THE NEW CALCULUS

ANALYZING AIRPOWER'S CHANGING ROLE IN JOINT THEATER CAMPAIGNS

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Prepared for the United States Air Force

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Approved for public release; distribution unlimited
The research reported here was sponsored by the United States Air Force under Contract F49620-91-C-0003. Further information may be obtained from the Strategic Planning Division, Directorate of Plans, Hq USAF or the Department of Defense.

Library of Congress Cataloging in Publication Data
The New calculus : analyzing airpower's changing role in joint theater campaigns / Christopher J. Bowie [et al.].
   p. cm.
   "Prepared for U.S. Air Force."
   Includes bibliographical references.
   "MR-149-AF."
UA23.N37 1993
355.02'15—dc20 93-16125 CIP

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Published 1993 by RAND
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
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The collapse of the Soviet Union has transformed the nature of America’s “strategic problem.” This provides both an opportunity and a need to reexamine U.S. military forces with an eye toward designing a posture suited to the nation’s needs in the post–Cold War period. The new emphasis in U.S. military planning on regional conflicts is an appropriate starting point that presents several challenges, including numerous potential locales, smaller forward deployments, short warning times, long deployment distances, and increasingly lethal weapons in the hands of adversaries.

This report’s main objective is to evaluate the capabilities of U.S. forces for achieving key operational objectives in future major regional conflicts. In particular, it focuses on means of improving airpower’s potential capabilities in the context of joint operations. We recognize that the capabilities of ground- and sea-based forces can be enhanced by new operational concepts and technologies and have highlighted some relevant areas. But we did not explore the full range of options for improving army and naval forces in the same depth.

In conducting this analysis, we first examined the broad outlines of future U.S. national military strategy and a range of potential military threats to U.S. interests. We then developed a number of scenarios involving a major regional conflict between U.S./allied and enemy forces. Employing these scenarios, we simulated the deployment and employment of a joint U.S./allied force to estimate the length of time required to achieve key operational objectives. This approach provides a quantitative and operationally realistic means for
comparing various operational strategies and modernization programs in terms of their impact on the U.S. ability to achieve these objectives.

NATIONAL MILITARY STRATEGY

The point of departure for this analysis is the assumption that the United States—a power with global economic interests and interdependencies—must remain engaged in world affairs to influence decision-makers (friend, foe, and nonaligned) as they contemplate choices that impinge upon our national goals. The collapse of the Soviet Union has fundamentally altered U.S. strategy and force planning. But it clearly has not eliminated the need for powerful U.S. forces. In the future, as in the past, the United States must maintain the ability to bring military power to bear when appropriate to protect its interests, as well as those of its allies.

The Joint Chiefs of Staff (JCS) have recommended that the United States should field forces capable of defeating aggression in two concurrent major regional conflicts (that is, conflicts that erupt sequentially, but at times must be prosecuted simultaneously). For purposes here, we took the two-conflict requirement as a given element of our national military strategy and assessed U.S. military capabilities to support the strategy. But such a requirement has important implications for the size and mix of the future U.S. force structure. We would like to make the following observations.

Whether or not one believes the probability is very high of the United States prosecuting two concurrent major regional conflicts, sizing forces for more modest criteria (e.g., for one major regional conflict or for smaller scale conflicts) could engender substantial and unnecessary risks. In the event of a major conflict in one region, such a posture would risk creating opportunities for an aggressor in another region. It would leave the United States vulnerable if a larger threat arose, such as from a coalition of regional powers or the reemergence of an aggressive and anti-Western regime in Moscow. A larger force structure provides flexibility and some margin for responding to the unexpected—both valuable qualities when dealing with something as inherently uncertain as military operations 10 to 20 years in the future. And finally, sizing forces for two conflicts need not cost twice
as much as sizing for one, since many key elements of the military infrastructure do not need to be expanded commensurately. But a two-conflict capability will cost more—and hence this requirement is bound to be the subject of much debate in the coming years.

In addition to the gross quantitative criterion of being able to prevail in two concurrent major regional conflicts, important qualitative criteria should be specified for future U.S. military forces. Economic and manpower constraints, as well as political sensitivities, will constrain the United States from stationing sizable forces overseas on a routine basis. Thus, forces needed to cope with fast-developing crises or conflicts must be rapidly deployable.

When engaged, the United States must be able to achieve its aims in regional conflicts quickly, decisively, and with the capability to minimize casualties. These aims must be clear to three key “audiences”: potential aggressors, U.S. allies, and the American public. If the United States lacked such qualitative advantages, the proclivity of other powers to contemplate aggression would be increased, the confidence among its allies that the United States could provide assistance on time undermined, and an American president’s options in dealing with future threats to U.S. interests severely constrained.

SCENARIOS

The size of the potential military threat facing the United States has decreased dramatically when compared to the days of the Cold War. The United States no longer needs to plan forces to engage a power with 55,000 tanks, a large “blue-water” navy, and 7,500 combat aircraft. For force planning purposes, analysis of current and potential regional powers indicates that hostile forces confronted in such conflicts could comprise approximately 3,000 to 5,000 tanks, an equivalent number of armored personnel carriers (APCs), between 500 and 1,000 combat aircraft, and perhaps ballistic missiles. Several nations today possess such forces, and other powers possess the economic, military, and technical wherewithal needed to build up to these levels fairly rapidly.

For analytic purposes, we examined a wide range of scenarios involving conflict in Southwest Asia (SWA) and Korea. Neither these nor
other scenarios should be seen as predictive of a future conflict, but they are useful as representative future challenges to test the capabilities and robustness of U.S. forces. We varied the warning conditions, environment (in terms of weather and terrain), the size of the opponent’s military forces, and the size and modernization levels of U.S. forces to examine sensitivities to outcomes. Given limited U.S. peacetime forward presence in Southwest Asia and the weakness of allied forces there, this scenario proved to be the more demanding—and hence forms the focus for the results summarized below.

Drawing from the analysis of worldwide military capabilities, we postulated an invasion of Saudi Arabia by a force equipped with just over 4,000 tanks and 4,000 APCs (enough to equip 10 mechanized/armored divisions and an equivalent number of infantry divisions), 500 to 1,000 combat aircraft, and possibly ballistic missiles. Such a force would be expected to quickly overwhelm indigenous allied forces.

The joint force commander's objectives in such a scenario would be to:

- Rapidly deploy forces to establish a lodgement;
- Gain local and then theater air superiority to protect arriving forces and establish the conditions needed to conduct effective operations;
- Stop the invading force to minimize loss of territory and vital facilities;
- Conduct strategic strikes to degrade enemy war-fighting capabilities;
- Launch an air-land offensive to evict the aggressor from captured territory.

ASSESSING THEATER FORCES

Warning Assumptions and Force Commitments

For the base case, we focused on the most demanding case: a conflict where “strategic warning” is very limited. Contending with such scenarios raises many challenges. Forces engaged in forward-pres-
ence missions play an important role in U.S. military strategy by signaling U.S. resolve and may well deter an adversary contemplating aggression. But if deterrence fails, we believe that for force planning purposes it is both prudent and validated by history to analyze short-warning scenarios. In the past, the United States has often failed to anticipate when and where it has had to go to war. Pearl Harbor in 1941, Korea in 1950, and Kuwait in 1990 were not anomalies—similar failures in gauging the intentions of potential aggressors and responding to strategic warning are likely to be the rule, not the exception, as the United States enters a new era of uncertainty and instability. Moreover, if U.S. forces could deal with short warning scenarios, our analysis indicates they could also deal with conflicts where more warning time is available.

We examined the capabilities of a joint force composed of a contingency corps (5 divisions), 3 to 4 carrier battle groups, 2 Marine brigades (plus attached air), 6 to 10 fighter wings, 80 bombers, and related command, control, and surveillance assets.

Deployment

In our base case, we assumed that no U.S. forces, except for a single carrier battle group, were deployed in theater at the start of the conflict. Accordingly, additional forces would have to be deployed quickly and in quantity. As forward presence declines and conflicts erupt far from U.S. shores, the nation’s mobility triad—aerial, sealift, and prepositioning—emerges as an increasingly vital element of U.S. force structure. For the first critical weeks of combat, U.S. forces would have to rely almost exclusively on airlift and maritime prepositioning (the latter greatly increasing U.S. flexibility compared to land-based prepositioning). Sealift remains critical for deployment of heavy forces and for long-term sustainment of all deployed forces.

Establishing Control of the Air

Gaining air superiority would be a top priority for the joint force commander. Control of the air is achieved through establishing a robust air defense network, suppression of enemy air defenses (SEAD), and destroying enemy airfields and command and control facilities.
Given the rapid mobility of U.S. air-to-air fighter forces and their command, control, communications, and intelligence (C^3I) support (Airborne Warning and Control System [AWACS] aircraft), we estimate that a robust air defense against aircraft could be established within roughly one week from the decision to deploy. Though others have matched the capabilities of U.S. fighters, the fielding of the AIM-120 medium range air-to-air missile preserves a U.S. advantage in air combat. But active radar missiles similar to the AIM-120 are proliferating throughout the world. Our detailed simulation work indicates that the United States needs to procure a new aircraft to maintain its decisive edge in this critical area. In the air-to-air arena, the United States cannot rely on a missile alone to keep a qualitative advantage.

Ballistic missiles, particularly when coupled with weapons of mass destruction, would complicate operations despite whether these weapons are used by U.S. adversaries. We did not simulate use of such weapons in our analysis. We did, however, allocate sufficient airlift and set deployment priorities to ensure the earliest possible arrival of theater missile defense batteries.

SEAD operations are an integral part of achieving air superiority. To account for this, our simulation allocated a substantial portion (about 25 percent) of the fighter force to SEAD operations. Such an emphasis should enable the United States to minimize attrition of friendly penetrating aircraft. Strikes aimed at destroying airfields and air defense command and control facilities were included in the strategic offensive operations discussed below.

**Conducting Strategic Offensive Operations**

Conducting strategic strikes against an adversary would degrade an adversary's war-fighting capabilities. Current U.S. capability rests largely upon fighters and sea-launched cruise missiles. The former could be heavily engaged in more pressing tasks, such as stopping a ground invasion; the latter offer a useful, but limited, punch. Equipping the long-range bomber force with precision munitions (such as inertially guided weapons) and standoff weapons (such as cruise missiles) would allow the United States to dramatically increase both the effectiveness of attacks on strategic assets in the early
days of conflict and the rate at which it can destroy such targets. Penetrating fighters would still be needed to deal with a range of targets that require great precision and/or a man in the loop, such as hardened facilities and areas where the United States needs to minimize collateral damage.

**Stopping Enemy Surface Forces**

Stopping enemy surface forces and establishing an “assured defense” (that is, inflicting sufficient attrition on enemy ground forces so that there is a high probability enemy forces would have to stop their advance) depend critically upon the speed at which invading enemy surface forces can be destroyed and disrupted. The analysis examined the contribution of indigenous ground forces, carrier aircraft, and land-based fighters and bombers. In a short warning scenario, land-based airpower would provide the lion’s share of this capability. Improving the U.S. ability to stop an invading force depends heavily on fielding dispensers equipped with smart anti-armor submunitions (such as the Sensor Fuzed Weapon or SFW). Our analysis indicates that airpower forces equipped with such weapons could stop a force of 10 armored/mechanized divisions in about one week after the decision to deploy—roughly half the time of the same forces armed with current weapons. Increasing the proportion of airlift assets to deploy fighter forces can further increase the speed at which an assured defense can be achieved. Moreover, inertially guided dispensers filled with smart anti-armor submunitions could be employed by the B-2 bomber to increase up-front punch and further decrease the time needed to stop an armored invasion.

Carrier battle groups provide a unique military presence in peacetime and in crisis may be on scene at the start of conflict. In such cases, their early contribution can be very valuable. But the limited numbers of fighters provided by carriers mean that they can only play a limited role in theater warfare. We examined a range of cases in which carrier fighters were the only attack assets employed—for analytic purposes, we assumed the availability of the USAF’s C3I system to focus carrier firepower most effectively, the use of SFW to maximize kill rates, and typical Southwest Asia weather. In the base case (with three carriers arriving on C+0, C+7, and C+28, respectively), it would take over a month to establish an assured defense.
We also examined two alternatives: one in which four carriers were available and arrived at weekly intervals (C+0, C+7, C+14, and C+21); and one in which four carriers were on station at the start of conflict. In the first alternative, an assured defense could be established in just under four weeks; in the second alternative, the four carriers could establish an assured defense in just over two weeks. Like air and land forces, naval forces cannot be expected to win a war in isolation.

Launching a Ground Offensive

In the case in which an aggressor chooses not to withdraw from captured territory, our analysis indicates that the key constraint in launching a ground offensive is not the ability to weaken enemy forces through attrition, but rather, the rate at which U.S. and allied ground combat and support forces in theater could build up to launch a ground offensive.

After enemy forces had been stopped and dug in, airpower forces could employ current types of point weapons (Maverick and laser-guided bombs) to destroy most of the remaining enemy forces. Our estimates of the time required for this task in the base case range from an additional 8 days (with ten fighter wings in typical Southwest Asia weather) to 27 days (with six fighter wings in typical Korean weather).

U.S. ground forces would require 60 days or more after the decision to deploy to mount an air-land offensive.

Assessing Capabilities for a Second Conflict

Under currently planned force levels (the Base Force), each of the Services would, in principle, possess sufficient residual combat forces for a second conflict (which for analytic purposes was assumed to be of the same size as the first conflict). Of these residual forces, the Army (as currently structured) would have difficulty generating sufficient combat and combat services support to conduct operations in a timely manner for other than light force operations. For short notice operations, the three carriers provided by the Navy are all that typically might be readily available. The Marines could
provide an active brigade. The Air Force would retain 10 to 12 wings that might be employed for a second operation, though additional long-range attack aircraft and command and control assets would be needed to conduct the most effective operations.

Most other nations that the United States might be called upon to help defend could provide some sort of ground forces, but most would have greater difficulty in fielding effective offensive air forces. Land-based airpower also appears to offer the most stopping power per commitment of airlift resources. Accordingly, we emphasized deployment of land-based airpower and light U.S. ground forces in our simulation of a second conflict.

The amount of time separating the two conflicts is critical for determining the feasibility of mounting a successful defense. In evaluating U.S. capabilities to deal with two contingencies with D-days separated by less than three weeks, our analysis indicates that the strains on the tanker and airlift forces alone would prevent the United States from deploying forces to the second conflict in a timely manner. Conflicts separated by more than three weeks would allow it to support operations in the first conflict relying primarily on sealift and shift the bulk of the airlift fleet to deploy forces to the second conflict.

Assuming the latter conditions, our analysis indicates that the United States has the capability in this economy of force operation to blunt an invasion successfully and conduct strategic strikes in a second conflict. The time required to build up additional ground and air forces to eject enemy forces from friendly territory would depend importantly upon the outcome of operations in the first conflict and the availability of sealift assets to close forces to the second conflict.

CONCLUSIONS

Figure S.1 illustrates the contributions over time of the various elements of the U.S. joint force posture. In the early stages of crisis, naval forces provide enduring presence. As we transition to conflict, the relative (but not absolute) contribution of naval forces declines; rapidly deployable land-based airpower emerges as the dominant element in the crucial initial stages of conflict. Ground forces build up slowly but are essential for evicting the aggressor from occupied territory.
In posturing its forces to deal with short notice theater conflicts, the United States must rely heavily upon airpower in the crucial initial stages of combat. Aircraft are highly responsive and mobile, capable with tanker and airlift support of deploying anywhere in the world in a matter of days. Such air forces can be supported, at least in the crucial initial stages of combat, by airlift and can outrange almost any opponent through use of the nation’s tanker fleet. Though attrition cannot be ignored, judicious employment of electronic and lethal defense suppression systems can minimize losses. Moreover, air operations place at risk a much smaller number of U.S. personnel than large-scale ground operations.

These results do not imply that airpower alone will suffice to meet the needs of U.S. national security. As illustrated by this analysis, in some situations, weather, terrain, countermeasures, disruptions of the deployment of forces, and enemy operational strategies could reduce the effectiveness of an “air dominant” approach. Other scenarios are certainly possible—and such scenarios would stress different elements of the U.S. joint force structure. An insurgency, for example, would typically demand different sorts of forces: advisory and training missions, civil engineering teams, light ground combat
units, helicopter and fixed-wing gunships, and Special Operations Forces. These results imply that the nation needs a joint land, sea, and air force for use in theater conflicts, which can present potential enemies with the decisive and flexible force needed to underwrite deterrence.

But the results of our analysis do indicate that the calculus has changed and airpower's ability to contribute to the joint battle has increased. Not only can modern airpower arrive quickly where needed, it has become far more lethal in conventional operations. Equipped with advanced munitions either in service or about to become operational and directed by modern C³I systems, airpower has the potential to destroy enemy ground forces either on the move or in defensive positions at a high rate while concurrently destroying vital elements of the enemy's war-fighting infrastructure. In short, the mobility, lethality, and survivability of airpower makes it well suited to the needs of rapidly developing regional conflicts. These factors taken together have changed—and will continue to change—the ways in which Americans think about military power and its application.

To exploit airpower's potential, the United States needs to ensure its ability to control the air, which allows it to conduct more effective attacks of enemy forces and strategic assets. It needs to equip its future forces with advanced munitions, which play a critical role in enhancing their lethality. Our analysis indicates that procurement of additional long-range fighters capable of carrying heavy payloads (the F-15E) would significantly increase force effectiveness and flexibility. Finally, a rapidly deployable theater C³I system (consisting of airborne command, control, and surveillance assets combined with deployable ground-based facilities) is essential to the effective operations of these forces—and appears achievable through the integration of current systems if upgraded as planned.

Changes in the international environment combined with the increasing effectiveness of U.S. forces mean that reductions in the U.S. military force structure are both possible and prudent. Future U.S. military strategy will set demanding requirements for U.S. military forces. While a smaller force can support U.S. strategy, that force must be of high quality. Hence, the United States must maintain a "qualitative edge" in its military capabilities through selective
modernization. The enhancements discussed above—mobility forces, advanced munitions, advanced fighters, and C³I assets—will require a significant investment. It may be necessary to "trade" a portion of the U.S. joint force structure for selective modernization. This will require a new approach to coping with spending cuts, which in the past have focused primarily on reducing procurement accounts and have tended to be apportioned more or less evenly across services and mission areas.