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PAPER

**Ground
Conventional Forces for NATO:
Mobility and Logistics Issues**

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U.S. AIR AND GROUND CONVENTIONAL FORCES FOR NATO:
MOBILITY AND LOGISTICS ISSUES

The Congress of the United States
Congressional Budget Office

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PREFACE

The defense budget that the Congress will be considering in fiscal year 1979 places a strong emphasis on improving U.S. conventional forces for NATO. U.S. decisions concerning air and ground conventional forces for NATO are, however, tied closely to, and must be assessed in terms of, the capabilities of our NATO allies.

This paper outlines the increasing importance of mobility and logistics in NATO defense. It compares U.S. and allied capabilities in those areas and presents options regarding U.S. decisions on logistics and mobility. The paper is part of a CBO series on the U.S. military role in NATO. Other papers in this series are U.S. Air and Ground Conventional Forces for NATO: Overview (January 1978), Assessing the NATO/Warsaw Pact Military Balance (December 1977), and two forthcoming background papers, Air Defense Issues and Firepower Issues. This series was undertaken at the request of the Senate Budget Committee. In accordance with CBO's mandate to provide objective analysis, the study offers no recommendations.

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Alice M. Rivlin
Director

March 1978

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SUMMARY

Mobility and logistics are increasingly important to the defense of Western Europe. If NATO is to respond effectively to a Warsaw Pact non-nuclear attack across the West German border, it must be able to move and re-equip troops with materiel rapidly. NATO's mobility--its capacity to move men and materiel to and within Europe--can compensate for the Pact's ability to choose the time and location of an invasion. Further, if the Pact's ability to launch a short-warning attack is increasing--as some observers argue--NATO mobility capabilities become even more important. NATO's logistics--as reflected in its capacity to sustain intense combat through the maintenance of sufficient war reserves--is likewise not only intrinsically important, but also of increasing concern because the Warsaw Pact's ability to mount and sustain an intense attack appears to be growing.

The United States has already undertaken a series of major programs to improve its mobility and logistics resources. And the Congress will deal with new proposals for more improvements in fiscal year 1979. This is in marked contrast to the action of most European members of NATO: most allies not only lag behind the United States in their airlift resources and war reserve stocks, but they also appear to be planning few improvements in those areas over the next five years.

This discrepancy between U.S. and European capabilities in mobility and logistics could seriously weaken the alliance's ability to defend Europe. For while the logistics and mobility resources of NATO forces have always been considered a national responsibility and have evolved into separate systems, they are nevertheless interdependent. For example, supplies destined for U.S. forces, based primarily in southern Germany, must cross allied sectors, and they are moved almost entirely by European, not U.S., resources. Hence, in the event of war, the failure of one or two of NATO's logistics systems to re-equip their forces and sustain combat might lead to the collapse of NATO's resistance along the the entire Central Front--that region marked roughly by the border separating the Federal Republic of Germany from Eastern Europe.

THE U.S. RESPONSE

Over the last several years, the United States has embarked on a series of strategic (transatlantic) and tactical (intra-theater) mobility resource improvement programs. It has also undertaken programs to increase its war reserve stocks. The Congress has already approved initial funding for the first steps of a Defense Department effort to nearly double the transatlantic delivery capability of the U.S. airlift force. This effort includes programs to expand the cargo capacity of the 234 C-141 aircraft in the Military Airlift Command and enable them to be refueled in flight; maintain the current capability of the 70 C-5A aircraft by improving their wing structure; and make wide-bodied commercial aircraft in the Civil Reserve Air Fleet (CRAF) more capable of transporting military cargo.

Additional funding requests for these programs are continuing in fiscal year 1979, as are requests to procure an Advanced Tanker/Cargo Aircraft (ATCA) for the strategic airlift force. The Advanced Medium STOL Transport (AMST) for the tactical airlift fleet has been under development, but funds for fiscal year 1979 for this program have been deleted. In addition, funding requests for the Army include programs to modernize CH-47 helicopters and to procure Utility Tactical Transport Aircraft Systems (UTTAS)--renamed Black Hawk in fiscal year 1979--as replacements for the UH-1 helicopters. The Defense Department has also requested funding to pre-position additional sets of divisional equipment in Europe for Army forces that would be moved to Europe in the event of a crisis. (The Army's acronym for such equipment is POMCUS, for "pre-positioning of materiel configured to unit sets.")

The United States has also sought to improve its ability to sustain high levels of combat by reconstituting the stocks of ammunition and other war reserves that were drawn down by the 1973 Middle East war. And because the Defense Department has revised its calculations of the level of materiel needed to sustain a conventional war in Europe, additional funding requests to increase U.S. war reserve stocks, some of which would be pre-positioned in Europe, have been proposed in the fiscal year 1979 budget.

THE ALLIED RESPONSE

Although, in contrast to the United States, European NATO allies do not need strategic mobility resources, most are not even considering any tactical airlift improvements until the late

1980s. And while the United States has increased both its targets for and its stocks of war reserves, its allies do not appear to have done either. The Federal Republic of Germany recently took steps to improve its military's response time to a crisis and is now studying a wide range of ways to improve early operational readiness. But none of the allies have committed themselves to the kind of mobility improvements or the expanded war reserve stock programs on which the United States has embarked.

OPTIONS FOR U.S. MOBILITY AND LOGISTICS

Given what appear to be continuing and perhaps growing differences between U.S. and allied views on the mobility and logistics needs of NATO, how might decisions on major U.S. mobility and logistics programs be structured? The answer depends in large part on which of the three U.S. military roles in NATO the Congress might want to emphasize. In a broad sense, the United States performs three NATO military roles: defending the U.S. sectors of control, augmenting the allies' capability to defend their sectors by improving U.S. capabilities in Europe, and reinforcing NATO's overall defenses with U.S. troops and materiel located outside Europe. Decisions on mobility and logistics resources can be viewed in that framework. Relatively high investments in interoperable war reserve stockpiles pre-positioned in Europe, for example, would enable NATO allies to use U.S. resources rapidly anywhere along the Central Front; hence, that funding approach would emphasize the second U.S. military role in NATO. Similarly, relatively high investment in strategic mobility resources and in equipment pre-positioned in Europe for U.S. combat forces would be consistent with a desire to improve the capacity of the United States to reinforce NATO from outside Europe. Finally, if the Congress believes that the United States should delay major improvements of its mobility and logistics resources until the allies commit themselves to comparable improvements, it might wish to restrict mobility and logistics improvements to those programs that emphasize the defense of the U.S. sector in Europe.

Structuring mobility and logistics decisions for NATO in such a way suggests the following options regarding the major mobility and logistics decisions for fiscal year 1979. The options are not based on cost-effective analysis, but are meant to illustrate the kinds of programs that would be consistent with the general objective of each option.

Option I: Building U.S. Forces in Europe to Augment Allied Defenses

- o Continue support for C-5A rewinging programs and C-141 modification programs.
- o Support the CH-47 helicopter modernization program.
- o Procure UTTAS (Utility Tactical Transport Aircraft System).
- o Support expansion of major war reserve stocks, particularly pre-positioned stocks that can be used by the allies.
- o Do not support procurement of ATCA, AMST, or additional CRAF modifications.

Option II: Building U.S. Forces to Reinforce NATO Directly

- o Continue support for C-5A rewinging, C-141 modifications, and CH-47 modernization.
- o Support procurement of ATCA, AMST, and UTTAS.
- o Support the establishment of additional POMCUS and additional pre-positioned war reserve stocks.

Option III: Defending the U.S. Sector: Modernizing Smaller U.S. Forces for NATO

- o Delete three Army divisions.
- o Continue support for C-5A rewinging programs and C-141 modification programs.
- o Support continued modernization of CH-47 helicopters.
- o Support procurement of UTTAS, but in numbers appropriate for fewer active forces.
- o Do not support procurement of ATCA, AMST, or additional CRAF modifications.
- o Support procurement of war reserve stocks appropriate to meet the requirements of fewer active forces.

Option III would be the least expensive budgetary strategy implied by the three options. Compared to Option III, for example, Option I would cost roughly \$10.6 billion more over the next five years. Option II, inherently the most expensive approach and the most similar to Department of Defense plans for mobility and logistics for the next five years, would cost about \$10.8 billion more than Option III over the next five years.

The five-year costs of each option--as compared to what appear to be the implications of the Administration's fiscal year 1979 budget--are portrayed in the following table.

ADDITIONAL COSTS OR SAVINGS OF THREE MOBILITY AND LOGISTICS APPROACHES COMPARED TO PROJECTED COSTS OF THE FISCAL YEAR 1979 DEFENSE BUDGET: BY FISCAL YEAR, IN MILLIONS OF CURRENT YEAR DOLLARS

	1979	1980	1981	1982	1983
Option I (Augmen- tation Emphasis)	270	380	440	430	750
Option II (Reinforcing Emphasis)	330	430	480	550	630
Option III (Sector Defense Emphasis) <u>a/</u>	-610	-1,350	-1,960	-2,325	-2,130

a/ The majority of these savings are associated with the deletion of three Army divisions.

CHAPTER I. INTRODUCTION AND BACKGROUND

The United States builds and maintains conventional air and ground forces principally for the defense of the North Atlantic Treaty Organization (NATO). Major improvements in U.S. conventional forces--such as those the Congress will consider in the fiscal year 1979 defense budget--are likewise aimed primarily at defending Western Europe.

Major improvements in U.S. conventional air and ground forces may not, however, significantly enhance NATO's ability to withstand a Warsaw Pact invasion from Eastern Europe. ^{1/} For example, the greatest relative weaknesses in NATO defenses at present are not in its U.S. forces, but in the armies of its Western European allies, which provide three-quarters of the ground and air forces in Western Europe. Further, NATO is organized so that each national army is located in and responsible for defending a designated sector of the West German border (see Figure 1). ^{2/} Although a Warsaw Pact attack could occur in any sector of NATO's Central Region, the most favorable geographic conditions for such an invasion are in the northern part of West Germany, where the weaker Western European armies are positioned. Major improvements in U.S. conventional forces might therefore not only strengthen

^{1/} For a full discussion of the relationship among assumptions concerning how the nature of the Warsaw Pact attack shapes force requirements, see the CBO fiscal year 1978 budget issue paper series, Planning U.S. General Purpose Forces. This series of papers included an Overview and four studies on individual forces: The Navy (GPO Stock No. 052-070-03826-8), Army Procurement Issues (GPO Stock No. 052-070-03834-9), The Tactical Air Forces (GPO Stock No. 052-070-03847-1), and The Theater Nuclear Forces (GPO Stock No. 052-070-03846-2). (Note: Only the Overview paper is available from CBO; the other four papers should be ordered from the Government Printing Office by the GPO stock numbers in parentheses after each paper.)

^{2/} Canada also maintains forces in West Germany, but it does not have a designated corps sector.

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.

NATO's already strongest force, but do so in an area where force improvements might be least effective.

NATO's capacity to mobilize its forces in response to a Pact invasion across the Central Front and to sustain combat in the European theater is essential to the success of any allied defense of Western Europe. The mobility and logistics resources upon which that capacity depends are expensive. In fiscal year 1979, about 35 percent of the U.S. Department of Defense budget--roughly \$44 billion--is being requested for mobility and logistics procurement and services.

In recent years, a growing concern that a Warsaw Pact attack is likely to occur with little warning has led to pressures to improve NATO's ability to move men and materiel rapidly to and within the European theater. Similarly, a heightened perception that conventional warfare in Europe might be intense and use up materiel at extremely high rates has aroused concern regarding NATO's ability to sustain its combat forces.

Some observers, for example, argue that, as a result of such factors as the Warsaw Pact's improved airpower, armored personnel carriers, and firepower, the most likely Pact strategy would be a sudden attack and a short, intense war, designed to bring overwhelming force to bear against the NATO Central Front--particularly northern Germany--before reinforcements from outside NATO Europe could arrive. 3/

The possibility of a sudden Warsaw Pact attack clearly increases the mobility and logistics needs of NATO. The shorter the warning of an invasion, the less time NATO would have to introduce more forces to the Central Front or to distribute them in a way that would improve defense capability. Less warning would also weaken the ability of NATO's forces to sustain combat. For example, shorter warning would lessen NATO's ability to transport ammunition and other materiel rapidly expended in war to positions where it would be readily available. Less warning would also give NATO less time to eliminate the bottlenecks in supply lines that simply do not surface during peacetime operations.

3/ See statement of Senator Sam Nunn, "Gearing Up to Deter Combat in Europe," Congressional Record (September 13, 1976), p. S15661.

Other observers have raised the possibility of higher expenditures of materiel than previously projected. Arguing by analogy from the very early but heavy losses of ammunition and other materiel in the 1973 Middle East war, these observers suggest that a war in Europe is likely to be fought largely with the materiel on hand. Thus, they see the victor as the side best equipped and able to move materiel as needed within the European theater.

Taken together, these concerns point to the most challenging non-nuclear scenario that NATO might face. Given the Pact's initial advantage in any outbreak of war in Europe of choosing where and when it would occur, it might launch a sudden and intense attack against the relatively weakly defended North German Plain, whose terrain is most suited to the kind of armored tactics that the Pact is believed to use. If the intensity of the assault is great enough to exhaust NATO's supplies before they can be replaced, the Pact might break through NATO's defenses. In that event, the supply lines to West German and U.S. forces in southern Germany could be severely threatened, reinforcement of NATO defenses could become extremely difficult, and the possibility that NATO forces in the south might be isolated could become very real.

In short, changing perceptions of the threat and of the nature of modern conventional warfare have, over the last several years, brought mobility and logistics issues to the forefront of NATO defense planning and budgeting. ^{4/} Scenarios like the one sketched above are, of course, planning artifacts, not predictions of war. But because they posit such dire consequences, they are gaining more attention. And because they question NATO's ability to sustain high-intensity combat at almost any point along the Central Front, they indicate an increasing need for the United States to assess the mobility and logistical resources of all NATO forces. In the last analysis, the capacity of the United States to move forces to and within Europe and to sustain combat there cannot be separated from the capacity of the NATO allies to do the

^{4/} Assessments concerning the NATO/Warsaw Pact balance--that is, a decision as to which alliance would win a conventional conflict--are a matter of judgment. For a full discussion of the determinants of NATO/Warsaw Pact balance assessments, see the companion budget issue paper, Assessing the NATO/Warsaw Pact Military Balance, Congressional Budget Office (December 1977).

same. U.S. decisions concerning logistics and mobility are therefore tied closely to, and must be assessed in terms of, allied mobility and logistical capabilities.

As background for Congressional consideration of the fiscal year 1979 budget, this study--part of a larger study of NATO conventional forces ^{5/}--outlines major current U.S. and allied mobility and logistical resources and proposed improvements in these resources, sketches the kinds of budgetary decisions regarding them that the Congress is likely to face, and frames those mobility and logistics decisions in terms of optional ways of supplementing or complementing what the allies are likely to do.

Chapter II sets the stage by discussing the major logistical issues for NATO, namely, mobility resources and war reserve stocks. Chapter III describes and compares the mobility and logistics approaches and programs of the United States with those of the NATO allies. Chapter IV places pending decisions regarding U.S. mobility and logistical resources in three strategic frameworks, each of which would supplement allied capabilities and contribute to NATO's defense somewhat differently. The first option concentrates on augmenting weak areas by positioning more supplies in Europe. The second emphasizes improving the U.S. capability to reinforce NATO's weak areas with reinforcements based in the continental United States. The third option focuses on defending only U.S. sectors of the Central Front, which would lead to a reduction in U.S. forces. The study concludes with estimates of the costs associated with each approach.

^{5/} See the CBO budget issue paper for fiscal year 1979, U.S. Air and Ground Conventional Forces for NATO: Overview (January 1978) and the forthcoming companion background papers, Firepower Issues and Air Defense Issues.

CHAPTER II. MAJOR LOGISTICS ISSUES FOR NATO: MOBILITY RESOURCES AND WAR RESERVE STOCKS

Logistics, broadly defined, refers to the many elements that move, support, and sustain combat forces. This paper focuses, however, upon two specific logistical issues involved in the role of the United States in the defense of NATO:

- o Our ability to transport U.S. troops and equipment to and within continental Europe in response to a Warsaw Pact invasion of West Germany.
- o Our ability to ensure the availability of U.S. war reserve stocks to sustain combat in the European theater.

The first issue confronting the United States involves decisions regarding U.S. "mobility forces"--the number and types of transportation resources needed to move U.S. combat forces and materiel to Europe at the outbreak of a war and within the European theater during a war. The requisite level of mobility forces is determined primarily by such factors as expected warning time before an attack, the amount of men and materiel that are to be moved, and the capacity of reception facilities. The size of equipment in U.S. inventories is another factor influencing U.S. mobility needs. In recent years, for example, the Army's choice of larger firepower items has tended to decrease the effectiveness of current airlift resources; that is, as the size and weight of ground force equipment have grown, it has become more difficult and more time-consuming to move. U.S. mobility force decisions therefore involve trade-offs between its air, ground, and sea transportation resources and the level of equipment pre-positioned in Europe for active-duty troops located in the United States. (The Army's phrase for this equipment is POMCUS, an acronym for "pre-positioning of materiel configured to unit sets.")

Decisions concerning the logistics resources needed to sustain combat in the event of a NATO war revolve primarily around the issue of U.S. war reserve stocks. Decisions regarding war reserve stocks--combat-essential items stockpiled to replace combat losses--must also be made in terms of how well things can be moved. Debate here revolves around questions of how large the

stocks of materiel should be, what they should contain, and where they should be positioned. ^{1/} These, in turn, are a function of estimates of the intensity and duration of combat and the amount of destruction.

MOBILITY

The movement of troops and materiel from the United States to Europe in the event of a Warsaw Pact invasion can be thought of in terms of three phases. The first stage of such a transportation effort--the "preparation phase"--consists of alerting and equipping troops with materiel at home bases and assigning them to airfields or seaports. The second phase of the movement--the "deployment stage"--begins with the movement of men and materiel to airfields and seaports, where they are loaded onto aircraft or ships and dispatched. This phase involves the use of "strategic mobility resources"--that is, transoceanic aircraft or ships--to transport men and materiel to Europe. Airlift is obviously faster but also more expensive, so it is reserved for priority items. Sealift, accounting for the remainder, would transport greater tonnages of materiel and equipment too bulky to be moved by air. The third major stage concerns movement within Europe. Once troops and materiel arrive in Europe, they can be moved by a variety of "tactical"--that is, intratheater--transport, including rail, truck, barge, and air.

Figure 2 (at the back of this paper) depicts the major steps in this transportation process. While the figure implies that the requisite sealift transportation would be available, not all sealift resources would be available immediately (see the Appendix for a more detailed discussion). Further, although Figure 2 portrays the C-5 and C-130 aircraft as only strategic or tactical lift resources respectively, many aircraft can be used in either mode.

^{1/} Pre-positioned war reserve stocks are a separate category of equipment from POMCUS, although many of the same items are contained in each. POMCUS equips a division (and, in some cases, includes materiel necessary to support a division). War reserve stocks, on the other hand, essentially refer to replacement items--such as ammunition and tanks--that are expected to be consumed once fighting begins; such stocks may or may not be pre-positioned.

There is a direct trade-off between strategic mobility resources and POMCUS: mobility requirements can be reduced by pre-positioning equipment and supplies in Europe. For example, pre-positioning of equipment for U.S.-based Army divisions not only reduces the need for transoceanic transportation, but also allows forces to be built up in Europe much more rapidly, since it is faster to equip units after they have been deployed in Europe than it is to prepare and transport them with all their equipment. More pre-positioning would also enable some U.S. strategic airlift resources to shift to a tactical role in Europe more quickly.

Too much pre-positioning can, however, be costly and dangerous. Materiel placed in Europe cannot, for example, be used for training by troops stationed elsewhere. POMCUS may therefore require the purchase of more equipment if troops are to be trained and efficient in its use. (The amount of additional equipment needed would, however, be less than a full division set.) Further, storage costs in Europe are high. And finally, while pre-positioned materiel allows forces to be built up more rapidly in Europe, it is also susceptible to destruction by the Warsaw Pact.

WAR RESERVE STOCKS

War reserve stocks are high-consumption, combat-essential items (equipment, munitions, and supplies) stockpiled to replace early combat losses. They may or may not be pre-positioned. The amount of war materiel that should be stockpiled depends on estimates of the intensity and duration of combat and the length of time it would take factories to produce materiel in wartime. Appropriate levels of war reserves for U.S. forces are also a function of the number of U.S. divisions positioned in Europe early in the war, when consumption of those items is expected to be high.

All NATO members maintain war reserve stocks of varying levels to sustain the forces they would commit to combat, but how those levels are calculated also varies. The United States stocks enough war reserves for 90 days of conflict. Some NATO allies, for example, have 30 days of stocks. ^{2/} But because

^{2/} Richard Burt, "U.S. Analysis Doubts There Can be Victor in Major Atomic War," New York Times (January 6, 1978), p. A-4.

these requirements are calculated differently, 30 days of allied stocks may not equal 30 days of U.S. stocks.

PROBLEMS RESULTING FROM THE CONCEPT OF LOGISTICS AS A NATIONAL RESPONSIBILITY

NATO has always considered logistics a national responsibility. Although there are many multinational bodies concerned with European logistics issues, there is no common NATO logistics posture, only a collection of disparate national support systems. Indeed, six independent logistics systems have evolved in Europe, each responsible for supporting a national force within a specific area of NATO's Central Front. Each support system has its own maintenance, storage, and distribution facilities and procedures.

Multiple logistics systems for NATO are in large part necessary because U.S. and allied military equipment is generally not interoperable. 3/ If it were, a single NATO-wide logistics system might be feasible; surpluses of items in one national inventory could, for example, be used to meet the needs of other sectors and other national inventories.

Separate national logistics systems and procedures are more a liability than an advantage. For one thing, they introduce excessive complexity into NATO planning and hinder evaluation. The lack of a standard NATO-wide measure of each ally's level of war reserve stocks, for example, prevents NATO planners from accurately estimating how long each ally would be able to fight. Separate national logistics systems would also hinder the wartime movements of NATO forces along the Central Front, inasmuch as the use of forces across sector boundaries would require additional logistics arrangements.

The possibility that some Central Region sectors do not have enough materiel to sustain combat for very long, when coupled with the possibility that an ally's combat needs cannot be filled with resources from the other NATO allies' sectors, raises the spectre of a Warsaw Pact breakthrough. That, in turn, could jeopardize the entire NATO defense structure, since a Pact breakthrough in

3/ "Interoperability" refers to the ability of one NATO ally to use another ally's items, such as spare parts and ammunition, to operate nonstandard NATO weapons systems.

one sector of the Central Front might also sever lines of communication and resupply to other sectors.

NATO's logistics are not, however, a story of absolute independence. Agreements with some European NATO allies allow the United States to use European ships for wartime deployment. Reliance by the United States and other NATO allies on host-nation support within Europe is another important exception to the concept of national responsibility for logistics: transportation within the European theater, excluding airlift, is now almost entirely the responsibility of host nations. In general, the United States now relies on indigenous resources (European civilian transportation and manpower) to the largest extent possible. Host-nation support, as practiced in the REFORGER exercise ("return of forces to Germany," an annual NATO peacetime exercise), for example, includes a "full range of port and rail services; billeting, food and medical services for U.S. personnel; and convoy, fuel and limited maintenance support" for U.S. vehicles. 4/

Our allies have more than enough ground transportation capacity to support the deployment of all NATO forces in the event of a Warsaw Pact invasion. Nevertheless, some U.S. observers question the wartime reliability of allied civilian labor and transportation. Those questions point to our general inability to measure the degree to which U.S. reliance on host nations for logistical support would actually work in time of war. Such uncertainties serve as an incentive for us to maintain as much independence and control as possible; that, in turn, tends to support the concept of logistics as a national responsibility, and hence the multiple logistics systems now characteristic of NATO.

4/ "USAREUR Changing Logistics Scene," Army Logistician (May-June 1977), pp. 2-3.

CHAPTER III. U.S. AND ALLIED PROGRAMS FOR MOBILITY AND
WAR RESERVE STOCKS

The logistics resources needed to support U.S. NATO forces are significantly different from those of the other NATO forces. Unlike the other NATO nations, the United States must maintain a strategic--that is, a transoceanic--mobility force in order to both initially deploy and resupply its troops with equipment in the event of a war in Europe. 1/

Despite the virtually unique mobility and logistical problems generated by its great distance from Europe, the United States shares with all NATO allies the basic problem of creating and maintaining transport systems and providing supplies that will enable NATO forces to respond effectively to a possibly intense, short-warning Warsaw Pact invasion at an unspecified place along the Central Front, most likely in one of the more weakly defended allied sectors, in particular, the North German Plain. Assessing NATO's mobility and logistics capability thus involves examining U.S. and allied mobility inventories and levels of war reserve stocks.

The geographic location of the United States accounts for the emphasis it has placed on procuring and improving strategic mobility resources; it also accounts for the lack of allied emphasis on strategic mobility reflected in their mobility inventory and improvement programs.

Even in tactical mobility, however, the United States has more versatility than do the other NATO allies. In the event of war, the United States and the European allies would use the European highway and rail transportation networks. In addition, however, to its shared access to ground mobility transport, the United States has significantly more numerous--and more capable--tactical aircraft than the allies, which reduces U.S. reliance on ground transport (see the Appendix). Further, while the United

1/ Canada similarly confronts the logistical problems posed by distance, but plans to transport to Europe far less materiel than the United States.

States has undertaken a major effort to improve its airlift capacity to transport and resupply troops and materiel within Europe in the event of a Pact invasion, the other NATO forces have only maintained a roughly constant capacity, and they plan few improvements during the next five years. Hence, the already disparate tactical mobility capabilities of the United States and the other allied armies appear to be increasing rather than decreasing.

Similarly, as previously mentioned, the United States has substantially more war reserve stocks than do the allies. And while the United States is investing heavily in ammunition, it does not appear that the allies have planned similar initiatives.

MOBILITY

The U.S. Response

Over the last several years, the United States has embarked upon a series of both strategic and tactical mobility improvements. The Congress has already approved initial funding for major strategic airlift programs:

- o stretching and aerial refueling C-141 aircraft; 2/
- o modifying wide-bodied commercial aircraft of the Civil Reserve Air Fleet (CRAF) to make them more capable of transporting military cargo in wartime;
- o rewinging C-5A aircraft; 3/

2/ "Stretching" refers to structural aircraft modifications that expand the volume of their cargo compartments. C-141s have the power to lift heavier loads than their cargo compartments can hold; "stretching" enables them to carry more equipment.

3/ The C-5A rewing program is necessary to ensure that the C-5As will be capable of remaining in the inventory for nearly the original expected service life. The C-5As were purchased with the expectation that each would have a service life of 30,000 flying hours; without the rewing, service life will be cut to 8,000 hours.

- o developing and procuring the Advanced Tanker/Cargo Aircraft (ATCA).

The C-141 stretch program, CRAF modifications, and a proposal to increase C-5A and C-141 aircraft utilization rates (the number of hours per day a plane may fly) were submitted as an airlift enhancement package by the Department of Defense in 1975. The C-5A rewing and C-141 stretch programs, subsequently funded somewhat in line with Defense Department requests, are now underway. Programs for utilization rate increases, and especially CRAF modifications, received funding on a much more limited basis than the Defense Department's original request. Together, these programs were originally designed to approximately double the transatlantic delivery capability of the U.S. mobility force (as measured in tons per day), reducing the approximate air delivery time of an infantry division from fourteen to seven days. ^{4/} As they are now designed, these programs will, however, fall short of that goal because of reductions in utilization rate objectives and in the number and kind of CRAF modifications.

In fiscal year 1979, the Defense Department has again asked the Congress to increase our strategic airlift capability. Additional funding requests to modify wide-bodied commercial aircraft (CRAF) will require decisions. And while President Carter did not request funds in fiscal year 1978 for the Advanced Tanker/Cargo Aircraft (ATCA)--a new airplane designed largely for strategic mobility use--the fiscal year 1979 defense budget includes funds for that program. ^{5/}

Funds to improve tactical airlift are also being requested in fiscal year 1979. The major tactical airlift program is

^{4/} The Posture of Military Airlift, Hearings before the Subcommittee on Research and Development, House Committee on Armed Services, 94:1 (November 1975), p. 235. Air delivery time for armored and mechanized divisions is somewhat more than 14 days and somewhat less for airmobile and airborne divisions.

^{5/} Fiscal year 1979 is an appropriate time to decide whether to continue the ATCA program, since authorization for the first two airplanes is requested in fiscal year 1979. The cost of the ATCA for the next five years is programmed at \$940 million.

replacement of the C-130, the workhorse of the tactical airlift fleet. Candidates include the Advanced Medium STOL (Short Take-Off and Landing) Transport (AMST), for which there are two prototypes, and a stretched STOL C-130. Although there are no funds for it in the fiscal year 1979 budget, the AMST program--still in the research and development phase--is potentially expensive. Its estimated five-year cost is about \$1.1 billion. In addition, there are programs underway to improve transport helicopter capability. These include continuing modernization of the Army's CH-47 and acquiring UTTAS (Utility Tactical Transport Aircraft Systems) to replace the UH-1. ^{6/} (The latter would be assigned to individual Army units.) Funding for these programs for fiscal year 1978 was \$312 million. Requests for funding for fiscal year 1979 are \$365 million.

The fiscal year 1979 budget contains requests to cover some costs associated with POMCUS stocks. A program to replenish stocks used to supply Israel during the 1973 Middle East war, funded by the Army's projected procurement for equipment, is underway. By 1983, the Department of Defense plans to pre-position enough additional equipment for three more divisions, ^{7/} which would bring the total number of POMCUS-equipped divisions to the equivalent of four or five divisions and some support units. ^{8/} Potential costs associated with increasing the number of divisions with pre-positioned equipment include real estate for storage sites, construction of storage facilities, and possibly procurement of additional equipment. (A more detailed discussion of these costs is included in Chapter IV.)

Table 1 summarizes the major mobility improvements being proposed to the Congress in fiscal year 1979. That table, which adopts the movement stages discussed earlier, shows that the Defense Department will seek to expand its mobility capabilities by spending a little over \$0.8 billion in fiscal year 1979.

^{6/} UTTAS is well into the production phase and could cost some \$2.2 billion over the next five years. The Defense Department's Annual Report, Fiscal Year 1979 refers to this system as Black Hawk.

^{7/} The Budget of the United States Government: Department of Defense Extract for Fiscal Year 1979, p. 52.

^{8/} The Posture of Military Airlift, Hearings, p. 587.

TABLE 1. U.S. MOBILITY PROGRAMS BEING PROPOSED TO THE CONGRESS:
FISCAL YEAR 1979 COSTS IN MILLIONS OF DOLLARS

Movement Phases				
Preparation (Movement to Seaports/Airfields)	Deployment (Transatlantic Movement)		Reception and Employment (Tactical Mobility)	
None	C-141 Stretch	\$66	AMST	0
	C-5A Rewing	\$37	Stretch STOL C-130 <u>a/</u>	0
	Modify Wide- bodied Commer- cial Aircraft	\$69	CH-47 Modernization	\$42
	ATCA	\$157	UTTAS	<u>\$377</u>
	More POMCUS (1 Division)	<u>\$71</u>		
Totals		\$400		\$419

a/ The stretched STOL C-130 has been offered by Lockheed as a competitor with AMST prototypes to replace the C-130. It is not a program that is receiving Congressional funding at this time.

The Allied Response

In marked contrast to the United States, the allies have very few current programs or plans to improve their tactical airlift forces. 9/ The lack of changes in their tactical airlift

9/ European NATO allies, by definition, do not need strategic mobility forces for a war in Europe.

resources is likely to lead to even more pronounced differences in U.S. and allied intratheater airlift capabilities (see the Appendix for a comparison of U.S. and allied tactical airlift resources). For example, part of the rationale for U.S. mobility improvements stems from the fact that changes in the Army's major firepower items (tanks, mechanized artillery, and other heavy equipment) have changed airlift requirements. That is, as equipment has become larger and heavier, airlift delivery time has increased, and hence our mobility capability has decreased. Allied inventories are also shifting toward larger ground equipment. Yet, while the United States has been planning to procure new tactical airlift systems, like the AMST, to transport most of these large items within the European theater, the allies have no comparable projects underway.

One reason the allies may not be choosing to invest in tactical airlift programs for the modern Army's heavy equipment is because they are expensive. The AMST, for example, would cost about \$800 million for full-scale development alone.

Whatever their rationale, most of the allies will not even be considering airlift force improvements until at least the late 1980s. The West German Air Force does not plan to procure transports and helicopters until the 1990s, as its C-160 Transall short-range transport aircraft and CH-53G helicopters are expected to be operable until then. ^{10/} The French have, however, reopened the production line for the Transall in order to meet the Air Force requirement to replace Noratlas. ^{11/} The oldest of Canada's C-130 Hercules transports will probably not be replaced until 1985; the Boeing 707s, shortly thereafter. ^{12/} The Canadian transport fleet does not now plan to procure additional aircraft. ^{13/}

^{10/} "The West German Air Force Re-equips for the 1980s," Interavia (April 1976), p. 386.

^{11/} "World Air Forces 1977," Flight International (July 2, 1977), p. 44.

^{12/} W.N. Russell, "Airlift '85," Canadian Defense Quarterly (Winter 1975-1976), p. 15.

^{13/} "Air Transport Flying Well Without Buying New Planes," Financial Post (February 19, 1977).

The British also have no plans to upgrade their aircraft mobility programs significantly. The C-130s, the core of their airlift resources, are now being reconditioned to extend the lifetime of the force into the late 1980s. ^{14/} But this represents a retrenchment from their plans of several years ago. Indeed, the British have been forced by budget constraints to retire some of their current force and to postpone procurement of some transport helicopters. Plans to procure medium-lift helicopters were delayed in 1976, and while the British may seek to procure CH-47Cs ^{15/} or CH-53Ds ^{16/} in the future, the prospects for this are not high.

Thus, intratheater as well as transoceanic airlift improvements for NATO are almost exclusively a U.S. undertaking. The West Germans have concentrated their mobility improvement efforts on the first stage of mobility (preparation). For example, they have made arrangements to ensure that military personnel on off-duty standby will be instantly available. They are also studying other ways to achieve early operational readiness, including adopting more effective recall and induction procedures; extending standby readiness to logistics troops; maintaining a more suitable stock of ammunition, fuels, lubricants, food, clothing, equipment, and medical supplies; and reducing the time required to furnish combat vehicles with their initial loads of ammunition. ^{17/} In brief, like the West Germans, the allies generally appear uninterested in going beyond this preliminary stage, despite some recognition of a requirement for tactical airlift. ¹⁸

^{14/} "World Air Forces 1977," p. 46.

^{15/} "News in Brief," Interavia (July 1977), p. 660.

^{16/} "European Views on Military Helicopters," Interavia (April 1977), p. 311.

^{17/} Security and Defence: The Policy of the Federal Republic of Germany, Publication of the Minister of Defense of the Federal Republic of Germany (June 1977), pp. 45-46.

^{18/} Primarily because of the commitment of troops to Northern Ireland, the British Army of the Rhine has only 40,000 men in West Germany, down about 15,000 from the level of several years ago. Some of the equipment for the troops in Northern

Notwithstanding the fact that the United States has not only more mobility resources, but also more mobility improvement programs than the other NATO nations, in the event of war the active forces of most NATO allies can still be positioned in the Central Region before all divisions stationed in the United States arrive there. This discrepancy in U.S. and allied mobility capabilities is, however, almost entirely a function of their extreme difference in geographical distance from the Central Front.

Hence, in the last analysis, firm conclusions about the comparative adequacy of allied and U.S. mobility capacity are difficult to draw. The allies have less versatility and capability to move forces and supplies rapidly within Europe than the United States, but the implications of these differences for U.S. mobility requirements are difficult to determine.

An important factor, then, in estimating U.S. mobility and logistics requirements is the ability of the NATO allies to sustain an attack. That capability depends largely on levels of war reserve stocks. In particular, allied sustainability is one factor that must be considered in determining the rate at which the United States should be able to deploy reinforcements to the European theater. It also raises the issue of possible U.S. purchases of war reserves for allied use.

WAR RESERVES--U.S. AND ALLIED RESPONSES

U.S. and allied differences in war reserve stocks strongly suggest major differences in their capacity to sustain an intense level of combat. Although all NATO members have formally agreed to develop war reserve stockpiles sufficient to sustain their forces in combat for specified time periods, each ally calculates these requirements differently. Over the last few years, the United States has modified its calculations to the point that the estimated requirement has been doubled. Thus, although the Services' new estimates indicate significant shortfalls between what they now have on hand and what they believe is required,

Ireland is pre-positioned in Europe. These troops and some of their equipment, however, would have to be recalled if an attack were to occur and, to augment their forces at the planned rate, the British would have to have more mobility forces.

the United States has at this time more war reserve stocks in Europe than at any time in history. The United States is, moreover, continuing to increase the amount of money allocated for war reserves. Requests for war reserve ammunition alone are expected to grow from \$760 million in fiscal year 1978 to over \$1.5 billion by fiscal year 1981.

The allies, however, do not appear to have significantly adjusted their war reserve requirements, and the discrepancy between allied and U.S. estimates of war reserve requirements is growing, not declining. If U.S. estimates are correct, this raises serious doubt as to the ability of some of the allies to defend their corps areas long enough to allow either the arrival of replacements or wartime production of new equipment, supplies, and ammunition.

There are indications that the United States is correct in its upward revision of war reserve requirements. First, nearly all observers of the most recent example of modern conventional warfare--the 1973 Middle East war--were impressed by the greater destructiveness of improved weapons. The analogy between what happened in 1973 on the sands of the Sinai and what would occur on the North German Plain should war break out in Europe is, of course, limited. But there is a consensus that the new weaponry entering the inventories of the Warsaw Pact necessarily means that the intensity of conflict in Europe--and hence its destructiveness--would be higher than previously estimated.

Second, there is a growing belief that the Warsaw Pact is today better able to maintain a high-intensity conflict for a longer period than it was ten or even five years ago. In addition, NATO weaponry has improved, so it is likely that the rates at which its ammunition and materiel would be expended would be higher, quite apart from consideration of any changes in Pact weaponry. Available evidence thus suggests the validity of the general U.S. approach of calculating increased war reserve requirements.

CHAPTER IV. U.S. OPTIONS FOR MOBILITY AND WAR RESERVE STOCKS

In the broadest sense, the U.S. military role in NATO is threefold. In the first place, like most other members of NATO, the United States is responsible for defending its sectors of the Central Front, and we currently deploy ground forces and their associated combat support forces and logistics bases in Europe to carry out that mission. As shown earlier in Figure 1, the bulk of U.S. Army forces in Europe is located in southern Germany, astride major avenues of approach from eastern Germany toward Stuttgart and Frankfurt. This disposition is, however, more a legacy of post-World War II occupation agreements among the United States, Great Britain, France, and the Soviet Union than it is a reflection of military considerations. 1/ For, as the earlier discussion has suggested, the area of greatest military concern to NATO defenders is increasingly seen as the North German Plain, about 200 miles north of most U.S. peacetime deployments. 2/

Secondly, the United States is responsible for augmenting the defense of other sectors of the Central Front--a military requirement generated by the fact that the Warsaw Pact would probably have the initial choice of where and when a war would begin and might be able to bring overwhelming power to bear against a localized area in the initial stages of a conflict. In the event of war, therefore, the use of U.S. troops and materiel positioned in Europe would not necessarily be restricted to the U.S. sectors, and NATO strategists consider using European-based U.S. resources to augment the strength of its NATO allies anywhere along the Central Front.

1/ Richard D. Lawrence and Jeffrey Record, U.S. Force Structure in NATO: An Alternative (Washington, D.C.: The Brookings Institution, 1974), p. 39.

2/ The importance of the North German Plain is recognized by U.S. and NATO planners, and the United States has deployed a separate brigade there. Of the roughly 200,000 U.S. ground troops in Germany, however, over 90 percent remain deployed in the CENTAG area of southern Germany.

Finally, the United States is committed to reinforcing NATO with additional U.S.-based resources. That is, in the event of war or in preparing for it, the United States plans to transfer U.S. forces and materiel from bases in the United States or other points outside Europe to the Central Front. These incoming military resources could be used to bolster U.S. forces already stationed in southern Germany, but the location of their employment would depend primarily on where the need was greatest. And that means the likelihood that they would be sent to the North German Plain is high.

CONGRESSIONAL CONCERN WITH U.S. ROLES IN NATO

Many of the mobility and logistics decisions before the Congress in fiscal year 1979 could stress one or more of the three roles to which the United States is committed in the defense of NATO. Adoption of one funding approach would not, however, necessarily diminish our ability to perform other roles. Relatively high investments in pre-positioned, interoperable war reserve stockpiles in Europe, for example, would tend to emphasize the concept of augmentation--that is, increasing the ability of NATO allies to use U.S. resources. By this same token, additional investments in strategic mobility resources or in POMCUS stocks would improve the capacity of the United States to reinforce NATO rapidly from outside Europe. And should the Congress wish to emphasize defense of the U.S. sectors, it might well adopt mobility and logistics modernization programs appropriate for a reduced force.

What, then, would be some of the major considerations that might lead the Congress to emphasize one or more of the three military roles the United States performs in Europe? What kinds of logistics and mobility programs would be consistent with these approaches? And how much would they cost? The following sections structure the major decisions before the Congress on logistics and mobility in terms of three options, each directed toward emphasis on one of the three roles the United States performs in fulfilling its military commitments to NATO. Rationales--the kinds of assumptions and concerns that might lead the Congress to support an option's mobility and logistics elements--are included. The costs of each option--expressed in terms of additions to or reductions from the projected five-year costs of the fiscal year 1979 defense budget--are also presented. These options are not structured to include the most cost-effective methods of accomplishing the role emphasized in each. Rather, they are illustrative of the

kinds of programs that should be considered as consistent with the general direction emphasized by each option. Thus, the costs associated with each option do not necessarily portray how much it would cost to achieve the option's goal. They are, however, accurate estimates of the costs of achieving each option's goal in the manner described and, as such, can be used for comparisons.

OPTION I: BUILDING U.S. FORCES IN EUROPE TO AUGMENT ALLIED DEFENSES

If the fundamental problem facing NATO is the possibility that an intense, short-warning Warsaw Pact attack on one of the more weakly defended allied sectors of the Central Front might overwhelm NATO defenses there before major reinforcements could arrive, one way the United States could improve NATO's defense capabilities would be through procurement of flexible, mobile, and interoperable U.S. assets. The mobility requirements of this option would be tactical mobility forces that could rapidly transport supplies, particularly ammunition, to the weaker, and hence more prone to attack, areas of the Central Front. This option would also call for building war reserve stocks that could be used very early in a conflict by both U.S. and allied forces in Europe.

Modernization of U.S. tactical airlift assets, already begun, will provide the resources necessary to meet the mobility requirements of this option. Hence, adoption of Option I implies that the Congress need not support additional budgetary requests to increase U.S. tactical airlift resources--or, in particular, our strategic airlift resources--in fiscal year 1979. The following budgetary decisions would be consistent with a NATO defense approach that stresses building U.S. forces in Europe to augment allied defenses:

- o Continued support of the strategic mobility improvement programs to rewing C-5As to maintain their current capability, to stretch C-141 aircraft, and to modify C-141s for aerial refueling. 3/ Current strategic airlift

3/ The C-5A rewing, C-141 stretch, CH-47 modernization, and UTTAS procurement are included in some form in all three options largely because funding for them is ongoing and has gone beyond the point where cancellation would make sense.

resources, with those improvements, would enable the United States to have about eight divisions deployed in Europe within 21 days after the beginning of mobilization (five divisions already stationed there, two-thirds of three divisions with POMCUS, and an additional armored division arriving by air). 4/

- o Continued support of CH-47 helicopter modernization programs and the procurement of UTTAS. Those tactical airlift improvement programs would extend the expected service life of the CH-47 helicopters, thereby preserving their current lift capability into the 1980s, and, by replacing the UH-1 with UTTAS, increase the overall transport capacity of the Army's helicopter resources.
- o No procurement for ATCA or additional CRAF modifications. Since each of those programs could improve the transatlantic airlift capacity of the United States, their addition would not be particularly consistent with the intratheater mobility objectives of Option I.
- o No procurement for the AMST. Although the AMST is designed to improve tactical mobility, its major aim is to increase our tactical capacity to transport large items of equipment--such as tanks--by air. Option I, however, stresses our capability to move ammunition rapidly within Europe, which can be done with the current C-130 fleet that the AMST is to replace. Thus, the AMST might not be worth the additional cost, given the demands of Option I.

4/ Sealift begins arriving two or three weeks after mobilization begins. With certain improvements in the preparation phase (funds for which have not been appropriated by the Congress), sealift could, however, transport the equivalent of four divisions within 30 days. (This estimate takes account of expected attrition.) Rates of deployment by air are based on figures contained in The Posture of Military Airlift, Hearings before the Subcommittee on Research and Development, House Armed Services Committee, 94:1 (November 1975), p. 241. Sealift capability in tons is based on U.S. Department of Defense, Navy Accelerated Sealift Study: Project Sea Express (July 25, 1974), p. 43.

In terms of stockpiling considerations, Option I would call for purchasing more war reserve stocks than U.S. forces alone require, and for pre-positioning those stocks in locations in the Central Front where they could be used rapidly by allied forces.

War reserve stocks purchased for allied use would differ slightly in composition from those purchased solely for U.S. use. This option concentrates on providing ammunition, since providing the allies with ammunition is considered to have a high payoff. To ensure their availability very early in the war, these ammunition stocks for the allies should be pre-positioned in Europe. Pre-positioning of such stocks would also reduce demands on U.S. strategic mobility resources.

War reserve stocks for the allies must, of course, consist of interoperable items. Examples of interoperable NATO ammunition include ammunition for 155 mm. howitzers, 8-inch howitzers, and 105 mm. tank ammunition. Hawk missiles, some aircraft ordnance, and some small arms ammunition could also be included.

Table 2 portrays the effect Option I would have on the fiscal year 1979 defense budget's projected five-year costs for major mobility and logistics programs.

TABLE 2. OPTION I: ADDITIONS TO AND SAVINGS FROM THE FISCAL YEARS 1979-1983 DoD FIVE-YEAR DEFENSE PROGRAM: BY FISCAL YEAR, IN MILLIONS OF CURRENT YEAR DOLLARS

	1979	1980	1981	1982	1983
Strategic Mobility					
ATCA	-160	-260	-260	-250	0
CRAF modifications	-70	-130	-130	-140	-70
One POMCUS division	-70	-80	-20	-30	-30
War Reserve Ammunition for Allies	<u>570</u>	<u>850</u>	<u>850</u>	<u>850</u>	<u>850</u>
Net Changes	270	380	440	430	750

OPTION II: BUILDING U.S. FORCES TO REINFORCE NATO DIRECTLY

If the Congress believes that the most effective NATO response to an intense, short-warning Pact attack is the rapid introduction of additional U.S. combat power to the European theater, then it might want to emphasize building U.S. forces to reinforce NATO directly. Two ways of doing this would be to reduce the time required to get a sizeable U.S. combat force--about a three-division corps--in position to counter the most likely avenue of Pact attack, and to increase the overall deployment rate for U.S. reinforcements. This approach would be consistent with procurement of additional POMCUS for northern Germany, continued improvement of U.S. strategic airlift resources, and increased war reserves.

More strategic airlift resources would help U.S. efforts to dispatch U.S. troops and materiel to NATO's Central Front more rapidly, but the biggest payoff in terms of increased mobility is likely to come from the procurement of more POMCUS. The pre-positioning in Europe of equipment for three additional divisions would significantly reduce the time required to introduce major U.S. combat strength, because it takes much less time to transport U.S.-based troops to their equipment sites in Europe than it does to airlift a unit and all its equipment from the United States to Europe. The combat troops attached to divisions with pre-positioned equipment would need approximately only one day per division to travel to Europe and one day to be issued their equipment. In contrast to Option I's capacity to deploy about eight divisions in Europe 21 days after the decision to send them, the pre-positioning of equipment for three divisions would make it possible to have about 10 U.S. divisions in Europe within 10 days.

Determination of the optimal number of units with pre-positioned equipment depends, in part, on assumptions one makes about warning time. The shorter the expected warning time, the lower the estimates of equipment and troops that airlift can deliver before a war begins. Therefore, as warning-time estimates decrease, emphasis on POMCUS will increase. But the optimal size of POMCUS also depends on command structure considerations. Judged in these terms, three divisions seem a reasonable level--large enough to assure both considerable combat power and U.S. control if used outside the U.S. defense sectors in southern Germany.

The following budgetary decisions would be consistent with an emphasis on the U.S. reinforcement role:

- o Continued support of the Defense Department's strategic airlift enhancement programs, particularly those designed to rewing C-5A aircraft, stretch C-141 aircraft and make them capable of being aeri ally refueled, and the CRAF modifications.
- o Procure ATCA. The Advanced Tanker/Cargo Aircraft is designed in part to meet the increase in the numbers of aircraft that can be aeri ally refueled. Since Option II places a premium on rapid transatlantic movement, the marginal increase in airlift delivery speed provided by ACTA would be consistent with the thrust of this option. Aerial refueling increases airlift capacity by approximately 25 percent. That same increase, however, could be obtained by using existing KC-135 tankers, assuming a sufficient number could be freed from their responsibilities in the Strategic Air Command (SAC).
- o Establish additional POMCUS sites for three divisions in Europe and procure any equipment necessary to fill them.
- o Procure additional war reserve stocks and pre-position them in Europe. Additional pre-positioned war reserves would support the objectives of this option because more U.S. forces would arrive in the early stages of combat, when consumption rates of such stocks are expected to be highest. In addition, war reserves for the allies would increase the probability that they could successfully sustain combat.
- o Procure the Advanced Medium STOL Transport (AMST). The AMST would provide more capability to airlift large Army equipment. If, in addition to building reinforcement capability with troops based in the United States, the United States wants a capability to reinforce weak areas within Europe with full Army units, purchase of the AMST would be justified. 5/

In sum, Option II would enable the United States to have the following forces in place 21 days after mobilization:

5/ The AMST has been a controversial program, and funds for it have been deleted from the fiscal year 1979 defense budget. Although the value of the capability it would add to the

- o The equivalent of five divisions already stationed in Germany.
- o Five divisions with pre-positioned equipment (and some support units).
- o One and one-half armored divisions arriving by air (depending on the number and type of CRAF modifications).

Except for procurement of the AMST, this option is very similar to Defense Department plans for mobility and logistics for the next five years. It would, however, be more expensive than the current five-year defense program, primarily because the cost of pre-positioning equipment for three more U.S. Army divisions in Europe is likely to exceed current Army estimates for several reasons. First, the cost of real estate for the storage sites in Germany or the Benelux is very high. Second, storing equipment so that it would be ready very quickly in the event of war could require building ready-for-issue centers. Those centers would be much larger than equipment sites, because they would contain more complete facilities for issuing, assembling, and maintaining equipment. The real estate and the construction and maintenance costs for such centers would thus be higher than those of simple storage facilities.

Current estimates of additional pre-positioning costs might also be too low because purchases of additional equipment to complete the unit sets of equipment for each division might be necessary. In theory, it is possible to pre-position another division set of equipment in Europe without purchasing additional equipment. Equipment drawn from war reserve stocks can be pre-positioned in Europe, at which point it can become the POMCUS set for that division. If mobilization occurred, the division would deploy to its POMCUS site, leaving its own division equipment in the United States. The remaining equipment would then be allocated partly to war reserves, which would be sent to Europe to resupply U.S. forces in Europe, and partly to the military reserves, who do

current force is debatable, consideration of the AMST program seems consistent with a general concern with rapid strategic and tactical reinforcement capability. It is included in this option because the thrust of this option is to build combat forces in Europe more rapidly. Thus, demands for tactical mobility might be higher in the earlier stages of the reinforcement.

not have as much equipment as active forces. In fact, there is considerable uncertainty about whether this could be achieved, especially for more than one additional division, since there seem to be some shortages in the Army's inventory of equipment. More specifically, the Army is currently below its stated objectives for war reserves. If these shortages proved sufficient to prevent a full POMCUS set from being created, the cost of POMCUS would then depend on the amount and type of equipment necessary to fill the shortages. Additional procurement costs could be \$0.7 to \$3 billion over five years.

Pre-positioning equipment in Europe also reduces the amount of equipment available for training purposes in the United States. One group likely to be affected by the equipment reallocation is the military reserves. This is inconsistent with the current policy of improving their capability, and especially their readiness. 6/

Option II would add about \$2.4 billion to the cost of the Defense Department's program for fiscal years 1979-1983 (in current year dollars). Table 3 summarizes these additions.

TABLE 3. OPTION II: ADDITIONS TO THE FISCAL YEARS 1979-1983 DoD FIVE-YEAR DEFENSE PROGRAM: BY FISCAL YEAR, IN MILLIONS OF CURRENT YEAR DOLLARS

	1979	1980	1981	1982	1983
Strategic Mobility					
Two POMCUS Divisions	--	--	140	250	130
Tactical Mobility					
AMST	30	130	140	200	400
War Reserves	<u>300</u>	<u>300</u>	<u>200</u>	<u>100</u>	<u>100</u>
Totals	330	430	480	550	630

6/ See Congressional Budget Office, Improving the Readiness of the Army Reserve and National Guard: A Framework for Debate, Budget Issue Paper (February 1978).

OPTION III: DEFENDING THE U.S. SECTOR: MODERNIZING SMALLER
U.S. FORCES FOR NATO

Some considerations argue for an approach that stresses the defense of U.S. sectors of the Central Front, perhaps at the expense of the United States' ability to perform other defense roles. For instance, if the United States wished to demonstrate to the allies an unwillingness to continue bearing a large portion of the financial burden of NATO's defense without greater allied contributions, it might limit its NATO defense improvements to those which would help most in performing its own sector defense role.

This approach could also be a logical extension of some of the rationale underlying Options I and II. For example, if one believes that the early arrival of U.S. reinforcement divisions is crucial to reducing the risk of a successful Pact attack but one is unwilling to bear the cost of increasing U.S. reinforcement capability, it could be argued that the United States has more forces than could be used effectively in the event of a NATO war. In such a case, a reduced force would be appropriate for supporting the role of defending the U.S. sector.

Option III would remove three divisions from the current structure of the Army, thereby reducing its total active and reserve force to 21 divisions. The lower force level, combined with the relatively slow rate of deployment needed to strengthen only U.S. forces in NATO, argues for giving mobility and logistics programs low priority for spending.

The following specific measures would be consistent with this approach:

- o Buy war reserve stocks to meet only the requirements of the reduced force.
- o Support continued modernization of strategic airlift resources by maintaining programs to rewing C-5A aircraft and modify C-141 aircraft.
- o Support continued modernization of tactical airlift resources by maintaining the CH-47 modernization program.
- o Procure UTTAS, but in numbers appropriate for the reduced force structure.

- o Undertake no new mobility initiatives, such as procuring ATCA or AMST, or supporting additional CRAF modifications.

Option III would still enable the United States to have the following forces in place in the Central Front 21 days after the beginning of mobilization:

- o The equivalent of five divisions already stationed in Germany.
- o Two-thirds of three divisions with pre-positioned equipment (and some support units).
- o Approximately one armored division arriving by air.

The savings suggested by this approach, vis-a-vis what appear to be the five-year implications of the fiscal year 1979 defense budget, are summarized in Table 4.

TABLE 4. OPTION III: SAVINGS FROM THE FISCAL YEARS 1979-1983
DoD FIVE-YEAR DEFENSE PROGRAM: BY FISCAL YEAR, IN
MILLIONS OF CURRENT YEAR DOLLARS

	1979	1980	1981	1982	1983
Delete 3 Army Divisions	-240	-810	-1,470	-1,830	-1,950
Strategic Mobility					
ATCA	-160	-260	-260	-250	0
CRAF modifications	-70	-130	-130	-140	-70
One POMCUS division	-70	-75	-25	-25	-30
Tactical Mobility					
UTTAS (for 21 divisions)	<u>-70</u>	<u>-75</u>	<u>-75</u>	<u>-80</u>	<u>-80</u>
Net Savings	610	1,350	1,960	2,325	2,130

A P P E N D I X

APPENDIX. CURRENT U.S. AND ALLIED MOBILITY RESOURCES

U.S. CAPABILITIES

U.S. airlift forces comprise aircraft under the Military Airlift Command (MAC), the Civil Reserve Air Fleet (CRAF), and helicopters under the command of the Army and the Marines. MAC has active mobility forces consisting of 70 C-5As and 234 C-141s, which make up the strategic airlift inventory. In addition, there are 15 active squadrons of C-130s (234 aircraft) and 254 C-130s in reserve and Air National Guard units which make up the tactical airlift force. 1/ (Increased reliance on host-nation support for intratheater mobility has not affected airlift requirements, since airlift is not included in host-nation support agreements. 2/

The Civil Reserve Air Fleet (CRAF) consists of civilian passenger and cargo aircraft under contract to the Department of Defense for use in emergencies. These planes would be flown and maintained by commercial pilots and crews. As of November 1, 1975, 244 long-range aircraft have been committed to this program, 91 of which are passenger aircraft. The remaining 153 are cargo

1/ Current inventory numbers for C-5As, C-141s, and C-130s were provided by the Department of Defense and represent the number of unit-equipped (UE) aircraft. There are some additional aircraft that are in the inventory to keep the capability at the UE level when aircraft are in need of maintenance and repair.

2/ Bulk cargo, such as rations and some ammunition, can be transported in any mobility ship or plane. C-141s and C-130s are capable of carrying oversize cargo, which include such items as refueling trailers and 105 mm. howitzers. Any cargo that is too large to be transported by a C-141 is considered outsized, and must be transported by the C-5As if it is to go by air. Examples are CH-47 Chinook helicopters, 20-ton cranes, and M-60 tanks. There are some items of equipment that cannot be transported by air, such as heavy cranes and some fixed-wing aircraft.

or cargo/convertible aircraft. 3/ These aircraft would be used primarily to augment MAC's C-141 force. A detailed list of U.S. airlift resources is shown in Table A-1.

U.S. sealift resources consist of ships under the Military Sealift Command (MSC), the U.S. Merchant Marine, the National Defense Reserve Fleet (NDRF), the Effective U.S. Control Fleet (EUSC), and NATO flag ships.

As of September 1976, the MSC has had a government-owned fleet of 67 ships, including six cargo ships. The remaining 61 ships include tankers, project, and fleet support ships. In addition, 21 cargo ships from the Merchant Marine are under contract to the MSC, bringing the total number of cargo ships within what is known as "the MSC-controlled fleet" to 27.

The NDRF contains 130 World War II Victory ships. These resources are maintained primarily to augment the MSC fleet in the event of a major contingency and to provide backup capability for the Merchant Marine. It has been estimated that it would take a considerable amount of time, perhaps months, to put these ships in operable condition. 4/

ALLIED CAPABILITIES

In general, the allies have very few airplanes in their inventories comparable in range to U.S. strategic airlift resources. Most allied aircraft are similar in range and capability to, but are far less numerous than, the U.S. tactical airlift fleet. Table A-2 provides a detailed list of allied airlift resources.

In addition to military airlift resources, NATO allies have a considerable wartime airlift capacity from their civilian aircraft resources. The allies do not have at this time a formalized

3/ The Posture of Military Airlift, Hearings before the Subcommittee on Research and Development, House Committee on Armed Services, 94:1 (November 1975), p. 190.

4/ National Defense and Economic Benefits of the U.S. Flag Merchant Marine, Hearings before the Subcommittee on The Merchant Marine, House Committee on Merchant Marines and Fisheries, 94:1 (August 1975).

system, comparable to the U.S. CRAF fleet, for controlling commercial airplanes during wartime. However, efforts are underway to encourage the allies to formally commit commercial assets for military use in time of war. The capability of these aircraft for cargo transport would be significantly enhanced if the planes were to undergo modifications similar to those proposed by the United States under the CRAF modification plan.

TABLE A-1. CURRENT U.S. AIRLIFT INVENTORIES

	Range (miles)	Payload (pounds)
<u>TACTICAL</u>		
488 C-130s <u>a/</u>	2,487	44,000
Helicopters		
434 CH-47s <u>b/</u>	115	12,000
73 CH-54s	230	23,000
126 CH-53s <u>c/</u>	257	13,000
3,987 UH-1s <u>d/</u>	318	4,000
<u>STRATEGIC</u>		
70 C-5As <u>e/</u>	3,749	220,000
234 C-141s	4,080	70,847

SOURCES: Jane's All the World's Aircraft (annual volumes for 1968 through 1977) for range and payload data; numbers in U.S. inventory from Department of Defense.

a/ Data is for C-130H; C-130s can carry 92 troops or 64 para-troops.

b/ Data is for CH-47C; CH-47s can carry 44 troops.

c/ Data is for CH-53D; CH-53s can carry 37 combat-equipped troops.

d/ Data is for UH-1H; UH-1s can carry 12 troops.

e/ 220,000 is design, not current, payload.

TABLE A-2. CURRENT ALLIED AIRLIFT INVENTORIES

Country	Range (miles)	Payload (pounds)
BELGIUM		
Tactical		
12 C-130H	2,487	44,000 (92 troops or 64 paratroops)
BRITAIN		
Tactical		
11 VC-10s	N/A	N/A
45 C-130s	2,487 <u>a/</u>	44,000 <u>a/</u> (92 troops or 64 paratroops)
Helicopter		
Wessex	N/A	N/A
CANADA		
Tactical		
5 C-130H	2,487	44,000 (92 troops or 64 paratroops)
19 C-130E	2,420	44,000
12 Buffaloes	691 <u>b/</u>	18,000 <u>b/</u> (41 troops or 64 paratroops)
Strategic		
5 Boeing 707s	4,300	89,000
FEDERAL REPUBLIC OF GERMANY		
Tactical		
76 C-160D Transalls	1,056 <u>c/</u>	35,000 <u>c/</u> (93 troops, 61-81 fully- equipped paratroops)
3 VFW 614s	748	7,992 (40 passengers)

(Continued)

SOURCE: Jane's All the World's Aircraft (annual volumes for 1962 and for 1968 through 1977).

a/ Details are for C-130H designation.

b/ These figures refer to performance with smooth airfield surfaces. An unprepared airfield would reduce the range to 403 miles and the payload to 12,000 pounds.

TABLE A-2. (CONTINUED)

Country	Range (miles)	Payload (pounds)
FEDERAL REPUBLIC OF GERMANY (Continued)		
Helicopters		
110 VFW/ Sikorsky CH-53G	N/A	N/A (37 combat-equipped troops)
105 Bell UH-1Ds	318 <u>d/</u>	4,000 (12 troops)
Strategic		
4 Boeing 707 320Cs	4,300	89,000
4 Hansa Jets	1,615	4,000 (7-12 passengers)
FRANCE		
Tactical		
86 Transalls	1,056	35,000 (93 troops, 61-81 fully- equipped paratroops)
120 Noratlas	N/A	17,000
Helicopters		
70 Alouette IIIs	298	1,650 <u>e/</u>
190 Alouette IIs	62 <u>f/</u>	1,322 <u>e/</u>
130 SA 330 Puma	370 <u>f/</u>	N/A (16 individually- equipped troops)
NETHERLANDS		
Tactical		
Fokker VFW F-27 Troopship	1,197 <u>g/</u>	13,000 <u>g/</u> (44 passengers)

c/ These details are for the C-160F designation.

d/ This figure is for the UH-1 designation.

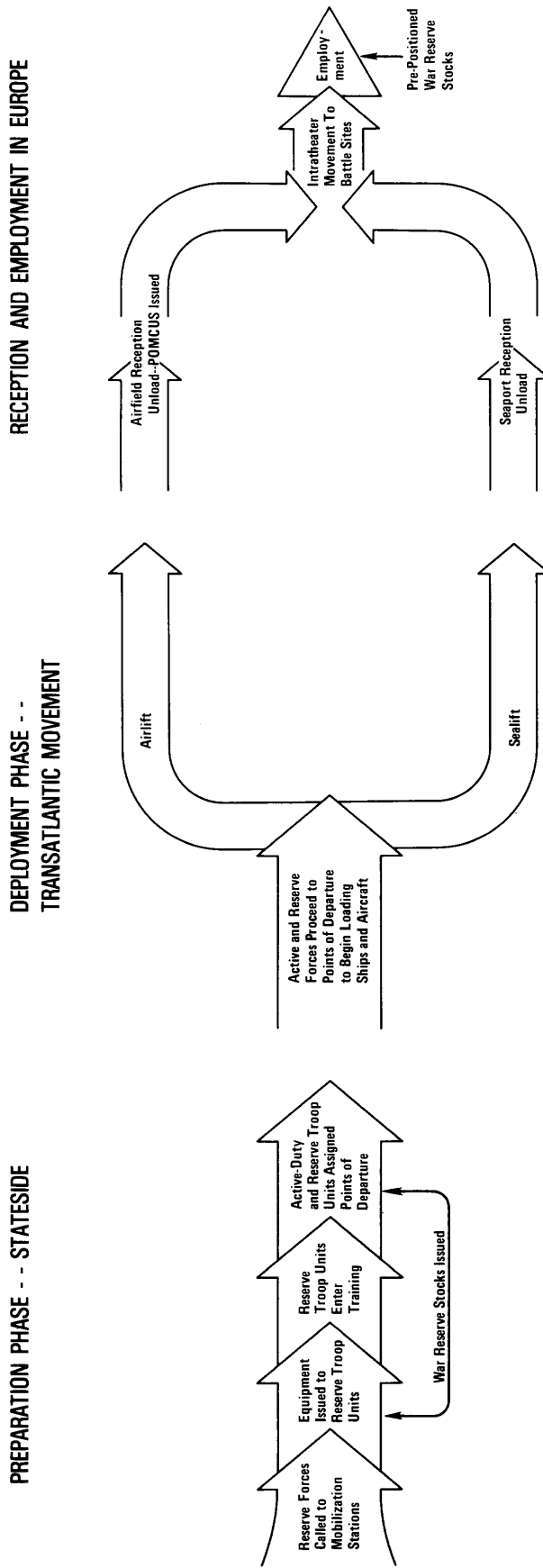
e/ Payload is for external sling loads.

f/ Range at sea level with a reduced payload is 447.

g/ Details are for MK-200 designation.

Figure 2

Three - Phase Movement of U.S. Forces to Europe in the Event of a Warsaw Pact Invasion



Preparation of reserve forces--distinct from active-duty troops--involves equipping them for dispatch to airfields and seaports. Reserves' first move is to local mobilization stations throughout the United States, where they are issued the materiel they will take abroad. Some such equipment comes from inventories of war reserve stocks (rapidly used-up items, including tanks and guns, stockpiled to replace early combat losses). The reserve troops are given weapons and field training and then assigned points of departure. Active forces, who may be issued equipment from war reserve stocks if replacement of materiel is necessary, are assigned points of departure.

The deployment phase begins with the movement of active and reserve forces to airfields and seaports, where troops and equipment are loaded for crossing the Atlantic. Transoceanic movement of both active-duty and reserve forces is accomplished by "strategic" vessels and aircraft. The airlift planes, reserved for priority items, include C-5As and C-141s and the Civil Reserve Air Fleet (civilian craft put to military use); KC-135 tankers are used to refuel C-5As in flight. Heavy materials move mainly by sealift, provided by Merchant Marine ships, the Military Sealift Command, the National Defense Reserve Fleet, the Effective U.S. Control Fleet, and NATO flag ships.

All movements within Europe fall under the heading reception and employment. The troop- and equipment carriers are unloaded at seaports and airfields and their cargo moved into position by various intratheater ("tactical") means--road, rail, airplane, helicopter. POMCUS--Pre-positioning of Materiel Configured to Unit Sets--is issued to active duty troops whose equipment was pre-positioned in Europe. Combat forces may also be re-equipped with pre-positioned war reserve stocks to replace early combat losses.