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**COMPETITIVE STRATEGIES AND NATO
CENTRAL REGION AIR OPERATIONS**

A Monograph

by

Major Frank E. Metrusky

United States Air Force



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**School of Advanced Military Studies
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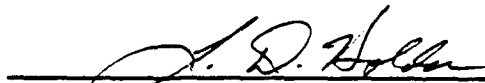
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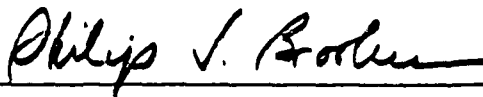
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ABSTRACT

COMPETITIVE STRATEGIES AND NATO CENTRAL REGION AIR OPERATIONS, by Major Frank E. Metrusky, USAF, 61 pages.

Within the past few years, there have been a number of reports referring to "Competitive Strategies." In one sense, Competitive Strategies is the Defense "buzzphrase" of the late 80s. However, it is also more. Secretary Weinberger directed DoD to institutionalize the concept in 1986. Recent SECDEF Reports to the Congress indicate that institutionalization is proceeding. DoD, services, and theatre CINCs now widely participate in the process. If, as appears likely, the concept will be with us, it behooves the military to understand what it is and how it works.

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I INTRODUCTION

Within the past few years, there have been a number of reports referring to "Competitive Strategies." In one sense, Competitive Strategies is the Defense "buzzphrase" of the late 80s. However, it is also more. Secretary Weinberger directed DoD to institutionalize the concept in 1986.¹ Recent SECDEF Reports to the Congress indicate that institutionalization is proceeding. DoD, services, and theatre CINCs now widely participate in the process. If, as appears likely, the concept will be with us, it behooves the military to understand what it is and how it works.²

But little beyond general concept and speculations have made it into the public domain. The specific purposes of this monograph are to 1) examine the Competitive Strategies concept, 2) develop specifics about the process associated with the concept, and 3) determine whether or not the concept contributes to further development of the operational level of war and operational art.

Before proceeding, a few words about limitations and restraints are in order.

First, my intent is to make this paper available to as wide an audience as possible. A classified paper, obviously, would greatly interfere with that intent. Therefore, while I referenced classified sources in my background research, I used only the unclassified portions of this material in the paper.

Second, to keep the inquiry within manageable bounds, I limited the context solely to NATO's attempt to gain air superiority at the outset of a general war, although NATO air would accomplish other tasks.

Third, I do not address specific force structure in numbers of "eaches." I hope to illustrate Competitive Strategies and apply it in a general sense to a specific context. I do not get bogged down in "bean counts" for two reasons: They differ among analysts, and conclusions drawn about relative balances or "correlations of forces" based on number counts and quality of forces do also. My intent is to walk through the methodology to illustrate how it works and identify specific capabilities and significant vulnerabilities, but at the unclassified level.

Finally, I do not address US logistics or sustainment. This is not because logistics and sustainment are not important or do not constrain the operational artist. As has been more than amply demonstrated through the long history of war, they clearly do. However, logistics and sustainment are largely tied to force structures which, as I have already stated, I will not examine or address.

This paper seeks to add to the literature on Competitive Strategies. To do this, it will cover three major areas. First, it reviews the concept and how the U.S. Department of Defense has institutionalized it. Second, it covers possible enhancements to NATO's offensive and defensive counter air operations. Third, it explains possible Soviet counters to these improvements. Based on my analysis of these three areas, I will offer some conclusions on the Competitive Strategies concept and will recommend improvements to make the Competitive Strategies concept more meaningful for the operational artist who must use the products Competitive Strategies will provide.

II COMPETITIVE STRATEGIES

The 1987 SECDEF Annual Report to the Congress first publicly enunciated the significance of Competitive Strategies (CS). Defense Secretary Caspar Weinberger identified CS, arms control, nuclear and conventional deterrence, and the Strategic Defense Initiative as the four pillars of US Defense Policy.³ Since then, the Department of Defense has institutionalized CS within DoD. Although there apparently remains some debate over how best to integrate CS into national military strategy and strategy making, it seems relatively clear that CS will remain a key ingredient in both the substance and process of US military strategy.

This section will do two things. First, it will explain CS by examining its key aspects: assumptions, aims, organizational structure in DoD, and methodology. Second, it will determine if CS is a radical departure from traditional US strategy and its development, or whether CS adapts principles already in existence and long familiar to strategists.

Various sources have alternately described Competitive Strategies as a method, guide, process, tool, notion, or doctrine. A relatively recent Defense Department document defines Competitive Strategies

as a method of strategic thinking for developing and evaluating US national defense strategy in light of our long-term competition with the Soviet Union. It is also a guide for gaining and maintaining an advantage in that competition.... The concept's principal objective is to make our approach to the US-Soviet competition more effective and to enhance deterrence and the security of the US and its allies.⁴

Taken together, these statements provide both a concise definition of CS and a point of departure for examining the general components of CS.

A number of assumptions underlie CS. The first is that despite recent pronouncements and changes within the Soviet Union about "new thinking," glasnost, and perestroika, the US and the Soviet Union are, and will

continue to be, in long-term competition with one another. Second, this competition occurs in times of peace, crisis, and conflict. Third, the military is only one aspect of this competition. Fourth, other national needs and requirements, constrain defense spending on both sides. Fifth, an opponent's actions partially influence what an actor will do and where and how he will spend his defense monies. And, finally, CS assumes that the Soviets -- or any other opponent -- are capable of beating us at our own game.⁵

Added to these six, are three more which Secretary Weinberger enunciated in his 1987 report. First, the Soviet Union's investment in all areas of military development far exceeds that of the US, and we can expect this trend to continue. Second, the US must maintain an effective force within our constrained budget. (A corollary is that we cannot match the Soviets plane for plane, ship for ship, and tank for tank.) And, finally, as we enter a period of rapid technological growth, the US has the greater capacity to exploit technology in the development and manufacture of war materials. In combination, these three assumptions add up to the conclusion -- and the aim -- that the US can and should develop strategies which will enable us to compete more effectively within selected areas.⁶

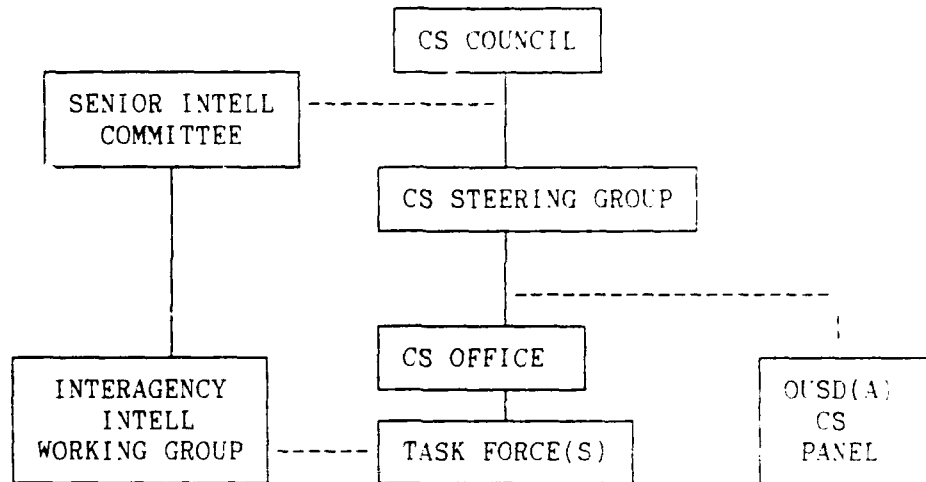


Figure 2-1

To develop these strategies, DoD has a CS organizational structure, shown at Figure 2-1.⁷ At the top is the Competitive Strategies Council, which the Secretary of Defense chairs. Membership includes the Deputy Secretary of Defense, Service Secretaries, Chairman of the Joint Chiefs, four service Chiefs of Staff, Under Secretaries of Defense for Policy and for Acquisition, Directors of the National Security Agency and Defense Intelligence Agency, and Chairman of the Competitive Strategies Steering Group. The Council's purpose is to provide guidance, approve candidate Competitive Strategies, and set priorities to implement them.

Directly subordinate to the Council is the Competitive Strategies Steering Group. The Special Advisor to the Deputy Secretary of Defense chairs the Steering Group. It consists of representatives of the service secretaries, Chairman of the Joint Chiefs of Staff, services, Under Secretary of Defense for Acquisition, Directors of Net Assessment, Program Analysis and Evaluation, and Defense Intelligence Agency. The Steering Group identifies candidate Competitive Strategies areas and measures, designates personnel to serve on the various Competitive Strategies task

forces, orchestrates the efforts of those task forces, and makes recommendations to the Council based on task force findings.

A Senior Intelligence Committee supports the Council and the Competitive Strategies process. The Director of the Defense Intelligence Agency chairs the committee. The Director of the National Security Agency, four service intelligence chiefs, Deputy Director for Intelligence from the Central Intelligence Agency, and Director of the Intelligence Community Staff are members. An Inter-agency Intelligence Working Group, subordinate to the Committee, assists the Steering Group and the task forces as requested.

The Competitive Strategies Task Force is the heart of both the organizational structure and the CS process. A task force is an interdepartmental group formed for a period of approximately three months to develop specific candidate Competitive Strategies. The Joint Staff and services all provide experts to examine the issues that the Council selects. The first Competitive Strategies Task Force (Task Force I) was convened in July 1987 and presented its final recommendations that November.⁸

Perhaps the greatest strength offered by the Competitive Strategies process is the task force methodology. The methodology employs a "chess match" analysis in a "move-countermove-counter countermove" sequence. The analytical process identifies specific areas of potential high leverage, or leverage points.⁹ Leverage is a strategy of scale which involves increasing the return on one's own investment by maximizing the cost of responding by an adversary.¹⁰ To find areas of potential high leverage, the Task Force examines areas of an opponent's strength, to find vulnerabilities within those strengths against which we can align our

strengths. If we are successful in doing that, we force an opponent to commit resources to redress that vulnerability. If he doesn't, we render that aspect of his military power less potent, possibly even obsolete. Leverage addresses the direction of an opponent's defense investment by encouraging him down a path which is less threatening to us. Leverage can apply to any aspect of military power, including weapons, technology, organization, doctrine, policy, plans, tactics and training.¹¹

Leverage has a number of possible advantages in addition to the two already mentioned (committing resources to protect strengths and/or rendering obsolete or rendering a strength less potent.) First, if employed properly, leverage can encourage an opponent to allocate resources to capabilities we could either avoid or counter. Second, because we choose the area and thus shape the competition, we can establish areas of enduring competence. Third, leverage can present an opponent with military capabilities which may have significantly unfavorable impacts. And, finally, leverage can increase the uncertainty about the effectiveness of one or more aspects of an opponent's military capability.¹²

Identifying and exploiting leverage points is only half of a competitive strategy. The other half is exploiting time. Employing leverage and time together can produce synergistic results. By timing actions in an area of leverage and channeling an adversary down a desired path, we can buy time in other areas, because the opponent only has a finite amount of resources to invest. As one observer has put it, "A smart competitive strategy does not allow the opponent to forsake his old systems for new ones, but requires him to commit resources to both."¹³

Having developed leverage points and considered the time factors involved, the task force develops initiatives which are applied to the specific cases in which we think we have, or can develop, a significant military advantage. Against those initiatives, the task force projects possible Soviet responses. Given these responses, the task force considers various US counter responses to the Soviet response. Through this process, the task force can get an estimate of how enduring US advantages might be and identify a range of likely Soviet responses. The methodology helps ensure that an initiative would gain and maintain a long-term military advantage, despite Soviet actions.¹⁴

If a task force's candidate competitive strategies look promising, they are evaluated in a two-phase process that includes review by the Joint Staff, services, CINCs, and intelligence community (Figure 2-2).¹⁵ Phase I is a first look at the task force's recommendations from the perspective of suitability (Would implementing the recommendations result in increased US and allied strategic leverage?), feasibility (Are current or projected resources and capabilities adequate to support the recommendations?), and viability (Could the recommendations be implemented at reasonable costs, risks, and uncertainties?).

Phase II involves a more thorough validation of the recommendations from a detailed operational and programmatic standpoint. During this phase, the task force recommendations compete with other candidate strategies in the Chairman's Net Assessment for Strategic Planning (CNASP). It is at this point that a Competitive Strategies analysis formally interfaces with the Joint Strategic Planning System. During Phase II, the Office of the Secretary of Defense, Joint Staff and services also assess tradeoffs necessary to implement the recommendations. If a

Competitive Strategies analysis produces recommendations that favorably withstand the scrutiny of this evaluation process, the Secretary, through his Defense Guidance, will direct the Services to develop force programs incorporating the Competitive Strategies initiatives.¹⁶

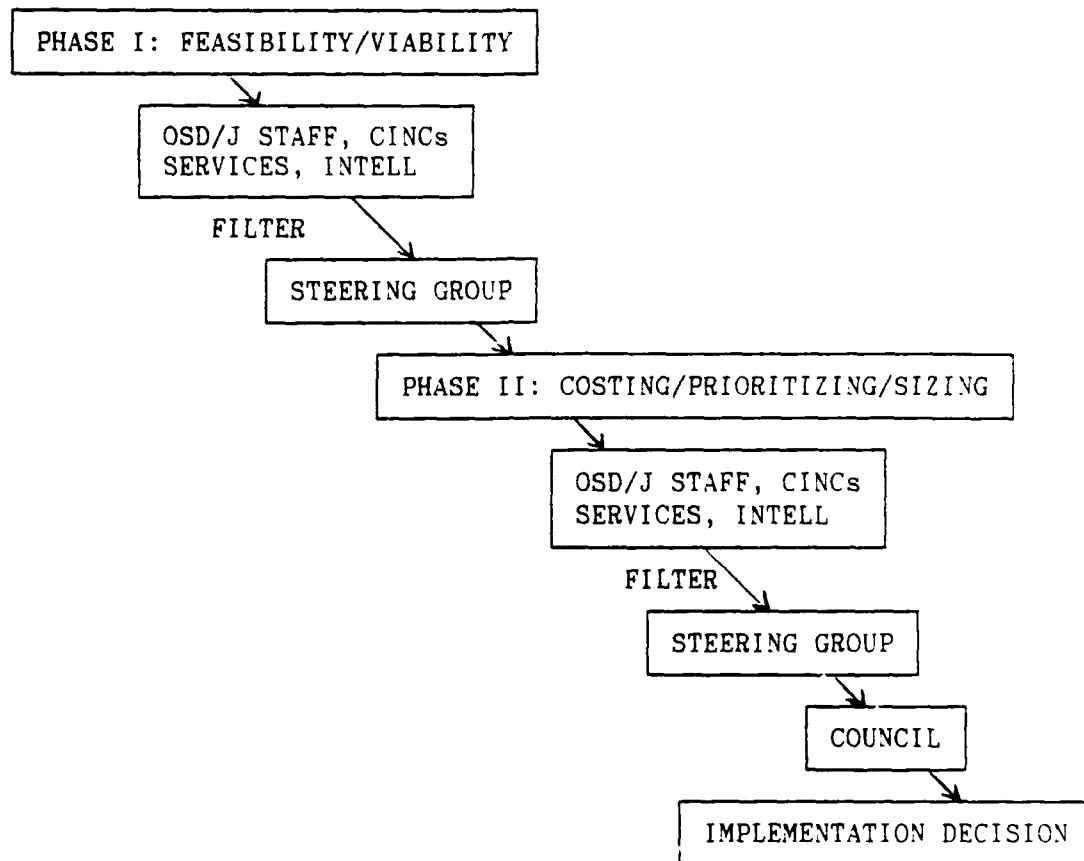


Figure 2-2

Having reviewed the underlying assumptions, aims, methodology, and organization, we can now answer the question of whether or not Competitive Strategies represents a fundamental change in US military strategy.

Although one can find numerous examples of Competitive Strategies approaches in the past (even within DoD),¹⁷ the current approach is a different one. One critic has stated

....no serious student of American defense policies within the four post-World War II decades is likely to challenge the notion that this principle [trading on strength vs an opponent's vulnerability] has not been an explicit, let alone consistent, guide to US strategic and technological planning. In fact, it can be posited that, overall, US defense planning has been remarkable for its inattention to the criteria of relative advantage and disadvantage in the competition with the Soviet Union.¹⁸

DoD has admitted much of the validity of this criticism. The November 1988 Competitive Strategies Primer noted

Our traditional military planning is based in large measure on assessing where the Soviets are strong, where we are weak, and on addressing our weaknesses. What Competitive Strategies adds to the process is the long-term dimension of capitalizing on our strengths and trying to set a maximum return in areas where we are strong.¹⁹

The Department of Defense has explicitly noted other differences. For example, A.W. Marshall acknowledged as differences the emphasis on searching for areas of enduring competitive advantage, focusing farther out in time than normal (5-15 years vice that of the Five Year Defense Plan), and the implicit commitment to compete in areas by maintaining advantages.²⁰ The January 1989 Department of Defense Competitive Strategies Fact Sheet also pointed out that "CS is different from traditional defense planning.. in several ways." The fact sheet specifically cited 1) the chess match methodology, 2) assuming rather than substituting for the basics (i.e., sustainability, infrastructure, C³I, etc.), 3) examining only a few areas (and is thus an adjunct to rather than a replacement for the Planning, Programming, and Budgeting System, and the Joint Strategic Planning System), 4) aligning strengths and weaknesses over a 5-15 year timeframe, and that 5) CS aims to channel the competition into areas where the US holds competitive advantage.²¹

But perhaps the greatest difference in CS from traditional US defense planning is that:

Central to this approach is a much greater focus on the other major actors, in particular the opponent, than is typical of standard types of analysis used in program planning. An ability to reflect in some detail the thinking and behavior of the opponent, and analyze the most likely of his reactions to particular choices and actions on your part, is a major task in the construction and choice of competitive strategies. Clearly there are many uncertainties in this. How to treat this uncertainty and how to anticipate an appropriate range of reactions by the opponent and integrate them into the analysis is clearly a very difficult problem.²²

Focusing on enemy actions and risk are two areas of strategy with which two of the greatest theoreticians on war grappled: Sun Tzu and Clausewitz. By implementing Competitive Strategies in DoD, we have -- once again -- admitted the great value of melding theory and practice. That it took a "new approach" to defense planning to do that emphasizes the differences with the way we traditionally did planning.

III COUNTERING SOVIET AIR OPERATIONS

We cannot... gain a favorable air situation by remaining on the defensive alone. We would have to take [the enemy] by the throat and, as soon as we got political clearance, pin him down on his airfields through our own offensive counter air attacks. Only that way, with the right combination of offensive and defensive operations, could we begin to wrest the air initiative from the enemy.²³

Air Marshal Sir Patrick Hine
Former Commander 2 ATAF

Having reviewed the CS concept, methodology, organization, and process, we can now turn to Countering Soviet Air Operations in NATO's Central Region. In general, this section will follow the methodological process of Task Force I, represented schematically below:

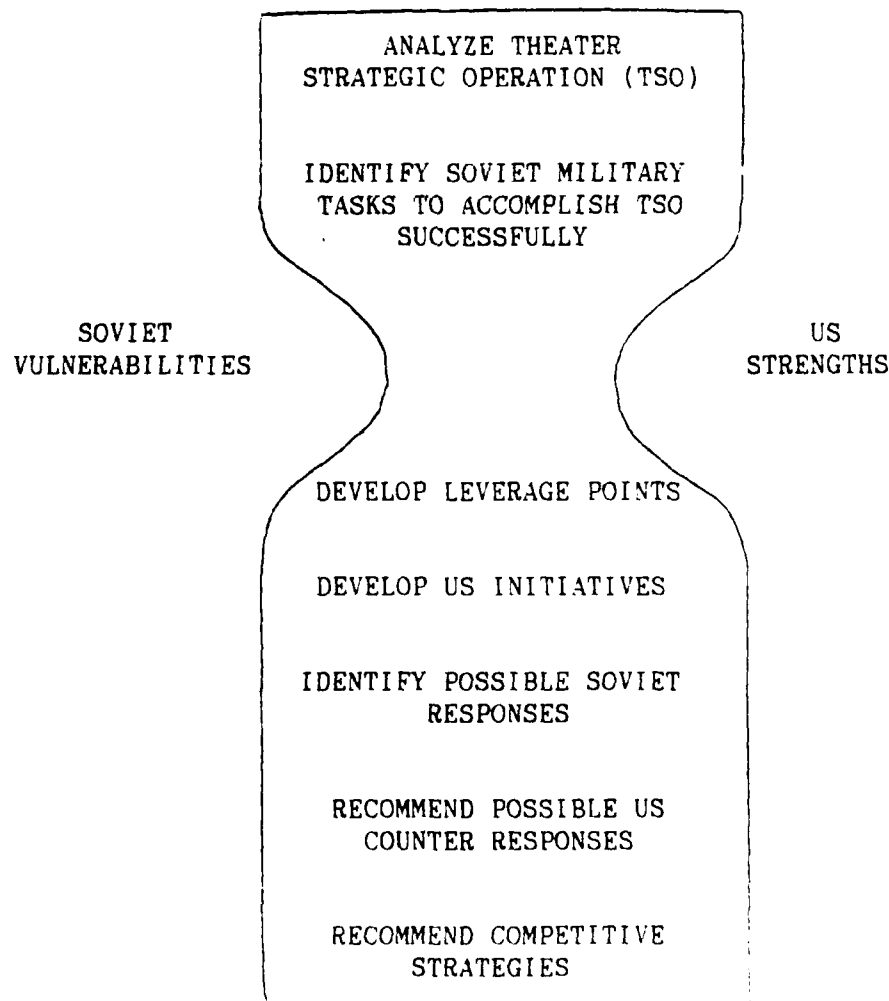


Figure 3-12⁴

This section will step through the process to develop US initiatives from open source data. In doing so, I do not imply that this was the data the Task Force used. Rather, I seek to show the process the Task Force used to develop the initiative of Countering Soviet Air operations.

As can be seen from the diagram, identifying Soviet vulnerabilities and US strengths is the narrowest part of the hour glass. Identifying strengths and vulnerabilities is 1) the fundamental essence and most difficult part of the methodology, and 2) the transition point between analysis and synthesis.

Although it is also not my purpose to consider possible scenarios under which war could break out between NATO and the Warsaw Pact, one can safely assume that if it did, it would be the tasks of both NATO and Warsaw Pact forces to "win" that war. We can assume that NATO would fight in accordance with the NATO strategy of Forward Defense and Flexible Response. We can also assume that for the Warsaw Pact to initiate a war with NATO, it would be over issues of such fundamental, supreme importance that the strategic goal would be the total eradication of NATO by shattering its military forces and neutralizing its political institutions.²⁵ To accomplish these goals and objectives and reduce the risk of escalation to nuclear weapons by NATO, the Soviets would conduct a theater strategic operation (TSO).²⁶ By definition, a TSO destroys enemy forces in the theatre, devastates the military-economic base of the opposing alliance, and achieves overall military objectives through offensive and defensive operations by combined arms forces. The goal of a TSO is to achieve these aims by using conventional weapons, rapidly destroying enemy nuclear assets and command and control facilities, and quickly intermingling friendly and enemy forces.²⁷ Thus, this is the

appropriate starting place for a CS-type analysis of a NATO-Warsaw Pact war.

The concepts for theatre strategic operations are founded in World War II theory and practice, as modified over the past four decades by the spectrum of factors influencing Soviet doctrine. Historical precedent and evolving Soviet military thought suggest that the Soviets will retain the broad context for conducting TSOs. This context includes operations by air, antiair, frontal, naval, and large-scale airborne forces. These are coordinated, integrated, and conducted in accordance with a common plan, and intended to achieve decisive politico-military goals.²⁹

The Soviets see the Central Region as the decisive theatre of NATO operations. The objective of the TSO would be to seize the initiative before NATO is fully deployed and conduct high speed, conventional, deep penetrations of NATO defenses in the first few days of the war.²⁹

Organizationally, the forces conducting a TSO against NATO are fully integrated, in a combined arms structure under a single overall commander at the TVD level. This structure includes all air defense and air units, including those allocated to the TVD by V GK from the central strategic reserve. The TVD "air component" and air defense commanders serve as deputy commanders on the TVD Commander's staff. The next lowest level commander at the front have the same relationship with the air and air defense commanders at the TVD level.³⁰

Having examined the nature of the TSO, we now turn to the next step in the methodology: determining military tasks the TVD must accomplish to achieve success.

We can assume that the Soviets would conduct a TSO in accordance with principles established by theoretician V.E. Savkin in the Basic Principles

of Operational Art and Tactics. The most important are surprise, mobility, and high rates of combat operations, concentration of the main effort, all-arms coordination, and simultaneous action against the enemy to the entire depth of his deployment. Three other principles also apply: marching separately and concentrating at the last moment, the offensive leads to victory, and never support failure, always reinforce success.³¹

Obviously, in an operation of such size, scope, complexity, and combined arms nature, there are a myriad of requirements, not all of which fit neatly into the category of either "air" or "land."³² This is because effects of land and air actions are reverberative in nature. However, we can generally look at overall ground and air tasks.

On the ground, the Soviets must rapidly achieve deep penetrations. They must also maintain a high tempo and initiative. However, due to terrain limits and so as not to present NATO commanders with lucrative battlefield nuclear targets, they must also echelon their forces. Echelonment requires detailed planning and complex movement to maintain tempo. This leads to the requirement to synchronize commitment of follow-on forces. Synchronization requires command and control which is at once highly structured, operationally flexible, yet tactically conforming.³³ Given all these requirements, it was logical for Task Force I to develop the initiatives of Countering Soviet Penetration of NATO Forward Defenses and Stressing the Warsaw Pact Troop Control System.³⁴

As for air operations, the Soviets have two overall imperatives. In offensive air, they must strike deep to attain fire superiority; and in air defense, they must provide freedom of action for offensive forces. Put in other terms, they must achieve general air superiority through air and antiair operations, respectively.³⁵

Soviet authors have been explicit about the critical role of the air operation in their conception of the TSO.³⁶ Two American authors have called it "the linchpin" for a strategic offensive against NATO. Should the Warsaw Pact attack NATO, the attack would most likely begin with massive, combined arms attacks to achieve success leading to a quick decision in the overall conflict.³⁷

In developing specific plans for air operations, Soviet planners would use a "top down" approach. They would cause destruction and time delays at the top of the NATO C² and air defense systems which would be passed through the pyramid. They would induce additional delays by physically attacking or employing countermeasures in other areas. But, if they can sufficiently degrade the top part of the pyramid, there would be fewer requirements for measures at the bottom. This "top down" progression offers a considerable advantage to the attacker because the bottom elements are the most difficult to degrade or defeat.³⁸

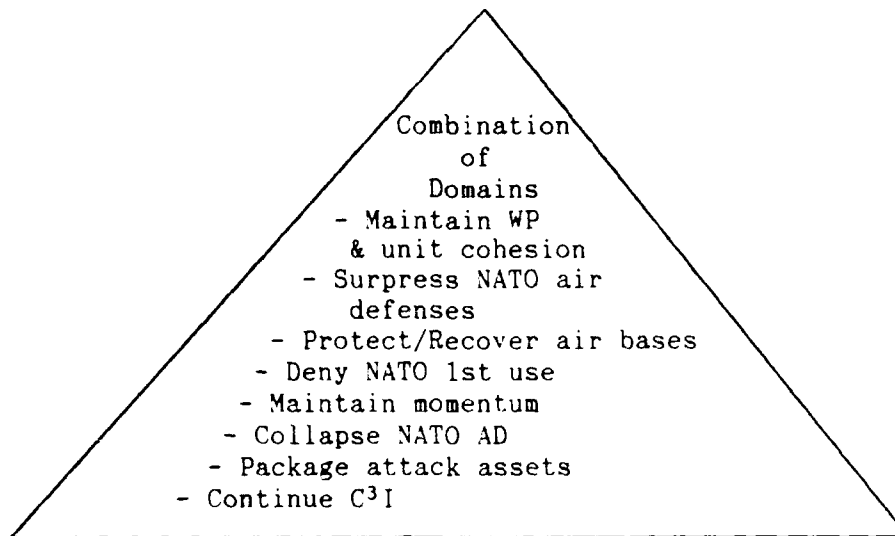
During the initial air operation, the Soviets would attack a wide range of targets using a wide range of forces, over a period of several days. Targets would include C² facilities, nuclear storage sites, airfields, and air defense installations. Forces would include missile, air assault, special purpose, partisan, and air assault forces, fixed-wing ground attack aircraft from the tactical air armies of the fronts and TVD, and intermediate range aircraft from strategic and naval aviation. The TVD, which would probably plan the air operation due to its scale, would likely send three massed strikes on the first day of the operation and one or two on subsequent days. The first mass strike is the most important, and would probably number more than 1200 aircraft. The objective would be the destruction of at least 60 percent of NATO aircraft in the theater.³⁹

Consistent with the importance of air and antiair operations, the Soviet Union has gone to great lengths to transform its "tactical" aviation assets from a primarily defensive role to one with significant deep penetration and offensive strike capability.⁴⁰ The increase in numbers of aircraft and concurrent improvements in range, armaments, and, to a lesser degree, avionics, have provided the Soviets with a potentially viable non-nuclear option for gaining the operational initiative and creating what a number of theorists have viewed as the precondition for victory in the period immediately following the outbreak of hostilities.⁴¹

To accomplish the initial air operation successfully, the Soviets would have to complete a number of critical military tasks with five different force elements (aircraft availability, aircrews, logistics, base and base support, and C³I) in the moral, physical, and cybernetic domains of war.⁴² The tasks are illustrated at Figure 3-2.

Train for Operations
Motivate Forces

M O R A L



PHYSICAL

- Deploy to MOBs
- Logistics Prep
- Protect bases
- Win Electronic War
- Sustain operations
- Recover Aircraft.

CYBERNETIC

- Locate targets
- Orchestrate air operation
- Orchestrate antiair operations
- Optimize attack time & place
- Get feedback

Figure 3-2

The next step in the methodology is, given the military tasks which have been identified, to search for vulnerabilities within the Soviet strengths that significantly contribute to ability to accomplish those tasks. This step requires some creative thought. This is true for two reasons. First, even if we can identify weaknesses, not every weakness constitutes a vulnerability. The problem is how to identify those vulnerabilities that are exploitable within a strength that contribute to a critical capability.⁴³ Second, this is difficult to do because the Soviets take the "systems" approach to both operations and force

development. While Western defense planners normally apply the term "system" to a weapon and its associated equipment, the Soviets apply the term to all elements required to attain an objective. These include forces, hardware, C³I, logistics, and the operational plan to include timing to achieve objectives. This perspective leads Soviet planners to examine both their own and opposing forces for capabilities and vulnerabilities,⁴⁴ and develop operational plans for future conflict which take advantage of capabilities and enemy vulnerabilities. This sounds like the point to which Competitive Strategies is trying to get. The bottom line to this process is that although US needs to avoid the natural tendency to attack the strength directly, identifying potential weak links within a system is a more difficult proposition than it appears.

By their nature, however, Soviet operations do have inherent elements of potential vulnerability.⁴⁵ A discussion of some of these potential vulnerabilities follows.

The first is the highly preplanned and relatively rigid nature of Soviet offensive air operations. In air operations at the onset of a conflict, the Soviets must differentiate carefully among target categories, missions/functions, environmental factors (weather, visibility, terrain, etc), operational ranges of aircraft, possible NATO counteraction, etc.⁴⁶ Additionally, there is the all-arms coordination requirement. A successful air operation must largely be preplanned. The preplanning requirement, however, coupled with possible changes in the overall situation, leads to the possibility of large numbers of elements not going according to plan. If that happens, the commander may have to adjust the plan. But to do so requires agility and flexibility in the

C³I organization and processes. But overall Soviet technological weaknesses in five key areas (sensors, miniaturization, intelligence fusion, smart munitions, and microcomputers)⁴⁷ contribute to his not being able to do that effectively.

Second is the requirement for swift success. If at all possible, any CS recommendations should exploit the Soviet requirement for strict time management and maintenance of high tempo operations within the context of the TSO.⁴⁸ If the Soviets adopt the offensive strategy presented here, there are at least three requirements for success: surprise, sustaining the momentum, and coordinating all associated activities,⁴⁹ particularly in the initial air operation. To the degree that different elements of this operation can be desynchronized, NATO would have the initial opportunity to attrite severely Warsaw Pact air forces.

To coordinate various elements of his air and air defense forces, the Soviets need a highly effective C³I system. His is highly centralized, and requires information to feed into its heavily modelled and centralized decision-making process. Because of its rigidity, it is of particular value to disrupt it. There are a number of ways to do that. They include 1) destroying, deceiving, or disrupting the flow into it, 2) destroying the decision-making centers and the decision-makers themselves, and 3) disrupting or destroying the flow out of it. The means include electronic warfare, physical disruption, and deception.⁵⁰

A third is the Soviet air defense net. The Soviets have developed a highly capable, redundant, consolidated system of both ground and air components. But it suffers from two potential vulnerabilities: dependence on radar acquisition and tracking systems, and lack of automation.⁵¹

Fourth, the Soviets have large numbers of ground attack and fighter aircraft. However, a majority of the attack aircraft are restricted in their ability to find and destroy ground targets at night. Only the latest generation of fighter aircraft have the sophistication necessary for effective night aerial combat.⁵² The bulk of the Soviet inventory will also be restricted to day or fair-weather night operations for some time to come. If NATO can engage this part of the threat economically, small numbers of high performance aircraft should be enough to deal with the high technology end of their spectrum of aircraft.⁵³

Fifth is a potential vulnerability in the moral domain. At the outset of a Central Region War, Soviet aircrews would have no experience in war. While NATO's wouldn't either, the Soviet aircrews would be at a relative disadvantage. First, they would have to fly over territory which would be "demonstrably unfriendly." Second, they would have to penetrate to targets flying at altitudes much lower than they normally train in peacetime. And, third, NATO aircrews would be defending their airspace. Thus, if NATO could, by using air defenses in the right way and by getting as many fighter aircraft as possible airborne to break up the early mass raids, causing pilots to evade and jettison weapons, frustrate attacks, and inflict high attrition, NATO could begin at the end of the first one or two days to gain the psychological upper hand.⁵⁴

Finally, the transition to high performance aircraft poses possible vulnerabilities. The new, sophisticated Warsaw Pact aircraft increase the possibility of affecting Soviet air operations through attacks on enemy airfields. Several characteristics of current state-of-the art fighters make them dependent on complex, fixed bases. These dependencies include 1) the need for such substances such as liquid oxygen, halon, and

hydrazine which are difficult to handle and produce, 2) the large quantity and increased quality of ground support required and 3) increased fuel, weapons, and spare parts requirements prestocked at main operating bases. The combination makes a Warsaw Pact MOB a very lucrative target. These requirements have led more than one observer to label the airfield as the "Achilles heel" of Soviet airpower. To the extent that the Warsaw Pact ties its airpower to fixed MOBs, it provides the opportunity to reduce sortie rates so greatly, that it would have a major impact on which side gains air superiority.⁵⁵

The questions are how to gain the upper hand, and with what? The next step is to determine US strengths to counter their vulnerabilities.

Section II of this paper noted that one of the Competitive Strategies assumptions is that the US has a greater capacity to exploit technology in the development and manufacture of war materials. All other things being equal, advanced technology can make a difference in human costs and effectiveness in air operations, as the Syrians again found out in the Bekaa Valley in 1982.⁵⁶ In the next few years, the potential for major improvement in NATO air's conventional improvement is quite high. Advanced technology will be responsible for much of that improvement.⁵⁷ Figure 3-3⁵⁸ summarizes a generic list of technologies which support Task Force I candidate competitive strategies, their effects, and weapon systems currently under development.

Technology	Possible Effects	Systems
Sensors & Data Links	Extends capacity to detect & send data long distance	JSTARS, JTIDS
Fusion	Real time targeting	Joint Tac Fusion Cntr, ASAS
Precision Guidance	High/Multiple Kills. Tailor munitions	SADARM, SKEET
Aerodynamics & Propulsion	Long-range delivery systems	Tacit Rainbow, ATACMS, ACM, etc.

Figure 3-3

This by no means exhausts the list, either. A recent journal article reported that some 22 new systems were explored in a CS wargame,⁵⁹ and one defense industry spokesman moaned to the New York Times, "Some of the things you are most proud of are still on the black side."⁶⁰ Small wonder that one noted defense analyst has concluded that technology is still the US's trump card.⁶¹ Task Force I concluded that our technological lead in long-range, highly accurate, mobile systems will provide NATO with a key competitive advantage in the 1990s.⁶² An unnamed participant in the first CS study noted the extent to which an integrated C³I system would be the essential foundation for a theatre-wide targeting system, but that is also an area in which the US leads the Soviets "by substantial margins."⁶³

The next step in the methodology is to develop leverage points and US initiatives. While the ultimate measure of effectiveness is victory (however defined), from the air standpoint of operational art, the number of aircraft sorties flown for different types of missions by both sides is the true measure of airpower's effectiveness.⁶⁴ If, as a former Commander of Allied Air Forces Central Europe has stated, the NATO goal is to fly 3,000 sorties of all types per day,⁶⁵ two things must happen.

The first is to present an effective air defense against the initial air operation until political authorities grant permission to conduct offensive counterair operations. Until they do, the defense must impose severe losses on the attacker because of his overall numerical superiority. Given the combined arms nature of the Soviet air operation, NATO air defense must also be integrated. It must combine passive measures like dispersal, camouflage, hardening of critical installations, and concealment with active measures like ECM, surface-to-air, and air-to-air operations. Integrating air defense is the first leverage point.

One example of possible integration is the Patriot surface-to-air missile system. Patriot has the ability to provide (with fighter-interceptors) an integrated aircraft-SAM defense against Soviet aircraft. Patriot's capabilities, which significantly reduce the problem of fratricide of friendly air, has led to 4 ATAF's development of a new operational concept for NATO: Forward Area Defense Operations. In the past, NATO defenses have been "layered" with a missile engagement zone forward and a fighter engagement zone behind it. This layering gives an advantage to the Soviet planner, because he is able to configure his raid to counter each specific layer of the NATO defense. Integrating SAMs and fighters against Soviet air significantly complicates the Soviet planning process and provides a synergistic advantage to the air defense. Here we see an example of a technologically advanced system leading to a new operational concept -- which is another, albeit often overlooked -- aspect of Competitive Strategies.⁶⁶

The introduction of the Advanced Medium Range Air-to-Air Missile, a radar-guided, air-to-air missile will further improve NATO's air defense

performance of both the F-15s and F-16s. This missile has performance improvements over current air-to-air missiles, and will permit simultaneous engagement of multiple targets. The longer range and launch-and-leave performance also add to fighter-interceptor survivability and capability. The combination of new technology and new operational concepts will provide a synergistic improvement of NATO defenses against Soviet aircraft.⁶⁷

The second requirement is to attack the source of Soviet sortie generation: The airbases themselves, exploiting Soviet vulnerabilities with our strengths.

Two systems could lend immense help in NATO offensive counter air operations: Stealth aircraft and unmanned aerospace vehicles (UAVs). The Air Force publicly unveiled the F-117A last fall. This aircraft apparently was designed to penetrate Soviet air defenses and deliver "smart weapons" against key elements of the air defense system.⁶⁸ As for UAVs, the 1982 Lebanon invasion saw Israel pioneer their operational use. The Scout and Mastiff drones provided real-time reconnaissance, artillery spotting, electronic intelligence, communications and radar jamming, decoy operations, and damage assessment. With the advance of technology, some believe that although UAVs may not replace unmanned aircraft totally, they may be better suited for missions like enemy air defense suppression, reconnaissance, air base early warning, and communication relay.⁶⁹ This would "free up" aircraft for other missions.

The preceding only represents the tip of the "emerging technologies" end of the spectrum. Upgrading and modifying existing technology can also add greatly to air capabilities. The F-15E, which can carry a 24,000lb

bomb load, will have 200 mile greater operating radius than the F-16. Both the F-15E and F-16 will be configured with the Low Altitude Navigation and Targeting Infrared for Night (LANTRIN) system. This system will allow automatic terrain following (increasing survivability during deep penetration missions) as well as night and all-weather capability. The ability to deliver ordnance accurately at night is a key and quantum leap in air capabilities.⁷⁰

To attack Soviet main operating bases, the US and NATO could phase the attack, with unmanned vehicles in the lead. This is the second leverage point.⁷¹ Combined, the two leverage points became the Task Force I initiative of "Countering Soviet Air Operations."

Having walked through the first major portion of the process of determining US initiatives, and having looked at unclassified sources to determine the types of underlying considerations which could have led to those initiatives, we can now approach possible Soviet counters to those initiatives.

IV POSSIBLE SOVIET COUNTERS

The US would like to take initial courses of action that would drive Soviet reactions, and have preplanned peacetime, US responses to those reactions. Thus, predicting Soviet reactions with a great degree of accuracy is critical to the CS Concept. As in a game, and as Clausewitz realized in his day, each of the two contestants has an independent will, and is predictable and controllable only to a limited extent.⁷²

This being the case, a degree of uncertainty enters the equation. With uncertainty comes the need for developing systems that are either robust or versatile.⁷³ As the Soviet methodology of developing military capabilities is the controlling element for their possible responses to CS initiatives, rather than detailing specific responses to individual systems/concepts developed from CS, this section will explain the context in which those responses would evolve, and draw some overall conclusions about possible Soviet reactions.

For the Soviets, any possible response will be framed within the context of Soviet Military Doctrine. Unlike doctrine in US terms, Soviet Military Doctrine is the official expression of the Communist Party's military policy, and is an all-encompassing military philosophy applied as an element of Marxist-Leninist Doctrine. It encompasses the whole spectrum of the Soviet state's preparation for war, the psychological preparation of the population for war, the nature and organization of the economy and mobilization, the principles of foreign policy, and the type of war in which the state might become involved or seek to start.⁷⁴

Soviet Military Doctrinal development goes through an intellectual process, the sequence of which is important. First, it starts with the ideological tenets about the historical process, class struggle, politics,

etc.. Second, it considers the nature of technology., Third, and only then, comes the assessment of the forces available to both the capitalist and socialist states, as well as the resources available to the Soviet Union. Finally, once all of the above have been considered, the state develops industrial, social, and manpower policies.⁷⁵ It is, in brief, a rational process approach based on ideological first tenets, the nature of the environment, and what is needed.

Soviet Military Doctrine is also dialectical, not dogmatic. The process approach seeks to anticipate and manipulate change, rather than just react to it. It is expected to provide a structured decision-base that ensures control and eventual stability--but on Soviet terms.⁷⁶

Over the seven decades of Soviet military activity, the doctrinal development process has led to a recurring, discernible pattern. This pattern begins with an apparent recognition that Soviet military capabilities are limited by three conditions: low technical ability of the manpower base when measured against the requirements for modern warfare, an insufficiently developed industrial base to provide modern technology and weaponry of a qualitatively high standard, and new technologies that are beginning to change the nature of future warfare.⁷⁷ The evolution of Soviet military writings over the last eight years makes it clear that the Soviets are gravely concerned about the extent to which conventional systems can now or will soon provide capabilities that previously required the use of nuclear weapons. Examples include -- among many others -- a 1980 article in Naval Digest on the US Tomahawk cruise missile system, a July 1985 article by Colonel General Gareyev about a turning point in military art and science, and a 1988 Red Star article about the Pentagon's "Strategies of Rivalry,"⁷⁸

the Soviet nomenclature for Competitive Strategies. The most-often quoted, and perhaps most eloquent expositor of this trend has been Marshal Nikolai Ogarkov. John G. Hines has laid out Marshal Ogarkov's description in accordance with the Soviet dialectical force development process in the following way:

"A PROFOUND, AND IN THE FULL SENSE REVOLUTIONARY TURN IS TAKING PLACE IN MILITARY AFFAIRS IN OUR TIME

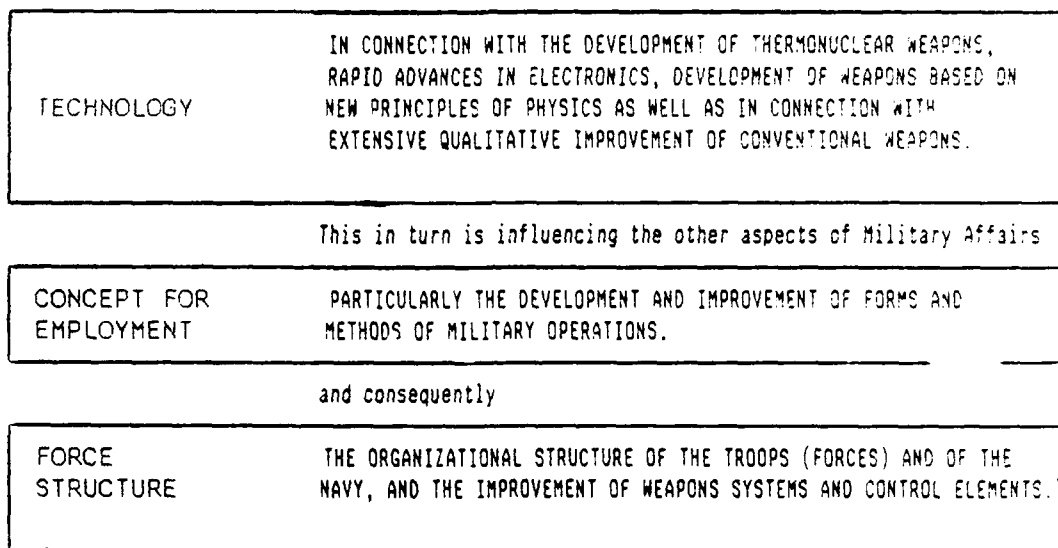


Figure 4-17⁹

It is one thing to work out the findings of military science in light of technologies. It is, however, something else to build the modern industrial base needed to produce modern weapons that the "revolutionary turn" makes possible.

The logic of Soviet Military Doctrine in both its socio-political and military technical aspects emphasizes the organic relationship of the society and the economy with the military.⁸⁰ According to Jacob Kipp, of the U.S. Army's Soviet Army Studies Office at Fort Leavenworth, Kansas, a careful reading of what members of the Soviet General Staff have been

writing on the topic of future war and the on-going scientific-technical revolution makes military acceptance of the Party's commitment to military modernization by economic rejuvenation and technological innovation quite clear.⁸¹ Condoleeza Rice also contends that Soviet military leaders are acutely aware of the need to retool the Soviet economy to yield the new technologies for the 21st century.⁸² The Soviets have determined that they will need qualitatively different technologies, concepts for employment, and force structure for future warfare. The question is how to get there from here: they see the need, but the economic base will not fulfill that need.

In this light, the lessening of tension, detente, perestroika and glasnost to provide a less threatening environment looks decidedly different from the "conventional" wisdom that the Cold War is over. Rather, it is but one arm of Soviet Military Doctrine, the socio-political one: reduction of the appearance of the Soviet Threat to undermine the US's will to compete, thereby preventing the US from taking full advantage of its military-technical superiority. At the same time, the Soviets mount the effort to modernize their industrial/technological base to develop the weapons the "third revolution" in military affairs makes possible.

The Soviet reaction to Competitive Strategies from this perspective is extremely consistent. They see the current technological challenge in some respects as a U.S. effort to use the arms race to bring about the economic exhaustion and decline of the Soviet Union. They describe CS as:

The US Defense Department's strategy of forcing the Soviet Union into an intensive arms race in a maximum number of directions. By using the leading position of the U.S. in a scientific-technical field they are counting on continually and purposefully devaluing Soviet military assets and forcing the USSR to expend new resources and then once again devaluing them.⁸³

In the context of an inferior societal base, using arms control proposals and unilateral arms reduction to manage 1) the Western perception of the threat, 2) the will to deploy new systems, and 3) the level of these new systems is not only a good one, but is also consistent with the tenets of Soviet Military Doctrine.⁸⁴

Regardless of whether or not that arm of the strategy fails, however, there are three principles of Soviet military art in the military-technical sphere which guide Soviet actions. The first, which is derived from the overall Marxist-Leninist dialectic, is the law of negation of the negation. Simply put, each new US weapon that appears to negate or threaten Soviet weapons must in itself be negated. The second is the coordination of mutually-supporting forces in combat. As has been pointed out, as modern combat is combined arms in nature, each Soviet weapon system is developed and deployed in relation to the capability of other types, in close coordination with them and "in such a way that the weak points of one are compensated by the stronger points of another."⁸⁵ (Emphasis added.) Thus, when confronted with a new threatening weapon, the Soviets may use two or more types of weapon systems or forces to counter it. Taken together, these two principles amount to the normal Soviet modus operandi of tailoring strategy, operations, and tactics to exploit NATO vulnerabilities while minimizing their own.⁸⁶ Finally, the third principle is to launch attacks with overwhelming forces at the very outset of hostilities, so that the enemy will not recover. Savkin stated the principle very clearly: "Victory in war will be formed not so much from the sum of particular successes, but as the result of the effective application of a state's maximum power at the very beginning of armed conflict."⁸⁷ In other words, "strike hard, move fast and finish rapidly."

We see continued application of these principles in two separate areas: war plans and forces. In the first area, despite public declarations of "defensive defense,"⁸⁸ the General Staff has made it quite clear that they consider any defensive concept that denies them the capability for decisive counter attack to be "military nonsense."⁸⁹ But such a counterattack could also be used for a pre-emptive attack on NATO. Thus, William E. Odom's contention that "defensive defense" represents a change in war plans, not a change in doctrine in the Soviet sense.⁹⁰ In the second area, forces, while Gorbachev has proposed unilateral force cuts, those cuts, even if implemented, will still leave the Warsaw Pact with a numerical superiority in a number of important systems.⁹¹ Additionally, the FY 90 SECDEF Report states that we have yet to see any slackening in Soviet military production, and modernization of systems continues.⁹²

One area, air defense, illustrates the preceding principles. The Soviets have deployed a number of new systems, including the SA-11, SA-12, and SA-17. These three roughly correspond to the US/NATO Patriot system. The Soviets have deployed a large number of systems, in part because of technological shortcomings, and in part to tailor army and front-level missiles to more specific roles. Deployment of three systems provides distinct advantages. Although still radar controlled, the diversity of radars will pose greater problems for NATO in the ECM arena. The SA-11 carries its own engagement radar on each launcher vehicle (unlike its predecessor the SA-6) making it necessary to suppress each vehicle to suppress the battery. The SA-12 is an extremely long-range system, designed for a variety of roles, but probably intended to threaten NATO high-altitude platforms like AWACS, TR-1, and JSTARS.

These platforms could -- and presumably would -- also be suppressed at the outset of the war as part of the initial air operation. Thus, we have but one example of the Soviets complying with all three of the aforementioned principles of military art: negating new weapon systems (JSTARS, AWACS, etc.) mutually supporting systems (a number of different SAM systems) and overwhelming force at the beginning of a conflict (possible use of SAMs against critical NATO platforms at the outset).⁹³

There are two final notes. First, the concept of deep operations with the commitment to attack enemy formations throughout the depth of dispositions is one in Soviet military art that dates back to Triandafillov and Tukhachevsky.⁹⁴ In theory, it is nothing new. The problem has been that the practical realities to implement the concept have not advanced as quickly as the theory. Nonetheless, there is now a "third revolution" in military affairs which, as Ogarkov and others have explained, for the first time may make practical what the Soviets refer to as a "reconnaissance destruction complex (RDC)."⁹⁵ An RDC consists of command control, real-time intelligence, and weapons systems to destroy targets at operational depth. Although the Soviets do not yet have the technology, particularly automated data processing to make these systems work, as new computers become available, and as real-time reconnaissance becomes practical, they will become part of Soviet military doctrine and force structure. This, despite complaints by both the Minister of Defense, Dmitri Yazov, and the former Chief of the General Staff, Marshal Sergie Akhromeyev, that the Competitive Strategy weapons were "an automated reconnaissance and destruction complex."⁹⁶ Second, analyses have shown that although the Soviets lag behind in some basic technologies, they usually catch up to US military capabilities relatively quickly.⁹⁷

The bottom lines in terms of response to CS follow. First, the Soviets have determined that technology has changed the nature of warfare. Second, in accordance with that determination, they have already responded at both levels of Doctrine to maximize their strengths, minimize their weaknesses, and try and prevent the US from deploying new systems. Third, they are pursuing -- and will continue to pursue -- the capability to execute their historic theory of Deep Battle. And, fourth, the race is on to attain that capability before the US does. I believe these four elements will guide Soviet actions over the long term. While they may take US actions into account, the Soviets will not allow us to "seize the initiative," if they can at all prevent it.

V CONCLUSIONS AND RECOMMENDATIONS

In the preceding pages, I have reviewed the Competitive Strategies concept, methodology and organization, and presented a postulated framework for Soviet military decision making which could guide Soviet responses to CS initiatives. Having walked through these frameworks, my next task is to draw conclusions and make recommendations which would enhance the performance of an operational artist who would employ the products of Competitive Strategies. My comments will fall into three general areas: an overall assessment of CS, the relevance of theory to it, and the role of the operational commander in employing the products of it.

In general, Competitive Strategies is a welcome addition to US defense planning. It employs one of the oldest principles of strategy: focusing one's own strengths on enemy vulnerabilities. In this sense, it is different from and additive to traditional US defense planning in the post World War II era. It appears, as Lt Col Robert M. Davis has written:

....To be a viable management system with which to engage the Soviets in a battle of strategy formulation and development. It is a well thought out and sound methodology which will maximize our defense dollars through the application of leverage at critical points as technology evolves, rather than random opportunistic application.⁹⁵

On the one hand, CS has the potential for revolutionary impact in defense planning. On the other, however, it has a number of limitations which, unless overcome, can limit that impact. These include further institutionalization, Task Force methodology, and including of all required participants.

Within the Department of Defense, the concept appears to be well on its way toward institutionalization. However, within the government bureaucracy, the institutional boundary appears to lay at the outer ring

of the Pentagon.⁹⁹ To date, there has been no institutionalization of CS at either the National Security Council (NSC) or the Department of State, two other major participants in the US national security strategy development process. Given the interest in CS by at least two members of the NSC -- George Bush and Dan Quayle -- this could change in the not-too-distant future. It needs to.

The second limitation of CS is the Task Force "chess match" methodology. The Department of Defense touts this as one of CS's great strengths, and it is to the degree that it exists. However, the methodology has two apparent points of analytical vulnerability. First, it assumes that the US will be able to "take the initiative" as the first move; and, second, it approaches the task from essentially a US "Blue" perspective.

Relative to the first point, the reality of strategy is not that neat and clean. In fact, it may be that the postulated opponent 1) may have already begun his "countermove" (known or unknown to us) or 2) he may not be "rational" quite in the way we credit him as being. Either way, it creates differences between the analysis and what the opponent is actually doing.

We can briefly explain the second vulnerability using the "Sullivan's Prism" construct, illustrated below at Figure 5-1, and explained by Lt Col G. Murphy Donovan in the Summer 1988 Strategic Review.¹⁰⁰

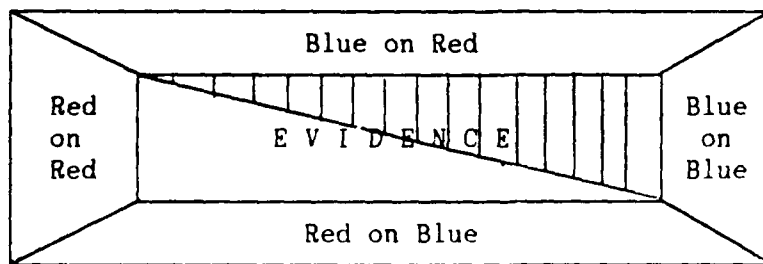


Figure 5-1

Sullivan's prism indicates that there are four dimensions of military perception: Soviet assessment of the threat, Soviet appreciation of its own capability, US estimates of the threat, and US appreciation of its own capability. This situation is complicated further by dissimilar assessment methods. My concern is, despite the inclusion of and support by the intelligence community in the Task Force process, the area of evidence represented by the shaded portion is what gets the greatest weight in the methodology. If so, we miss a great deal. To ensure this doesn't happen, a Red Task Force could and should be employed as a parallel effort to the Blue one, using known Red assessment methods and perceptions (to the degree they are known) and present a countering assessment of the same problem.

The second area is the relevance of military theory to the CS process. My specific concern in the area is the report in the 20 December 1988 Wall Street Journal that

The high-tech weapons used in last summer's war game seem to have been hatched in a Tom Clancy thriller. And as in the Clancy novels, the weapons all work without a hitch. Soldiers and pilots are replaced by weapons controlled from computerized command post far from the battlefield. "Smart" mines pop out of the ground to immobilize Russian tanks. Hundreds of pilotless "drone" aircraft are kept aloft and then sent smashing into enemy radars. Reconnaissance plans beam precise targeting information to long-range conventional cruise missiles.¹⁰¹

The problem is that rarely -- if ever -- do peacetime assessments and wartime performance of either man or machines match. The reasons are largely the same as when Clausewitz studied war in the 19th century. They include -- among others -- the independent will of the enemy, fog and friction, change and uncertainty, danger and exertion. In real war, "commanders continually find that things are not as they expected, and all information and all assumptions are open to doubt."¹⁰² A modern

exposition of this theme is Dr. Paul K. Davis' The Role of Uncertainty in Assessing the NATO-Pact Central Region Balance. In it, Davis writes that the beginning of wisdom about this balance is to recognize that war outcomes are sensitive to scores of factors, rather than just the handful regularly discussed. The balance is multifaceted, and should be approached that way.¹⁰³

Part of the problem of peacetime assessment vs wartime performance stems from viewing warfare largely either as an information management problem or a vast engineering project whose details can be calculated precisely in advance.¹⁰⁴ With regard to aerial warfare, these perspectives combine to the point that

As the microcomputer impacts more and more on airpower, it is tempting to look forward to a golden age of instant communication, perfect navigation, unambiguous target identification, infallible weapon accuracy, and inevitable target destruction, all flowing from a multirole, infinitely maneuverability, and probably invisible aircraft platform.¹⁰⁵

The belief that weapons, sensors, and computers can see through the fog and operate without the friction of war is dangerous because it may contribute more to fog and friction than eliminate it, especially if decision making is centralized.¹⁰⁶ This is so largely for two reasons. First, the more dependent a force becomes on a system, the more attractive it becomes as a target. Second, over the past forty years, new technological developments have been promptly followed by another designed to neutralize them. The SA-12 development which counters TR-1, JSTARS, and AWACS is, again, a perfect example.

The final theoretical relationship is that the moral, physical, and cybernetic domains are interdependent. Figure 4-1 displays a number of tasks which the Soviets must accomplish in an initial air operation. Although these tasks are in different domains of war, humans must

accomplish all of them. With increased real-time firepower of greater lethality, the historic trend toward the "distributed battlefield" will become even greater. As it does, small units will become more important and have even greater opportunity to achieve operational effects than in the past. Whereas the information management/engineering school of war sees the military machine as "basically very simple and therefore easily managed," the student from the theoretical approach also sees that, "a battalion is made up of individuals, the least important of whom may chance to delay things or somehow make them go wrong."¹⁰⁷ In this situation, cohesion becomes even more critical. Doctrinally, the US Air Force is right on track in viewing cohesion as "critical to the fighting effectiveness of a force."¹⁰⁸ No technological devices will change fundamentally this enduring feature of war.

Finally, there is the role of the operational commander. As the person who must plan, organize, direct, and control the transition from deterrence to defense, he is critical. The example of a painter with a blank sheet of canvas is usually applied to him, but the parallel of a composer of a symphony and a conductor of the orchestra is perhaps more appropriate. A composer writing a symphony has a blank sheet of paper, but he must remain within the theoretical bounds of what a symphony is. Practically, he must also have the skills of a conductor. He must know what he is trying to do -- leading an orchestra to perform the best it can -- knowing the capabilities and limitation of each of the sections: brass, woodwinds, percussion, etc. At each point, he uses these capabilities to the maximum effect he is trying to create.

The air component commander at the operational level fills both

roles. He writes the plan and conducts the forces under his control to greatest effect. To do that, he must understand the theory of war as well as the practical aspects such as capabilities and limitations, strengths and vulnerabilities, both friendly and enemy. His key task is to attack the opponent's center of gravity by exploiting his opponent's vulnerabilities, yet protect his center of gravity at the same time. To do this, he needs two things: 1) genius and 2) the proper tools of war as well as the in-depth knowledge of what those tools can do.

Competitive Strategies represents a step in improving the tools that an operational commander has at his disposal. However, to use those tools effectively, a number of additional requirements still must be met. These include developing the tools in the first place, identifying their optimum use, writing the doctrine for their employment, and providing for their sustainment. But most of all, the operational commander must understand where the products of the Competitive Strategies process fit into his requirements and overall concept of operations. In these areas, we still have much work to do.¹⁰⁹

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17. For examples with DoD, See A.W. Marshall, "Competitive Strategies -- History and Background," U.S. Department of Defense, Directorate for Freedom of Information and Security Review, 3 March 1988; and G. Murphy Donovan, Lt Col, USAF, "Military Vulnerabilities: Why We Ignore Them," Strategic Review 16 (Summer 1988): 41. In terms of applying the "strength or vulnerabilities" principle in military operations, both the U.S. Air Force in Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force and the U.S. Army in Field Manual 100-5 explicitly recognize and state the principle: the Air Force as the principle of war (maneuver), and the Army as an AirLand Battle Imperative. A cursory examination of strategic/military theory, strategic contests between nations, and economies/business will unearth numerous examples of the principle.

18. Jon England, "The Doctrine of Competitive Strategies," Strategic Review 15 (Summer 1987), 64.

19. Department of Defense, "Competitive Strategies Primer," 8.

20. A.W. Marshall, "Competitive Strategies -- History and Background," 2.

21. Department of Defense, "Department of Defense Competitive Strategies Fact Sheet," (Washington D.C.: Office of the Secretary of Defense, Competitive Strategies Office), 1.

22. A.W. Marshall "Competitive Strategies -- History and Background," 3.

23. Quoted in John M. Halliday, "Tactical Dispersal of Fighter Aircraft: Risk, Uncertainty and Policy Recommendations," (Rand Note, RAND Corp. 1987), 44-45.

24. Department of Defense, "Competitive Strategies" Briefing, 12-14.

25. Christopher N. Donnelly, "Soviet Operational Concepts in the 1980s," in Strengthening Conventional Deterrence in Europe: Proposals for the 1980s, American Academy of Arts and Sciences (New York: St. Martin's Press, 1983), 108.

26. This is the method by which the Soviets would seek to achieve strategic end while lessening the risk of NATO escalation to nuclear weapons.

27. Graham H. Turbiville, Jr., "Theatre-Strategic Operations: Evolving Soviet Assessments," Military Review 68 (December 1988), 28.

28. Ibid, 29.

29. Department of the Army, U.S. Army Field Artillery School, "Deep Battle," Briefing, Ft. Sill, OK, 15 June 1988.

30. John G. Hines and Phillip A. Petersen, "Is NATO Thinking Too Small? A Comparison of Command Structures." International Defense Review 13 (May 1986): 566. For an additional discussion of Soviet air organization and forces, see Joseph E. Noble, Maj, USMC, "Air Component Commander -- Is the Concept Viable?" Student Monograph, U.S. Army School of Advanced Military Studies, 1989.

31. D.L. Smith and A.L. Meier, "Ogarkov's Revolution-- Soviet Military Doctrine for the 1990s," International Defense Review, June 1987, 870.

32. Successfully accomplishing modern combat operations, in fact, requires integrating both land and air into a unified, coherent whole, the effects of which are synergistic in nature. The Soviets have clearly recognized this imperative, and have taken the appropriate steps to implement it organizationally. To counter the effects of integration, a defending force must, likewise, be integrated, lest it be defeated piecemeal. L.D. Holder, Col, USA, "Catching Up With Operational Art," (Ft. Leavenworth, KS.: School of Advanced Military Studies, 1989). For an in-depth discussion of this point, see Richard L. McCabe, Maj, USA, "The Nature of Modern Warfare; Decisive Points in the Third Dimension," Student Monograph, U.S. Army School of Advanced Military Studies, 1989.

33. Department of the Army, Field Artillery School "Deep Battle" Briefing.

34. Department of the Defense, Report of the Secretary of Defense, Frank C. Carlucci, to the Congress on the FY 1990-1991 Biennial Budget AND FY 1990-1994 Defense Programs (Washington D.C.: U.S. Government Printing Office, 1989), 117. For an in-depth discussion of the specifics of the method and process at the classified level see Bonder, et. al., "U.S. Army Science Board Ad Hoc Subgroup Briefing.

35. Department of the Army, Field Artillery School, "Deep Battle"; Phillip A. Petersen and John R. Clark, Maj, USAF, "Soviet Air and Antiair Operations," Air University Review 36 (March-April 1985): 40. For an historic perspective on the development of Soviet "Tactical Aviation," See Jacob W. Kipp, "Soviet 'Tactical' Aviation in the Postwar Period: Technological Change, Organizational Innovation, and Doctrinal Continuity," Airpower Journal 2 (Spring 1988): 8.27.

36. Kipp, "Soviet 'Tactical' Aviation," 24-25.

37. Petersen and Clark, "Soviet Air and Antiair Operations," 52; Joerg Bahnenmann, Maj Gen, GAF, "Air Defence in Central Europe," NATO's Sixteen Nations 30 (December 1985): 40-41.

38. Petersen and Clark, "Soviet Air and Antiair Operations," 42.

39. Petersen and Clark, "Soviet Air and Antiair Operations," 42-46; Department of the Army, Field Manual 100-2-1 The Soviet Army: Operations and Tactics (Washington D.C.: Headquarters, Department of the Army, 1987), 12-1.

40. Dennis L. Cole, Lt Col, USAF, "A Conceptual Design for Modeling the Air War in Central Europe" (Research Report, U.S. Army War College 1982), 22.

41. Department of the Army, Field Manual 100-2-1, 12-1.

42. Professor James L. Schneider, Theoretical Paper No. 3. The Theory of Operational Art. 2nd Revision (Ft. Leavenworth, KS.: School of Advanced Military Studies, 1988) pp.6-7, has defined these three domains. At the risk of oversimplifying the definitions, the physical domain is concerned with the whole process of destructic : the effects of weapons and munitions, terrain, weather, logistics, and other physical factors that affect the battle. The cybernetic domain is generally concerned with the command, control, communications, information, and organization of forces. The moral domain is concerned with the disintegration and breakdown of will, which is the engine of all action. Morale can be viewed as the magnitude of will within any army. Leadership plays a particularly critical role, especially at the tactical level, in sustaining and revitalizing morale. While there are separate domains, they can and do interact with and upon one another.

43. Bonder, et. al., "U.S. Army Science Board Ad Hoc Subgroup Briefing," 9.1T.

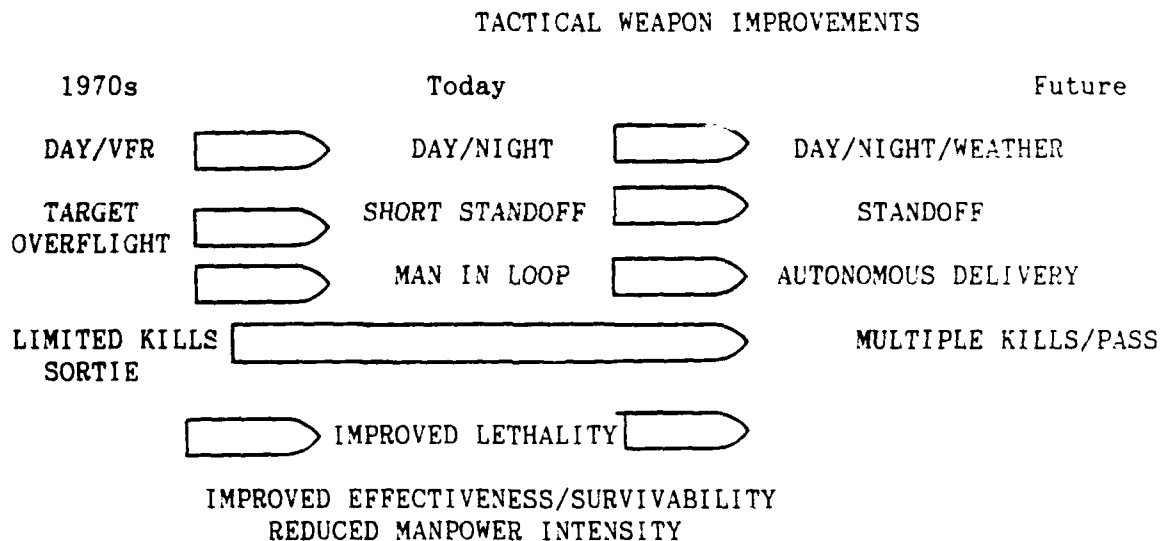
44. John G. Hines, Lt Col, USA, and George F. Kraus, Jr., Cdr, USN, "Soviet Strategies for Military Competition," Parameters 16 (Autumn 1986): 28.

45. American Academy of Arts and Science, Strengthening Conventional Deterrence in Europe: Proposals for the 1980s. (New York: St. Martin's Press, 1983): 18.
46. Ibid., 182.
47. John D. Marocco, "Pentagon Officials to Push Ahead on Competitive Strategies Doctrine," Aviation Week & Space Technology, 3 October 1988, 23.
48. Department of Defense, Report of the Secretary of Defense, Frank C. Carlucci to the Congress on the Amended FY 1988/FY1989 Biennial Budget (Washington, D.C.: US Government Printing Office, 1988), 117.
49. R.A. Mason, AVM, RAF. "The Decade of Opportunity: Air Power in the 1990s," Airpower Journal 1 (Fall 1987): 10.
50. Wayne M. Hall, Maj, USA. "Training to Focus Combat Power," Military Review 68 (March 1988): 72.
51. Cookerly, David H., Lt Col, USAF, "Unmanned Vehicles to Support the Tactical War" (Research Report, Air War College, 1988), 9-10; Julian Lake, "The F-117A Fighter," Defense Science 8 (January 1989): 25.
52. Cole, "Modeling the Air War," 47.
53. J.R. Walker, AVM, RAF,, "Air Power: Present and Future," RUSI Journal 131 (June 1986): 20.
54. Halliday, "Tactical Dispersion," 44-45.
55. David R. Mets, Lt. Col, USAF (Ret), "What If It Works? Air Armament Technology for Deep Attack," Military Review 66 (December 1986): 16; Ian H. Halliday, "Tactical Dispersal of Fighter Aircraft," 20; Department of Defense, Soviet Military Power: An Assessment of the Threat 1988 (Washington, D.C.: U.S. Government Printing Office, 1988), 91; Robert M. Chapman, Maj, USAF, "Technology, Air Power and the Modern Theatre Battlefield," Airpower Journal 2 (Summer 1988): 47. This is, of course, not to express or imply that NATO's airpower is not its Achilles Heel, or that it does not have vulnerabilities. Clearly it does. For a cogent discussion of the threat to NATO's airbases and corrective measures underway or proposed, see Low Nordeen, "Air Base Survivability -- A Threat to NATO Airpower," National Defense 73 (September 1988): 31-34; and Price T. Bingham, Lt. Col, USAF, "Operational Art and Aircraft Runway Requirements," Marine Corps Gazette, January 1989, 20.21.
56. Another example serves to illustrate the point further. During the Vietnam War, the U.S. flew 872 sorties against

the Than Hoa Bridge in North Vietnam, losing 11 aircraft. On 27 April 1973, eight sorties, using laser guided munitions destroyed the bridge, with no aircraft lost. Paul F. Gorman, Gen, USA (Ret) "What the High Technology Edge Means," Defense 83 (June 1983): 22-27.

57. Perry M. Smith, Maj Gen, USAF, Ret., "Air Battle 2000 in the NATO Alliance: Exploiting Conceptual and Technological Advances," Airpower Journal 1 (Winter 1987-1988): 5.

58. This figure is a composite example drawn from two separate sources: Henry Rowen, "New Weapons Technologies and East-West Security in the 1980s," in The Art and Practice of Military Strategy, ed. George Edward Thibault (Washington, D.C.: National Defense University, 1984), 521; and Department of Defense "A Department of Defense Competitive Strategies Primer," (Washington, D.C.; Office of the Secretary of Defense, Competitive Strategies Office), 6. The evolution in Tactical air weapons delivery capability is shown below:



Source: Edgar Ulsamer, "The Vast Potential of Tactical Technology," Air Force Magazine, April 1987, 55.

59. John G. Roos and Benjamin F. Schemmer, "Revolution in NATO's Conventional Defense Looms from 'Competitive Strategies' Initiative," Armed Forces Journal International, October 1988, 114.

60. Harry Zubkoff and John Englund, "Competitive Strategies," Defense Science & Electronics 6 (October 1987): 63.

61. Englund, "The Doctrine of Competitive Strategies," 66.

62. Department of Defense, "Arms Control and Competitive Strategies -- Information Memorandum," Office of the Secretary of Defense, Competitive Strategies Office, Washington, D.C. 10 May 1988, 1.

63. Roos and Schemmer, "Revolution Looms from Competitive Strategies," 114. For the type and level of sophistication possible in a theatre wide command and control system, see Glenn W. Goodman, "New NATO Air Command and Control System Moves Toward Implementation," Armed Forces Journal International, December 1988, 88 and K.G. Benz, "ACCS: A C² System for NATO's Air Forces in Europe," International Defense Review, November 1984, 1635-1642.

64. Cole, "Modeling The Air War," 36.

65. Speech by Charles L. Donnelly, Jr., Gen, USAF, Commander, Allied Air Forces Central Europe, to the Air Force Institute of Technology, 1 August 1985. Cited in Clifford R. Krieger, "Fighting the Air War: A Wing Commander's Perspective," Airpower Journal 1 (Summer 1987): 22.

66. See Holder, "Catching Up on Operational Art," and Mark Curley, Maj, USA, "Forward Area Defense Operations," Research Report, Air Command & Staff College 1988. Enhancements to sensor software, guidance system, and warheads of Patriot can also provide a defense capability against Soviet tactical ballistic missiles (TBMs). As the Patriot system would, itself, be a target for TBMs used as a defense-suppressor weapons before an attack, a self-defense capability at a minimum would protect a key element of NATO's a defense capability. The cost for this latter capability has been estimated at less then \$20,000 per missile. Ian B. Cuthbertson, The Anti-Tactical Ballistic Missile System and European Security, Occasional Paper Series 7, Institute for East-West Security Studies (Boulder, Co.: Westview Press, 1988), 57. The Anti-Tactical Ballistic Missile (ATBM) debate within NATO is one in which there is a wide divergence of opinion over virtually every aspect. On one side of the debate are Manfred Woner, "A Missile Defense for NATO Europe," Strategic Review 14 (Winter 1986): 13-20; U.S. Senator Pete (sic) Wilson, "A Missile Defense for NATO: We Must Respond to the Challenge," Strategic Review 14 (Spring 1986): 9-15; and Jacob W. Kipp, "Soviet Tactical Aviation," 24. Dr. Kipp, citing Kerry L. Hines, "Soviet Short Range Ballistic Missiles: Now a Conventional Deep-Strike Mission," International Defense Review, December 1985, 1909-1914, writes that "...the rocket forces have been equipped with a new generation of conventional warheads that will allow them to attack stationary targets with an effect similar to that of tactical nuclear weapons of a generation ago." The 1987 and 1988 edition of the U.S. Defense

Department's Soviet Military Power provide the following data on Soviet shorter-range missiles.

USSR Shorter Range Missiles

SYSTEM	RANGE KM	DEPLOYMENT LEVEL	NUMBER DEPLOYED
FROG-7	70	Division	500
SS-21	100	Division	140
SS-1 SCUD-B	300	Army/Frost	600

Department of Defense, Soviet Military Power 1987 (Washington, D.C.: U.S. Government Printing Office, 1988), 42 and Department of Defense Soviet Military Power: An Assessment of the Threat 1988, 54-55.

67. William L. Kirk, Gen, USAF, "After the INF," Air Force Magazine, April 1989, 54.

68. Julian Lake, "The F-117A Fighter," Defense Science 8 (January 1989): 24.

69. Cookerly, "Unmanned Vehicles to Support the Tactical War." 1, 9, 15-21, 25. This research report is particularly useful for information on UAVs. For additional data, see Sheldon B. Herskovitz, "Planes without People; Progress in Payloads," Journal of Electronic Defense 11 (June 1988): 39-50; and Seven Shaker, "Unmanned Air Vehicles," Journal of Defense & Diplomacy 5 (September 1988): 71-76.

70. John T. Correll, "Back Through the Wringer," Air Force Magazine, April 1989, 34-39; William L. Kirk, Gen USAF, "After the INF," Air Force Magazine, April 1989, 54. For a discussion of the problems (and solutions to those problems) in high air attack, see Mike Witt, "Night Air Attack," Military Technology, April 1987, 22-33.

71. Department of Defense, "Secdef Report on Amended FY 1988/FY 1989 Biennial Budget", 117. For an historically based study of airfield attacks, see B.L. Blustone and J.F. Peak, Air Superiority and Airfield Attack: Lessons from History, McLean, Va: BDM Corporation, 1984. This study addresses the 1939 Polish Campaign (1939, Battle of Britain (1940), Operation Bodenplatte (1945), Soviet experience, Operation Pointblank, Korea (1950-1953), Suez (1956), Six Day War (1967) and Yom Kippur (1973).

72. Carl von Clausewitz, On War ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 77.

73. "Robust" means that a course of action is taken so that neither its development, implementation, or operational effectiveness is likely to be affected by future contingent events -- a situation which rarely occurs in practice.

"Versatile" means that it is designed so that its future development, implementation, and/or operational effectiveness can be affected by future contingent events, but accordingly is designed to adapt to them when and if they occur. Bonder, et.al., "US Army Defense Science Board Ad Hoc Subgroup," 6.1T.

74. Department of Defense, Soviet Military Power, 10; Christopher N. Donnelly, "The Development of Soviet Military Doctrine," International Defense Review, December 1986, 1589.

75. William E. Odom, Lt. Gen., USA (Ret), "Soviet Military Doctrine," Foreign Affairs 67 (Winter 1988/89): 119.

76. Donovan. "Military Vulnerabilities," 40.

77. Odom, "Soviet Military Doctrine," 118-119.

78. Armed Forces Journal International, "Soviet Concern About Strategies of Rivalry." Armed Forces Journal International, October 1988, 120.

79. In Phillip A. Petersen, "The Modernization of the Soviet Armed Forces," NATO's Sixteen Nations 31 (July 1986): 38.

80. Odom, "Soviet Military Doctrine," 127.

81. Jacob Kipp, "Soviet Military Doctrine and Conventional Arms Control," Military Review 68 (December 1988): 16.

82. Englund., "Competitive Strategies," 66.

83. Kipp, "Soviet Military Doctrine and Conventional Arms Control," 13.

84. Ibid., 14.

85. James H. Hansen, "Countering NATO's New Weapons: Soviet Concepts for War in Europe," International Defense Review, November 1989, 1617.

86. Christopher N. Donnelly, "Soviet Operational Concepts in the 1980s," in Strengthening Conventional Deterrence in Europe: Proposals for the 1990s. American Academy of Arts and Sciences (New York St. Martin's Press), 110.

87. Hansen, "Countering NATO's New Weapons," 1617.

88. For three such statements see Makhmut Gareyev, "The Revised Soviet Military Doctrine," Bulletin of the Atomic Scientists, December 1988, 30-34, and "Soviet Military Doctrine: Current and Future Developments," RUSI Journal 133 (Winter 1988): 5-10. For discussions of the meaning of them, see Phillip A. Petersen and Notra Trulock III, "Origins and Implications," Strategic Review 16 (Summer 1988): 9-24; and Leon Goure, "Reality or Mirage," Strategic Review 16 (Summer 1988): 25-33.

89. Christopher N. Donnelly, "Future Soviet Military Policy Part 2: Where and How," International Defense Review, January 1989, 145.

90. Odom, "Soviet Military Doctrine," 130.

91. Military Technology, "Conventional Forces in Europe - A NATO Analysis," Military Technology, February 1989, 48-54; Phillip A. Karber, "The Military Impact of the Gorbachev Reductions," Armed Forces Journal International, January 1989, 54-64.

92. Department of Defense, Report of the Secretary of Defense, Frank C. Carlucci, to the Congress on the FY 1990/FY 1991 Biennial Budget and FY 1990-94 Defense Programs (Washington, D.C.: U.S. Government Printing Office, 1989), 13-19.

93. Steve Zaloga, "The Soviet Antidotes to NATO Tactical Air," Armed Forces Journal International January 1989, 26-28. Nor, it should be noted, does this cover the deployment of advanced fighter-interceptors.

94. James J. Schneider, "V.K. Triandafillov, Military Theorist," Journal of Soviet Military Studies 1 (September 1988): 285-306.

95. D.L. Smith and A.L. Meier, "Ogarkov's Revolution -- Soviet Military Doctrine for the 1990s," International Defense Review, June 1987, 871.

96. Tim Carrington, "Some Pentagon Hands Push a New Strategy Reflecting War Game," Wall Street Journal, 20 December 1988, A.7.

97. Stanley P. Siefke, Maj, USAF, "The Soviet Stealth Fighter: Check or Checkmate? Research Report, Air Command and Staff College, 1988, 21-23; Renato Contin, "M.G-29: A New Step in the Mirror Policy," Military Technology, April 1987, 122-129; for a very useful exposition of the Soviet "military industrial complex and its capabilities, see George T. Wade, Col, USAF, Soviet Research and Development and the Military Industrial Compels," Research Report, Air War College, 1988.

98. Davis, "Competitive Strategies," 11.
99. Englund, "Competitive Strategies," 66-69.
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101. Carrington, "Some Pentagon Hands Push a New Strategy," 1.
102. Clausewitz, On War,
103. Paul K. Davis, "The Role of Uncertainty in Assessing the NATO-Central Region Balance," RAND Paper, RAND Corp, 1988.
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106. Chapman, "Technology, Air Power, and the Modern Theatre Battlefield," 49-50.
107. Clausewitz, On War, 119
108. Department of the Air Force, Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force (Washington, D.C.: Headquarters, United States Air Force), 2-9, 2-10.
109. See especially Smith, "Air Battle 2000 in the NATO Alliance" for a particularly useful exposition of sense of the problems -- and recommended solutions on this area.

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