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General Purpose Forces:
The Tactical
Air Forces**

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PLANNING U.S. GENERAL PURPOSE FORCES:
THE TACTICAL AIR FORCES

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PREFACE

As the Congress makes decisions on budget targets for the First Concurrent Resolution on the Budget for Fiscal Year 1978, the appropriate size of the defense budget will be one of the most important issues. The military forces which that budget buys can be divided into two parts: the strategic retaliatory forces--inter-continental missiles and bombers and submarine-launched ballistic missiles; and the general purpose forces--all the rest of the Navy, Army, Air Force, and Marine Corps. The general purpose forces account for most of the defense budget, and decisions about their size, location, equipment, and level of readiness determine much of the defense budget. The appropriate character and size of these forces, in turn, is tied to conceptions of how and where they would be used and assessments of the capability of likely adversaries.

The group of CBO Budget Issue Papers, of which this is a part, is intended to lay out the most important assumptions underlying current planning of the general purpose forces, discuss the match between those assumptions and the current or projected forces, and suggest what might change in defense programs if somewhat different planning assumptions were adopted. The other paper in this series are: Overview, Army Procurement Issues, The Navy, Theater Nuclear Forces, and Forces Related to Asia.

This paper was prepared by Nancy J. Bearg of the National Security and International Affairs Division of the Congressional Budget Office, under the supervision of Robert B. Pirie, Jr. and John E. Koehler. The author wishes to acknowledge the assistance of Patrick L. Renehan and Steven A. Thompson of the CBO Budget Analysis Division, Patricia H. Johnston, and Patricia J. Minton. In keeping with CBO's mandate to provide nonpartisan analysis of policy options, the report contains no recommendations.

Alice M. Rivlin
Director

January

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SUMMARY

Decisions about the size of the defense budget and its component parts must be made by the Congress annually. This paper attempts to build a framework for considering decisions about the tactical air forces in the broad context of the role they would be expected to play in a NATO/Warsaw Pact war in Western Europe.

Should a war actually occur between NATO and the Warsaw Pact, U.S. tactical air power could make a critical difference in NATO's prospects of defeating a Warsaw Pact invasion, especially if the attack came before ground forces were in place. The flexibility of tactical air power is such that it can be brought to bear quickly in a battle and can move more rapidly than ground forces to areas where enemy forces are concentrated. The primary role of tactical air power in the land battle is to support friendly ground forces by contributing firepower against enemy ground forces and by warding off enemy air attacks on friendly forces.

This paper focuses on a NATO/Warsaw Pact war because the major planning case in the design of U.S. general purpose forces, which with support allocated¹ account for about 60 percent of the defense budget, is a war primarily centered in Europe but with requirements to fight the Soviet Union and its allies elsewhere simultaneously. The reasoning is that if the United States, in conjunction with its NATO Allies, can deter an attack by the Warsaw Pact, or successfully hold against such an attack if it should come, the U.S. force levels which support that capability should be sufficient to

1. For purposes of allocation here and later in this paper, support costs associated with Central Support and Mission Support Forces in the Defense Planning and Programming Categories were allocated to primary mission forces (strategic and general purpose) in proportion to the total dollars allocated to each of the primary mission forces.

deal with other contingencies requiring the use of U.S. military forces.

The major planning assumptions used by the Department of Defense (DoD) for a NATO/Warsaw Pact war are listed below. These factors do not constitute a prediction that U.S. forces will be employed in the place and manner specified, rather they comprise a broad scenario that provides a common ground for debates and decisions about the design and deployment of U.S. general purpose forces.

- o Although U.S. forces must be ready to meet a surprise attack in Europe, the assumptions that determine their overall size involve a conflict beginning after several weeks of warning time during which NATO forces in place and some reinforcements could mobilize to meet a Warsaw Pact attack.
- o Forces are planned to stop an initial attack and then fight on as long as necessary to outlast the Warsaw Pact. It is assumed that ground force reinforcements would arrive from the United States.
- o The conflict would be (at least as it begins and continues for a time) nonnuclear, with NATO playing primarily a defensive role.

It is a matter of judgment whether these planning assumptions are the most realistic. Other assumptions might be just as sensible and could be expected to produce different forces and/or deployment patterns. This paper examines an alternative to the several weeks' warning time/long war scenario: a force planning scenario of a short, intense conflict occurring after little or no warning. A short war must be fought successfully to get to a long war. That is, NATO forces must survive the early phases of the war and maintain a coherent defense, without major loss of territory, if the war is to be ultimately concluded on terms favorable to NATO. So, many of the requirements and capabilities associated with a short war are also part of a long war. Planning for the long war can provide a hedge for both contingencies, as long as resulting combat forces are also able to win the short war. In allocating scarce resources, a trade-off may have to be made between

support forces for a long war and combat forces for a short war. Decisions about forces and associated support and materiel for either type of war must take into account the associated risks of buying too few or the wrong kind. In either case, the overriding consideration should be to maintain forces of such a character that the enemy war planner will lack the confidence to support an attack, especially from a surprise posture.

THE ROLE OF TACTICAL AIR POWER IN EUROPE

In a little-or-no warning scenario, additional U.S. Army units would not arrive in Europe to reinforce NATO until after the war begins. If there were even as much as three days mobilization time, the U.S. Air Force plans to have a significant portion of its augmentation force moved to Europe. In such a case, if they can overcome problems posed by the heavy Warsaw Pact surface-to-air missile and anti-aircraft artillery threat, perennially poor European weather, and damage from initial Pact air attacks, tactical air forces can provide invaluable help in slowing the Warsaw Pact attack until ground forces in Europe are in position and reinforcements begin to arrive.

The U.S. capability to fight a long war in Europe is predicated on the ability to reinforce units already based there. This strength in depth is provided by active and reserve forces, many of which in the case of ground forces, cannot get to Europe until after two or three months into the war. If the war ended after one month, the arriving units would obviously be too late to have any effect on the war. In the case of tactical air power, the situation is different. The Air Force plans that virtually all its active and reserve tactical air units can get to Europe within a month or less, and so would be more likely to have a role in the war, even if the war were relatively short. If arrangements were made to use land bases, some Navy and Marine tactical air power could also be prepared to move quickly to Europe to support NATO in the land battle.

NATO tactical air forces are generally recognized to be superior to those of the Warsaw Pact in equipment and training, though the Pact may have greater numbers. Thus, the value of these NATO forces is particularly high both as a deterrent and as a war-fighting capability.

The following points are revealed when the forces are related to the current planning assumptions of several weeks' warning time/long war and the alternative assumptions of little or no warning/short war:

Air Force

- o It appears that the Air Force part of the tactical air forces is fairly well suited to both a long war with warning time and a short war with little or no warning. It is hard to distinguish clearly tactical air forces that primarily fit with one assumption or the other.
- o In order to increase the effectiveness of Air Force tactical air power in Europe, several limitations, such as a shortage of hardened aircraft shelters, shortcomings in night and adverse weather capability, and difficulties in neutralizing enemy ground-based air defense systems, should be addressed.

Navy

- o The primary role of the Navy is sea control, i.e., keeping the sea-lanes open. Participation in the land battle ("power projection") is a secondary mission, likely to occur after control of the seas is gained. Thus, under current planning, if the war were of short duration, Navy tactical air power would most likely not contribute to the land battle.
- o The primary problem in sea control against the Soviet navy is antisubmarine warfare, so the question arises whether the use of Navy tactical aviation in sea control is an efficient allocation of funds and resources.
- o If decisions were made to do so, some Navy tactical air power, which is 31 percent of total U.S. tactical air resources, could be employed in the land battle. It might be wise to establish a Navy capability to operate its tactical aircraft from forward land bases, as well as from aircraft carriers. In the longer run, if planners believe that the level of aircraft carriers should be

reduced and some U.S. tactical air resources should be shifted from sea to land, those aircraft should probably be procured for the Air Force rather than the Navy.

Marine Corps

- o The traditional Marine Corps amphibious role is not well suited to a European scenario, whether it is based on either set of assumptions discussed here. The likelihood of Marine amphibious landings during a European war, especially a short war, is small, though the Marines plan and train for such landings. The Marine Corps could not get its amphibious forces to Europe for several weeks; then it could not put them onto defended shores without substantial Navy support. Unopposed landings, which could occur early in a war for purposes of preemption, would not require heavy Navy support.

- o Marine Corps air power could be used independently of Marine ground forces in the European land battle.

BUDGET OPTIONS

Several budget choices that can be made in fiscal years 1978 and 1979 are raised by the preceding discussion. They involve force enhancements that might be undertaken to strengthen the force under any European scenario, plus several issues that might be decided differently under different planning scenarios and different budgets. Some of these choices are about improvements in capability through different concepts of employment of current tactical air resources rather than procurement of new equipment, though often changed concepts of employment will have attendant costs. Enhancements to survivability, capability, and flexibility such as those mentioned here will increase the general capability of the current tactical air forces and hence make them equivalent to larger forces without these improvements.

- o The Air Force aircraft shelter-building program could be accelerated to fund 217 shelters in the next two years rather than over the five years

the Air Force plans. The cost would be \$94 million in fiscal year 1978 and \$89 million in fiscal year 1979, compared to the \$38 and \$36 million per year proposed by the Air Force (all fiscal year 1977 dollars). Building more protection for aircraft on the ground is important regardless of warning time or length of a war.

- o Development of an A-10² with night capability and some adverse weather capability could be undertaken. It appears that this would require a two-seat A-10 because of the crew requirements associated with the capability. If prototypes were developed in fiscal years 1978 and 1979 to include an inertial navigation system and a Pave Tack pod,² it might be possible to include such modifications on the last 100 of the A-10s produced. The cost of developing the prototype would be approximately \$50 million in fiscal year 1978; the marginal cost of producing 100 two-seat A-10s with Pave Tack pods and the associated equipment would be about \$115 million (fiscal year 1977 dollars). This force enhancement would be important in any of the war scenarios discussed in this paper.
- o If the Navy bought "bare-base" kits for two carrier air wings, which would enable them to operate from air strips not developed as military bases, wings associated with carriers ashore in overhaul could be deployed to operate from land bases in Europe in support of the land battle in Central Europe or on the flanks. The total cost of two such kits would be about \$92 million in fiscal year 1977 dollars.

These enhancements would cost about \$365 million over the five-year period fiscal years 1978-82, with about \$190 million of the cost in fiscal year 1978 (fiscal year 1977 dollars).

These enhancements, plus an added dimension in the use of the Navy and Marine Corps resources, increase total force capability and should also be considered when decisions are made about increasing the size of the Air Force, as the Air Force plans, from the equivalent

2. See Glossary.

of 22 to 26 tactical fighter wings. This is not meant to imply that the enhancements are the equivalent of four wings, but rather that the question of increasing the force to that extent may become less important in light of different assumptions, different budgets and increased capability and availability of the current force.

The present DoD plan to expand the force primarily affects its capability for sustained combat. The improvements in sheltering and A-10 capability would help both short- and long-war capability, but are primarily intended for greater early capability. These improvements can be made in addition to the force expansion planned by DoD, or, if resources are constrained, can be made in conjunction with some smaller expansion and modernization program. If the smaller expansion program is thought to pose excessive risk, it could be offset in part by buying the necessary equipment to operate Navy aircraft from land bases and by planning to operate Marine Corps tactical air units in the Central European land battle. Two general options are as follows:

OPTION ONE

- o Accelerate the shelter program.
- o Add night/adverse weather capability to a portion of the A-10 force.
- o Accept the DoD program to complete the expansion of the Air Force to 26 tactical air wings.

OPTION TWO

- o Accelerate the shelter program.
- o Add night/adverse weather capability to a portion of the A-10 force.
- o Procure bare-base kits for the Navy and plan for some Marine Corps tactical air units to be used in Central Europe.
- o Restrain the expansion of the Air Force to fewer than 26 tactical fighter wings.

1

In Option One, the last item is already programmed by the Defense Department. Acceptance of all three items in this option would cost \$274 million (fiscal year 1977 dollars) over and above the present DoD program in fiscal years 1978-1982.

Option Two does not specify to what degree Air Force expansion would be restrained. If one chose to curtail the programmed expansion, the first reduction might be an F-15 wing. The F-15s would be taken out first rather than A-10s or F-16s, because the A-10s are needed in the important close air support role and the F-16s are multipurpose and are less expensive than F-15s for the air superiority/air defense role. A two-wing reduction might involve two wings of F-15s. Further reduction in the number of wings planned would logically be F-16s, if one accepted the argument discussed in this paper that the specialized antitank capability of the A-10 is crucial. However, the United States' purchase of F-16s, programmed over the next five years, is tied into a consortium of NATO Allies, making reductions difficult. Another way to restrain the growth at 22 or 23 wings would be to retire aircraft more rapidly than now planned, but such an action would not save a significant amount of money. Thus, the range of Option Two is the enhancements package plus restraint in Air Force growth to 24 or 25 wings. The range of savings from fiscal year 1978-1982 is from \$1.0 billion to \$2.5 billion in fiscal year 1977 dollars.

The budgetary consequences of these options are shown in more detail in the following table.

TABLE S-1. COSTS OF ALTERNATIVE TACTICAL AIR FORCE PROGRAMS RELATIVE TO THE CURRENT PROGRAM, BUDGET AUTHORITY, IN MILLIONS OF FISCAL YEAR 1977 DOLLARS, BY FISCAL YEARS

OPTION ONE				
Budget Action	1978	1979	1980-82	Total
Accelerate shelter program	+56	+53	--	+109
A-10 night/adverse weather modification, development and additional cost for 100 aircraft	+50	--	+115	+165
Increase Air Force to 26 tactical fighter wings	--	--	--	--
Total	+106	+53	+115	+274

(continued)

(Table S-1continued)

OPTION TWO				
Budget Action	1978	1979	1980-82	Total
Accelerate shelter program	+56	+53	--	+109
A-10 night/adverse-weather modification, development and additional cost for 100 aircraft	+50	--	+115	+165
Procure two bare-base kits for the Navy	+80	+ 3	+ 9	+ 92
Subtotal	+186	+56	+124	+366
Restrain Air Force growth; Eliminate from program: One F-15 wing (25-wing force)	-500	-400	-500	-1400
Total	-314	-344	-376	-1034
Two F-15 wings (24-wing force)	-700	-700	-1500	-2900
Total	-514	-644	-1375	-2534
Range of Option Two	-314 to -514	-344 to -644	-376 to -1375	-1034 to -2534

The fiscal year 1977 tactical air forces budget is \$11.9 billion; with support allocated, the figure is about \$22 billion, or 20 percent of the total defense budget (in fiscal year 1977 dollars). In authorizing and appropriating these funds the Congress made specific decisions about such things as aircraft procurement, manpower strength, and operations and maintenance funds in the context of force modernization--and, in the case of the Air Force, force expansion. In general the Congress supported the tactical air budget proposals of the administration.

This paper addresses, in the context of a NATO/Warsaw Pact war in Europe, increasing force capability--and therefore the force size equivalent--through enhanced survivability and flexibility of the current force and aircraft now being procured. The question of force expansion is not discussed at length. The Air Force does plan to increase its tactical air fighter/attack wings from the equivalent of 22 to 26, but funds to complete this plan will be in the budget requests over the next several years, and future decisions still can be made about force size.¹ It may be determined that such enhancements as those discussed in this paper make the question of force expansion less critical.

Indications are that the fiscal year 1978 tactical air budget (at least in the initial submission) will continue the modernization and expansion themes of the previous year, with the size of the tactical air budget likely to increase. The Congress will be faced, as it is every year, with a range of decisions about the tactical air forces.

1. For a more complete discussion of this issue, see CBO Staff Working Paper, U.S. Tactical Air Forces: Overview and Alternative Forces, Fiscal Years 1976-81, April 14, 1976.

This paper attempts to build a framework for considering these decisions in the broad context of the role the tactical air forces would be expected to play in a NATO/Warsaw Pact war, along with other elements of the general purpose forces. The paper describes the assumptions that underlie planning for current and future tactical air forces, then relates the current and programmed forces to the planning scenario. It shows the sensitivity or lack of sensitivity of the force to different planning assumptions, and suggests illustrative budget choices that might be made to enhance force capability in light of different planning scenarios and different budgets.

The analysis focuses on a NATO/Warsaw Pact European war. This is the major planning case in the design of United States general purpose forces, which with support allocated account for about 60 percent of the defense budget. Particular attention is paid in the analysis to the suitability of the forces to fight a short, intense war coming after a very short warning period, a scenario that is receiving increased public attention.² The current Department of Defense (DoD) planning factors, however, assume a longer war coming after several weeks' warning time. The paper focuses on the land battle in Europe on the premise that the heart of the conflict would be a Warsaw Pact ground attack in Central Europe.

U.S. TACTICAL AIR FORCES CONTRIBUTION TO NATO

As part of NATO's overall military power, U.S. tactical air forces provide a significant capability, especially as a source of mobile, flexible firepower to help ground forces blunt an enemy attack. Since NATO ground forces are somewhat less numerous and more lightly equipped than are Warsaw Pact ground forces, the contribution of tactical air firepower to the land battle can be very important. NATO tactical air forces are superior in equipment and training to those of the

2. See, for example, Senator Sam Nunn, "Gearing Up to Deter Combat in Europe: the Long and Short of It," Congressional Record, September 13, 1976, p. S15661.

Warsaw Pact, though the Warsaw Pact forces may have numerical advantage. Thus, the war-fighting value as well as the deterrent value of U.S. tactical air forces is high. How this contribution is to be made is an important factor in the size of budgets for the tactical air forces themselves and also for those of other U.S. forces.

In peacetime, the United States provides about 25 percent of NATO's tactical aircraft already positioned in Europe. Under full NATO mobilization, the U.S. Air Force would provide over half of NATO's tactical aircraft, and a significantly larger share of total weapons delivery potential. If Navy and Marine Corps aircraft are counted too, the U.S. contribution could be even larger.

TACTICAL AIR ROLES AND MISSIONS

Of total U.S. tactical air forces, the Air Force operates 57 percent; the Navy, 31 percent; and the Marine Corps, 12 percent. Each service contains a complete air arm in itself, with fighter and attack, reconnaissance, defense suppression, electronic warfare, early warning, and refueling aircraft. The design of each force--i.e., the size, configuration, equipment, and capability--is based on traditional roles and missions and the perceived threat. One of the points of this paper will be that the traditional roles should not bind the services in such a way that forces are not available to be employed where needed most.

The aircraft and mission capabilities of each service are more similar than different, but each of the three services envisions a different role in a NATO/Warsaw Pact war. The role of each service has evolved over time, as forces have been built and wars have been fought. The differences have been perpetuated and even protected. So, for example, the Navy expects to operate its tactical aircraft from carriers--rarely, if ever, from land bases--for sea control and power projection missions. Thus, carrier deck spaces determine the Navy's tactical air structure, and the resulting aircraft are committed to the carriers and the missions envisioned for the carriers.

CHAPTER II ANALYSIS OF MAJOR PLANNING ASSUMPTIONS

CURRENT PLANNING ASSUMPTIONS

U.S. general purpose forces planning is fundamental to the annual Department of Defense budget cycle involving the Secretary of Defense and his civilian staff, the services, and the Joint Chiefs of Staff. Underlying the planning is general guidance issued by the Secretary of Defense about contingencies the forces are expected to be able to meet. The forces are sized, configured, equipped, and postured against four basic scenarios and related assumptions. The major assumptions about such factors as warning time, length, and intensity of a war are critical variables around which the DoD dialogue about force structure and budget decisions is centered. Force design is generally sensitive to the assumptions, and in theory would change if different assumptions were used, though in the past force structure has not changed dramatically in response to different assumptions. Forces tend to be just as much the result of inherited assets, budget pressure, interservice rivalry or agreements, and politics as of force planning around specific assumptions.

It is useful, however, to examine current and alternative planning assumptions because they ought to provide a framework for debate about the adequacy of U.S. forces, and thus be one of the driving factors in decisions about the types and amounts of military forces and support the United States will have. The assumptions do not constitute a prediction of world events or exactly how the forces will be employed, but are rather a common basis for debate and decision about designing defense forces and allocating funds within the defense budget.

Though the details of the DoD planning guidance are classified, the general outline has been discussed in public statements. The major assumptions of the planning guidance are as follows:

- o The scenario that chiefly drives the planning is a major war with the Warsaw Pact, centered in Central Europe but with requirements to

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fight the Soviet Union and its allies elsewhere simultaneously. The reasoning is that, if the United States in conjunction with its NATO Allies could defend against a nonnuclear attack both by the deployed and reinforced Warsaw Pact forces, U.S. force levels should also be sufficient to deal with other contingencies.

- o The services are instructed to plan their forces against an official assessment of the threat, though there is disagreement about aspects of the threat, such as the rate of Warsaw Pact mobilization. The rift between the Soviet Union and the People's Republic of China is assumed to continue.
- o It is assumed that the Warsaw Pact would precipitate the war in Europe, that NATO would be on the defensive, and that fighting would thus occur primarily on Allied territory.
- o The conflict would be focused on the Central Region of Europe, although it could begin on the flanks of NATO¹ or the areas peripheral to it. In any case, U.S. planning assumes some commitment of U.S. resources would be required on the northern and southern flanks.
- o U.S. force planning assumes that about three weeks warning of an impending Warsaw Pact attack would be available to permit mobilization and deployment of NATO forces,² though U.S. forces are also expected to be ready for a sudden attack. The planning scenario assumes that NATO would not decide to order its own mobilization until a number of days after Pact mobilization. Thus the Pact forces would have a head start.

1. The northern flank includes Scandinavia, Denmark, and adjacent waters. The southern flank is the Mediterranean Sea and the European countries on its shores.

2. Senator Nunn, "Gearing Up to Deter Combat in Europe," p. S15661.

Meanwhile NATO would have to interpret Warsaw Pact intentions, and NATO governments would be faced with the possible escalatory consequences of their own mobilization.

- o The war is presumed to be a nonnuclear conflict, at least at first, with tactical nuclear weapons as a back-up in case the Soviets should use them or in case a conventional defense should fail.
- o The war is expected to continue beyond the initial attack, requiring reinforcements from the United States. The length is not stated, though the planning figure for war reserve stocks is several months and the guidance is to be able to outlast the Pact.
- o Availability of Allied airfields for U.S. use is assumed, as is Allied participation in the war.

ALTERNATIVE PLANNING ASSUMPTIONS

Assumptions other than the current DoD planning assumptions could be equally realistic. This section will explore an alternative set of planning assumptions that has been discussed publicly.

Warning Time

A Warsaw Pact attack could come with little or no warning. Secretary of Defense Rumsfeld does not rule out surprise attack, stating that it is one of the causes of concern in Central Europe.³ The Warsaw Pact forces in place are sufficient to conduct a credible attack, under such circumstances, particularly from an exercise posture and especially with the aid of their air forces. Recognizing the historical successes of

3. Donald H. Rumsfeld, Report to the Congress on the Fiscal Year 1977 Budget and its Implications for the Fiscal Year 1978 Authorization Request and the Fiscal Year 1977-81 Defense Program, January 27, 1976, p. 117

1

surprise attack, the Soviets have trained, postured, and equipped their forces for offense, surprise, and shock effect. A key reason for the Soviets to execute a surprise attack could be to achieve their objectives quickly before NATO could organize resistance or bring in reinforcements.

Length of War

Assumptions about how long a war might go on are crucial determinants of force size and war materiel stocks. A "short war" means one lasting a few weeks or less, until some conclusion is reached. A "long war" is one which persists longer, i.e., months or even years. A conclusive end to either could be reached, for example, by ceasefire, by a clear Soviet victory, by NATO destroying the attacking force and pushing the Pact back to its own territory, or by escalation to global nuclear war.

Though U.S. forces are designed on the assumption of a long war, the possibility of a short war is well recognized. Soviet military doctrine suggests that the Warsaw Pact would hope to seize West Germany, Belgium, the Netherlands, Luxembourg, and Denmark in a campaign lasting less than a month.⁴ Their forces are configured for a short, intense war, with emphasis on immediately available combat power and limited support, on the theory that in a short war maintenance, repair, and replacement are not critical.

A short war must be fought successfully to get to a long war. Therefore, many of the requirements and capabilities associated with a short war are also part of a long-war capability. Planning for the long war can provide a hedge for both contingencies as long as combat forces are of such character as to win the short war. The question, then, is to what extent should U.S. forces reflect the short war concept and to what extent should the long war hedge be allocated resources?

4. Office of the Secretary of Defense, A Report to Congress on U.S. Conventional Reinforcements to NATO, June, 1976, p. III-1.

Planning for a short war involves emphasis on quantities of immediately available combat forces for an intense fray. Support forces and reinforcements are less important than in a long war.

The issue of length of war cannot really be separated from the issue of the intensity or pace at which the war will be fought. This primarily relates to the consumption rate for ammunition, fuel, bombs, missiles, spares, and other war stocks; to attrition rates; and to the ability to sustain high rates of operation. A short war that is extremely intense, such as the 1973 Middle East war, can consume as much materiel or more than a longer war of moderate intensity. Thus, in planning for a short war, the question of intensity may drive war stock and other requirements to the levels required for a longer war. And if planners wish to hedge against the war continuing after a short, very intense initial phase, the requirements will be even greater.

In any case, the overriding consideration should be to maintain forces of such character that the enemy war planner will lack confidence in the success of an attack, especially a surprise one.

CHAPTER III CONCEPTS OF SERVICE ROLES IN A WAR IN EUROPE

No one can predict with certainty how a war might begin and then develop. In designing forces, planners must make assumptions about the most likely or most stringent sequence of events. Each of the services does this in response to the general planning guidance issued by the Secretary of Defense, with important consequences for the forces they design and procure.

This chapter examines the planning assumptions made by the Defense Department and the services about war between the Warsaw Pact and NATO forces, exploring the roles and missions each service expects to play and carry out in such a war. The purpose of the chapter is to describe the planned use of the forces as a background for the analysis in Chapter IV, in which the actual forces are related to the assumptions about the war.

No modern theory of war presumes that decisive battles between nations at war will be won solely by air power or sea power. In a European war, the land battle will decide defeat or victory, with tactical air power potentially making significant contributions. Thus, this chapter begins with the land battle.

THE CENTRAL REGION LAND BATTLE

Based on published Soviet doctrine and what is known about the capabilities and dispositions of its land forces, it is likely that a land battle in Central Europe, if it ever occurred, would be characterized by massive concentrations of armored forces attacking in a blitzkrieg fashion in one or several areas. However it started and wherever it came, the Warsaw Pact attack would likely be pressed on a 24-hour basis and could occur in any kind of weather.

The outcome of the ground battle would depend heavily on the circumstances under which it began and how long it lasted. NATO land forces caught by surprise or after only a few days warning would be far weaker than if given a few weeks warning time, and

a successful Warsaw Pact surprise attack might pose very large threats to successful NATO defense. The cohesion of the defense depends upon the defenders' having time to settle in their positions. NATO forces typically have to travel considerable distances to reach initial positions. However, if the NATO defense were successful in the first weeks, the reinforcement capability of NATO nations would be permitted to come into play, substantially improving prospects for subsequent defeat of a Warsaw Pact invasion.

The Role of Tactical Air Power

Tactical air power (especially that of the Air Force), can bring firepower quickly to bear against enemy forces concentrated for a breakthrough or after a breakthrough. It thus has a potentially vital role to play, particularly in the early phase when U.S. and other NATO land units have not yet had time to reach the battlefield. Tactical air power also is capable of influencing the outcome of a prolonged conflict by attacking enemy resources and facilities to the rear of the battle area. Its capability to perform both missions depends on the design of its own forces, equipment, ordnance, and the competence of Warsaw Pact forces and equipment--notably in tactical air forces and in ground-based air defense forces.

Air-to-Ground Attack. Air-to-ground attack encompasses several missions. Attacks on enemy forces in contact with friendly forces are called close air support, require close coordination with friendly ground forces, and are intended to blunt the shock of the Warsaw Pact tank attack. The Air Force calls air-to-ground attacks anywhere behind the battleline interdiction, but a distinction can be made between attacks on enemy forces in the second echelon which are moving up to the battle area (battlefield interdiction) and attacks on lines of communication, reserve forces, factories, etc. farther back in enemy territory (deep interdiction). Attacks on enemy airfields are traditionally called counterair or air interdiction by the Air Force because they are an effort to crush the air threat before it is airborne; such attacks require the same bombing payload/range as deep interdiction.

The Warsaw Pact air-to-ground attack capability historically has been much less than that of NATO. The traditional primary role of Soviet Frontal Aviation (the part of the Soviet Air Force associated with the ground forces) has been defensive, i.e., to protect armies in the field. Thus, Soviet tactical aircraft have tended to be short-ranged and limited in payload and not very capable of close support of engaged ground forces. There are signs that this is changing, and that the Soviets now wish to provide a significant ground attack capability for Frontal Aviation. Newer Soviet aircraft deployed in Europe since the late 1960s have improved capability to attack NATO airfields, facilities, lines of communication, and ground forces.

Overall numbers of Soviet tactical aircraft have increased since the late 1960s and more aircraft are rapidly being produced, but it should be noted that the newest and most capable aircraft are deployed in limited numbers. And according to Secretary of Defense Donald Rumsfeld, "In practically every aspect of tactical aviation technology, Pact capabilities remain deficient relative to their U.S. or NATO counterparts."¹ While Soviet aircraft are improving, their capabilities should not be overstated.

Air-to-Air Combat. Although the major role of tactical air power in Europe would be support of the ground forces, there would be significant air combat as well, as each side attempted to deprive the other of the capacity for air support.

Some students of Soviet military doctrine believe that the Soviets would mount an initial attack made up of several waves of bomber and attack aircraft escorted by fighters deep into NATO territory to knock out conventional forces and nuclear reserves. NATO aircraft would be expected to intercept this attack before the Pact aircraft reached their targets. This is called air defense. NATO keeps aircraft on alert at all times for this purpose. NATO intelligence, early warning, and surface-to-air missile systems all aid in the counter effort.

1. Rumsfeld, Annual DoD Report, FY 1977, p. 127.

Over the battlefield, both sides want air superiority; that is, they want to operate in the airspace free of an enemy air threat and they want to keep enemy aircraft from attacking friendly forces. The ideal situation for NATO to reach would be theater-wide air superiority, but this would be practically impossible unless virtually all NATO air resources were allotted to the air superiority goal. Thus, local air superiority is sought as a reasonable, achievable goal.

The air superiority battle takes the form of air-to-air clashes of fighter aircraft and attacks on airbases and surface-to-air missile systems. This mission is called counterair. Technology is particularly important in air-to-air battles, with speed, maneuverability, climb capability, acceleration, and armament at a premium. U.S. fighter aircraft are superior to Soviet fighter aircraft. Pilot skills are also important, and U.S. pilots have recent experience and sophisticated training programs.

A difference between Pact and NATO counterair capability is that Pact pilots are still tied to ground radar control and have detailed operational procedures that allow little flexibility to react to the unforeseen. U.S. and other NATO pilots make use of ground radars and command, control, and communications (C3) to help them in watching out for enemy aircraft, but they are taught to be flexible and are not strictly tied to the ground control.

A major contribution to the air superiority effort is made by NATO's ground-based surface-to-air missiles (SAMs) and anti-aircraft artillery (AAA). Fixed-base surface-to-surface missiles (SSMs) might also be a cost-effective complement to aircraft in attacking fixed targets, such as the runways of Warsaw Pact air bases. Decisions about allocation of resources to the counter-air mission should include consideration of these systems.

Mission Priority. The Air Force has long argued that, although the specific scenario will dictate how its forces are used, air superiority must be achieved before extensive air-to-ground attack in support of the Army ground forces can be undertaken. The reason underlying this argument is twofold: first, that in the early stages of a war the Air Force believes it must suppress the air threat so that it can operate relatively unhindered, keeping attrition to acceptable proportions;

and second that achieving air superiority is of primary importance to the Army anyway, since it secures them from enemy air attack.

In the face of a massive Warsaw Pact attack, however, especially when NATO ground forces have been caught by surprise, airpower can make a crucial contribution to stopping the attack. Thus, despite high attrition rates, assistance to ground forces from the first moment should be of high priority. At the same time, attacks on NATO airfields and other facilities will have to be met and thwarted. Thus, close air support, battlefield interdiction, and air defense will be the most important combat missions performed by NATO tactical air forces in a NATO/Warsaw Pact war. Attacks on enemy forces, facilities, and logistics far behind the battle lines will not be immediately effective in slowing the Warsaw Pact onslaught, and thus should be accorded a secondary priority.

Reconnaissance. Good reconnaissance, which specialized tactical aircraft can provide, is of vital importance to both air and ground forces, providing information about enemy troop movements and location. New technology is being applied to this problem, with dramatic potential. Side-looking aircraft radar (SLAR), coupled with data link transmission is now reaching the stage of actual deployment with tactical air forces abroad. These developments can significantly enhance overall NATO force capabilities.

THE SEA BATTLE VERSUS THE LAND BATTLE IN CENTRAL EUROPE

The Role of the Navy

Unlike the Air Force, the Navy has a prior combat mission--sea control (keeping the sea-lanes open)--that it must accomplish before it can bring its tactical air resources to bear in the land battle. The Department of Defense planning assumptions about a NATO/Warsaw Pact war include the assumption that U.S. and Soviet naval forces would come into conflict worldwide, particularly in the North Atlantic, Mediterranean Sea, and Western Pacific. Sea control is the Navy's primary mission, with Soviet submarines by far the greatest

worldwide threat to U.S. and Allied navies and merchant shipping. According to U.S. Navy planning, Navy tactical air would participate in the sea battle until control of the sea was assured; then the resources could be used in the land battle on NATO's flanks. This is the "power projection mission." If the war ended before the sea-lanes to Europe were cleared, the Navy would probably not bring its airpower, which is carrier-based, to bear in the land battle at all. Certainly this would be the case in a short war. If Marine forces were called upon to perform amphibious landings on the periphery of Europe, the Navy would be expected to devote carriers and their air resources to the operations until the Marines were established ashore. But this mission may have little relevance to the NATO Central Region scenario. Thus, the important contributions of Navy carriers to a NATO war are likely to be destruction of enemy threats to shipping and protection of the fleet.²

Tactical aircraft are deployed in large numbers on Navy carriers (approximately 75 per carrier) primarily to aid in defending carrier fleets, destroying enemy naval forces, and attacking shore targets, such as ports and naval bomber airfields. The aircraft in a Navy tactical air wing are capable of the same general missions as land-based aircraft: attacking aircraft and attacking surface targets. In at least two cases (F-4 and A-7) the Navy and Air Force use the same aircraft. Carriers also carry aircraft and helicopters for antisubmarine warfare (ASW). ASW is not a tactical aircraft role but is both a sea control and a self-defense measure employed by the Navy. Analysis of the role of Navy tactical air and the use of the carrier takes account of ASW aircraft requirements.

Fighter aircraft (F-4 and F-14) are aboard the carrier to defend it and the fleet from Soviet naval bomber attack and (in the case of the F-14) antiship missile attack and to provide air superiority where required. Attack aircraft (A-6 and A-7) are designed

2. For a more complete discussion of Navy issues, see CBO Budget Issue Paper, Planning U.S. General Purpose Forces: The Navy, December, 1976.

to attack enemy ships at sea and enemy aircraft and related facilities on land. Other aircraft on a carrier aid in detecting enemy naval and air forces, in jamming or destroying their radars and SAM systems, and in conducting ASW. When Navy tactical air power participates in the land battle, operations are the same as those for the Air Force, discussed earlier in this chapter, but under current planning the aircraft would operate from the carrier rather than from land bases. This is preferred by the Navy because the supplies, weapons, maintenance, and other support facilities for the carrier air wing are already on the carrier.

The air threat to U.S. naval forces in the Mediterranean primarily involves Soviet bombers and submarine-launched missiles. It is greater in the Eastern Mediterranean than in the Western Mediterranean because of the distances involved from Soviet bases. Since the Soviets no longer have the use of bases in Egypt, the bombers would have to come from the Soviet Union and would have to overfly the NATO countries of Greece or Turkey in order to take advantage of a reasonably direct route. Assuming that some Soviet aircraft survive attacks by land-based fighters in those countries, they would encounter Navy combat air patrol (CAP) aircraft and additional interceptor aircraft launched from the carriers when warning was received of an incoming raid.

The Soviet carrier-borne air force is too new to be evaluated completely. It is unlikely that the one carrier (and two more under construction) bearing about 25 V/STOL (vertical short takeoff and landing) aircraft would represent much of a threat to U.S. attack carriers.

If U.S. carrier forces try to operate in the Norwegian Sea they would encounter very stiff opposition, primarily from Soviet submarines, but also from a significantly greater bomber threat than in the Mediterranean. In Atlantic Ocean operations, the bomber threat would probably be much less. The primary threat to carrier forces in the Atlantic is posed by Soviet submarines.

The Role of the Marine Corps

The function of the Marine Corps is to seize or defend advanced naval bases and to conduct land operations essential to naval campaigns in conjunction with the Navy. Because its capability is organized to be launched from ships, and because the Navy will initially be busy with sea control, the Marine Corps' role in the NATO Central Region land battle is not clear.

Marine Corps aircraft can perform all of the missions over land and sea that the Air Force and the Navy do. The aircraft are generally the same models as Navy aircraft because they must be capable of operating from carriers. But Marine pilots train mostly in missions supporting ground forces, because the historical role of the Marine Corps is amphibious assault on defended shores, where the Marine air wing and ground division work together. The air/ground team is a complete package that can be inserted virtually anywhere in the world, provided that Navy resources can be marshalled to support the initial landing. A division-sized Marine landing in the face of opposition requires several carriers, though the Marine Corps is structured on a building block principle and smaller units, complete in themselves, require less naval support.

In the case of a NATO/Warsaw Pact war, the Marine Corps is considered as a strategic reserve since its forces are not formally committed to take part in such a war. However, the Marines foresee and practice participation in the battle on the flanks, either using their air power from land bases or utilizing their resources in an amphibious landing, though the likelihood of an amphibious landing in a NATO war is small, especially because of problems with timing and Navy support.

CHAPTER IV RELATING THE FORCES TO THE ASSUMPTIONS

This chapter will bring together the planning assumptions, what is known about the battle as described in Chapter III, and the forces in existence. The suitability of the forces to the DoD several weeks warning time/long war planning scenario will be assessed; then the suitability of the forces to a little or no warning time/short war scenario will be discussed.

AIR FORCE

Warning Time/Long War--Good Match

It appears that Air Force tactical air forces fit fairly well within the current Defense Department planning assumptions for a NATO/Warsaw Pact war. The major virtue of the force is its mobility, both in reaching the European theater rapidly and in concentrating firepower quickly where needed against Warsaw Pact forces. The traditional Air Force missions, though difficult to perform in the face of Warsaw Pact air forces and air defense systems, would be required. The aircraft currently in the Air Force inventory and those being procured seem to suit the missions fairly well.

Under the current planning scenario, there is a period of up to three weeks warning time. The first tactical air units could begin arriving from the United States in two or three days,¹ with most active and reserve units arriving in Europe by the end of several weeks. Deployments to Europe in that time could

1. These "dual-based" and "rapid-reaction" squadrons comprise about 20 percent of the total Air Force forces available to augment forces in Europe. Dual-based squadrons are automatically committed to the European theater at the time of mobilization and are organized to move to Europe on extremely short notice. Rapid-reaction squadrons are organized to be more readily available for commitment to Europe than are the follow-on squadrons.

dramatically increase the number of NATO tactical aircraft in the theater and provide the commander with depth across the whole range of tactical air missions for flexibility in responding to whatever form the initial attack might take.

The Air Force is designed for both a long and a short war. In the short run, the aircraft could provide direct support of ground forces with close air support and battlefield interdiction and by fighting off would-be attackers in the air. In the longer run, after the battlefield situation was stabilized and the war continued, the Air Force could go deeper into enemy territory to attack logistics and reinforcements.

Currently, the primary mission of 85 percent of all Air Force fighter/attack air units (except those in the Pacific) is air-to-ground; the other 15 percent is primarily oriented to air-to-air missions. This mix seems appropriate given the importance of ground attack in a likely NATO scenario. Most of these are F-4s, which technically could be used either way, although units train primarily for either air-to-air or air-to-ground. The new F-16 will also provide this "swing" capability.

New aircraft being procured by the Air Force will enhance both air-to-air and air-to-ground capabilities. The A-10 is a close air support aircraft and will also be able to do battlefield interdiction. The A-10 will not be employed in deep interdiction. The F-15 is being called an interceptor/air superiority fighter, but it also is capable of air-to-ground attack, including deep interdiction. A wing of F-15s will be deployed to Germany in 1977. The F-16 will be much like the F-15, only smaller and less expensive, with shorter range air-to-air missiles. The F-16 will also be used in air-to-ground missions.

The capabilities of the Air Force National Guard and Air Force Reserve are pertinent to a European war because they, more than the reserves of any other service, are geared to rapid response and could play an important part in a NATO war, short or long. Of the 38 Reserve and Guard squadrons, currently 13 are the same aircraft types as those used by the active force. The only real

problem among the other aircraft types in the Guard and Reserve is the A-37, which is a very small, light aircraft, which would not be well-suited to a European environment, especially in the early days. The Air Force plans to modernize its entire reserve force by the early 1980s, buying new A-10s, and eventually F-16s.

In addition to planned modernization, the Air Force is presently in the process of expanding from 22 to 26 tactical air wings. It now has the organizational structure for 26 air wings, and expects to have all wings modernized and at full strength by the early 1980s. This force expansion will be costly. An alternative to the expansion, which would take account of constrained resources and uncertainty concerning appropriate overall tactical air and ground force levels, was derived by CBO.² It involved keeping the Air Force at 22 tactical air wings, making the 1981 force two wings less each of A-10s and F-15s. As argued elsewhere in this paper, A-10s are an important factor in the Air Force's direct contribution to the ground war. If a primary concern is that the early intense phases of the ground war will be decisive, then this direct contribution will be relatively more important than the indirect contribution of an equivalent investment in air superiority aircraft such as F-15s. Thus, if resources are constrained, restraint in the expansion of F-15 wings would appear to be the appropriate first step toward a lower-cost force option.

Some Limitations

In order to realize the potential of tactical air forces for a NATO contingency, several limitations should be noted. These limitations may degrade the effectiveness of tactical air operations in Europe under any of the scenarios described here.

Shortage of Shelters. The first problem is a shortage of hardened shelters designed to protect tactical air forces on the ground against enemy attack.

2. See U.S. Tactical Air Forces: Overview and Alternative Forces, Fiscal Years 1976-81, CBO Staff Working Paper, April 14, 1976.

Studies have shown that against a strike of Pact aircraft employing nonprecision guided weapons, the probability of aircraft surviving in hardened shelters is very high compared to the survivability of aircraft in the open. Even though this survival probability difference could be reduced if the Warsaw Pact eventually employs precision-guided munitions, these shelters, if well-scattered and well-camouflaged, will compound the enemy's targeting problem to the extent that the number of surviving aircraft will contribute significantly to sustaining NATO's warfighting capability.

In Western Europe, there are currently enough shelters, either built or under construction, for the U.S. aircraft based there in peacetime. Most of the reinforcement aircraft arriving in the theater during the mobilization period, however, would be without shelters. U.S. policy is to provide shelters eventually for all aircraft committed to arrive in Europe from the United States during the mobilization time. The current Air Force program, however, only budgets for 217 more shelters through fiscal year 1982 (about 43 shelters per year), a program that would leave the Air Force far short of its final goal.

Though the shelter program is extremely important, it is not clear that as many shelters as the Air Force eventually plans to build are necessary. After a war is underway for a few days, aircraft attrition will decrease the number of aircraft requiring shelters and in some cases, two aircraft can fit in one shelter. Eventually, as attrition continues there will be enough shelters. Also during this period NATO forces would reduce the Warsaw Pact's air attack threat to unsheltered aircraft.

Although the number of shelters eventually needed is not clear, it is apparently greater than the number programmed over the next five years. The value of shelters, both in preserving NATO aircraft for combat and as a possible deterrent to enemy attack on NATO airfields, is very high.

Darkness and Weather. A second limitation on NATO tactical air power effectiveness in virtually any European scenario is darkness and weather. Soviet ground forces are trained to fight at night and in bad

weather. Unless U.S. tactical air forces can also operate at night and in bad weather, they will be ineffective a significant portion of the time. Such capability in our air forces could conceivably provide an important margin in the land battle.

Darkness is a factor, of course, at any time of the year, but in the winter months in Central Europe, darkness prevails about two-thirds of the time (daylight of only eight hours). Weather conditions (cloud ceiling and visibility) in Europe, especially in the winter, limit tactical air operations a significant part of the time, though all aircraft do not require the same weather conditions to operate. While the aircraft are able to take off and land in bad weather, they cannot perform ground attack missions as effectively as in good weather. In close air support, this poses a particular problem because it is important to avoid hitting friendly ground forces in the area.

Western night and adverse weather technology is more advanced than that of the Soviets, but a highly accurate all-weather attack capability has not yet been developed. Night capability is better developed than adverse weather capability. Current precision-guided munitions (PGMs), which can be guided or guide themselves to a target, require clear night or clear daylight conditions. Ultimately, PGMs have a potential to change modern warfare dramatically, but they are limited now in that the target must first be seen visually or detected by other sensors prior to attack. Thus they do not have a true all-weather capability. Several new systems are becoming available to enhance the capability of the force. These include such developments as infrared guidance systems, which are particularly helpful at night; beacon bombing, a method by which the signals from a ground-based beacon transponder locate the aircraft in relation to its target; new tactical LORAN, a navigation and bombing system utilizing ground stations; and other all-weather locator systems. Further technical development is necessary, however, before the requisite level of accuracy for close air support can be achieved.

In case of war, current adverse weather resources should be used fully. A wing of Air Force F-111s (the best Air Force all-weather aircraft) is stationed in England and another wing will be added in 1977, replacing an F-4 wing. The Air Force has a total of four F-111 tactical wings. Later discussion will propose use of Navy and

Marine Corps A-6 all-weather attack aircraft in the land battle as well.

A problem in U.S. planning is that the A-10, which will be the backbone of the antitank air force, will have difficulty fighting at night or in bad weather. The A-10 was designed as a relatively simple, inexpensive aircraft that would fly in daylight beneath the clouds, with location and attack of targets being done visually by the pilot. However, A-10 effectiveness will be severely limited at night or during the day when the cloud ceiling is lower than 1,000 feet and visibility is less than two miles. This is better than the F-4, which requires as much as 3,000 feet and three miles, but it is nevertheless a limitation which could severely reduce sorties in support of ground forces.

With a night-fighting capability, which would also confer some improvement in adverse weather capability, the A-10 would be more flexible and better suited to the European environment. It would also be more expensive to buy and maintain because of the addition of more sophisticated systems.

Night and adverse weather capability of air-to-air fighters is not as deficient as it is with air-to-ground systems. Engagements between fighters may occur above the clouds, in daylight, or under ground radar control. Fighters that intercept bombers and attack aircraft may have to do so down lower where the weather is bad. For such a purpose, the F-4, F-15, and F-14 carry radars and missiles that can see through clouds to the target.

The Ground-Based Air Defense Threat to NATO Aircraft Support. The effectiveness of NATO air attack against Warsaw Pact ground forces depends heavily on how well Pact ground-based air defense systems are countered. Soviet surface-to-air missile and anti-aircraft artillery systems (SAMs and AAA), which are widely distributed throughout Eastern Europe with interlocking radars that provide redundant coverage of the whole area, strongly challenge successful operations by NATO aircraft. The in-place systems behind the battlelines, defending fixed targets such as airfields, will make successful penetration of enemy airspace, especially deep in enemy territory, very difficult. In the immediate battle area, NATO aircraft

will be menaced by both mobile SAMs and AAA, including the impressive Soviet ZSU-23-4 anti-aircraft gun. These mobile systems, which work together in army units, can be set up fairly quickly, but the network will be less organized, less dense, and less effective than the fixed, in-place systems found in Pact territory.

To allow tactical aircraft to do their jobs in spite of the SAMs and AAA, the United States uses electronic countermeasures (ECM) equipment. This includes specialized ECM aircraft to jam enemy air defense radars (reduce their range of effectiveness), other aircraft ("Wild Weasels") to seek out and destroy SAMs, and equipment for individual attack aircraft to assist them in detecting, avoiding, or jamming SAMs. For example, an ECM pod³ carried by an individual aircraft can jam radars that are an immediate threat to it. The Air Force, Navy, and Marine Corps are procuring ECM pods for their active forces but not for the reserves.

Beginning in 1979, the Air Force plans to add to its radar jamming capability by modifying 40 F-111A long-range, all-weather attack aircraft into EF-111s, which will be much like the Navy's EA-6B, the most sophisticated ECM system in the U.S. inventory. The EF-111s are intended to jam the enemy radars that (1) warn of oncoming enemy aircraft (early warning radars), (2) control Warsaw Pact fighter aircraft (ground control intercept (GCI) radars), and (3) establish the location of air targets so SAM radars can find them without staying on so long as to become a target themselves (acquisition radars). This ECM system was not designed to jam the radars that actually target aircraft for the SAMs. The EF-111 was originally designed to escort aircraft on strikes against sites deep in enemy territory (deep interdiction) and enemy radars there. The Air Force also plans to use the EF-111 to provide jamming closer to the central battle (1) to allow close air support aircraft to operate in a given area free from a SAM threat and (2) to reduce the capability of Warsaw Pact radars to detect NATO aircraft rendezvousing and en route to targets in enemy territory. The effectiveness of the EF-111 in long- and short-war scenarios is discussed later in this chapter.

3. A pod is a container carried externally by an aircraft and containing specialized equipment.

The Air Force has a number of F-105G and F-4C "Wild Weasels," which are aircraft designed to search out and destroy enemy SAMs with missiles. A new program to modify 116 F-4Es into F-4G Wild Weasels is programmed to be completed in 1979 or 1980.

A view held by many European military specialists is that it is possible to fly fast under enemy SAM radars to deliver ordnance and that tactical air dollars are better spent on more combat aircraft than on aircraft and systems specially designed to counter enemy defenses.⁴ (Some critics of this tactic argue that flying in low and fast makes target acquisition very difficult and attrition to guns very high.) The European allies are buying some ECM pods for their aircraft, but they are not generally procuring systems like the EF-111 and Wild Weasel, which clearly represent the high-cost end of the ECM scale. Ideally, a blend of equipment and tactics is the best way to confuse the enemy or to keep him off balance. And the existence of some electronic countermeasures (ECM) systems in the NATO inventory compels the Warsaw Pact to spend money on electronic counter-countermeasures (ECCM).

Chaff dispensed by aircraft or drones can also decrease the effectiveness of enemy radars by confusing and blocking the radar picture. Chaff is tinsel-like bits of metal or synthetic material cut to block specific radar frequencies. An inexpensive countermeasure, chaff can be laid in large quantities to counter SAM radars in a specific area where friendly tactical air forces wish to operate, and it can serve as self-protection for individual aircraft.

Another counter to Soviet SAMs in the battlefield area is ground-based artillery. If the artillery can acquire the target and if it is in range, it can disrupt enemy operations and inflict damage on radars, missile launchers, AAA guns, and other targets. Because of limitations in range and target acquisition, and thus effectiveness, artillery cannot be completely substituted for aircraft electronic countermeasures and defense suppression systems. But in situations where enemy SAMs are within

4. Steven L. Canby, "Tactical Airpower: The Problem of Invalidating Premises," Technology Service Corporation, Los Angeles, California, August, 1976.

artillery range, artillery is probably more cost-effective than air attack. Aircraft, on the other hand, expensive as they are, may be the only means to get at many targets beyond artillery range.

Little or No Warning/Short War

It appears that neither the design, deployment, nor employment of Air Force tactical air power would be dramatically changed if the planning scenario were changed to little-or-no warning and a short war. In both instances, the difference Air Force tactical air power would make in NATO's ability to hold against a Warsaw Pact attack could be significant.

In a little-or-no-warning scenario, additional U.S. Army units would not arrive in Europe to reinforce NATO until after the war began. If there is even as much as three days warning, the U.S. Air Force plans to have a significant portion of its augmentation force moved to Europe. Thus, tactical air must, to the extent it can in the face of the heavy SAM and AAA threat, slow the Warsaw Pact attack until ground forces in Europe are in position and reinforcements begin to arrive.

The U.S. capability to fight a long war in Europe is predicated on the ability to reinforce the units already based there. This strength in depth is provided by active and reserve forces, many of which, in the case of ground forces, cannot get to Europe until two or three months into the war. If the war ended after one month, the arriving units would obviously be too late to have any impact on the war. In the case of the Air Force, the situation is different. Virtually all Air Force active and reserve tactical air units can reach Europe within a month or less under current planning, and so would be more likely to have a role in the war even if the war were relatively short. Some of the reserve units are expected to get to Europe within five days. The requirement for all Air Force National Guard and Air Force Reserve units is to be ready to go 72 hours after mobilization.

Warning Time. With enough warning time to allow mobilization, NATO's defense would be more orderly and better coordinated than under surprise attack, when NATO ground forces might not even be in their forward defense

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positions yet. (Some of the ground forces would need at least 24 hours to move into position, having to travel almost 200 miles.⁵) Without adequate warning time, the flexibility of air power rapidly to reach any point along a battlefield where a breakthrough might be occurring could be critical.

In the case of a surprise attack, the mix of the tactical air forces deployed in Europe in peacetime would be important. The most important missions would be air defense against preemptive air strikes and close air support/battlefield interdiction to blunt the tank offensive. The current mix of Air Force forces (F-4s and F-111s) and training in Europe heavily favors air-to-ground attack. Most of the aircraft are multipurpose F-4s; the F-4 units that are primarily air-to-air are based in Germany where the threat to NATO air bases is greatest. The F-111 air-to-ground aircraft would be particularly helpful in case of a ground forces surprise attack, especially if it came in bad weather or at night. When A-10s are deployed to Europe in 1980, the immediately available antitank capability, important in stopping or stalling an enemy breakthrough, would be enhanced. And the new F-15 and F-16 would provide impressive air defense, the latter assisting in the air-to-ground role as well. Reconnaissance aircraft would be an aid in detecting an impending ground attack and in increasing the effectiveness and efficiency with which NATO forces could respond. The Airborne Warning and Control System (AWACS) would provide timely warning and battle management information for the air forces.

Also critical in case of surprise attack, when tactical air reinforcements might not have arrived and the ground forces are in disarray, would be a surge capability; that is, the ability to generate and sustain a higher than normal rate of military activity. For support planning purposes, each aircraft type is assigned a number of sorties per day that is considered achievable for a period of weeks. Surging the force means increasing the sortie rate and sustaining it for several days. Surging the force, of course, draws down war supplies such as fuel and munitions

5. "Surprise Attack Could Make Nuclear Weapons Useless." The London Times, March 3, 1976, p. 1. This article discusses a reported NATO study which concluded that NATO's inefficiencies could allow the Warsaw Pact to conduct a surprise attack on NATO and be at the Rhine in 48 hours.

more rapidly than normal sortie rates and lowers the effectiveness of maintenance support. Therefore, a balance must be sought between surge rates and regular sortie rates that allows surging but does not use up the force and its war supplies in the short run, leaving a possibly fatal gap in capability in the long run. If the United States believes it important to have a surge capability, more war reserve materiel could be stocked in Europe. However, the ultimate limitation on surge capability is fatigue of pilots and other personnel.

It would be possible to increase force capability on a more permanent basis by increasing the regular sortie rate per day figure. To do so would require a much higher crew ratio (more pilots per aircraft), more maintenance personnel, more spare parts, more war reserve materiel-- and a larger budget.

Another means of countering a sudden Warsaw Pact ground attack would be to marshal quickly large amounts of additional firepower to strike enemy ground forces. In the case of massed enemy forces, area munitions, which cover an area and therefore a number of targets, make more sense than weapons that strike one target at a time. Area munitions typically are large bombs that break open over the target area, scattering individual bomblets. The probability of destruction is higher with a point munition, especially a precision-guided munition, but an area munition has a higher probability of damaging more targets in a shorter time, where these targets are closely spaced, even though direct hits are required to knock out targets. The United States has such a munition, called Rockeye; the British have one called the BL-755; and others are being developed.

What may be most crucial to countering a surprise attack is the readiness of the forces to perform their assigned missions. Neither aircraft quantity nor quality matters if the forces are not operationally ready with a capability to continue operating.

Aircraft shelter requirements might be less if little or no warning were assumed than under a longer mobilization scenario. If the attack occurred before any reinforcements had arrived from the United States, which is unlikely, all of the U.S. aircraft would be sheltered. However, if the attack occurred even after





two or three days of mobilization, many of the reinforcements would have arrived and the problem would be the same as under a longer mobilization scenario.

Distinctions Between Long- and Short-War Capabilities. The Air Force, as currently designed, could fight either a long or short war; it is difficult to distinguish clearly between long- and short-war capabilities.

It can be argued that deep interdiction capability would be more appropriate to a long war than a short war, because in a short war combat power would be more effectively used against engaged forces and their immediate reinforcements than against forces not immediately threatening friendly forces. However, in the early days some deep penetration aircraft would probably be well employed in the counterair role against enemy aircraft on the ground, especially at refueling bases that might not have shelters. And a long-range capability would be useful in close air support and battlefield interdiction missions for tactical mobility, loiter time, and operations from more distant bases.

Building a deep-penetration capability into aircraft makes them more expensive: they must be heavier and carry more complex navigation systems than aircraft not designed for long-range operation into enemy territory. If forces were designed strictly for a short war scenario, the need for deep penetration aircraft might diminish, and the aircraft designed could be potentially cheaper. The problem is made even more complex, though, by requirements for aircraft capable of carrying tactical nuclear weapons on deep-strike missions. The practice has been to design "dual-capable" aircraft, i.e., with nuclear and conventional capability. If this practice is followed and if there is a continued requirement for nuclear-capable tactical aircraft, some part of the force will have to have deep penetration capability. If a short-war planning assumption were in effect, the long-range, conventional aspect of these aircraft could serve as a long-war hedge.

Enemy battlefield air defenses might require different responses depending on the expected length of the war. If the war were to be short and intense, it would be important to have combat aircraft to provide required firepower early. The EF-111 ECM aircraft will not provide direct combat power against Warsaw Pact forces and thus may not be cost-effective in a short war, especially in its

deep interdiction role. Existing and planned assets, such as F-4G Wild Weasels and individual aircraft ECM protection, should provide adequate SAM suppression in this case. If a longer war were thought to require the more stringent planning assumptions, consideration could be given to funding the EF-111. The Air Force estimates that the total procurement and modification cost to modify 40 F-111s as EF-111s will be \$420 million in fiscal year 1977 dollars, or \$10.5 million average per EF-111.

NAVY

Warning Time/Long War--Problems

It appears that Navy tactical air forces do not fit well with the current planning assumptions about a NATO/Warsaw Pact war because they would not contribute significantly to the crucial land battle until control of the seas was established, except to the extent that keeping sealanes open assists in the land battle by providing more materiel. Nor do the forces fit with a short war scenario because Navy tactical air power would still be protecting the fleet when the land war ends. The conclusion can be drawn that Navy aircraft would likely not play a role in the first phases of the war unless they operated from land bases in Europe.

The Navy sizes its force primarily for sea control. One can argue that the emphasis on the sea battle is correct, because the Army and Air Force are supposed to handle the land battle, but one can also argue that sea control relates primarily to a long war. The purpose of sea control is to keep the sea lines of communication open worldwide for the United States and her Allies. During a NATO war, the specific reason for sea control would be to resupply and reinforce NATO. If the war were of short duration, sea control would be less important because most forces from the United States arriving by sea would be too late for the battle.

The primary problem in sea control against the Soviet navy is ASW so the question arises as to whether the use of Navy tactical aviation in sea control is an efficient allocation of funds and resources. Some tactical aircraft would be needed to protect the fleet against enemy bombers in high threat areas, for sea

surveillance, and for some attacks on enemy surface ships. But, to assign all Navy tactical aircraft to sea control during a NATO/Warsaw Pact conflict, ignoring the land battle until sea control is achieved, might not be the best use of available resources, given the importance of the land battle.

When Navy air power does shift to the land battle, its role is expected to be in battles on the flanks of NATO. Whether this could be done without suffering prohibitive attrition through Soviet attacks on the Navy's aircraft carriers, and whether the contributions made by naval tactical aviation would affect the course of the war is uncertain.

Possible Applications for the Land Battle

To make possible the use of Navy tactical airpower (31 percent of U.S. tactical air resources) in the land battle, it might be wise to establish a Navy capability to operate its tactical aircraft from land bases in Europe. This could be accomplished in a way that would provide flexibility for air units to operate from land bases without taking resources away from the sea control mission.

The Navy currently has thirteen carriers and thirteen carrier air wings. At any one time, only about two-thirds of the carriers are at sea (one-third on station, one-third on the way to or from sea duty). Of the other third, two are generally in overhaul, which varies in time from a few months to two years, and two are receiving routine maintenance. Thus, at any time, about one-third of the wings are not aboard carriers. (Some of the aircraft are in overhaul at the same time as the carrier and some squadrons are in transition to new aircraft and would not be available.) In wartime, the Navy would expect to take its carriers out of overhaul, marry them up with their wings, and return them to sea. In the case of several weeks mobilization or if the war persisted beyond a few weeks, the carriers in overhaul could provide a hedge as replacements for carriers lost early in the war. But, if a war were of short duration, the prospect of getting these carriers and their wings to sea in time to make a difference in the war outcome would be slim.

Thus, in peacetime and wartime, not all Navy tactical air resources are linked to carriers at sea, nor are they likely to be utilized other than as fillers for aircraft lost in battle. If the flexibility were developed for current Navy tactical air forces to operate from land bases in Europe, there would be at least two benefits:

- o Available resources, which might otherwise not be utilized in a NATO/Warsaw Pact war, could be utilized.
- o Navy tactical air power would participate in the land battle at the beginning of the war when it might be needed most. If the war lasted beyond a month, naval air power that had been devoted to sea control could then still have an important role in the land battle.

If the Navy had "bare-base" kits, its tactical aircraft could operate from land bases in Europe. A bare-base kit is a complete set of equipment designed to convert an air strip into a base capable of supporting operations for about six months. Consisting of pre-packaged equipment and facilities for housing crews and providing maintenance and other support, the kits could be forward-based somewhere in Europe. If a war came, the prepositioned kits could be moved (using tactical airlift) to airfields where Navy tactical air units that were not on carriers could move and begin to operate.

Such a proposal could make available to the NATO commanders such assets as the A-6 night- and adverse-weather attack aircraft for early use or as a reserve, providing added flexibility and depth to the tactical air forces in NATO.

Procuring bare-base kits for the Navy adds flexibility in employment of the current force. In the longer run, if planners believe that the level of aircraft carriers should be reduced and some U.S. tactical air resources should be shifted from sea to land, those aircraft should probably be procured for the Air Force rather than the Navy.

III

Sea control missions, especially fleet air defense and sea surveillance, could also be performed from land bases. This concept applies particularly well to the so-called G-I-UK gap, i.e., the ocean and sea areas between Greenland, Iceland, and the United Kingdom. Soviet bombers would be likely to fly through this area en route to land targets in England or sea targets in the G-I-UK gap area or the Atlantic. Their ships and submarines would be active in this area too. U.S. Navy tactical aircraft based in Greenland or Iceland could assist NATO's efforts to counter these forces.

Little or No Warning/Short War

Assumptions about warning time do not greatly affect Navy tactical air force design. With warning time, the carriers could move out of high threat areas but this is more a matter of deployment than force design. The surprise element would not necessarily change air wing configuration or aircraft design; however, planning against surprise preemptive attack at sea might result in dividing aircraft resources among smaller carriers.

MARINE CORPS

Warning Time/Long War--Uncertain Use

The Marine Corps is not primarily designed for a European war, and the mission of the Marine Corps seems to be ill-suited to the current NATO planning scenario because Marine Corps resources would likely not be brought to bear in the land battle. In the case of tactical air resources, this means 12 percent of total U.S. tactical air forces would not be utilized.

To operate in its amphibious mode in Europe, the Marine Corps would need warning time longer than the planning scenario calls for. To move a division from the United States requires almost all available Navy amphibious shipping, half of which is in the Pacific, and half of which is in the Atlantic.⁶ Half the division

6. James R. Schlesinger, Annual Defense Department Report, FY 1976 and 1977, p. III-93.

could deploy to Europe after several days, but the other half would have to wait for the ships to arrive on the eastern coast of the United States. By that point in the planning scenario, the war would have begun and attrition rates would be high as the ships crossed the Atlantic.

Possible Applications

Marine tactical air resources could play importantly in the land battle independently of Marine ground forces. Two wings of Marine aircraft, for example, could add more than 200 fighter/attack aircraft to NATO's firepower. Marine Corps tactical air units could get to Europe as quickly as the first Air Force units, provided some degree of airlift were available for accompanying equipment. The Marine Corps would compete with the Army and the Air Force for airlift.

Marine pilots are trained in close air support and some of their aircraft are particularly well suited to blunting an enemy ground attack. For example, the five squadrons of all-weather A-6 attack aircraft would be particularly important as a supplement to the Air Force F-111. The Marine Corps also has F-4s, which could participate in the land battle.

Another advantage of using the Marine Corps is that it has its own tankers for mid-air refueling. The Air Force tactical air units have no tankers of their own; they must be borrowed from the Air Force Strategic Air Command.

Little or No Warning/Short War

The traditional amphibious role of the Marine Corps would not be suited to a little warning/short war in Europe because of the time and resources required to conduct an amphibious assault.

In a short, intense conflict in Central Europe, amphibious landings would not likely be necessary. Nor would Marine forces likely be able to perform such a landing or landings, as pointed out above. The extensive Navy support that is required for a landing might not be forthcoming if the Navy were heavily engaged in sea battles.

Marine tactical air resources could contribute to the land battle as discussed above. Their ability to arrive quickly would be particularly important in this scenario. Planning for such use has effects on airlift requirements, base availability, war reserve materiel stocks in Europe, etc., that should be considered.

Design of the tactical air forces is relatively insensitive to different planning assumptions about a war in Europe, and these forces are a hedge against different scenarios. They are a major part of NATO's deterrent to Warsaw Pact attack. If such an attack occurred, these forces could make a major difference in the capability of NATO to defend Central Europe. Their contributions to the early phases of the war would be particularly important. Air Force tactical air power is designed to participate in a European land war, though there are some problems and uncertainties about whether and how much its contribution would be affected by bad weather and enemy air defenses. The role of the Navy and Marine Corps tactical air resources is less clear. Their primary responsibilities are not the land battle in Europe, but some portion of their resources could participate in the land battle from the earliest stages of the war without jeopardizing other missions, such as keeping the sea-lanes open.

Several budget issues with which the Congress could deal in fiscal years 1978 and 1979 arise from this analysis. Some of these budget choices bear on increasing the deterrent and fighting capability of the existing force for a NATO/Warsaw Pact war in Europe through force enhancement and more flexible employment of current resources. They are not major aircraft procurement issues about the type or mix of aircraft. The potentially increased capability afforded through these enhancements in turn raises the issue of force size and should be considered when decisions are made about increasing overall force size.

This chapter will discuss steps that could be taken to increase the effectiveness of the current force. Then it will relate those enhancements and a planned increase in force size to the planning scenarios described earlier.

FORCE ENHANCEMENTS

Shelters

The shortage of hardened aircraft shelters in Europe for Air Force aircraft expected to participate in a NATO/Warsaw Pact war means that, in the early days of a war, a large part of the force would be highly vulnerable, resulting in high attrition rates. Such attrition could dramatically reduce the size of the force and its sortie and firepower capability.

Hardened aircraft shelters are a force enhancement with high payoff in almost any European scenario, though perhaps their value is highest against a surprise attack at the outset of a war. An alternative to sheltering the force is to have more aircraft in reserve to take the place of those lost.

The Air Force sheltering program over the next five years is to build 217 shelters at a cost of about \$170 million (fiscal year 1977 dollars). The question of the total number of shelters eventually needed in Europe has not been settled, though it appears the utility of shelters warrants a degree of priority for shelter construction. Accelerating this program to fund all of those shelters in fiscal year 1978 and 1979 would mean that 217 more aircraft--or 434 if two aircraft are put in each shelter--would be protected from enemy air strike in 1980 than is now the case. This would increase NATO's sortie (combat mission) potential substantially. Such a building program alone would be an indication of seriousness on the part of NATO. Numbers associated with the shelter building program beyond fiscal year 1979 are suggested here illustratively at the original level planned by the Air Force.

Accelerating the shelter program would raise the fiscal year 1978 and 1979 budgets by \$56 and \$53 million, respectively in fiscal year 1977 dollars, as shown in the following table.

Procurement of Aircraft Shelters
(Quantity/Budget Authority, in millions of fiscal year
1977 dollars, by fiscal years)

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total</u>
CBO	109/94	108/89	39/34	40/32	47/31	343/280
Air Force ^a	<u>44/38</u>	<u>47/36</u>	<u>39/34</u>	<u>40/32</u>	<u>47/31</u>	<u>217/171</u>
Change to Budget	+56	+53	---	---	---	+109

a. Figures furnished by the Air Force and adjusted to fiscal year 1977 dollars by CBO. The cost of building shelters varies by location.

Night and Adverse Weather Capability

To improve the overall capability of forces likely to be involved in a European war, it might be wise to equip a portion of the A-10 attack force to fight at night and in adverse weather. To do so might require developing a two-seat A-10 (all A-10s now being produced are single-seat aircraft) with an inertial navigation system (INS) and the capability to carry the Pave Tack pod. Pave Tack is a highly sophisticated forward-looking-infrared system (FLIR), which will be used on F-4 and F-111 aircraft and will allow the acquisition of targets in conditions of darkness and weather that is lightly cloudy or hazy. Its main benefit would be at night. Operating this complex system requires more attention than the pilot could give, so the aircraft would have to carry a second person. The second person should probably be a systems operator rather than another pilot. If prototypes of a two-seat A-10 were developed in fiscal year 1978, the last 100 A-10s produced for the Air Force (under the fiscal year 1977 program) could be two-seaters with INS and Pave Tack. The development cost would be a total of about \$50 million in fiscal year 1978. Procurement cost would be about 15 percent more per aircraft than the unmodified A-10. One hundred Pave Tack pods and INS would cost an estimated \$35 million. The total addi-

tional cost would be \$165 million, as shown in the table below. (All figures are fiscal year 1977 dollars.)

An A-10 night/adverse weather capability would diminish the likelihood that the Warsaw Pact could conduct successful breakthroughs on the ground at any time they chose. This improved A-10 would be important in any of the scenarios in Europe discussed in this paper.

A-10 Modification (Quantity/Budget Authority, in millions of fiscal year 1977 dollars, by fiscal years)						
	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total Cost</u>
Development of two-seat A-10 prototypes	2/50	---	---	---	---	50
Procurement cost dif- ference be- tween one- seat A-10 and two-seat A-10	---	---	---	100/80	---	80
Pave Tack Pods	---	---	---	100/35	---	35
Total	50	---	---	115	---	165

Navy Land Bases--Using Navy Resources for the Land Battle

Under current planning, Navy tactical aviation will contribute to the land battle late in the war at best. Steps can be taken to help assure that current Navy tactical air forces will have the flexibility to be used as needed. Providing means toward this flexibility of existing aircraft might have a higher yield in combat capability for a given amount on input resources than buying additional Air Force or Navy tactical air forces.

If bare-base kits were acquired for the equivalent of two Navy air wings and prepositioned in Europe (un-

assembled), the flexibility of Navy tactical air power would be increased greatly. A bare-base kit, such as those in use by the Air Force, consists of two parts, a basic base structure with housing, hospital, etc., and sets of support equipment for operation. The latter sets are each designed for a specific type of aircraft and include power, heat, maintenance facilities, etc. If the Navy bought and maintained two of the basic sets, each capable of supporting a wing of 10 fighter/attack squadrons and two reconnaissance-electronic warfare (EA-6B), and early warning (E2C) squadrons, the cost would be about \$92 million (fiscal year 1977 dollars) as shown below. Stationing the kits in Europe would avoid using scarce cargo airlift resources to transport them from the United States to Europe during a war. Tactical airlift (within Europe) would be required to move the kits to the bases where they would be set up. Such kits would provide greater flexibility for employment of Navy tactical aviation in many scenarios, but the greatest benefit would be in a short war.

Navy Bare-Base Kits
(Quantity/Budget Authority in millions of fiscal year
1977 dollars, by fiscal years)

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total Cost</u>
Procurement of kits and annual main- tenance costs	2/80	3 ^a	3 ^a	3 ^a	3 ^a	92

a. maintenance costs.

The total estimated cost of the improvements discussed above is shown in the following table.



Force Enhancements--Additions to Defense Program
(Budget Authority in millions of fiscal year 1977 dollars,
by fiscal years)

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>Total Cost</u>
Shelters	56	53	---	---	---	109
A-10 night/ adverse- weather capability	50	---	---	115	---	165
Bare base kits	<u>80</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>92</u>
Total	186	56	3	118	3	366

These improvements in force capability can either be treated as add-ons to the defense budget or they can be traded off with other items in the budget.

AIR FORCE FORCE SIZE

As mentioned earlier, the Air Force plans to increase its tactical fighter wings from the equivalent of 22 to 26. This involves procurement of about 400 aircraft. This force increase is considered in the budget options discussed in the following section, in light of the assumptions, force enhancements, more flexible use of Navy and Marine Corps tactical air resources for the land battle, and constrained resources.

BUDGET OPTIONS

The utility of tactical air forces is not very sensitive to changes in assumptions about warning time or the duration of the conflict. In a way, tactical air forces are a hedge against both intense early attack and prolonged conventional combat. The present DoD plan to expand the force primarily affects its capability for

sustained combat. Other improvements which would help both short- and long-war capability, but are primarily intended for greater early capability are: (1) decreasing force vulnerability to surprise attack by accelerating the aircraft shelter program, and (2) increasing the probability that the tactical air forces would be able to assist ground forces during darkness or bad weather by providing a night/adverse weather version of the A-10. These improvements can be made in addition to the force expansion planned by DoD, or, if resources are constrained, can be made in conjunction with some smaller expansion and modernization program. If the smaller expansion program is thought to pose excessive risk, it could be offset by buying the necessary equipment to operate Navy aircraft from land bases and by planning to operate Marine Corps tactical air units in the Central European land battle. Two general options are as follows:

OPTION ONE

- o Accelerate the shelter program.
- o Add night/adverse-weather capability to a portion of the A-10 force.
- o Accept the DoD program to complete the expansion of the Air Force to 26 tactical air wings.

OPTION TWO

- o Accelerate the shelter program
- o Add night/adverse-weather capability to a portion of the A-10 force.
- o Procure bare-base kits for the Navy and plan for some Marine Corps tactical air units to be used in Central Europe.
- o Restrain the expansion of the Air Force to fewer than 26 tactical fighter wings.



In Option One, the last item is already programmed by the Defense Department. Acceptance of all three items in this option would cost \$274 million (fiscal year 1977 dollars) over and above the present DoD program in fiscal years 1978-1982.

Option Two does not specify to what degree Air Force expansion would be restrained. If one chose to curtail the programmed expansion, the first reduction might be an F-15 wing. The F-15s would be taken out first rather than A-10s or F-16s, because the A-10s are needed in the important close air support role and the F-16s are multi-purpose and are less expensive than F-15s for the air superiority/air defense role. A two-wing reduction might involve two wings of F-15s. Further reduction in the number of wings planned would logically be F-16s, if one accepted the argument discussed in this paper that the specialized antitank capability of the A-10 is crucial. However, the United States' planned purchase of F-16s programmed over the next five years, is tied into a consortium of NATO Allies, making reductions difficult. Another way to restrain the growth at 22 or 23 wings would be to retire aircraft more rapidly than now planned, but such an action would not save a significant amount of money. Thus, the range of Option Two is the enhancements package plus restraint in Air Force growth to 24 or 25 wings. The range of savings from fiscal year 1978 to 1982 is from \$1.0 billion to \$2.5 billion (fiscal year 1977 dollars).

The budgetary consequences of these options are shown in more detail in the following table.

TABLE I. COSTS OF ALTERNATIVE TACTICAL AIR FORCE PROGRAMS RELATIVE TO THE CURRENT PROGRAM, BUDGET AUTHORITY, IN MILLIONS OF FISCAL YEAR 1977 DOLLARS, BY FISCAL YEARS

OPTION ONE				
Budget Action	1978	1979	1980-82	Total
Accelerate shelter program	+56	+53	--	+109
A-10 night/adverse weather modification, development and additional cost for 100 aircraft	+50	--	+115	+165
Increase Air Force to 26 tactical fighter wings	--	--	--	--
Total	+106	+53	+115	+274

(continued)

(Table I, continued)

OPTION TWO				
Budget Action	1978	1979	1980-82	Total
Accelerate shelter program	+56	+53	--	+109
A-10 night/adverse-weather modification, development and additional cost for 100 aircraft	+50	--	+115	+165
Procure two bare-base kits for the Navy	+80	+ 3	+ 9	+ 92
Subtotal	+186	+56	+124	+366
Restrain Air Force growth; Eliminate from program:				
One F-15 wing (25-wing force)	-500	-400	-500	-1400
Total	-314	-344	-376	-1034
Two F-15 wings (24-wing force)	-700	-700	-1500	-2900
Total	-514	-644	-1375	-2534
Range of Option Two	-314 to -514	-344 to -644	-376 to -1375	-1034 to -2534

GLOSSARY



GLOSSARY

A-6. Navy/Marine Corps adverse-weather attack aircraft.

A-7. Navy and Air Force light attack aircraft.

A-10. Air Force close air support aircraft entering the force in 1976.

AAA. Anti-aircraft artillery.

Air Superiority. To deny the enemy use of the air space to launch attacks against friendly air or surface targets.

Area Munitions. Bombs that break open and scatter individual bomblets over an area.

ASW. Antisubmarine warfare.

AWACS. Airborne Warning and Control System, early warning aircraft being procured by the Air Force.

Battlefield Interdiction. Air attacks on enemy forces in the second echelon which are moving up to the battle area.

Bare-Base Kits. A complete prepackaged set of equipment designed to convert an air strip into a base capable of supporting combat operations.

CAP. Combat air patrol; airborne force ready to perform air superiority or fleet air defense.

Chaff. ECM aid dropped by aircraft or drones, consisting of tinsel-like bits of metal or synthetic material cut to block specific radar frequencies.

Close Air Support. Air attacks on enemy forces in contact with friendly forces.

Counterair (Air Interdiction). Air-to-air clashes of fighter aircraft and air attacks on enemy airfields.

Deep Interdiction. Air attacks on lines of communication, reserve forces, factories, etc., farther back in enemy territory than the area near the battleline.

EA-6B. Navy and Marine Corps electronic countermeasures aircraft.

E-2C. Navy early warning aircraft.

EF-111. Air Force F-111 modified as ECM (radar jamming) aircraft; program currently in development; none procured.

ECM. Electronic countermeasures.

ECCM. Electronic counter-countermeasures.

F-4. Air Force, Navy and Marine Corps multipurpose fighter/attack aircraft.

F-4G ("Wild Weasel"). Air Force fighter/attack aircraft equipped with warning and attack systems to seek out and destroy enemy SAMs.

F-105G. Early model of "Wild Weasel," now being replaced by F-4G.

F-14. Navy air superiority/fleet air defense fighter and air-to-ground aircraft.

F-15. Air Force air superiority fighter, entering the force in 1976.

F-16. Air Force multipurpose aircraft, scheduled to begin entering the force in 1979.

F-111. Air Force variable wing ("swing wing"), adverse weather attack aircraft.

FLIR. Forward-looking infrared, a TV-like system capable of detecting objects by their infrared radiation.

GCI. Ground control intercept, a system of controlling the operations of interceptors from ground radar stations.

Interdiction. Air-to-ground attacks anywhere behind the battleline.

INS. Inertial navigation system, a system of navigation that keeps track of a vehicle's location by continuously measuring its acceleration in all directions; it can operate without any external reference.

Pave Tack. Highly sophisticated forward-looking system that allows the acquisition of targets in conditions of darkness and weather that is lightly cloudy or hazy.

PGM. Precision-guided munition.

Pod. External container mounted on aircraft, containing specialized systems.

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

R & D. Research and development.

SAM. Surface-to-air missile.

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.

SLAR. Side-looking airborne radar.

SSM. Surface-to-surface missile.

Surge Capability. The ability to generate quickly and sustain a higher than normal rate of military activity.

Wild Weasel. Air Force aircraft specially equipped to search out and destroy enemy SAMs with missiles. Currently includes F-4C, F-4G, and F-105G.

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