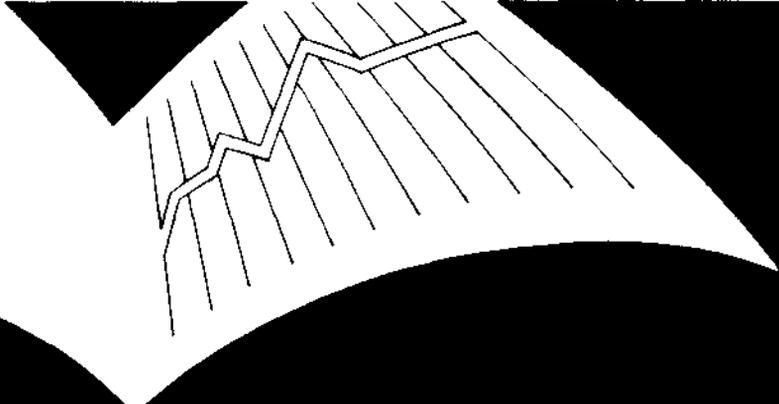


U.S. Projection Forces: Requirements, Scenarios, and Options

APRIL 1978



BUDGET ISSUE PAPER FOR FISCAL YEAR 1979

U.S. PROJECTION FORCES:
REQUIREMENTS, SCENARIOS, AND OPTIONS

The Congress of the United States
Congressional Budget Office

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington D.C. 20402

PREFACE

A significant portion of the defense budget goes to procure ground, naval, and tactical aviation forces that can rapidly project military power into areas remote from the United States. These projection forces would play major roles in any U.S. military action in non-NATO areas such as the Persian Gulf or Eastern Mediterranean, where the United States has important political and economic interests, as well as on the flanks of NATO. This paper, prepared at the request of the Senate Budget Committee, examines options that reflect alternate judgments about the size and types of projection forces that might be required to meet contingencies in these areas, or elsewhere, where a premium would be attached to rapid response, over long distances, to opposing military forces. In accordance with CBO's mandate to provide objective analysis, this paper offers no recommendations.

This paper was prepared by Dov S. Zakheim, of the National Security and International Affairs Division of the Congressional Budget Office, under the general supervision of John E. Koehler and James R. Blaker. The author gratefully acknowledges the contributions of Major General Fred Haynes, USMC (Ret.), who served as a consultant; Edward Swoboda of CBO's Budget Analysis Division, who prepared cost estimates; and Sara Lynn Bass, James Capra, John Ellwood, Marshall Hoyler, Patrick Renehan, and John Shewmaker. Patricia Johnston edited the manuscript; Connie Leonard and Nancy Swope prepared it for publication.

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Director

April 1978



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SUMMARY

Each year Department of Defense (DoD) funding requests include money for the operation and modernization of U.S. projection forces--forces that are configured primarily to respond rapidly to Presidential directives for long-distance entry into enemy territory against armed opposition. They include the two divisions of the U.S. Army XVIII Corps (the 82nd Airborne and 101st Airmobile Divisions), the three active Marine divisions and air wings, and parts of the sea-based Navy and Air Force tactical air forces. The issue before the Congress is one of choosing among alternate levels and modernization programs for these forces.

Since World War II, most of these forces have been used primarily outside NATO's Central Region in Europe. They are generally thought of in relation to non-European contingencies and, in fact, are likely to be used if the United States were to employ military force rapidly outside Europe. Projection forces are planned, however, to help the United States pursue what has been called a "one-and-one-half war" strategy--namely, the capacity to wage simultaneously a major conflict centered in Europe with the Warsaw Pact and a less demanding military contingency elsewhere. Thus, the size and structure of the projection forces that the Congress is asked to fund derives from the way the Department of Defense estimates they might be used both in Europe and elsewhere.

The scenarios DoD employs as analytic devices to size and structure forces are purposely constructed to be very demanding. These scenarios reflect major assumptions that inherently generate high force requirements:

- o That the United States would have little support from allies;
- o That a half war demanding considerable U.S. resources could occur concurrently with a major war centered in Europe;
- o That such a conflict might involve Soviet forces; and
- o That many forces employed in a half war--particularly ground forces--could not be redeployed for operations in the major conflict.

CONFIDENTIAL

THE PERSIAN GULF AND THE EASTERN MEDITERRANEAN AS HALF-WAR CONTINGENCIES

The United States could become involved in a variety of contingencies other than a NATO/Warsaw Pact conflict. The logic of DoD planning is to focus on those half-war contingencies that could plausibly call for U.S. military operations and that would demand a relatively high level of U.S. involvement. Possible contingencies in both the Persian Gulf and Eastern Mediterranean regions reflect these characteristics. Both regions are seen by the Congress as well as by DoD as volatile areas where the United States has important political or economic interests. They are also areas that DoD considers to be very demanding militarily should the United States seek to project military force into them, for they reflect criteria consistent with its planning assumptions: relatively strong indigenous forces, located so that access would be relatively harder for the United States than for the Soviet Union.

PROJECTION FORCE REQUIREMENTS FOR THE HALF WAR: A RISK-AVERSION APPROACH

Scenarios that most closely reflect DoD's concerns emphasize the magnitude of the military threat U.S. forces might face and tend to downplay constraints upon that threat. For example, a Persian Gulf scenario consistent with a risk-aversion approach might involve an Iraq-Iran conflict in which the Iranians would also face active military opposition from the Soviet Union. Such a scenario would emphasize Soviet ground force capabilities in the Middle East, particularly because of the common border with Iran. It would highlight requirements for a large, speedy U.S. military response and for sufficient logistical capabilities to facilitate that response.

Analysis suggests that U.S. requirements in such a scenario would amount to about four divisions and six air wings, a level of force which could be met by the currently programmed projection forces. These forces might not have sufficient logistics and mobility support, however. Thus, if the Congress accepts DoD's risk-aversion approach to force planning for a half war, it should look closely at what seems necessary to round out the U.S. capability to meet its demands.

MODIFIED REQUIREMENTS FOR THE HALF WAR: AN OPTIMISTIC APPROACH

The Congress may wish to reexamine DoD's assumptions and prefer to accept more optimistic assumptions governing a half war. It is arguable, for example, that risk-aversion interpretations of projection requirements may overstate the Soviet Union's ability to project military power in regions outside Europe. They may also understate the assistance that would be available to the United States from local allies.

Both reservations apply particularly to the Persian Gulf and Eastern Mediterranean regions. The United States has supplied vast amounts of military equipment to friendly states in both areas under the Guam (Nixon) Doctrine. Additionally, the Soviet Union might hesitate to commit large forces to these regions because of the strains such commitments would place on both their lift resources and their posture in Europe. As a result of these two conditions, U.S. force requirements for such a scenario could be considerably lower than those postulated by DoD. For example, an Iran-Iraq conflict might not call for more than two U.S. ground force division equivalents and three air wings, in addition to two carrier task forces, if greater importance is attached to constraints upon Soviet projection capability and increased Iranian war-fighting capabilities.

PROJECTION FORCE REQUIREMENTS: BUILDING UPON THE DEMANDS OF THE "FULL WAR" FOR PROJECTION FORCES

The overall projection force levels are, however, determined by the requirements of both the full and half wars. The Congress must, therefore, consider the demands of a NATO/Warsaw Pact conflict before choosing between alternative force level options and budgets; the requirement for projection forces in the major conflict must be added to projection force requirements for a half war.

While the primary combat theater in a European conflict would likely be NATO's Central Region, projection forces would probably more likely be used in that war on NATO's Northern Flank. Projection forces, notably the ground force divisions, would not be as capable as armored divisions along much of the Central Front, where terrain favors armored maneuver units. On the other hand, terrain in the areas of Schleswig-Holstein/Jutland and Norway, which constitute the Northern Flank, facilitates the operations of units such as the Army airborne and airmobile divisions and the Marine ground forces.

U.S. projection force requirements along the Northern Flank are a function of both the size of attacking Pact forces and the contribution of the European allies. Even if attacking forces far outnumbered those of the local allies, the availability of allied reinforcements would lower the requirements for U.S. ground force support. Analysis suggests, for example, that a total U.S. force of about one-and-two-thirds divisions, supported by the equivalent of two Air Force wings, would be sufficient to support the NATO allies' defense of either subregion.

Assuming this is the baseline requirement for projection forces in Europe, it is then possible to construct overall projection force alternatives from "half-war" requirements that reflect either "risk-aversion" or more optimistic assumptions about a non-NATO conflict. The following options do so.

OPTION I: A PROJECTION FORCE TO MATCH DoD'S ASSUMPTIONS

An overall projection force requirement of six divisions, eight Air Force wings, and four carriers would be consistent with very demanding assumptions about the half-war requirement. This level of force could meet the baseline projection force level for Europe and provide four divisions, six Air Force wing equivalents, and two carrier task forces for operation in the Persian Gulf and two carrier task forces in the Mediterranean. All of these forces can be provided by presently authorized force levels. There may be shortfalls, however, in manpower and systems that affect both the way the projection forces are equipped and the lift needed to transport them rapidly to their scene of operations. This option would, therefore, add to the projection force to rectify these shortfalls:

- o The CH-53E heavy-lift helicopter for the Marines to add to Marine mobility in armored environments;
- o The Vertical/Short Take-Off and Landing (V/STOL) aircraft for the Marines to provide a tactical air capability that does not depend upon sophisticated base support;
- o Amphibious ships to expand Marine lift capability and permit more rapid deployment of two Marine divisions; and
- o More airlift crews to allow greater utilization rates for C-5A, C-141, and KC-135 aircraft and permit more rapid deployment of two airlifted divisions.

OPTION II-B: RECONFIGURATION OF GROUND FORCES: CREATING A
"HEAVY" MARINE DIVISION

A second policy option derives from optimistic assumptions about a half war. Forces that might have been retired could be retained as a "strategic reserve" for all contingencies. Funds saved from retiring the airmobile brigade might be utilized to "heavy up" one Marine division, in order to use it more effectively in Europe's Central Region if it is felt that additional forces and firepower are needed there. The Marine air wing could also be preserved to supplement the division's capabilities. These units would also be available for non-NATO contingencies, thereby lowering the risk of U.S failure in any given scenario.

This option's five-year program resembles that of Option II-A, but there would be lower savings from retiring forces. The procurement cost of the remainder of the Option II-B program, when added to that of reconfiguring the Marines, would total \$130 million in fiscal year 1979 and \$390 million for the five-year period. The total cost of Option II-B would come to \$5.3 billion in fiscal year 1979 and \$25.6 billion in fiscal years 1979-1983.

The following table illustrates the cost differentials among the three options.

COMPARISON OF FIVE-YEAR MARGINAL BUDGET COSTS OF DIFFERENT PROJECTION FORCE PLANNING STRATEGIES: BY FISCAL YEARS, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983	Total
	<u>Procurement/Additional Manpower Costs</u>					
Option I: Demanding Assumptions	1,080	1,470	1,620	1,300	1,760	7,230
Option II-A: Optimistic Assumptions/ Force Retirement	170	170	140	--	--	480
Option II-B: Optimistic Assumptions/ Force Reconfiguration	130	130	130	--	--	390
	<u>Total Budget Costs</u>					
Option I: Demanding Assumptions	6,170	6,560	6,710	6,390	6,850	32,680
Option II-A: Optimistic Assumptions/ Force Retirement	5,070	4,770	4,530	4,280	4,280	22,930
Option II-B: Optimistic Assumptions/ Force Reconfiguration	5,280	5,230	5,210	4,950	4,950	25,620

For over 30 years, the United States has pursued a forward-based military strategy, namely, the peacetime deployment of troops abroad to protect its national security interests. The United States has assigned a defensive mission to some of these forces, particularly those stationed in Europe and along the 38th parallel after the Korean War. Other forces, called projection forces, reflect the U.S. ability to project its power beyond those areas where they are normally stationed. 1/ These forces include not only aircraft carriers and their supporting units, the three Marine divisions, three air wings, and their associated amphibious lift, but also Army airborne (82nd) and airmobile (101st) divisions 2/ and some Air Force wings as well.

The projection units are noteworthy for two common characteristics:

- o They are configured for long-distance, forcible insertion into enemy-occupied territory against armed opposition.
- o They provide or support a rapid and flexible military response to Presidential directives for contingency operations. In particular, both Marine amphibious formations and carrier task forces can mobilize off a potentially hostile shore without necessarily becoming committed to hostilities.

1/ For example, carrier operations during the Vietnam War consisted primarily of deck-launched air strikes against targets on land.

2/ The 101st Airmobile Division, formally designated an "air assault" division, is not designed for forcible long-distance insertion into hostile territory. It can, however, serve as a follow-up division to the 82nd and is joined with it as part of the XVIII Army Corps.

DoD's APPROACH TO FORCE SIZING: ONE-AND-ONE-HALF WARS

The size and structure of the projection forces are derived from Department of Defense (DoD) assumptions regarding their use. DoD does not explicitly set projection force requirements on the basis of the demands of non-NATO contingencies. Instead, it plans its projection force needs in light of the demands of what it terms the "one-and-one-half war" strategy.

The one-and-one-half war strategy is an analytic device used in programming sufficient forces for the United States to meet the military demands of both a major and a minor contingency simultaneously. It reflects the risk aversion inherent in force planning. Because it calls for more forces than might be needed in a single major conflict, it lowers the risk that the United States would sustain a military defeat in that conflict even if it were simultaneously engaged elsewhere. 3/

This strategy was first enunciated by Secretary of Defense Melvin Laird in 1969. He singled out a NATO/Warsaw Pact conflict in Europe or an Asian conflict as the major contingency for which forces had to be procured. The strategy, as originally formulated, did not designate a particular minor contingency. Later Secretaries of Defense--most notably Harold Brown--have, however, designated both the Persian Gulf and Eastern Mediterranean as particularly volatile areas that could well be the scenes of possible half-war contingencies. 4/ The Congress also has shown considerable concern over the protection of U.S. interests in these areas.

3/ During most of the 1960s, the United States nominally had planned forces for a two-and-one-half war strategy, the two major wars being one in Europe between NATO and the Warsaw Pact and one between the United States and Chinese-supported forces in Asia. The 1969 shift in U.S. strategy derived from new perceptions about both the competition between the Soviet Union and China and relations between the United States and each of them, and from the inadequacy of U.S. forces for conducting two major wars at the same time.

4/ Remarks of Secretary of Defense Harold Brown before the National Security Industrial Association (DoD News Release, September 15, 1977).

THE NATURE OF THE HALF WAR: DoD's CONSIDERATIONS

The Department of Defense plans against a half-war contingency that could precede, lead into, and then go on simultaneously with a major worldwide conflict with the Soviet Union and its Warsaw Pact allies. 5/ DoD also views the minor contingency as one that would "initially involve U.S. but not Soviet forces." 6/ This view could be interpreted to imply that the unilateral U.S. action ultimately could lead to operations against both local and Soviet forces.

DoD's assumptions about the relationship of the contingency to the major conflict, about the role of allies, and the involvement of the Soviet Union all imply a requirement for large numbers of highly capable contingency forces. DoD is concerned with minimizing the risk of defeat in a major war. It seeks to ensure that U.S. involvement in a minor conflict would in no way increase that risk. Thus, the notion that a minor contingency might occur concurrently with a major worldwide conflict, coupled with an assumption that it would be difficult to shift forces between the conflicts, results in planning for forces in addition to those required for the major effort. 7/ As a consequence, it could lead to higher overall force levels.

DoD's invocation of a unilateral effort is another facet of its risk-aversion approach. It seeks to plan against a very demanding form of half war, since that in turn would result in the greatest drain upon U.S. resources that potentially might be required for the major conflict. The unilateral scenario appears to downplay the contribution of local allies, thus justifying large, diversified projection forces with many support units.

The participation of allies, if significant, however, could have a major impact on U.S. force requirements. For example,

5/ Department of Defense, Annual Report, Fiscal Year 1978, especially pp. 53-54. Were the larger conflict to erupt first, most of the forces that might have been employed in the lesser contingency would be used in the European war.

6/ Ibid., p. 54. (CBO emphasis)

7/ Ibid., p. 98. Were the worldwide conflict to begin first, it might well absorb all the "contingency forces."

if an ally had strong ground forces, then U.S. aviation might be the only assets actually required. Similarly, in the event of an actual crisis, it might be possible to use an ally's logistical assets, particularly airfields, airfield support, and ports. These could be available to the United States even if the ally in question had a very weak military establishment. In such a case, the ability of projection forces to respond rapidly could be much more important than having a large number of forces available for use in a conflict. DoD planning, however, apparently makes little mention of allied capabilities or of the degree to which such capabilities might moderate the need for many U.S. forces that are capable of rapid, long-range insertion against armed opposition.

Additionally, DoD's allowance for some form of Soviet participation during the conflict implies that Soviet forces should be added to the threat to U.S. interests that regional antagonists pose. The demands upon U.S. forces would consequently increase, as would the potential for undermining U.S. capability in the major conflict. Indeed, Soviet involvement could plausibly trigger the expansion of the conflict to the European theater, thereby justifying DoD's theoretical link between the half war and the major worldwide conflict.

DoD's planning factors can be associated with force planning for contingencies that might occur anywhere. Again, however, the most significant of these hypothetical situations for DoD planning purposes reflect circumstances that not only plausibly could call for U.S. involvement but that also could impose demanding requirements upon U.S. resources. The high demands of these plausible contingencies could, of course, in most cases subsume the requirements of other equally plausible but less demanding contingencies. 8/

The Department of Defense has singled out the Eastern Mediterranean and the Persian Gulf as two of the non-European regions in which U.S. interests are so great that the United States might

8/ Such contingencies would include those involving local antagonists that do not benefit from Soviet support, as well as conflicts in areas remote from the Soviet Union where Soviet projection capabilities remain limited. For a discussion of those capabilities, see Appendix A.

undertake military operations to defend them. ^{9/} They are also areas where large numbers of highly capable forces might be necessary should the United States have to intervene militarily. The Soviet Union also has considerable interests in the two areas; its projection capabilities are enhanced by the proximity of both regions to its borders. A regional conflict could thus involve both superpowers. Additionally, local powers posing threats to U.S. interests in either region have large and relatively sophisticated military establishments. A possible requirement for U.S. forces to defeat combined Soviet and local opposition would appear to be very demanding, more so than in other contingencies in which Soviet projection capabilities may be limited by logistic constraints. ^{10/} If they actually materialized, such demands could significantly reduce potential U.S. capabilities in the event of a concurrent NATO war. The use of Persian Gulf and Eastern Mediterranean scenarios thus reinforces the inherently conservative nature of the one-and-one-half war strategy and supports demands for higher overall force levels.

^{9/} A northeast Asian contingency conceivably could demand a higher U.S. force level than either a Persian Gulf or a Mediterranean conflict. Nevertheless, the announced withdrawal of U.S. forces from Korea appears to indicate that the Administration considers such demands unlikely to materialize (particularly with respect to ground forces) unless North Korea were aided by China or the Soviet Union. A war involving the support of either Communist power for North Korea could not really be termed a "minor" contingency, though it could be less demanding of U.S. resources than a European conflict might be. Force requirements for northeast Asian contingencies might be subsumed in a combination of the requirements generated by a worldwide conflict (which could include a northeast Asian theater) and those for a minor contingency that itself could demand fewer U.S. resources than would the northeast Asian conflict.

^{10/} The Soviets face considerable constraints upon the use of their projection forces in remote areas. Indeed, these units have been used primarily in support of other ground force operations in Europe; the Soviets have never forcibly projected their units to a remote locale (see Appendix A).

A more optimistic view of political affairs and military forces in both regions could, however, justify lower force requirements. Like potential U.S. adversaries, probable U.S. allies in both regions have significant military capabilities. Indeed, it has been conscious U.S. policy, particularly since the announcement of the 1969 Guam (Nixon) Doctrine, 11/ to enhance their capabilities. 12/ Additionally, a number of constraints, such as competing claims for projection forces, may inhibit Soviet participation in either region despite their proximity to Soviet borders.

Focusing upon both a more optimistic assessment of the capabilities of potential local allies in both regions and possible limitations upon Soviet capabilities does, however, involve acceptance of a greater risk of defeat in the half war. By extension, it also accepts increased risk of defeat in a NATO/Warsaw Pact war. For if the half war demanded more resources than had been anticipated so that forces "held back" for a full war had to be drawn upon, the United States might find that it could only assure success in that half war at the risk of a possible military failure in the more decisive conflict.

PROJECTION FORCES: THE CHOICE BEFORE THE CONGRESS

The choice that confronts the Congress with respect to projection force programs involves the trade-off between risk aversion and optimistic assessments of U.S. capability to fight one-and-one-half wars. The projection forces are those that are most likely to be employed in a half war. They also could be employed in a full NATO/Warsaw Pact conflict, especially if that conflict extended throughout Europe and beyond the border between the two Germanies.

11/ The Guam Doctrine attempted to define the U.S. role in Asia after the Vietnam War. It reemphasized U.S. treaty commitments and promised to provide a nuclear shield and military and economic assistance to allies threatened with aggression. But it called upon regional allies to assume primary responsibility for providing manpower for their defense. See U.S. Foreign Policy for the 1970s: A New Strategy for Peace, Report to the Congress by Richard Nixon, President of the United States (February 18, 1970).

12/ See Appendix B.

The Congress could support programs that reflect worst-case assumptions about the half war; these programs would call for high force levels to ensure that U.S. full-war projection force capability is not reduced. Alternatively, the Congress could take a more optimistic view of possible conflicts in the Persian Gulf and Eastern Mediterranean. It could accept lower projection force levels because of the relative implausibility of half-war scenarios that might generate the risk of a reduced U.S. posture for a NATO/Warsaw Pact conflict.

This paper discusses the role of the projection forces in both the full and half wars. Chapter II describes these forces. Chapter III examines alternative sets of assumptions for military scenarios in the Persian Gulf and Eastern Mediterranean. It assesses the projection force capabilities implied by Department of Defense programming for fiscal years 1979-1983 against the requirements of those scenarios. Chapter IV addresses possible requirements for projection forces in a full NATO/Warsaw Pact war. These requirements provide a measure of the projection forces that would have to be held "in reserve"; that is, for planning purposes, they would not be considered available for half-war contingencies.

Given the two sets of requirements for both major and minor contingencies, Chapter V poses alternative total force options and corresponding costs for programs associated with projection forces for fiscal years 1979-1983 in light of the varying requirements derived from the non-NATO contingencies. These options focus on the following budgetary considerations:

- o The level of projection-oriented ground forces required to perform airborne and/or amphibious operations in areas outside the European theater as well as within it.
- o The degree to which these forces need additional firepower and tactical mobility for effective operations.
- o The degree of airlift, amphibious lift, and tanker capability required to support the operations of projection units outside the NATO area.

CHAPTER II. THE NATURE AND ROLE OF U.S. PROJECTION FORCES

Projection forces comprise a variety of ground, naval, and tactical air forces that can respond to Presidential directives for contingency operations quickly and in force over long distances against armed opposition. The ground forces that most reflect these characteristics are the air assault units of the XVIII Army Corps--the 82nd Airborne Division with the 101st Airmobile Division as its follow-on--and the three Marine divisions. ^{1/} These forces tend to have fewer tanks and armored vehicles than other infantry units; their emphasis is on mobility. Small Marine units are forward deployed at sea to provide immediate response to crises that might develop nearby. Elements of the 82nd Airborne are maintained at a particularly high state of readiness in the United States for rapid airborne deployment overseas.

Naval forces include carrier task force units and amphibious assault shipping to support Marine deployments. The carrier units constitute a highly mobile source of naval tactical air firepower. Tactical aviation forces also include the Marine air wings, as well as several Air Force wings.

GROUND FORCES

The 82nd Airborne and 101st Airmobile

The 82nd Airborne, the last of the U.S. parachute-drop divisions, is the "lightest" of all Army divisions in terms of

^{1/} Other Army infantry divisions could be used in contingency operations, though they are not optimized for rapid power projection. A partial exception is the 2nd Army Division, which has been identified as being part of any force initially responding to an East Asian crisis. See remarks of Secretary of Defense Harold Brown before the National Security Industrial Association (DoD News Release, September 15, 1977). The 6th Air Cavalry Brigade is an independent unit requiring corps-level support that might be included among projection forces for certain missions (see p. 38).

its armored weaponry (see Table 1). Since its conversion to an airmobile division in 1973, the 101st Airmobile has served as the Army's experimental tactical mobility force. Like the 82nd, the 101st is extremely light; it is entirely transportable within a combat theater by its helicopters.

TABLE 1. U.S. GROUND PROJECTION FORCES

Type	Size (thousands of persons)	Tanks	Armored Personnel Carriers	Artillery	Antitank Missile Launchers
82nd Airborne	15.2	0	0	54 <u>a/</u>	417 <u>b/</u>
101st Airmobile	17.9	0	0	54 <u>a/</u>	372 <u>b/</u>
Marine Divisions <u>c/</u>	19.8	70 <u>d/</u>	60 <u>d/</u>	84 <u>e/</u>	360 <u>b/</u>

SOURCES: Derived from John M. Collins, "American and Soviet Armed Services, Strengths Compared, 1970-76," Congressional Record (August 5, 1977), p. S14082; and information provided by the United States Marine Corps.

a/ 105 mm. M102 air-droppable howitzer.

b/ Dragon and TOW.

c/ Nominal size of each of the three active divisions.

d/ Force troops only, average per division (see p. 13).

e/ 105 mm., 155 mm., 8-inch.

The Army tends to view the missions of both units as similar. Airborne and airmobile infantry are meant to: 2/

- o Seize airfields and airheads thousands of miles distant;
- o Conduct airmobile raids far into enemy-held territory;
- o Conduct wide-area surveillance and denial operations;
- o Launch assaults in towns, forests, or mountains, where the conduct of armored operations is extremely difficult.

The Army stresses the importance of its airborne and airmobile units for battle areas other than the Central Front. 3/ It draws particular attention to their role in the world's mountain, jungle, and desert regions. It also points to northern Europe and Europe's built-up areas as particularly suitable for light airmobile operations. 4/ It is perhaps noteworthy that, apart from the Vietnam War, the 82nd and the 101st have only infrequently been among U.S. military forces called upon to respond to contingency crises. 5/

Lift for Airborne Forces. The responsiveness of both airborne and airmobile units to requirements in remote areas depends critically upon the availability of strategic airlift forces to transport them. These forces consist of two key elements: cargo

2/ U.S. Department of the Army, Field Manual No. 100-5 (July 1976), pp. 4-7.

3/ Ibid., pp. 1-2. The Army views the Central Front primarily as a theater for armored and mechanized warfare (see below, p. 31ff.

4/ Ibid., pp. 4-7; 14-2 to 14-15, passim.

5/ See Barry M. Blechman and Stephen S. Kaplan, The Use of the Armed Forces as A Political Instrument (Washington, D.C.: The Brookings Institution, 1977), pp. XI-19, XII-72. Of 115 incidents involving the show or use of U.S. ground forces since World War II (apart from the Korean and Vietnamese conflicts), only 15 involved injection of airlifted U.S. ground forces (p. IV-8).

aircraft (see Table 2) and, particularly where extremely long transits (over 5,000 miles) are required, tanker aircraft to refuel them. 6/

TABLE 2. CARGO AIRCRAFT RESOURCES

Type	Number	Maximum Design Load	Unrefueled Range with Maximum Load	Type of Load
C-5A	70	220,967 lb.	3,256 nm.	Outsize <u>a/</u>
C-141	234	70,847 lb.	3,500 nm.	Oversize <u>b/</u>

a/ Extremely large units carried only by C-5As.

b/ Large units that conventional cargo aircraft cannot carry.

Both cargo and tanker aircraft have other missions in addition to transporting these divisions, however. Cargo aircraft are critically necessary to rapid transport of elements of Army divisions to Europe and of Air Force support units for sustained tactical air operations. Tanker aircraft (KC-135s), which would also be necessary to support long-range tactical air deployments, are assigned to the Strategic Air Command (SAC), and their availability for other missions depends on a Joint Chiefs of Staff assessment of SAC requirements, which have precedence.

The Marines

Unlike Army airborne and airmobile divisions, Marine ground forces have direct control over their tactical air support--

6/ Tanker support can enhance the load-carrying capability of cargo aircraft over shorter distances but is not a necessary condition for those transits (see Appendix D).

the Marine air wings--and their strategic lift support--Navy amphibious shipping. Marine divisions frequently are thought of as light infantry divisions, primarily because the division structure (about 19,800 personnel per division) does not include any tank battalions. 7/ However, Marine "force troop" units usually provide tanks, vehicles, and other support to accompany the divisions (see Table 1). 8/ Additionally, each Marine air wing is associated with a division and functions with it as an integrated Marine Air/Ground Task Force (MAGTF). The three Marine air wings vary in size and composition but usually include three fighter and attack groups consisting of F-4 fighters and A-4, AV-8A, and A-6 attack aircraft squadrons. 9/ Reconnaissance and electronic warfare squadrons support the fighter/attack elements. Marine air wings also include a helicopter group consisting of assault, utility, and transport helicopters.

The Navy amphibious lift force has been designed to support the continuous forward deployment of battalion-sized Marine units that would be ready to respond immediately to crises in their general vicinity. The total force now can provide lift for assault elements of just over a division. It is, however, deployed throughout the world, supporting up to four battalion landing teams (BLTs) deployed in the Mediterranean Sea, the Pacific Ocean (two teams) and, on occasion, the Caribbean Sea. It also supports Marine aviation units to complement three of these teams (and form Marine Amphibious Units--MAUs). With the entry into service of the LHA general purpose amphibious ship, the force will support four MAUs. Worldwide Marine amphibious deployment means that considerable time would be required to assemble sufficient shipping to lift the assault elements of a division-sized force in a single operation.

7/ See Martin Binkin and Jeffrey Record, Where Does the Marine Corps Go from Here? (Washington, D.C.: The Brookings Institution, 1976), pp. 16-18.

8/ Ibid. Force troops are supporting units, outside the Marine division structure, that provide additional firepower to the divisions.

9/ The number of unit equipment (UE) aircraft in each squadron varies with plane type. An F-4 squadron normally consists of 12 aircraft; an A-4 squadron, 16; an AV-8A squadron, 20; and an A-6 squadron, 12 (see Ibid., p. 21).



also permits it to be configured for missions that are primarily defensive in nature, such as fleet air defense or antisubmarine warfare. Nevertheless, it is in the projection of air power ashore that the carrier is more effective than all other naval systems. ^{13/} In fact, carriers have been employed since the end of World War II primarily to project power ashore. ^{14/}

TACTICAL AIR FORCES

Air Force Units

Tactical air support for U.S. projection forces could be provided by Air Force wings in place of, or in addition to, the Marine and Navy wings outlined above. Most active Air Force tactical units are rapidly deployable; their primary limitations are range, availability of landing sites, and logistics support. Fighter and attack aircraft would rely heavily upon refueling for long transits from their bases in the United States. As noted above, however, there are other calls upon KC-135 refueling assets, notably refueling for strategic bombers and for cargo aircraft in extremely long transits of 5,000 miles or more. The number of tactical Air Force units available for long-range projection missions will therefore be limited by other demands upon tanker assets.

^{13/} See Congressional Budget Office, Planning General Purpose Forces: The Navy, Budget Issue Paper (December 1976), pp. 17-20.

^{14/} Ibid., p. 20.

CHAPTER III. FORMULATING REQUIREMENTS FOR PROJECTION FORCES OUTSIDE EUROPE: THE DEMANDS OF PERSIAN GULF AND EASTERN MEDITERRANEAN CONTINGENCIES

To formulate requirements for U.S. projection forces in non-NATO contingencies, it is necessary to examine the balance of local forces in the two regions under consideration--the Persian Gulf and the Eastern Mediterranean--as well as the potential involvement of the Soviet Union in both areas. The demands of contingencies in either area could vary widely with the nature of the participants. For example, the demands of a hypothetical U.S. unilateral seizure of oil fields in the southern Gulf, without any Soviet involvement, ^{1/} would likely be lower than those of a contingency in which there were a greater likelihood of Soviet military support of a local state hostile to the United States. This chapter will address the implications of contingencies that are likely to reflect relatively high demands upon U.S. projection forces because of both the relative strength of regional participants and the plausibility of Soviet involvement. These contingencies are:

- o U.S. support of Iran against a Soviet-supported Iraqi attack.
- o U.S. intervention in an Arab-Israeli war.

U.S. INTERESTS AND THE PERSIAN GULF BALANCE OF FORCES

U.S. Interests

The United States has several political and economic goals in the Persian Gulf. It seeks to foster the preservation of

^{1/} Constraints upon Soviet projection capability would limit its effectiveness in the southern Gulf (see Appendix A). In certain circumstances, seizure of oil fields could be a formidable unilateral task. See Oil Fields as Military Objectives: A Feasibility Study, prepared by the Congressional Research Service for the Special Subcommittee on Investigations, House Committee on International Relations, 94:1 (August 1975).

friendly regimes, such as Iran, Saudi Arabia, Kuwait, and the United Arab Emirates, as well as a favorable balance of forces in the region (see Figure 1). It also seeks to minimize Soviet influence in the area. Additionally, the United States wishes to maintain the continued flow of petroleum from the Gulf states, particularly because both the United States and, even more so, its NATO allies and Japan have become increasingly dependent upon Persian Gulf oil. 2/

All of these goals contributed to the U.S. decision to apply the Guam (Nixon) Doctrine to friendly Gulf states, notably Iran and Saudi Arabia. Since 1970, U.S. military aid and sales to both states have risen substantially; sales reached a combined total of \$4.0 billion in 1975. With rising military sales has come an increasing American technical presence in the Gulf and, consequently, an additional U.S. aim: to protect the more than 20,000 U.S. citizens residing in the Gulf area. 3/

U.S. Force Requirements: DoD Assumptions

In setting out its force planning factors for a non-NATO contingency, the Department of Defense stresses the unilateral nature of U.S. involvement and alludes to the possibility of direct participation by Soviet forces. Thus, a risk-aversion view of a "minor" contingency scenario would call for large U.S. military operations in the Gulf--for example, military support of Iran against attacks by both Iraqi and Soviet forces. This scenario logically allows for a range of U.S. force requirements, depending upon the assumed size of Soviet forces, the speed with which they could be deployed to Iran, and the degree of success that Iranian forces might achieve against the Iraqis.

Since the Department of Defense tries to minimize the risk of defeat, however, it is likely to plan its force requirements against the more demanding variants of such an Iraq/Iran conflict scenario. It could, for example, take into account the fact that the balance between Iran and Iraq is relatively even with respect to ground forces (see Table 4) and assume that, in the event of

2/ For a more detailed examination of U.S. interests and local and Soviet capabilities in the Persian Gulf, see Appendix B.

3/ See Appendix B.

TABLE 4. IRAN AND IRAQ: SOME STATIC MILITARY INDICATORS
(Additional materiel on order in parentheses)

	Iran	Iraq
Ground Forces		
Manpower		
Active	220,000	188,000
Reserve	300,000	250,000
Divisions		
Armored/Mechanized	3	6
Infantry	4	4
Independent Brigades	4	5
Medium Tanks	1,620 (1,220)	1,350 (42)
Light Tanks	250 (110)	100
Armored Personnel Carriers/ Fighting Vehicles	2,000	1,800
Helicopters		
Attack	120 (82)	40 (20)
Transport	212 (193)	125
Howitzers/Major Caliber Guns	650	700
Air Forces		
Fighter/Bomber and Ground Attack Aircraft	285 (229)	214
Interceptor Aircraft	40 (40)	135
Reconnaissance/ AEW Aircraft	16 (7)	--
Tanker Aircraft	10 (1)	--
Transport Aircraft	87 (6)	47
Naval Forces		
Destroyers/Frigates	7 (4)	--
Corvettes	4	--
Patrol Boats	20 (12)	14
Submarines	-- (3)	--
Patrol Aircraft	12 (3)	--

SOURCE: International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977), pp. 35-36.

a war between the two states, the Iranians could spare only as few as two divisions to defend against a Soviet attack to the north. A scenario consistent with such assumptions might discount Iranian capabilities vis-a-vis the Soviets, despite the influx of western weaponry to Iran during the past decade. On the other hand, it could assume a high and immediate threat from Soviet forces. It could include three divisions of Soviet ground forces in the Transcaucasus (about 33,000 men), all immediately ready for combat (termed "Category I"), 4/ as well as most of the Category I divisions in European Russia, which rail lines might transport to Iran within a month. 5/ It could also include two airborne divisions that the Soviet airlift force could rapidly transport to the Iranian front 6/ and at least 475 combat aircraft stationed in the Caucasus. 7/ This "worst-case" threat to Iran would be built solely upon Soviet capabilities. It would ignore constraints upon the use of Soviet forces.

The demands generated by such a scenario clearly would be very high. They could, for example, call for the injection of four U.S. divisions and six air wings to support the Iranian ground forces and for two carrier air wings to provide air superiority over the Persian Gulf (and relieve the Iranians of

4/ Jeffrey Record, Sizing Up the Soviet Army (Washington, D.C.: The Brookings Institution, 1975), p. 19. The Iranians have stated on numerous occasions that at best they could hope only to slow the progress of a Soviet attack, even without having to fight along a second Iraqi front, and would look to the United States to bolster Iran. See U.S. Military Sales to Iran, Subcommittee on Foreign Assistance, Senate Committee on Foreign Relations, 94:2 (July 1976), p. 10.

5/ See Appendix C.

6/ Commander James G. Roche, USN, "The Soviets' Growing Reach: Implications of Comparative Capabilities to Project Military Power" (paper presented before the European-American Workshop, 1977; processed), p. 19. See also Record, Sizing Up the Soviet Army, pp. 18-19.

7/ Robert P. Berman, Soviet Air Power in Transition (Washington, D.C.: The Brookings Institution, 1978), p. 43. The total force in the southern Soviet Union exceeds 900 aircraft.

that task) as well as deny the Soviets seaborne access to it. 8/ Because of the nature of Iranian terrain and the premium placed upon a rapid U.S. response, the four U.S. divisions in this hypothetical scenario could be a combination of Marine and airborne/airmobile units. Given the mountainous regions in which they might fight, light infantry--particularly airmobile units--certainly would appear most appropriate. The topography in these areas hinders armored mobility and yields some advantage to defending forces. Additionally, Marine amphibious forces could land in the Gulf for operations in the south or transfer to northern Iran.

Force Implications of a Gulf Contingency Consistent with Risk-Aversion Assumptions. The availability of airlift and sealift assets is critical to the speed with which projection forces could respond to a crisis. In the case of a Gulf contingency such as that outlined above, limitations upon airlift--notably tanker support for lift units--and upon assault shipping could seriously delay the arrival of many units. It could be argued that if the United States wishes to plan against such a contingency, it would have to expand and enhance its lift and associated tanker capabilities.

Given present lift resources, approximately two light divisions, including a small Marine amphibious force (two-thirds of a division and air wing with carrier escort), could arrive in the Gulf within 30 days. 9/ Other combat and support forces would probably take longer to arrive, however, and the airlifted units would be competing for cargo aircraft space with support materiel required for Air Force and some Marine tactical air operations, including bare-base units that might be necessary for such operations in many parts of Iran.

Assuming that no European bases would be available for refueling cargo aircraft (since the operation would not involve NATO but that Israeli bases would be available, cargo as well as

8/ One-and-one-half wings are assumed to support each division. Carrier task groups consist of at least two carriers with their air wings. (See Appendix C for calculations of hypothetical U.S. force requirements.)

9/ Information from U.S. Marine Corps; see Appendix D.

tactical aircraft might have to be aerially refueled. Aerial refueling would reduce the arrival time of the airborne and airmobile divisions from the United States by about a week if the United States could not use Clark Air Force Base in the Philippines. 10/

A large part of the tanker fleet would, however, have to be withheld for support of the U.S. strategic mission. The consequent strains upon both airlift and tanker assets might seriously undermine the U.S. effort to provide a force of sufficient size to stop a Soviet thrust into Iran, since it is unlikely that the immediately available Soviet divisions would require more than 30 days to advance into Iranian territory. Furthermore, unless additional assets were procured, strains upon lift resources would be further intensified if, as a result of the Gulf crisis, the United States began to reinforce its units in Europe in anticipation of a Soviet attack there. 11/

U.S. Force Requirements: Modified Assumptions--More Optimism and Higher Risk

Because Department of Defense planning emphasizes risk aversion, it tends to generate very high force requirements. It is, however, possible to derive alternate force requirements by highlighting some political/military considerations that DoD tends to ignore. A more optimistic assessment of Iranian capabilities and of the constraints upon Soviet forces could lead, for example, to lower U.S. projection force requirements for a Gulf conflict, even for a conflict reflecting the major elements of the scenario outlined above. Such an assessment would tend to downgrade the increased risks associated with committing fewer U.S. resources to the Persian Gulf. Instead, it would point to the risks that the Soviet Union would face if it joined a Gulf conflict.

10/ See Appendix D.

11/ Some sealift assets would be available to support the U.S. effort. However, most ships are unlikely to arrive in the Persian Gulf within 30 days of a U.S. decision to deploy forces there. These ships could resupply the assault units transported either by air or amphibious shipping. See Oil Fields as Military Objectives, Committee Print, pp. 64-65.

A modified assessment of U.S. requirements that assumed recent Iranian military acquisitions would improve Iranian military effectiveness could ultimately reduce the perceived need for many U.S. resources. A more effective Iranian force, for example, could result in a lower Iranian requirement vis-a-vis Iraq and permit Iran to station more troops facing the Soviets. In these circumstances, the Soviets would probably have to draw down upon their strategic reserve, in addition to their Transcaucasian and airborne divisions, in order to defeat the Iranians. Yet in doing so, they would reduce their capability to support Warsaw Pact operations in Europe. In short, modified assumptions about a Gulf conflict that emphasized Iranian capabilities and Soviet risk aversion could reduce estimates of the requirements for U.S. military operations in the Gulf. A scenario built on such assumptions might call for a maximum U.S. commitment of two divisions and three air wings, supplemented by two carrier groups, to reinforce Iran. This level of force could, within this more optimistic set of assumptions, drive the demand upon Soviet strategic reserve reinforcements beyond the point at which the Soviets were willing to downgrade their European capabilities. ^{12/} Given the history of Soviet caution with respect to military adventures, it might be argued that they would accept neither the risk that an attack might fail nor the toll upon their European capabilities.

Force Implications of Modified Assumptions. Deriving requirements from a scenario that is more optimistic and accepting the accompanying somewhat higher risk of not having enough forces results in a lower demand for additional lift assets beyond those presently available. A U.S. force could be composed of either Marines or airborne troops. Airlift resources would permit an estimated additional force of the 82nd Airborne and the assault elements of the 101st Airmobile Brigade to arrive in the Gulf well within a month. Two-thirds of a Marine division (a small MAF) could arrive there at about the same time. Finally, two carrier wings might be needed to escort the Marine amphibious units and deter Soviet ships from seeking to approach the region.

^{12/} One-and-one-half wings are assumed to be required to support each division. (See Appendix C for force calculations.)

U.S. INTERESTS AND THE EASTERN MEDITERRANEAN BALANCE OF FORCES

U.S. Interests

U.S. interests in the Eastern Mediterranean are primarily political and strategic. They include support for Greece and Turkey as well as the search for political stability between those two NATO allies and between Israel and her Arab neighbors. Additionally, the United States has sought to prevent the spread of Communist influence in the area. A more recent concern has been the preservation of Yugoslavia's integrity in the post-Tito era.

The Eastern Mediterranean is one of the world's most heavily armed regions. In particular, both Israel and her Arab neighbors combined possess armed forces establishments that rival those of European powers in both numbers and sophistication. They have fought four wars in the past thirty years and, because tensions persist, a fifth war cannot be ruled out. Both the United States and the Soviet Union could be involved in a new war. The last war, in 1973, almost led to a major U.S.-Soviet confrontation, as the United States airlifted supplies to the Israeli forces while the Soviet Union threatened to intervene in the war after Israel encircled the Egyptian Third Army. ^{13/} A key focal point of that confrontation was naval: the U.S. Sixth Fleet and the Soviet Mediterranean Squadron moved to within weapons range of each other. While tensions persist in sectors of the Eastern Mediterranean apart from the Israel/Arab theater, the most likely focus for U.S. as well as Soviet intervention in the Mediterranean remains that of an Arab/Israeli war.

The Role of Extraregional Forces in the Eastern Mediterranean

Both the Soviet Union and the United States could inject a variety of projection forces into the Eastern Mediterranean. Soviet bombers based in the Black Sea have the range to reach

^{13/} For a discussion of the nature of possible Soviet intervention in the 1973 war, see Charles G. Pritchard, "Soviet Amphibious Force Projection," in Michael McGwire and John McDonnell, eds., Soviet Naval Influence: Domestic and Foreign Dimensions (New York: Praeger, 1977), pp. 265-266.

Mediterranean targets; Soviet airborne troops are within range of any of the coastal states. 14/ Most significant of all Soviet forces in this region, however, are the naval surface and sub-surface units that they deploy to the Mediterranean. The Soviet Mediterranean Squadron numbers an average of 55 ships, including 20 to 25 warships, of which about 12 are submarines. 15/ The squadron includes a small number of amphibious ships, although these may be tasked for the evacuation of Soviet nationals rather than the projection of naval infantry forces. 16/

The U.S. naval presence in the Mediterranean antedates that of the Soviets; the Sixth Fleet has operated there since 1948. The fleet, which numbers some 40 to 45 ships on routine deployment, is centered around two carrier task groups and a Marine Amphibious Unit (MAU) consisting of a battalion landing team and one-ninth of an air wing. The fleet also includes support for the carriers in the form of repair and replenishment ships. Submarines on routine deployment can also provide anti-submarine escort support to the carriers. Patrol aircraft are available for surface surveillance and antisubmarine warfare. The Marines are carried by an amphibious task group comprising a range of amphibious lift ships. 17/

To augment its Mediterranean forces, the United States could call upon its tactical air force units, its airborne and air-mobile divisions (with required airlift), and additional carrier task forces and Marine units. Nevertheless, it is the sea-based forces in the area that could provide the most rapid initial U.S. military response to any contingency demand.

14/ See p. 27, fn. 18 for a discussion of the prospects of a successful Soviet airborne attack.

15/ For a full description of the Soviet Mediterranean Squadron, see Jesse W. Lewis, Jr., The Strategic Balance in the Mediterranean (Washington, D.C.: American Enterprise Institute, 1976), pp. 59ff.

16/ Pritchard, "Soviet Amphibious Force Projection," p. 265.

17/ Martin Binkin and Jeffrey Record, Where Does the Marine Corps Go from Here? (Washington, D.C.: The Brookings Institution, 1976), p. 23; Lewis, The Strategic Balance in the Mediterranean, pp. 33-41.

U.S. Requirements in the Eastern Mediterranean: Focus on Naval Requirements

Although U.S. intervention in the Arab-Israeli conflict could demand the participation of ground, tactical air, and naval forces, only the aggregate level of naval-based forces is likely to match that necessary in the Persian Gulf. Ground force requirements might be minimal if the United States actually were to support Israel in a relatively short Arab-Israeli war, since the Israelis can quickly field nearly as many ground troops as any two Arab "confrontation" states. ^{18/} The demand for U.S. resources in such a contingency might focus on tactical air support, since the Israelis' difficulties in the Yom Kippur War, like their success in the Six Day War, were in large part a function of their command of the air over the battlefield.

Somewhat larger ground force requirements could be generated if the United States were to intervene between the warring parties. Nevertheless, such an interposition would likely be in support of a cease-fire, with the trip-wire threat of U.S. retaliation should the interposing forces be attacked by either side. A trip-wire force could well be a small one, perhaps of multi-brigade size, akin to the 7,000-man United Nations Emergency Force currently stationed in the Middle East since 1973. ^{19/} Clearly, the demand for a ground force of this size, or even one several times as large, could be subsumed in the demands for ground forces that a Persian Gulf contingency would likely generate.

The demand for naval forces, particularly sea-based tactical air forces, cannot be subsumed in this manner. The United States

^{18/} See International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977), pp. 35-41. Israeli forces include reserves available within 72 hours. The Soviets could quickly transport the assault elements of two airborne divisions to Syria and add naval infantry units as well. The airborne divisions would be no match for Israeli armored units, however, while naval infantry would be threatened by Israeli shore units and missile boats as well as, of course, U.S. naval forces. See Pritchard, "Soviet Amphibious Force Projection," p. 266.

^{19/} Yearbook of the United Nations, 1973 (New York: United Nations Office of Public Information, 1976), p. 217.

constantly faces the presence of a potentially hostile Soviet squadron in the Mediterranean. This squadron complicates the demands upon U.S. naval forces in support of interposition and evacuations or, indeed, in providing active tactical air support of Israel against Arab opponents. The squadron could intervene at any time and, at least initially, possesses sufficient firepower to reduce the capabilities of the Sixth Fleet carriers it might attack.

The need for rapid Navy tactical air support might be particularly acute if the United States sought to provide tactical air support to the Israelis against Arab forces. Such support could only be forthcoming from carriers deployed in the Mediterranean, since transit times would be too long for the deployment of carriers from other areas. To be sure, some Air Force units could also support the Israeli air effort. Apart from F-111s, however, Air Force aircraft may not have the unrefueled range to attack Arab targets in the Eastern Mediterranean if deployed from the bases of any NATO ally other than Turkey or Greece. Whether either of these two states, or any NATO ally, would permit the deployment of air force units from their bases is problematical, particularly in light of the refusal of most European states to permit U.S. airlift forces to refuel enroute to Israel in 1973. Since Israeli aircraft would be involved in the conflict, it is unclear whether base congestion would limit the number of U.S. Air Force units that could operate from that country.

The two carrier task forces in the area, combined with those Air Force units that could fly from Israel, could, however, contribute fighter and attack aircraft to bomb Arab targets and dogfight Arab fighters in support of Israel. Carrier aircraft could also provide defenses to deter against possible Soviet cruise missile attacks. Of course, if Soviet activities indicated a naval force buildup in the area, the U.S. force could in turn be reinforced by additional carrier task groups.

In short, the demands of an Eastern Mediterranean contingency are likely to involve naval and tactical air assets much more than ground forces. Because of transit distances and possible logistical constraints (such as the unavailability of the Suez Canal) between the Persian Gulf and the Eastern Mediterranean, estimated requirements for naval forces in each region must be taken as additive. On the other hand, because ground forces could be airlifted to either locale, the likely higher demands of a Gulf contingency might be taken to subsume those for contingencies in the Eastern Mediterranean.

ADDING REQUIREMENTS FOR THE HALF WAR TO THOSE FOR THE FULL WAR

Chapter I indicated that the one-and-one-half war strategy posits that forces employed in a half war might not be available for operations in a major war, should the two occur concurrently. It implicitly argues that the requirements for projection forces in a half war should not reduce the availability of adequate projection forces for a major war. For planning purposes, some level of projection forces will have to be "held back" from operations in a half war so that they could be employed, if and when needed, in a major conflict. The sum of the two levels of projection forces would be the total force requirement. This chapter indicated that the half-war requirement depends upon assumptions about the nature of that contingency. The following chapter will examine the level of projection forces that might be required for a NATO/Warsaw Pact war and that will therefore have to be programmed in addition to whatever the half-war projection force level is determined to be.

CHAPTER IV. PROJECTION FORCES IN EUROPE: SETTING REQUIREMENTS
FOR THE FULL WAR

Projection forces are general purpose forces and, as such, could be employed in a wide variety of roles in different locales around the globe. These forces could be utilized in a major worldwide war with the Soviet Union. Indeed, the requirement for projection forces in a NATO/Warsaw Pact war sets the baseline for overall projection force levels to which requirements for a half war might be added.

Projection force units could be employed along Europe's Central Front separating West Germany from Eastern Europe. They might not be well suited for the kind of armored warfare likely to take place in the event of a conflict there. It is possible, therefore, that some of the funds used to procure and maintain the projection forces might be better spent on forces more suited for combat on the Central Front. On the other hand, projection forces appear to be more appropriately suited to combat along the northern flank of Europe, which could well be the scene of NATO/Warsaw Pact operations that extend beyond NATO's Central Region. This chapter examines the suitability of various projection forces for the different combat environments of Europe. It focuses on the demands of combat in the northern European sector of a NATO/Warsaw Pact conflict as the key measure of its projection force requirements. The forces thus postulated for the major war could then serve as a base to which the half-war projection requirements discussed in the preceding chapter could be added. 1/

THE EUROPEAN CENTRAL FRONT

Ground Forces

Airborne, airmobile, and Marine forces could all be utilized on Europe's Central Front. That area, however, is one in which

1/ The European theater is accorded highest priority in U.S. planning--hence the necessity to have a baseline for projection forces derived from the European context. (See Department of Defense, Annual Report, Fiscal Year 1979, p. 23.)



armored units are expected to play the primary role in both NATO and, particularly, Pact forces, 2/ which rely heavily on tank and mechanized units. 3/ The historical record of combat in Western Europe during World War II indicates that infantry does not operate well against forces whose tactics maximize the maneuverability that tanks and mechanized armor afford them in relatively flat, unevenly populated terrain. 4/ Even the addition of antitank weapons does not, in itself, overcome the infantry's disadvantages vis-a-vis tanks in that environment. 5/ It is for that reason that U.S. forces dedicated for European combat recently have taken on a "heavier" (that is, armored) emphasis. 6/

2/ An exception would be Central Europe's urban areas, such as those in the northeastern sector of the Federal Republic of Germany. The implications of urban sprawl in Europe have not yet been fully analyzed, and many areas of approach remain through lightly populated parts of the northern sector. (See below, p. 35, fn. 10.)

3/ See, for example, General of the Army I.G. Pavlovskiy, "In the Battles for the Motherland," Izvestia (March 18, 1975), translated and reprinted in Strategic Review (Fall 1975), p. 116. See also the emphasis on mobility and armor in Lieutenant-General V. Reznichenko, "The Role of Tactics in Modern War," Soviet Military Review (September 1976), p. 10.

4/ A good brief discussion of this record appears in Senator Robert Taft, Jr., A Modern Military Strategy for the United States (White Paper on Defense, 1976; processed), pp. 2H-11H.

5/ Results of the 1973 Middle East war support this conclusion. (See Chaim Herzog, The War of Atonement (London: Weidenfeld and Nicolson, 1975), p. 272.

6/ See Congressional Budget Office, Planning U.S. General Purpose Forces: Army Procurement Issues, Budget Issue Paper (December 1976), pp. 15-21. Even critiques of the Army's move focus more on the problems involved in the timely dispatch and arrival of forces in Europe than on the actual principle of "heavying them up." Marine forces could be "task-organized" as a heavy division; such a tasking, however, has never taken place, either in combat or training.

Carrier Forces

Carrier task forces do not appear to be optimized for Central Front operations. Although attack aircraft have sufficient range to reach Central Front combat zones from carrier bases in the North Sea, carrier operations in that sea could be hazardous, since the carriers would be vulnerable to attacks by medium-range bombers based in Eastern Europe or the Soviet Union. Indeed, these bombers could be escorted by Soviet fighters as well. ^{7/} Additionally, the relative proximity of the North Sea to Soviet and East European shores means that carrier forces would be vulnerable to diesel submarine attacks as well as to attacks by nuclear-powered boats, possibly coordinated with the bomber missions. In any event, if carrier-based aircraft were deemed crucial to Central Front operations, they might be deployed from European bases that had been readied for their use in advance. ^{8/}

THE NORTHERN FLANK

Compared to their utility on the Central Front, U.S. projection forces might be used with greater effect in what is termed "the Northern Flank" of Western Europe (see Figure 2). This area comprises all of Europe north of the Elbe River. Its critical zones are the German region of Schleswig-Holstein and neighboring Denmark and Norway. These areas are strategically important because they comprise both an overland route that would enable Pact forces to bypass stronger allied defenses in central Europe and a sea line to the Atlantic which, if used, would enable Pact naval units to threaten the resupply of NATO forces

^{7/} See Congressional Budget Office, The U.S. Sea Control Mission: Forces, Capabilities and Requirements, Background Paper (June 1977), p. 9.

^{8/} Congressional Budget Office, Planning U.S. General Purpose Forces: The Tactical Air Forces, Budget Issue Paper (January 1977), pp. 32-34; and Congressional Budget Office, Planning U.S. General Purpose Forces: The Navy, Budget Issue Paper (December 1977), pp. 10-11.



SOURCE: General Sir John Sharp, "The Northern Flank," *RUSI Journal of the Royal United Service Institute for Defense Studies*, 121 (December 1976).

in both northern and central Europe. 9/ Over the last few years, NATO's concern for the defense of these areas in the event of a major European war has grown as a result of increasing Soviet projection capabilities coupled with the decline in Britain's maritime forces, once the key to a successful defense of the region.

The combat environment in both areas differs from that of central Germany in that it is more conducive to operations by light forces. Schleswig-Holstein, the German corridor to the Jutland Peninsula of Denmark, is a flat area interspersed with waterways. The speed of a Pact armored advance would be limited by the need for substantial engineering--especially bridge-building--efforts, particularly in the Kiel Canal area. 10/ Northern Norway is a rugged region that has few good roads--and these cross numerous streams. Furthermore, the roads are of use only in the few months of the year when they are neither snowbound nor flooded. 11/ In both cases, Pact armored units are unlikely to match the speed of advance of their counterparts in central Germany. Given these conditions, lighter NATO defenses could exploit geography to halt and possibly reverse a Pact offensive; Marines, or the airborne or airmobile units, could provide a significant part of that defense.

9/ See Vice Admiral (Rtd.) R. Steinhaus, FRGN, "The Northern Flank" (paper presented to the American Enterprise Institute conference on "The U.S. Navy: What Is Its Future?", 1977; processed), pp. 12-13.

10/ An additional factor affecting Soviet speed of armor in this region is the growth of the Hamburg conurbation. As noted above, urban sprawl can hamper speed of advance; the defense of urban areas calls primarily for light forces with short-range weapons. For a view of the implications of urban sprawl for a war in Europe, see Paul Bracken, "Urban Sprawl and NATO Defense," Survival (November/December 1976), pp. 254-265.

11/ For a description of topography and infrastructure in Norway, see General Sir John Sharp, "The Northern Flank," RUSI, Journal of the Royal United Services Institute for Defense Studies (December 1976), pp. 10-12.

Opposing Forces in the Northern Flank

The extent of a possible U.S. contribution to each of the two key northern areas would depend primarily upon the level of Pact forces threatening the Northern Flank and the size and capabilities of allied forces available to meet those threats. It is extremely difficult to predict the exact composition of the forces that might engage each other in the event of war. Nevertheless, the nature of available forces in these areas suggests that Pact forces consisting of East German, Soviet, and Polish units could achieve well over a two-to-one manpower advantage over German and Danish forces in the Schleswig-Holstein/Jutland area, while Soviet forces on the Kola Peninsula might outnumber their Norwegian counterparts by an even larger margin. 12/

The balance in air and maritime forces is somewhat more favorable to NATO. German and Danish antiship fighter/bomber and interceptor squadrons, as well as mining capabilities, 13/ appear sufficient to pose severe obstacles to Pact attempts to

12/ See Appendix C for a detailed description. Pact forces could face severe transportation problems. For example, Polish sealift capabilities, which might be used against Denmark, are sufficient for only about 2,600 men. Similarly, while the Soviets maintain a full amphibious regiment on the Kola Peninsula, their North Sea fleet cannot transport the entire regiment in a single operation.

13/ The Danes maintain three fighter/bomber squadrons (60 aircraft) and two F-104G interceptor squadrons (40 aircraft) available for use in the theater. The Germans maintain four fighter squadrons and three antiship bomber squadrons (96 aircraft). On German and Danish mining capabilities, see Jane's Fighting Ships 1976-77; International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978 (London: 1977); and Captain Walter Jablonsky, FRGN, "The 206-Class Submarine," Navy International (September 1975), p. 21. The seaborne approaches to Schleswig-Holstein/Jutland are particularly susceptible to mining; see Commander Michael Sallitter, FRGN, and Commander Ulrich Weissner, FRGN, "Shallow Water Warfare in Northern Europe," United States Naval Institute Proceedings (March 1977), p. 43.

achieve air superiority, provide close air support, 14/ and conduct naval operations and amphibious landings in the Schleswig-Holstein/Jutland theater. Similar difficulties would face Soviet forces in Norway. The Norwegians can quickly deploy their 103 interceptor, fighter, and attack aircraft to the north. They maintain both strong coastal artillery defenses and a capable coastal navy with minelaying submarines, Penguin missile-armed patrol boats, and a small number of other warships. 15/

Given the capabilities of the allies most affected by Pact incursions into Schleswig-Holstein/Jutland and Norway, it appears that the major shortcoming that the United States would have to help fill is that of ground forces. The forces which the allies could field against Pact forces in Schleswig-Holstein/Jutland or Norway appear insufficient for the threat they would have to face, even when the nature of terrain in either area is taken into consideration. Part of the demand for additional forces could, however, be filled by other NATO forces, notably British, Dutch, and Canadian brigades and the Allied Mobile Force. The remaining shortfall would, however, still have to be filled by U.S. forces.

Aggregate U.S. Projection Force Requirements for the Northern Flank

Although the Soviets could bring considerable force to bear either in Schleswig-Holstein or in northern Norway, present levels of allied forces in both regions seem to call for relatively small U.S. force increments to reduce the ground force balance. Even if it is assumed that Soviet forces would attack both areas, the total U.S. force requirement appears to be no greater than about five brigades with about two Air Force wing equivalents supporting them. 16/ Since Marines could, given additional winter

14/ Jeffrey Record, Sizing Up the Soviet Army (Washington, D.C.: The Brookings Institution, 1975), p. 51. It can be assumed that most of these resources would be dedicated to the main focus of Soviet incursion, NATO's Central Region.

15/ See IISS, The Military Balance, 1977-1978 and Jane's Fighting Ships, 1976-77.

16/ See Appendix C.

training, 17/ play as important a role in Norway as they might in Schleswig-Holstein, three of the brigades might be Marine regiments with complementary air groups (which, in turn, would further enhance allied air capabilities). The remaining brigades could be drawn from the 82nd Airborne and the 101st Airmobile Divisions. 18/ Lastly, the 6th Air Cavalry Brigade, an independent corps-level resource not usually associated with the projection forces, could be made available to further augment the capabilities of the five brigades drawn from the projection-oriented divisions.

BUILDING UPON PROJECTION FORCE REQUIREMENTS FOR THE FULL WAR

It would appear that, for planning purposes, a five-brigade (or regiment) equivalent strategic reserve force that could be drawn from the 101st Airmobile, 82nd Airborne, and three Marine divisions and supplemented by the Air Cavalry Brigade, could meet requirements for reinforcing NATO units on Europe's northern flank. In practice, of course, all six brigades (including the Air Cavalry) could be utilized in a variety of ways, as a strategic reserve within or outside the European sector. For example, the European-oriented projection forces could supplement NATO forces on the southern flank of Europe. Adding the European-oriented projection forces to allied forces could show a manpower balance in the area not unfavorable to NATO. 19/

17/ Such training presently is not sufficient for maximum effectiveness in cold climates. See Major Donald F. Bittner, "British Army's World War II Experience Casts Doubt on Corps' Ability to Fight in the Arctic," Marine Corps Gazette (July 1977), pp. 29-34.

18/ Airborne units could well be involved in Middle Eastern operations, however (see Chapter III). The availability and effectiveness of any of these forces depends upon strategic and tactical lift, as well as the existence of a logistics train for resupply. Lift requirements can, however, only be discussed in the context of total force needs. See Congressional Budget Office, U.S. Air and Ground Conventional Forces for NATO: Mobility and Logistics Issues, Background Paper (March 1978) and also Appendix D.

19/ See IISS, The Military Balance, 1977-1978, pp. 103-104. Additional U.S. projection forces that might otherwise have

Projection forces for the full war are a key part of the total projection force requirement. They serve as a fixed base upon which the total force requirement can be built. The variable element of the total force would be that relating to the half-war contingency. As Chapter I noted, different assumptions about the nature of such a war will lead to different force requirements. The following chapter will outline total force and program options based upon these requirements and will highlight program options to support alternate projection force levels.

faced southern Soviet troops (see above, pp. 21ff) might also be used on the southern flank if Soviet troops were committed there. Lastly, because of the inherent flexibility of naval forces, carrier air power available for Eastern Mediterranean contingencies (see above p. 28) could quickly be transferred for operations in the northern part of that sea.

CHAPTER V. BUDGET OPTIONS FOR PROJECTION FORCES, FISCAL YEARS
1979-1983

DETERMINING U.S. FORCE REQUIREMENTS

As the Congress addresses the question of U.S. projection force requirements for fiscal years 1979-1983, it has two broad options before it. It can accept the DoD concept of minimizing risk in both the full and half wars and procure forces to that end. Accepting assumptions that support DoD's approach to force sizing could lead to greater demands for projection forces for non-NATO conflicts and, consequently, to the need for some additions to the budget for general purpose forces.

Alternatively, the Congress might prefer to view a non-NATO conflict more optimistically, focusing particularly on the possible supportive role of allies and the limits on Soviet participation. It might be prepared to accept the somewhat greater risk of U.S. military defeat that would accompany more optimistic assumptions about the nature of a half war. The Congress could then support and modernize the projection forces at less cost. This section draws upon the alternative projection force requirements in Chapter III and the NATO-related requirements outlined in Chapter IV to present alternate projection force procurement packages for fiscal years 1979-1983.

OPTION I: A PROJECTION FORCE TO MATCH DoD ASSUMPTIONS

Force Levels

The Department of Defense postulates that U.S. forces could become involved in a unilateral operation outside Europe. This scenario includes confrontation with the Soviet Union both in the regional theater and ultimately in Europe. As noted above, it would be consistent with DoD assumptions to specify that, if the United States unilaterally defended Iran against both Iraq and the Soviet Union, such action might require four divisions and six Air Force wing equivalents to provide necessary air superiority and close air support. About five additional brigades (excluding the Air Cavalry Brigade) with about two Air Force wing equivalents--sufficient for supporting forces for combat on Europe's Northern

Flank--would be consistent with DoD's assumption that some units might not be extricated from the half war, were hostilities to begin in Europe. 1/ Thus, an overall projection capability of about five-and-two-thirds divisions and eight air wings would be suitable to support DoD's one-and-one-half war strategy.

In terms of organization, the present three Marine division/two airborne division corps structure, supplemented by the 6th Air Cavalry Brigade, might be sufficient to meet DoD assumptions regarding the total projection force requirements. 2/ The three Marine air wings would support the Marine divisions. The present Air Force structure is highly flexible and might be able to supply tactical air support for the Army divisions, although the exact level of available support would depend upon a determination of Air Force requirements for the European Central Front. 3/ There appear to be significant shortcomings in terms of equipment and airlift support, however, that might impose critical constraints upon the effectiveness of both forces.

Configuration

Heavy-Lift Helicopters. The Department of Defense five-year defense program for fiscal years 1978-1982 included a purchase of

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- 1/ Department of Defense, Annual Report, Fiscal Year 1978, p. 98.
- 2/ There is a nominal two-brigade shortfall in the present force. For planning purposes, however, the manpower in five Marine and Army divisions (excluding the Air Cavalry Brigade) might be taken as equivalent to five-and-two-thirds Army infantry division equivalents of 16,000 men per division because of the large size of each Marine division.
- 3/ Air Force requirements for the Central Front would vary under different assumptions of the U.S. role there. Higher requirements would place greater strains upon the availability of residual assets for non-European contingencies. For a discussion of the Air Force role in the Central Front, see Congressional Budget Office, U.S. Air and Ground Conventional Forces for NATO: Overview, Budget Issue Paper (January 1978) and U.S. Air and Ground Conventional Forces for NATO: Air Defense Issues, Background Paper (March 1978).

30 operational (UE) Marine heavy-lift CH-53E helicopters. 4/ These aircraft can lift 55 men or up to 16 tons over a distance of 50 nautical miles at speeds exceeding 150 knots and up to nine tons for 100 nautical miles. Procurement of these aircraft frequently is justified in terms of their ability to enhance the range and speed of Marine amphibious landing operations. 5/ Perhaps more importantly, however, their mobility characteristics could also enhance the battlefield capabilities of Marine forces by providing them with the ability to redeploy company-sized anti-tank units very rapidly for up to 100 miles. 6/ This capability could be extremely valuable to Marine operations in the armored environments of southern Iran or the Eastern Mediterranean. 7/

V/STOL Aircraft for Marine Operations. The Marine Corps' Vertical/Short Take-Off and Landing (V/STOL) program seeks to give the Marines integral close air support without the need to depend upon local airfields. It assumes that air support would also be unavailable from carrier task forces accompanying Marine landing units. In fact, apart from the Persian Gulf, carrier forces could provide that support in most parts of the world where Marines might deploy. Because it is a relatively narrow, enclosed body of water, the Gulf is a special case in

4/ UE, or unit equipment, signifies the number of operational aircraft in each unit. The 30 CH-53E helicopters could be divided into forces of 15 aircraft equally allocated to the Atlantic and Pacific fleets.

5/ See statement by General Lewis Wilson, USMC, Hearings on Military Posture and H.R. 5068 (Department of Defense Authorization for Appropriations for Fiscal Year 1978), Hearings before the House Committee on Armed Services, 95:1 (February, March, and April 1977), Part 1, p. 721.

6/ The Marines are organizing their TOW antitank units into companies, with one company for each Marine division. See *Ibid.*, p. 717.

7/ The 16-ton capacity of the heavy-lift helicopter also permits serious consideration of acquiring a light tank for the Marines that would further enhance mobile armored warfare capability. See D.F. McDonald, B.E. Edney, and D.N. Henry, Employment Concept for a Light Armored Combat Vehicle, Report No. BDM/W-77-245-TR (McLean, Va.: BDM Corporation, 1977).

that carriers might run great risks if they sought to venture past the Straits of Hormuz. Nevertheless, carrier aviation could, with carrier-based refueling, provide air cover for Marine landing operations. If friendly bases were available for landing and refueling, carrier aviation could conduct air support operations in the northern Gulf as well.

Assuming that there would be little or no support from regional allies and that land bases for tactical aircraft might not be available, it might be possible to justify a requirement for V/STOL aircraft in the Persian Gulf area. Should the United States seek to deploy at least one Marine division to the Gulf, a large number of these aircraft might be needed to support initial Marine operations before bases could be made available for conventional tactical air operations.

The Marines have sought to procure 342 AV-8B V/STOL aircraft. These planes improve on the range and payload of the AV-8A planes, about 110 of which are now in service with the Marine Corps. Continuation of the V/STOL program in the form of AV-8Bs might therefore be justified given the assumptions of U.S. unilateral action and unavailability of allied ground bases or U.S. carrier air support.

Long-Range Lift. The availability of long-range lift for the projection forces is a critical constraint upon their effectiveness. The fleet of C-5As and C-141s is intended to be available for both NATO and non-NATO operations; the KC-135 fleet has a primary mission of supporting the Strategic Air Command. As noted in Chapter IV, the United States simply does not have the capability at present to move more than two divisions to Iran by air and sea in much less than a month. Yet the United States would likely place a premium on speed, in order to quell a crisis before it escalated, to forestall Soviet activity, and to free resources for other needs, particularly if a war were to begin in Europe. Mobilization day for Europe could take place shortly after the first U.S. and Soviet forces landed in the Gulf area, well before even a second division had deployed there. All assets would then be taken up for the European contingency, and requirements for the Gulf could not be met.

It would therefore appear that, under the assumptions of a requirement of four divisions for the Persian Gulf as well as a requirement for forces in Europe shortly after deployments to the Gulf, several lift-related programs would have to be expanded significantly. Currently planned mobility programs will improve

long-range lift capabilities. These include the C-141 stretch modification, which permits a refueling capability and expanded payload; modification of part of the Civil Reserve Air Fleet (CRAF), enabling civilian aircraft to carry large-sized military cargo; and sufficient flight crews for both C-5As and C-141s to permit high wartime utilization rates. These improvements may not, however, in themselves suffice for the transport of even two divisions (airborne and airmobile) as well as tactical air force support units--including bare-base units for converting air strips to combat-support bases--to the Persian Gulf well within a 30-day period. If European bases and Clark Air Force Base in the Philippines were not available, aerial refueling would be crucial to the success of an effort to deploy two divisions rapidly to the Persian Gulf. 8/ In these circumstances, tanker requirements for both cargo and tactical aircraft would be so great as to strain a tanker force primarily committed to the strategic mission. It would be necessary to expand KC-135 utilization rates significantly in order to meet Persian Gulf deployment requirements, assure a capacity for possible simultaneous deployment of forces to Europe, and maintain support for the strategic bomber force. 9/ Lastly, the expansion of the Marine amphibious shipping fleet to carry two divisions would permit at least one-and-two-thirds MAF to arrive in the Gulf well within 30 days of a decision to deploy. Procurement of additional helicopter-carrying assault ships would constitute a major step toward achieving the Marine Corps' two-division lift goal.

The ability to deploy about four divisions to the region most remote from the United States within about a month would significantly enhance U.S. capability to project sufficient force to stop a Soviet advance in northern Iran. It would also lower the probability that the United States would find itself unable to meet NATO deployment commitments while in the midst of conducting rapid-reaction operations in the Gulf.

8/ Clark Air Force Base will likely remain in U.S. hands at least until 1991, when the present treaty with the Philippines expires. However, Philippine control over some base activities may come sooner. See "Filipinos May Control U.S. Bases," Philadelphia Inquirer (November 17, 1977), p. 1.

9/ See Appendix D for a discussion of the costs and merits of procuring the DC-10 Advanced Tanker Cargo Aircraft for this mission.

Costs of Option I

The programs associated with Option I are designed to support DoD's assumptions concerning the nature of a half war, as discussed above. This option would call for procurement of AV-8B aircraft and the CH-53E helicopter and for the start of a new amphibious ship program. Additional funding would be needed to provide crews to increase KC-135 utilization rates. The fiscal years 1979-1983 cost of these programs totals \$7.2 billion in fiscal year 1979 dollars. Fiscal year 1979 costs amount to \$1.1 billion. Both sets of costs are outlined in detail in Table 5.

Option I would also seek to maintain present projection force levels with respect to ground, naval, and tactical air forces. A total of five divisions plus the 6th Air Cavalry Brigade would be consistent with planning assumptions designed to reduce risk. Similarly, four forward-deployed carriers could be justified in terms of the demands of possible Persian Gulf and Eastern Mediterranean scenarios. 10/ The required level of Air Force wings is somewhat more difficult to determine and, therefore, to cost. Nevertheless, as indicated in the discussion of risk-aversion assumptions, it would appear that at least three Air Force wings could be directly associated with projection forces. 11/ The annualized operating, maintenance, and manpower costs of these wings for fiscal years 1979-1983 total \$2.6 billion. Taken together, the cost of projection forces would total at least \$6.0 billion in fiscal year 1979 and \$32.7 billion for fiscal years 1979-1983.

10/ It is extremely difficult to allot the costs of the entire carrier force either solely to power projection or to sea control. Carriers would be involved primarily in projection-type operations in a half war, and forward-deployed carriers are located in or near areas where such half wars are likely to take place. On the other hand, while the remainder of the carrier force might be devoted primarily to sea control, it also supports the forward deployments. This paper attributes the costs of the four forward-deployed carriers to the primary projection mission. Further study is required for determining how best to attribute the costs to the remainder of the carrier force.

11/ Marine air wings tend to be about twice as large as Air Force wings and provide about 50 percent more combat aircraft. Thus, three Air Force wings added to these Marine wings yields about eight wings (see Appendix C).

TABLE 5. OPTION I: DEMANDING HALF-WAR ASSUMPTIONS, MARGINAL BUDGET COST OF PROJECTION FORCES: BY FISCAL YEAR, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983	Total
Procurement Costs						
CH-53E helicopters	170	170	140	--	--	480
AV-8B	110	180	360	500	640	1,790
Amphibious ships: LPD/LHA	--	320	320	--	320	960
Total Procurement Costs	280	670	820	500	960	3,230
Manpower Costs						
Increase KC-135 utilization rate	800	800	800	800	800	4,000
Operating Costs						
3 Marine divisions	1,360	1,360	1,360	1,360	1,360	6,800
3 Marine air wings	530	530	530	530	530	2,650
4 carriers ^{a/} and wings (2 CV, 2 CVN)	1,090	1,090	1,090	1,090	1,090	5,450
20 escorts (12 conventional/8 nuclear)	410	410	410	410	410	2,050
Airborne division	510	510	510	510	510	2,550
Airmobile division	550	550	550	550	550	2,750
Air cavalry brigade	110	110	110	110	110	550
3 composite Air Force wings	530	530	530	530	530	2,650
Total Projection Forces	6,170	6,560	6,710	6,390	6,850	32,680

a/ The carrier force soon will contain four nuclear-powered (CVN) and eight conventionally powered carriers. The four carriers have arbitrarily been divided equally between both types, with nuclear-powered carriers requiring four escorts and conventionally powered carriers requiring six.

OPTION II-A: A PROJECTION FORCE DERIVED FROM MODIFIED ASSUMPTIONS ABOUT THE HALF WAR

As Chapter IV indicated, a more optimistic view of the political contexts of both the Persian Gulf and the Eastern Mediterranean regions suggests that the United States would probably have local allied support when conducting operations against a major regional opponent aided by the Soviet Union. Force requirements for such contingencies in either region could



be lower than those implied by DoD assumptions. The forces that meet these modified requirements may also prove sufficient for other equally plausible but lesser contingencies elsewhere, even if these involve unilateral U.S. operations. 12/

Force Levels

Given the assumptions, first, that Iran was capable of exploiting its newly acquired weaponry and, second, that the Soviets could be deterred from crossing into Iran, one possible force level for U.S. support of Iran in a conflict with Iraq could consist of as few as two divisions and three Air Force wing equivalents, in addition to two carrier task forces. 13/

This force level would appear to subsume that which might be required for a contingency in the Eastern Mediterranean. A peace-keeping intervention there would appear to require brigade-sized forces; intervention on the side of Israel would stress tactical air support. On the other hand, because there could be some constraints upon the use of Air Force assets in a Middle East war, 14/ the Navy would have to provide the bulk of tactical aircraft in the form of several carrier air wings. The two-carrier force now deployed in the Mediterranean would appear adequate for initial U.S. operations there, though additional carrier support ultimately might be needed. These carrier task forces would be in addition to the two required for the Persian Gulf contingency. 15/

12/ Soviet projection capabilities remain limited relative to those of the United States in regions remote from the Soviet Union (see Appendix A). Of plausible contingencies requiring unilateral U.S. operations against a foe with limited or no support from the Soviets, those in the Persian Gulf and Eastern Mediterranean appear most demanding.

13/ As indicated earlier, this is but one of a range of U.S. force levels that could be consistent with modified assumptions about U.S. requirements in a Gulf conflict.

14/ See Chapter III, p. 28.

15/ The carrier force requirement does not necessarily imply a fixed forward deployment. Flexible deployments could meet the same requirement. The cost of backup carriers is not addressed in this paper (see above, p. 46, fn. 10).

Transit times are too long to permit a flexible deployment from one region to another.

The estimated force of two divisions, three Air Force wing equivalents, and a minimum of four carriers for contingency operations would provide the bulk of the projection forces. Assuming that these forces could not be easily extricated from the half war, however, more would be required to meet the one-and-one-half war strategy. An estimated force for the full war, based on Northern Flank requirements, might consist of about five brigades and two fighter/attack Air Force wing equivalents. Thus, given modified assumptions about the nature of a half war, a projection force option could call for a total of three-and-two-thirds divisions, five Air Force wing equivalents, and four aircraft carriers and associated wings. 16/

Composition of Ground and Air Forces. In determining the composition of the projection ground forces, it is important to note that airborne units would be most useful as part of a division force in northern Iran or northern Norway, airmobile units could form all or part of a force in Schleswig-Holstein or in northern Iran, and Marine units could serve in all areas. It would therefore appear that a force that maximized the flexibility of the projection forces would include two Marine divisions, the 82nd Airborne Division and two airmobile brigades of the 101st, as well as the independent 6th Air Cavalry Brigade. The forces could be deployed in a variety of modes in Europe and elsewhere. The tactical air complement to these units would probably amount to about two Marine air wings and three Air Force wings. 17/

This projection force requirement postulates a force substantially smaller than the present five divisions--three Marine and two Army--in the projection forces. It also assumes at least one Marine air wing less than is now in the force structure. The remaining four brigade equivalents and Marine air wing could be retired gradually over the fiscal years 1979-1983 period.

16/ As noted in Chapter II (p. 9, fn. 1), the projection force is in addition to the Second Division, which is earmarked for rapid dispatch to East Asia in the event of a major crisis there that required a U.S. military response.

17/ Since Marine wings would be associated with Marine divisions, just under three Air Force wings would be needed for one-and-two-thirds Army divisions.

Configuration

Changes or modifications in assumptions about the nature of half wars that might take place in the Persian Gulf or Eastern Mediterranean would affect more than just the level of projection forces. They would also affect the way those forces are equipped.

V/STOL Aircraft. If support from allies in a regional conflict is assumed, the need for a Marine V/STOL program would be less pressing. Carriers could provide close air support to the Marines on land except in a very few areas, like the Persian Gulf, where they could be vulnerable in an enclosed stretch of water. Even in the Gulf area, however, if allied support was assumed to be available, Marines could rely on Iranian bases once they landed; carrier aviation from carriers stationed outside the Straits of Hormuz could, with refueling, cover the landing. The other geographically similar areas of the world contain no comparable threat to the United States.

It has sometimes been argued that carriers, even if they could provide close air support for Marine operations in the Gulf, would not do so because of requirements elsewhere. What would be needed, however, is only a very few days of close air support during and after a landing in order to permit the Marines to seize a base or set up bare-base operations for their conventional attack aircraft. If carrier aircraft could land and refuel at friendly bases in the Gulf, however, they could provide this short-term support. Additionally, while AV-8 V/STOL aircraft need not fully depend on sophisticated bases for their operations, they would require a support supply line; ^{18/} all other Marine aircraft would still require conventional base facilities. A Marine wing with only attack aircraft, even if they were AV-8Bs, could provide only limited support to Marine ground operations.

Heavy-Lift Helicopters for the Marines. Modified assumptions about the nature of the half war would not affect the need for Marine heavy-lift helicopters. Depending on availability of lift, it might be expedient to include a Marine force of at least brigade size in a U.S. force sent to the Gulf or Mediterranean. If Marines were required for active combat, they could benefit from the mobility that the addition of 30 CH-53E heavy-lift helicopters would provide for antitank warfare in armored environments.

^{18/} See Lt. Col. R.C. Blackington, USMC, "Harrier Is Not Totally Independent," Marine Corps Gazette (December 1977), p. 14.

Long-Range Lift

One effect of modifying assumptions about the nature of the half war and force requirements appropriate to some of that war's more demanding possibilities is to lessen the need to add significantly to present U.S. airlift capabilities for non-NATO contingencies. Current airlift resources could probably deliver an airborne division and airmobile brigade to the Persian Gulf within a month; two more Marine brigades could be sealifted in about the same time. Given an airlift requirement for only one-and-one-third divisions, it does not appear as necessary to increase KC-135 utilization rates ^{19/} as it would have been if airlift requirements for the Gulf totaled at least two full divisions. Similarly, given a total Marine force of two divisions for projection missions and a requirement for amphibious lift that would not appear to be in excess of two brigades for any one area, it would seem unnecessary to augment significantly the present amphibious lift capability for slightly over one division.

Costs

Option II-A calls for a four-division projection force, of which two are Marine, one airborne, two-thirds airmobile, and one-third cavalry; four carriers; and three Air Force and two Marine air wings. This force level would ultimately save \$810 million annually compared to present levels if one Marine division, an airborne brigade, and a Marine air wing were retired. These savings, in millions of fiscal year 1979 dollars, would come into effect gradually between fiscal years 1979 and 1983, as shown below.

Fiscal Year 1979	\$190 million
Fiscal Year 1980	\$490 million
Fiscal Year 1981	\$710 million
Fiscal Year 1982	\$810 million
Fiscal Year 1983	\$810 million

These are net savings; they take account of the cost of retiring one-and-one-third divisions and a Marine air wing.

^{19/} Some increase might still be necessary to meet other tanker requirements. These involve SAC and NATO requirements that are beyond the scope of this study.



OPTION II-B: RECONFIGURATION OF GROUND FORCES: CREATING A "HEAVY" MARINE DIVISION

Some of the projection ground forces in the present structure could be reconfigured, rather than retired, to meet the need for armored units in central Europe. This policy assumes that relatively more U.S. forces and firepower would be needed along the Central Front. Given that requirement, the cost of maintaining four light brigades could be used to "heavy up" three of them, that is, providing the equivalent of a division with sufficient tanks and motorized vehicles to support a "heavy" Marine division.

The Marines have a traditional strategic reserve role for all European operations. Adding firepower and mobility to the third Marine division would significantly enhance the relevance of the Marine strategic reserve role for the Central Front. It would, of course, also provide an additional reserve of projection force strength for all other contingencies and locales.

This approach, primarily intended to add forces and firepower to Central Front capabilities, would leave the Marine air wing intact and associate it with the new, heavier Marine division. This unit would be outfitted as a mechanized division. The cost of providing it with more tanks, armored personnel carriers, and associated equipment could be offset by savings from retirement of one airmobile brigade. By fiscal year 1983, these changes would result in savings of \$140 million annually (see Table 6).

TABLE 6. RECONFIGURATION OF ONE MARINE DIVISION AND ONE AIRMOBILE BRIGADE TO ONE HEAVY DIVISION: BY FISCAL YEAR, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983
Savings from Retiring Airmobile Brigade <u>a/</u>	-90	-180	-180	-180	-180
Cost to Reconfigure Marine Division	<u>140</u>	<u>150</u>	<u>160</u>	<u>40</u>	<u>40</u>
Net Savings (or Costs)	(50)	-30	-20	-140	-140

a/ Savings, less cost of retirement.

Options II-A and II-B would not call for V/STOL procurement or augmentation of the present amphibious lift force and tanker capability. Purchasing the CH-53E would, however, still be consistent with these options. The total cost of each option would amount to \$22.9 billion and \$25.6 billion, respectively, for fiscal years 1979-1983 (see Tables 7 and 8). The cost differential between an option based on DoD assumptions and one based on modified assumptions would be substantial even if residual projection forces were "heavied up." This differential would only make itself felt after fiscal year 1979, however, when net savings from retirement of the airmobile brigade would begin to be realized, while procurement costs of Option I would increase significantly. Table 9 outlines the five-year contrasts among the costs of the three alternate projection packages: Options I and II-A, with forces retired, and Option II-B, with forces reconfigured.

TABLE 7. OPTION II-A: OPTIMISTIC HALF-WAR ASSUMPTIONS/RETIREMENT OF GROUND FORCE ELEMENTS, MARGINAL BUDGET COST OF PROJECTION FORCES: BY FISCAL YEAR, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983	Total
Procurement Costs						
CH-53E helicopters	170	170	140	--	--	480
Operating Costs						
2 Marine divisions	910	910	910	910	910	4,550
2 Marine air wings	350	350	350	350	350	1,750
4 carriers a/ and wings (2 CV, 2 CVN)	1,090	1,090	1,090	1,090	1,090	5,450
20 escorts (12 conventional/8 nuclear)	410	410	410	410	410	2,050
Airborne division	510	510	510	510	510	2,550
Airmobile division (2 brigades)	370	370	370	370	370	1,850
Air cavalry brigade	110	110	110	110	110	550
3 composite Air Force wings	530	530	530	530	530	2,650
Cost of Phasing Out						
One Marine Division/Wing and One Airmobile Brigade	620	320	110	--	--	1,050
Total Projection Forces	5,070	4,770	4,530	4,280	4,280	22,930

a/ The carrier force soon will contain four nuclear-powered (CVN) and eight conventionally powered carriers. The four carriers have arbitrarily been divided equally between both types, with nuclear-powered carriers requiring four escorts and conventionally powered carriers requiring six.

TABLE 8. OPTION II-B: OPTIMISTIC HALF-WAR ASSUMPTIONS/RECONFIGURATION OF GROUND FORCES, MARGINAL BUDGET COST OF PROJECTION FORCES: BY FISCAL YEAR, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983	Total
Total Projection Forces (from bottom line of Table 7)	5,070	4,770	4,530	4,280	4,280	22,930
Less Cost of Retiring a Marine Division/Wing	-560	-320	-110	--	--	-990
Additional Procurement Costs-- Reconfiguring Marine Division	130	130	130	--	--	390
Additional Operating Costs-- Marine Division/Marine Air Wing	640	650	660	670	670	3,290
Total Projection Forces	5,280	5,230	5,210	4,950	4,950	25,620

TABLE 9. COMPARISON OF FIVE-YEAR COSTS OF DIFFERENT PROJECTION FORCE PLANNING STRATEGIES: BY FISCAL YEAR, IN MILLIONS OF FISCAL YEAR 1979 DOLLARS

	1979	1980	1981	1982	1983	Total
Procurement						
Option I:						
Demanding Assumptions	280	670	820	500	960	3,230
Option II-A:						
Optimistic Assumptions/ Force Retirement	170	170	140	--	--	480
Option II-B:						
Optimistic Assumptions/ Force Reconfiguration	130	130	130	--	--	390
Total Budget Costs						
Option I:						
Demanding Assumptions	6,170	6,560	6,710	6,390	6,850	32,680
Option II-A:						
Optimistic Assumptions/ Force Retirement	5,070	4,770	4,530	4,280	4,280	22,930
Option II-B:						
Optimistic Assumptions/ Force Reconfiguration	5,280	5,230	5,210	4,950	4,950	25,620

APPENDIX A. SOVIET PROJECTION FORCES: AN OVERVIEW

The Soviet Union traditionally has maintained small forces with some projection capability but which have been geared primarily to the support of advancing ground units. Over the past decade, the Soviet Union has improved its capability to project its power into distant areas. 1/ Its projection capability, however, remains greatest with respect to areas contiguous to the Soviet Union, where the airlift and naval infantry forces continue to serve as an adjunct to ground forces. With respect to more distant locales, the Soviets continue to face significant constraints upon the effectiveness of their airlift force, the transport of large numbers of troops by amphibious means, and maintenance of naval operations for extended periods.

The Soviet strategic airlift force (VTA) is limited in both the volume of the cargo it can carry and the range at which it can operate. Most of the force is composed of small, short-range aircraft, notably the propeller-driven AN-12. The largest Soviet long-range cargo aircraft, the AN-22, carries two medium tanks but falls significantly short of the C-5A in both range and payload. 2/ The newer IL-76 does not improve upon the AN-22's range, is not refuelable, and can carry no tanks and only half the AN-22 payload. Its contribution to Soviet airlift capacity rests primarily on the fact that it "frees" the AN-22 aircraft to concentrate on carrying bulkier equipment. Although the introduction of the IL-76 is improving the overall efficiency of Soviet long-range airlift, the Soviet Union remains restricted in its capacity to airlift forces to extended distances.

1/ Commander James G. Roche, USN, "The Soviets' Growing Reach: Implications of Comparative Capabilities to Project Military Power (paper presented before the European-American Workshop, 1977; processed), pp. 7-9.

2/ The AN-22 has a range of 3,100 miles and a maximum payload of 176,350 lbs. The C-5A has a range of 3,750 miles, a design payload of about 220,000 lbs., and is refuelable. See Jane's All the World's Aircraft, 1977-78.

These limitations would not severely hinder the types of actions associated with Soviet airborne divisions in the past--relatively short-distance operations in Europe in support of other Soviet ground forces. With respect to longer-range transits, however, the airlift fleet now can carry the assault echelons of only two of the seven Soviet airborne divisions. With the AN-22 reportedly no longer in production (50 are in the fleet), 3/ and the IL-76 its sole follow-on, it appears unlikely that the Soviets will significantly expand their lift capacity within the next decade.

The Soviet Naval Infantry (SNI) has more than doubled its size in the past decade but, at 12,000 men, it remains a small force divided among four fleets. In the past, it has served primarily as a river-crossing and short-range assault force. It is not capable of sustained combat; unlike the U.S. Marines, whose forces are designed for combat of at least 30 days, the SNI has no organic logistics and support and must be reinforced in four or five days. 4/ The amphibious fleet outnumbers its U.S. counterpart but lifts only a fraction of the U.S. Navy's capability. The force's largest ships, the 4,100-ton, 18-knot Alligator class, carry only 375 men and 26 tanks. Other ships are far smaller, and most of them are considerably slower as well. By comparison, the smallest active U.S. amphibious ship displaces over 6,500 tons; the 39,000-ton LHA can alone transport a fully equipped Marine battalion (about 2,000 men with supporting helicopters). 5/

The Soviets have improved the capability of their surface warships during the past decade. They have also developed a sea-based aviation capability; the Kiev vertical take-off and

3/ See Charles M. Gilson and Bill Sweetman, "Military Aircraft of the World," Flight International (March 4, 1977), p. 580; International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977), p. 10.

4/ Roche, "The Soviets' Growing Reach," pp. 11-12.

5/ See Jane's Fighting Ships, 1976-77; Charles G. Pritchard, "Soviet Amphibious Force Projection," in Michael McGwire and John McDonnell, eds., Soviet Naval Influence: Domestic and Foreign Dimensions (New York: Praeger, 1977), p. 262.

landing (VTOL) aircraft carrier is the first of a class of at least four ships. Lastly, they have improved the effectiveness of their nuclear-powered cruise missile and torpedo attack submarine fleets. These could support projection activities by serving as escorts for surface units. Nevertheless, Soviet projection capabilities now appear effective only in lower-threat environments. Many Soviet ships lack an ordnance reload capability 6/ and therefore are vulnerable to sustained attacks from aircraft, particularly if these were accompanied by attacks from naval platforms. Even the Soviet aircraft carrier Kiev, with its own fixed-wing aircraft, has no integral airborne early-warning or electronic warfare countermeasures capability to support the conduct of its air-to-air operations.

Lack of sufficient airpower would also hinder the Soviet replenishment effort, particularly if it must rely upon merchant ships not optimized for military operations. 7/ The Soviet Union is relatively inexperienced with underway replenishment techniques and has only a limited number of dedicated military replenishment ships. These factors would militate against their ability to sustain long-term naval presences in areas where shore-based facilities were unavailable and where the threat to Soviet forces was of medium or high intensity.

Closer to home, such as on Europe's northern flank, many of these problems do not arise. Taking the Northern Flank as an example, the shorter transit routes for airborne units allow greater loads for airlift forces, allow VTA to rely extensively on the numerous but shorter range of AN-12 aircraft, and allow more rapid repeat sorties. Similarly, naval forces can operate under the umbrella of air cover provided by short-range fighters and in conjunction with short-range offensive naval units such as patrol boats. The Soviets' powerful short-range offensive reach also provides significant support for the Soviet Naval Infantry, whose amphibious lift also will not face the difficulties imposed by long-distance transit. Lastly, underway replenishment might be conducted at sea under the umbrella of both sea-based aviation and tactical aviation deployed from bases on Soviet shores.

6/ See James W. Kehoe, Jr., "Warship Design: Ours and Theirs," U.S. Naval Institute Proceedings (August 1975).

7/ See Richard T. Ackley, "The Merchant Fleet," in Michael McCwire and John McDonnell, Soviet Naval Influence: Domestic and Foreign Dimensions (New York: Praeger, 1977), p. 304.



It is significant that "there are no examples to date of the Soviets projecting a major conventional fighting force to a remote region." 8/ Soviet influence in the Third World has been more a function of military assistance and of the presence of a nominal war-fighting capability than of sustained combat with larger units. Thus, it is not at all clear that the Soviets would view the nature of power projection in the same manner as the United States does or that they would employ their forces in a manner similar to U.S. operations. 9/

8/ Roche, "The Soviets' Growing Reach," p. 1.

9/ Ibid., p. 4ff.

APPENDIX B. U.S. INTERESTS AND THE BALANCE OF FORCES IN THE
PERSIAN GULF

U.S. INTERESTS

The United States has played an active political role in Gulf affairs since the end of World War II and has been economically linked to that region since the 1930s. Whereas the primary focus of U.S. economic interests was for many years Saudi Arabia, 1/ the center of U.S. strategic concerns until the 1970s lay further north, where it sought to prevent Communist encroachment in the Gulf region (see Figure 1). Thus, in 1946, the United States helped Britain force the Soviets to abandon the Azerbaijani state that had been carved out of northern Iran. In 1949, it established a small Middle East naval force that patrolled the Gulf area. In 1953, it applauded the overthrow of the leftist Mossadegh government in Iran. It was associated with the creation of the Baghdad Pact in 1955, to which both Iran and Iraq belonged, and signed a bilateral security agreement with Iran after a leftist regime took Iraq out of the Pact (renamed Central Treaty Organization) in 1958. 2/

Britain's announcement in 1968 that it was abandoning most of its installations east of Suez, coupled with growing Western, especially European, reliance upon Persian Gulf petroleum resources, led to the merger of long-standing U.S. political and economic interests and to a new U.S. effort to preserve the non-Communist regimes of the area's oil-producing states. Apprehensive about the hostility of leftist South Yemen and especially of Iraq toward pro-Western Saudi Arabia, Iran, and

1/ For a full discussion of the development of U.S./Saudi economic relations, see Emile A. Nakhleh, The United States and Saudi Arabia: A Policy Analysis (Washington, D.C.: American Enterprise Institute, 1975), pp. 11-12.

2/ See Access to Oil: The United States Relationships with Saudi Arabia and Iran, Senate Committee on Energy and Natural Resources, Committee Print 95-70; 95:1 (December 1977), pp. 70-73.

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Kuwait and concerned about the expansion of Soviet naval presence in the Indian Ocean, the United States responded by applying the Nixon Doctrine of U.S. arms assistance to friendly states in the Persian Gulf area. By 1973, it had expanded substantially the level of military assistance--primarily by sales--to both Iran and Saudi Arabia. The level of U.S. military sales to both states jumped again after the 1973 war, and the subsequent oil embargo further underlined the economic importance of the Gulf to the West. By 1975, annual military sales (including military construction) reached a total of \$4.3 billion for Saudi Arabia and Iran. ^{3/} With rising military sales came an increasing American technical presence in the Gulf; some estimates indicate about 50,000 U.S. citizens will be working in defense-related jobs in the Gulf states by 1980. ^{4/}

THE BALANCE OF REGIONAL FORCES

The infusion of foreign armaments into the Gulf so far has not provided any one state with clearly preponderant military capabilities. Apart from Iran and Iraq, all other Gulf states--including Saudi Arabia--have relatively small military establishments. For example, while the Saudis have the largest force of the southern Gulf states, they have only a few brigades in their ground force, an air force numbering less than 140 combat aircraft, and a navy consisting of a few patrol boats. The influx of new weaponry into that country may not materially affect its standing vis-a-vis the Gulf powers. Potential manpower shortages might constrain both the number of systems it could utilize and

^{3/} United States Arms Sales to the Persian Gulf, report prepared for the House Committee on International Relations by a study mission to Iran, Kuwait, and Saudi Arabia, 94:1 (January 19, 1976), p. 5. Other western states, notably France and Britain, also increased their arms sales to the Gulf, while the Soviets maintained a steady flow of arms to their Iraqi allies.

^{4/} The Persian Gulf, 1975: The Continuing Debate on Arms Sales, Hearings before the Special Subcommittee on Investigations, House Committee on International Relations, 94:1 (June and July 1975), p. 120.

the level of their maintenance and support. 5/ Other Gulf states have smaller forces and gear them primarily toward providing local order and protection against guerrilla operations.

Iran and Iraq--the former pro-Western, the latter close to the Soviet Union and the recipient of Soviet arms for many years--have the largest military force structures in the Gulf region and provide the key to its stability. Relations between the two powers, as well as between each of them and other states, have not been very stable during the past ten years. Iraq was involved in a border dispute with Kuwait as recently as 1973. 6/ The Iranians seized three small Gulf islands from the Trucial States in 1971. Three Kurdish rebellions in Iraq since World War II increased tensions between Iraq and Iran. The Iraqis have pressed long-standing claims upon territory in western Iran. 7/ Although all disputes, including the Iraqi claims, appear to have been resolved, the continued force buildup in both states offers the potential for armed conflict to arise out of any new causes of political instability (or revival of old ones).

With the exception of naval forces, where Iran dominates, the two states appear to have about equal military capabilities (see Table 4, p. 20). Both states are continuing to expand all of their forces and their infrastructure, with Iran's programs better known because of its contracts with Western firms. Iraq may have

5/ See Oil Fields as Military Objectives: A Feasibility Study, prepared by the Congressional Research Service for the Special Subcommittee on Investigations, House Committee on International Relations, 94:1 (August 1975), p. 44; International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978 (London: 1977), p. 40.

6/ For a discussion of Soviet involvement in this dispute, see Anne M. Kelly, "The Soviet Naval Reserves During the Iraq-Kuwait Border Dispute: March-April 1973," in Michael McCwire, K. Booth, and J. McDonnell, eds., Soviet Naval Policy: Objectives and Constraints (New York: Praeger, 1975), pp. 287-306.

7/ For a discussion of major controversies between the two states, see Robert D. Tomasek, "The Resolution of Major Controversies between Iran and Iraq," World Affairs (Winter 1976-77), pp. 206-230.

an edge on Iran in that its men have had combat experience in the last few years (during the Kurdish rebellion and the October 1973 war), while the Iranians only fought light skirmishes against the Dhofar rebels of Oman. On the other hand, since the Iraqis have an unimpressive record against both the Israelis and the Kurds, their edge in combat experience is questionable.

OUTSIDE FORCES: THE ROLE OF THE SOVIETS

Were a conflict to erupt in the Persian Gulf, hostilities could be intensified by the presence and participation of Soviet forces. As noted in Appendix A, the Soviet Union has a variety of projection forces that could come into play in a Gulf campaign. Soviet airborne divisions and naval units could operate in the Gulf area. Soviet Transcaucasian ground forces, tactical and bomber aircraft, and naval infantry could also play a major role if the Gulf conflict was one between Iran and Iraq.

A number of factors constrain the use of Soviet projection forces, however, 8/ and any Soviet airborne operations would encounter difficulties similar to those that a U.S. operation might face, notably vulnerability to new ground-to-air and air-to-air weapons systems.

Naval infantry, probably from the Black Sea fleet, would have a very long transit to reach the Gulf. 9/ There are no amphibious ships located in the Caspian Sea to land in Iran in the event of an Iranian-Iraqi war. It is unlikely that more than a few such ships could be moved over land across the Caucasus for operations in that sea. The Naval Infantry force, if employed, would thus be very small.

Ground forces stationed in the Transcaucasian region of the Soviet Union could join hostilities taking place between Iraq and Iran. Three of the 23 Transcaucasian divisions and a portion of

8/ See Appendix A, p. 58.

9/ There was but one amphibious deployment to the Indian Ocean in 1976. See Commander James G. Roche, USN, "The Soviets' Growing Reach: Implications of Comparative Capabilities to Project Military Power" (paper presented before the European-American Workshop, 1977; processed), pp. 7-9.

the 12-division Soviet strategic reserve in European Russia would be available for immediate operations (Category I). 10/ Rail lines from European Russia to the Transcaucasus do not match those to Eastern Europe but might permit sizable troop movements to the Iranian border well within a month. There may be other higher-priority calls upon the strategic reserve, however, such as requirements to support European or Chinese-front operations. Similarly, even some of the Transcaucasian Category I divisions might be held back from a Gulf conflict, since these divisions are considered to be part of the force directed against China. 11/ Most ground forces nearest the Gulf are unlikely to be effective in immediate combat. They are either half-manned (Category II) divisions, requiring 30 days for combat readiness, or cadre (Category III) divisions, requiring up to 90 days to be combat-ready. 12/

Soviet air forces, with the exception of the bomber force, lack the range to attack targets in the southern Gulf. They could, however, play a significant role in a battle against Iran. The Soviets can call upon about 900 combat aircraft committed neither to a NATO war nor to one with China. About 475 aircraft actually are stationed in the southern USSR/Caucasus region. 13/ Given what many analysts feel is a Soviet shortage of close air support aircraft in the European theater, however, it can be assumed that most of the aircraft in question would be of the air superiority/dogfighter variety. 14/

10/ See Appendix C; Jeffrey Record, Sizing Up the Soviet Army, (Washington, D.C.: The Brookings Institution, 1975), p. 19.

11/ See Barry M. Blechman, et. al., The Soviet Military Buildup and U.S. Defense Spending (Washington, D.C.: The Brookings Institution, 1977), p. 28.

12/ See IISS, The Military Balance, 1977-1978; Record, Sizing Up the Soviet Army, pp. 19-22.

13/ Blechman et. al., The Soviet Military Buildup and U.S. Defense Spending, p. 13; Robert P. Berman, Soviet Air Power in Transition (Washington, D.C.: The Brookings Institution, 1978), p. 41.

14/ These would primarily be MiG-19s, 21s, and 23s. See Oil Fields as Military Objectives, Committee Print, p. 22; Jane's All the World's Aircraft, 1976-77.



It is difficult to determine how Soviet naval operations might affect a Persian Gulf contingency. The Iranian Navy is designed to maintain control inside the Straits of Hormuz, which also could be mined, thereby preventing the entry of most Soviet ships of the Indian Ocean squadron or Pacific Fleet. 15/ With their fast patrol missile boats, combined with local air superiority, 16/ the Iranians could be more than a match for any Soviet warships that successfully passed through the Straits. To be sure, Soviet naval units could attempt a blockade off the Gulf, but this could well bring about a Western naval response (and the French have the largest deployment in the Indian Ocean). Furthermore, that campaign could be conducted as effectively with Soviet minelaying operations at the mouth of the Gulf.

15/ An amphibious landing by the Soviets against a southern Gulf state is unlikely because of extreme logistical problems.

16/ Soviet planes do not have the range to reach southern Iraq for operations in the Gulf. They would have to be crated, airlifted to Iraq, then reconstructed. See Roche, "The Soviets' Growing Reach," p. 22.

APPENDIX C. METHODOLOGY FOR SETTING ESTIMATED FORCE REQUIREMENTS

The following sections illustrate the types of force options that are consistent with alternate assumptions underlying requirements for projection forces in the full- and half-war scenarios.

Considerable uncertainty attends any force-sizing exercise. No single measure suffices to gauge the effectiveness of forces or to permit reliable comparisons between them. There are many unquantifiable intangibles, such as morale and the effects of training, that contribute to the outcome of a battle. These complicate all force-sizing efforts and attempts to predict battlefield outcomes accurately.

This study employs the relatively simple methodology of attacker/defender manpower ratios as the basis for postulating estimated force requirements along different fronts in varying locales. Among commonly used attacker/defender ratios are those which call for better than 3:1, or alternately 1.5:1, attackers to defenders for a successful front-wide defense. 1/

These ratios are not immutable. They are based primarily on the judgmental considerations of military officers and have often been belied by actual events, such as some of the German blitzkrieg victories in World War II. Nevertheless, such ratios are used in force-planning efforts, and this study adopts one of the more conservative of these, less than 1.5:1 attackers to defenders as a level at which a successful defense can be conducted. 2/

1/ Robert Lucas Fischer, Defending The Central Front: The Balance of Forces (London: IISS, 1975), p. 25. See also Congressional Budget Office, Assessing the NATO/Warsaw Pact Military Balance, Budget Issue Paper (December 1977), p. 60.

2/ See, for example, Department of Defense, Annual Report, Fiscal Year 1976 and Fiscal Year 1977, p. III-15. It should be noted that terrain tends to favor the defenders in most of the locales considered in this study: a successful defense might in fact tolerate less favorable ratios, whether with respect to manpower or, indeed, to other force measures. See also Fischer, Defending the Central Front, p. 25.

THE FORCE BALANCE IN NORTHERN EUROPE

Schleswig-Holstein/Jutland

It is extremely difficult to predict the exact composition of opposing forces in northern Europe. Many Pact and NATO forces are highly mobile and could confront each other along a variety of battlefield locales. Nevertheless, because Soviet ground forces in East Germany generally are counted as part of the Central Front force balance, this study does not include them as part of the force balance with respect to Schleswig-Holstein/Jutland. It is conservatively assumed, however, that all six East German divisions might be employed in an attack through the region.

While the exact deployment of airborne units is likewise extremely difficult to predict, this analysis conservatively assumes that Pact airlift units could deliver three full-strength Soviet and Polish airborne divisions to the Schleswig-Holstein sector. 3/ Small elements of the Soviet and Polish Naval Infantry are also included. These levels are consistent with lift limitations for both forces, but they ignore vulnerability to antiship attacks in the North Sea. 4/ As Table C-1 indicates, the total attacking force could amount to 86,000 troops.

In-theater NATO forces consist primarily of German and Danish units. These total about 36,500 troops, if the Danish augmentation force is included. 5/ British and Dutch Marines, some 7,700 and 2,900 troops respectively, can be added to the allied total, which would bring the force to 47,100 (see Table C-1).

3/ The Poles presently are limited to about 60 relatively small transport aircraft, many of 1950s vintage and of problematical readiness. See International Institute for Strategic Studies (IISS), The Military Balance, 1977-1978, (London: 1977). Total Soviet lift capabilities presently permit the transport of less than two full airborne divisions. See Chapter IV, p. 32 regarding general limitations of airborne units.

4/ See Chapter IV, pp. 36-37.

5/ The Danish Home Guard is not included. Were part of it to be counted, it could add significantly to the margin of NATO defense. The augmentation forces, on the other hand, while not actually "active," are so quickly available that they must be counted in all calculations.

TABLE C-1. FORCE BALANCE IN SCHLESWIG-HOLSTEIN/JUTLAND

Warsaw Pact			NATO		
Country	Divisions	Manpower	Country	Divisions	Manpower
German Democratic Republic	6 armored/infantry divisions	60,000 <u>a/</u>	Federal Republic of Germany	1 armored division	15,000 <u>a/</u>
Soviet Union	2 airborne divisions; 1 naval infantry division	14,000 <u>b/</u> 3,800 <u>c/</u>	Denmark	5 brigades; augmentation force	17,000 <u>a/</u> 4,500 <u>b/</u>
Poland	1 airborne division; 1 naval infantry division	7,000 <u>a/</u> 2,645 <u>c/</u>	United Kingdom	Marines	7,700 <u>b/</u>
			The Netherlands	Marines	2,900 <u>b/</u>
	Total Pact Manpower Given 1.5:1 Ratio	87,445 58,296		Total NATO Manpower NATO Shortfall	47,100 11,196

a/ Based on Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: IISS, 1975), p. 11, Table 5, which outlines estimates of available combat manpower only.

b/ International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977).

c/ Soviet forces based on 375 troop capacity for four Alligator-class ships and 115 troop average capacity for 20 Polnocny-class ships. Polish forces based on 115 troop average for 23 Polnocny-class ships. See Charles G. Pritchard, "Soviet Amphibious Force Projection," in Michael McGwire and John McDonnell, eds., Soviet Naval Influence: Domestic and Foreign Dimensions (New York: Praeger, 1977), p. 261; John M. Collins, "American and Soviet Armed Services, Strengths Compared, 1970-76," Congressional Record (August 5, 1977), p. S14097; Jane's Fighting Ships, 1976-77.

Given the need to better a 1.5:1 attacker/defender ratio, the total required force is:

$$\frac{87,445}{1.5} = 58,296 \text{ troops}$$

With allied forces supplying 47,100 troops, the resulting force shortfall would be just above 11,000--the equivalent of two large U.S. brigades.

Norway

Total Soviet forces are conservatively estimated at a total of 120,000 troops, including support forces. This estimate ignores the very real limitations that difficult terrain imposes on the massing of highly maneuverable forces. 6/ Allied in-theater forces consist solely of a Norwegian brigade, assumed to number 5,000 troops (see Table C-2). Supplementary European NATO forces are available from the Norwegian Home Guard (which can be mobilized in four hours), the 7,700 men of the Allied Mobile Force, and the Canadian brigade of 2,800 troops. 7/ Based on the 1.5:1 ratio, 80,000 defenders would be required to stop a Soviet advance. Table C-2 indicates that European allies could provide about 56,500 of these. The resulting shortfall of about 23,500 troops could be filled by three reinforced brigades, equivalent to a reinforced division.

6/ See John Erickson, "The Northern Theater (TV): Soviet Capabilities and Concepts," RUSI, Journal of the Royal United Services Institute for Defense Studies (December 1976), p. 80. This calculation also tends to overlook the fact that in any but the limited overland axes of approach from the east into Norway, the Soviets could not mass a force of more than about 20,000 airborne and naval infantry units, all of which would be vulnerable to ground, naval, and airborne defenses.

7/ IISS, The Military Balance, 1977-1978.

TABLE C-2. FORCE BALANCE IN NORWAY

Warsaw Pact			NATO		
Country	Units	Manpower	Country	Units	Manpower
Soviet Union	--	120,000 <u>a/</u>	Norway	1 brigade; Home Guard	5,000 41,000 <u>b/</u>
			Canada	1 brigade	2,800 <u>b/</u>
			Allied Mobile Force	7 battalions	7,700 <u>b/</u>
Total Pact Manpower		120,000	Total NATO Manpower		56,500
Given 1.5:1 Ratio		80,000	NATO Shortfall		23,500

a/ Postulated Soviet threat from John Erickson, "The Northern Theater (TVD): Soviet Capabilities and Concepts," RUSI Journal of the Royal United Services Institute for Defense Studies (December 1976), p. 80. This figure is for total manpower, including unit support.

b/ See International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977). Total Norwegian Home Guard is 80,000. This figure is based on the proportion of ground forces in the active services.

PERSIAN GULF

Assumptions Consistent with DoD Planning Factors

The balance in the Persian Gulf is even more difficult to estimate than that in Europe. There is no certainty as to how many Soviet divisions could be deployed to the Iranian border within a few weeks. Three Transcaucasian divisions, about 33,000 troops, are immediately available for combat (Category I) and could be dispatched to northern Iran shortly after a Soviet

decision to intervene. Two airborne divisions could be lifted to the combat theater quickly. 8/

The key uncertainties lie in the level of Strategic Reserve Category I ground force divisions that might be employed in an Iranian operation and in the speed with which they could arrive from the Soviet western military districts where they are based. Rail lines to the Caucasus are nowhere near as plentiful as they are to Eastern Europe; travel times are longer and rail capacity smaller. In light of their estimated capability to deploy to Eastern Europe in about five days, it might take Soviet Category I divisions from the Strategic Reserve about twice as long to deploy to the Iranian border, since the distances to Iran are about twice as far as the shortest distances to East Germany. Thus, it can roughly be estimated that the first Soviet Category I divisions from the western military districts could arrive near the Iranian border about 10 days after mobilization. Rail-loading limitations are difficult to estimate. While there are fewer rail lines to the Caucasus than to East Germany, where Soviet Category I divisions are estimated to arrive at the rate of three per day, troop movements could be given priority over other rail transportation, possibly allowing the Soviets to move divisions at the rate of one per day. 9/

Given these assumptions, it would be possible for the Soviets to introduce their entire Category I Strategic Reserve, the Transcaucasian divisions, and airborne units within three weeks of mobilization. The resulting force of 157,000 troops (see Table C-3) could be massed at the Iranian border and, even if they did not enter Iran until after the initial arrival of U.S. forces, might overrun the northern part of that country unless sufficient defensive units--about 105,000 troops, based on the 1.5:1 ratio--were available to stop them.

Measuring the Iranian Contribution. The Iranian contribution to the defense of its northern border would depend on two factors:

8/ See Chapter III, p. 21.

9/ Fischer (Defending the Central Front, p. 21) estimates Soviet Category I divisions based in Soviet western military districts could begin to arrive in East Germany five days after mobilization and arrive at a rate of three per day for the next eight days.

TABLE C-3. PERSIAN GULF BALANCE, CONSISTENT WITH DOD ASSUMPTIONS

Units	Manpower	Units	Manpower
		<u>Iraq</u> <u>a/</u>	<u>Iran</u> <u>a/</u>
4 Tank Divisions	44,000	3 Armored Divisions	49,500
6 Infantry Divisions	72,000	4 Infantry Divisions	64,000
Total Iraq Manpower	116,000	Total Iran Manpower	113,500
Given 1.5:1 Ratio	77,300	Total Iran Shortfall	--

<u>Soviet Union</u>		<u>Iran</u>	
12-Division Strategic Reserve	124,000 <u>b/</u>	Residual from Iraqi Front	36,200
3-Division Transcaucasian Force	33,000	Discounted for 50 Percent Capability	18,100
Total Soviet Manpower	157,000	Total Equivalent Iran Manpower	18,100
Given 1.5:1 Ratio	104,700	Total Iran Shortfall	86,600

a/ Source: International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977).

b/ Total of five tank, five motorized, and two airborne divisions. Derived from Jeffrey Record, Sizing Up the Soviet Army (Washington, D.C.: The Brookings Institution, 1975), pp. 18-19; Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: IISS, 1975), pp. 11, 18.

the level of forces required to defend against Iraq in the postulated scenario and the way in which Iranian force capabilities compare, or are weighted, relative to Soviet capabilities.

With respect to the first consideration, Iraq is assumed to utilize all of its combat divisions (116,000 troops) in an assault on Iran, with independent brigades and reserves withheld for token defense of other borders. Given the 1.5:1 ratio required for the defense of the Iraqi front, Iran would have to call on about 77,000 of its 113,500 regular combat forces to counter the Iraqi attack.

The remaining 36,500 troops cannot be assumed equivalent on a one-for-one basis with Soviet forces. Their capability must be discounted, and any such effort will be purely subjective. Assuming that the Iranians cannot benefit fully from their weapons acquisitions, this paper posits--for illustrative purposes only--that Iranian forces are about half as effective as, or are weighted at 0.5 of, Soviet forces. Thus, in effect, the analysis used attributes an Iranian force level of 18,250 troops toward a force of 105,000 required to maintain the 1.5:1 ratio. The shortfall (about 87,000 troops) could be covered by the manpower of a reinforced U.S. airborne division (33,000 troops), an airmobile division (17,950 troops), and two Marine divisions (an estimated 39,000 troops).

The Persian Gulf: Modified Assumptions

Postulating possible force levels under the modified assumptions regarding Iranian contributions and constraints upon Soviet forces entails all of the difficulties outlined in the preceding section. In particular, it assigns additional capabilities to the Iranian forces, on the assumption that they could indeed significantly benefit from their weapons acquisitions. Again, for illustrative purposes, that capability is assumed increased by 25 percent.

Given that assumption and assuming that Iraqi capabilities are not better than in the previous calculations, Iranian force requirements vis-a-vis Iraq would decline. To maintain the 1.5:1 ratio, Iran would need only about 62,000 troops, compared to 77,000 required if Iraqi and Iranian capabilities are assumed to be about equal, unit to unit:

$$\frac{116,000}{1.5 \times 1.25} = 61,900 \text{ troops}$$

This would leave about 51,600 troops for deployment to Northern Iran. Assuming an Iranian "weight" of 62.5 percent vis-a-vis Soviet units (since the 0.5 capability has increased by 25 percent), there would be 32,250 Soviet-force equivalent Iranian defenders against a Soviet attack (see Table C-4).

To defeat this force, the Soviets would require 1.5 x 32,250 troops, or over 48,000 men, about the sum of their Transcaucasian forces and two immediately deployable airborne divisions. Doubling the Iranian force capability by inserting two U.S. divisions, including a reinforced airborne division, would force the Soviets to draw heavily upon their Strategic Reserve. Indeed, given the 1.5:1 ratio, the Soviets would have to draw down at least seven of their ten Category I divisions in European Russia. To be sure, deploying but two divisions to Iran involves some element of risk that the Soviets would call upon their entire Category I Strategic Reserve. Nevertheless, given the arguments outlined above about calls upon these forces elsewhere and traditional Soviet reluctance to undertake great risks to pursue military adventures outside Europe, supporters of a view embracing the modified assumptions would consider that element of risk to be relatively small.

Note on Derivation of Tactical Air Requirements

The derivation of tactical aviation requirements, unlike that for ground forces, is not discussed in open literature. Tactical aviation requirements are inherently more difficult to calculate, since they address both a support relationship to ground forces (close air support) and an independent battlefield mission (air superiority, including offensive counterair).

In the absence of more rigorous algorithms, this paper posits a speculative requirement of about 1.5 wings per division and overlooks the air-to-air relationship. This ratio is drawn from the current force structure of 26 Air Force wings and 16 Army divisions. It is consistent with the Marine structure of one wing per division, since Marine air wings have 50 percent more firepower than Air Force wings. The paper treats Marine wings as 1.5 Air Force wing equivalents.

Nevertheless, because of the imprecision attached to this calculation, a round figure of three Air Force wings is applied to each option, while only Marine wing structure is varied. The latter have a clear support relationship to Marine divisions; hence, reduction of a Marine division sized unit could justify reduction of a wing-sized force.

TABLE C-4. PERSIAN GULF BALANCE, MODIFIED ASSUMPTIONS

Units	Manpower	Units	Manpower
	<u>Iraq</u> <u>a/</u>		<u>Iran</u> <u>a/</u>
4 Tank Divisions	44,000	3 Armored Divisions	49,500
6 Infantry Divisions	72,000	4 Infantry Divisions	64,000
Total Iraq Manpower	116,000	Total Iran Manpower	113,500
Given 1.5:1 Ratio	77,300	Total Iran Shortfall	--
Given 25 Percent Increase in Iran Capability	61,900		

<u>Soviet Union</u>		<u>Iran</u>	
X-Division <u>b/</u> Strategic Reserve	Y <u>b/</u>	Residual from Iraqi Front	51,600
2-Division Airborne	14,000	Discounted for 62.5 Percent Capability	-19,400
3-Division Trans- caucasian Force	33,000	Total Equivalent Iran Manpower	32,200
Total Soviet Manpower	47,000 + Y	Total Iran Shortfall	--
Given 1.5:1 Ratio	$31,300 + \frac{Y}{1.5}$		

a/ Source: International Institute for Strategic Studies, The Military Balance, 1977-1978 (London: 1977).

b/ X, Y: The level of non-airborne strategic reserve is uncertain (see discussion in text).

c/ Based on Robert Lucas Fischer, Defending the Central Front: The Balance of Forces (London: IISS, 1975), p. 11.

APPENDIX D. METHODOLOGY FOR SETTING AIRLIFT AND TANKER
 REQUIREMENTS

MEASURING AIRLIFT CAPACITY

Strategic airlift effectiveness often is measured in terms of the tonnage that aircraft can transport over given distances in any day. This measure frequently is represented in terms of ton/miles per day, or simply tons per day for a fixed distance. Assuming that forces are ready for deployment, the total tonnage that the U.S. airlift force could lift in any given day depends upon several factors: the number of aircraft available for airlift; the utilization rate of each aircraft; their speeds; their payload; a factor that accounts for training and ferry time back to base; and the distance the planes must travel. The relationship between all these factors may be expressed as:

$$(1) \quad L_{ij} = \frac{N_i \times U_i \times S_i \times R_i}{D_i} \times P_{ij}$$

Where

L_{ij} = strategic lift capability of aircraft, i, for a cargo of a force, j, measured in tons/day

N_i = number of aircraft, i

U_i = utilization rate of aircraft, i

S_i = speed of aircraft, i

R_i = productivity factor for aircraft, i (training and ferry time)

D_i = distance aircraft, i, travels

P_{ij} = payload of aircraft, i, given cargo of force, j

Several factors can affect the payload of each individual aircraft. The allowable cabin load (ACL) represents the maximum load the aircraft can carry over any given distance. Once the plane has traveled some specified distance without refueling, ACL will decline in some proportion to the additional distance the plane must travel. The total longest unrefueled distance a plane must travel on any given trip is termed its "critical leg," for it will limit the payload the plane can carry on that trip. The volume of the cargo being carried will also constrain the total payload of any given aircraft. Some cargo cannot be carried at all by certain aircraft types. For example, C-141s cannot carry extremely large units, such as some tanks, termed "outsize cargo." Other units, though relatively light, are very bulky; their volume will fill the plane well before the maximum load has been reached. Indeed, volume constraints, such as carrying helicopters, can often result in even lower limits upon aircraft loading than those that "critical leg" will permit.

This paper addresses the lift capabilities of C-5As and C-141s only. (Other assumptions are discussed below.) Given daily loads (in tons/day) that each of these planes can carry for a given force, j , the time required to move that force may be expressed as:

$$(2) \quad T_j = \frac{OU_j + x}{L_{(C-5A)j}} = \frac{OV_j - x}{L_{(C-141)j}}$$

Where

T_j = Time to move force, j

OU_j = Outsize tonnage associated with force, j

OV_j = Oversize tonnage associated with force, j

$L_{(C-5A)j}$ = Daily lift of C-5A for force, j , as from equation (1)

$L_{(C-141)j}$ = Daily lift of C-141 for force, j , as from equation (1)

and

x = Total oversize load of the C-5A

The Role of Tanker Aircraft

Tankers eliminate the effects of "critical leg" by permitting aircraft to refuel aurally and thereby possibly increasing allowable cabin load to the maximum (if there are no additional volume constraints). If volume constraints limit aircraft load below that permitted by "critical leg" constraints, tanker aircraft are of little value to that particular transit. Thus, aerial refueling can improve the total payload of the airlift force and thereby increase the speed with which units are transferred, but only in cases where transit distance, rather than volume, critically affect the allowable cabin load of each cargo aircraft.

Measuring the Time Required to Deploy Airborne and Airmobile Units to the Persian Gulf

Chapter IV outlined two alternate forces that might be lifted to the Persian Gulf within three weeks. The first consisted of a reinforced airborne division, an airmobile division, and support for three composite Air Force wings. The second force consisted of the reinforced airborne division, an airmobile brigade, and support for one composite wing. In measuring the actual time that airlifting these forces might take, this study made the following assumptions about aircraft utilization and base availability:

- o Civil Reserve Air Fleet (CRAF) would be alerted to Stage II and would carry all troops as well as bulk cargo.
- o C-141 aircraft are "stretched."
- o The estimated utilization rates for the C-5A and C-141 would each be 12 hours per day.
- o Cargo aircraft could not overfly or refuel in the following countries: all European and North African states, Jordan and Saudi Arabia, and, in the Pacific, Japan and Thailand. Cargo aircraft could refuel in Lod, Israel.
- o Tankers, if used, would obtain sufficient fuel at Lod.
- o Tanker utilization rates would be ten hours per day.
- o The productivity factor is set at a nominal 0.445 to allow for training and ferry time. (Ferry time alone would result in a 0.5 factor.)



- o Because of low payloads for non-refueled C-141 transits to Israel, unrefueled C-141 transits would be via the West Coast of the United States, Hawaii, Guam, Clark Air Force Base (in the Philippines), and Diego Garcia.
- o Air Force estimated wing loads approximate those for an F-4 wing.

Table D-1 outlines the values that these assumptions yield for each factor.

TABLE D-1. ASSUMED VALUES FOR AIRLIFT FACTORS

Factor <u>a/</u>	C-5A	C-141
N	74.0	250.0
U	12.0	12.0
S	428.0	407.0
R	0.445	0.445
D	9,500.0	17,000.0 (9,500.0) <u>b/</u>
P _j , when j is:		
j Airborne	40.3	21.4
Airmobile	40.3	21.4
Airborne Support	42.5 (95.0) <u>c/</u>	32.0
Air Force Support	42.5 (95.0) <u>c/</u>	32.0

a/ Source for all factors was U.S. Air Force, except for U, which was assumed; D, which was derived from both Air Force and Congressional Research Service calculations; P (airmobile), which was conservatively assumed equal to P (airborne); P (airborne support) and (Air Force support), which were derived from Air Force load/distance charts for the two aircraft.

b/ Distance if C-141 is refueled.

c/ All figures for P_j apply to refueled and unrefueled aircraft except where parentheses occur. Those in parentheses are for refueled aircraft; those beside them, for unrefueled. Figures in parentheses derived from Air Force calculations for armored division. These factors are optimum loading factors that will not necessarily be duplicated in a real-world situation.

Given these factors, the total optimum daily load in tons/day, per force type, for each plane is illustrated in Table D-2.

TABLE D-2. TOTAL OPTIMUM DAILY LOAD, BY PLANE AND FORCE TYPE

Force Type	C-5A	C-141
Airborne/Airmobile (unrefueled)	717.46	683.98
Airborne/Airmobile (refueled)	717.46	1,223.96
Airborne and Air Force Support (unrefueled)	756.63	1,022.77
Airborne and Air Force Support (refueled)	1,691.28	1,830.21

Once the outsize and oversize tonnages of each force are given, the optimum time required to move the total force can be calculated for each option, using equation (2) above. Table D-3 outlines the optimum times for moving the forces discussed in this paper. It can be seen that refueling saves a week with respect to either option and makes a minor impact on the DoD assumptions in which not all forces can arrive well within three weeks. If, as noted in the text, Clark Air Force Base is assumed unavailable, however, refueling would be necessary because C-141s cannot transit from a friendly base to Diego Garcia with any meaningful load (the distance from Guam to Diego Garcia exceeds 5,400 miles). Refueling does not appear necessary under the modified assumptions.

Assessing the Need for ATCA

The Air Force has requested funding for about 20 Advanced Tanker/Cargo Aircraft (ATCA), primarily in order to provide a long-range refueling capability for C-5As and C-141s in areas

TABLE D-3. OPTIMUM TIME FOR MOVEMENT OF SELECTED AIRLIFTED FORCES

Force	Outsize Tons	Oversize Tons	Movement in Days (Unrefueled)	Movement in Days (Refueled)
<u>DoD Assumptions</u>				
Airborne Division	146.0	10,361.0	7.5	5.4
Airmobile Division	766.0	8,613.0	6.7	4.8
Airborne Support	2,877.0	7,115.0	5.6	2.8
Air Force Support (3 wings)	--	2,399.4	1.4	0.7
Total	3,789.0	28,488.4	21.2	13.7
<u>Modified Assumptions</u>				
Airborne Division	146.0	10,361.0	7.5	5.4
Airmobile Brigade	256.0	2,871.0	2.2	1.6
Airborne Support	2,877.0	7,115.0	5.6	2.8
Air Force Support (2 wings)	--	1,599.6	1.0	0.4
Total	3,279.0	21,946.6	16.3	10.2

SOURCE: All units except airmobile brigade and Air Force wings, United States Army. Airmobile brigade taken as 33 percent of airmobile division. Source for Air Force wings: U.S. Air Force, Military Airlift Command. It should again be noted that these figures assume optimum factors, not necessarily duplicated in a real-world situation.

where bases enroute might be unavailable. 1/ As the preceding analysis has indicated, aerial refueling becomes a necessity when almost every base enroute to the Persian Gulf is unavailable. The Gulf is logistically the most remote region from the United States or its territories. Thus, in the first instance, the justification for ATCA--or indeed any aerial refueling requirement--rests primarily on the loss of all bases that the United States currently could expect to use.

Even making that assumption, however, does not imply a need for the ATCA itself. Given the types of forces that the United States might deploy to remote regions--such as those illustrated in both the high and lower options of this paper--and given, too, the 12-hour utilization rates for the C-5A and C-141 which this paper posits and, lastly, given the assumption that at least Israel would serve as a refueling point for tankers, a force of about 250 KC-135s could sustain the airlift if operating at the same utilization rates as about 120 ATCAs. 2/ That 250 KC-135 force presently is available in the tanker fleet. 3/ The cost of

1/ See testimony of Lt. General Alton Slay, USAF, in Hearings on Military Posture and H.R. 11500 (Authorization for Appropriations for Fiscal Year 1977, Hearings before the House Committee on Armed Services, 94:2 (February/March 1977), Part 5, p. 665ff.

2/ Source: Average payload cycle, based on U.S. Air Force response to CBO question on tanker requirements to support a lift from Dover, Delaware to Lod, Israel given conditions of no overflight rights of European countries; 12.5-hour utilization rate for C-5As and 11.9 hours for C-141s; 10-hour utilization rate for ATCA/KC-135; single cycle for airlift aircraft; unavailability of Lajes, Azores and Torrejon, Spain for refueling; fuel available at Lod and tanker operations possible there; payloads of 40.3 and 95.0 tons for C-5As and 21.4 and 32.0 tons for C-141s. Peak loads would lead to a higher requirement; fewer KC-135s would, of course, be needed if C-5As transited without aerial refueling.

3/ The total number of KC-135 tankers, both active and reserve, is 618 (see Alton H. Quanback and Archie L. Wood, Modernizing the Strategic Bomber Force: Why and How (Washington, D.C.: The Brookings Institution, 1976), pp. 35-36). There are 396 aircraft in the U.S. strategic bomber force (see John H.

of achieving optimum KC-135 utilization rates to permit a 250-plane force to support the airlift in question is \$800 million a year, or \$8.0 billion over an estimated 10-year life cycle period. The cost of procuring sufficient ATCAs for this mission, before any operating costs are considered, is \$5.8 billion; the cost of operating these planes is at least 50 percent more. Given the assumptions outlined above, the case for ATCA, therefore, remains to be proved.

Collins, "American and Soviet Armed Services, Strengths Compared, 1970-76," Congressional Record (August 5, 1977), p. S14074). Whether the tanker force could support strategic and conventional operations simultaneously depends on bomber availability, flight paths, and recovery bases. Additionally, given a SAC need for tankers, C-5As could fly unrefueled, thus lowering the number of tankers required for Gulf operations to well below 250.

GLOSSARY

Airborne Forces: Airlifted ground combat forces designed primarily to conduct parachute or other types of air assault into enemy-held territory.

Airmobile Forces: Ground combat units that employ helicopters under their control to maneuver rapidly within given areas of operation.

Brigade: In U.S. Army force structure, two or more maneuver battalions with supporting artillery and other combat units, numbering 3,000-6,000 troops.

Carrier Task Force: A group of naval warships usually comprising an aircraft carrier, cruisers, and several additional destroyers. The cruisers and destroyers contribute to the defense of the carrier.

Category I, II, III: States of readiness of Soviet combat units.

Category I: Units with 90 percent or more troops immediately available for combat.

Category II: Units with approximately 50 percent of troops ready for combat. These units would require up to 30 or more days to be fully ready.

Category III: Cadre units, with only 10 percent of troops ready for combat. These units could require as many as three months to be ready for combat.

Close Air Support: Air strikes against targets near enough to ground combat units so that detailed coordination between air and ground elements is required.

Corps: In U.S. Army force structure, two or more divisions with other combat and support units, numbering 50,000-100,000 troops.

Deploy: To array troops for battle.

Division: In U.S. Army force structure, three brigades with other combat and support units, numbering approximately 16,000 troops.

Escorts: Naval vessels that are employed in the protection of ships they accompany. The protected ships may themselves be armed (e.g., carriers) or unarmed (merchant ships).

Heavy Division: An armored or a mechanized infantry division, so called because of the equipment associated with the division.

Knot: A nautical mile; a nautical mile per hour.

Light Division: An infantry, airborne, or air assault division, so called because of the equipment associated with the division.

Marine Air/Ground Task Force: An organization of Marine ground force and tactical aviation units tailored to a specific mission requirement. These task forces most frequently take the form of:

Marine Amphibious Unit (MAU): 1/9 of a Marine division and air wing.

Marine Amphibious Brigade (MAB): 1/3 to 2/3 of a division and air wing.

Marine Amphibious Force (MAF): At least a division and air wing.

Power Projection: In naval terms, the launching of sea-based air and ground attacks against enemy targets on shore.

Sea Control: Naval support of the relatively unimpeded transit of friendly shipping across selected sea lanes; denial of the enemy's ability to pursue similar operations in those areas.

TOW: Tube-launched, optically-tracked, wire-guided missile. The U.S. Army heavy antitank guided missile. Mounted on a tripod or on a vehicle, the TOW is guided throughout its flight to its target by a wire connecting the missile to the gunner's sight. TOW is also carried by the AH-1S Cobra helicopter.

Warsaw Pact: The mutual defense organization consisting of the Soviet Union and the Eastern European nations.

Wing: Two or more squadrons of combat aircraft; notional Air Force fighter/attack wings consist of three squadrons of 24 aircraft each.

ABBREVIATIONS

APC: Armored Personnel Carrier.

ASW: Antisubmarine Warfare.

AV-8: Vertical/short take-off and landing attack plane (U.S. Marines).

BLT: Battalion Landing Team.

CENTO: Central Treaty Organization.

CH-53E: Heavy-lift helicopter (U.S. Navy, U.S. Marine Corps).

CRAF: Civil Reserve Air Fleet.

F-111: Variable-wing, adverse-weather attack aircraft (U.S. Air Force).

KC-135: Tanker aircraft (U.S. Air Force).

LHA: General purpose amphibious assault ship.

MAB: Marine Amphibious Brigade.

MAF: Marine Amphibious Force.

MAGTF: Marine Air/Ground Task Force.

MAU: Marine Amphibious Unit.

NATO: North Atlantic Treaty Organization.

SAC: Strategic Air Command.

TOW: Tube-launched, Optically-tracked, Wire-guided missile.

UE: Unit Equipment.

V/STOL: Vertical/Short Take-Off and Landing.