter aircraft;**
- o Acquire improved surface-to-air weapons.

#### **Communications, Command, and Control**

- o Implementation of second phase of the NATO Integrated Communications System;
- o Cooperation and coordinated efforts in maritime communications, tactical trunk networks, single-channel radio access, **NATO/national** area interconnection, strategic automatic data processing, and war headquarters improvements .

#### Electronic Warfare

- o Improved **capability to counter Warsaw Pact electronic warfare;**
- o Improved organization and procedures.

#### Rationalization

- o New procedures for long-range armaments planning;
- o Improved formulation and utilization of **standardization agreements;**

- o Continuation of work undertaken by the Conference of National Armaments Directors in the field of intellectual **rights**.

#### Logistics

- o Policy and organizational improvements to harmonize and coordinate arrangements to improve logistics support;
- o Development of a logistics master planning system;
- o Increased war reserve **stocks**;
- o Improved flexibility in the use of ammunition **stocks**.

#### Theater Nuclear Modernization

- o Measures are being developed to ensure these forces continue to play their essential role.

