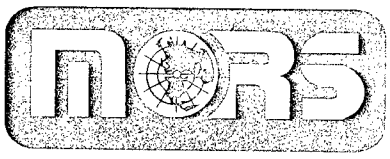
# Military Operations Research Society



## Mini-Symposium

# OPERATIONAL ART and ANALYSIS

# (OPARTAN)

Clayton J. Thomas, FS - Chair

National Defense University

6 - 9 March 1990

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*E-mail: rwiles@dgis.dtic.dla.mil*

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*This Military Operations Research Society Mini-Symposium report faithfully summarizes the proceedings of that meeting. While it is not generally intended to be a comprehensive treatise on the subject, it does reflect the major concerns, insights, thoughts, and directions of the authors at the time of the symposium.*

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This proceedings is from the Mini-Symposium on Operational Art and Analysis (OPARTAN) held at the National Defense University, Washington, DC, 6-9 March 1990.

The objective of the Mini-Symposium was to begin to help military operations research analysts "work the operational art problem." The purposes were to (1) enhance the analytic community's understanding of current and past thinking, both here and abroad, on operational art and its relationship to strategy and tactics; (2) enhance the analytic community's understanding of its role in working "the operational art problem," including what has been, and should be done to design and apply useful games, models and simulations.

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# Military Operations Research Society



Mini-Symposium

## OPERATIONAL ART and ANALYSIS

## (OPARTAN)

Clayton J. Thomas, FS - Chair

National Defense University

6 - 9 March 1990

*101 S. Whiting Street • Suite 202 • Alexandria, VA 22304-3483 • (703)-751-7290 • FAX (703)-751-8171*
*E-mail: rwiles@dgis.dtic.dla.mil*

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# Executive Summary

Clayton J Thomas, FS Air Force Studies and Analyses Agency

# Operational Art and Analysis
## (OPARTAN)
## Executive Summary

**Introduction**

OPARTAN responded to a challenge to the analytical community from Lt Gen B.C. Hosmer, USAF, "to work the operational art problem." His article in *PHALANX* (Vol 21, No 3), "Operational Art: The Importance of the Operational Level of War," urged the importance of the operational level that links the lower tactical level to the higher strategic level of war. Tactics are designed to win battles; operations are designed to win campaigns; and strategy is designed to win wars.

Gen Hosmer's concern is that parts of the military community and the supporting analytical community ". . . have been so absorbed working the problem of understanding and improving tactical engagements, we may have lost sight of the importance of operational art . . . The issue is NOT how does a new weapon system change the tactical effectiveness of the force, but rather: How does it allow the CINC to change the concept of operations to more effectively accomplish the mission."

The Air Force, the Army, and the Joint Staff Sponsors of MORS picked up this challenge and became proponents of the OPARTAN Mini-symposium, which MORS endorsed. As chair and co-chairs it selected Mr. Clayton Thomas, Col John A. Warden, USAF, Dr. John Battilega, SAIC, Mr. Eugene Visco, US Army MISMA, and Mr. Peter Byrne, Joint Staff (J-8).

To begin to meet Gen Hosmer's challenge, OPARTAN had two main objectives: first *to sensitize the analytical community to operational art and its importance*, and second, *to sample the potential of games, models, and simulations to support analysis at the operational level.*

To attack these objectives, some 75 OPARTAN participants converged on National Defense University (NDU), 6-9 March 1990--a mixture of "operational artists" and "apprentices." To welcome them were Ms Mary Pace of MORS, VADM Baldwin, President, NDU, as host, and Maj Gen Harrison, ACS SA, HQ USAF, on behalf of MORS' sponsors and OPARTAN proponents.

**The Keynotes**

Each of the four days of OPARTAN began with a Keynote, to underline important fundamentals. Four distinguished generals agreed to give the Keynotes:

LtGen B.C. Hosmer, then The Inspector General, HQ USAF, reviewed the study he had commissioned as President, NDU, which had formed the basis of his PHALANX article that inspired OPARTAN. That study compares the impact of improvements at the tactical level with that of improvements at the operational level. It shows the necessity of attaining a certain threshold of tactical strength below which no amount of operational art can salvage the situation. Above that tactical threshold, however, the leverage is more and more with operational art--the commander's operational level concept for using his tactical assets. In acquiring weapons, therefore, it is most important to choose those that will permit operational commanders to design around them powerful concepts of operations. This then becomes a key point for analysts as they develop and apply their tools--games, models, and simulations.

Gen John Vogt, USAF, retired, is the only individual to have commanded all USAF forces in both the Pacific and European theaters. He drew on his experience which ranged from World War II through command of the famous Linebacker I and II air campaigns in Vietnam, to identify several key factors for military success: a sound strategy for attaining national objectives, an effective plan supported at the highest level of government, and suitable delegation of authority to operational commanders. He foresees future conflict as posing challenges to commanders much like those of conflicts in which we were engaged in the three decades preceding OPARTAN.

Gen William DePuy, USA, retired, had combat experience in both World War II and Vietnam, was the principal author of the Army's Field Manual

100-5 on overall doctrine for combat operations, and was the first commander of the Training and Doctrine Command. He now sees an important trend in the declining number of our divisions on line in Europe from some 200 in World War I, and about 75 in World War II, to 22 in NATO before CFE -- the exploration of cuts in Conventional Forces in Europe. This decline, combined with the declining density of troops in recent conflicts in other parts of the world, has led him to observe that "linear warfare may be on the way out." In the future, the Army may need to use surveillance and reconnaissance systems to know where to go to concentrate and fight, thus emulating its sister services: the Navy, unable to fill the ocean with ships, and the Air Force, unable to fill the skies with planes, have previously relied extensively on surveillance and reconnaissance systems.

Maj Gen E. B. Atkeson, USA, retired, was known to OPARTAN participants both as a former commander of the Army's Concepts Analysis Agency, and as author of the recent *The Final Argument of Kings* quoted in OPARTAN's call for papers. He emphasizes the challenges that alliance and coalition warfare pose to operational art. As cautionary illustration, he notes some of the problems that NATO's forces would have faced in seeking effective communication and coordination. The basic problems included the fragmented and rigid ("layer-cake") assignment of troops of different nations to zones along the West German border. Thus in building future alliances we should be sure to design for effective operational command.

**Papers on the US Perspective**

Col Warden chaired this session, and also gave an overview of the "levels" of war as an OPARTAN luncheon speaker. These proceedings include the followiing papers from this session:

*The Logic of Operational Art*, Samuel B. Gardiner, Col USAF (Ret)

*Operational Art: An Airman's Perspective*, Lt Col Price T. Bingham, The Air University

*Centers of Gravity--The Key to Success in War*, Col John A. Warden III, HQ USAF

*Operational Art from the Top Down Instead of the Bottom Up*, Michael J. Morin, Col, USA (Ret), US Army War College

Gardiner's *The Logic of Operational Art* develops the three logics of war--tactics, operational art, and strategy--as a framework for understanding the perspective of operational art. His mind-expanding paper is a good introduction that also merits repeated reading for deeper insights.

Bingham's *Operational Art: An Airman's Perspective* translates the concepts of operational art into specific implications for combat in the aerospace environment.

Warden's *Centers of Gravity--The Key to Success in War* gives us a recipe for thinking our way through the often bewildering number of enemy systems and potential target sets to see what is operationally significant. He conceptualizes the vital strengths of a nation and its military organization as concentric circles: At the most important central core is the *command ring*, and then, moving to the outer rings, *essential production, the transportation network, the population,* and *the fielded military forces.*

Morin's *Operational Art from the Top Down Instead of the Bottom Up* gives an appreciation of the origins and differences of the Services's doctrines bearing on the operational level, and thoughts on the development of joint doctrine.

Each of these authors gives us unique insights into operational art. As we integrate them, we acquire deeper understanding of how to view war from this perspective.

**Papers on the Soviet (Non-US) Perspective**

Dr. Battilega chaired this session and gave a luncheon address on the horizons and future of operational art. Though papers on other "non-US" perspectives were welcome at OPARTAN, only the Soviet perspective appeared in offered papers, a reflection of recent emphases in US military analysis.

These proceedings include the following papers from that session:

*The Soviet Approach to Operational Art*, Garrett R. Fonda, SAIC

*Soviet Naval Operational Art,* Prof Russel H.S. Stolfi, presented by Capt Thomas Grassey, both of the Naval Postgraduate School

*Soviet Operational-Level Troop Control,* Lauren D. Kohn, SAIC

*The Evolution of Soviet Operational Art: The Significance of Strategic Defense in a Premeditated Defense in the Conduct of Theater-Strategic Operations,* Dr. Jacob W. Kipp, Soviet Army Studies Office, Ft Leavenworth, KS

*Recent Changes in Soviet Operational Art: Sources and Directions,* John T. Banks, SAIC

Fonda's paper introduces the subject of Soviet operational art with a discussion of their overall approach and how it is manifested in the Front operation, the basic Soviet combined arms operation of land warfare.

Stolfi's paper discusses the Soviet approach to naval operations, using as a conceptual example requirements for a campaign in the North Atlantic/-Norwegian Sea/Scandinavia in a war between the Warsaw Pact and NATO.

Kohn's paper concludes the introductory triad with a discussion of the Soviet approach to wartime command and control at the operational level.

Following this introduction to Soviet operational art, Kipp's paper discusses the new Soviet doctrine and its implications for Soviet operational art in the future.

Bank's paper concludes the set with a discussion of recent changes in Soviet operational art as they relate to technology and Soviet concepts of current requirements for warfare.

Each of the papers individually gives an interesting glimpse into Soviet thinking on operational art. Collectively, they open our horizons to a beginning appreciation of the elaborate conceptual structure of Soviet military analysis.

**Papers on the Historical Perspective**

Mr. Visco chaired this session, which is represented in the proceedings by the following papers:

*Operational Art Anthology,* Col Michael Krause, US Army Center for Military History

*Gettysburg and Gettysburg and the Operational Art,* Col Art Grant, National War College

*Thinking About Warfare,* Lt Gen Philip D. Shutler, USMC(Ret), SYSCON Corporation, abstract by Mr. Eugene Visco, Session Chair

*Master of the Operational Art: General Kenney's Early Campaigns,* LtCol Charles M Westenhoff, The Air University

*Iraqi Power and US Security Interests in the Middle East,* LtCol Douglas V. Johnson and Dr. Stephen C. Pelletiere, US Army War College

In his paper, Col Krause describes an anthology then in progress. He gives its outline, authors, and conceptual framework. The latter uses as basic concepts *objectives, theater setting, concept of operations, intelligence, deception, maneuver, operational fires, reserves, logistical functions,* and *command.*

Gen Shutler also introduces a framework for combat categorization. He distinguishes five locational regimes and four aspects of combat, thus deriving 5 x 4 = 20 pairs or "blocks." An attacking force may be in any of 5 regimes, and its "target" in any of the 20 blocks, so that there are 5 x 20 = 100 distinguishable "modes" of combat. Gen Shutler extends the framework by defining subclasses of modes, and a concept of "combat shield." In his full paper, he illustrates his framework with the historical examples of French experience in WW I, the Rabaul campaign in WW II, and Israeli cross-canal operations in the 1973 war.

The other three papers in this session focus on specific military examples as interpreted in terms of operational art. The first two examples involve the U.S. Civil War and World War II when the term "operational art" was not prominent in the U.S. military lexicon. The basic concepts, however, are as old as military genius, and recalling examples from

several wars helps to deepen our appreciation of the concepts.

Col Grant reconstructs the events leading up to Gettysburg, and a few "non-events" that "should" have occurred. His perspective is that of operational art, which implies a focus on the entire campaign. His paper explains how it was that the campaign led to Gettysburg, and, how, given more "artful" operations, it "might" have led elsewhere.

Lt Col Westenhoff similarly gives an excellent reconstruction of the past, in his case the early World War II campaigns of General Kenney, as seen with the perspective of operational art. In this case he has a success story to tell as he recounts the exploits of a master who may be the "patron saint" of Air Force operational artists.

The final paper by Lt Col Johnson and Dr. Pelletiere puts campaigns of the Iran-Iraq War into an operational-level perspective. It concludes that Iraq's achievement in forcing Iran to accept a truce represents an authentic victory, and that the victory was attained because the Iraqis planned and successfully executed large scale military operations while shrewdly managing their resources.

Mr. Visco notes that though his session contains the papers labelled as taking an historical perspective, some papers in other sessions also give interesting historical examples. He goes on to add a word of caution about the inferences we draw from such examples. Because historical events are sometimes very dramatic, we may be tempted to see in them parallels to current events and even guides to decision. Visco recalls the techniques that Richard E. Neustadt and Ernest R. May give in *Thinking in Time: The Uses of History for Decision Making* to help us determine the applicability of an historical event to a specific present or future problem.

**Papers on Models. Games, Simulations, and Analysis**

Mr. Byrne chaired this session, which is represented in the proceedings by the following papers:

*Tactical Fighter Force Planning Analyses--The Two Things Wrong and How to Fix Them*, W. Leon Goodson, B/Gen, USAF (Ret), STR Corp

*Limited and Focused Operational Level Campaign Planning Against Fuel,* Maj Edward J. Felker, HQ USAF

*Ground Force Casualtv Patterns--The Empirical Evidence,* George W.S. Kuhn, Logistics Management Institute

*A Bilateral US-Canadian Response to the Threat of Soviet Attack in Norwav,* Lt Col Adolph Carlson, US Army War College Fellow

*Command and Control in the RAND Strategy Assessment Svstem (RSAS),* Dr. Paul K Davis and Mr. Robert D. Howe, The RAND Corporation

*Air Campaign Games: Direction and Decision Aids for Commanders,* Edward P Jordan, Frontier Technology, Inc.

*War Gaming with Graphics*, Zaven C. der Boghossian, CACI Products Co

*Wargaming in Support of Operational Art and Analysis,* Lt Col Alan Dunham (USAF), DARPA

These papers exhibit a great variety of aims and approaches. They include, collectively, both the discussion of tools with a potential for studies and analyses that seek to illuminate the operational level, and some actual studies/analyses with operational level implications. The tools themselves also illustrate a variety of approaches, some more purely analytic that center about models and simulations, and some more in the spirit of war gaming that seeks to capture the creativity of the human mind by using human players.

Despite their variety, the papers have in common a concern with the *operational* level. This implies a concern with longer time scales and higher order measures of effectiveness than those typical of the more immediate *tactical* level. Thus the models and simulations intended for use at the higher operational level must meaningfully represent the appropriately longer time periods and higher level measures of effectiveness, and the war gaming approaches must be structured so that their play will represent operations and decision making over campaign-length periods and yield the appropriate measures of effectiveness. Techniques that facilitate the rapid and/or suitably realistic play of games may thus

contribute to the use of games for operational level investigations.

Dr. Goodson, in a paper near the analytic end of the spectrum, urges the use of a "top down" approach to tactical fighter force planning analyses, and a collection of models that centers about the use of multi-stage, zero-sum, twoperson games. His approach incorporates the menu of options into the analytic models and represents decisions via game-theoretic optimization. His paper gives an unclassified application to illustrate the approach.

Maj Felker gives a "sanitized" unclassified study to illustrate focused *operational level* campaign planning. A notional BLUE force commander seeks to inhibit or slow a breakthrough of notional opposing ORANGE forces by mounting a campaign of concentrated attack of ORANGE fuel stores.

An executive summary of a long report by Dr. Kuhn shows statistics of casualty rates that give empirical evidence of quantitative differences between battles and campaigns. Incidentally, his data give no evidence that "casualty rates *for a given situation* have increased significantly, if at all, since World War II."

Lt Col Carlson uses operational level historical-political analysis to address the NATO problem of Norwegian defense that arose in 1987 when Canada shifted some units from such a defense to other NATO uses. He suggests and explores bilateral U.S.-Canadian initiatives that would provide a Norwegian defense.

Dr. Davis and Mr. Howe describe use of the RAND Strategy Assessment System (RSAS) for operational level campaign analysis. In most applications, RSAS uses expert systems and analytic war plans as surrogates for human players.

The other three papers of this session describe techniques that may be used in many applications to enhance or extend war gaming (and some apply also to simulations). Mr. Jordan urges the use of microcomputers, coupled with techniques used in commercial war games, to obtain fast running, micro-computer hosted games for applications that range from training to decision aiding. Mr. der Boghossian advocates the use of graphics in displays of simulations and war game computer assist programs to ease user assimilation of information, and gives numerous examples to illustrate that a picture is indeed worth many words or lines of numbers. Lt Col Dunham describes the use of interactive and distributed war gaming, gives the example of the ACE89 exercise, notes advantages and disadvantages of war gaming, and suggests some ways to attain the advantages with fewer disadvantages.

Using as a sample the papers offered in this OPARTAN session, one may draw two conclusions: First, studies and analyses at the operational level, while not as numerous as we would like, do in fact exist. Second, there are many promising techniques for models, games, and simulations to enhance the performance of studies and analyses at the operational level.

**Wrap-Up**

OPARTAN had two main objectives: First, to alert analysts to the importance of Lt Gen Hosmer's challenge "to work the operational art problem," and second, to sample illustrative studies/analyses and techniques that might help analysts to meet that challenge. Although the basic challenge "to work the operational art problem" will remain of importance to the analytic community for a long time to come, OPARTAN did make important contributions through its successful attack on the two main objectives.

The attack on the *first* objective began with the planning of OPARTAN and issuing the announcement and call for papers. That in itself made many analysts aware of the concept of "operational art" and of Lt Gen Hosmer's PHALANX article. The some 75 active participants in OPARTAN had in its three and a half days more intense involvement. Some of that experience has already spread to other analysts through personal contact. In addition, summary reports of OPARTAN appeared in PHALANX (June 1990) and in the Proceedings of the 58th MORS Symposium. With the publication of these OPARTAN Proceedings, the papers are available to the analytic community.

OPARTAN attacked the second objective with its papers giving examples of studies and analyses at the operational level or its papers on techniques that can enhance the use of models, simulations, and games at that level. The primary contribution to this second objective comes, of course, from the eight papers of

the fourth main paper segment, though model builders and game designers should derive value from concepts and examples in other papers as well. The eight "core" papers exhibit great variety, but they have in common a focus on the "operational" or "campaign" level, either by giving results useful at that level or by giving techniques with promise for improving the tools to be used in studies and analyses at that level.

Any thinking at the "operational level," whatever its analytic component, requires a perspective that transcends the tactical or battle level. Many of the OPARTAN papers remind us of the traps that beset our efforts to acquire that higher operational perspective. Operational commanders must resist excessive focus on the individual battle. Analysts must resist undue focus on the lower level measure of effectiveness or the battle model.

Commanders and analysts alike have been warned before of the traps. In his book on airpower, Gen William Momyer has reminded airmen that "airpower can win battles, or it can win wars. All commanders since Pyrrhus have been tempted at one time or another to confuse the two, but few distinctions in war are more important." In similar vein, Dr. Charles Hitch in his paper on sub-optimization long ago reminded analysts that "The operations researcher will do most of his effective work on low level problems. But he will do better work if he studies and bears in mind the characteristics of the optimization at the appropriate higher level, and the relation to it of his sub-optimizing criteria."

OPARTAN should help us see, and perhaps elude, some of the traps.

# Keynotes

# KEYNOTE

## GENERAL HOSMER

What I plan to do today is simply walk through a refined version of what was laid out for this group a couple of years ago, the concept of which is drawn from the *MORS* article. I will update that slightly with some observations, and then see how it goes from there. I would also tell you that the responsibility to do this task has weighed as heavily on my wife as it did on me. This morning she said she had a dream last night, or nightmare might be closer. "I dreamed that you and a French and German acquaintance of ours were on a MORS Symposium in eastern Europe, and there was a local counter-insurrection., the bad guys were back in charge." "Oh," I said, by now I'm in my granola, "what happened?" She said, "Well you got caught. You guys were up to the things you do and you got caught; and the three of you were in front of the judge and you had all been declared guilty. You were going to meet your executioner, and he asked if you wanted one last wish." The Frenchman said, "Yes, or course, I would like a state banquet dinner. Then the judge turned to you (she said to me) and said, "What do you want?" She said in my dream I said, "I'd like to make one last speech about the operational level of war." I said "Yes that makes sense and then what?" "Well," she said, "the judge turned to our German friend and asked if he wanted anything." He said, "Yes, I do have a wish, please shoot me before Hosmer gives his speech."

Let's start the slides.

### Background

**"THUS, WHAT IS OF SUPREME IMPORTANCE IN WAR IS TO ATTACK THE ENEMY'S STRATEGY."**

**SUN TZU**

**Slide 1**

Sun Tzu captured the core of what we are talking about, when we deal with the operational level of war. (Slide 1) The interplay between the commanders on opposing sides, is captured as well in that 2600-year-old statement as anywhere in print. What Sun Tsu referred to as strategy, can really be called operational concept, or commander's concept, or operational level of war. I use all those terms roughly interchangeably.

**ROAD MAP**

- **OPERATIONAL EXCELLENCE VS TACTICAL EXCELLENCE:**

  **WHERE IS THE PRIORITY?**

- **IMPLICATIONS:**

  1. **WHY BUY "WIDGETS?"**
  2. **HOW DO WE IMPROVE THE SYSTEM?**

**Slide 2**

When we first asked what mattered about this topic, one of the answers came up as the issue of equipment. (Slide 2) How you decide what systems to buy to go to war? If you believe the operational level is important, does that suggest different answers about what you should buy? How do you make a decision about which of two choices is correct? It seemed at first glance that if operational level excellence is important it should have bearing on acquisition decisions.

**ROAD MAP**

- **OPERATIONAL EXCELLENCE VS TACTICAL EXCELLENCE**

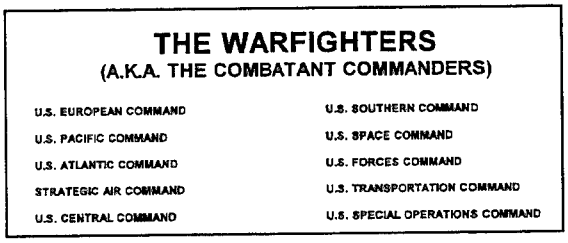
  **WHERE IS THE PRIORITY?**

- **IMPLICATIONS:**

  1. **HOW WE PREPARE OR PLAN TO FIGHT**
  2. **HOW WE INTEGRATE OPERATIONAL CAPABILITIES**
  3. **HOW WE CAN IMPROVE THE PROCESS**

**Slide 3**

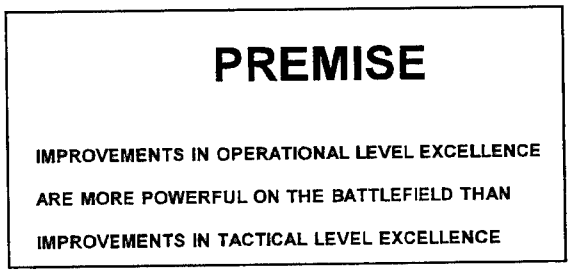
Some other implications became evident as we walked down the road. Things like, how do you prepare to fight? How do you get your leadership ready to do that combat task which is most important? How do you integrate operational capabilities? (Slide 3) There are some others. I'll talk to these later, but as you think about it, the implications go way beyond the first question of what you buy to go to war.




Slide 4

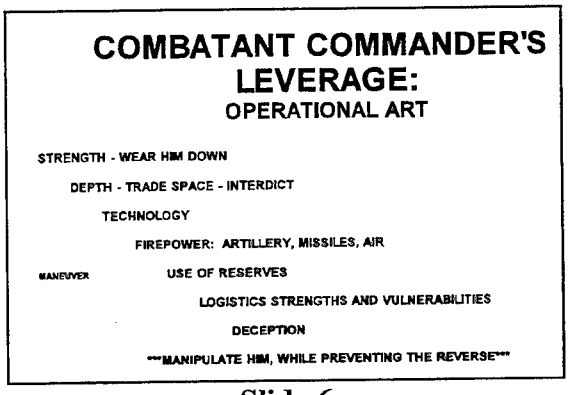
Just to keep everybody oriented, we will talk about whose operational concept matters. These are the war fighters. (Slide 4) These are some of the commanders who we call combatant commanders. Joint task force commanders may also qualify.

As you know, the use of the term "operational" can be very confusing. That term is used in different senses. By operational, I mean a separate theater of combat operations. In most circumstances, Operational Level Warfare is organized at theater level by these Joint commanders. This is not universally true, but this tends to be what we mean. With the crumbling of the Berlin wall that generalization may also crumble. The future will probably hold smaller, discrete or isolated military actions where an approach based on the operational level will dominate the outcome. As many have pointed out, size is not what makes a conflict operational.



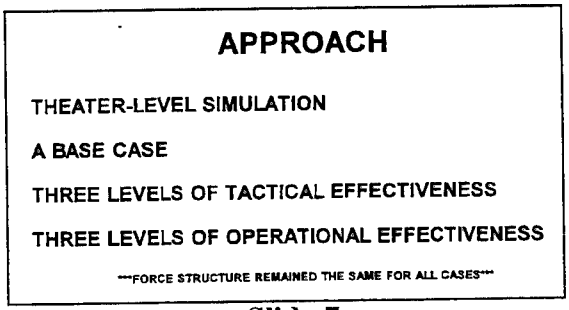

Slide 5

As we examined this issue, we tried to formulate clearly whether or not you can distinguish between leverage on the battlefield at the tactical level and leverage at the operational level. So the premise we tried to test was: Improvements in operational level excellence will be more valuable on the battlefield that improvements in tactical level excellence.(Slide 5)




Slide 6

What we were trying to test, what we were reacting to, was the way in which students at the National Defense University discover how to use some of these tools during advanced seminars in theater warfare.(Slide 6) When allowed to replay a theater campaign over and over--against an able, interactive opponent--students (National War College and Industrial College Students) discovered by trial and error that the way these operational-level tools were used affected the outcome powerfully. The classic literature is fairly rich in discussing these fields. You'll also notice the word maneuver up there. That's a refinement that became more and more obvious as we went down the road. Maneuver or motion or momentum is also involved in the way in which great commanders use all those tools.



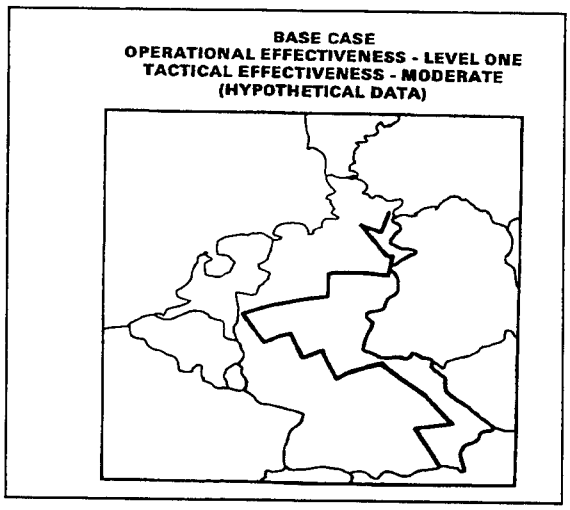

Slide 7

## The Test

The approach that we took in trying to test the premise, (Slide 7), was: (1) use an interactive theater-level simulation, (2) devise a base case, (3) using the base case, test two additional levels of operational effectiveness and two additional levels of tactical effectiveness for a total of three each.

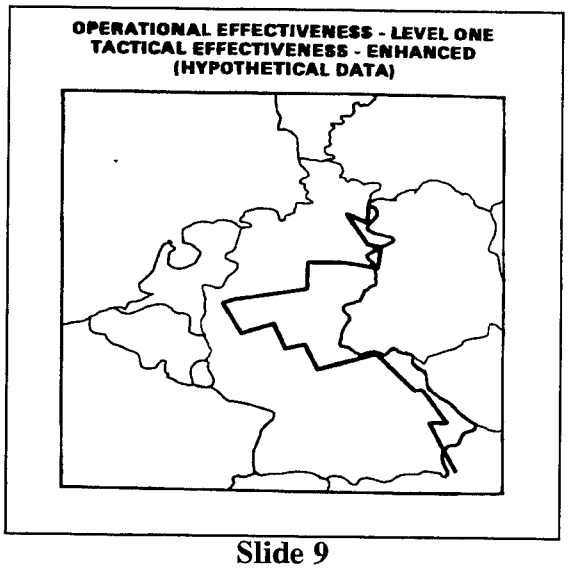
In case of tactical effectiveness, we turned the knobs both up and down. What we tried to do was select a level of tactical effectiveness about 25% larger than the base case and one about 25% smaller.

In the case of operational effectiveness, we tried initially to look at only one level of operational effectiveness greater than the base case. Having done that, the results looked so interesting we decided to test yet another level above that. So there are a total of three levels, one up and one plus one. In all cases, it was an honest comparison using identical starting conditions. What we were trying to do was use a simulation in a legitimate way. We were just making A to B comparisons, holding fixed all of the entering conditions. Force structures are the same, etc. We were attempting to make valid comparisons, changing only the variables you see here.



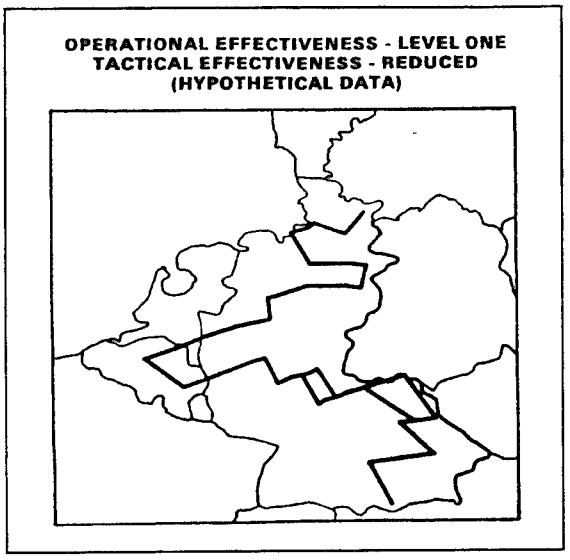

**Slide 8**

One should be clear that this was not the most elaborate or a sophisticated test one could make of the premise. It was the best we could do with the simulation we had and the time available. It was done on hip pocket time, in addition to everybody else's normal work. This was not primarily a line duty for anyone except that I asked those involved to do it. It was difficult too. The scenario you'll recognize here (Slide 8) involves a classic NATO vs Warsaw Pact war across the inter-German border. The line is what the border looks like after 10 days of a Goliath versus Goliath contest in central Europe. I won't go into detail about the force structures and all that is involved because that turns the chart classified. I will simply say it is a typical Goliath versus Goliath battle using a reasonable set of assumptions. The assumptions assume unusual prescience and determination at the political level in getting the NATO side postured for the fight. We took that as the base case in making these comparisons.



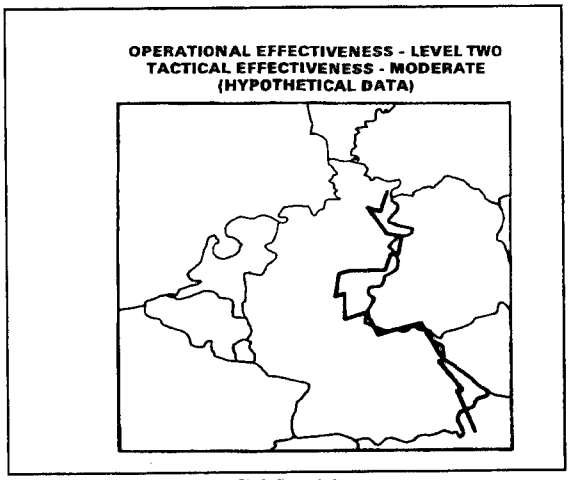

**Slide 9**

Starting with Slide 9, the graphics will repeat the base case battle front (dotted line) and then keep comparing it to the variations that we ran. Each front line represents 10 days into the battle with the same starting conditions. The only difference will be the particular variable tested in that case. The first case (Slide 9) tested enhanced tactical effectiveness, and you will note there is an improvement, the front line has not moved so far west. Not a big gain, but there is a difference. This war was played out with the same decisions and the same timing at the operational level as the base case. The only change was that all those volume knobs that described tactical effectiveness at the small unit level were raised about 25%.




**Slide 10**

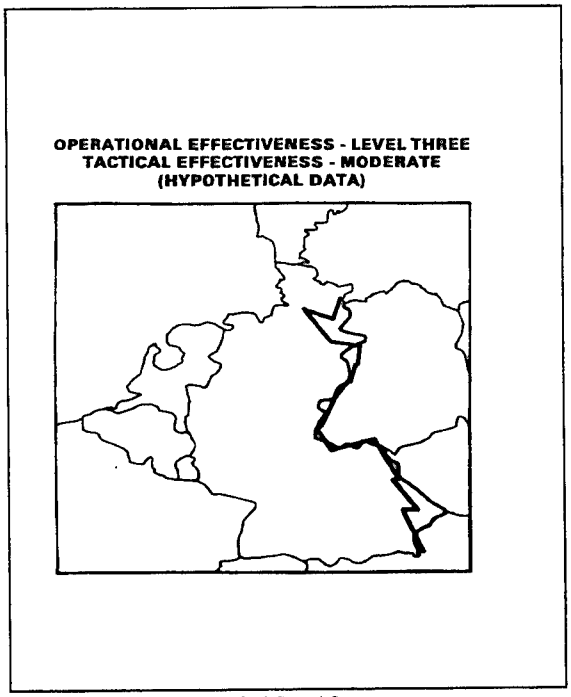
The next comparison, case two (Slide 10), is the reverse. This has tactical effectiveness reduced. As you see,the effect is much more dramatic. If you take account of some other iterations which are not shown here, the conclusion implied by these first two comparisons, is roughly speaking, valid. An increase in effectiveness at the tactical level doesn't yield much to the theater campaign. But, if you reduce tactical effectiveness the same amount, you get a considerable loss in the effect of the theater campaign. Lesson is: Given today's military posture, a modest reduction in tactical effectiveness can be a critical loss. However, adding tactical effectiveness doesn't gain a great deal.




**Slide 11**

Now in case three we take tactical effectiveness back to base case level and add the first increment of an increase in operational level effectiveness. (Slide 11) Most people, seeing this the first time say, "Gee whiz, tell me exactly what you did." I am not going to do that. This is simply a test of concept. To tell you exactly what led to these results implies confidence that the specific operational moves we used would be right in some real situation. I don't have that confidence. All this says to me is that working at an operational level has a powerful impact. The particulars have to do with reinforcement time, use of air, etc., etc. In my opinion, the precise details are not that significant.

When we got to this point, I asked the project team to explore further. I said all right, see what you can do if you really turn up the wick, get ambitious at the operational level and do some unorthodox things, perhaps break down some of those internal barriers and long-standing conventions on the alliance side.




**Slide 12**

The results give us case four showing the third level of operational effectiveness, which looks like this.(Slide 12) At this point, I have to remind you the forces were the same, the starting conditions were the same. We kept it straight, an honest case

versus case comparison. The key difference are decisions made at the operational level and how you fight the force.

There is another difference that is enlightening when you consider the implications. Trying to improve your tactical level effectiveness by 25% is not cheap. It costs like hell. It's new equipment, it's much more training, it's a lot of things that you pay for. On the other hand, improving your operational-level effectiveness in the fashion that was done for these comparisons is a question of making different decisions. Granted, to implement some of those decisions may have required training before hand. I don't want to make too bold a statement, but essentially improving operational-level effectiveness as in case four (Slide 12) is a matter of different decisions.

One further point: Operational-level deception featured in this fourth case. I would like to reinforce a point that I heard made earlier that I believe to be is absolutely fundamental. In fact, I'd use this almost as a litmus test. If you are a new commander, at the operational-level, and you want to make a quick judgment as to whether the plans on the books qualify as operational-level plans, in my opinion the first thing you look at is whether operational deception is built into the basic conception of the plans. If it's not, the plan doesn't qualify. I think this is so fundamental that if your deception activities are paste-ons, tricks, or after the fact addenda, you don't really have an operational-level plan.

## Findings

The test obviously led us to conclude that operational-level excellence is in fact more powerful than tactical, and we can begin to look at implications. Restated: The power of the commander's operational concept -- the concept- around which he designs his campaigns -- begins to look like a critical factor in battlefield success. It may be *the* critical factor.

## Implications and Analysis

At this point, organizations that rely on analysis of combat for their existence begin to get uneasy. They are uneasy because military commander's judgment has just re-entered the equation, and we don't know how to write algorithms that portray military judgment. But, if what we have said so far has merit, you can't come to grips analytically with what works at the operational level without finding some way to come to grips with military judgment; that is, with the operations concepts the commander uses to construct his campaign.

Of course, we must keep in mind that you can't forget tactical competence. If tactical level competence drops off significantly, you cannot salvage the battle. There is another set of runs that I didn't show you of situations in which tactical effectiveness was reduced and operational effectiveness was increased. We attempted to answer the question: If you slack off on the tactical excellence, can you salvage it with operational level brilliance? The basic answer to that question is no. You can ameliorate, soften the impact, but you can't save the battle.

## Acquisition

Now, the "So what," questions begin to occur. Let's see if I can elaborate any. Acquisition is a key question and an obvious key issue. I will simply summarize my own conclusions in this way. If our analysis is valid then one of the longest, if not the longest, levers that the commander brings to the battlefield is the most powerful operational concept that he can design, given the equipment, and people, and the situation he has to work with. If that is so, we have answered the question posed on Slide 2: Why buy widgets? I can't think of a stronger reason to chose one widget over another than that the one permits the operational commander to design and execute a far more powerful concept. I think that is the key issue.

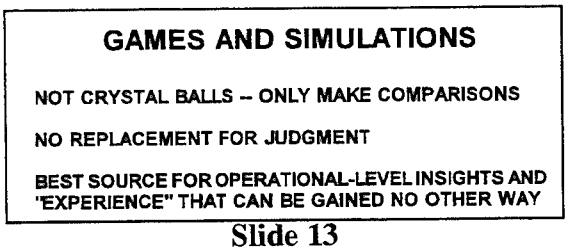
This premise seems worth pursuing, but we don't make a practice of such comparisons in the acquisition world today. Some of you may be involved in attempts to do it. But I know of no acquisition decisions based on a new system allowing a theater commander to build his campaign using different, more powerful concepts. However, that seems to be the key issue. In practice we discover the new concepts after the new system is fielded. GPS allowing the Hail Mary maneuver out of the trackless Iraqi desert is a good example.

One indication of such an approach would be changing scenarios in analytic comparisons. Typically, an analysis examining the merit of a proposed new weapon will compare it to present equipment by calculating the effectiveness of both in a given combat scenario. Such procedure misses

entirely what could be the most compelling support for the new system; that it makes possible a different scenario employing a different and more powerful operational concept -- a concept promising greater impact on the battle.

## Readiness

Other implications just blossom as you think about them. One I'd point out is military preparedness. What I'm really referring to is the ability of senior commanders and their staffs to draw on these concepts in formulating their campaign plans. Another one is arms control. You may reach different conclusions about what are rational arms control proposals, or how to respond to your opposite number's proposals -- if you consider the operational utility, instead of the tactical utility, of the remaining forces. The items that can be compromised and those that should not be negotiable, may be entirely different in the two different approaches.

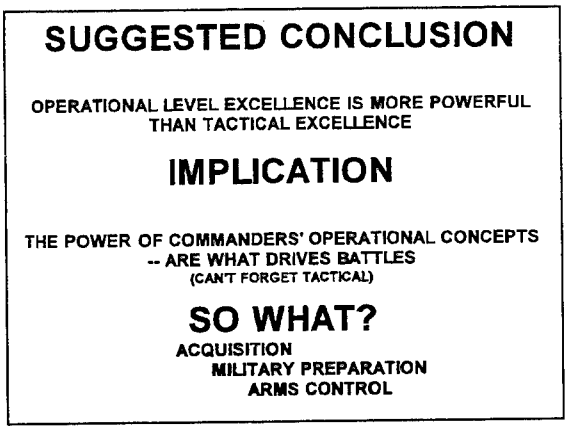



**Slide 13**

Since these conclusions are based on a simulation, I have to offer some qualifications (Slide 13). This audience shouldn't need it, but just for form I do need to point out that these simulations are not crystal balls. I am making no assertion at all that these front-line traces predict a precise truth. What I think they do is illustrate the impact of the different cases tested using the simulation. They are not a replacement for judgment. In fact, one general conclusion they support is that military judgment must have a larger role in these affairs than one could demonstrate before we did this work. The commander's concept of operation -- a pure example of military judgment -- appears to dominate the outcome.

Good historical study can tell us a great deal about how to use operational-level approaches in war effectively. Other possibilities also exist. In our NDU course on theater warfare, we took a small group of people and said, all right you are SACEUR. Here is your base case, i.e., your current plan and the opening results. If you don't like it, change it. Then we let them try different approaches until they improved the results. I think that procedure probably taught a good understanding of how to use operational level of war effectively -- because they found, by trial and error, that the classic operational level approaches work.

These students learned from a vicarious kind of experience. We live in an era in which free-play military exercises, those in which you actually let forces engage each other, for an extended campaign and without scripted results, rarely happen any more. Working with a simulation may become the only kind of operational-level experience that commanders can bring to the table when they need it.

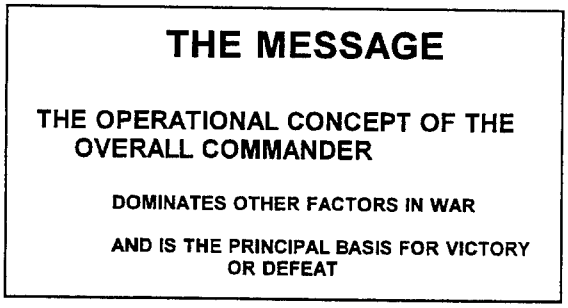



**Slide 14**

Slide 14 simply names some of the conclusions at this point. We have already discussed most of these. I think most of our senior officers are able to make use of the operational level of war if they are given some exposure to it. However, we stand here today after 30 years during which most of our senior military people have not had any exposure to the trial and error of making decisions at the operational level and seeing them work or not work. Further, they have had little exposure to the kind of simulation that lets you try an approach, then change concept and try again, and change again, with a reasonably quick turnaround. Most of our simulations are really fine grain -- detailed at the tactical level -- because we've paid so much attention to the fine-grain tactical results. Most officers, because of their close knowledge of tactical engagements,

instinctively go to details at the tactical level to explain what happened.

In the same way, we use an examination of tactical-level interactions -- at the small unit or airplane vs. airplane level -- to decide whether to buy this weapon or that sensor. Our whole structure is built to focus at the tactical level. With some exceptions, our officers have simply not been exposed to experience showing that there is something above the tactical level that really matters.




**Slide 15**

I know of no better way to summarize this presentation than to say the message is -- and my conviction at this point is -- that the operational concept, the campaign in the mind of the commander who approaches and frames the campaign, is what dominates other factors in war (Slide 15). This is the principal basis for victory or defeat.

## Epilogue

Time is short, so I'll offer a few points related that have emerged since we started. For one, skeptics abound. Many officers, including senior officers, believe that the operational level is simply an accumulation and aggregation of impacts and effectiveness at the tactical level.

Often Navy officers have difficulty with some of these concepts because the language doesn't match up with the traditional language used for a lot of maritime warfare. That troubled me until I realized that when we talk about classic maritime warfare, we are referring to control of access -- control of access and all of the military operational level actions that one might take to control access. Likewise, when we talk about classic continental warfare, what we're talking about is control of a physical place, or control of location.

When you say it that way, it becomes apparent that if you are dealing with an issue of control of access, all of the services play. You shed a lot of the classic labels which are associated with maritime warfare. Likewise, when the issue is control of location, again you can easily see how all services play. You don't lose Navy people when you are talking about control of location because they see the role that their capabilities have in that action and you don't lose Army people when you talk about control of access because Army people see the role that their capabilities can play in that action.

Another point: You here, and your colleagues everywhere, can have a very strong influence on understanding and use of the commander's operational concept. If you find a way to demonstrate the effect, at the operational level, of missile A vs. missile B, or the change in power of the operational concept that can be built around missile A vs. missile B -- believe me, that set of concepts will become well understood very quickly. In like fashion, if you produce operations analysis of military issues that invoke the commander's operational-level concept of operation, your work will have a powerful effect on the concepts that our senior decision makers use.

One last observation is that, despite the collapse of the Berlin wall, I don't think anything has changed about the power of the operational approach to a war campaign. The utility of an operational level approach in dealing with smaller contingencies will be no less important. In fact, the need to put theater command in the hands of those who have powerful concepts of operation, and who can apply them according to the circumstances, will only increase. This will become more important than it is today. We are likely to be dealing with situations which must be entered and resolved quickly. We won't be able to stop and methodically build a campaign plan over a long period, as we have in the last four decades (added: or Desert Storm).

# KEYNOTE

## GENERAL JOHN W. VOGT

It's a pleasure to be here this morning gentlemen. Rather than try to give you some very very erudite views on operational level warfighting, I thought I would go over my experiences in two wars and let you draw the lessons that fall out of what I have to say. This way you will get to hear a few war stories and hopefully you won't be overcome by a tendency to want to go to sleep. I am going to draw an analogy between WWII and the war in Vietnam to formulate the answer to a question that is so often asked of me by many people. "General, you were in two wars, one extremely successful, WWII, and Vietnam, where we lost. What the hell went wrong?" Why did this great power, the U.S., find itself humbled by a little nation which was completely outclassed. Why did a nation that could whip the mighty German armies find itself in defeat in Vietnam?

I'd like to start by running down for you the kind of planning that went into our involvement in the war in Europe in WWII. President Roosevelt, as early as 1941, realized that U.S. was about to become involved in the war against the axis powers. He asked the military what it would take to successfully prosecute that war and defeat the Germans. Elaborate planning began in the Planning Staffs of the three services to determine what would be needed in the way of material support for this massive undertaking. The airstaff of the army in those days went to work and determined that we were going to need at a minimum, 63,000 airplanes to do the job. The President said 63,000 airplanes seems like a lot but if you need it we'll do it. And, he put into motion a vast production program in the U.S. to produce the necessary war material. Not only airplanes, but tanks, guns, and everything else that was required. You'll forgive me if my bias today and my emphasis is on air since that is primarily the area in which I have been operating in my military career, although I've had lot of joint service as you undoubtedly know.

Even before we were involved in the war, American and British military staffs at the very highest level met to mark out the grand strategy for winning the war. This was the American-British Conference Number I held in February of 1941. That strategy basically said we will have a defensive operation in the Far East. We'll have an offensive operation in Europe and we'll start with a sustained air offensive against the German military establishment, not only the military structure itself, but the industrial base that supported it. Following our entry into the war, the Casa Blanca Conference of January '43, drew up plans for a combined air offensive for the destruction of the German military and industrial complex. It also approved the adoption of a plan to undermine the morale of the German people. This combined bombing plan, which was to involve daylight bombing by the US Air Force and night operations by the Royal Air Force, was designed to put maximum pressure on the German military machine and population on a 24-hour basis. The master plan called for a year's softening-up operation by the use of strategic attacks against the heartland of Germany, to be followed, if necessary, by an invasion of the continent itself. The entire planning effort of the military was directed toward this plan and its success.

In January of 1943, I went to Europe as a pilot in the 56th Fighter Group. This was the first P-47 group to enter operations, providing cover for the B-17 bombers that were flying the daylight raids into Germany. The B-17 was encountering fierce resistance by the German air force and the need for fighter cover was urgent. The P-47 had been designed to fly at high altitudes to escort the bombers deep into Germany. Its high altitude capability stemmed from a turbine system which supercharged the engine and, presumably, gave it superiority over the German air force at the very high levels at which it would operate. Typically, the B-17s were going in at 20,000 or 25,000 feet. An airplane providing top cover had to be above them by several thousand feet and the man who had the highest fighter perch would dominate the air battle. For a year, we conducted this military campaign into the heartland of Germany. We ran into some tactical surprises. First, the superiority which we thought we had at high altitudes with the P47 was erased one day when five thousand feet above our high cover at 35,000 there appeared a Luftwaffe squadron which turned out to be flying Messerschmitt 109G models with a pressurized cockpit, and a two-stage blower that gave it superb

performance at high altitudes. And, we suddenly found ourselves in a position of no longer occupying the top perch. I was a squadron commander by this time, and I gathered the staff around me and said, "Gentlemen, what do we do in a situation like this where we now have an airplane that can outperform us in our regime?" Republic aviation representatives (the company that built the Thunderbolt) happened to be at the meeting. What could we do to once again make this airplane the superior fighter overnight? And, as we sat there talking, we came up with a plan to lighten the weight of the airplane by taking out four of its eight machine guns, stripping other elements of the airplane that we found to be nonessential, and by boosting the manifold pressure of the engine up to the redline levels and beyond. It turned out there was a safety factor of some 15% cranked into the manifold pressure safety margins in the airplane. We upped the manifold pressure levels, managed to get our hands on some higher octane fuel and, overnight, created the Superbolt. Now you may wonder how a squadron commander can take an airplane apart, exceed redline placards, and arbitrarily blast off into the blue. Do you know what would happen today to a squadron commander or wing commander, or even an air force commander who fiddled with specs on a U.S. fighter? He'd find himself court-martialed. But, the operational needs of combat were apparent and we did it and we created what we called the Superbolt, an airplane that vastly outperformed the 109G. In addition, we found new long-range capability in the aircraft because it could carry less external tanks, thus reducing drag. We suddenly found ourselves once more in command of the air and resumed our 10 to 1 shoot-down ratio over the Luftwaffe. I cite this little example because what I want to demonstrate to you is that sometimes the operational level merges with the tactical level in an unexpected way. A whole air campaign can go down the drain because of something that has developed at the tactical level which is countering your master plan with either superior weapons, or new tactics. What we had as commanders in WWII was great flexibility, the ability to fiddle with specifications, do what we had to do to stay on top.

The air campaign in Europe proceeded according to plan. Some say not decisively. The bombing survey after the war said, "Well, you know you didn't completely destroy German industry. You didn't destroy the production of German airplanes to the point where they were no longer able to fight!" True, but we crippled their war machine enough, so that when the invasion finally came, they no longer had the operational edge to defeat us. That use of air power before the invasion with its constant pounding of the ball bearing plants, and the transportation systems, as well as factories and electrical generation capacity, exacted a heavy price from the Germans. Early in 1944, the decision was made to invade the continent, secure in the knowledge that we would dominate the air over the battlefield.

Preliminary operations stressed the importance of insuring air superiority. We started first with a major attack on German aircraft factories in an effort to reduce the capability of the German air force to a minimum for the day when the invasion would begin. In one week, for example, during February of 1944, we sent 8,150 bombers against German aircraft factories. The Luftwaffe lost over 642 fighters in that one week of operations trying to defend those factories. So, not only were we crushing the production of German fighters, but we were wiping them out in the air. Two months before the actual invasion itself, we began a tactical air campaign in preparation for the actual landing. Ninety-nine rail centers in France, Germany, and in the Low Lands, were attacked on a daily basis. We bombed and strafed all the airfields within 130 miles of the possible landing zones, and we began to soften up all the coastal defenses, starting all the way from the Belgian coast down into southern France. In this two-month campaign, over 167,000 tons of bombs were dropped. On D-Day itself, a master demonstration of operational planning at its best, a highly structured plan for aerial attack was put into motion. The evening before the actual landing on June 6th, the RAF moved in with heavy bombers and dropped 5,000 tons of bombs in the drop areas and attacked again at 6:30 the following morning with another 3,000 tons. These operations were conducted at night. At dawn, on the day of landings, 1,600 fighters were put into the air over the beachhead at Normandy, and I was privileged to lead my squadron in a pre-dawn takeoff and to sit on a perch 12,000 feet above the Normandy beaches and watch this beautiful operational plan unfold before me. Our mission was simple, keep any German air from getting into the area, do what you had to do to stop it, and see that German air did not interfere with the actual landings. In additon, we were carrying bombs which we would jettison, of course, if we had aerial engagements. But the bombs would be used, if we didn't have to

jettison them, for an hour's bombing mission following our appointed time on-station against any German forces moving into the beach areas. It is difficult now to envision the sheer mass of forces that were involved that day. There were 1,600 fighters in the air during an 8-hour period of the landing--literally blackening the sky with their presence. Today, we talk in terms of 100-200 sorties as being a large effort. That afternoon B-26s moved in, some 450 of them, and dropped 634 tons of bombs against German forces opposing us. Later in the afternoon, 594 heavy bombers, B-24s, came in dropping their loads. All-in-all, Allied air forces flew 7,106 sorties in one day in support of the landing at Normandy. A massive undertaking, and a vastly successful one! It paralyzed the German defense effort. The months of preparation had dwindled their air strength to less than 3,000 total airplanes, and it never grew beyond that point again. Only a fraction of them were available to get into this battle. Many were needed for the defense of the homeland. A handful showed up at the battle scene and caused virtually no attrition to our landing forces. Gentlemen, this was operational planning at its best! Our planning started with an attack against Germany's industrial base with no holds barred, and with an objective to achieve unconditional surrender of the enemy. This was something that everybody could understand and something everybody could work toward in a concerted way. And, our objective was achieved.

We had our setbacks, of course. I recall the Arnem-Nijmegen operations in Holland, where we tried to leapfrog into the North with U.S. and British airborne forces. We dropped the forces into the drop zones only to find, belatedly, that a German division had been sent up there for rest and recreation, and was parked in the area undetected by intelligence. Consequently, we were dropping into a drop zone that was immediately surrounded by an entire German mechanized unit. Our forces on the ground had to be resupplied each day. The drop areas were ringed. The flack became intense, and they called me one day to say my squadron had been given the honor of going in every day, twenty minutes before the resupply drop-time of the C-47s towing gliders. Our job was to soften up the defenses. A real dubious honor, believe me! We found ourselves flying at 200 to 500 feet trying to find German foxhole positions from which 20-mm and .30-calibre fire was coming. The area, of course, was confined by the limits of the drop zone, itself. Within two weeks, I had lost 50% of my squadron in those operations. Do you know what happens today to a man conducting a military operation which has loss rates involving 50% of his squadron in two weeks? Picture those figures in the Vietnam context. He'd be summoned to Washington to meet some sort of a board. Those days, it was expected. Attrition occurred, people understood it. The objective, which was total victory, made it worthwhile. Once again, as a measure of the magnitude of this WWII effort in the month of June 1944 during which the Normandy landings occurred Allied fighters flew a total of 70,000 sorties. Seventy thousand sorties in one month! Gives you some idea, gentlemen, of what massive air power, when applied properly can do to ensure the success of a tactical operation. Our ground forces were momentarily held up at St. Lo, as you recall, but we sent in heavy bombers, as well as fighters, later on in the month of June, and blasted a hole in the St. Lo defenses through which U.S. armor poured, and, thus, began the roll back of the German armies in Europe itself.

Now, I want to run through the Vietnam situation to draw some comparisons for you and show you the kinds of limitations that operational planners are faced with today in this era of enlightened warfare. You will recall that our involvement in Vietnam began way back in 1954 when the French were facing certain defeat at Dien Bien Phu. The U.S. military were concerned about what was going to happen if the French were defeated in this battle. You recall it involved French forces in an enclave position surrounded on all sides. The high ridges around the position were controlled by the enemy who were firing down into the French encampment areas, threatening to annihilate them. The French called for U.S. assistance. There was some talk of using an atomic bomb or two in the area. This was discounted. The idea didn't receive any support politically or militarily. I think it had been suggested originally by Admiral Radford who was Chairman of the Joint Chiefs at the time. But, there were other things that could have been done, including the use of air, to take out those offensive weapons in the higher ridges around Dien Bien Phu. But, before the President agreed to get involved in actual shooting he wanted certain assurances from the French that they would give eventual independence to the Vietnamese. I found myself part of a two-man delegation, a State Department man, Phil Bonsel, Assistant Secretary of State, Far Eastern Affairs, and myself, a lowly Lt. Colonel on the staff of the JCS working with the

NSC, to go talk to French about their intentions. Our message, which we carried to them, was very clear and simple. It came right from President Eisenhower. He said, "We will provide military support to save Dien Bien Phu if you agree to a timetable for granting complete independence to the Vietnamese." In essence, the French diplomats said "Why should we fight on for our colonies that are no longer going to be our colonies?" I talked to the French military and got the same reaction. What, kill more Frenchmen, just to turn it over to the Vietnamese, themselves? We came back and reported that to the President. The decision was made to let Dien Bien Phu fall which eventually occurred. The French sued for peace with the Paris accords, and Vietnam was divided. The United States found itself involved in a massive lift, moving over a million people from the north to the south, who didn't want to live under the communist regime. And, thus, began our long efforts through the years to preserve the southern part of that divided country. I'm not going to bore you with all the piecemeal interventions that occurred through the years, but the picture was one of increasing our involvement as the enemy threat mounted. We had no master plan. Each successive administration decided what minimum effort would be required to keep things from going down the drain, and ultimately, we found ourselves sucked into substantial involvement on the ground, and a substantial effort in the air, but always on a stop-gap, piecemeal basis. There simply was no plan for final victory or a decisive outcome.

The North Vietnamese, on the other hand, had a very clear plan. The objective was, of course, to unify the whole country under their control. No sooner had the accords been signed than they went to work undermining the south. They created the Viet Cong, the so-called South Vietnamese resistance movement. We have evidence now that demonstrates quite clearly that the Viet Cong structure originated in the north as part of the master planning of the North Vietnamese, themselves. They engineered the so-called uprising in the south and provided the major support. We fought a war in the bushes for a number of years, culminating, of course, in the Tet Offensive, when the American public began to lose its willingness to support the continued efforts in Vietnam. You will recall our bombing in the north from 1965 to 1968. These air operations against the North Vietnamese heartland were called Rolling Thunder. They were characterized by micromanagement from Washington with the President, The Secretary of State and the Secretary of Defense picking the targets on a weekly basis. In 1968, the President, convinced that our piecemeal efforts were not going to win, badgered by the press, and under intense pressure by liberal elements on the Hill, decided to go for a negotiated settlement. He called off the air war in the north, and began intense negotiations with the Vietnamese in Paris. The North Vietnamese took advantage of this respite from bombing to begin a massive effort with the help of the Chinese and the Russians to equip their armies to launch a largescale conventional invasion. The new tack called for abandoning the guerilla war and launching a conventional invasion against South Vietnam. So while we were seriously negotiating, they were working and preparing, and in March of 1972, they began the Easter Offensive against South Vietnam. I had been the J-3 of the JCS two years before this, and had been the Director of the Joint Staff at the time of the actual invasion, involved in all the planning by the JCS against the eventuality of an invasion. Our efforts to get a coherent policy hammered out across the river came to naught. There was always the hope expressed in many circles that the negotiations would be successful and that the north would agree to terms that would preserve the independence of the south. It was a dream. The north had no intentions of doing this. And, they launched the offensive in 1972, after two years of intense preparation. The character of the war changed dramatically at this point. The guerilla warfare had gone. What we had now was conventional warfare with enemy forces equipped with new weapons never before used in South Vietnam. The South Vietnamese forces hardest hit were in the Quang Tri area. I-Corps was devastated by the initial attacks. The T-54 tanks and 130-mm long-range artillery caused large casualties. One division in the I-Corps area broke and ran. Many of them deserted and the road seemed open to an easy North Vietnamese advance down the coast. In the II-Corps area, another North Vietnamese division was thrown in with the ultimate objective of taking Pleiku, the provincial capital. Down in the III-Corps area, they moved from the Cambodian border up the road toward Saigon.

The President called me into his office at that point, and said he had decided to send me down to become the air commander, and he wanted to have a confidential talk with me about what he hoped to achieve and what had to be done. There were only three of us in the room, the President, Henry

Kissinger and myself. The President said, "While we have been talking sincerely and hoping to achieve peace, these people have been planning behind our backs to take over the country militarily. They have launched an invasion. I do not intend to let them succeed. We will do everything in our power to see that South Vietnam does not fall." And then he said, "Of course, I have to honor my commitments to the Congress and the American public to get our ground forces out of there. I am going to continue to do that."

You will recall he had initiated the Vietnamization program, designed to convert the South Vietnamese armies into an effective fighting force that could fight alone. I said, "Mr. President, South Vietnam's forces are now faced with a greatly enhanced threat. Do you still intend to take out all U.S. ground combat support?" "That's right, he said, the job will have to be done with air and naval forces, and that's why I'm sending you down there. Tell me what you need, you'll get it. We'll send all the air power and naval power the situation requires, but the ground forces must come out. And, I don't want South Vietnam to fall." This was an operational challenge of some magnitude! Five hundred thousand U.S. forces had been in there before, and were unable to sway the balance in that in-country war. Now they were out of the combat, and the north was pouring in 13 divisions fully equipped by the Chinese and the Russians. They employed sophisticated weapons for the first time, such as Sagger anti-tank, wire-guided missiles, and Strella hand-held antiaircraft missiles. They were clearly aiming for a knockout blow! On that note, I went down there. In fact, the President said, "Get there immediately. I want you there in three days." This necessitated an aerial refueling of JCS alternate command post aircraft. When I got there, I found near-chaos. I went up to see the I-CORPS commander, General Trung. He said, "General Vogt, the situation is grim. I can't form a successful defense line. I have deserters in the rear. The enemy is moving in with heavy tanks. They have defeated us in a major tank engagement at Quang Tri, itself. I am being devastated by long-range weapons, 130-mm guns that they have in great numbers. I can't establish a defense line. I don't know what's going to happen, but within a matter of months, they will be marching on the city of Hue, itself." We began a massive air campaign in support of the South Vietnamese forces and for the first time that I am aware of in the war in Vietnam, an air commander was able to sit down with the ground commanders in the forward areas and plan the campaign for the next day. This was a unique opportunity because I no longer was limited to just an air advisory role. I was now the Deputy Commander of MACV, having replaced General Frederick Weyand, who became Commander, MACV, with General Abrams' departure. My responsibilities now covered both air and ground action, and I was able to go forward to work with the ground commanders. We began planning operations where the air came in at the prescribed time, at the right place, and with the right mix to support the day's operations by Vietnamese ground forces. And, I spent a great deal of my time flying back and forth between I-Corps and Saigon preparing these operations. They were dramatically successful. The massive doses of air that we put in there, B-52 and precision tactical air, both USAF and US Naval, decimated the enemy forces. We destroyed virtually all their 130mm guns. We confirmed, by photography, some 240 130-mm gun positions wiped out in this air campaign. Incidentally, we used laser-guided bombs to dig them out of their individual foxholes.

By October of that year, South Vietnamese forces were marching back into Quang Tri City. The three divisions of the North Vietnamese forces had been soundly whipped and were in full retreat. In the II-Corps area, similar applications of massive air had turned the tide there. The enemy initially achieved a dramatic advantage when they introduced the Sagger wire-guided missile against the 23rd Division armored forces who were equipped with M41 tanks and caused a complete routing of the whole division in the battle of Tan Kann. I flew up over the battle area and assessed the situation. We applied full air support, stopped the offensive, and a defensive line was reformed. South Vietnamese forces gradually moved back to take over the original positions at Tan Kann.

Another major battle was fought in the south at An Loc where the North Vietnamese coming in from Cambodia were traveling up the highway toward Saigon, itself. An Loc, completely surrounded by enemy forces, was kept alive for weeks by aerial resupply. Superb airmanship was displayed by our airmen flying the supplies in with C-130s, using low-altitude air delivery methods. They took heavy losses, but got the job done. Finally, by a decisive and devastating attack by B-52s on the enemy

positions around An Loc, the battle for An Loc was ended, spelling the defeat of the North Vietnamese forces and their attempt to move into Saigon.

By October of 1972, we saw a totally defeated North Vietnamese invading force. Their casualties had been extremely high. They were licking their wounds. They had withdrawn to remote areas. We were moving back north without difficulty. The Vietnamese commanders came to me and said, "General Vogt, can you get us authority to go beyond the DMZ? We can go all the way to Hanoi! There is only one division left in all of North Vietnam for the defense of the homeland. The rest have been defeated in the campaign in the south." Go on the offensive in Vietnam? What would Washington think of this proposition? We weren't there to achieve victory. We were there only to prevent the loss of South Vietnam.

At that point, Henry Kissinger arrived in Saigon and announced that peace was at hand. Negotiations in Paris had suddenly taken a turn for the better. The North Vietnamese were being very reasonable now. The U.S. terms were suddenly considerd reasonable. Dr. Kissinger said he was going to fly up to Hanoi to put the final ink on the paper that would end the war. And he sat down with us and reviewed the proposal that he had in his hand for ending the war. It was a reasonable proposal. It called for no further resupply of the North Vietnamese forces in the south other than maintenance of status quo. It provided for inspection of check points by international groups that would monitor the supplies coming into the country. If successfully implemented and enforced, the agreement would have dramatically limited the enemy's chances of ever achieving total victory in Vietnam. Then he said, "You know it's going to be difficult for Le Duc To, the man I am going to be negotiating with, to get this thing signed because of the hardliners in his own government unless we make some gestures. I am going to propose to the President that we stop all bombing in the north while they are considering peace terms. That will give Le Duc To some leverage with his hardliners and should lead to a signing of the paper." I said, "My God, Dr. Kissinger, you're not going to take the pressure off them before they sign are you?" He said, "This was necessary." That evening, he drafted a message to Washington urging the President to stop all bombing while these delicate negotiations were going on. The President bought the recommendation and the bombing stopped immediately. He didn't get to Hanoi, as planned, because some concerns were expressed in Washington about the turn of affairs, including a lack of support for the agreement by South Vietnam. He was called back to Washington.

We were no longer permitted to bomb in the north, but our reconnaissance, which still went on, showed in a matter of weeks a dramatic rebirth of their industry in the north. The Russians were flying in heavy equipment, landing it in Hanoi. The Chinese were pouring things in over the reopened railroads. In effect, with the bombing heat off them, they had reverted to their old plan of taking over South Vietnam.

After several months of this, the President realized the only way he was going to get them back to the negotiating table was by a massive dose of strategic air, and we began the Linebacker Two Operations. You recall this was an eleven-day campaign using B52s against essentially the same targets tactical air had hit previously and which were now being restored. We flew some 750 sorties against the north using the B-52s. Now, what was the primary use of the B-52s? Not to achieve the military objectives of the Linebacker One Operation which was to limit their ability to support the forces of the south. It was, in my judgment, an effort to apply massive psychological pressure against the regime to get them back to the negotiating table, and it worked! When it was demonstrated to them that we had the ability to move in massive air, and destroy at will virtually any target in Vietnam, they came back to the table and participated in the final negotiations which led to the signing of the cease-fire. While our POWs were being returned and combat in the south fell to very low levels, we had only succeeded in buying some time. We had signed a document which in a week was violated openly in the north. I sent back urgent messages reporting violations of the agreement. They were massively resupplying their forces in the south. The Ho Chi Minh Trail which was not to be used at all by the north, under the terms of the agreement, was now being used again with 300 vehicle convoys pouring down through Laos. I couldn't use a single airplane to attack them. They were preparing once again to take over South Vietnam. Finally, the Congress said no more bombing after the 15th of August 1973. We stopped all the bombing in Southeast Asia at that point, and at that instant, sealed the doom of the South Vietnamese. I came back to the JCS and reported the campaign was

under way for the final defeat of South Vietnam. The Corps commanders had all told me that another offensive was in preparation. They could see the enemy positions being prepared for the jump-off. The JCS said we are powerless to do anything. It's a political matter. Go see the State Department. I asked for a meeting with Dr. Kissinger and his people which was granted. I went over there. He didn't show up. His deputy, Ken Rush did, and all the pertinent assistant secretaries. I said, " Gentlemen, in a matter of months, South Vietnam will fall unless somebody has the guts to resume the air campaign in Vietnam." They ridiculed this. "We've signed a peace agreement. It's recognized internationally. Our ambassador in Saigon assures us that conditions have never been better than they are now. There's less and less territory each day under North Vietnamese control. The Viet Cong has disintegrated." They painted a totally different picture from what I was seeing as the senior military man on the scene. I said to them, "Gentlemen, let the record show that I have stated South Vietnam will fall in a matter of months unless U.S. air is reintroduced in massive doses." Well, it wasn't. The offensive came. It took longer than I thought it would. As you recall, by 1975 they had marched into Saigon and taken over the South.

Now, what I've told you today is history as I have seen it. There was brilliant planning in the European theatre and a dismal lack of good planning of our war efforts in Vietnam. An operational commander can only do so much. If he doesn't have a master plan, a strategic level plan, supported at the very highest levels of government, drawn up in a way which can be implemented, with the required resources thrown in to support it, defeat is certain. If the political will isn't there to support that master plan, defeat is certain. One thing you can be sure of is that in the future, military engagements will be more like Vietnam than WWII. It's a gentler world. You try not to hurt people when you fight wars. You do the least you can, not the most, to achieve a political objective. So the task for the operational planner of the future at the strategic and the operational, as well as the tactical level, is to come up with great flexibility in your planning and in the design of your forces so that you can go with the political winds that are blowing at the time and still, hopefully, achieve the national objectives as remote as they may be. Good luck in your efforts, gentlemen, because you're really going to need it to work in this environment.

Thank you very much.

Any questions?

Question 1 concerned the relation of allied bombing to countering the potential threat that German reserve forces constituted to the Allied beachhead early in the Normandy invasion.

Answer: Our forces certainly would have been jeopardized. We could have been pushed back into the water if the known German divisions in reserve had been able to get into position. I recall the Germans had positioned a crack armored division in south France, which if it had arrived on the scene in the first several days of the landings, would have caused the defeat of our efforts. So, we had to go all out in our efforts to see that nothing moved. Incidentally, that division that was stationed down in southern France at the end of the rail line wasn't held up because of United States bombing or RAF bombing. It was held up because of the actions of the French underground which was turned loose on the rail system. They did a magnificent job. We did prepare them for that work however. We began a number of drops with B-17's in support of their operations just prior to the invasion, so they had the explosives and the equipment to do that kind of job. That was part of the master plan. But, you are right. Every now and then, in our enthusiasm to achieve objective one, we jeopardize objective two. But there is no choice on the part of the man on the scene at the time. He's got to go and work the plan best for each objective and then hope that he can minimize the negative consequences as he goes along. It worked out. We finally caught up logistically on the ground too.

Question 2 concerned the command and control of our air forces in Vietnam.

Answer: You've got to look at the situation that actually existed at the time with regard to command and control in Vietnam. What we had, of course, was a commander, MAC-V, who had lost much of his leverage over the South Vietnamese forces when the last U.S. ground force quit the battle. There never was a combined staff. General Abrams had no command over the South Vietnamese forces, nor did General Weyand who took over later. He couldn't influence their master planning, their strategic, nor their tactical level planning any way other than to

offer advice. He found himself isolated. I discovered quickly that there was no master plan in South Vietnam for defeating the invasion. Each Corps commander reported directly to the President, not to the Joint General Staff of the SVN forces. They called up the President, and said "I want to do something," and he'd say "okay go ahead and do it." And, I discovered almost immediately that I was wasting my time going across town to the General Staff to find out where I ought to be working to provide air support, because they had no idea what was going to happen the next day. The Corps commander was busy out there with his own plans. I finally found the key to the support required by flying into the Corps areas on an almost daily basis, talking to the Corp commander, finding out what he thought he could do and couldn't do, in many cases suggesting to him what he ought to be doing, and then backing it up with something he understood. Air power would be there to ensure that he succeed. Now, General Trung who was the I-Corps commander, a very capable officer, grasped this immediately and he said you have authority to go out to the division commanders and talk to them any time you want to and work out with them plans for the utilization of American air. And, I in fact did. I found myself one day up at the front lines before Quang Tri with a Marine division commander, the First Marine Division which was in the cutting edge of the I-Corps forces, where we had a big discussion. I said how are you doing? "Oh, all this air support you're giving me is great, I have moved and moved and moved, but I am temporarily stopped." I said how come? He said, "Well, we tried to leap off yesterday morning after all that B-52 softening up you gave us but when we popped out of the fox-holes we were brought under intense artillery fire and it was very accurate." I asked why was it so accurate. He said, "Well, see those two water towers," and we looked through the glasses and there were two water towers. He said "They have observation posts in those water towers, and those observation posts are directing fire on us, and it is withering and we can't move. I said "Well, why didn't you call us, call Blue Chip and ask us to come in with some laser bombs? We could have knocked those towers out." He said, "Oh we tried, I had my U.S. air liaison officer make the request." He summoned this officer over, and he said, "Tell him, major, why you couldn't get air." The major said to me, "Well, general, I called up Blue Chip and I told them that we had two water towers we wanted taken out and the man on duty there said it wasn't cost effective to use laser bombs on water towers!" Now this man obviously had very good training in the Pentagon under the MacNamara regime and he knew what was cost effective. You don't use laser bombs on water towers! The fact that it was holding up a whole military campaign, stopping an advance, had no bearing. Well, I got on the phone immediately, ordered the attacks, and watched. And, two hours later those water towers disappeared. Piffew! Like that! And the marines moved. They came out of their holes and advanced to the objective for the day. By the way, with the use of air power effectively working with the local commander, we moved on up the line. MAC-V was commanding very little at this point. All his troops had been removed from combat. The South Vietnamese were working at the Corps levels directly with their own president. Air was the name of the game. Of course, Naval Air was a big part of this. We had carriers right off the coast. I coordinated with them carefully. The Naval Forces came in under the control of my forward air controllers for a large part of this campaign. I flew out to the carriers for discussions. Vice Admiral Hutch Cooper, the Task Force Seven commander who controlled the carriers, was in my headquarters frequently. He'd fly in from the carrier deck. We planned many campaigns together, including the destruction of all the power in North Vietnam during the Linebacker One operations. We agreed on the targets to be hit. Incidentally, I didn't have time to cover all this but Washington gave me for the first time, unlike Rolling Thunder, the authority to pick the targets on a daily basis, to hit what I wanted. For the first time we could conduct a campaign that made some sense tactically. In Rolling Thunder, the targets were picked in Washington by the President of the United States meeting with the Secretary of State, and the Secretary of Defense every Tuesday morning at breakfast. They'd select the targets for the next seven days of operation. That's how they were fighting the war. Why did they do it this way? Well, they wanted to nibble rather than to grab. They wanted to be subtle. They wanted to send messages. They wanted to do just enough to stave off defeat but not enough to win a decisive victory!

Question 3 concerned the relative roles in combat decisions of local commanders and remote higher headquarters.

Answer: Well, I think that you'll find that my record is clear on that. I've been, I think, in the forefront

over the years in trying to enhance the authority and the responsibilities of the theater commanders. I learned early on in my JCS experience that you can't run a war without combined operations planned at the highest level. The theater commander clearly is needed to orchestrate operations in his area. However, in the Vietnam war we did have a problem. The theater commander, CINCPAC, was rather remote from the war. Admiral Gaylor who was the CINC when I was in Vietnam frequently worked at cross purposes with what we were trying to accomplish in-country. This led to a great deal of frustration on the part of General Abrams. One example, is the use of B-52's. At one point, Admiral Gaylor decided after some talks with visiting Congressmen that it wasn't moral to use B-52's in Cambodia because of their destructive capability. He got on the kick of trying to stop B-52 operations. He started initially by saying that we ought to be able to do the job without B-52's.

B-52's were vital in the Cambodian war in the defense of Phnom Penh. He came down one day and said he was going to stop all B-52 use. I told him if he did, he'd face the loss of Phnom Penh within a few days. He nevertheless sent a message to Washington recommending to the JCS that he be given authority to stop all B-52 operations in Cambodia as of two or three days hence. I got a phone call from the Chairman of the Joint Chiefs, Admiral Moorer, via our secure satellite phone. He said, why in the hell did you agree with Gaylor that we ought to stop B-52 bombings? I said I never agreed. I worked all day to dissuade him. He said, well he's come in with this message and he implies that the all the commanders in the area agree. Well, Gaylor was forced to rescind the message. But here's a case where the theater commander is so remote from the actual combat operations, doesn't understand the tactical situation, doesn't realize the consequences of what he's talking about. So if his area becomes too vast and he's too far away and he's not in daily contact, he loses his ability to exercise good judgment. So some how, some way, the theater commanders must be prepared to delegate to subordinate commanders, overall responsibility for the conduct of campaigns in their areas. I don't know how this is going to work out, but I am clear in my own mind it has to be done. I know that Abrams in his last few days in Vietnam in discussions with me, said if there's one thing I am going to do it's convince the JCS that you can't have people meddling from 5,000 miles away in the conduct of a daily military operation. So, I leave it to you to figure out how we are going to do all this, but I do know that we did have great problems. In fact, one day his headquarters ordered that I not bomb when I had just received authority directly from the Joint Chiefs to bomb a critical target. He was in the loop in a way which was extraneous. If I had followed his direct orders, I would have been in violation of directives from Washington itself.

## KEYNOTE

## GENERAL WILLIAM E. DEPUY, USA (RET)

I want to thank you for inviting me here to address this small but illustrious group. It's an important subject that you have but struggling with, and I am sorry I missed your earlier talks and discussions. I am going to get at operational art, but very indirectly. I also am going to suggest to you that there is a new dimension to the problem--a new urgent dimension. I am going to talk about what I call the rise and fall of linear warfare. If my assessment is correct and linear warfare is on its way out, then there are many implications for the defense establishment of which you are an important part--doctrine, force structure, force design, tradeoffs, plans, operations, priorities, acquisition strategy, etc.

Linear warfare descended on Western armies, and that included the Russian army, in WWI in the second decade of this century, and I think there is a good chance that it may depart by the end of the 10th decade for reasons which I am going to try to explain. In 1914, the German army went through Belgium on it's way to Paris in order to find an open flank. When the attack culminated on the Marne, both sides extended their flanks to the North Sea, to the channel, and there was a continuous line from Switzerland to the ocean, and I would say that linearity descended on modern warfare.

By the way, speaking of "culminating points," I've always had a slightly pragmatic view of the significance of that much used term. I think the reason that Von Kluck's army, and the German army in general, were stopped on the Marne, was that they were a foot mobile army and they were tired and hungry, and they started to loot. In WWII, it was part of my experience that when Gen Patton reached a culminating point along the Moselle river, it was because he ran out of gas. I don't think it is any more complicated than that. You can say it's because he outran his logistics, but the proximate cause was that he ran out of gas. When the two German panzer armies in the Battle of the Bulge reached their culminating points, it was because they ran into too many American divisions. So, I want you to know that although I've been accused of being a theoretician, I am a very poor one.

Returning to WWI, I said the line extended from Switzerland to the Channel. However, what I really mean is that maneuver formations, armies, corps, divisions, regiments in those days--what we now call brigades--battalions, and companies--were all lined up cheek by jowl contiguously and continuously in a solid line covering every mile, every kilometer of France, every foot, every meter, and every yard at all times. There was never a time in which a particular foot of the front line was not assigned to some maneuver element.

It took very large armies to do that. By 1918 there were about 200 divisions on each side, give or take a bit. The front was about 700 kilometers long; so taking out reserves here and there, the division frontages or sectors were about 3 to 5 kilometers wide. Also, and perhaps even more importantly, anywhere from 50 to 75% of the divisions on the front were inactive on any average Thursday afternoon throughout the war. In other words, they were on the quiet part of the front. The battle was taking place somewhere else and being fought by other forces.

WWI was characterized by plenty of firepower, very poor mobility, mostly on foot, and very poor intelligence. The war ended in a state of exhaustion. In 1918, the Germans learned a great lesson. They redeployed their army from the Russian front because the revolution had taken place and the Russian armies collapsed. They retrained it and moved it to the west and tried to get the war over before the American army had arrived in strength. They nearly made it, and just to tell you how serious the problem of the American army was to them, 300,000 American troops arrived in the month of July alone. They were coming in at the rate of 100,000, 200,000, or 300,000 a month. So the German high command was understandably and appropriately in a hurry. I won't go into details, but using infiltration tactics they

destroyed the British 5th Army and made a tactical breakthrough. But, again, it was a foot and horse-drawn army. They moved about 50 miles forward, at which point they were exhausted and the troops began to look for food and loot. They had no operational mobility to exploit their tactical success.

After the war, the Germans remembered how close they had come to success, and learned from that lesson, whereas no one else did. And so in the 1920's and 1930's, they developed an army that had both tactical and operational mobility; and in 1939, 1940, and 1941, they were able to do what they could not do in March of 1918. They achieved freedom of operational maneuver by the use of Panzer formations. The Allies, in 1939, 1940, and 1941, were behind the power curve, but quickly organized their armies on the German pattern. They emulated the German success and by 1943 because of their industrial power and the general disparity in their size, surpased the Germans in all of the ingredients of what we remember from early in the war as "Blitzkrieg."

Armies were also smaller than in WWI (at least, the western armies). At the end of the Battle of the Bulge there were about 75 Allied divisions. They were stretched across a front about 700 km long. Taking out a few reserves on the Allied side, divisions had frontages of about 10 to 15 km compared with the 3-5 km of WWI. But it was still linear, and even though great battles might be taking place on the Saar, in the Huertgen, at Aachen, and Arnhem, every inch of the rest of the front was covered by a maneuver unit of some kind and most of them were relatively inactive. They were on security missions--economy of force roles, in reserve or refitting.

In 1944, VIII U.S. Corps as part of 1st U.S. Army was deployed across that favorite avenue of German attack, the Ardennes. It consisted of four divisions, two had been beaten up in the Huertgen Forest and two were brand new and there was also the nub of an armored division. By that time the Allied forces were more mobile even than the Germans. Allied firepower was superior to that of the German army, intelligence was lousy. The 5th Panzer army and the 6th SS Panzer army were moved from the center of Germany into the Bitburg area in November and December of 1944 on over 400 railroad trains--undetected. There was no surveillance. Reconnaissance was grounded by poor weather, so that POW interrogation and SIGINT were about the only sources of intelligence. Of course, the radios of the Panzer Force were silent.

So, WWII could be summarized as being very high in mobility and, including, conspicuously the tactical air forces, a lot of firepower, but extremely poor intelligence. They used many of the available 75 divisions just to cover the front. Korea was a replay of WWII with the same style, and the same kinds of forces: good firepower, poor terrain for mobility, and poor intelligence.

Vietnam was a very large and non-linear war--heavy firepower, excellent mobility, and very poor intelligence. However, it was the beginning of the use of air cavalry for reconnaissance, a fact to which I will return. Unfortunately, from the operational standpoint there was never a winning and viable operational plan for Vietnam that had any real chance of ending the war under favorable, you could say, honorable conditions.

In NATO today, or perhaps I should say yesterday, there were 22 divisions on line, or nearly on line. The front is about 880 km from the CINCENT North Boundary in Schleswig down to the Danube somewhere south of Regensberg. With a few divisions in reserve, very few, the sectors of a division run from 40 to 50 km on average. Now we have gone down from 200 to 75 to 22 divisions and I haven't come to the CFE negotiations which will lead to further reductions. With these accumulating difficulties, linearity has been stretched beyond its elastic limit and its nature has begun to change.

Some people say it has become lumpy, meaning that there haven't really been enough divisions to put uniformly across the front, and so the war plans cluster them opposite or on the flanks of the more obvious potential avenues of enemy attack--for example, Meiningen, Fulda, Hannover, Paderborn, and so on. Not only that, but the mobility of the forces is better than ever. Firepower is on the verge of revolutionary improvement with smart munitions, and operational and strategic intelligence is radically better. A lot of that strategic and operational intelligence is now being piped down to the tactical levels as well, and has given the commanders some confidence that they will get some kind of warning, and strong indications about where the attack will be,

thus, the lumpiness of deployment concept.

But, it is still a linear deployment. Every foot of ground is still covered by a maneuver element. If war started, all of the secondary areas like that of the VIII Corps in the Ardennes would still be covered with only too scarce and only too expensive maneuver units, and then finding themselves on the wrong part of the battlefield and not participating in the critical engagements. In NATO, we have never had an op plan with the slightest chance of leading to a favorable battle outcome, which I define as a forward defense without going to nuclear weapons.

So we've gone from 200 to 75 to 22 and now we're going to go to some lower number of NATO divisions. Of course, the geography remains fixed. The 880 km are not being negotiated away. All this may of course become irrelevant, but never mind that. Let's talk as though there still may be some kind of a defensive array in Central Europe. This trend towards smaller armies has been proceeding independently of the current negotiations, but interacting with it very much.

High costs have also been working their insidious way for a long time. Even in land forces, each new generation of systems produces budget requirements 2 to 20 times that of its predecessor. That's only for investment costs. And O&S (Operations and Support) costs also increase from 1.5 to over 5 times, and yet since 1985 total budgets have been going down. Now, they are going to go down more rapidly. So even if Gorbachev had not come along, we were going to have smaller armed forces deployed on the same wide fronts.

The trend is clear, obvious, long-standing, and looks almost irreversible, and now we have the negotiations. So far, they seem to be all in our favor because of the move to rough parity. Even parity doesn't solve the basic problem I am addressing. It helps. But the ratio of troops to terrain begins to get into the design of forces, begins to impact upon the structure of forces, and begins to get into the doctrine for the employment of those forces, even against different sets of the enemy. So if CFE takes another batch of divisions out of the 22 starting divisions, and forgetting for the moment reinforcements, one of the questions that comes up is whether or not even lumpy linearity may not have reached its elastic limit. It seems probable to me that smaller forces can't afford to be on the wrong part of the battlefield, but better be in the fight and smaller armies can't afford to make mistakes in deployment because they might not be able to recover.

Now contingencies, which have been in the forefront of our minds recently because of Panama, may also be a large fraction of all of our future concerns. They are all non-linear if you leave Korea out. Tactical and operational objectives may be the same from the very beginning. In Panama, there were between 20 and 30 initial tactical objectives which after a few hours had been achieved, which added up to the achievement of the central operational objective, namely the defeat of the Panama defense force. In such contingencies, there is an unusually intimate and intricate relationship between the tactical and operational levels of war.

Future force structure may be at least in part based on contingency requirements, and I just have to ask you whether you think we know how to handle that. I am very skeptical. Up to now we have used for contingencies what we put on the shelf for other purposes. Except for special operations and some light divisions, 80 to 90% of our force structure was designed for Europe and theoretically available for contingencies.

Now there may be a happy convergence, however, a serendipitous convergence in time, between this problem of non-linearity and what I call the second wave of post-Vietnam modernization. That includes, of course, long range missiles and aircraft with precision terminally guided munitions, and that will be important in any event. But the real revolution that is now on our doorstep is the revolution in combat information.

The first big revolution in the 20th century was firepower, artillery, massive and inefficient, but effective enough to stop maneuver. The second great revolution was in mobility--including, of course, the mobility of tactical air forces. The third great revolution, it seems to me, is in intelligence, or more specifically in combat information. And, this second generation of post-Vietnam technology is producing capabilities that bear on that problem. Whereas recently in Europe, we have had strategic and operational intelligence; and therefore longer warning and better indications of the main thrusts, we are now about to get in addition tactical, real time, continuous

intelligence for the first time in ground warfare.

It seems to me that this is a convergence of opportunity and necessity--the necessity being smaller forces, and the opportunity being a better way to fight non-linear warfare. Now, I am going to ask some questions, and some of them are rhetorical. They're loaded with my own views, and they are not too well disguised. Never mind, they further my subject.

I guess the first question is whether we have now reached the point, or will in this decade reach the point, where land force operations will begin to resemble naval and air operations, in that linearity will be represented only by surveillance and reconnaissance. The Navy has never been able to fill the oceans with ships, and the Air Force has never been able to fill the skies with planes. They have relied on surveillance to tell them where to go to concentrate and fight. So, it may just be that we are about to acquire the capabilities to apply that same general process to air/land forces. And, when I say air/land forces I am talking about the tactical air forces within the air/land battle team. I know the Air Force shudders at that formulation, but you know what I am talking about.

The second question is whether or not the surveillance system ought to be backed up by reconnaissance systems. The Navy has reconnaissance systems to back up ocean surveillance. The Air Force has reconnaissance to back up the intelligence and surveillance systems, some of it manned aircraft. The U.S. Army practically scrapped its reconnaissance capability because of NATO. Back in the 70's, the army's cavalry, including that in Europe, was converted to tank killers on the premise that finding tanks wasn't a problem. It was killing tanks that was the problem. Of the great strides made in Vietnam in air cavalry reconnaissance, vestiges remain only in the 101st Division and the 6th Air Cavalry Brigade. All the rest of our air cavalry has really become tank destroyers. You know that high tech sensors can go down for mechanical reasons, or they can go down because the enemy wants to neutralize or destroy them, or perhaps we don't buy enough J-stars. And so maybe reconnaissance has got to become a back-up to surveillance, a back-up against failures in surveillance, a mediator between electronic surveillance and maneuver force commanders; a tool for post-strike assessment of long-range attacks by fire. So we may find that air cavalry has got to be resurrected in terms of air reconnaissance and integrated with surveillance.

And you can ask if we are beginning to resemble in land warfare certain aspects of both naval and air warfare, and whether there is some kind of a universal engagement sequence that would apply to all of them. It would start with surveillance, that is detection, go through identification, description and tracking, some of which would be reconnaissance, and target acquisition, a decision about how to attack the target, the means and modes of attack, Recovery, Reconstitution, and Recycle. That isn't a bad description of an air force generating and employing attack sorties. Is it possible that corps will have divisions that generate battalion and brigade sorties? Is there a danger--I think there is--which is already evident in tactical air support, that this whole cycle could become mechanical, instead of either tactical or operational, and just grind along, engagement after engagement, because targets had been detected? The capability to strike is there, and so is the temptation to grind out our little war, not necessarily to the benefit of any operational concept.

The offense has always been non-linear, at least it always should have been. And so the question comes up, will the same tactical sequence I just described, the surveillance, reconnaissance, fire, maneuver, and support, be applicable operationally in Europe and in contingencies? It seems to me that perhaps in Europe this set of functions and capabilities is laid out horizontally. Out front is the surveillance, next comes the reconnaissance, and then comes the strike and reaction forces. But in Panama, the Falklands, and Grenada, they would have been layered from top to bottom. They are coextensive in space and in time. So they are more of a functional sequence than they are a horizontal deployment. In a form of warfare where we have continuous knowledge of enemy location and movements, and we are dynamically engaged in action and reaction, can we insert these operational and organizational concepts into the stream of engagements in order to continue to hold the initiative? There have been plenty of tactical examples, Vietnam being foremost in our minds, in which we have ground out tactical engagements without an operational context.

And what are the other operational implications? I am going to end up with what I would call a few housekeeping questions. If the divisions are not in

line, where are they? That's a housekeeping question. Where are they, and what are they doing? Are they in reserve concentrated positions opposite key avenues of approach? Or coiled for offensive action? Are they tucked in behind a linear surveillance and cavalry screen?

And, mind you, I am not inventing non-linear warfare. It has arrived all by itself. I don't think we have enough maneuver units to fight and to cover 880 km of terrain, as a surveillance--a poor man's surveillance system. If divisions don't have sectors, will corps have sectors, and are we back to linearity? Will they be sectors? Or zones? Or are we really talking about areas of synchronization? Will there be any difference in controls between the offense and the defense? Can the defense send its very scarce fire attack and maneuver units unerringly to a vulnerable enemy force so that they are on the right part of the battlefield at all the right times? Is the corps now the tactical formation that has all the functional capabilities required, including also its nexus with the tactical air forces, to cope with non-linear situations? And if that's true, will divisions trend toward being smaller, concentrating on maneuver and support of maneuver only?

And how in non-linear warfare do we protect that vast array of activities in the rear? All the C3I, all the air defense, all the Tac Air bases, the tactical air control system, the helicopters, the engineers, the logistics, the lot. Will division, brigade, and battalion AO's become happenings instead of longlasting boundaries? In other words, will they be assigned only in respect to a particular mission for the duration of that mission as they go into an attack? That's exactly what was done in Panama. Each battalion--they were mostly battalion actions--in every case, had a one-time AO. If they had had to go to a second mission, they would have had a new AO. How would modeling and analysis handle non-linear situations in which we are not pushing FEBA's around, and in which loss exchange ratios will be of historical importance only? And the only linearity that we'll be able to afford will be the boundaries of the surveillance system and the outer reach of the reconnaissance system.

And now, finally, it's obvious that there is a lot of thinking that needs to be done. If there is any merit whatsoever in what I've been saying, there's a lot of work to be done, a lot of thinking to be done, and not least by the people in your business. And there isn't as much time to do it as we thought we had. We thought we had ten years to the turn of the century before we had to put together all this surveillance, reconnaissance, LHX, J-stars, UAV's intelligence fusion and better C3. We thought we had ten years to do that. But, I would suggest to you that unless the services can individually and jointly conceptualize a solution to these problems, the wherewithal may be negotiated away in the next year or two. If there isn't a concept to shape and discipline the drawdown, the downsizing, then isn't it probable that we'll throw away the options inadvertently in ignorance of our real requirements, and the downsizing will continue, as it has so far, to be driven by bean counts, so many tanks, so many this, 195,000 of that, and by collapsing budgets. And in this whole process should not operations research and operations researchers play a very central role?

# KEYNOTE

## MAJOR GENERAL EDWARD B. ATKESON, USA (RET)

I am not really too anxious to get into the line of fire between the DCI and the SECDEF on how much of a threat the Soviets will pose to us in this new decade. There is a certain surrealistic aspect to our discussions here on operational art in these days of radical change in the East. Some would have the Warsaw Pact joining the list of endangered species, along with the snail darter. Maybe they are right.

The East European armies continue to exist in one form or another--invariably smaller than they were a year ago. But nowadays they are loaded with entropy. If each had identifiable "north" and south" poles, like ferrous molecules, I am sure we would find that they were pointing in practically every direction of the compass--except, perhaps, west. My impression is that even the Soviets have lost interest in getting them to pull together any more.

In this atmosphere, it is difficult, sometimes, to get a good conversation started on just what operational art is--or why we should care about it any more. If the Pact is out, who can threaten us militarily with anything more than a tactical scrap? Well, perhaps if we look closely at what we are talking about, we will be able to answer that question.

According to the forthcoming encyclopedia of military affairs, operational art is a branch of military art. It is also (I quote):

> "a concept of military practice dealing with large, combined arms forces for the accomplishment of strategic goals in a theater of war or a theater of operations. It takes into consideration the strategic aims of the belligerent powers, both hostile and friendly, and the tactical doctrines of the forces involved, but its focus is on an intermediate level of affairs between the strategic and tactical. Essentially, it provides context and purpose to battles and engagements. It is the principal activity pursued at the operational level of war, involving the design, organization, and conduct of campaigns and major operations."

That is a mouthful. Nevertheless, it tells us a number of important things.

First, it puts operational art in context with the other branches of military art: strategy and tactics.

Second, it gives us a feel for the size and complexity of the thing.

Third, it talks about "purpose." This is the level where we can begin to see *why* we are doing things. It may be OK for the Light Brigade to fulfill Tennyson's wonderful description of a "Noble 600" thundering off into clouds of dust, eternal glory, and the history books without asking "Why?" But at the operational level there has to be some fellow whose job is to ask, "What do you want to do that for?" and, "Is there any other way to accomplish the same thing?" That is what "purpose" is all about.

I can remember an occasion in Vietnam when the question arose as to why we were going to make a foray into a particularly unsavory neck of the woods in Long Kahn Province. It was apparent that the keeper of the keys to enemy order of battle was uncomfortable that the operations people had been looking at old red grease pencil marks on their maps and not paying much attention to the more recent intelligence briefings. As far as he knew, the place was innocent of any Main or Local Force units while we were plotting to smash the area flat under the wonders of high technology warfare.

As you can imagine, it was as though someone has made an embarrassing noise in church. After a rather strained silence, the Field Force commander did a little recapitulation of the effort which had already gone into preparing for the sojourn, suggesting that we had considerable sunk costs in the enterprise, measured in terms of prestocked ammo, fire base preparation, air and naval fire support planning, mobile PXs, and whatnot. At that point it

would have been pretty difficult to turn things around.

Fortunately, we had an imaginative G-3 who moved to take the boss off the hook. "Well," he said, "we'll just say we are doing a reconnaissance in force. We want to keep the enemy off balance, and who knows, by the time we get in there, maybe the enemy will have come back."

Of course, we could talk about how the G-2 should be brought into the picture a little earlier in the game, but that is not the point. Commanders can do anything they want, so long as they move generally in the direction of mission accomplishment. But they need to know what it is that they are doing. It would not have been very good form for us to have gone ahead under the impression that we were about to knock the 7th VC Division off the map, or something like that. On the other hand, if the commander wanted to run operations designed to "keep the enemy off balance," that was his business.

The point I want to make is that we were working at the level where "the reason why" was important. Perhaps it was too late to do anything else useful. That was a judgment call. There is always another battle to be fought tomorrow. The difference between our Field Force commander and Lords Cardigan and Lucan at Balaklava is that, after some discussion of the alternatives, our boss decided not only what he was going to do, but why. That gave him a perspective from which he could assess the potential risks and benefits. He may have come to realize that his initiative was not going to make much of a contribution to victory in Southeast Asia, but then, the risks were commensurate. I don't think Tennyson would have bothered to write a poem about our operation, anyway, but at least we retrieved some sense to it by asking the right questions.

Yossef Bodansky, who is sort of a guru in these matters, once commented that the real difference between tactics and operational art is intent. "Tactics," he said, "are designed to win battles. Operations are designed to win campaigns." Looking back on it, I think our boss in Vietnam understood that. He may not have run his staff very well, but he never thought that he was trying to win a battle. I think he would have liked to have brought about a situation in which a battle might have been fought on terrain of his choosing with the deck well stacked in our favor. But he knew what his job was, and he stuck to it. Unfortunately, neither that episode, nor the war as a whole, turned out very well.

The Panama experience was a little happier. It was a success story. The joint services did a number down there which I expect speakers will be rehashing in these hallowed halls for some time to come. And it really was an exercise of the operational art.

Whether or not you agree that it was the right thing to do, (and certainly, we have a lot of neighbors in the hemisphere who do not think it was), you must grant that it was rather well done. The larger question of whether the President was correct ordering it in the first place was really a strategic issue. That point is important to help us grasp the upper boundary of the operational art.

Look at the complexity of the undertaking. The opposition may not have amounted to much in big war terms, but it was spread all over the place, and had to be dealt with a high degree of simultaneity.

There was a fuss over the delay at getting to the Marriot Hotel. And another in getting to the transmission tower over which Noriega was able to broadcast during the day of the attack. These may have been tactical slip-ups, but they do not denigrate the nature of planning that went into the operation. I would argue that this was a superb example of war at the operational level. We had many things going for us that we cannot normally expect--such as the existing base structure in the old Canal Zone--but the presence of US non-combatants lent special risks to the operation, too.

With that episode under our belts, maybe we are beginning to understand what this particular flavor of military art is all about. Certainly we have to give more credit to those who handled the Panamian invasion than to the unfortunate souls who had to pull the Grenada show together in such a hurry. *The New York Times* pointed out afterward that the services didn't even sit in on each other's planning session in that case. We shouldn't be surprised. As little time as anyone had, it is a wonder that they did any planning at all.

Anyway, the Panamian job was accomplished without serious flap. We didn't run into mines, or get bombed by "neutral" aircraft, or shoot down any

civilian airliners, as we did in the fiasco in the Persian Gulf. Those are the normal by-products of a campaign when no one is quite sure just which end is up. (The best some people could figure out about the Persian Gulf was that we were there to protect our principal commercial competitors' access to the oil. Anyone who has heard about the Ishihara-Morita book, *The Japan that Can Say 'No,'* which some wag has referred to as a Japanese *Mein Kampf* aimed at America, may wonder what we ever did that for; but that is another story.)

Let's talk about the Big War theater--Europe. I wish I didn't have to return to the dissolution of the Warsaw Pact to find something encouraging to say. In a nutshell, the answer is: No. I don't think we ever got it right. We tried and tried, with edition after edition of FM 100-5 pouring out of Ft. Monroe, but we never quite got the hang of it.

Let me pause for just a moment to explain something. I am going to throw you a little "red meat." I would like to take a little license this morning and just slightly overstate the case so as to cast my views in somewhat bolder relief than normal. This is a little the way we make terrain models--the vertical scale is a multiple of the horizontal, just to make significant points stand out.

I find myself using the past tense in talking about NATO, because I suspect that the real opportunities for fixing up the alliance are past. In my opinion, we blew it. Our greatest enemy in most attempts to correct the structural flaws in the scheme was the saying, "we are working on that." That seemed so often to be the bottom line in any serious discussion. Then we would get on to the next problem. My only hope is that we do not save all the bad ideas that went into the pact and screw it up again, 20 or 30 years from now, when we have set up an alliance structure again someplace.

Let's look at what we did. You are all familiar with the "layer cake" defense pattern. That does not mean that we designed our defenses in layers in depth. It refers to the way we chopped up West Germany's eastern frontier into corps zones, mixing up units so that it was almost guaranteed that no one could talk or coordinate anything serious with his neighbor.

Look at NORTHAG. From north to south, it went Dutch, German, British, and Belgian. The Dutch had Danes on their left, while the Belgians had more Germans on their right. Who was supposed to reinforce them? Americans. It might have worked. Fortunately, it was never tested. Either deterrence worked, or the Russians never had any intention of attacking us. The last time in human memory anyone tried to fit so many different national entities into the line may have been the German effort at Stalingrad. They had Hungarians, Italians and Romanians to deal with--and with predictable results.

In CENTAG one found two US corps side-by-side, but most of the time the 12th Panzer was stuck in between, making sure that the press got a good photo opportunity. Now, make no mistake. I am not complaining about the mixture of various nationalities. They were all allies, and certainly they all had the right and the duty to participate. The point I want to make is that command and control of such a heterogeneous organization was inherently a very difficult problem. We should have been doing everything we could to strengthen it. There, at the operational level, we should have been focusing our intellectual and material efforts. Instead, too often we sorely neglected it.

We should have recognized that that was where we had the headquarters with the greatest chances for misinterpretation of orders, lack of understanding, and bungling. The army groups, air forces, combined fleets, regional headquarters and so forth were all composed of international staffs with members who may or may not have understood each other. Certainly, they were composed of good, bright, hard-working people, but with different political interests and raised in different schools and cultures with different languages, all of which had to be compressed into a common denominator. Even if we had been serious about wanting to give them the wherewithal for exercise of the operational art--and it is not all apparent that we ever were--this was a tough environment in which to work.

The chances for planning and successfully carrying out anything beyond the most strict adherence to the approved defensive plan for Western Europe was very low. Von Moltke (the elder) once commented that the first casualty of war is the plan. If he was right, NATO would have been in deep trouble on D+l into a canonical Warsaw Pact attack.

But that, you might say is opinion. Some who have served on NATO staffs--particularly very senior officers who tend not to be drawn too closely into the hurly-burly of staff compromises--speak far more favorably of their old organizations. Fair enough.

Let us look at an example of the sort of support we gave to NATO headquarters. (I am really talking about the various military headquarters below SHAPE--I think you understand that.) The first thing we did was designate personnel, intelligence and logistics as national responsibilities. That meant that at best, NATO headquarters were minor players in these areas, as if these matters had only marginal impact on the progress and outcome of battle. The NATO headquarters could monitor and kibitz the national entities nominally under their control, but if push came to shove, they couldn't really make their subordinates do anything in these areas to which they were not otherwise inclined. If the Americans wanted to keep their ammunition while the Belgians ran out, that was pretty much their call. Perhaps a NATO commander could order a shift, but how would he know where the stuff was?

I submit that this would have been a pretty tough way to have to handle things in the high-stress, dynamic environment that we might have expected on a modern high-intensity battlefield. Even the best of friends develop different views of things under great stress--without sleep, and under the constant threat of nuclear annihilation. It would have been tough.

Take, for example, intelligence. Since intelligence was a national responsibility, NATO had no serious intelligence collection assets under its direct control. It had some reconnaissance aircraft and an armored cavalry regiment or two, but it didn't have the real stuff: the satellites, the SIGINT stations, the clandestine agent outfits, the deep reconnaissance groups. These were national, and they may or may not have made contributions to the general pot. Certainly they were not assets to which a NATO commander or his G-2 could say, "Forget all that stuff you are doing and turn your attention to what I am interested in."

A US Corps commander, or his G-2, could talk like that, but not an army group or regional combined force commander. As a matter of fact, the NATO commander or G-2 may not even have known what assets his subordinates had access to. They were simply out of the loop--not so much because they couldn't be trusted, but because that's the way we designed the system. It was invented back in the late 1940s when all we understood were tactical and strategic levels of war. It had never occurred to us, until the 1980s, that anything serious might have to be decided by a commander wearing an international hat.

Unfortunately, we made only the most superficial attempts at overcoming this absurdity. We talked a lot about "getting a handle on 'C cube I'," but no one who talked like that understood that the real problem was our innocence of the significance of the operational level of war. We thought first about hardware and only secondarily, if at all, about the systemic organizational and operational problems. When we get right down to it, we just never came to think of operational art as much of our concern. The unspoken proposition was that that was NATO's business, and if money or effort were required for something at that level, NATO could pay for it.

Before Gorbachev came in and started breaking up the doctrinal furniture in the Warsaw Pact, the Soviets had a pretty interesting concept going. Under a few bright men, like Nikolai Ogarkov, it was developing rapidly. The basic idea was that the key decisions in armed conflict should be made at a level high enough to understand what was going on and what the purpose of the exercise was.

One can argue that something like this is probably better suited for a crowd raised under a top-down political system than for folks like us who like to make up our own minds about things. They are focused on method and system, while we prefer the eclectic, make-it-up-as-you-go kind of approach. (If you will pardon the reference, I likened this in my book to a competition between a nation of chess players, on the one hand, and a nation of video games players, on the other.)

Soviets found during World War II that they did better when the army and *front* commanders called the shots and the tactical commanders did what they were told to do: no more, no less. For them, the focus was on the operational level of command--the level at which the commander could commit decisive quantities of resources when he took it into his mind to do so. There was little pressure on him from eager

subordinates to fritter away his goods on less than history-making initiatives.

What Ogarkov was pushing for--before he got pushed out himself--was the shifting still further upward of that center of gravity for key decision making. He revived the idea, which the Soviets had been working toward in the latter stages of World War II, of a theater headquarters for control of everything in the theater of operations, or TVD, as they term it.

In 1982 Ogarkov wrote:

> The principal operation of the war of today is not the *front,* but rather a larger-scale form of military operations--the theater strategic operation.

The contrast with our traditional approach is striking. We continue to think of parceling out resources to tactical commanders. Ogarkov's view was that resources should be husbanded under high level control so that their commitment could have decisive impact on the outcome of the conflict.

One model of such thinking, of course, is the German break-through in the West in 1940. There the British and French had more tanks than the Germans, but they parceled them out across the front. The Germans concentrated them in Panzer corps under high level control, so that when they were committed they were decisive.

The Soviets, of course, prefer their own examples of such high level direction of operations. And they have many. Now, under their defensive doctrine, they are focusing on the big, centrally directed counteroffensives at Moscow in 1941, Stalingrad in 1942, and Kursk in 1943. In each of these they let the Germans get bogged down in the defenses. They held off reinforcing the front until things reached a critical point. Then they blew the whistle and walloped the enemy from the flanks with huge masses of forces built up behind the lines.

The Soviets really didn't care much about tactics. The Germans could usually beat them at that game. The Germans put enormous emphasis on the quality of small unit leadership, and their small unit successes were remarkable. If Hitler had not been so rigid regarding the mobility of larger formations (they were seldom permitted to give an inch on the defense) they might have been more successful at the operational level, too.

What can we make of all of this? I would suggest just a few points, which may serve as a sort of summary of what I have said.

First: We are fortunate to have a far less threatening era about us now. But that does not mean that we should go to sleep. This is the time when we should be able to address our problems in a deliberate, methodical way. That does not mean that it is going to be easier.

Our entire defense establishment will be paring back over the coming years, and all bureaucratic oxen are going to be gored, and maybe some heretofore sacred cows are going to be converted to glue and hamburger. Nevertheless, we should be looking at principles and developing ideas. For a change, we may be able to focus on theory without having to worry about who is going to get the contract. Very likely, no one is. But intellectual activity doesn't demand much in the way of resources.

Second: We should take a zero-based look at what we did in NATO and attempt to develop other ways of putting such a coalition together. If we were going to do it over again, would we have to make it so that everything serious had to be done by a national entity at the tactical level? The fatal flaw in NATO was its rigid national corps structure with its inability to wield the collective power of the alliance in any manner other than head-long frontal combat. I would argue that just as we found in our own forces that we needed improved joint doctrine and education and organization, when we build an alliance we should be thinking in terms of giving the combined commander great authority in all matters relevant to the success of his command in the field. And this includes personnel, logistics and above all, intelligence.

In NATO, we might have started by simply chopping EUCOM, USAREUR, USAFE and NAVEUR HQ direct to SACEUR command, and let the SACEUR--in his capacity as SACEUR--decide what sort of lash-ups would be most useful between the US structure and the rest of the international machinery. The only good connection we ever really got was that between USAFE and AAFCE, where a

few imaginative people built an interoperable structure--with the Tactical Fusion Center (TFC) and Combat Operations Intelligence Center (COIC) if you are familiar with those things--which might have even worked for a while in war time.

Third: We ought to take heart from the Panamanian campaign that we can really think and act at the operational level. And perhaps that is a model for the sort of thing we are most likely to have to deal with over the rest of our professional lives. Anyway, it is worth our study.

Finally: We should try to be a little less ethnocentric in our study of big war. We have a considerably smaller experience base in large landmass operations than the Soviets, and we ought to take a close look at what they were coming up with before Gorbachev pulled the plug. Or, perhaps, some of the new stuff they are talking about is relevant. Certainly we are defensively oriented. Perhaps we should be looking at counteroffensives the way they do. Somehow, we may want to attempt to reconcile this with our residual concepts of forward defense and Airland Battle and FOFA, and all the other stuff we have been talking about for so long.

In, sum, ladies and gentlemen, I think there is plenty to think about regarding the operational level of war. We have scratched the surface in some areas. In others we seem to have simply wandered around the subject. Fortunately, it is these latter ones in which we appear less pressed just now. But that does not mean that we can forget it. It is always the big ones that are most dangerous to the survival of the state.

## Luncheon Presentation

Dr John A. Battilega, SAIC

# Principia Opartanica

**John A. Battilega**

Ladies and Gentlemen. When I was first approached several months ago with a request to be a speaker at this conference, I was somewhat taken aback. Although I have given many talks to audiences before, this was the first time I have ever been asked to be an after-luncheon speaker to a group of military operations research analysts meeting on the subject of operational art. Nevertheless, I accepted.

Now the problem was to figure out what to do next. That night I went to the bookshelf in my den and took down my tried and true copy of *10,000 Jokes for Any Occasion.* I turned to the index and looked up operational art. To my surprise, there were several entries....kidneys, appendectomy, tonsillectomy....I could see that I was on the right track, so I lay down on the couch to see what I could find.

I promptly fell asleep.

I started to dream. In my dream, I found myself walking in what appeared to be Washington D.C...the Capitol Hill section. The year was 2090. I knew that because there was a newspaper on the corner with that date. (The headlines of the newspaper featured the new grand opening of a movie in Washington--"Indiana Jones and the Very Very Very Very Last Crusade", starring Harrison Ford the VI as Indiana Jones the IV, and featuring his great great grandfather Professor Henry Jones, played by Sean Connery).

As I continued to walk I went into a building that was located where the current Library of Congress building sits. Only this building was much smaller, and was very modern. I went inside, but found no books. There was only a big open room, with a small console cabinet in the middle, and many computer terminals located around the walls. Clearly the macro stacks had been replaced by microchips.

I looked across the room. There was a large glass window case on the far wall. The case was very ornate, containing shuttered doors for extra protection. It clearly housed something of great importance. I peered to see what was worth such a place of reverence.

There was a single, large, old, heavy book in the cabinet. I could see, even from a distance, the title. Embossed on the cover, in large gold letters, were two words: **PRINCIPIA OPARTANICA**.

I thought to myself...could this really be...

I was excited. Away to the window I flew like a flash, tore open the shutters, and broke in the glass. I carefully removed the book, carried it over to the top of the computer console, and set it down. I opened the cover.

"I sing of operational art and the man," it began.

I then realized what this was. It was the chronicle of the history of operational art, which had been carefully recorded, preserved, and handed down from generation to generation. (It had obviously formerly been classified, for carefully stamped in big red letters on the top and bottom of every page were the words "Trilateral Commission: Eyes Only"). I began to read.

My first thought, remembering the difficulties I had experienced in talking to military analysts in 1990, was that I now will be able to finally learn what operational art *is*. So I turned to the index to look for a definition.

There was none.

I wondered why. I turned to the entry for the year 1991. I found that in that year there had finally been an international conference for the specific purpose of exchanging definitions of operational art, with the hopes of arriving at a consensus. All of the nations of the world were invited, and all attended. There were a series of 43 sessions held over a 24 month period, but to no avail. After 39 sessions, a consensus had almost been reached, with the last 4 sessions unsuccessfully spent trying to convince the three holdouts--the U.S. Army, the U.S. Navy, and the U.S.

Air Force (who had no problems with the rest of the world, but could not agree with each other).

But there was some progress recorded. In spite of the lack of consensus on the definition, there was international agreement on the essential elements of operational art. Operational art had something to do with:

-- large scale combat,

-- high tempo,

-- massing,

-- surprise,

-- timing,

-- the employment of reserves, and

--the achievement of strategic objectives.

I turned the pages further. Under the year 1995 was an entry stating that operational art had become an antiquated form of combat. The sudden demise was due to the Soviet peace offensive of 1989, which had led to massive force reductions at a much faster pace than anyone had anticipated. By 1995 there were no large force postures remaining on the earth, and only a few forces of operational size. *Operational Art Was Dead.*

Taken aback somewhat, I noticed that in spite of the fall, the **Principia** had many more pages in it. I read on.

The pages for the year 2000 discussed new "artillery like" systems that, from a single tube, could achieve effectiveness that previously had only been possible with battery salvos. They discussed enhanced conventional munitions of unprecedented lethality and areas of effectiveness. They discussed zero CEP weapons, and space sensors that allowed effective fire to be brought on deep targets very rapidly via long range conventional strike systems. They discussed the new mobility of forces and platforms that had been fielded in the 1990's. They discussed doctrines that used these new technological capabilities to execute high tempo large scale combat over wide areas with extremely small force postures that could be massed very rapidly and very effectively at decisive places and times.

Perhaps operational art was not dead after all.

The pages for the year 2010 discussed the new international order which had arisen after the Cold War. It seems the world at that time consisted of 5 military superpowers, 6 economic superpowers (not all of which were military giants), 12 nations of substantial military capability sitting astride many of the worlds critical resources, and 27 nations of lesser military capabilities, but capable of banding together in coalitions. Furthermore, the 5 military superpowers and the 12 nations with substantial military capability had a wide range of strategic objectives which they had to support via military force if necessary. Finally, the nations of the world were finding that it was extremely difficult to orchestrate the correct tempo, massing, surprise, and reserve commitments for military campaigns because of the strategic implications and complexities of multipolarity.

By 2020 the millennium feeling had begun to wane. The **Principia** recounted how the nations of the world, and especially the superpowers, began to focus on the actual requirements for war. The principal emphasis was on mobilization and countermobilization. Soviet military art gave birth to a new mobilization operation, a countermobilization operation, and a countercountermobilization operation. Space, which now contained a number of national peacetime communications and global information assets for several nations of the world, had also given birth, in Soviet military art, to a new ASAT operation, and also an anti-ASAT operation (as some 17 nations of the world now possessed space assets to varying degrees).

By 2030, as a result of the research which had been initiated in the late 20th century, major breakthroughs in space transportation occurred. This had caused space to become a practical medium for both space industrialization and space power sources to earth. Since so many nations were now involved in space utilization, there was now a requirement for military forces to protect the massive space infrastructures that were under development by these nations, infrastructures which contained manned and unmanned platforms performing many military, commercial, and non-military public sector functions. In response to this, Soviet military science formally

declared as a Theater of War, involving three different Theaters of Military Activity (TVDs) which differed from each other by their proximity to earth. The Soviets also formally defined a new space control strategic operation focused on that entire theater.

The **Principia** entries for the year 2040 documented the new concerns of the nations of the world about military force postures. It seems that the technological developments and changes in the international situation of the last 50 years had created new military requirements and capabilities for:

-- large scale combat,

-- high tempo,

-- massing,

-- surprise,

-- timing,

-- the employment of reserves, and

-- the achievement of strategic objectives.

In response to this situation, an international conference was called by the Global Military Operations Research Society (GLOMOR) for the purpose of discussing and defining operational art. Some of the conclusions of the conference were the following:

1. Operational art was alive and well.

2. New concepts, capabilities, and issues for operational art had emerged over the last several decades.

Specifically

-- Distributed and smaller terrestrial forces now existed that contained operational scale capabilities and effectiveness.

-- The essence of operational art now consisted of massing C3 in the sense of focusing command and control attention throughout the operational depth as a precursor to immediate and lethal military action at the point of attention.

-- Several new types of operational problems had occurred. These included strategic and operational scale space operations, especially ASAT, anti-ASAT, and space control. They also included the issues associated with mobilization and countermobilization operations. Finally, the force postures of the world, supporting the many power centers that now existed, now had the capability to execute somewhat arbitrary and highly distributed operational scale forms of combat throughout major regions of the globe.

-- There now existed much more complex sets of strategic objectives to be resolved through military force because of true military and economic multipolarity.

I reached to the **Principia** to turn the page. But all of a sudden I felt a shaking. Something bright was in my eyes. I looked up and I had awoken. The sun was shining through the window. My wife was standing there, excited. She was waving the morning paper. "Look! Bush and Gorbachev have reached an agreement, and forces will be cut down. There will be no more large forces. This means that there is no need for a Conference on Operational Art and you can stay home and we can go dining and dancing and eat bagels and cream cheese..."

I looked up at her and smiled. I thought of the **Principia Opartanica**.

"Don't cancel the plane tickets, " I said.

# I - Papers on the US Perspective

Colonel John A. Warden, USAF, HQ USAF, Chair

# OPERATIONAL ART: A SPECTRUM

## Executive Summary

The papers in this section challenge the reader to explore the definition of operational art. Their diverse perspectives are held together by a unifying theme which, though at times elusive, gives depth and meaning to the term. Operational art is shown to be an orchestration of means and ends. Whether one begins by examining the capabilities of the common warrior seeking a way to exploit them for political purpose or rather, one identifies a strategic goal then searches for a military solution; the path taken, is operational art.

Samuel B. Gardiners' **The Logic of Operational Art** presents operational art as a way to "...look over the chaos of war. That is look over it but not over look it." By developing the three logics of war--tactics, operational art, and strategy, he gives the reader a framework for understanding operational art as orchestration.

Vital to any complete understanding of this subject is his discussion of the misapplication of the logics mentioned above. He posits that early twentieth century American theorists rediscovered "operations" and then erroneously stratified war into tactical, operational and strategic levels. He argues persuasively that war is best understood as a multi-faceted whole where each undertaking has a tactical, operational, and strategic dimension.

Price T. Bingham offers **Operational Art: An Airman's Perspective**. He concentrates on the importance of the commander's personal understanding of operational art and how that understanding leads either to victory or defeat. He attempts to show how the successful commander employs operational art to create fog and friction for his adversary.

His work points out the criticality of exploiting the aerospace environment to achieve these ends. The reader will find his treatment of combined arms operations both thought provoking and enlightening.

In his **Centers of Gravity--The Key to Success in War** John A. Warden III focuses on the need to identify clearly the intended objectives of war. Although the spectrum of conflict is a gradation of objectives and choices of campaign methods, he brings the reader to the realization that it is bound together by an underlying need to address the enemy's centers of gravity.

His invaluable contribution to the understanding of operational art is the development of a methodology for identifying these centers of gravity and their operational significance. He shows how each state and military organization possesses centers of gravity which can be organized into concentric circles of relative importance. Beginning at the most important central core - the command ring, he moves outward through essential production, the transportation network, the population and ends with the fielded military forces.

The final article is Michael J. Morin's **Operational Art From the Top-Down Instead of the Bottom Up.** He has taken on the daunting task of attempting to dispel the fog and friction created by the Services' doctrinal treatment of the operational level of war.

After finishing his article, the reader cannot fail to appreciate the depths of confusion which have been built up concerning what constitutes the operation level. Morin traces the roots and the disconnects of the various Service definitions and shows that the joint doctrine process mandated by Goldwater-Nichols has further to go than it has come.

Individually, these articles offer keen insights into operational art. Together, they foster a deeper understanding.

# The Logic of Operational Art

**Samuel B. Gardiner**
**Colonel, USAF (Ret)**
**Consultant**

*...our comments on the nature of military activity in general should not be taken as applying equally to action at all levels. What is most needed in the lower ranks is courage and self-sacrifice, but there are far fewer problems to be solved by intelligence and judgment.*

Clausewitz

## A Narrow Track

When the U.S. Army published Field Manual 100-5 in 1982 and forced us all to think more about the operational level of war, the authors did us a great service and a great disservice. The disservice was to have us focus on operations as a level of war. I think that has caused us to miss the essence of operational art, and it certainly has not prepared us for the current transition, a need to think less and less about high-density, high-intensity operations.

## The Concept of Useful Perspective

How far is it from Bangor, Maine to Miami? It depends.

If you are filing a flight plan there is one distance. If you will travel by interstate highway, there is another answer. If you will take U.S. 1, there is another answer. If you will walk along the edge of the water, there is certainly another answer. If you were a ladybug, there would be another answer. Carried to total precision, the answer approaches infinity. But, it does depend on your purpose.

The answer is different depending on your objective, but the way of approaching the problem is different. If you are filing a flight plan, you are interested in commercial routes, high volume areas, and approach patterns. If you are driving the interstate, you might be interested in rest stops and motels.

Operational art, like planning the trip by interstate highway, is a different perspective. By using it as a perspective, you can see what is important and what is not important.

Perspective clarifies. The example of the different distances along the coast of the United States is often used in describing chaos theory. The idea is that what may appear chaotic at one level of perspective--ask the ladybug to describe her trip--may not be chaotic at another perspective. The other value of the operational art perspective, then, is that it allows one to look over the chaos of war. That is look over it but not overlook it.

There are certainly many military examples of differences of perspective. The United States landings in Normandy in 1944 offer a particularly good example.

Most of what has been written about the operations following the landings mention the difficulty the Americans had fighting their way through Normandy hedgerows.[1] It was a tactical nightmare to advance in that kind of terrain. It seems hard to imagine how any more difficult landing area could have been chosen.

The operational perspective was completely different, however. Reading the descriptions written by the planners of OVERLORD, one gets a completely different point of view. For the planners of the operation, the first phase of the campaign was to establish a foothold on the continent of Europe. It was important not to be thrown back into the Channel.

From the tactical perspective, the GI's had to fight their way through the hedgerows. From the operational perspective, the hedgerows were defensive barriers that the Germans would have had to fight through to eliminate the Allied beachhead. Perspective is extremely important.

**Fire in the Forest**

Operational art is more than just a perspective. It is of a different logic. Clausewitz said that war has a logic of its own. He was right but did not go far enough. War seems to have at least three logics. There is a logic of tactics; there is a logic of strategy; and there is a logic of operational art.

Fire is bad. The logic is simple. An uncontrolled fire is something to be stopped. But, a large, uncontrolled disastrous fire can be good.

Studies done on forest fires have shown that there is a great deal of good that comes from a forest fire. New growth is stimulated. The ground gets needed fertilization. There will be more food for animals. In fact, naturally caused forest fires may be a necessary part of the growth process. As difficult as it may be, it might be better to allow them to burn out naturally.

The same logic, then, doesn't apply to all fires. The same logic doesn't apply all aspects of war.

**The Objective of Operational Art**

Thinking about deterrence and the realm of nuclear weapons has clouded most western military writing to the point that objectives have become unclear. It is a mistake to confuse policy objectives in war with military objectives. Military objectives are to lead to policy objectives.

In operational art, the objective always must be the enemy's military capability. Mahan understood that. Douhet understood that. Clausewitz understood that. The Soviets certainly understand it today. Certainly, political considerations will modify the objective, but without this objective as a vision to begin planning, all else will not be in focus.

It may not be necessary to carry the objective to the extreme, the total destruction of the enemy's military capability. In fact, it would be much better to be able to threaten his capability in such a way that fighting is not necessary.

**Operational Art: A Summary**

Operational art is different. The concepts are different from the concepts of tactics. In some cases, even the logic of the use of force is different from tactics. The concepts and logic of operational art are not the same as the concepts and logic of strategy.

Operational art assumes a discontinuity. At some point in the application of tactical forces, there is a qualitative change, a change that is more than just the sum of the tactical applications. Operational art is the attempt to find the discontinuity.

In tactics, the defense has the advantage because of terrain, cover and the ability to concentrate fires. In operational art, the offense has the advantage. Mountains favor the tactical defense and the operational offense.

Tactical effectiveness is the goal of the tactical commander; operational effectiveness is the goal of the operational commander. Tactical effectiveness can prevent failure and tactical ineffectiveness can result in failure, but only operational effectiveness can achieve policy objectives. In addition, operational effectiveness can overcome tactical ineffectiveness.

Many brilliant tactical decisions will not accrue into brilliant operational effectiveness.

In tactics, the commander maneuvers to create the advantage for fires. In operational art, the commander maneuvers to leverage his force capabilities beyond his ability to deliver fires. In operational art, fires are maneuver forces.

Tactically fires support maneuver forces. In operational art, maneuver forces can support fires. Fires and maneuver are means to the same kind of ends.

In tactics, ground forces have terrain objectives. In operational art, terrain is secondary. Enemy forces are objectives.

In tactics, naval forces seek to destroy enemy naval forces. In operational art the destruction of enemy naval forces is usually a means to an end.

In tactics, air forces seek to destroy enemy air forces. In operational art the destruction of air forces is a means to an end.

In tactics, reserves are usually identifiable forces. In operational art, reserves are future capabilities. Reserves in operational art may not even be

designated. In operational art, reserves may be logistics. In tactics, reserves are important; in operational art, reserves are critical.

In strategy, the center of gravity is usually found within the enemy nation and may be the will of the people, a fragile government or maybe a weak industrial capability. In operational art, the center of gravity is the center of the enemy's combat power. It can be found on a map.

The tactical commander is concerned with enemy capabilities. The operational commander is concerned with enemy intent. He wants to understand the intent of his enemy, but more important, he seeks to influence his intent.

In tactics, logistics is an input. In operational art, logistics is a major means with which the commander influences the battle.

Chemical weapons can be tactically devastating but have never historically proven operationally decisive.

Tactics is now. Operational art is later. Tactics is here. Operational art is there.

For the tactician, deception is protective. Deception is used to "cover" tactical preparations and dispositions. For the operational artist, deception is a major means through which he shapes the campaign; he seeks to create a difference between reality and image in the enemy. In tactics, deception tasks can be identified. In operational art, the distinction between operations and deception will be blurred.

Every act of military violence has a political dimension. In tactics, the political dimension is imperceptible. In operational art, military actions have a large political dimension. What a commander does impacts the policy objectives of his nation as well as those of his enemy's. The political dimension is a major part of strategy.

Beyond this, the operational commander is usually only once removed from the policy makers; a major activity of the operational commander is selecting a military objective that will achieve the policy objective for which military force is being used.

Tactical operations are generally problem oriented. The common term, "tactical problem," reflects this nature. A hill to be taken is a problem to be solved; a bridge to be destroyed is a problem to be solved. The reaction of the enemy is fairly predictable. In operational art, the two-sided nature of war is more dominant.

Tactical logic, particularly dealing with naval air problems, searches for scientific solution. "Observation," "evaluation" and "computation" are the kinds of words that apply. The search for a scientific solution to the questions of operational art is to search in the wrong arena. Operational art is intuitive.

Operational art is being prepared to react to the way the enemy reacts to the way you react to his reactions. Operational art is shaping this equation. Most important, operational art is seeing more than two moves ahead.

All command has two aspects--insight and execution. Insight is seeing what needs to be done, and the execution is getting it done. In tactics, seeing what needs to be done is only a small part of leadership. In operational art, insight becomes more important. The operational commander will have people working for him who can accomplish things; he must provide unity of vision.

In tactical decisions, compromise can be fatal. In operational art decisions, compromise is usually a necessity. Compromise is the essence of strategic decision making.

In tactics, the commander expends a great deal of his effort reducing his own friction. In operational art, the commander expends a great deal of his effort increasing the friction of his enemy.

Friction produces the unexpected for the tactical commander. The operational commander expects his tactical commanders to encounter friction. The operational commander plans for the unexpected.

Focus in tactics is achieved by unity of command; in operational art focus is achieved through unity of effort.

Combined arms in tactics is single service; in operational art it is multi-service. Combined arms works in tactical operations because of training and

doctrine. Combined arms works in operational art because of the commander.

The tactical commander trains to reduce his losses in reaching his objectives. The operational commander reduces his losses in the way he sets his objectives.

In tactical operations, the important thing is the concentration of forces or fires. In operational art, it is important to have a concentration of effort; that is having all aspects of the command focused on the same objective. In strategic operations it is critical to have concentration of objectives; that is limiting objectives to ones that can be achieved.

**The Major Concepts of Operational Art**

*Interchangeability*. Operational art is formulating a series of battles in a campaign which will achieve a military objective which will achieve a policy objective. The functions of maneuver, operational fires, deception and intelligence, and logistics are interchangeable in putting together the campaign. The "art" in operational art is the way in which these functions are orchestrated. Operational fires for example are not "support" for maneuver forces. Fires can serve the same functions as maneuver forces. In operational art, operational fires and maneuver forces are interchangeable to a high degree.

*Leverage*. Basic to operational art is the idea that it is possible to create a concept of operations for a campaign which will generate a cumulative capability which will go beyond any measurement of just tactical capabilities.

**Misapplication of the Logic**

Assessing the NATO balance is one of the activities that keeps civilian analysts busy. After the comparisons have been made, one of the common statements is that one needs to keep in mind NATO has the advantage of the defense. The argument continues that since NATO has the advantage of the defense, it doesn't need the same number of forces as the Warsaw Pact.

Arguing that NATO has the advantage of the defense is one of the most common misapplications of military logic. The defense is superior in the tactical situation. In the operational situation, the offense has the advantage. Applying tactical logic to operational art can not only mislead. It can be absolutely wrong.

Civilians aren't the only ones guilty of the misapplication of military logic or mixing tactical, strategic and operational logic. Military people tend to be guilty in the same direction as the civilian analysts, extending tactical logic to operational and strategic situations. The most common military mistake is in not understanding the large policy dimension in operational art and strategic situations. It would be wonderful to use military force without having to worry about all of the complications of policy objectives and political considerations. To even argue that is to show a lack of understanding of military logic.

During the 1961 Berlin Crisis, the Soviets threatened U.S. access to Berlin. The United States decided to test the Soviets by sending a convoy down the autobahn to the city. The convoy commander was a company grade officer. During the operation, the White House talked directly to the convoy commander. This case is often cited as one of the examples of the civilian leadership becoming involved in military things that should be left to the military.

The question of command and control is a separate one, but to imply that the line of trucks was doing something tactical is to misunderstand the different logics. The convoy was a strategic operation. Tactical logic did not apply. Operational logic did not apply.

Another classic example of the misapplication of the logics comes in trying to apply the logic of operational art to the strategic situation. Winston Churchill did this in his strategic arguments during World Wars I and II.

Churchill's arguments for attacking Turkey during World War I and the "soft underbelly" of Europe during World War II have all the elements of maneuver warfare, the elements which apply in operational art but not in the strategic situation. He extended operational art logic too far. The Allied attack up the muddy roads of Italy certain did not unhinge the Germans.[2]

**Operational Level vs. Operational Art**

The operational level of war. When the U. S. Army rediscovered "operations" in the early 1980's, the focus was on the operational level of war. The meaning then and for most who write about the subject today is that there is some organizational level at which war is different. At least some aspects of war are different at some organizational level.

For the Americans, particularly those who were writing doctrine for the Army, in the early thinking that meant echelons above the corps. In the Federal Republic of Germany, where the issue was joined because of what the U. S. Army was doing the level was defined to be the corps.[3]

Even the Soviets will define an organizational level at which the operational art applies. The distinction for the Soviets is important. They don't talk about the operational level in the same way as the West. They don't define the operational level of war. They talk in terms of a level at which operational art is practiced.

If there is a separate logic of operational art--and tactics and strategy--then we are wrong to talk in terms of tactical, operational and strategic levels of war. We would understand better if we looked at a particular situation in terms of the logic that should apply.

**Notes**

1 My father landed at Omaha Beach. He said that in their preparations for the operation that they had spent a great deal of time on getting off the beach and very little time thinking about the hedgerows. I grew up believing that the Americans had limited their thinking to the beaches. It wasn't until I read the accounts of the planning that I was struck by how the planners viewed the terrain as an advantage.

2 B.H. Liddell Hart was one of the British military thinkers who looked at World War I and concluded that maneuver warfare was a better answer than directly attacking an enemy's strength. He argued for the "indirect" approach. In his book, **On Strategy,** he makes the point that it is possible to extend the idea of the indirect approach too far. He argues that you can be successful in the indirect attack as long as the enemy cannot change his front to meet your indirect attack. This is an important point that is missed by those who try to extend maneuver warfare to strategic operations.

3 The Germans had a particular problem to solve in their definition of the operational level of war. If they had reached a conclusion similar to the U.S. Army, they could have defined themselves out of the current debate. If they would have said that the operational level of war is above the corps, they would have said that operational thinking is for foreigners since they have very few commanders who hold positions above corps.

# OPERATIONAL ART: AN AIRMAN'S PERSPECTIVE

**LtCol Price T. Bingham, USAF**
**The Air University**

Aerospace power has the potential to make an immense contribution to success in war. Its actual contribution, however, depends greatly on the quality of a commander's operational art.[1] This paper will explain why by examining what a commander must do to exercise operational art effectively. Examining what is required to win campaigns will reveal the immense importance of the advantages aerospace forces can provide surface forces before a battle begins and the major contribution they can make in exploiting opportunities after a battle is over. It will also help explain why analysis that measures the effectiveness of aerospace forces only in terms of the physical destruction aerospace forces cause during a battle can be so spectacularly misleading.[2]

The importance of a commander's operational art derives from the fact that war is characterized by fog, friction, and chance.[3] Thus, the chance a commander will wage a successful campaign can depend heavily on whether he has the art needed to create a concept that magnifies enemy fog and friction, while simultaneously minimizing his own.[4] To a large extent a commander's ability to create such a concept is determined by the art with which he maneuvers[5] and, synchronizes[6] his forces.

Maneuvering his aerospace[7] and surface forces gives a commander a potentially very effective means of creating fog. Maneuver can do this by making an enemy less certain as to when or where a commander's forces will appear, let along how quickly and in what strength. As a result of the fog maneuver can create, an enemy is likely to have less time to react. The enemy's need to hurry can then lead to the creation of friction. Thus, by using maneuver to magnify enemy fog and friction, a commander has the potential to increase greatly the chances that his aerospace and surface forces will have the advantages (such as concentration, position, and surprise) they need to win battles.[8]

After a battle a commander can continue using maneuver in the form of a pursuit or envelopment to create further fog and friction, making it a major means for exploiting the opportunities created by combat.[9] The tremendous potential maneuver has for magnifying enemy fog and friction explains why Napoleon said, "Marches are war...Aptitude for war is aptitude for movement...Victory is to the armies which maneuver.[10]

Synchronizing the employment of his forces provides a commander with another important means for magnifying enemy fog. When a commander effectively synchronizes the employment of his forces, he greatly increases the complexity of the problem the enemy must solve to defeat the commander's concept. This increased complexity, especially if unanticipated by the enemy, acts to magnify his fog.

Enemy friction is also likely to be increased when a commander's synchronization creates a dilemma the enemy cannot solve because he does not have sufficient time or forces. Even without a dilemma an ad hoc reaction to the complex problem produced by synchronization may easily result in more enemy friction. Of course, the complexities involved in synchronization may mean a commander will also increase his own friction, especially if he must rush the planning and execution of his concept. This danger provides an important reason why commanders often prefer the initiative.

As will become evident, when a commander appreciates the importance of magnifying enemy fog and friction, while simultaneously reducing his own, he will *always* create a concept in which control of the aerospace environment is one of the first objectives. Gaining control requires neutralizing the enemy's aerospace forces. To do this a commander is unlikely to have the option that is often available in neutralizing surface forces of avoiding combat with the bulk of enemy forces.[11] Instead, the range and speed of aerospace platforms will often make it necessary for a commander to destroy most, if not all, of the enemy's aerospace capability to prevent it from posing a serious threat.

If the enemy has the initiative and possesses powerful aerospace forces, it may be necessary for a commander to gain control in increments, beginning first with the aerospace environment over his own surface forces. Initially, he may be able to achieve only temporary control. In any case, to achieve and maintain control a commander must create advantages for his forces that enable them to inflict disproportionate losses on the enemy. The magnitude of these losses must be sufficient to persuade the enemy that they cannot be sustained.[12]

Once a commander has gained the degree of control he needs in the aerospace environment over his own forces, he is likely to find it easier to maintain it if he makes a persistent effort to expand his control to the aerospace environment over the enemy's forces that are closest to his own. Such an expansion will usually be necessary in order to keep sufficient pressure on the enemy so that he is denied the opportunity to recover and rebuild his strength. There will be problems, however, if the enemy operates his aerospace forces from a sanctuary. A sanctuary gives the enemy the opportunity to preserve his forces by refusing to fight, except under conditions of his own choosing. In this circumstance, it may be difficult for a commander to achieve permanently the degree of control he desires over the aerospace environment in close proximity to the sanctuary, which would force him to modify his concept of operation accordingly.[13] Gaining and maintaining, let alone expanding control of aerospace environment is rarely a task for aerospace forces alone. A commander is likely to find he has the best chances of success when he employs his surface forces so their maneuver complements his employment of aerospace power. An example of such a concept would be one where a commander used his surface forces to seize air bases or locations suitable for bases.[14]

Gaining more bases, especially bases that are closer to the surface battle, creates a number of important advantages. Reducing the distance from a base to the enemy can be important because it allows a commander to generate more sorties with a given force structure, while simultaneously making those sorties more responsive, able to deliver more munitions, possess more persistence, and have less risk of being lost due to fuel exhaustion or accidents due to the fear of fuel exhaustion.[15] Unfortunately, many models attempting to simulate air warfare do not have the resolution to show the immense impact the distance from a base to the fight has on an aircraft's tactical performance.

Despite the advantages of having bases closer to the enemy, it is possible that a commander will make his aerospace forces more vulnerable. Actual increases in base vulnerability, however, may not always materialize. For example, improvements in the ability to operate effectively may make it possible for a commander to gain and maintain the initiative and, thus, reduce or even prevent the enemy from exploiting the opportunity provided by the location of his bases.[16]

If a commander possesses sufficient numbers of long-range aircraft his need for bases closer to the enemy may be reduced, but not eliminated. This is because increasing the distance from a base to the fight reduces the numbers of sorties a commander can fly with a given force structure. Besides the time needed to fly farther, the time it takes to prepare a long-range aircraft for another sortie also reduces the sortie rate. Moreover, unless his aircraft loiter in the air close to the enemy, their responsiveness will be poor and this can be very important in a dynamic situation. Yet another problem is that aircraft capable of flying a great distance without aerial refueling tend to be very large, which may reduce their survivability against air and surface-based threats. Plus, such aircraft are often much more expensive, which acts to decrease the number of available platforms, making losses less affordable.

Air refueling, by extending either aircraft range or endurance, provides a commander with still another important means for making his concept feasible when he does not possess bases that are close to the enemy (or large numbers of long-range aircraft). Extensions in range from refueling are likely to make it easier for a commander to achieve surprise and a more effective concentration of aerospace platforms. Extensions in endurance are likely to reduce his risk of losing platforms due to fuel exhaustion. This capability may be particularly valuable when a commander is limited to using a small number of bases and the availability of these bases is uncertain due to weather or enemy action.

Yet, air refueling cannot change the impact that distance from a base to the enemy has on sortie rates and responsiveness. Moreover, air refueling may

increase the complexity of a commander's control, which can result in making his concept more predictable. In addition, air refueling may lead to increases in the concept's risks when refueling takes place within range of an enemy's aerospace forces, which would probably be the case if refueling took place between the base and the enemy.

Thus, even when a commander possesses long-range platforms and refueling capability, the success of his concept is likely to depend on gaining bases closer to the enemy. Moreover, adding to the number of available bases should allow a commander to better disperse his aerospace platforms, making each base a less concentrated and, therefore, less lucrative target. Dispersal also makes it easier for a commander to use deception and concealment, further increasing the survivability of his platforms when they are on the ground.[17] In addition, dispersal should enable him to reduce the overall impact on his concept including the risk of aircraft losses due to fuel exhaustion during diverts, if enemy attacks or poor weather prevent the use of a particular base. Having more bases suitable for diverts also has the advantage of decreasing the risk of aircraft losses that are likely to result if there was no option other than using a damaged base's minimum operating strip.[18]

Besides seizing bases, a commander may be able to increase the effectiveness of his aerospace forces in the battle for control of the aerospace environment by creating a concept which uses the maneuver of his surface forces to attack the enemy's surface-based air defenses. Such attacks can enhance the effectiveness of aerospace forces either by destroying the enemy's defenses or by degrading their operation through the denial of advantageous locations (which may simultaneously improve the effectiveness of friendly surface-based defenses) and disruption of their command, control, and resupply.[19] Just the perceived possibility of such attacks may make an important contribution by causing the enemy to relocate his defensive systems, which greatly magnifies the problems of maintaining an integrated system, or devote scarce resources to their protection.[20]

Still another way a commander can use his surface forces to help gain and maintain control of the aerospace environment is by synchronizing their maneuver with that of his aerospace forces to create a dilemma for the enemy. Such a dilemma would result if a commander created a concept that used maneuver to launch a powerful surprise surface offensive in an area where the enemy's surface defenses were weak. Ideally, this attack would occur where the commander already had or could quickly maneuver his aerospace forces ( perhaps because he possessed more nearby bases) so as to achieve a more powerful concentration of aerospace power than the enemy. This situation would create a dilemma by forcing the enemy to choose between allowing his surface forces to be defeated or throwing his aerospace forces into what could be a prohibitively costly attempt to buy time for his surface forces to react.[21] Regardless of the concept a commander creates to gain air superiority, it is sure to provide early evidence of the quality of his operational art.

As he increases the degree of control he exercises over the aerospace environment, a commander should usually be able to reduce his uncertainty and magnify the enemy's. One reason is because he will be better able to exploit the elevation, speed, and range possessed by aerospace platforms to gain information (on the enemy and the environment) that will allow him to employ his forces more effectively. At the same time, control will deny the enemy similar opportunities.[22]

Friction provides another important reason why control of the aerospace environment is so important to the success of a commander's concept. With control it will be more feasible for a commander to use his aerospace platforms to provide transportation, navigation, and communications capabilities that he needs to reduce the frictions associated with maneuvering his forces. Perhaps most importantly, control makes it easier for a commander to employ air interdiction and close air support to magnify the enemy's friction by attacking his maneuver.

The contribution air interdiction makes to the outcome of a campaign, however, depends greatly on whether a commander's concept synchronizes it with the maneuver of his own surface forces in a way that creates a dilemma for the enemy. The enemy's dilemma would be this: if he attempts to counter the commander's maneuver with his own maneuver he is likely to make his forces easier for aerospace forces to detect and destroy; yet if the enemy employs measures that are effective at reducing his losses by avoiding detection, he is less likely to be able to maneuver fast enough to prevent friendly surface forces from achieving important advantages. Thus,

regardless which choice the enemy makes, a commander may succeed in creating advantages that make it more likely his surface forces will prevail in battle.[23]

To have the best chance of creating a dilemma by synchronizing surface maneuver with air interdiction, a commander must design his concept to exploit the nature of the surface.[24] For example, if his concept involves fighting on and over the land, a commander must base his design on how the surface's complexity will influence where various types (i.e. mechanized or not) of land units can maneuver, in what strength, and how quickly. He must also base his design on how this complexity influences the ability of his aircrews performing air interdiction to find and destroy enemy units.[25]

Likewise, when a commander's concept involves fighting on and over significant bodies of water, he must base his design on the profound impact the nature of water has on maneuver and air attack. Due to its nature, the maneuver of military forces across water is totally dependent on the availability of ships, the characteristics of these ships, and the infrastructure needed to transit between land and ship. The same fluid nature results in a relative (compared to land) lack of surface complexity which makes it easier for aircrews performing air interdiction to employ technologies like radar to find and attack ships.

Then, if the attack succeeds in sinking a ship, it completely destroys both the ability to maneuver and, often, all the forces using the ship to maneuver. Even when aircrews do not detect ships they can still have a significant impact on the enemy's ability to use water for maneuver by destroying infrastructure (such as docks and oil terminals) needed for transhipment or by mining bodies of water (such as harbors, straits, or canals) that limit where maneuver by water can take place.[26]

The same cause and effect relationships that apply to surface maneuver and air interdiction also apply to close air support. If enemy surface forces attempt to maneuver rapidly, they are less able to employ measures that reduce the immense physical destruction close air support can cause. Yet, if the enemy attempts to reduce the risk of high losses from close air support by dispersing and hiding, his surface forces are less likely to have the strength (concentration) or speed needed to counter the maneuver of friendly surface forces.[27]

Although enemy forces on land can take advantage of the surface's complexity to construct defensive positions that may reduce their losses from close air support, this does not necessarily mean that close air support will be ineffective. One reason is that the time and effort it takes the enemy to build these positions may significantly delay and disrupt enemy maneuver. Another is that applied suddenly and in concentration, close air support has an immense, but temporary and difficult to quantify, psychological impact on the enemy's ability to fight effectively. When friendly surface forces are prepared to use rapid maneuver to exploit the opportunity this temporary effect provides, they are likely to be able either to close with and destroy or by-pass the enemy before he can recover.[28]

Similarly, a commander must also ensure his aerospace forces are prepared to exploit opportunities provided by the dynamics of surface combat through the timely application of close air support. Recognizing how fratricide can have a debilitating effect out of proportion to the physical damage it causes (a reality many models ignore), a commander must also ensure that the aerospace platforms, munitions, and tactics he uses to attack enemy surface forces in close proximity to friendly forces do not create unacceptable risks for either friendly surface or aerospace forces. Of course, he must judge these risks in terms of how such attacks can contribute to the campaign, recognizing that at times significant risks not only will be acceptable, but required.[29]

Besides creating advantages vital for achieving tactical success, a commander who synchronizes his air interdiction and close air support with his surface maneuver will also be better able to exploit any opportunities that result from tactical victory. One way a commander might choose to exploit these opportunities is by maneuvering his surface forces to envelop and destroy large portions of the enemy's surface forces. A series of such envelopments could weaken the enemy to the point he is unable to continue to resist.[30] Another way a commander might choose to exploit opportunities resulting from tactical victories would be to have his surface forces penetrate deep into the enemy's rear area, where the infrastructure the enemy depends on to control, move, and sustain his combat forces is located. Here

surface and aerospace forces could wreak havoc, causing such immense physical and psychological disruption that the coherence of the enemy's entire defense could suddenly collapse.[31]

While aerospace forces clearly have the potential to make an immense contribution to the success of a campaign, a theater or joint force commander's ability to realize this potential depends greatly on the command arrangements he uses to control aerospace forces. The arrangement that experience shows has the best chance of achieving success in a campaign is one in which a commander has an airman act as his air component commander, controlling all his aerospace forces.[32] A commander should usually select his air component commander based on which service provides the bulk of his air assets. The reason this arrangement has been so successful is that it is best suited to the uncertain nature of war, as well as the characteristics (range, speed, and flexibility) of aerospace forces.

Creating fog and friction for the enemy depends on being able to exploit the characteristics of aerospace forces to achieve, suddenly, powerful concentrations of force. This ability requires that all aerospace forces within a theater be centrally controlled. Then, if this centralized control is exercised through an air component commander, it has the advantage of decreasing the effect of fog and friction on friendly performance by allowing the theater or joint task force commander to devote more time and attention to the design, organization, and conduct of the campaign. This advantage is heightened if the air component commander is an airman because an airman is more likely to have the detailed knowledge required to maintain aerospace capabilities in the midst of war's dangers and exertions.[33]

The fog and friction of war also explain why the advantages created by having an airman serve as air component commander are greatest when he delegates authority for controlling tactical execution to qualified subordinates.[34] The need for such delegation results from the fog and friction that impede the synchronization of aerospace and surface forces in the dangerous and uncertain environment that characterizes high intensity, fluid combat. Delegation of control reduces the complexity of the problem an air component commander faces by keeping his span of control more in harmony with his situational awareness.[35] Moreover, delegation has the advantage of reducing the enemy's ability to create friction by attacking an air component commander's command and control facilities.

In conclusion, although aerospace power has the potential to make an immense contribution to success in war, this potential is unlikely to be realized unless commanders know what the exercise of operational art involves and why. Such knowledge must be gained by studying war intensively from a campaign perspective.[36] Only a campaign perspective can reveal how and why aerospace power has the potential to make such a big contribution to the effectiveness of surface forces. Just as importantly, such a perspective is needed to understand how and why surface forces are often the key to making aerospace forces more effective.

**Notes**

1. According to one definition, to attain strategic goals in a theater of war, a commander exercises operational art through his design, organization, and conduct of campaigns. See US Department of the Army, *Operations,* Field Manual 100-5 (Washington, D.C.: Government Printing Office, 5 May 1986), 10.

2. For example, see Barry R. Posen, "Is NATO Decisively Outnumbered?" *International Security,* 12 (Spring 1988), 186-202. Posen attempts to perform an admittedly abbreviated "campaign analysis," while totally ignoring how air power in the form of air interdiction might influence ground force ratios. The only mention of air power in his campaign analysis is in a footnote where he states that due to space constraints he has omitted "certain important issues, such as NATO and Pact attack helicopters and close air support aircraft."

3. As Carl von Clausewitz pointed out, war is not "the action of a living force upon a lifeless mass...but always the collision of two living forces." This collision produces a climate consisting of danger, exertion, uncertainty, and chance. Clausewitz determined that "Friction is the only concept that more or less corresponds to the factors that distinguish real war from war on paper." Carl von Clausewitz, *On War*, ed., and trans. by Michael Howard and Peter Paret (Princeton, New Jersey: Princeton University Press, 1976), 104, 119, and 579.

4. "The commander's concept is his supreme contribution to the prospect of victory on the battlefield whether he is at the tactical or operational level. Without a sound and dominating concept or operation, no amount of command presence, personal flair, years of rectitude, demonstrated integrity, advanced degrees, perfectly managed assignments, warrior spirit, personal courage, weapons proficiency or troop morale can hope to compensate," Gen William E. DePuy, USA Retired, "Concepts of Operation: The Heart of Command, the Tool of Doctrine," *Army*, August 1988, 26-40.

5. "Maneuver is the movement of forces in relation to the enemy to secure or retain positional advantage. It is the dynamic element of combat--the means of concentrating forces at the critical point to achieve surprise, psychological shock, physical momentum, and moral dominance..." *Operations*, 12.

6. "Synchronization is the arrangement of battlefield activities in time, space and purpose to produce maximum relative combat power at the decisive point. Synchronization is both a process and a result." *Operations,* 17. Also see, DePuy, "Toward a Balanced Doctrine," *Army,* November 1984, 18-25.

7. While the maneuver of aerospace platforms after they have left the surface is extremely important, this is not the only form of aerospace maneuver important to the outcome of a campaign. Aerospace forces can also maneuver by occupying new and old air bases and launch facilities. Often this form of maneuver is a prerequisite to effective maneuver in the aerospace environment. The ability of General Kenney to maneuver his fighters to a forward, undetected base at Marilian, New Guinea, enabled him to surprise and devastate Japanese air forces based at Lae. George C. Kenney, *General Kenney Reports* (Washington, D.C.: Office of the Air Force History, 1987), 251, 262, 274-279. Ninth Air Force conducted similar maneuvers in World War II, building bases first in Normandy and later across France as Allied armies and air forces pursued the retreating German forces. William B. Reed et al., eds., *Condensed Analysis of Ninth Air Force* (Washington, D.C.: Office of Air Force History, 1984.

8. When he provides these advantages, a commander's forces will not have to fight outnumbered and may even be able to win despite possessing equipment or tactical skills that are inferior to the enemy's. The value of these advantages was evident in the Soviet defeat of German forces in 1944-1945. It is also a major reason for the success American and British armies had fighting the German Army.

9. The German Army's race across France shows how a successful penetration of enemy defenses can be exploited.

10. La Comte de Dervieu, *The Transformation of War,* cited by J.F.C. Fuller, *The Conduct of War, 1789-1961* (New York: Minerva Press, 1962), 50.

11. The World War II Pacific campaigns fought by Admiral Chester W. Nimitz and General Douglas MacArthur provide excellent examples of the ability to neutralize enemy surface forces while avoiding combat with the bulk of those forces. They did this by conducting campaigns that by-passed many islands occupied by large numbers of Japanese ground forces. However, before they could by-pass these islands, they first had to fight and defeat Japanese air forces in order to gain control of the aerospace environment over and around those islands.

12. The defeat in the air of both the Japanese and Germans during World War II resulted, in large part, from their inability, compared to the allies, to sustain high pilot attrition. See R.J. Overy, *The Air War 1939-1945* (New York: Stein and Day, 1981) 141-145.

13. This was the case in the Korean War where achieving air superiority close to the Yalu proved difficult, resulting in limitations in the United Nations' ability to employ B-29s. Robert F. Futrell, *The United States Air Force in Korea 1950-1953* (Washington, D.C.: Office of the Air Force History, 1983) 401-431.

14. The need to seize bases was emphasized in a lecture on World War II by Sir Arthur Tedder. He stated "That in our discussions (during the North African campaign) my naval colleague was as insistent as I was in emphasizing to our army colleague the urgency of the recapture of the airfields in the Benghazi bulge, without which convoys could not get through to save Malta from starvation. Equally my army colleague put the capture of airfields or of areas suitable for airfields as a primary consideration in the planning of his land operations.

The land-war in the Mediterranean became, in fact, a battle for airfields. When we lost airfields we lost the initiative on land and at sea...(thus) if you study the campaign along the Coast of Africa and across the Mediterranean to Europe, you will see how the advance went, step by step, from one airfield area on to the next." Marshal of the Royal Air Force Sir Arthur Tedder, "Air, Land and Sea Warfare," *The Journal of the Royal United Service Institution,* February 1946, 63. Learning from the Allies' experience in North Africa, Ninth Air Force gave great attention to the subject of air base availability in its preparation for the invasion of France. After the war its analysis noted that, "Mobility, closely analogous and second in importance only to flexibility, is another prime prerequisite. To a tactical air force mobility on the ground is what flexibility is in the air. Fundamental to the mobility of a tactical air force is the provision of airfields where, when, and of the types required by the tactical commands and administrative elements most effectively to carry out their respective tasks." Reed, 3.

15. During the North African campaign Major General James H. Doolittle noted that the lack of suitable bases within reasonable range of the enemy meant that he could employ at one time only about a third of the 600 aircraft at his disposal. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II,* vol. 2, *Europe: Torch to Pointblank, August 1942 to December 1943* (Chicago: University of Chicago Press, 1949), 116; also 83, 89-91, 94, 100, 117-121. Increases in aircraft effectiveness resulting from having bases as far forward as "we could get them" was vital to General Kenney's success in the fall of 1943. Kenney, 299. In Korea Brigadier General Edward J. Timberlake, deputy commander of Fifth Air Force, noted that "One F-51 adequately supported and fought from Taegu Airfield is equivalent to four F-80s based on Kyushu." Futrell, 65-68, 87, 94-95.

16. This was the case with the forward bases Kenney build in the Pacific and those the Allies built in Normandy.

17. Concealment and deception were essential to General Kenney's ability to establish a base at Marilian, which was closer to the enemy at Lae that his Dobodura bases. Until Marilian was available, Kenney's fighters did not have the persistence they needed to dominate the skies over Lae. Kenney, 251.

18. In order to be as realistic as possible, a model of modern air war cannot afford to ignore the loss rates that are likely if aircraft attempt to use a base's minimum operating strip during poor weather or darkness.

19. General Sharon's ground attack across the Suez Canal on 15 October 1973 neutralized four SAM sites, opening up a gap in the Egyptian air defenses that the Israeli Air Force quickly exploited to regain air superiority. M.J. Armitage and R.A. Mason, *Air Power in the Nuclear Age* (Chicago: University of Illinois press, 1983), 134.

20. Unfortunately, the impact of mobility on the effectiveness of a surface-based air defense system appears to be given little consideration in many models that are attempting to simulate fluid combat conditions.

21. The Germans would have been faced with such a dilemma in Normandy, if the Allies had not already achieved air superiority by the time they landed. Before the invasion the Allies attacked and neutralized all German air bases within a 150-mile radius of Caen. Then, soon after the initial landings, they began building bases to ensure they could achieve and maintain a more powerful concentration of air power over Normandy than the Germans. By 24 July 1944 Ninth Air Force had 18 fighter-bomber and reconnaissance groups (equivalent to today's wings) operating from 15 bases in Normandy and bases for five more groups were under construction. Craven and Cate, vol. 3, *Europe: Argument to V-E Day, January 1944 to May 1945,* 69; Reed, 25. To a limited degree the initial actions of the Egyptian and Syrian armed forces had this effect on the Israeli Air Force in the 1973 war. However, neither the Egyptians nor the Syrians were able to capitalize on the situation. A better example is the British effort to recapture the Falklands. In his attempt to defeat the British naval maneuver the Argentinean commander was forced to commit his air forces to battle at such a distance from their mainland air bases that the tactical effectiveness of his aircraft was severely compromised. The British took advantage of this situation and succeeded in inflicting loses the Argentinean pilots could not sustain. As a result, the British were able to gain and maintain the degree of control over the aerospace environment they needed for their campaign to achieve its objective.

22. Control of the aerospace environment was a major factor in the success in Fortitude South. Adolph Galland, *The First and the Last,* translated by Marvyn Savill (New York: Ballantine Books, 1965), 212.

23. During the Battle of the Bismarck Sea General Kenney's land-based aircraft sank a convoy of eight transports carrying the Japanese 51st division from Rabaul to New Guinea. This action created a dilemma for the Japanese Imperial General Headquarters by demonstrating that without air superiority the maneuver of major formations across large bodies of open water involved great risks. Faced with this dilemma the Japanese chose not to attempt large scale reinforcement or evacuation, making it possible for the Allies to neutralize large numbers of Japanese troops by by-passing numerous occupied islands. Ronald H. Spector, *Eagle Against the Sun* (New York: The Free Press, 1985), 226-229. The Germans faced a similar dilemma in the campaigns for Stalingrad and Tunisia. In both cases the desperate nature of the situation caused the Germans to choose to use airlift for resupply despite not possessing air superiority. Both efforts proved futile, costing the Luftwaffe 495 aircraft, including 269 JU-52s, at Stalingrad and 371 more transports resupplying Tunisia, including on one day, six Me-323 "Giants" and 25 JU-52s, carrying 800 troops. Williamson Murray, *Strategy for Defeat* (Maxwell Air Force Base, AL.: Air University Press, January 1983), 155, 163.

24. The nature of land is characterized by its complexity. It possesses infinite variations in gradient and its strength varies according to location, weather, and traffic. Vegetation and man-made structures also add to this complexity. Richard K. Simpkin, *Race to the Swift* (London: Brassey's Defence Publishers, 1985), 57-77.

25. Models should not ignore factors, such as surface complexity, that influence the probability aircrews will acquire valid targets. The reason is apparent in the ability of land units to use measures (such as dispersal, concealment, and camouflage) that exploit surface complexity so as to make it more difficult for aircrews performing air interdiction and close air support to find them. Of course, taking advantage of this complexity often causes significant delays in the maneuver of surface forces. General von Senger, commander of the XIV Panzer Corps in Italy, noted that the impact of these delays on his ability to maneuver was like being a chess player "who for three of his opponent's moves has the right to only one." Moreover, surface complexity can also make it easier for aircrews to cause delay and disruption by destroying transportation infrastructures, such as bridges and tunnels, that make rapid land maneuver possible. Frido von Senger und Etterlin, *Neither Fear Nor Hope* (New York: E.P. Dutton, 1964), 224.

26. The success of mining was clearly evident in 1972 when the US Navy mined Haiphong. The Iraqi air attacks on Iran's Kargh Island oil terminal provides still another example of air power's ability to influence movement by sea.

27. This was the case in 1950 when Chinese units attempted a rapid pursuit of retreating United Nations ground forces. By the middle of December the Chinese decided they could no longer sustain the high losses caused by air attacks and broke off their pursuit. Futrell, 261-264.

28. Many World War II German army commanders believed close air support, such as that provided during Operation Cobra, was extremely effective, even though relatively few troops were lost. As they noted, such bombing produced "terrifying immobility." These effects, however, were only temporary and an immediate assault by ground forces was necessary to achieve the "maximum benefit." General Omar N. Bradley, *Effect of Air Power on Military Operations*, Air Effects Committee, 12th Army Group, 15 July 1945), 37, 183.

29. For example, during Cobra, Allied bombing inflicted numerous friendly casualties. Despite these losses, the air attacks were a major factor in the allies' success. Bradley, 103-105, 108, 185.

30. After the Allied break-out from their lodgment in Normandy, they missed three such opportunities at Falaise, on the Seine, and on the Beveland Isthmus, to envelop and destroy major portions of the retreating German army.

31. The German invasion of France in 1940 is seen by many as a classic example of psychological dislocation leading to a sudden collapse of effective defense. Although this was clearly the result, it may not have been the intent or expectation of many senior German leaders.

32. Study of the Allied North African campaign makes clear the need for an airman acting as air component commander. For excellent treatments of this issue, see Daniel R. Mortensen, *A pattern for Joint Operations: World War II Close Air Support North Africa* (Washington, D.C.: Office of Air Force History, 1989).

33. General George Kenney's performance as General Douglas MacArthur's air component commander provides an excellent example of how an airman's expertise is necessary to maintain the capabilities of aerospace forces in combat. His logistical skills were the key to keeping his small force in combat despite extremely primitive basing facilities and tenuous lines of communication. See Kenney.

34. General Kenney entrusted tactical operations to Brig Gen Ennis C. Whitehead, thus freeing himself to concentrate on fighting the campaign. See Maj Charles M. Westenhoff, USAF, "Aggressive Vision," *Airpower Journal,* Fall 1989, 34-49.

35. Modern communications and intelligence gathering technology has often unappreciated limitations. These limitations and the importance of balancing centralized control with decentralized execution can be better understood if one realizes that "From Plato to NATO, the history of command in war consists essentially of an endless quest for certainty... Everything else being equal, a larger and more complex task will demand more information to carry it out...(but) to attain certainty, one must first of all have all the relevant information. The more the available information, however, the longer the time needed to process it...(This leads to) the realization that certainty is the product of time as well as of information, and the consequent willingness to do with less of the latter in order to save the former." Thus, success in war has often been the result of "a readiness at higher headquarters to accept more uncertainty while simultaneously reducing it at lower ones. Properly understood, the two way of coping with uncertainty (centralization and decentralization) do not therefore consist of a diminution as opposed to acceptance, but rather of a different distribution of uncertainty among the various ranks of the hierarchy." Martin van Creveld, *Command in War* (Cambridge, MA., Harvard University Pres, 1985), 264-267, 270, 274. Also see, Captain Kevin B. Smith, US Army, "Combat Information Flow," *Military Review,* April 1989, 42-54.

36. Preparing officers to exercise operational art effectively requires an approach which is significantly different from that suitable for developing tactical expertise. Compared to tactics, exercising operational art effectively requires a much greater degree of imagination, as well as a comprehensive understanding of the cause and effect relationships among many more factors, most of which are variables. These differences help explain why training, which can be an effective means of developing tactical competence, contributes much less to developing the ability to exercise operational art effectively. Instead, short of actually waging war, developing the knowledge needed to exercise operational art effectively requires studying real war, primarily through the means of history.

# CENTERS OF GRAVITY
# --THE KEY TO SUCCESS IN WAR--

**Colonel John A. Warden, USAF**
**Air Command and Staff College**

Thinking about war and actually conducting war require that we have a good understanding of what war is, what we intend to gain from it, and what the links are between the instruments of war and the ends desired. Too frequently, our vision of war concentrates almost exclusively on its most obvious manifestation--the clash of the fielded military forces of the contestants. Indeed, Clausewitz identified the battle as the essence of war.[1] Perhaps, however, Clausewitz identified battle as the essence of war because in his vantage point in time and place battle dominated the process of war. Indeed, his native land, Prussia, was known as an army with a country; thus, the only way to defeat Prussia was to defeat its army. Furthermore, in reaction to the stylized magazine wars of the preceding century, Clausewitz tended to focus his attention on the actual clash of men and to see that clash as the dominant form of war. Clausewitz may have been right for the time and place in which he lived with its accompanying technology, but it is not clear today that the actual clash of men on the front is the only way or the best way to wage war. We will suggest, to the contrary, that it may be the most costly and least productive approach in perhaps the majority of cases. To understand why this may be so, it is necessary to look at the objective of waging war at the strategic and operational levels and then to look at descriptive models of modern day combatants. We will begin with objectives.

**Objectives**

The theater commander and his component commanders are responsible for conducting military operations that will lead to attainment of the political objectives specified by the leaders of their country. To do so, they employ the air, sea, and ground forces needed to attain a military objective that supports the political objective of the war. The political and military objectives of both sides together establish the nature of the conflict. The political objective of a war can range from demanding unconditional surrender to asking the opponent to grant favorable terms for an armistice. The military objective that will produce the desired behavior on the part of the enemy will be related to the political objective and will in turn heavily influence the campaign plan designed to attain it. In the most basic of terms, the political objectives will be realized when the enemy command structure, the enemy leader or leaders, is forced by direct or indirect action to make concessions. It is the enemy command structure, civil and military, which must be the ultimate aim of all military operations. At the strategic and operational level, inducing the enemy to make the desired concessions requires identification and attack of those parts of the enemy state and military structure which are most essential to the enemy's ability and desire to wage war. What concessions might the enemy be asked to make?

An enemy can concede his right to existence, or he can concede his desire to destroy his opponent. In between, he can concede a province, a trade right, or an offensive. Important to note is that most wars through history have dealt with concessions that were far removed from conceding a right to exist. Indeed, wars carried to this extreme have been so rare that we still refer to them as "Carthaginian solutions." Since most wars have ended with concessions short of utter destruction, the overwhelming majority of wars have ended with the side which made the most concessions (the defeated side) relatively intact. Even in the extreme cases of Japan and Germany in World War II, the defeated states made their final concessions long before the total destruction of their fielded military forces. This point is key because it implies a relatively high degree of rationality on the part of most states and military forces. That is, states and military forces make concessions based on some kind of a cost benefit calculus. The Japanese, for example, surrendered--made a concession--based on the assessment that continuing the war was going to be very costly and unlikely to produce much benefit.

Every state and military force differs in how it assesses costs and benefits. In general terms, however, every modern state and military force has

similar concentrations of strengths. These strengths are centers of gravity--but they are also vulnerabilities in the same way that Samson's hair was at once his strength and his weakness. When a state's centers of gravity are put under sufficient pressure, it will either make appropriate concessions to relieve the pressure (anticipated costs of not doing so too high for likely gains) or it will make concessions because the pressure has become so intense that it is no longer physically capable of continuing its prior course.

The concept of centers of gravity is simple in concept and difficult in execution because of the likelihood that more than one center of gravity will exist at any time and that each center will have an effect of some kind on the others. It is also important to note that centers of gravity may in some cases be only indirectly related to the enemy's ability to conduct actual military operations. As an example, a strategic center of gravity for most states beyond the agrarian stage is the power generation system. Without electric power, production of civil and military goods, distribution of food and other essentials, civil and military communication, and life in general become difficult to impossible. Unless the stakes in the war are very high, most states will make desired concessions when their power generation system is put under sufficient pressure or actually destroyed. Note that destruction of the power system may have little short term effect at the front. If a theater commander concludes that the enemy's power generation system is a key center of gravity, he should design his campaign to attack it.

Every state and every military organization will have a unique set of centers of gravity--or vulnerabilities. Nevertheless, it is possible to create a general model which provides the theater commander a starting place for his analysis. The next few paragraphs discuss the model in terms of rings; some centers of gravity are more likely to be more important than others and consequently can be laid out in the form of five concentric circles with the most important element in the center, essential production second, the transportation network third, the population fourth, and the fielded military forces--the and spear--fifth.

The most critical ring is the command ring because it is the enemy command structure, be it a civilian at the seat of government or a general directing a fleet, which is the only element of the enemy which can make concessions. In fact, wars through history have been fought to change (or change the mind of) the command structure--to overthrow the prince literally or figuratively--or put in other words, to induce the command structure to make concessions. Capturing or killing the state's leader has frequently been decisive. In modern times, however, it has become more difficult--but not impossible--to capture or kill the command element. When the command element cannot be threatened directly, the task becomes one of applying sufficient indirect pressure that the command element rationally concludes that concessions are appropriate, realizes that further action is impossible, or is physically deprived of the ability to continue combat. The command element will normally reach these conclusions as a function of the degree of damage imposed on the surrounding rings. Absent a rational response by the enemy command element, it is possible to render the enemy impotent by destroying one or more of the outer strategic rings--or centers of gravity.

The next most critical ring contains essential industry. Essential industry is not only war related industry; indeed, war related industry may not be very important *qua* war industry in many cases. The growth in the size of cities around the world and the necessity for electricity and petroleum products to keep a city functioning has put these two commodities in the essential class for most states. If a state's essential industries--or absent its own industry, its access to an external source--are destroyed, life itself becomes difficult and the state becomes incapable of employing modern weapons and must make major concessions--which could be as little as forswearing offensive operations outside its own borders. Depending on the size of the state and the importance it attaches to its objectives, even minor damage to essential industries may lead the command element to make concessions. The concessions may come because

a. Damage to essential industry makes it physically difficult or impossible to fight

b. Damage to essential industry has internal political or economic repercussions which are too costly to bear

The number of key industrial targets in even a large state is reasonably small and each of the targets

in key industries such as power production and petroleum refining are fragile.[2]

The third most critical ring contains the enemy state's transportation system--the system which moves goods and communications, civil and military, around the state's entire area of operations. It includes rail lines, air lines, highways, bridges, airfields, ports, telegraph lines, satellite uplinks, radio stations, and a number of other similar systems. For both military and civil purposes, it is necessary to move goods, services, and information from one point to another. If this movement becomes impossible, the state ceases to function. Compared to key industrial systems, there are more transportation facilities and more redundancy; thus, a greater effort may be required to do enough damage to have an effect.

The fourth most critical ring holds the population and its food sources. Moral objections aside, it is difficult to attack the population directly; there are too many targets and in many cases, especially in a police state, the population may be willing to suffer grievously before it will turn on its own government. Indirect attack on the population, such as that North Vietnam used against the United States, or Sherman used against the South by marching through Georgia, may be effective especially if the target country has a relatively low interest in the outcome of the war.

The last ring holds the fielded military forces of the state. Although we tend to think of military forces as being the most vital in war, in fact they are means to an end. That is, their only function is to protect their own inner rings or to threaten those of an enemy. A state can certainly be led to make concessions by reducing its fielded military forces--and if all of its fielded forces are destroyed, it may have to make the ultimate concession simply because the command element knows that its inner rings have become defenseless and liable to destruction.

Viewing "fielded forces" as means to an end and not necessarily important in themselves is not a classical view--in large part because the majority of the classical writing and thinking on warfare has been done by continental soldiers who had no choice but to contend with enemy armies. Modern technology now, however, makes possible new and politically powerful options that in fact can put fielded forces into the category of means and not ends.

In most cases all the rings exist in the order presented, but it may not be possible to reach more than one or two of the outer ones. As an example, the Germans in World War II were incapable of making serious attack on anything but the fourth and fifth rings (population and fielded forces) of their primary enemies after they lost the Battle of Britain and the submarine campaign because they didn't have long range attack capability. The Japanese could attack only the fifth ring (fielded forces) of their primary enemies. Conversely, the United States and her allies could attack every German and Japanese ring of vulnerability.

It is imperative to remember that all actions are aimed against the mind of the enemy command; thus, an attack against industry or infrastructure not only has some ultimate effect on fielded forces, but has a direct effect on commanders who must assess the cost of rebuilding, the effect on the state's economic position in the post war period, and whether the cost is worth the potential gain from continuing the war. The essence of war is applying pressure against the enemy's innermost strategic ring--its command structure. Military forces are a means to an end. It is pointless to deal with enemy military forces if they can be bypassed, by strategy or technology, either in the defense or offense.

Before continuing, we must ask ourselves if states exist that do not have all five rings or centers of gravity. As we go back in history, we find that the second, third, and fourth rings decreased in importance or disappeared entirely. As an example, when William the Conqueror developed his campaign plan for the conquest of England, he could not have identified key production, critical transportation, or the population as centers of gravity. Harold and his army constituted the only real centers of gravity; neither the state nor the army depended on key production, little or no transportation system was needed to serve the meager needs of the state or army, and the people had little to say about Harold's policies (and perhaps didn't care). William, therefore, had no choice but to clash with Harold and his army. Today, it is difficult to imagine a similar situation; we have all become too dependent--even in the Third World--for both our daily subsistence and our ability to fight on elaborate production and transportation systems. The one exception may be where an entire people rises up to conduct a defensive battle against an invader. If the people are sufficiently motivated,

they may be able to fight for an extended period by using the resources naturally available to them. Where such may be possible for the defense, for the offense, it is not.

To this point, we have discussed centers of gravity that we tend to identify as "strategic" centers. An operational level commander may be told that his objective is to attack strategic centers of gravity. On the other hand, he may be forced to deal with the enemy's fielded military forces because he cannot reach strategic centers without first removing enemy defenses or because his political masters will not permit him to attack strategic centers. If he cannot attack strategic centers, or if he must reduce enemy fielded military forces before he can do so, he must still concentrate first on the concept of centers of gravity.

Centers of gravity exist not only at the strategic level, but also at the operational level--and, indeed are very similar. At the operational level, the goal is still to induce the enemy operational level commander to make concessions--such as retreating, surrendering, or giving up an offense. Like the state command structure, however, the operational commander has rings of vulnerability--or centers of gravity--surrounding him. In fact, each major element of his command will also have similar centers of gravity.

At the operational level, the first ring or center of gravity is the commander himself. He is the target of operations either directly or indirectly because he is the one who will decide to concede something to the enemy. Included in his center ring is his central command, control, and communications system; without the ability to collect information and issue orders to his subordinates, the commander--and his command--are in peril. As at the strategic level, however, the likelihood of physically seizing or paralyzing the command ring is relatively small; thus, recourse to the operational rings, or centers of gravity, surrounding the operational level commander may be necessary.

The next operational ring is the logistics ring which contains the essentials of combat--the ammunition, the fuel, and the food without which modern war cannot be prosecuted. A cursory review of history quickly reveals the dire straits that operational level commanders have encountered when their logistics ring suffered from enemy attack. Indeed, war in the 17th and 18th centuries was in large measure designed around isolating a commander from his logistics ring. Recent work examining operational level POL distribution in the Soviet army suggests that the problem of providing key logistics support for a large scale offensive has become more difficult than ever in the annals of warfare. The difficulty and complexity, however, make attack of this center of gravity easier and more decisive than in earlier wars where total requirements per man in the field were a fraction of what they are today.[3]

Necessary to move the materiel found in the logistics ring, as well as fielded military forces themselves, is an infrastructure--and the infrastructure is the third operational ring. It consists of roads, airways, seaways, rails, communication lines, pipelines, and a myriad other facilities needed to employ fielded forces.

None of the three inner rings will function without personnel to man them and these support personnel constitute the fourth operational ring. Like the population in the fourth strategic ring, however, these personnel present difficult targets and will rarely be appropriate for direct attack.

The fifth and last ring of the operational commander is his fielded forces, his aircraft, his ships, and his troops. The fifth ring is the toughest to reduce, simply because it is designed to be tough. As a general rule, a campaign that focuses on the fifth ring (either by choice or because no alternatives exist) is likely to be the longest and bloodiest for both sides. Nevertheless, it is sometimes appropriate to concentrate against the fifth ring and sometimes it may be necessary to reduce the fifth ring to some extent in order to reach inner operational or strategic rings.

**Conclusions**

The focus of war operations must be against the enemy leadership whether civil or military. When the leaders, whether they be in the nation's capital or in the field, believe they are defeated or bested, the nation or forces they lead are beaten--at least until a new leadership is installed. To affect the enemy leadership, we must understand what the enemy looks like conceptually. If we accept the idea that an enemy is conceptually a leader in the center surrounded by

centers of gravity, we can think more clearly about how to affect the enemy leadership. By thinking in these larger strategic and operational level terms, we simplify our tasks enormously. We may not have to find and destroy thirty thousand tanks if we can destroy the few hundred fuel or ammunition distribution points. We may not have to destroy the few hundred fuel distribution points if we can immobilize an entire society by destroying dozens of electrical generation systems. And we may not need to destroy dozens of electrical generation systems if we can capture or kill the enemy leader. Our task is to look and work as close to the center of the enemy's operational and strategic rings as possible. When we have identified where the real centers of gravity lie, we must then decide how best to strike those centers. If we go through this process honestly and rigorously, we can be confident that we have crafted a good campaign that will lead to realization of the political aims of the war.

**Notes**

1 Karl von Clausewitz, *On War,* trans. and ed. by Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), p. 95.

2 Superficially, Allied attacks on German industry in World War II would seem to contradict the idea that essential industry is fragile. In that conflict, however, bombing accuracy was atrocious; more than half of all bombs dropped missed their targets by well over a thousand feet. When accuracies are improved to where more than half of all bombs fall within a few feet of their target, it becomes clear that what took thousands of sorties and many tons of bombs can now be accomplished with orders of magnitude less effort.

3 A significant amount of German transport used on the offensive against the Soviets in 1941 was horsedrawn. Likewise, the supplies needed to keep Patton's entire Third Army on the offensive in 1944 would barely support a single corps today. The proliferation of motor vehicles, communications equipment, and doctrine demanding high rates of fire has perhaps created more problems than it has solved for an offensive army. It has also accentuated the need for a very high degree of air superiority, if not air supremacy, if the complex logistics train of today is to function effectively.

# OPERATIONAL ART FROM THE TOP DOWN INSTEAD OF THE BOTTOM UP

**Michael J Morin**
**Colonel, USA (Ret)**
**United States Army War College**

## INTRODUCTION

### The Essence of Joint Warfare

"Separate ground, sea and air warfare are gone forever. If ever again we should be involved in war, we will fight it...as one single concentrated effort...strategic and tactical planning must be completely unified, combat forces organized into Unified Commands..."

President Eisenhower 1958

President Eisenhower made this statement, based on his experience in World War II, just prior to the enactment of the Defense Reorganization Act of 1958. It took the Defense Reorganization Act of 1986 to cause the development of a Joint Doctrine Master Plan, creating the necessary Joint Doctrine about unity of effort in theater warfare, that President Eisenhower called for.

The United States' reluctance to develop high-level military doctrine is also recognized in Major General Atkeson's book, *The Final Argument of Kings*, from a different perspective when he says, "Faith in the intellectual quality of the leadership and the wisdom of military doctrine is a powerful force in any arsenal-usually more powerful than the design of the weaponry in hand. At present, the Soviets profess a fully unified military science for the preparation of the socialist community for war, and they deride the West for its backwardness in this regard." Gen Atkeson then examines the state of military art and science and concludes, "Congress and the Administration can help by requiring the Services to develop and explain coherent proposals; together with the supporting military theory, for supporting long-range strategic goals."[1] Perhaps this theory of the art and science of warfare, American style, is starting to emerge in the Joint Keystone publications.

With the publication of JCS Pub 3-0 (Test), *Doctrine for Unified and Joint Operations*, a construct of the governing principles of theater warfare has been codified. These principles have always been broadly stated in JCS Pub 0-2, *UNAAF*.[2] The concept of dividing the thought and activities of war into three levels was agreed to by the JCS before the development of Pub 3-0 so the publication incorporated this concept while concentrating on how the strategic level influences the operational level. Definitions of these two levels are found in the new DOD Dictionary, JCS Pub 1-02.[3] Understanding these two levels is essential to the argument of this paper. The CINC's theater war plan, which is a strategic plan, is an activity of the strategic level as the definition shows. Why the CINC operates at this level will be explained later in the paper. Suffice it to say at this point the former CJCS Admiral Crowe in testimony before the Senate Armed Services Committee thought the CINC and his theater perspectives were strategic.[4] Certainly when the CINCs speak at the USAWC, they think they have a strategic perspective. However, many writers and readers think the CINC is at the operational level because this view is presented in the Army's FM 100-5. Other writers are ambiguous on this point.[5]

In the announcement for the mini-symposium, Lt Gen Hosmer is quoted as stating, "Tactics are designed to win battles; operations are designed to

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win campaigns; and strategy is designed to win war." In his article he further concludes that, "One must first determine, as well as possible, what the enemy's strategy is, and then develop a concept to attack that strategy. This concept is the essence of the operational level of war, and skill at employing the concept is operational art."[6] Again it appears that the perspective of operational art as found in FM 100-5 is the basis of Lt Gen Hosmer's statement. This paper agrees that operational art is a skill; however, the concept to defeat an enemy's strategy is a strategic concept whose implementation is both a strategic and operational endeavor orchestrated by the theater commander in a top-down manner.

Since the "top-down" perspective on operational art in JCS Pub 3-0 is different than the "bottom-up" perspective of FM 100-5, this paper will examine why that is so. The 1982 edition of FM 100-5 created the three levels of war without defining them. It did state that the principle activities of the three levels were military strategy, campaigns and operations, and battles and engagements, respectively.[7] The 1986 edition stated that the structure of modern warfare required a national undertaking from "the highest levels of policymaking to the basic levels of execution" and said the broad divisions of activities of this endeavor were "military strategy, operational art, and tactics" followed by a vague reference about the principles of war applying differently to each level of war.[8] Since the former activities of "campaigns and operations" became the activity of "operational art," it was easy for the reader to assume that operational art was the activity of the operational level of war particularly so when the definition of operational art placed the theater commander (and the theater of war) and his subordinates (and their theaters of operation) at the operational level of war.[9]

Thus, two interrelated issues to this paper are whether the CINC and his subordinates are at the same level of war and whether the activity of operational art is solely at the operational level. The purpose of the paper will be to examine both of these issues sufficiently to show why JCS Pub 3-0 is a top-down perspective on operational art as a skill focused on strategic intent, and its implementation by the CINC in his theater strategy and campaign so as to link the three levels of war.

This purpose should enhance the military operations research analysts understanding of the activities of operational art as it affects the planning and conduct of theater warfare. The subject area of special interest of this paper is on the current concept of operational art as found in JCS Pub 3-0.

## OPERATIONAL ART FROM THE TOP-DOWN

The focus of the argument herein centers on the answers to three questions: What does operational art encompass? Who practices operational art at what levels of war? What is the relationship of operational art to the levels of war? Each of these questions will be answered leading to the operational art perspective in JCS Pub 3-0. First, is operational art a skill or an activity?

The Random House College Dictionary states that art is the "skill in conducting any human activity." Military activity occurs at all levels of war. As Maj Gen Atkeson rightly points out in Part I of his book, understanding the art and science of war is a must in the pursuit of the essence of war. The art and science apply at all levels of war, but the art which determines the strategic intent for the defeat of the enemy's strategy gets close to the "essence of war." Lt Gen Hosmer already agrees that "skill in employing the concept is operational art." This paper and Pub 3-0 assumes that operational art is first and foremost a skill which conceives of an intent which integrates certain activities of war.

## WHAT DOES OPERATIONAL ART ENCOMPASS?

When one examines the joint doctrine and memorandums existing before the writing of Pub 3-0, an hierarchy of activities of war emerges as follows: national security strategy, national military strategy, theater strategy, campaigns, unified operations, joint and service operations, and tactics.[10] These activities were integrated and codified in Pub 3-0. The integration of these activities causes national strategic direction to influence the planning and conduct of theater warfare. In order to determine which of these activities is in the domain of operational art, we will examine what FM 100-5 says it is.

> "Operational art is the employment of military forces to attain strategic goals in theaters of war or theaters of operation through the design, organization and conduct of campaigns and major operations"[11]

Since Army operational art integrates military forces, strategic goals, theaters of war and operations, campaigns and major operations, each of these activities will be individually examined from a joint perspective to show how the concept of joint operational art was derived in Pub 3-0.

In joint doctrine, joint forces are defined in terms of Service forces. Service forces are defined as armed forces of the United States, i.e., Army, Navy, Air Force, Marine Corps, and Coast Guard. Joint forces are generally two or more of the Services operating under a single commander. However, these definitions occurred before the definition of unified operations was added to the dictionary. Pub 0-2, *UNAAF*, explains that "a unified operation is the wide scope of actions taking place within unified commands under the overall direction of the commanders of those commands. Within this general category of operation, subordinate commanders of forces conduct either single service or joint operations to support the overall unified operation."[12] Unified, joint and service operations, and supporting operations, combined operations, and interagency actions are all explained in Pub 3-0. Since a unified commander conducts unified operations, Pub 3-0 assumes he commands unified forces, not yet defined in the dictionary. Since subordinate commanders conduct joint or single service operations, Pub 3-0 assumes they command joint or service forces. Thus military forces in Pub 3-0 are unified, joint or service forces. So, joint operational art conceives the employment of unified, joint and service forces, and combined forces and other government agencies if they are part of unified operations.

In joint doctrine, strategic objectives are primarily found in the National Security Strategy and National Military Strategy and in the Joint Strategic Capabilities Plan and in the Unified Command Plan.[13] Generally, these documents direct the CINC to achieve strategic tasks. Pub 0-2 creates the need for a CINC to devise a theater strategy, and Pub 3-0 elaborates on how this is done and what it contains.[14] Admiral Crowe in the same testimony before the SASC said, "...during the course of these hearings, several of the CINCs will testify on... the regional strategy they propose to employ".[15] Pub 3-0 integrates the three levels of strategy so that the CINC conceives of his strategic intent in a variety of strategic concepts and provides strategic direction to his subordinates through these concepts.[16] Since operational art attains strategic objectives, the question is does it encompass the theater strategic objectives found in the CINC's theater strategy?

In joint doctrine, three levels of theaters are integrated into methods of dividing up the territory of the CINC's area of responsibility (AOR) assigned him in the UCP. First, the theater is the AOR and it is a strategic environment (Pub 0-1 calls it a strategic region) in a regional sense with obvious connections to the global environment. Theater is the overall term used in peace and war. Theater strategy covers all threats or instabilities in the theater. For war planning purposes or in preparation for war or major conflict, the CINC can create a theater of war of which he would be in charge. Generally it would not cover the entire theater. If the CINC wants to subdivide the theater of war, he can assign his subordinates theaters of operation.[17] The question becomes does operational art link the three levels of theater activities?

In joint doctrine two levels of campaigns are outlined at the theater level. Global campaigns apply to the national level. There is a difference in how the Army defines a campaign. FM 100-5 defines a campaign as "a series of joint actions designed to attain a strategic objective in a theater of war." Pub 3-0 defines a campaign as "a series of related military operations aimed to accomplish a strategic or operational objective within a given time and space."[18] Both definitions attain strategic objectives but the joint version can also achieve an operational objective. The Army version limits the campaign to a series of joint actions in a theater of war. The joint concept is a series of related military operations--unified, joint, and service--in a given time and space which can be applied to two levels. One level of campaign achieves national strategic objectives in the theater of war, and the other achieves theater strategic and operational objectives in theaters of operations.

Thus, Pub 3-0 incorporates two levels to campaigning in the theater, a theater campaign which is "a series of related unified operations in a theater of war designed to achieve national or alliance strategic objectives", and a subordinate campaign as "a series of related operations in a theater of operations designed to achieve the CINC's strategic and operational objectives.[19] Colonel Warden's addressal of the air campaign (subordinate level) as

being supporting to the "overall theater plan" is a proper usage of current joint doctrine.[20]

Consequently, the activities of war--military forces, strategic objectives, theaters, campaigns and operations--under Army operational art have been expanded and refined as they appear in Pub 3-0. Military forces have become unified, joint and service forces. Strategic objectives also occur at the theater level and are translated from the theater strategy as a strategic concept which goes into paragraph 3a of the theater campaign plan. Subordinate campaigns accomplish the theater strategic mission and concept through a phased series of operational concepts and objectives. Unified operations are conducted by theater commanders, and joint or service operations are conducted by subordinates. From a joint perspective the activities essential to the articulation of a strategic vision by a CINC are national strategic direction, theater strategy, theater campaign, subordinate campaigns, and unified, joint and service operations as they influence battles. Does operational art encompass all these activities?

**WHO PRACTICES OPERATIONAL ART?**

FM 100-5 says "no particular echelon of command is solely or uniquely concerned with operational art, but theater commanders and their chief subordinates usually plan and direct campaigns."[21] Maj Gen Atkeson in addressing the roles played in a given campaign says, "In particular, we need to make a distinction between forces which are players at the operational level and those levels of command which operational decisions are made." He goes on to say about Napoleon that, "the emperor would execute strategic movements with the units to create threats to his opponents and to bring the players to the places where he wanted to give battle. Then he would manipulate them operationally to insure that superior numbers would be brought to bear at selected critical points."[22] Although CINCs are not emperors, they are in charge of more territory than Napoleon was and they do view war from a strategic perspective. They also provide key operational direction to their subordinates. It is now time to examine why the CINC is not at the same level of war as his subordinates.

JCS Pub 3-0 agrees that theater commanders and their subordinates do campaigns but the similarity ends there. The argument so far has shown that a CINC conceives a strategic intent to carry out national direction and that intent goes into his campaign plan. It has also shown that subordinates accomplish both strategic and operational direction in their campaigns. If the CINC is at the strategic level of war then operational art must also include activities that are strategic in nature as well as operational.

A CINC is at the strategic level for four sets of reasons. His perspective is strategic because he assists in defining national strategic direction and provides theater strategic direction to his subordinates; his theater campaign plan (theater war plan) is a strategic plan which accomplishes strategic tasks; the concepts he integrates into his theater strategy and campaign are mostly strategic concepts; and, in addition to CINCs thinking they are at this level, the opposing enemy's strategy and German doctrine put them there. Obviously, a paper of this length cannot delve into all these areas but can ably scratch the surface.

A unified command is constituted for one essential reason: "a broad continuing mission exists requiring execution by significant forces of two or more Services and necessitating single strategic direction".[23] JCS Pub 3-0 explains how the CINC carries this out with a theater strategic estimate, a theater strategy and a theater campaign plan centered on a strategic concept. Additionally, the *UNAAF*, Pub 0-2, explains how the CINC participates in the formulation of national strategic direction in the strategic planning process. MOP 7 (formerly MOP 84) also explains his role in the strategic process. Pub 5-02.1, JOPS, Vol I, explains how a theater war plan is developed and approved by the CJCS (NCA) to insure the CINC's strategic concept accomplishes the assigned strategic tasks. Certain strategic concepts of Pub 1-02 were integrated into concepts that would influence the development of the CINC's intent expressed in his strategic concepts, i.e., such concepts as strategic advantage, strategic concentration, strategic mission, strategic reserve and the enemy's strategic center of gravity.[24] The German field manual, HDv 100-100, in Appendix 1 places SACEUR (CINCEUR) at the strategic command and control level.[25] Lastly, if one compares the Soviet levels of war with their chain of command with the US/NATO chain of command and the three levels of war, the fact that the SOVIET strategic level goes down to the Front level of command causes a misalignment of perspectives to occur with the

strategic level only going through the CINC.[26] This broad review can be better understood from a reading of the cited references. Suffice it to say such a review causes the CINC to be placed at the strategic level of war in Pub 3-0.

## WHAT IS THE RELATIONSHIP OF OPERATIONAL ART TO LEVELS OF WAR?

With the CINC at the strategic level, operational art from a joint perspective insures the "top-down" linkage of theater strategy to theater campaign and unified operations to subordinate campaigns, and joint or service operations to battles. Integrating activities of both the strategic and operational levels, from a joint perspective, into the concept of operational art insures that national strategic direction will be skillfully conceived and applied by a CINC's strategic intent to both his and his subordinates' campaigns to orchestrate the battles. Thus, operational art from a top-down perspective is as follows:

> "Operational art is the employment of military forces to attain strategic or operational objectives in a theater of war or in a theater of operations through the design, organization and conduct of campaigns and major formations. Operational art translates theater strategy into operational, and ultimately, tactical action. No specific level of command is solely concerned with the operational art."[27]

In summary, operational art from a joint perspective is a skill used by a theater commander to conceptualize his strategic intent in a manner to achieve his assigned strategic tasks in his theater in peace and war. This intent envisions the employment of unified, joint and service forces (combined when appropriate) and focuses on integrating two levels of strategic objectives. Joint operational art links the activities of the three levels of war and is practiced by the CINC and his subordinates. A more detailed comparison of the similarities and differences of operational art from an Army and Joint perspective is included at the end of the paper.

## CONCLUSION

Operational art is the essence of theater warfare. It is first and foremost a skill practiced by CINCs and subordinates to insure that joint combat power is applied in the right time and space so that battles occur at the right time and place according to the sequence of the theater campaign plan. Joint operational art:

- Must be understood from the top down perspective as found JCS Pub 3-0.

- Encompasses those activities which transmit strategic intent into operational and tactical actions.

- Is the vision which links the three levels of war.

- Applies across the operational continuum.

- Provides the conceptual framework for modeling of theater level wargames.

## ENDNOTES

1. Atkeson, E. B., Major General, USA (Retired). *The Final Argument of Kings*: Reflections on the Art of War, p. 10, 29.

2. The Joint Chiefs of Staff, Joint Pub 0-2, Unified Action Armed Forces (UNAAF), 1 Dec 86, pp. 1-1 to 1-3 (hereafter referred to as "Joint Pub 0-2"). Unity of effort is caused by the principles of maximum integration, full utilization of forces, interoperability and support.

3. The Joint Chiefs of Staff, Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms,* 1 Dec 89, p. 349 (hereafter referred to as "Joint Pub 1-02").
Strategic Level Of War. The level of war at which a nation or group of nations determines national or alliance security objectives and develops and uses national resources to accomplish those objectives. *Activities at this level* establish national and alliance military objectives sequence initiatives; define limits and assess risks for the use of military and other instruments of power; develop global or *theater war plans* to achieve those objectives; and provide armed forces and other capabilities in accordance with the *strategic plans.*
Operational level of war. The level of war at which *campaigns and major operations* are planned, conducted, and sustained to accomplish strategic objectives within *theaters or areas of operations.*

Activities at this level link tactics and *strategy* by establishing operational objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives.

4. Statement of CJCS Admiral William J. Crowe, Jr., USN, before the Senate Armed Services Committee, January 21, 1987. "Military Strategy Across the Continuum of Peace and War," *Defense Issues,* Vol. 2, No. 8, p. 5.

5. Warden, John A., *The Air Campaign: Planning for Combat,* p. 4. Since the theater command is referred to at the operational level and the examples cited were theater of operations commanders in WW II, it is not clear if "theater" means "of war" or "of operations." As it stands it would be a CINC because theater is the modern term for today's unified theater Commander.

6. Hosmer, B. G., Lieutenant General, USAF, *PHALANX*, p. 3.

7. FM 100-5, *Operations,* 1982, pp. 2-3.

8. FM 100-5, *Operations,* 1986, p. 9.

9. *Ibid.*, p. 10, pp. 27-29.

10. The documents are: The President's National Security Strategy, A Report to Congress, Jan 1988; MOP 7, *JSPS,* 20 Jan 1990; Joint Pub 0-2, *UNAAF,* December 1986; and, Joint Pub 1-02, *DoD Dictionary,* December 1989.

11. FM 100-5, *Operations,* 1986, p. 10.

12. Joint Pub 0-2, p. 3; Joint Pub 1-02, p. 384, The Joint Chiefs of Staff, *Joint Pub 3-0 (Test),* "Doctrine for Unified and Joint Operations," January 1990, p. I-11 and chapters II and III (hereafter referred to as "Joint Pub 3-0 (Test)."

13. Joint Pub 1-02, p, 231, p. 244; Joint Pub 3-0, p. I-3.

14. Joint Pub 3-0 (Test), p. I-4; Joint Pub 0-2, p. 4-29.

15. Statement of CJCS Admiral William J. Crowe, Jr., USN, before the Senate Armed Services Committee, January 21, 1987. "Military Strategy Across the Continuum of Peace and War," *Defense Issues,* Vol. 2, No. 8, p. 7.

16. Joint Pub 3-0, (Test), pp. xiii; I-3, 6, 8, 10; III-1, 2, 6, 7, 8, 9, 10; Appendix B and Appendix C, para 3a.

17. Joint Pub 1-02, p. 370; Joint Pub 3-0 (Test), pp. I-2, I-4, I-5, I-6, I-8, I-9, I-11, II-1, II-3, II-4, III-4.

18. FM 100-5, 1986, p. 10; Joint Pub 3-0 (Test), p. ix; Joint Pub 5-0 (Test), p. GL-3.

19. Joint Pub 3-0 (Test), p. III-13 to III-18 and Appendix C.

20. Warden, John A., *The Air Campaign: Planning for Combat*, p. 153.

21. AFM 1-1 Chapter 3, p. 9.

22. FM 100-5, 1986, p. 10.

23. Atkeson, E. B., Major General, USA (Retired), The Final Argument of Kings: Reflections of the Art of War, pp. 204-208.

24. Joint Pub 0-2, p. 3-21, Joint Pub 3-0 (Test), pp. I-2 to I-6, III-2 to III-10.

25. Joint Pub 0-2, pp. 2, 1-1, 1-4, 1-10, 1-14, 2-8 to 2-9, 3-4, 3-21, 3-22, 3-59, 4-26, 4-29 to 4-30; The Joint Chiefs of Staff, JCS Memorandum of Policy 7, 20 January 1990, pp. 1-10, 16-32, 38-41; Joint Pub 1-02, pp. 348-350; Joint Pub 3-0 (Test), pp. I-4, I-8, I-10 to I-11, III-2, Appendix B; Joint Pub 5-02.1, pp. I-5 to I-6, III-1 to III-20.

26. HDV 100-100, Appendix 1.

27. Vasiliy Savkin's book on the Soviet View of Operational Art does not contain a comparison with the United States view of the three levels of war. Using the USAWC Reference Text on the *Soviet Armed Forces Reference Text,* Chapters III and V, AY 89, a comparison of the opposing levels of war

and levels of commands (NATO and Warsaw Pact) was done. The Soviets strategic direction reaches further down the chain of command to the Front.

28. Joint Pub 3-0 (Test) (revised), p. xii and pp. III-5 to III-7.

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**OPERATIONAL ART - FM 100-5**

**DEFINED**

- Operational art is the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations.

**KEY POINTS:**

- A campaign is a series of joint actions designed to attain a strategic objective in a theater of war.

- Simultaneous campaigns may take place when the theater of war contains more than one theater of operations.

- Theater commanders and their chief subordinates usually plan and direct campaigns.

- A major operation comprises the coordinated actions of large forces in a single phase of a campaign or in a critical battle. Major operations decide the course of campaigns.

- Army groups and armies normally design the major ground operations of a campaign.

- Battles consist of a series of related engagements. Battles decide phases of campaigns.

- Major operations are the coordinated elements of phases of a campaign. Major operations are usually joint operations.

- Operational art thus involves fundamental decisions about when and where to fight and whether to accept or decline battle.

- Its essence is the identification of the enemy's operational center of gravity...and the concentration of superior combat power against that point to achieve a decisive success.

- No particular echelon of command is solely or uniquely concerned with operational art, but theater commanders and their chief subordinates usually plan and direct campaigns.

- Operational art requires broad vision, the ability to anticipate, a careful understanding of the relationship of means to ends, and effective joint and combined cooperation.

- Operational art requires the commander to answer three questions:

- What military condition must be produced in the theater of war or operations to achieve the strategic goal?

- What sequence of actions is most likely to produce that condition?

- How should the resources of the force be applied to accomplish that sequence of actions?

**POTENTIAL CONTRADICTIONS:**

- Military strategy is the art and science of employing the armed forces of a nation or alliance to secure policy objectives by the application or threat of force (FM 100-5).

- Military strategy is the art and science of employing the armed forces of a nation to secure the objectives of national policy by the application of force or the threat of force (Joint Pub 1-02)

- Military Strategy sets the fundamental conditions of operations in war or to deter war. It establishes goals in theaters of war and theaters of operations. It assigns forces, provides assets, and imposes conditions on the use of force (FM 100-5).

- While its formulation is beyond the scope of this manual, strategy derived from policy must be clearly understood to be the sole authoritative basis of all operations (FM 100-5)

- Military strategy, operational art, and tactics are the broad divisions of activity in preparing for and conducting war (FM 100-5).

- Successful strategy achieves national and alliance political aims. Operational art translates those aims into effective military operations and campaigns (FM 100-5).

- While the principles of war apply equally to strategy, operational art, and tactics. They apply differently to each level of war (FM 100-5).

- FM 100-5 strongly implies that the theater commander (CINC) operates at the operational level of war.

- Operational art links strategy to tactics and involves the activities of campaigns and major operations (FM 100-5).

**OPERATIONAL ART - JOINT PUB 3-0**

**DEFINED**

- Operational art is the skillful employment of military forces to attain strategic and/or operational objectives in a theater through the design, organization, integration and conduct of theater strategies, campaigns, major operations and battles. Operational art translates theater strategy and design into operational design and ultimately, tactical action, by integrating the key theater activities of all levels of war. No specific level of command is solely concerned with the operational art.

**KEY POINTS:**

- A theater commander's (CINC) theater strategy translates national and/or alliance strategies into a theater campaign composed of unified operations and subordinate campaigns composed of joint or service operations.

- The theater commander employs assigned forces to attain national strategic objectives while the subordinate commanders employ designated forces to attain theater strategic objectives.

- Operational art requires broad vision, the ability to predict, and an understanding of the interrelationships or all functional activities: operations, logistics, intelligence, and planning.

- Although a theater commander participates in the development of national military strategy and formulates his theater strategy, he and his principle subordinates are practitioners of operational art.

- The theater commander designs his theater campaign to seek theater and national or alliance strategic military objectives through a campaign or a single operation, while subordinates design their campaigns and major operations to support the theater commander's.

- Operational art enjoins an understanding of the design, organization, integration and conduct of theater campaigns and unified operations as they influence subordinate actions. A campaign is a series of related military operations aimed to achieve a strategic objective within a given time and space.

- Theater campaigns for conflicts are a series of related unified operations in a theater of war designed to achieve national or alliance strategic objectives. Integrated subordinate campaigns are a series of related operations in theaters of operation designed to achieve the theater commander's strategic and operational objectives. A theater campaign can also occur in other types of areas (joint operations area, sub-theater, etc).
- Central to the practice of operational art is the identification of an opponent's strategic and operational centers of gravity. The theater campaign is directed at the strategic center of gravity while subordinate campaigns are directed at operational centers of gravity.

- National security strategy is the art and science of developing and using political, economic and informational powers of a nation, together with its armed forces, during peacetime and wartime, to secure national security objectives.

- National military strategy is the art and science of employing the armed forces of a nation to secure the objectives of national security policy by the application of force or the threat of force.

- Theater strategy is the art and science of developing integrated strategic concepts and courses of action directed toward securing the objectives of national and alliance/coalition security policy by the use of force, threatened use of force, or nation assistance or security operations within a theater.

- Thus, there are three levels of strategy formulated at both the national and theater levels.

- The national military strategy has global or multitheater dimensions and frames regional concerns while theater strategy is regional in outlook but influences the global and regional guidance of the nationalstrategic plan.

- The national military strategy is developed by the JCS with assistance from the CINC's, the military departments and the services.

**SIMILARITIES/DIFFERENCES:**

- Army view is that operational art is an activity of the operational level of war; joint view is that operational art is a skill which

integrates the key theater activities of all levels of war.
- Both definitions apply to wartime in a theater of war and theaters of operation; but the joint view applies across the rest of the operational continuum.

- Army view deals with only war; joint view deals with operations across the continuum.

- Both definitions employ military forces to achieve strategic goals or objectives; but the joint view has the theater strategy and campaign achieving national strategic objectives, and subordinate campaigns achieving theater strategic objectives.

- Army view deals with campaigns and major operations; joint view deals with theater strategy, theater campaigns, subordinate campaigns, major operations and battles.

- In the Army view it is not clear what level of war the CINC is at but by implication he is at the operational level; in the Joint view he is at the strategic level and provides strategic direction and operational focus to his principal subordinates (through his theater strategy and campaign plan).

- Army view is that a campaign is a related series of Joint actions only in a theater of war; joint view is that a campaign is a related series of military operations in a designated area of the theater, with a theater campaign a series of unified operations and a subordinate campaign a series of joint or service operations.

- Army view is that its essence is to concentrate combat power at operational centers of gravity; Joint view is to strategically concentrate unified forces to gain strategic advantage that leads to defeat of enemy at his strategic center of gravity; and that operational forces concentrate at subordinate operational centers of gravity.

- Army view is no particular echelon of command is solely or uniquely concerned with operational art, but theater commanders and their chief subordinates usually plan and direct campaigns; Joint view is that operational art applies primarily to theater commanders and their principles subordinates to carry out "top-down" strategic intent and design (theater campaign) through operational intent and design (subordinate campaign).

- Army view recognizes strategic direction sets the fundamental conditions and is the sole basis for the employment of armed forces, and military strategy is the activity of the strategic level of war; but, the Joint view is of three levels of strategy, with military strategy divided into a national and a theater version. And, that operational art includes design of the theater strategy which applies to peacetime and wartime.

- Army view is theater of war and theaters of operation are at the operational level; joint view is that there are three levels of theaters with the theater commander's theater and theater of war at the strategic level and subordinate's theaters of operation at the operational level.

- Joint doctrine shows how Joint principles of war relate to developing strategic concepts contained in theater strategies and campaign plans.

# II - Papers on the Soviet (Non-US) Perspective

Dr John A Battilega, SAIC, Chair

# Non-U.S. Perspectives on Operational Art: An Introduction

**John A. Battilega**
**SAIC**

Any discussion of the non-U.S. Perspective on Operational Art should feature the military art of several nations. These certainly would include the UK, France, the PRC, Japan, Germany, Israel, Iran, and Iraq as well as the Soviet Union. This session is incomplete because it does not discuss the operational level of warfare from the perspective of all of these countries. The session more modestly, focuses only on the Soviet Union. Although incomplete, this focus probably reflects the principal attention of military analysts in the United States, at least in recent times.

But even the focus on the Soviet Union is limited. Soviet operational art is a subject fully imbedded within the formal structure of Soviet military science, which views combat as a combination of various standard "forms" and "methods" which are executed to achieve different military objectives. The "operation" is one such "form" (as opposed to battles, engagements, strikes, and systematic combat actions). Formally, a Soviet "operation" consists of a sequence of forms of combat action orchestrated in space and time to achieve a pre-specified objective. Within Soviet military science, the operation has become the centerpiece. With modern technology, an operation can encompass either the "strategic" or "operational" scale of warfare, leading the Soviets to develop an entire family of "operations" or "strategic operations" which form the basic Soviet building blocks of warfare.

Soviet military scientists, by analysis of technology, historical experience, the results of military exercises, and the results of other forms of research, have created a standard set of such "operations." These operations are many in number, and include air, land, sea, aerospace, and homeland defense forces in various combinations. As conditions change, Soviet military science attempts to keep pace by redefining the standard set of operations to meet contemporary combat circumstances. Hence, from the Soviet perspective, "operational art" is the really the centerpiece of Soviet large scale combat. It follows then, that from the perspective of this conference, a full treatment of Soviet operational art should, as a minimum, feature:

-- a solid discussion of the theory of the "operation" within the formal structure of Soviet military science

-- a discussion of each of the standard Soviet operations

-- a discussion of the Soviet approach to planning and controlling each of these operations, and

-- a discussion of the changes currently underway in Soviet operational art, the rationale for those changes, and the trends which may appear in future Soviet approaches to the operational level of warfare.

This session, because of time limits, does not accomplish these objectives. Rather, the session takes a snapshot of some of the main issues through a sequence of five papers designed to give a flavor of the Soviet approach.

The first three papers are designed to highlight the essence of current Soviet operational art. Gary Fonda from SAIC's Foreign Systems Research Center (FSRC) introduces the subject with a discussion of the overall Soviet approach to operational art, and how that approach is manifested in the Front operation, the basic Soviet combined arms operation of land warfare. Professor Russ Stolfi, in a paper presented here by Capt Tom Grassey (both from the Naval Postgraduate School), then discusses the Soviet approach to naval operations, using the requirements for the campaign in the North Atlantic/Norwegian Sea/Scandinavia in a war between the Warsaw Pact and NATO as the vehicle for discussion. Larry Kohn from the FSRC then discusses the Soviet approach to wartime command and control at the operational level.

After this discussion of current Soviet operational art, the remainder of the session discusses trends for

the future. Dr. Jake Kipp, from the Soviet Army Studies Office, first discusses the new Soviet doctrine, and what that may portend for operational art. Tom Banks from the FSRC then discusses recent changes in Soviet operational art that are related to technology and Soviet views of current requirements for warfare.

The papers, collectively, give a good snapshot of the Soviet approach. However, it is still true that the richness of the subject, and the effort devoted to operational art by the Soviets, sufficientlw warrant an entire conference specifically devoted to the Soviet perspective. Additionally, there would also appear to be a requirement for a similar conference devoted to foreign but non-Soviet perspectives. Such a subject will probably become increasingly important with time in the post-Cold War era.

# The Soviet Approach to Operational Art

**Garrett R. Fonda**
**John T. Banks**
**SAIC**

*Tactics make the steps from which operational leaps are assembled: strategy points out the path.*

**A.A. Svechin**
*Strategia*, 1926

In the late 1970's U.S. military specialists began to argue that a new component of military art governs the employment of large-scale military units. This new component--operational art--would be a conceptual link between tactics and strategy. Loosely referred to in the past as "campaign planning" and "grand tactics," this concept had existed only on the fringes of accepted definitions of military art in most modern armies. Ironically, Western military scholars have intuitively recognized the utility of such a concept for many years. In the United States, its roots can be traced as far back as the American Civil War

The U.S. military community continues to debate the concept of operational art: its definition, which commanders practice it, and what echelons conduct it. Opinions vary, but they tend to cluster according to the service that dominates the speaker's point of view. Thus, ground force analysts interpret operational art differently than air force analysts, who, in turn, interpret it differently than naval analysts. In this effort to define a distinctive American concept of operational art, the contribution that the well-developed Soviet theory of operational art could make has often been overlooked. This paper will introduce the Soviet concept of operational art, its historical legacy, and trends in its development into the 1980s.

In this paper, we wish to avoid the position that the Soviet experience in operational art is directly applicable to U.S. military art or, even more, that it should be adopted indiscriminately. We do believe, however, that Soviet operational art should be studied as a basis for comparison and analysis. Ground forces have always dominated Russian and Soviet military art. Other factors also play a role in differentiating the Soviet practice of operational art from the path taken by the United States. Among these are the existence of a General Staff system dating back to the Imperial Russian Army, a long-standing tradition of large-scale warfare, the extended geographical scale of Russian and later Soviet land warfare, a long history of multi-theater warfare, and a cultural propensity towards centralized institutions and solutions. Yet, in spite of these factors which so clearly differ from those which define the American experience, the theory and practice of Soviet operational art is a useful archetype for U.S. military specialists involved in developing or explaining their own concept of operational art.

## SOVIET DEFINITION OF OPERATIONAL ART

Soviet operational art does not exist independently; it cannot be isolated from the overall context of Soviet military art and military science. To a Westerner, one of the most striking aspects of Soviet military theory and practice is the systematic manner in which the body of information comprising this field has been developed and organized. As a result, words and phrases that are adopted for use usually have precise, universally-accepted technical meanings. These are often quite different from the meanings which the same word or phrase, literally translated, has in English, German, or another foreign language. In addition to having a different meaning, these phrases have precise meanings which are specifically linked to a discrete concept in the field of Soviet military science. Only occasionally is a word or phrase, once officially defined, used in ways that connote multiple, ambiguous meanings. A description of this system is beyond the scope of this paper. But the distinction between a few, key concepts which comprise the framework in which Soviet operational art fits needs explanation in order to demonstrate how the concept of operational art fits into this schema.

At its most abstract, the theory and practice of military affairs are divided into military doctrine and military science. *Military doctrine* is the system of officially accepted views held by the state (government) regarding the "essence, goals, and

character of future wars." Military doctrine also prescribes the measures that are needed to prepare the country and the armed forces for these future wars, and of the ways that these wars will be fought.[1] Soviet military doctrine is not simply a method or a procedure. Nor is it just a set of rules about how a branch of service (tanktroops) or a type of weapon (nuclear) is to be used in an armed conflict. It is a much broader concept that has both a political as well as a social-economic and military character. Military doctrine provides the state's vision of future threats to its security and prescribes general guidelines to counter these threats.

*Military science,* on the other hand, is the discipline that studies the nature and character war and armed conflict and the laws that govern them. This includes the study not only of war itself and the methods of waging war, but also of the means by which the armed forces and the general population are prepared to wage war.[2] Soviet military science stresses the scientific nature of its methods to a degree matched in the West only in the physical sciences. Until recently, authoritative Soviet sources spoke confidently of a "general theory" of military science on Marxist-Leninist principles.[3] More recent Soviet discussions of military science have somewhat downplayed references to Marx and Lenin, but they continue to strive toward a scientific, quantitative approach to the discipline.

Soviet military science exists in a close relationship to military doctrine. Doctrine provides military science its framework for analysis, its content, and its direction. In turn, the data and conclusions derived from the study of military science are used to reformulate military doctrine. Military science provides the theoretical and technical rules as well as the alternatives which are used to develop, modify, and evaluate the assumptions and measures which make up Soviet military doctrine.

Soviet military science has a number of component areas of theoretical inquiry. Each is paralleled by a practical component that exists along with but outside the field of military science. The more important of these component of military science include: the theory of military art, the theory of military organization and force development; the theory of military education and training; the theory of troop control; and military economics. Our interest in this paper is in military art, both the theory and the practice.

Soviet *military art is* the "theory and practice of preparing for and conducting military operations on the land, sea, and in the air."[4] The *theory* of military art is a component of military science.[5] The *practice* of military art is not part of military science, but is closely allied to it. Soviet military art (i.e., theory and practice) includes military strategy, operational art, and tactics. Although the U.S. military specialist has long been familiar with strategy and tactics, he has only begun to deal formally with the content and role of operational art since the introduction of AirLand Battle in the early 1980s.

Soviet *operational art* occupies an intermediate, linking position between military strategy and tactics. It involves...

> the theory and practice of preparing and conducting coordinated or independent combined arms (combined fleet) operations or combat actions by field formations [ob"yedineniya] of various branches of the Armed Forces.[6]

In the case of ground forces, the field formations referred to in this definition are *fronts* (army groups) and armies. The connection between echelons and the three components of military art lends itself to an intuitive explanation of the differences between them: divisions, regiments, and smaller units use tactics; armies and *fronts* operate in the framework of operational art; and theater commands and higher apply military strategy.[7]

The tasks associated with the theory of operational art, however, provide a broader description of the nature of operational art. These include:

- Studying the nature and character of operations and the laws that govern them;
- Studying the nature and character of other operational-level uses of field formations;
- Developing methods needed to prepare for and conduct operations;

- Developing methods for organizing coordination between formations, combat support and combat service support, and troop control;

- Determining requirements for organizing and equipping operational scale formations;

- Recommending operational-level force structure in theaters of military operations (TVDs);

- Studying the operational art of possible enemies.[8]

The practical aspect of operational art is rooted in these theoretical tasks. But it more directly encompasses the actions taken by commanders, staffs and forces of operational-level field formations while preparing for and conducting operations. It also involves associated actions carried out to insure the control and support (combat and combat service support) of these operations.[9]

## DEVELOPMENT OF SOVIET OPERATIONAL ART

Soviet military writings point out that the great achievements of Soviet operational art in the Second World War, together with their capabilities for conducting it in the postwar era, issue from the Soviet theory of deep operations of the 1930s. These achievements, they note with pride, occurred almost a half century before the U.S. Army adopted operational art as a component of its military art in 1982. Unfortunately, the parochialism so often characteristic of Soviet reflections about their past dulls our own sensitivity toward their genuine achievements.

While one cannot ignore the seminal role which the Germans played in establishing the conceptual and theoretical basis for operational art, proper recognition of that role should not overshadow the distinctive accomplishments of Soviet military theorists in developing operational art. Deeply rooted in the Imperial Russian experience, the Red Army specialists providently developed and formalized the role of operational art during the inter-war period despite stubborn opposition from some of their own senior leaders. By 1945, with its victory over the German Army, Soviet primacy in operational theory and practice stood unchallenged.

### The Historical Legacy of Soviet Operational Art

The changing nature of warfare in the mid to late-19th Century had a substantial influence on Russian military thinking.[10] From the Crimean War (1853-1856) through the turn of the century, the Russian Army found itself in a succession of wars, all of whose basic operational parameters exceeded those previously experienced or anticipated. Scale, depth and width of the battlefield, size of forces, ranges and effectiveness of weapons, pace of technological innovation, specialization of organizational structure, role of support functions, and complexity of control--all of these increased at rates that far surpassed the experience of previous times. Although the Crimean War was fought in a manner and style strikingly similar to the Napoleonic battles and campaigns a half century earlier, it bore only remote resemblance to the mode of warfare used in the Russo-Japanese War (1904-1905) a half century later.

The "operation" had existed in both Western and Russian armies during much of the 19th century as a concept defining the actions of heterogeneous force groupings, but the term as then used connoted strategic operations carried out under a single war plan. By the end of the Russo-Japanese War, however, it had become clear that ground warfare consisted of more than just strategic movement and tactical battles. Russian military commanders did not comprehend the operation's new significance or unique character at the time, but a qualitatively new form of armed combat had surfaced. Soviet military scholars look back on this period as an important step in the formulation of operational art.[11] In his book *M.V. Frunze--Military Theorist,* General Colonel M.A. Gareyev observes:

> With the increased scope of combat and the appearance of different operations and operational-tactical field forces *(front,* army, corps), a strategic operation was broken up into a number of simultaneously and successively conducted *front* and army operations. Experience showed that the methods of preparing and conducting such operations had substantial differences both from strategic operations and from combat

> operations [read "tactics"]. They did not fit within the confines of combat, but also did not encompass the war as a whole.[12]

With the Russo-Japanese War, the engagement became to the operational level what the battle was to the tactical level. The army operation acquired a new coherence as an "assemblage of battles, engagements, maneuvers, supporting actions, and actions of army resources not to the corps command" operating separately in time and space to fulfill strategic goals.[13]

Through critical evaluation of their failures in the Russo-Japanese War, a number of younger Russian military officers came to realize that a modern war could not be won in a grand battle such as those of the Napoleonic era. Kuropatkin, the Russian commander-in-chief, had tried to do that for a year in the Far East and had failed. War in the future, these younger officers concluded, would involve a series of coordinated movements, engagements, and other combat actions all linked to an overarching strategic plan. The actions required during the course of preparing for and conducting engagements and maneuver with armies and *fronts* were conceptually different from either tactics or strategy in a fundamental way. With a prescience that belies conventional wisdom regarding the Imperial Russian Army of this period, young Russian general staff officers such as A.A. Svechin and A. Neznamov began to map out the concepts which described this link between tactics and strategy in military art.[14] In spite of these early efforts, the void created by the inability of the old classifications in military theory to explain the new reality was not filled until the Soviet era twenty years later.

The timing of these events is remarkable in light of their influence on the subsequent development of Soviet operational art. At a military-technical level, defeat in the Russo-Japanese War had ended the stranglehold which Napoleonic concepts had held on Russian military thinking. This war also introduced a number of technical innovations which had an important influence on warfare. Among these were the machine gun, rapid fire cannons, and radios.[15]

Although notions of static trench warfare and stalemates color the Western military perception of the First World War, warfare on the Eastern Front was not as immobile as in France and Belgium. With notable exceptions, the Russian Army's war against the Central Powers was marked by maneuver and movement. In the Russian Civil War (1917-1922) that followed, the Red Army's experience against White Russian forces only reinforced belief in the importance of mobility and maneuver and of bold, decisive action in modern war. Both the Reds and the Whites had limited forces arrayed across vast distances of relatively flat, neutral terrain. Mobility was achieved by effective use of railroads and the horse. Armies of both sides advanced and withdrew hundreds of miles in the course of days during operations. The deep frontal strike, the envelopment, and the encirclement became the dominant forms of operational maneuver in an environment where defenses were weak by conventional standards. At times, both sides found themselves able to exert simultaneous pressure against the depth of the opponent's defense, disrupting his ability to take counteractions. Even methods of fighting with echelons were used. In a prototype for future operational concepts, Red Army forces in the Perekop-Chongarskiy Operation of 1920 used two cavalry armies of a *front's* second echelon to deeply exploit a breakthrough created by first echelon rifle armies.[16] The Red Army eventually flourished under these conditions, and this style of warfare captured the imagination and intellect of those directing it. Many saw it as being uniquely fitted to the revolutionary type of "worker" armies that were conducting it.

The 1920s and early 1930s were a time of intense theoretical and doctrinal debate in the Soviet Union. Soviet military thinkers thrived in an environment dominated by the requirement to develop a coherent military doctrine for the new Soviet state. They also were driven to find a solution to the new Soviet regime's security problems, initially against the specter of capitalist encirclement and, later, against a resurgent Germany and an expanding Japanese presence in the Far East.

Most of these Soviet military specialists had been trained in the Imperial Army, and many had been members of the prewar Imperial General Staff. Reflecting their experience, these diary specialists began to openly address the concept of operational art. The term itself first appeared in Soviet military-technical literature as early as 1922-1923 when Svechin first proposed it as a new component

of military art. The Red Army's Military Academy established a Chair of Operational Art in 1924, and the term was officially formulated in the Soviet military as early as 1926. Central figures in the development of the theory of operational art at its inception included Svechin, by then a Red Army general staff officer, M.V.Frunze, V.K. Triandafillov, and M.N. Tukhachevskiy, and N.E. Varfolomeev. By the end of the 1920s, the basic concepts underlying Soviet operational art were reflected in the theory of deep operations and the practical application of that theory in troop training exercises.

From a military-technical standpoint, the problem facing Soviet military theorists stemmed from the development and maturation of defensive capabilities in modern armies during the First World War. Defensive concepts in that war had led the belligerents to extensively prepare their defenses in breadth to counter enemy attempts to flank them. And in response to enemy attempts to breach defenses that eventually proved unassailable from the flank, both sides also began improving their defenses in depth. Although the tactical defenses could be penetrated, the length of time spent conducting the artillery preparation usually gave the defending side adequate time to maneuver reserves, counterattack, and restore the penetration.[18]

Western military specialists--especially the Germans and a few forward-looking officers in the British Army--were addressing this problem at the same time the Soviets were. Considering the close German-Soviet cooperation in the 1920s and the interest which the Red staff paid to foreign military developments, some Western ideas likely found fertile soil in Soviet military theory.[19] Nevertheless, the source of immediate inspiration for the theory of deep operations rests in the experiences of Soviet military specialists during the Civil War. Two concepts characterized that war: extended depth of action and the employment of simultaneous pressure against the enemy's front, flanks and rear. These concepts became the foundation for theory of deep operations, which sought:

> ...simultaneous effective engagement of enemy groupings throughout the entire depth of their operational formation by infantry, tank, artillery and air strikes, in combination with the landing of airborne forces in the enemy rear.[20]

Application of this theory required the attacker to contain the enemy at the operational level in two dimensions: along the forward edge and into the enemy's depth along the operational line of commitment.[21] Done effectively, this would preclude the defender's ability to use his reserves to counterattack against the attacker's penetration and subsequently restore the breach. Containment, however, required that the attacker have the ability not only to attack the front, but also to apply pressure simultaneously in depth.

The "deep operation" as laid out in the 1936 *Provisional Field Regulations* had two parts: a penetration phase and an exploitation phase. Instead of attempting to push the defender back along a broad front, attacking forces would conduct multiple breakthroughs at the defender's weakest points to establish the preconditions for operational exploitation. A key objective of this phase was also to establish the operational containment of the defender's forces. To achieve this, attacking first echelon forces would attempt to penetrate deep, bypass enemy forces, and attack them from the flanks and rear. The army and *front* would also conduct simultaneous actions with airborne troops, long range artillery, and aviation to prevent or restrict the maneuver of the defender's corps, army, and army group reserves.[22]

Particularly interesting in this formulation is the far-sighted approach taken in applying new technologies and methods of warfighting. M. N. Tukhachevskiy, a Chief of Staff of the Red Army and later Deputy People's Commissar of Defense, showed a special enthusiasm for the use of airborne assault forces and aviation to "nail the enemy down."[23] Although similar realization of the potential of airborne and aviation forces surfaced at the same time in the armed forces of other nations, Tukhachevskiy was the one who put these concepts into practice on an unprecedented scale. During the 1930s the Soviets formed airborne brigades, and by the early 1940s the Soviet Army had an entire airborne corps.[24]

The development of Soviet operational art went into retrenchment during the late 1930's. Stalin purged most of the top Soviet military leaders--Tuchachevskiy included--as well as many in the

middle ranks. The theories and practices associated with the purged "enemies of the people" were discredited. Using the poor performance of tanks in the Spanish Civil War (1937-1939) as evidence, senior Soviet military leaders who had escaped Stalin's purges moved to undo armored warfare doctrine based on the theory of deep operations. As a consequence, Soviet armored capability was truncated. Large tank formations necessary to provide the striking power to carry out exploitation were broken up, and the tanks were distributed piecemeal in battalion and regimental-size units to function as infantry support.

The *Wehrmacht's* success in Poland in 1939 and Corps Commander Zhukov's routing of the Japanese at Khalkin-Gol in August of that same year shocked the Soviet leadership. The Soviet Army responded by attempting to resurrect its deep strike, armored capability along the organizational lines envisioned in the theory of deep operations. Its efforts were in vain. The Soviet Army was still in disarray when the Germans invaded the Soviet Union in 1941. Not until the second period of the Great Patriotic War (November 1942-December 1943) was the Soviet Army capable of fully executing deep operations.

Soviet experience in the second and third[25] periods confirmed the theory of deep operations, probably--as Gayvoronskiy asserts--"even beyond expectation."[26] Yet, the Soviet success was achieved at great cost. The importance of some aspects central to the theory were underscored and magnified by wartime experience, but a few proved to be beyond the Soviet capability of the time.

For example, the need to concentrate forces on the main axis--a requirement stressed frequently in the theory of deep operations--became paramount in efforts to gain required force densities needed to achieve breakthroughs against the defending German forces. Soviet forces often took exceptional risks in weakening secondary sectors to achieve the necessary concentration.[27] On the other hand, Tukhachevskiy's belief in the usefulness of airborne assault troops as a key to achieving operational containment proved illusory--or, at least, premature. Lacking adequate means to deliver these troops and limited by their own lack of mobility once on the ground, Soviet airborne forces fought largely as infantry during the latter parts of the war after a series of devastating failures in the early phases.[28]

The Soviet experience set the framework for their approach to combined arms operational art into the postwar years. The use of artillery and aviation as an agent of operational importance, multi-echelon force deployments, the use of specialized reserves at all levels, the operational concept of the encirclement, and the use of mobile groups as highly-mobile, self-contained exploitation forces had become critical elements of the Soviet operational offensive by the end of the war.[29] They remained distinctive elements in Soviet operational art in the early 1980s as well.

The path taken by Soviet operational art in the intervening four decades has been discontinuous, with long periods of slow evolutionary change followed by abrupt shifts in theory and practice. These changes have occurred in tandem with major shifts in Soviet military art and doctrine. They can be classified into four periods. The first is the immediate post-war environment of the 1940s and early 1950s, when Soviet operational art remained rooted in the methods successfully employed at the end of the Great Patriotic War. Adopting lessons they had learned in the war, the Soviets restructured their operational formations by introducing for the first time armored infantry and by motorizing their rifle formations.[30] The smaller, more balanced formations provided the army with forces whose combination of mobility, protection, and firepower were closer to that envisioned in the original theory of deep operations.

The second period began in the mid-1950s. It was marked by what Soviet military specialists refer to as the "revolution in military affairs." The improvement and arming of the U.S. and Soviet armed forces with nuclear weapons and ballistic missiles in militarily significant numbers produced "fundamental qualitative change" in Soviet military art and in the organizational structure of the Soviet military.[31] Starting in 1960, after six years of study and preparation, the Soviet armed forces underwent radical changes in both its organization and methods. It did so in response to a new military doctrine which envisioned future wars being conducted with nuclear weapons from the onset.[32]

Overshadowed by the ascendance of the newly-established Strategic Rocket Forces, the Soviet Ground Forces were dramatically reduced in size. The army was also restructured to make its formations more capable of independent operations in a nuclear environment.[33] With the dominance of the nuclear

missile, the importance of military strategy grew and that of art decreased. If wars would be won with strategic nuclear weapons, it was argued, the success of operational-level actions conducted as a component of strategic operations were not essential to military success. Operations and operational art, consequently, became an adjunct to strategy.

As both sides fielded nuclear weapons small enough for battlefield use, Soviet military specialists reformulated fundamental notions of the theory of deep operations. In principle, the new theory retained the two phases of the operation, but no longer would the first echelon be to conduct the breakthrough and the second echelon assigned to exploit. Instead, nuclear strikes would create gaps in the enemy's defensive positions at the onset of the operation, and ground forces would begin exploitation immediately. With this development, the practice of using multiple-echeloned forces was largely abandoned because the reason for having echelons in the first place was their differentiated functions.

The locations where breakthroughs were attempted also changed. Under the operational theory developed in the 1920s and used during the Great Patriotic War, Soviet operational art sought to attack the enemy at his weakest points. This would ensure a more correlation of force at the point of penetration. The qualitative difference in the destructive power of nuclear weapons compared to conventional weapons changed that. Since nuclear weapons would create gaps in any defense, the stronger sectors became the points of breakthrough. Not only would breakthrough be assured by the destructive power of the nuclear weapon, but major portions of the defender's strength--which in conventional operations could disrupt the exploitation or occupy a large proportion of the attacker's strength to contain--would be eliminated early in the operation.

Responding to the U.S. adoption of "flexible response" and to their own success in approaching nuclear parity, Soviet military specialists in the mid-1960s moved toward a third period in the postwar development of operational art. It was based on a "more-balanced" view that future war might not inevitably begin with nuclear weapons.[34] Consequently, the armed forces had to be capable of fighting with either nuclear or conventional weapons.[35] With this came a renewed interest in operational maneuver and the methods of conducting army and *front* operations. By the 1970s operational art once again had regained its former prominence in Soviet military art and doctrine.

Soviet operational art after 1970 developed a hybrid character as it entered its third postwar phase (1970-1987). As the threat of a nuclear exchange occurring early in a strategic operation became less likely, greater attention was given to conventional methods of carrying out operational requirements even as the ability to fight theater nuclear war was maintained. The concepts underlying the theory of deep operations as perfected in the latter part of the Great Patriotic War became the basis for this. But two things were now different. First, Soviet operational art had to deal with theater nuclear warfare as its foremost priority. The requirement to eliminate the enemy's nuclear capability still dominated Soviet operational thinking throughout this period, and many of the methods of warfighting developed during the 1960s remained a part of operational art.

Second, qualitative changes in the capability of conventional weapons forced a reevaluation of the ways in which operational formations were employed. The introduction of the anti-tank guided missile and other precision-guided weapons, improved weapons lethality and range, increased effectiveness of mines and their means of delivery, wide scale introduction of battlefield sensors and surveillance systems, the growing sophistication of electronic warfare capability, and advanced C3I automation are just a few of the developments that threatened the Soviet capability at the operational level. By the early 1980s, influential Soviet military leaders even began speaking openly about certain new conventional weapon systems which were approaching the destructive capability of nuclear weapons.

In response, the methods for conducting conventional operations broadly adopted the concepts underlying the theory of deep operations: operational containment, echelons differentiated by function, non-linear application of combat power. Ground formations again took on a more balanced, less tank-heavy character, giving them more capability for sustained alterations. Emphasis was placed on improving artillery and missile capability, giving it increased operational influence. Specialized air assault, airborne, and special operations units designed to strike the defender's rear area and inhibit

his response were formed or improved. The formation described in the West as the operational maneuver group (OMG)--the successor to the mobile group of the Great Patriotic War--was adopted as a specialized, formation designed to conduct deep operational maneuver.

Soviet military specialists advanced the concept of anti-nuclear maneuver, developed in an earlier period, as a method of moving forces out from under the threat of nuclear attack. Time also became an even more important factor in operational planning than before. Soviet operational theorists assumed that in a situation where neither side wanted to use nuclear weapons except as a last resort, the control mechanisms governing approval and release of nuclear weapons would substantially delay their employment. As a result, operational tempo took on even greater importance. An attacker that could achieve and maintain high rates of advance would be doubly advantaged. A high operational tempo in penetrating enemy defenses and in successful exploitation would magnify the effect of conventional destruction on the enemy. By ensuring early defeat of defending formations, disrupting the defender's command and control, and seizing key operational and strategic targets, the possibility was also raised that a demoralized enemy might think a nuclear response futile and decide against it--or that if the defender finally did approve nuclear release, he would have inadequate capability remaining to carry it out effectively.

Responding to a fear of their opponent's nuclear capability and the offensive nature of its military doctrine, Soviet operational art also focused its attention on the decisive nature of the initial period of war. With forward deployed forces, measures to achieve surprise and to deny the defender knowledge of his opponent's intent and capability (i.e., *maskirovka)* became an important aspect of Soviet operational theory and practice.

Gorbachev's announcement of New Defensive Doctrine signaled the beginning of the fourth period in the evolution of Soviet operational art since 1945. Although New Defensive Doctrine introduced a defensive character to the military technical aspect of doctrine and placed greater emphasis on defensive forms of combat, it did not completely undercut the validity of operational theory. This remains applicable in the conduct of counterstrikes, counteroffensive operations and subsequent offensive operations. Instead, New Defensive Doctrine created a need for defensive operational concepts, which Soviet operational art has largely neglected in the past. By emphasizing the defense to an extent not seen since the doctrinal debates of the 1920s, this new phase promises to expand the *corpus* of Soviet operational theory more than has occurred since operational art was formally conceived as a component of military art a half century ago.

## OTHER FORMS OF OPERATIONAL ART

The development of combined arms operational art described here focused exclusively on just one of many types of operational art recognized in Soviet military affairs. The origins of naval operational art, for example, in some ways roughly paralleled those of combined arms operational art. Recent Soviet military theorists have observed that the development of the naval operation as an identifiable phenomena, like ground operations, also has its roots in the 19th century.[36] And the growth in complexity of operations, particularly during the Great Patriotic War, created conditions for the development of independent categories of operational theory for a number of specialized branches of the Soviet armed forces. Today, these include the operational art of the Strategic Rocket Forces, air defense forces, air forces, naval forces, operational rear services, and civil defense.[37]

## CONCLUSION

That the Red (Soviet) Army from its birth sought to develop the concept of operational art as a separate component of military art is not surprising considering its own origins. Throughout the 19th and early 20th Century, its predecessor, the Russian Army, repeatedly fought large-scale wars against modern enemy armies, and in peacetime maintained a large standing army. Military theorists in the Imperial Russian Army, like the military specialists in the Soviet Army that was to replace it, were irretrievably enmeshed in the rapidly-changing requirements of large-scale warfare. Moreover, many of the brighter officers of the Russian Army--and of its early Soviet successor--had a striking penchant for theoretical study and military scholarship. Buttressed by a pronounced, ideological willingness in the early part of the Soviet regime to break away from traditional modes of thinking, this distinctive

inheritance laid the foundation for the development of operational art as a distinctive component of military art.

There is a danger today that more pragmatic-minded students and practitioners of military art will find in the decline of the Soviet regime reason to ignore the Soviet Army's experience in developing operational theory and practice. Arguments reinforcing this attitude can come from two directions. One points out that the Russian and Soviet experience is derivative: German military thinking on operational art from the mid 19th century onwards provided the conceptual underpinnings for operational art and has set the pace for its development. The other sees in the Soviet Union's political and economic failures reason to doubt the lessons of its military successes.

Soviet operational art has much to offer military specialists. Borrowing wisely from the Germans and from their own military experience, Soviet leaders systematically developed a theory of operational art that was advanced for its time. They had the foresight and resolution to this theory in practice. Recognizing that operational art is contingent on the advances in military technology and other political, economic, and military considerations, Soviet military leaders have adapted their operational art widely over the years. One thing is certain given the changes occurring within the Soviet Union, the changes taking place in military technology, and the development of operational art in Western armies: Operational art will change. This does not, however, deny the usefulness of Soviet operational art to the U.S. military specialist. Its structure and conceptual precision offer a constructive basis from which to critically evaluate the role of U.S. operational art in the future.

**Notes**

1. *Military Encyclopedic Dictionary* Voyennyy entsiklopedicheskiy slovar'), 2 ed (Moscow: Voyenzidat, 1986) s.v. "Military Doctrine (Doktrina Voyennaya)."

2. *bid.*, s.v. "Military Science (Voyennaya nauka)."

3. *Military Encyclopedic Dictionary* (Voyennyy entsiklopedicheskiy slovar') (Moscow, Voyenzidat, 1983), s.v. "Military Science (Voyennaya nauka)."

4. *Military Encyclopedic Dictionary* (1986), s.v. "Military Art (Voyennoe iskusstvo)."

5. The connection between the theory of military art and the practice of military art is a close one. One must not infer from the obvious distinctions between theory and practice in these definitions that the two are different phenomena--or that the Soviets treat military theory as a rarefied, academic exercise only tenuously connected with the real business of practical application. The Soviet military specialist views military theory as the "systematic and generalized knowledge...of war and military affairs," but also as knowledge that is based on the requirements and experience of practical military actions. Practice forms the basis from which military theory is developed and improved. Practice also serves as the benchmark--the "criterion of truth"--by which military theory is evaluated. *Military Encyclopedic Dictionary* (1986), s.v. "Military Theory" (Teoriya Voyennaya). The idea that a concept could be "good in theory, but not in practice" would be viewed as internally inconsistent, because to be good in theory, a concept must, above all, be good in practice.

6. *Ibid.*, s.v. "Operational Art (Operativnoye iskusstvo)."

7. The Soviets consider a corps to be either a higher tactical or an operational-tactical formation, which in some circumstances can conduct operational missions and in the process employ operational art. This distinction is largely determined by a corps's composition and mission. *Ibid.*, s.v. "Corps (Korpus)."

8. *Ibid.*, s.v. "Operational Art (Operativnoye iskusstvo)."

9. *Ibid.*

*10.* Although Soviet military scholars argue that the "objective preconditions" for the operation--"a new form of armed conflict"--appeared in the first half of the nineteenth century; the operation did not appear as a distinct concept until the later half of that century. F.F. Gayvoronskiy, *The Evolution of Military Art: Stages, Tendencies, Principles* (Evolyutsiya voyennogo uskusstva: etapy, tendentsii, printsipy) (Moscow: Voyenizdat:, 1987), p.103.

11. Gayvoronskiy, *Evolution,* pp.102-104.

12. M.A. Gareyev, *M.V. Frunze--Military Theorist* (Frunze--Voyennyy Teoretik). Moscow: Voyenizdat, 1985), p. 154.

13. Gayvoronskiy, Evolution, p. 104.

14. Jacob W. Kipp, *Mass, Mobility and the Red Army's Road to Operational Art, 1918-1936* (Fort Leavenworth, KS: U.S. Army Combined Arms Center, Soviet Army Studies Office, [1987]), p.5.

15. *Military Encyclopedic Dictionary* (1986), s.v. "Russo-Japanese War 1904-1905 (Russko-Yaponskaya Voyna 1904-1905)."

16. Gayvoronskiy, *Evolution,* pp.162-163.

17. *Military Encyclopedic Dictionary* (1986), s.v. "Operational Art (Operativnoye iskusstvo)"; A.I. Radziyevskiy, gen. ed., *The Frunze Academy* (Akademiya imeni M.V. Frunze) (Moscow: Voyenizdat, 1973), pp. 71-72; Kipp, *Red Army's Road*, p. 17.

18. Gayvoronskiy, *Evolution,* p.106.

19. In 1924, while Commandant of the Red Army's Military Academy, Frunze founded the Chair of Foreign Languages. The chair devoted half of its efforts to teaching and studying English and German. Radziyevskiy, *The Frunze Academy,* p. 72.

20. Gayvoronskiy, *Evolution*, p. 166.

21. M.N. Tukhachevskiy, *New Problems in Warfare* (Novyy voprosiyvoyny), trans. *Readings in Soviet Operational Art* (A352) (Fort Leavenworth, KS: U.S. Army Command and General Staff College [5 January 1987]), pp.7-13.

22. *Provisional Field Regulations for the Red Army 1936* (Vremennyy polevoy ustav RKKA 1936), trans. Foreign Broadcast Information Service, *USSR Report: Military Affairs,* 12 June 1986 (JPRS-UMA-86-031), pp. 52-73.

23. Tukhachevskiy, *New Problems*, p. 9.

24. *Military Encyclopedic Dictionary* (1986), s.v. "Air-Desant Forces (Vozkushno-desantnyye voyska)."

25. The third period of the Great Patriotic War extended from January 1944 to May 1945.

26. Gayvoronskiy, *Evolution,* p. 170.

27. *Ibid.*

28. The Soviet Army's belief in the inherent potential of airborne assault forces remained evident in its force structure throughout the post-war era. With the mechanization of its airborne forces in the 1970s, the weaknesses they evinced in the Great Patriotic Ware were eliminated.

29. *Ibid*, pp. 170-174.

30. M.M. Kir'yan, *Military-Technical Progress and the Armed Forces of the USSR* (Voyenno-tekhnicheskiy progress i Vooruzhennyye Sily SSSR) (Moscow: Voyenizdat, 1982), pp. 230-233.

31. V. ye. Savkin, *The Basic Principles of Operational Art and Tactics* (Osnoviniye printsipy operativnogo iskusstva i taktiki) (Washington, D.C.: U.S. Air Force and GPO), p.167.

32. Gayvoronskiy, *Evolution*, p. 203.

33. Kir'yan, *Progress,* pp. 301-302.

34. Gayvoronskiy, *Evolution*, p. 203.

35. An early reevaluation of the role of conventional operations is in Kurochkin, P., "Operations of Tank Armies in Operational Depth," *Military Thought* (Voyennaya mysl'), no. 11 (1964), pp. 97-126, trans. *Readings in Soviet Operational Art* (A352) (Fort Leavenworth, KS: U.S. Army Command and General Staff College [5 January 1987]), pp. 143-172.

36. *Ibid.*, pp. 102-103.

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# Soviet Naval Operational Art[1]

**Russel H. S. Stolfi**
**Naval Postgraduate School**

## Section One

### Soviet Naval Operational Art: Significance, Origins, and Content

There is a Soviet naval operational art. It exists. The application of naval operational arts to the successful completion of naval operations. They will plan naval strategic operations in accordance with that art and execute the planned operations to achieve strategic obiectives in vast geographical areas of strategic importance to them called TVDs (Theaters of Strategic Military Action).[2]

As military formalists, the Soviets have established an extraordinarily coherent grammar of armed struggle.[3] Systematically and with claims of "scientific" rigor, the Soviets designate Naval Operational Art as part of Soviet Military Operational Art and bind the navy with its general principles. For the Soviets the general principles of Operational Art are identical with the general principles of Naval Operational Art. As Russians and survivors of a tough historical past of revolution and war, the Soviets have continued to wrestle with the special features inherent in naval warfare. During the past approximately eight years with the shift toward emphasis on extended conventional warfare, Soviet naval writers have characterized naval operations in various ways in terms of processes (e.g., reconnaissance, strike, command and control) and features (oceanic terrain) that have clarified significantly the principles of naval operational art for them.

The Soviets can be characterized in significant degree as being pedantic in their military formalism because of the stress that they place on arbitrary adherence to rules and form. Stiff Soviet adherence to rule is tempered by a Soviet military science which emphasizes that theory is historically conditioned and must be judged against practice, i.e., *praxis,* as the test of its applicability. This is the feedback loop of the system of knowledge. In this case we are not speaking of history as ideological construct but the more practical use of past experience through an institutionalized process of studying and articulating lessons learned. Such study has been a major function of the General Staff since 1918. The Soviet government organized the study of combat experience and use from the World War in September 1918. This was later expanded to include study of the Civil War while the struggle was still in progress. A systematic effort to do the same with war experience during the Great Patriotic War began in 1942. This linkage of theory and practice is what creates a "scientific method" *[nauchnyi metod].*

In the Soviet case dialectical materialism as the philosophical manifestation of Marxism-Leninism provides a unifying field theory, which unites all disciplines in the study of any social or natural phenomenon. The relationship is epistemological and not ontological--dialectical-materialism offers methodology of cognition, and not the metaphysics of being. If the Soviets are pedantic formalists, their pedantry is not confined to military matters. Whatever the limitations of their method of cognition, it imposes structure, rigor and coherence to their studies. Herein is the secret of Soviet "grammar.

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Perhaps the best way out of a potential dilemma of semantics in beginning to describe Soviet Naval Operational Art is to describe the historical origins and context, then let senior Soviet naval commanders speak about what they see as the role of Soviet Naval Operational Art, and finally proceed to a set of useful definitions. The initial Russian interest in the operational level of war followed the loss of the Russo-Japanese War and owed much to the breakdown of traditional, i.e., battlefield, control of forces. The focus on operational problems was not the product of some staff study of a long historical process but immediate requirements of military praxis-defeat is a wonderful, if costly, teacher. The rallying cry of the reformers after 1905 was a condemnation of Russian military art on the eve of

that war. It had prepared the army for the wrong war. As Colonel A. A. Neznamov asserted, "We did not understand modern war."

As a result, the Imperial Academy of the General Staff became the focus of studies of the operational level of war where German theory, especially that associated with Sigismund von Schlichting, and Japanese practice. Finally, the advocates of focusing on the military operation as a solution for the problem of troop control, e.g., Neznamov, Svechin, et al., were the authors of the 1912 Russian Army Field Regulations and forceful advocates of unified military strategy and doctrine in the pre-1914 period. Their advocacy set off a prolonged and bitter debate within the General staff and officer corps. These same figures became military specialists under the Soviet regime; they were allies of Frunze and Gusev in pressing for a unified military doctrine following the Civil War and articulated "operational art" in the 1920s. The development of operational art became directly tied to the problems of war plans for specific theaters, mobilization, concentration, and deployment of forces in the initial period of war.

As studies of operational topics expanded in the 1920s and early 1930s, three trends were clearly discernible: first, the extension of operational art to the other services, including the navy but also extending to the air force; second, an emphasis upon logistics as a key factor in defining the scale and content of operations; and, third, an attention to the impact of technological change on the conduct of operations, leading to the articulation of the concepts of deep battle, deep operations, and successive deep operations as outlined in the 1929 and 1936 Field Regulations of the Worker's and Peasant's Red Army (RKKA). In a very fine essay by James Schneider on V. K. Triandafillov and his contribution to the methodology for studying operational art, the author notes, for example, the inter-connections and mutual relations among troop control, operational scale, combat norms, technological modernization, and logistical support.

Operational art emerged in a military system dominated by a General Staff, which claimed to be the brain of the armed forces. The Navy, which was part of a unified Peoples Commissariat until 1937 and was dominated by the RKKA, came to operational art from without. As a continental power with a large army, the USSR had no place for a "naval strategy." In short, naval operational art is not a subset of "military" operational art but of operational art in general. Each of the five services, plus Rear of the Armed Forces and Civil Defense, has developed and has maintained its own operational art in keeping with the demands of its particular branch and the general categories of operational art. These arts are referred to as: all-arms operational art *[obshchevoiskovoe],* operational art of the Strategic Rocket Forces, operational art of the Air Defense Forces, operational art of the Air Forces, operational art of the Navy, operational art of the Rear of the Armed Forces, and operational art of Civil Defense. This system permits both unity and diversity and is supposed to facilitate the conduct of joint operations. Operational art is taught at the higher military academies, especially the Voroshilov Academy of the General Staff during a two-year course of instruction which concentrates upon the conduct of theater-strategic operations by multiple fronts and fleets during the initial period of war.[4]

* * *

Regarding the relationship between Soviet operational art as a general category and naval operational art as a subcategory, it can be seen today that operational art emerged as a term from the tsarist Army and among the military specialists in Soviet service beginning with the civil war. There were also changes in the nature of naval warfare which led the Russians to focus on operations. The new focus can be seen in the person of the late nineteenth century Admiral S. O. Makarov and his critique of A. T. Mahan and the concept of command of the sea. Mahan saw two distinct realms, specifically, tactics and strategy. The former he recognized as undergoing fundamental changes owing to the industrialization of warfare at sea. The latter he described as more static and governed by certain fixed principles a la Jomimi. Makarov who was at the cutting edge of the technological revolution--witness his work on warship design to enhance damage control and survival, his experience with mine and torpedo warfare, his promotion of long-range heavy artillery and fire control, and his development of the first icebreaker--saw tactics reshaping strategy. Moreover, as a Russian naval officer with a solid grounding in theater warfare (1877-1878, Black Sea), he had a good appreciation of the problem of joint actions to achieve strategic objectives. Makarov wrote an

appreciation of the Japanese employment of sea power during the Sino-Japanese War and an 1897 essay on naval tactics that show that he felt tactics and technology affect strateqy.

No less an authority than Admiral of the Soviet Fleet, S. G. Gorshkov, recent commander in chief of the Soviet navy, presents the view that by approximately 1910, naval art had produced a new form of fleet combat activity--the naval operation--which created the need for appropriate measures for its support: operational reconnaissance, cover and deception, the defense of major surface naval vessels during transit and in combat against submarines, etc.[5] With the appearance of the modern naval operation, Gorshkov and other Soviet naval authorities claim a logical progression in which their country had developed naval art theoretically before the Great Fatherland War. The more general military art included naval operational art which is described as,

> ...the theory and practice of preparing and conducting all-fleet, landing, and antilanding operations; employment of naval forces in combined-arms operations together with other branches of the Armed Forces, and in independent operations.[6]

The Soviets claim that they had developed the content of the naval operation as the aggregate of battles, actions, strikes, and maneuvers of mixed forces coordinated and interrelated by objectives, missions, place, and time and conducted under a single concept and plan. They indicate that they had developed naval operational art by 1941 with sufficient completeness to survive the great German surprise attack of the summer of that year.

* * *

In discussing modern war, the naval operation, and naval operational art, the Soviets often present their ideas obliquely in terms such as the principles of operational art, historical cases of naval combat particularly from the Second World War to include both Soviet and western examples, and commentary on current trends in both tactical thought and technology. The Soviet Union is controlled by a single political party that claims to be operating under a scientific world historical outlook superior to any other. The centralized and intensively organized Communist Party of the Soviet Union (CPSU) has unified political and military thinking at the highest level and demands conformance with the alleged scientific approach. Theorizing about military and naval art, as a result, is encouraged as a means for maintaining political control and as a way to keep the scientific rigor in military doctrine, science, and art. The Soviets emphasize theory and associated principle in their military writings about operational and naval operational art. We can learn a lot about Soviet naval operational art by studying the principles associated with it and discussed so prolifically by Soviet writers.

The Soviets think in terms of scientifically deduced general regulating principles of operational art that apply fundamentally also to *naval* operational art. The principles that the Soviets subscribe to are similar to the principles of war taught, for example, to officers in the armed forces of the United States, United Kingdom, and France. The long Soviet list of principles of military art--(1) readiness, (2) surprise, (3) assets (use all), (4) coordination, (5) concentration (on main axis), (6) full depth (defeat of enemy to), (7) political-military factors (calculation of), (8) control (continuous troop), (9) energy (resolving of ongoing problems), (10) rear organization (for continuous support), and (11) reserves (timely restoration of)[7]--include most of the principles of war considered as valid in the west. The Soviet principles of operational art are described in terms similar to those above but generally listed as fewer in number, for example, (1) mobility (tempo of combat), (2) concentration (on main axis), (3) surprise, (4) energy (combat activeness), (5) reserves (or preservation of combat effectiveness), (6) conformity of goals with means, and (7) coordination.[8] The Soviet principles of naval operational art, given the centralized unification of Soviet military thought, include the same principles noted above. The naval principles will be accentuated or attenuated in importance compared with the more general principles of operational art because of the unique sea and oceanic operating conditions or "terrain" of the naval operation.

* * *

Probably the most important principle of Soviet military operational art and one somewhat more important even than surprise to the Soviets is,

in English parlance, concentration of effort. In describing the principle that we refer to as concentration, the Soviets use the words.

> massing of forces and resources, the concentration in main and decisive sectors (action areas) of forces and resources or their fire (strikes) for ensuring the rout of the enemy and the achievement of the goal of the operation (engagement).[9]

In land warfare, it must be evident that military operational art ensures the concentration of forces and resources along the ground of the main axis of advance. In warfare at sea in independent or newly emerging Soviet combined fleet operations in oceanic TVDs (TSMAs), the Soviets must exert this principle through the massing of strikes from naval forces that may be either concentrated or dispersed. This interpretation of Soviet naval concentration of effort is demanded by the unique geographical terrain in which the naval operation takes place. In an oceanic TVD (TSMA), Soviet naval forces are not constrained to seize and hold ocean space or forced to advance according to the dictates of mountain, swamp, urban area, etc. The Soviet naval operation will be strike-oriented and Soviet naval operational art will systematically and predictably execute the operation with stiff emphasis on a winning correlation of strike weapons.

In joint operations with the army, for example, amphibious landings in a maritime-style TVD (TSMA), the navy would exert operational art more conventionally. Whether or not the navy were the controlling service in the operation, it would be forced to concentrate forces, means, and fires on the land area of the bridgehead and the sea approaches to it. The Soviets note, for example, that during the Second World War, navies massed forces and resources--the naval force, the landing troops, and aircraft--on the main landing sectors. With inimitable consistency, the Soviets continue on to say that "in doing so, a decisive superiority of forces and resources was often created."[10] Obliquely, the Soviets tell us here that Soviet naval operational art concentrates forces, resources, and fires in amphibious landing operations and does so within a set of rules that demands the establishment of winning correlations of force.

The Soviets comment on this business of massing in the open sea by arguing that in operations aimed at annihilating naval forces and disrupting sea lanes, the massing of forces is achieved by concentrating both homogeneous and heterogeneous naval forces against the more important enemy ship groupings and convoys. Operating out of various sectors, naval forces deliver simultaneous and successive strikes at the enemy until he is completely routed. The Soviets reveal a peculiarity in their way of thinking with the words homogeneous and heterogeneous naval forces. Soviet naval operational art dictates the massing of strikes against the strongest enemy targets but so do naval tactics in the west. The Soviets send a signal on their mentality both in terms of the emphasis on system and a lingering lack of confidence in handling naval forces. The signal is that to be systematic in naval operational art, you must differentiate between homogeneous (e.g., all-submarine, all-naval long range aviation, etc.) forces and heterogeneous forces able to engage in combat. Regarding the distinction between homogeneous and heterogeneous forces, the Soviet distinction is based on the real difficulty in the past of providing for tactical cooperation and support among heterogeneous forces. It is important to remember this is a navy dominated by submarines and land-based aviation.

Recently in 1986, a Soviet naval authority brought together in a brief article the regularities of modern naval operations. Written against the background of increased emphasis on conventional warfare and the "new stage of the scientific-technical revolution," the article summarizes the regularities, content, and characteristic features of the modern naval operation. In it, the Soviets emphasize that the regularities of conducting combat actions at sea are dictated by general laws of warfare and by the unique features of combat at sea. Regularities are described as similar to laws but with multiple meanings and more flexible application; for example, they can reflect necessary relationships among phenomena without indicating a particular law.[11] The Soviets elaborate that regularities of the modern naval operation are based on a group of laws of war that start to act at the beginning of a war and which dictate the course and outcome of combat actions. In a weighty commentary on the Soviet style in war, the Soviet authority, who can be taken as speaking for the navy, i.e., "the Soviets," states that the laws of war and associated realities of principles of naval

operational art "essentially are aspects (components) of a more general law--the determining role of the correlation of the belligerents' material and spiritual forces.[12] This statement by the first deputy chief of the Main Navy Staff supports an interpretation that the Soviets believe the most important regularity (or principle) at the level of naval operational art is the massing of strikes against the strongest naval targets along the main axis of attack.

The Soviets claim a mastery of military operational art based on their success in The Great Fatherland War and the application of the Marxist-Leninist historical and scientific dialectic (logic) to military science, doctrine, and art in the post-war period. They claim operational superiority over the Germans in the Second World War and similar superiority over the armed forces of the bourgeois, capitalist states arrayed against them at present. With compelling historical argument, the Soviets claim that the Napoleonic revolution in warfare, and, in particular, the advent of mass armies (armed forces), obviated any single battle from achieving the strategic objective of a war. Soviet military theoreticians note that the Napoleonic revolution demanded a new form of war fighting activity described as the military operation. For the Soviets, of course, the term military operation does not have the same more or less generic meaning of military combat activity that is common in the West. For the Soviets, the military operation is the combat carried out in a given time and place to achieve unified strategic objectives and consisting necessarily of two or more battles (engagements, or strikes and accompanying maneuvers) requiring the application of operational art for direction and coordination. This mini-definition of the Soviet military operation shows rather neatly the formalism associated with Soviet military theory. For the Soviets, a battle is a battle--combat carried out by tactical formations according to tactical principles and having the purpose to accomplish tactical missions, the most important of which are set by operational art. A ground battle conducted by a Soviet army division is not to be confused with an operation coordinated by an operational level front or independent army headquarters. Similarly, a naval strike conducted by a formation including first rank surface ships is not to be confused with a naval operation coordinated by an operational level fleet headquarters.

With relation to naval warfare, the Soviets note that naval art had produced by the beginning of the First World War, "a new form of fleet combat activity-- *the naval operation* [italics in original]--which created the need for appropriate measures for its support."[13] Imperial Russian naval thinkers and later Soviets linked larger navies and diverse higher performance naval weapons with a revolution in naval warfare demanding the coordinated naval operation in place of the previous brief, simple, surface ship engagement. With considerable systematic rigor, the Soviets created operational art to string together the battles, encounters, engagements, actions, strikes, and maneuvers of the tactical formations into operations. The Soviets note, for example, that the operational art of each service of the armed forces proceeds in its development from the general principles of operational art with associated due regard for the specific nature of the organizations, technical outfitting, sphere of operation, combat capabilities, and methods of combat employment of each service.[14] The Soviets insist that the Navy is bound by the general principles of operational art while simultaneously demanding the "imaginative application" of the general principles to the specific situations unique to the naval operation.

The Soviet naval operation is the most important key to the understanding of Soviet naval operational art. The modern naval operation exists in terms of wartime historical example and peacetime exercise, and in the Soviet navy, is orchestrated by a system of planning and execution described as naval operational art. The Soviets leave little doubt about the general form of orchestration stating that:

> Naval Operational Art *(Operativnoye Iskusstvo)* encompasses theory and practice of preparation for and conduct of integrated fleet, naval, and amphibious landing operations, antiamphibious operations, and employment of naval forces in combined arms, joint, as well as independent operations.[15]

In effect, the Soviet naval operation *is* naval operational art. With some originality, a naval officer at the U.S. Naval Postgraduate School has hypothesized that Soviet naval operational art is the

Soviet military skill of preparing and executing the plan for the naval operation. The officer suggests that the plan neither creates strategic goals nor engages in combat but serves as a link between strategy and tactics.[16] As such, the plan is necessarily the operation whose substance is the tactical combat orchestrated by the plan.

The Soviets leave little doubt that the naval operation is the sum total of its tactical combat activity. One Soviet authority notes, for example, that even before the Second World War his country had defined with sufficient completeness,

> ...the content of an operation as the aggregate of battles, actions, strikes, and maneuvers of mixed forces [e.g., naval surface ships, submarines, and naval aviation; coordinated and interrelated by objective, missions, place, and time and conducted under a single concept and plan...[17]

In discussing the revolution in modern war brought about by the mass armies of the French Revolution and the decisive war fighting style of Napoleon, other Soviet authorities echo the same description noting that,

> ...in military art a new category was conceived--the operation as an aggregate of a number of engagements and encounters by one or several army groupings [i.e., front(s), or in the navy, fleet(s)], unified by a single concept and conducted on a broad front for several days.[18]

Putting these two representative descriptions together, we see that the naval operation is the aggregate of tactical combat, e.g., battles, strikes, engagements, and maneuvers, orchestrated by naval operational art to achieve strateqic goals.

Soviet descriptions of military operations and operational art such as those recounted above allow us to put together a dictionarystyle definition of Soviet naval operational art. The limited usefulness of a definition, particularly at this early stage of the description of naval operational art, should be apparent. The definition will be largely a collection of words fraught with ambiguity, and triggering images of the translated Russian words that fit comfortably with a Western outlook. A definition is a fundamental beginning, however, and the following one issuggested as an initial measure of Soviet naval operational art. Given the considerable importance of operational art in potential future Soviet war fighting, it is suggested that the definition be included in future versions of U.S. Joint Chiefs of Staff Publication Number One, Dictionary of Military Terms:[19]

> Soviet Naval Operational Art (Sovetskoye Operativnoye Iskusstvo) is based on the theory that the revolution in modern war resulting from the appearance of the mass conscript armies of the Napoleonic period created a situation in which a single combat engagement could no longer achieve victory in a war or campaign. In the navy, the one-time, surface ship engagement was replaced by the Imperial Russian and later Soviet naval operation in which large numbers of diverse naval weapons and platforms engaged in multiple engagements over extended periods of time to achieve strategic goals previously often achieved in a brief, single battle. *Soviet Naval Operational Art* is the theory and practice of the preparation for and conduct of integrated multiple tactical engagements, strikes, and maneuvers comprising the modern fleet, other naval, and amphibious and antiamphibious operations. These operations are conducted according to a unified military strategy to achieve Soviet strategic goals in geographical theaters of strategic military action.

Armed at least with the words of a dictionary-style definition of Soviet naval operational art, we should be able to begin to ask the right questions about the phenomenon. One question that comes to mind is: just what are the factors associated

with the art that can be systematically broken out and examined to piece together an accurate and useful picture? By examining the following key words in the definition, we can begin to see the factors that make up Soviet naval operational art:

**Soviet Naval Operational Art: Key Words in Definition**

| Words | Suggests |
|---|---|
| **Strategic Goals** | **Naval Missions** |
| **Theory** | **Principles** |
| **Multiple Tactical Engagements** | **Combat Action** |
| **Unified Military Strategy** | **Central, Unified Strategy** |
| **Modern Fleet Operations** | **Processes of Naval War** |

**Figure 1**

The Soviets use the modern naval operation to achieve strategic goals. If Soviet naval operational art orchestrates the naval operation, it follows that the art has conceptualized strategic missions for naval forces in order to achieve strategic goals. The Soviets with characteristic formalism lay out the strategic missions for naval forces to accomplish in the naval operation. The list of missions in the *MED* follows an alphabetical order in the Russian original (VED, pp. 460-461).[20] In the past the Soviets have been very exact in their listing of priority missions. The 1969 Soviet textbook on the history of naval art listed, for example, strategic strikes against the short using nuclear-rocket weapons, anti-SSBN and anti-carrier operations, support of the ground forces in coastal directions, and conduct of SLOC and anti-SLOC operations. The current order does not fit this earlier hierarchy of mission, and it is surprising to note, moreover, the absence of any amphibious/ anti-amphibious missions from the list of missions. These have always been included in past listings and such operations were also a vital part of *Zapad 81* (Exercise West 81). Admiral I. M. Kapitanets as CinC Baltic Fleet conducted the amphibious landing of an army division along the Baltic Coast. He was named commander of the Northern Fleet in 1985 and has recently been appointed First Deputy CinC Navy.[21]

The current standard list includes the seven strategic missions for Soviet naval forces.

1. Disrupt Enemy Sea Lines of Communication (SLOCs)

2. Defend Soviet SLOCs and Naval Bases

3. Defeat Enemy Naval Forces in Closed and Open Seas and Ocean Areas Contiguous with Coasts

4. Destroy Enemy Land Targets

5. Destroy Enemy Carrier Groupings (Anticarrier Warfare, ACW)

6. Destroy Enemy Antisubmarine Forces (Anti-Antisubmarine Warfare, A-ASW)

7. Destroy Enemy Missile Submarines

The list is revealing. The missions track strictly alongside of the perceived Western threat and therefore seem to be cast defensively. The list does not include amphibious and antiamphibious missions, suggesting a doctrinal subordination of the navy to the army in landing and antilanding operations. Given the extreme centralization of planning and control in the Soviet armed forces, the list can be taken to be binding on the Soviet navy thus allowing Western military planners to anticipate that Soviet naval forces will be conducting naval operations strictly in rhe mission categories noted.

* * *

The Soviet navy is an instrument of armed struggle that conducts naval operations to achieve the strategic missions noted above. The Soviets in turn conduct the naval operation in accordance with the system of knowledge described as Soviet military art. For the Soviets, military art is the theory and practice of preparing for and conducting military operations on land, sea, and in the air. Soviet military art is part of Soviet military science and includes military strategy, operational art, and tactics, which for the Soviets are three closely interlinked systems of strategic knowledge. The fundamental theses of Soviet military art are expressed in its principles which are common to military operations of a strategic, operational, and tactical scale because the objective laws of warfare find expression in them.[22]

Soviet military and naval missions are accomplished, accordingly, through the application of the common principles of Soviet military and naval art

The Soviets apply these principles to the naval operation and the associated practice of naval operational art. The principles are taken seriously by them and provide a means for understanding the Soviet way in both ground and naval warfare and the many possible combined operations that can be executed by the five branches of the Soviet armed forces and their combat and supporting arms. Surprisingly, with the centralization of military theory in the Soviet Union, one important naval authority recently discussed principles of naval art "under today's conditions" and the principles are somewhat different not only in number but also in type (quality) of action.[23] The explanation for such a situation is probably that the naval authority, Admiral V. Chernavin, presently commander in chief of the Soviet navy, is attempting to emphasize the most important principles and particularly those which may be assuming greater importance under the impact of contemporary strategic and technological change. Chernavin can be assumed to have the authority and self-confidence to do so and discusses and emphasizes the following principles of naval art:[24]

*Chernavin's Five Selected Principles of Naval Art*

1. Combat Readiness *(boevaia sposobnost')*

2. Surprise *(vnezapnost')*

3. Coordination (or Combined Action, *vzaimyodeystvie)*

4. Maneuver *(manevr)*

5. Massing (Particularly of Fires in Terms of Strikes) *(Massirovaniye).*

The principles discussed by Chernavin are important for an understanding of the Soviet naval operation, naval operational art, and the Soviet style of warfare at sea.[25] In breaking out five principles of special importance to the practice of naval operational art, Chernavin can be assumed inadvertently or otherwise to have distinguished such art from operational art. It is difficult to imagine the principle of concentration of forces and means along the main axis of advance being missing from any list of more important principles. Chernavin leaves it out of his discussion preferring instead to include massing of fires. Both principles--concentration with its ground-oriented modifiers and massing with its naval (and nuclear) applications--can be seen to be part of a fundamentally similar pattern of action. Chernavin, in effect, considers concentration extremely important and considers massing of fires as the uniquely naval version of it.

It is also valuable to compare the *principles* of operational art with the *tasks* of operational art. Here is a current list of such tasks:

1. Investigate the rules, nature, and character of contemporary operations.

2. Work out the methods for preparing and conducting combat operations.

3. Determine the function of large units (fronts, fleets, armies) and formations (corps, divisions) of the armed forces.

4. Establish means and methods for organizing and supporting continuous cooperation, support, and troop control of forces in combat.

5. Delineate the organizational and equipment requirements of large units of the armed forces.

6. Work out the nature and methods of operational training for officers and troop control organs.

7. Develop recommendations for the operational preparation of the theater of military actions [TVD].

8. Investigate enemy views on the conduct of operational level military actions.

The Soviets theorize that naval operational art conducts both sequential and simultaneous combat activity toward the achievement of strategic missions and the securing of strategic goals. They see the naval operation as the total of the combat actions comprising the operation with a special increased effect (synergism) due to skill in the application of operational art. The Soviets find it necessary, therefore, to distinguish between the single coordinated operation and the operationally orchestrated combat actions comprising the war fighting substance of that single coordinated

operation. The Soviets also define combat actions in armed warfare in carefully structured, encyclopedia descriptions.

Because of the Soviet tendency toward pedantic formalism in theorizing about war, it is important to present these terms in transliterated Russian and with some explanation of their meaning in Soviet usage. Soviet military doctrine and science are highly centralized and demand adherence to structured and unambiguous terminology. In the practice of operational art, the Soviets will use words that describe war fighting events, which have similar meanings in all of the services. By enforcing synchronized, common terminology based largely on the army model, the Soviets also have left little doubt as to the senior service in conventional war and the style of thinking in nuclear war. The Soviets use words like the following ones to describe the combat events of the naval operation all of which are common to the five Soviet armed services except for obvious, uniquely naval events like the "naval landing":

1. Battle/Combat *(bitva/boi)*. The word battle *(bitva)* here must be used with care. With reference to naval operational art, the word is never used to cover large scale naval combat. It is used typically to describe a vast set of ground combats coordinated in time and space as illustrated in the definition of the word in the Soviet Military Encyclopedic Dictionary by the Kursk battle in July 1943. The word, *boi*, on the other hand, defined as combat, covers single actions in a small area, short time, and few forces and can be applied to naval operational art.

2. Encounter/Meeting Battle *(vstrechnvi boi)*. A form of offensive combat where units and formations of both sides are striving to achieve offensive tasks.

3. Engagement *(srazhenie)*. This is the Russian term for the great naval battles a la Trafalgar, Jutland, and Midway.

4. Meeting Engagement *(vstrechnoe srazhenie)*. This is described as the action of operational formations in the course of which both sides seek to achieve their established objectives by the offensive. Like the meeting battle, the meeting engagement is a term taken from ground combat by the Soviets and applied to naval warfare. It is, in fact, a set of meeting battles involving formations and units joined together by the concept and plan of the respective commanders and staffs of the large-formations so engaged.

5. Strike (udar). The definition emphasizes that this is "a form of operational (combat) use of rocket forces, ground forces, air forces and navy in an operation or combat. It consists of the short, powerful blow upon the enemy using nuclear or conventional weapons or by the offensive of troops (strike by troops *[udar voiskamil])*. Depending on the scale of the strikes, they might be strategic, operational or tactical, and depending upon the means used, they might be nuclear (nuclear-rocket) or fire (artillery, rocket, or aviation).[26]

6. Maneuver *(manevr)*. Maneuver is "the organized movement of troops (forces) in the course of combat actions to a new direction (line, to a region) with the objective of occupying advantageous positions in relation to the enemy and creating the necessary groupings of forces and means, moving forces out from under enemy strikes and effective use of forces while fulfilling set or newly arising tasks; transfer of fire, aviation efforts, strikes of rocket forces with the purpose of massed actions against the most important targets or new targets, the transfer of materiel for the most complete logistical and technical support of groupings of forces which are in action on the main axis. Depending on the scale (that is, the quantity of participating forces and means) maneuvers could be strategic, operational or tactical. Strategic maneuvers are conducted under the direction of the highest military command in one or several TVDs. It can be carried out by strategic nuclear means, large groupings of ground forces, air defense forces, air forces and forces of the navy (naval forces), by strategic reserves in order to achieve strategic results. Operational maneuvers are conducted according to the decision of the commander of large formations in order to fulfill combat tasks in an operation. It is usually conducted by large formations (combined units) of the branches of the armed forces, combat arms of troops and special troops, by re-targeting the strikes of aviation and operational-tactical rockets or by redistributing materiel and technical means of the large formation. Tactical maneuver is conducted on the decision of the commander of a formation (unit or subunit) in order to fulfill tasks in combat. It is carried out by units (ships), subunits of different combat arms of troops and special troops, by artillery fire, and by re-targeting strikes of tactical rockets."[27]

7. Naval Landing *(morskoy desant)*. A form of naval warfare in which troops are carried on special landing or transport ships. When using special landing ships, the troops land straight on the enemy shore. When using transport ships, the troops land with the help of various landing means including, for example, helicopters.[28]

As noted above, engagements in Soviet usage are comprised of encounter battles and combat which when they take on an organized content according to area, time, and commander's intent can be called engagements. Engagements grouped together make up operations. A set of operations in a given TVD (TSMA) according to the commander's intent take on operational-strategic significance. The operational level of war by definition encompasses action by large formations from different branches of the armed forces according to the design of the commander. The emphasis is upon joint operations in a given TVD (TSMA).

The Soviets specifically delineate the operation as,

> ...the aggregate of battles, engagements, strikes and maneuvers coordinated and interlinked in objective, tasks, place, and time, by various force organizations, conducted simultaneously and sequentially according to a common concept and plan to accomplish missions in a theater (theaters) of [strategic military action]...within a specified period of time.[29]

For the Soviets, battles and encounters are comprised of engagements and the word, engagement, signifies an organized armed clash or combat.[30] The Soviets in turn define tactics as the theory and practice of preparation for and conduct of an engagement.[31] The end result is that all the words describing combat *in the Soviet military operation* signify tactical combat and associated tactics. Conventional Soviet battles and encounters are comprised of tactical engagements and conventional strikes, the latter being tactically oriented deliveries of conventional ordnance, e.g., missile, torpedo, and naval aviation weapon systems in the case of the navy. From this we can derive the ultra-succinct definition of Soviet naval operational art as the stringing together of tactical engagements and conventional strikes to achieve strategic goals.

* * *

The Soviets can move with agility from the higher reaches of military strategy through tactical combat because of their highly centralized, scientific, long-term theories of world history. The Soviets note that naval operational art is dialectically (i.e., logically) connected with *military* strategy. With impressive systematic rigor, they continue on to define a single unified military strategy, denying the possibility of a naval strategy while keeping in touch with practical reality by the construction of an elaborate theory of the navy.[32] Soviet naval operational art, the theory of the navy, and military strategy are guided by the general principles of Soviet military art and the particular theories of Soviet naval art. In turn, the Soviets show military art guided by the laws and regularities of military science and the immediate, practical directives of Soviet military doctrine

**Notes**

1. This paper is a shortened version of a longer paper which has been condensed for inclusion in the proceedings. For copies of the full paper, contact Professor Stolfi at the Naval Postgraduate School, Monterey, California (408) 656-2981. The abbreviated paper was presented at the conference by Capt Thomas Grassey, also from the Naval Postgraduate School.

2. TVD is the Soviet acronym for *teatr voyennykh deystviy* or theater of strategic military action (TSMA). Other English language translations of TVD include, theater or military operations (widely used), and the literal translation, theater of military action (less widely used).

3. The Soviets, for example, use the term, armed struggle, in formalistic distinction to other warfare conducted in most spheres of social interaction without the firing of weapons.

4. See, for example, "Military Strategy: Lectures from the Voroshilov General Staff Academy, Introduction by Graham H. Turbiville, Jr.," *The Journal of Soviet Military Studies,* I, No 1 (April 1988), pp. 29-53.

5. ONI, *SME, Naval,* I January 83, entry: Naval Art (signed, S.G. Gorshkov).

6. See in, Ammon, "Naval Operational Art," *Morskoy Sbornik,* 2, 1985, p. 22.

7. Colonel V. Ye. Savkin, *The Basic Principles of Soviet Operational Art and Tactics* (A Soviet View) (Moscow, 1972) (Translated by U.S. Air Force), p.

8. *Ibid.*, p. 115.

9. ONI, *SME. Naval,* III, September 85, entry: Massing of Forces and Resources.

10. *Ibid.*

11. See in, Admiral P. Navoystev, First Deputy Chief of Main Navy Staff, "Regularities, Content, and Characteristic Features of Modern Naval Operations," *Morskoy Sbornik,* No. 7, 1986, p. 18.

12. Ibid., p. 19.

13. Office of Naval Intelligence, *Soviet Military Encyclopedia, Selected Translations of Naval Interest Collection I,* January 1983, alphabetical entry: Naval Art. This publication herein-after cited as ONI, *SME. Naval.*

14. ONI, *SME. Naval,* I, Naval Art.

15. Soviet Union, Military Affairs, *Military Encyclopedia Dictionary,* Volume VI, 17 August 1987, Foreign Broadcast Information Service, JPRS-UMA-87-011-L, alphabetical entry, Naval Operational Art. This publication hereinafter cited as Soviet Union, *MED.*

18. ONI, SME, Naval, I, Battle (Bitva).

19. See, for example, Vice Admiral K. Stalbo, Doctor of Naval Science, Professor, "Some Issues of the Theory of the Development and Employment of the Navy," *Morskoy Sbornik,* No. 4, 1981, p. 19.

20. *VED* is the acronym for *Voyenniyy Entsiklopedicheskiy Slovar', or Military Encyclopedic Dictionary.*

21. *Jane's Defence Weekly* (June 18, 1988), p. 1248.

22. Soviet Union, *MED*, II, 1985, p. 538.

23. See in V. Chernavin, "Regarding Several Categories of Naval Art Under Contemporary Conditions, *Morskoy Sbornik,* No. 9, 1986, pp. 28-33.

24. *Ibid.*

25. Chernavin's five principles require a comparative context to explain why he chose to emphasize the ones noted above in particular under contemporary conditions. There are a number of articles by Soviet naval theorists and operators who have addressed the theme of the principles of naval art over the last 25 years. In the following writings the Soviets address the problems of adjusting technology and organization and tactics to fit future war fighting requirements: See, for example, K.A. Stalbo, "O nekotorykh kategoriiakh voeeno-morskogo iskusstva v sovremennom ikh proiavlenii," (Concerning Certain Categories of Naval Art and Their Contemporary Manifestation) *Morskoy Sbornik,* No. 1 (January 1961), pp. 17-25 and for a more recent view, Gorshkov, *Voprosy Teorri voeeno-morskogo flota,* (Issues Concerning the Navy) *Morskoy Sbornik,* No. 7 (July 1983), p. 27-38.

26. *Voennyti entsiklopedicheskii slovar',* p. 761

27. *Ibid.,* p. 421.

28. See in, *Voennyy entsiklopedicheskiy slovar'* (Moscow: voenizdat, 1986), p. 229.

29. See in, Soviet Union, *MED*, VI, 1987, p. 2148.

30. See in, ONI, *SME,* Naval Collection III, entry: Engagement.

31. See in, *Ibid.,* entry: Tactics.

32. See the authoritative treatment in, Commander in Chief, Navy, Admiral of the Fleet of the Soviet Union, S. Gorahkov, "Questions of the Theory of the Navy," *Morskoy Sbornik,* No. 7, 1983, especially pp. 29-34.

## Section Two

### Soviet Naval Operational Art and Its Evolution in the Postwar Period

Since the time of the Soviet victory against national socialist Germany in 1945 as part of a grand coalition, the Soviets have worked hard to extract the lessons of the Great Fatherland War and to apply them to the form and content of armed struggle *(bor'ba)*. In the Soviet view, form, or organization of the armed forces, and content, or weapons, do not usually change evenly. Content, because it is more dependent on advancing technology, tends to change more rapidly and even to make revolutionary leaps as in the case of nuclear warheads and the delivery systems for them. Form, as the organizational structure of the armed forces, tends, in contrast, to change more slowly The Soviets believe that this situation creates a dialectical or logical tension that has had to be addressed in the postwar development of the Soviet Navy and especially the naval operation and naval operational art. The introduction of the term, "theory of the navy," with its many categories including operational art and tactics, reflects the intense concern that the Soviets have had for the science of information *(informatika)*.[1] At the heart of this situation, the Soviets emphasize the adaption and change of the Navy as a war fighting system to new demands. The Soviet development of naval operational art in the postwar period should be viewed within this context of system adaption.

Operational art fills the explicit need under conditions of modern war to link together tactical successes into strategic victory. Furthermore, operational art always addresses the theory and practice of the preparation and conduct of all-arms (all-fleet) joint and independent operations (combat actions). Thus, operational art addresses the combined arms employment of the branches of the armed forces at a specific scale of combat. The theory side of operational art is supposed to be an exercise in foresight by which military scholars discover the law governed patterns *(zakonomernosti)*, content, and nature of contemporary operations and ways and means of conducting them. This means that there is no static operational art, but a constantly changing theory. The praxis is the content of operations as such. Theory, through an educational process informs praxis, and praxis through the process of lessons learned informs theory. Praxis includes one's own combat experience, exercises, war gaming and simulation, and the combat experience of potential adversaries and their exercises and simulations. The objective is not "prediction." Prediction *(predskazanie)* implies no intervention, while foresight *(predvidenie)* implies conscious intervention to shape the future. One cannot predict in chess, but a master is judged by his ability to see combinations of moves out to several turns. Soviet naval operational art has similar elements of foresight in it that must be guarded against in naval war.

Because of the centralization and unification of Soviet military thought, the Soviets have synchronized the principles of naval operational art with the general principles of military art and the more specific ones of operational art. Soviet naval operational art, therefore, will be governed by general principles identical with those of operational art allowing western analysts to apply understanding of one to the other. Relatively well understood Soviet operational art, for example, can be applied with due respect to unique features of naval warfare and to an understanding of what Soviet naval operational art must be. To apply operational art to the better understanding of naval operational art, we must ask the questions: What are the content and characteristic features of the Soviet naval operation? What are the unique characteristics of the naval war fighting environment? And, among identically defined principles of military and naval operational art, what is the different emphasis that must be placed on the naval principles when they are part of a naval war fighting situation?

In discussing the content of the naval operation, the first deputy chief of the Main Navy Staff claims that the following words provide the fullest definition of a naval operation as a form of military actions: the aggregate of simultaneous and successive engagements, actions, and strikes conducted by naval forces, coordinated and interrelated by objective, mission, place and time for the purpose of repelling an aggressor in ocean and sea theaters of military actions, often to accomplish operational-strategic or operational missions in coordination with other branches of the armed forces. In the content of the "operation at sea," the Soviets

include Soviet objectives and missions, enemy targets of action, composition of friendly forces, factors of support, command and control, and the geographic (ocean, sea, coastal) factors. Similar descriptions of the Soviet naval operation have been equated in different contexts in other parts of this study and the content of the operation is recognizable to most army and navy officers as the headings for the important parts of any plan for a western combat operation.

Within the above nicely systematic framework, one Soviet naval authority makes several points which characterize Soviet thinking about war at sea in the postwar period. He notes that "in contrast to equipment of other branches of the Armed Forces, losses in modern submarines and surface combatants are essentially irreplaceable in the course of a war."[2] He then argues that this consideration of irreplaceable loss within the time of the naval operation results in special measures required to keep naval forces tracking towards the strategic goals of the operation. We see here a coherent explanation for the unique Soviet emphasis on "survival" (i.e., operational survival) in naval warfare, the peculiar Soviet emphasis on the obvious necessity to continue in the fight after the main strike.

Admiral Navoytsev gives more insight into the Soviet naval operational mentality by emphasizing "the first strike" as the most powerful, massive, and comprehensively supported and using the term: combat actions on the main axis. These things are well known from other avenues of approach, but he continues on to make an extraordinarily valuable observation that formations of the ground forces carry out a deployment or redeployment on friendly territory under cover of a constantly operating defense system, but naval forces carry out deployments across zones of possible enemy action. Here is a unique factor in naval operations compared with ground that would result in a difference in the applicability of the principles of operational art.

Navoytsev's conclusions tell a great deal about naval operations in a TVD (TSMA). This subject of the Soviet naval operational mentality especially from the viewpoint of what the Soviets are likely to understand about "massing of strikes" against the "main strength" of the enemy in a particular theater during the initial period of war, is a key to the understanding of Soviet naval warfare. The conclusions in Admiral Gorshkov's 1983 article in *Morskoy Sbornik*, especially in what can be considered to be his initial response to U.S. Maritime Strategy is particularly enlightening. He notes that the Soviets must conduct,

> ...a search for ways of the greatest possible localization of the growing efforts by the United States and NATO countries to achieve unilateral superiority in naval arms; there are two basic directions here: engineering-technical and operational-tactical. This is related both to the theory of naval art [read naval operational art, and tactics] and to the theory of organizational development of the Navy...[3]

This quote puts in context some recent developments: the changing exercise pattern *(Okean 85 and after)*, the reduction in oceanic deployments, the sharp focus on reconnaissance-strike complexes, the attention to other new naval technologies (wing-surface effects ships in addition to air-cushion vehicles), the protracted discussion of naval tactics and operational art, and even the recent pronouncements about the impact of the "new" defensive orientation of Soviet and WTO military doctrine upon naval affairs.

In describing typical characteristics of operations at sea, the Soviets give us a chance to gauge the unique features of the environment from their perspective. Most of the characteristics that the Soviets describe are typical in similar degree to ground operations, for example:

*Typical Characteristics of Operations at Sea*

1. Decisiveness
2. Spatial Scope (great)
3. Dynamic Nature (very)
4. Mixed and Combined Forces
5. Massed Employment (of Forces, Means)
6. Electronic Warfare (Wide Use)
7. Complex Coordination.

Among these characteristics, at least three stand out as being potentially so exaggerated in naval warfare and in the naval operation that they take on the quality of being unique. Those characteristics are decisiveness, spatial scope, and electronic warfare. Although army operations are "decisive," navy operations are exaggeratedly so. At Jutland (31 May-1 June 1916), for example, the opposing naval forces engaged in gun duels intermittently for a total period of approximately one hour of actual firing in six hours of maneuvering in tactical proximity each to the other. During that brief gun firing, the two sides lost approximately 10,000 men killed in action. The concentration of naval forces in a comparatively small number of relatively small but valuable and densely populated maneuver elements commonly results in astounding combat results in brief time periods. Precision guided munitions with long ranges and large warheads would tend to accentuate the characteristics of decisiveness in naval operations. Similarly, the characteristics of spatial scope and electronic warfare are exaggerated to the point of uniqueness compared with ground operations.

In vigorous discussion in the early 1980s, the Soviets debated the special nature of naval warfare and noted eight features inherent in naval warfare.[4] Every one of these features can be seen to be either unique to naval operations or untowardly important in them. The Soviets state that, (1) offensive naval actions at sea do not attempt to seize ground except, of course, in amphibious and other similar joint operations. It is difficult to fault the Soviets here; they have hit upon a unique feature of the naval operation, and perhaps someday, space operations. Their discovery is important for us in attempting to relate ground and naval operational art and to increase the understanding of the ground art by fitting together missing pieces of the puzzle. The question is: how does this unique feature of the naval operation bend naval operational art into a different shape from that of the army? An answer would be that Soviet naval operational art is more decisive in the way it exerts the principle of massing forces, means, and fires along the main axis of the attack. The Soviet navy does not seize surface ocean water, it concentrates on massing accurate, long range fires against the strongest enemy naval targets. It operates independently of the concept of an axis of advance determined in advance and bound in direction and location by the logic of ground terrain. In addition, naval operational art concentrates the massed strikes of the naval operation against the strongest enemy weapons platforms and appropriate supporting targets. The naval targets will be uniquely dense, relatively small in numbers, and subject to the unique catastrophic destruction of naval warfare--being sunk.

Closely associated with the above factor, the Soviets note that, (2) in naval warfare, objectives are achieved by attack against the strongest targets. The situation in naval warfare is a sharply etched one in which a few powerful naval targets capable of dangerous strikes against friendly naval and ground targets must be destroyed immediately upon detection. To attacking Soviet ground forces no such threat exists from the defending enemy army group to the Soviet front or associated hinterland. The pivotal Soviet military principle of concentration along the main warfare, over and above the establishment of an adequate correlation of forces in the TVD (TSMA), the Soviets will practice concentrating their strongest forces against the weakest possible defenders along terrain axes also selected to lead to the envelopment and surrounding of the stronger enemy forces. In naval warfare, the opposing forces, particularly the stronger one, will launch massed strikes directly against the strongest targets along the axis of strike least well defended. These are heavy differences between the naval and ground operation. They also show army operational art as less decisive in its cast than naval. We might generalize that given the tactically "permissive" nature of oceanic terrain over and above the technical side effects of sinking weapon platforms, the Soviet navy has mastered terrain and passed to a "higher level" of warfare in which immediate direct attack against an enemy is characteristic. Using this to forecast future Soviet ground operational art, we could characterize it as becoming similar to naval.

The Soviets continue on to note that, (3) defensive naval actions often do not have the purpose to hold terrain. This situation is in sharp contrast with ground warfare in which defending forces concentrate exclusively on terrain factors, for example, holding specific terrain at all cost, trading specific terrain for time, and slowing an opponent in specific terrain while accepting profligate, possibly fatal, casualties but denying him vital ground. The Soviets describe a situation that is different from any ground situation when a defending naval force is relatively strong and has large ocean space left in which to maneuver against a stronger attacker. An inexorable logic

develops though in which the defending naval force is driven back to its own coastal area, associated straits, approaches, narrows, etc., which it defends in a way similar to ground forces. In the open ocean, however, defending naval forces will not be tied to the defense of specific terrain, and the Soviets are largely correct in pointing out this as a factor of uniqueness in the defensive naval operation.

The Soviets claim uniqueness in naval operations in stating that, (4) in naval warfare deployment and redeployment may take weeks and may take place over hostile terrain. They tell us several things about themselves in the claim. We must infer that "weeks" is a long time and excessive compared with the standard we must assume of ground war. We can also infer that the concept of deployment is especially important to them to be broken out separately in such an analysis and that the factor probably represents frustration on the part of the naval service in educating the army on the distances, exposure of plans, and unique dangers inherent in naval deployments. Unlike the Germans, for example, representing a great land power but who took vast deployments in their stride, the Soviets reveal a fussy preoccupation with deployment that becomes magnified in importance in the practice of naval operational art.

Other factors that the Soviets suggest as being unique to naval warfare are not so credible as those above. They list as especially characteristic and unusual the points that, (5) fleets employ extraordinarily diverse weapons, and (6) some naval forces are severely constrained by weather. Modern armies, however, employ diverse weapons and are severely constrained by weather in their cross-country mobility and by combinations of weather and terrain almost as paralyzing as wind, wave, and surf in naval amphibious operations.

In pointing out unusual and particularly important features of naval warfare, the Soviets imply uniqueness in, (7) the scope of naval operations which may easily be global. The surface of the sea is a vast highway for Soviet navy combat and support forces. Naval forces are uniquely flexible in their peacetime ability to loiter and concentrate almost any place in the world touched by salt water. The Soviet navy has developed the surface support forces or trains to support a significant naval presence world-wide and an impressive number of foreign bases. The Soviet navy must still be regarded fundamentally as a sea denial force and the fact of its capability to present itself world-wide in peacetime does not necessarily translate into significant global operations in wartime. The Soviets are quite correct, therefore, in describing that naval operations may be global, but Soviet naval operations will not necessarily have that feature.

A last factor described by the Soviets as a unique feature of naval operations is, (8) combat activity in four terrain media, namely sea surface, undersea, air, and ground. Particularly when we consider amphibious operations, the Soviet navy is uniquely busy and varied in its physical combat environment, and Soviet naval operational art can be predicted to have special problems in coordinating forces so varied as undersea, surface, and air over the vast distances associated with the open ocean. Soviet naval operational art will be challenged by the problems of command and control under such circumstances and will show exaggerated concern for coordination in the naval operation.

Ocean and sea dominate the physical media in which naval warfare takes place today. Analysts of modern war have taken in at a glance the vast difference between sea and land as geographical terrain for combat and almost universally agree that the naval environment is uniquely different from land. In sharp contrast, much ink continues to be spilled over the perennial issue of whether or not naval warfare is unique. The Soviets take the unequivocal stand that the general principles of Soviet military art apply also to the naval operation and naval operational art. In effect, they maintain that the scientifically derived principles of military art that have centered on the army apply to all the services and are modified only by prudent regard for the physical environment of the combat. In the case of naval warfare, the Soviets have described and debated the question of the unique features of naval warfare. They have made effective arguments in support of several unique features of the naval operation but have not moved toward any claim of uniqueness of the naval operation or naval operational art.

The picture presented by the Soviets is similar in many respects to the picture of differences between ground and naval warfare in the west. Both pictures are classical ones of the presentation of a case that appears to be so obvious that no effort

seems necessary to test and criticize. The sea environment is vastly different from the land. So far, so good, but how is it different? The sea is different because it is a heavy fluid which unless disturbed by various well-described forces is perfectly level. Almost three-quarters of the earth's surface, therefore, presents the spectacle of a potential battlefield devoid of cover, concealment, obstacle, and obstruction for surface ships. Although the fluid has no solid obstacle on its surface, it represents in and of itself an obstacle to the movement of men on foot or in land vehicles; all men and their land vehicles are too dense to move across its surface. Men in ships, in contrast, are presented with a great highway for movement worldwide and simultaneously with a theater of naval operations larger than any possible land theater. Catastrophe strikes when ships are damaged in war, take in water, and sink. Alternatively, using true submersibles, men can move through the heavy fluid converting it into a unique three-dimensional "heavy space" for the conduct of war from undersea against surface, air, and land targets and opposing submarines. The formidable qualities of the modern submarine suggest the quasi-philosophical commentary that he who controls undersea controls the surface and in turn the land areas of the world.

Using this approach, we see several unique features of war at sea that can be translated into differences between Soviet ground and naval operational art. The following list is a reasonably full one that shows unique technical and terrain features of naval warfare and similarly unique tactical factors derived from them.

**Naval Terrain (Uniqueness)**

1. Featureless, fluid medium translates into unrestricted mobility for ships operating on its surface and within it.

2. No cover, concealment for surface vessels.

3. Unobstructed distant fields of fire for naval surface vessels

**Naval Weapons Platforms and Weapons (Uniqueness)**

1. Surface universe of combat dominated by relatively few compact, high-value surface weapons platforms or targets.

2. Surface ships susceptible to immediate catastrophic kill.

3. Relatively invulnerable submarines hidden in opaque heavy fluid.

**Tactics (Uniqueness)**

1. Accentuated premium on range and accuracy of naval weapons.

2. Physical camouflage (hiding) of surface ships almost impossible.

3. Electronic camouflage (hiding) of dense-technology surface ships uniquely emphasized.

4. Ultra-sensitivity of surface ships to detection, targeting, and catastrophic destruction because of range, accuracy, and lethality of weapons that overmatch targets.

The Soviets insist that the principles of operational art apply to both army and navy operational art. By extension of such thinking, we can see that they have taken the position that common laws of war exist that govern the warfare conducted by the five branches of the Soviet armed forces. The Soviets must be taken to believe that naval warfare is not unique although the degree of uniqueness would probably be argued differently by admirals and marshals. The Soviets make it clear, however, that the principles of naval operational art which are identical in statement to those of army operational art must be applied with due regard for the real world environment and we have made the analysis that the naval environment is indeed uniquely different in particulars affecting war at sea. The questions that remain to be answered are: how does the special environment of the sea affect the principles of naval operational art? And, how does this effect help us to understand the better known although identical principles of army operational art?

Taking probably the five most significant principles of naval operational art--readiness, surprise, coordination, maneuver, and massing--we can see that the unique naval factors discussed above exaggerate in every case the impact of the principles when they are applied to the naval operation. The valuable equation can be suggested that naval operational art is army operational art with every principle of

application exaggerated in importance. Why is this so? The above discussion summarized shows that the naval environment, once mastered by the technology of modern ship and submarine, presents fundamentally greater latitude in the practice of war--the regulating principles are the same but the frictions are different, less, and war moves at a faster pace on a higher plane.

There are important differences between war initiation in a maritime theater where naval and air forces represent the center of gravity and in a continental theater where the ground and air forces assume that role. The Russians and Soviets, moreover, traditionally have been concerned with their own slow pace of mobilization, concentration, and deployment of forces in continental TVDs, which would give their enemies the initiative during the initial period of war. This slowness was to be negated by all-out mobilization of forces and the negation of the enemy's initial advantage in covering forces. Surprise figured prominently in such initial operations only after WWII and the experience of Barbarossa. Russian and Soviet naval authors have emphasized high combat readiness throughout the modern era but have pointed to severe limitations in wartime procurement of warships. They have made the analysis, thus, that naval warfare is a "come as you are" affair. On the other hand, they have maintained that decisive results in a theater can be achieved by initial operations aimed at theater preemption. In later imperial times, the Russian Main Naval Staff (later the Naval General Staff) drafted various war games and plans for initial, preemptive operations against the Bosporus and the Dardanelles. The strategic war game which Admiral Kladov organized at the imperial Naval Academy involved such a combined arms preemptive strike against the Turkish Straits and the creation of a mine and artillery position from which to meet the British Royal Navy. The Soviets similarly have dwelled on the initial period of the war and have criticized German naval operations during the First and Second World Wars precisely as not being decisively executed in the initial periods of the wars and failing to involve joint coordination of naval forces on a sustained, continuous basis. For the Russians and Soviets in the area of naval warfare, the race is to the swift. They have clearly recognized the liabilities of their own geo-strategic posture for wartime oceanic deployments.

For the Soviets, the question of war initiation is one of supreme importance. As influenced by their Russian heritage, the Soviets have tended to be acutely concerned about the lessons of the past. Based upon the catastrophic experience of German Operation Barbarossa, and faced with a similarly-styled all-out, surprise attack by a western opponent with powerful, ocean-controlling naval forces, the Soviet General Staff and particularly the Main Naval Staff have been concerned with war initiation in the maritime and oceanic TVDs. Based upon their experience as practicing communists in control of a great state, the Soviets have applied a scientific, unified military doctrine to the challenges of war initiation and the initial stages of war. Especially since 1945, the Soviets have also emphasized the theme of the preparation of a TVD for war fighting and embraced a unique principle of operational art designated as readiness. The Soviets treat these factors with deadly seriousness and have linked them through the postwar years with the initiation of hostilities.

For the conduct of naval warfare, the Soviets began to construct a large blue water surface and submarine fleet with strong naval aviation components in the 1960s with the strategic mission of sea denial. While constructing such a fleet, Admiral Gorshkov articulated a theory of the navy in which victory could be obtained through means of a great opening battle in which the first concentration of massed strikes would result in victory for the Soviet sea denial navy over the stronger sea control forces of the west. With such a fleet and such a theory of the navy, the Soviets developed a mild obsession with readiness for a surprise attack by the west and the preparation of maritime and oceanic TVDs to resist surprise attack or alternately to preempt surprise attack with a "counteroffensive" of their own.

These results--either successful recovery from surprise attack by an opponent or all-out preemptive Soviet attack--demand the application of naval operational art in the construction of the necessary operation plans to achieve the appointed strategic goals. Attention to the plan for the naval operation is an important focus and provides special insight into Soviet naval operational art. The naval operation exists to achieve centrally directed strategic military goals through the linking together of tactical engagements, encounters, and strikes; and, it follows, therefore, that naval operational art is the plan that

connects strategy with tactics. In the highest reaches of strategy, for example, in the initiation of war, the great Soviet fleet operations plans would be subordinated to the general war plan drafted by the General Staff for the initial period of war. Those fleet operations plans would be based on the operational art necessary to connect the strategic objectives of the general war plan with the naval tactics necessary to achieve those objectives.

The Soviets link naval and other operations plans especially for the initial period of war to the process of "study and preparation of the theater of military actions" *(izuchenie i podgotovka teatra voyennykh deistvii)* which is done by the various staffs. In a continental TVD, this task falls to the General Staff, and the General Staff Study done in 1940 for operations in Iran which the Germans captured is a good example of such preparation. In oceanic and maritime TVDs, the task falls to the Main Naval Staff. A major portion of this work is drawn by the Hydrographic Directorate of the Main Staff. The Hydrographic Sections of the appropriate Fleet or Flotilla, in turn, are responsible for the detailed studies which go into such preparations of the theater. Russian experience in the Baltic, Black, and Caspian Seas and the Arctic and Pacific Oceans underscores the necessity for such preparation. For example, knowledge of the skerries of the Gulf of Finland was repeatedly used to frustrate naval operations by non-Gulf navies. The persistent Soviet submarine incursions into Swedish and Norwegian waters suggest serious preparations for war in those areas. Soviet hydrographic studies of the Arctic, including bottom mapping, have been quite intense for the last three decades. There is no shortage of articles dealing with this sort of preparation of a TVD for operations. Two recent articles deal with such navigational hydrographic preparation by Northern Fleet for operations in the Arctic TVD during the Great Patriotic War.[5]

Since the advent of nuclear weapons in 1945, the question of strategic missions for naval forces under the rubric of naval operational art has become an ultra complex issue. Because such strategic operations include nuclear strikes against land targets by SLBMs, the Soviets have had to face the question of who controls such forces and who plans their operations. Whether this applies to other sorts of strategic operations and what role the Far Eastern and Western TVD commanders and their staffs would play in planning theater-strategic operations using conventional means is much less clear. Recent works have suggested that the General Staff retains its central and unifying role in such operational planning for nuclear strikes. The very debate of the early 1980s which followed the renaming of the operational/tactical section of *Morskoy Sbornik* from Naval Art *(Voenno-Morskoe Iskusstvo)* to Naval Art and Questions of Theory *(Voenno-Morskoe Iskusstvo i Voprosy Teorii)* and then Theory of the Navy *(Teoriia VMF)* has been seen by some as further evidence of a unification of the various military arts of the branches under a single, general military art.

Changes between the first and second editions of Admiral Gorshkov's *Sea Power of the State* show differences in how naval operations relate to military art *(Voenno Iskusstvo)* and military science *(Voennaia Nauka)*. In the second edition, Gorshkov notes the role of the General Staff in making war plans and thus clearly suggests that the strategic missions of naval forces fall under the direction of the General Staff. At the time of the change in *Morskoy Sbornik* from the section heading Naval Art to that of Theory of the Navy, the Soviet *Military Encyclopedic* Dictionary (MED) defined Military Art to embrace "the theory and praxis of the preparation and conduct of military actions on land, sea, and in the air." Military art, furthermore, is a pat of military science and includes military strategy, operational art, and tactics. These definitions emphasize the close ties among these three elements and note that in capitalist countries, "operational art as an independent part of Military Art usually is not distinguished."[6] It should also be noted that the term "naval science" which was a recognized sub-category of "military science" down to the mid-1970s, has disappeared from use. As late as 1973, when *Voennaia Musl'* was running a series of articles on the nature of military science, Admiral Stalbo used the term science *(voenno-morskaia nauka)*.

**Notes**

1 N.N. Moiseev, *Sotsializm i Informatika (Socialist Science of Information)* (Moscow: Izdatel'stvo politicheskoi literatury, 1988), pp. 121-122.

2 *Ibid.*, p. 21.

3 Gorshkov, *"Voprosy teorii voenn-morskogo flota"* (Questions of the Theory of the Navy), *Morskoy Sbornik,* No. 7, (July 1983), p. 36.

4 See, for example, Vice Admiral K Stalbo, "Some Issues of the Theory of the Development and Employment of the Navy," Morskoy Sbornik, No. 4, 1981, pp.

5 A. Alekssev and M. Kariagin, *"Navigatsionno-Gidrograficheskoe Obespechenie Petsamo-KirkenesskoiNastupatel'noiOperatsii,"*(Navigational-Hydrographic Support of the Petsamo-Kirkenes Offensive Operation), *Morskoy Sbornik,* No. 5 (May 1980), pp. 22-27; and A.P. Aristov, *"Navigatsionno-Gidrograficheskoe Obespechenie Boevykh Diestvii Sil Flota v Arkticheskom Basseine,"* (Navigational-Hydrographic Support of the Combat Actions of the Forces of the Navy in the Arctic Basin), *Voenno-Istoricheskii Zhurnal,* No. 4 (April 19887), pp. 44-51.

6 *Voennyi Entsiklopedicheslii Slovar'*, (Moscow: Voenizdat, 1983), p. 140.

## Section Three

### Soviet Naval Operational Art and the Challenge of Future War

A Soviet offensive in Central Europe is probably the most popular military scenario that has been examined in the west. Two generations of free world military officers and analysts have looked at it from the bits and pieces of the myriad operations that could be conducted within the scenario to the overall offensive itself. The greater picture involves sorting out the strategic, tactical nuclear, and conventional possibilities for action at the North Atlantic, European, and intra-European levels. Since approximately 1980, the Soviets have increased their emphasis on extended conventional war and the west in parallel has decried the improvident growth in numbers of tactical nuclear weapons in Europe. The Soviet emphasis on conventional war and western concern over the counter-productive aspects of tactical nuclear weapons, makes an extended conventional war fashionable today (1989). In such a scenario, the Soviets would launch a great, conventional ground and air attack out of East German and Czechoslovakia. It would have the strategic goals to defeat the NATO armed forces on the continent of Europe so decisively that the U.S. government would lose the will to continue the fight and withdraw, isolated and weakened, to the North American continent.

Scenarios such as the one suggested here have been used by western analysts for years. Planners have used them to flesh out the conduct of entire wars, to gauge the impact of new technology, and to validate the effectiveness of newly considered small unit tactics. The purpose of the scenario presented here is to sort out the strategic missions assigned to the Soviet navy and show how the Soviets would apply operational art to the naval operations necessary to carry out those missions. The scenario is one of a vast, extended conventional war. In it the Soviets seek to occupy Western Europe from North Cape to the Straits of Gibraltar and exclude the United States from the affairs of Europe. These are heady Soviet strategic goals, indeed, almost outlandish. They are within the realm of possibility, however, and also represent the worst case possible for consideration of conventional war.

In such a scenario with goals so decisive, the Soviet army would take center stage in the existing key TVD (TSMA) for the Soviet Union--the Western. Within the Western TVD (TSMA), above all other considerations, the High Command of Forces (HCOF) would make the ultimate calculations for the Soviets in beginning to plan for the offensive--the correlation of forces between NATO and Warsaw Pact in the TVD (TSMA). The Soviets would be faced with a situation of almost overwhelming possibilities for action in terms of technical and tactical balances and time. They would be forced to consider ground numerical balances, qualitative technical balances based on weapons performance characteristics, questions of the tactical qualities of forces in terms of command and combat soldier style, and the grand timing of the operation. With so much at stake, the Soviets would have to calculate the effects of operations conducted on the northern and southern flanks of the great advance westward--the Northwestern and Southwestern TVDs (TSMAs), and, the plot thickens for the pursuit of the elusive Soviet naval operation and Soviet naval operational art, the Atlantic and Arctic oceanic TVD (TSMAs).

One of the Soviet principles of war, the use of all assets, would come into play in Soviet calculations and force them both through Soviet science and Russian predilection to deploy the navy and assign it missions in support of a continentally oriented war. In the style of the Soviets, the General Staff would be faced with important questions of missions to be assigned to the navy and questions of higher level command and control. Questions in the following pattern would undoubtedly arise and probably be resolved as noted. What is the fundamental relationship between the Soviet Army and Navy in conventional war for the control of the continent of Europe? The answer would have to be that the Soviet General Staff would assign naval missions in the Arctic, Atlantic, Northwestern, and the Western (specifically Baltic Flank) TVDs (TSMAs) that would reflect the most direct support possible for the army in terms of a quick ground

advance westward. This answer is supported by the Soviet style in which army predominates over navy, and the Western TVD (TSMA) predominates over all others. The answer may not be the "right" one, however, because the Strategic Rear of the Soviet Union would be imperiled in the conventional scenario by U.S. bombers and missiles flown directly over the Soviet Arctic Ocean TVD (TSMA). It is difficult to grant even the Soviet army much control over the Arctic Oceanic TVD (TSMA). Either the navy or the air defense branch (PVO) of the Soviet armed forces would probably control the HCOF in the Arctic TVD (TSMA) in an extended conventional war. The scene is complicated additionally by Soviet concern over a conventional war escalating to the use of nuclear weapons. We must suspect that the strategic rocket force and the General Staff are poised to intervene in the Arctic giving an unusual cast to operations there even in an extended conventional war.

If the Soviets decided to launch a conventional attack in the west and took the initiative to plan and execute it, they would have to be considered to have seen significant chances of successes in the extended conventional war that they had begun. Let us relax, therefore, on the issue of nuclear escalation, and, except where necessary to understand certain correlated deployments of conventional forces and weapons, assume that the Soviets would move according to the conventional logic under which the attack had begun. The assumption is reasonable enough. We have only to consider that the Soviets had decided that if their conventional offensive moved fast enough that the west would be presented with the cruel choice between the certain tactical nuclear of Western Europe or the uncertain continuation of a conventional war under extremely adverse conditions and chose the latter situation.

Within an extended conventional war in Europe centered on the Western TVD (TSMA), what would be the role of the Soviet navy? Strong argument exists to support a view that the Soviets would use it as a seaward extension of the army and a combat support mechanism for it. The arguments in support of so conservative a role and associated conservative Soviet naval strategic missions, are the Soviet style and experience of the Great Fatherland War, the centralized and unified make up of the Soviet navy today which is not a mirror image of the sea control forces of the west but a powerful, uniquely Soviet sea denial instrument. Reasoning at this high level of consideration, we can hazard the picture that the Soviets would vigorously employ naval forces on the Baltic as a maritime extension of the Western TVD (TSMA). We can construct a Soviet naval operation there with considerable confidence and understand the style and spirit of Soviet naval operational art applied to it. Such a naval operation would be an amphibious one directed probably against the Danish islands between the Jutland Peninsula and Sweden, controlled by the army, and less instructive than the possibilities for naval operations farther north.

* * *

Moving into the Northwestern TVD (TSMA), we see numerous possibilities for the Soviets executing the naval operation. The awkward choice of words here--the naval operation--is important to transfer the idea that the Soviets will not conduct a lot of battles which we would analyze from a western outlook as naval operations. In accordance with a unified military strategy and included naval strategic missions, the Soviets will painstakingly piece together the plan that will be executed as the engagements and strikes and maneuvers strung together to become the Soviet naval operation. If the Soviets tailored the boundaries close to the Norwegian coast, they would have roughly the following possibilities for a naval operation:

Coastal Northwest TVD (TSMA): Soviet Naval Operation

1. Joint amphibious landing: control by army
2. Joint amphibious landing: control by navy
3. Combined air defense/navy: control by PVO
4. Combined air defense/navy: control by navy
5. Combined air defense/navy: control by representatives of General Staff.

The joint amphibious landing is a strong bet to be one of the naval operations considered by the Soviets in the Northwestern TVD (TSMA) in an extended conventional war. As such, the operation is similar in essence to the joint amphibious landing

suggested as taking place in the Western TVD (TSMA) against the Danish Baltic islands. Unlike the peripheral landing operation in the Baltic, any significant landing in the Northwestern TVD (TSMA) brings up questions of Soviet strategic military goals and dependent naval strategic missions. Soviet naval operational art--a skill manifested in the operational plan to accomplish the strategic and missions through naval combat--proceeds in accordance with the strategic military goal associated with the strategic naval missions. The question that must be analyzed is: what would be the Soviet strategic military goals and associated naval strategic missions in the Northwest? The answer would probably be found among the following possibilities:

Northwestern TVD (TSMA): Possible Soviet Strategic Military Goals

1. Support of the Soviet Army in the Western TVD (TSMA).

2. Support of the Soviet Army in the seizure of the Norwegian coast in the Northwestern TVD (TSMA).

3. Support of the Soviet Army in the seizure of Finland, Sweden, and the Norwegian coast in the Northwestern TVD (TSMA).

4. Support of the PVO in the air defense of the Strategic Rear.

5. Support of the Strategic Rocket Force by seizure of the Norwegian coast and improved defense of the Arctic Bastion.

The Soviets have the naval strength in and around the Northwestern TVD (TSMA) to conduct numerous types of operations in support of the strategic goals of an extended conventional war. The Soviets would plan and execute an operation in order to accomplish one or more strategic missions derived from the above strategic military goals. The following are a few of these high level missions:

Northwestern TVD (TSMA): Possible Soviet Naval Missions

a. Seize and hold the Norwegian coast from Narwik to North Cape.

b. Seize and hold Narwik and the area around it.

c. Attack and destroy the Swedish navy in the Baltic.

d. Attack and destroy the Swedish and Finnish navies in the Baltic.

The matrix in Figure One analyzes the strategic situation in the Northwestern TVD (TSMA) in terms of the Soviet options for running the Soviet naval operation. The matrix indicates that a naval operation along the Norwegian coast or an operation against Sweden and Finland can contribute only in a most indirect way to the advance of the fronts in the Western TVD (TSMA). If the Soviet army forces in the Northwest have the strategic goals of taking the Norwegian coast (north) and/or Sweden and Finland, the matrix indicates that the Soviet navy will conduct at least a naval landing operation along the Norwegian coast *and* a naval fleet operation against the navies and naval bases of the Swedish and Finnish navies.

As concerns a vital Soviet strategic military goal for the PVO--the defense of the Strategic Rear from air attack over the Northwestern TVD (TSMA),--the matrix shows that naval operations in support of the army seizure of the Norwegian coast and/or Sweden and Finland would be of great assistance. The situation would be a challenging one for the Soviet General Staff because of the necessity to maintain the "stability" of the Northwestern TVD (TSMA) and Scandinavia while simultaneously assuring the air defense of the Strategic Rear. As concerns a vital Soviet strategic military goal for the strategic rocket force--the security and readiness of the Arctic strategic nuclear bastion--the matrix shows that a naval fleet operation against the Swedish and Finnish navies would be pointless. Such a naval operation along with the advance of Soviet

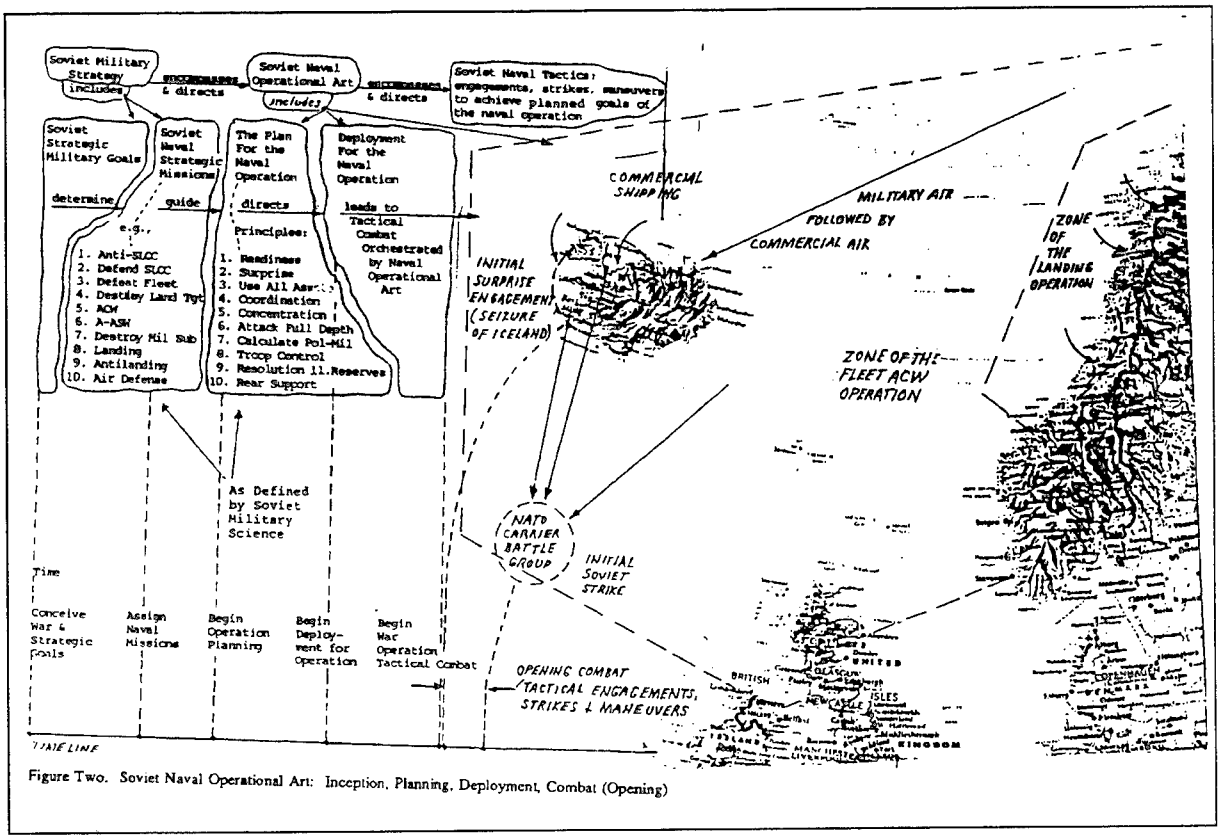



Figure Two. Soviet Naval Operational Art: Inception, Planning, Deployment, Combat (Opening)

## Soviet Naval Strategic Missions*

| Soviet Strategic Military Goals** | Seize Norway Coast | Seize Narvik | Defeat Swedish Navy | Defeat Swedish & Finish Navies |
|---|---|---|---|---|
| 1. Supt Army, W | 0 | 0 | 0 | 0 |
| 2. Supt Army, NW Coast | Yes! SNO | Yes! SNO | 0 | 0 |
| 3. Supt Army, NW SWE-Fin | Yes! SNO | Yes! SNO | Yes! SNO | Yes! SNO |
| 4. Supt ASF, NW+ | Yes! SNO | Yes! SNO | Yes! SNO | Yes! SNO |
| 5. Supt SRF Arctic++ | Yes! SNO | Yes! SNO | 0 | 0 |

*W = West TVD; NW = Northwest TVD; VO = Air Defense Service
** SNO = Soviet Naval Operation (or, snow)
+ ASF = Aerospace Forces (PVO)
++ SRF = Strategic Rocket Forces
O = Naval mission contributes little to achievement of strategic military goal
Yes! = Naval mission contributes substantially to achievement of strategic military goal

army forces into Finland and Sweden could destabilize the situation possibly to the extent of interfering with the army along the main strategic axes into Western Europe. In contrast, a Soviet naval landing operation on the Norwegian coast would contribute directly to the security of the Arctic bastion by extending the Soviet sea frontier westward along with accompanying naval and air bases and more effective Soviet sea denial in the Norwegian Sea.

* * *

Based on several strategic goals and notwithstanding whether or not the Soviet army would conduct an advance through Sweden and Finland, the Soviet navy would conduct a naval amphibious landing operation on the Norwegian coast. There would be some question of what service, the army or the navy, would control the operation. If, at the highest strategic level, the General Staff decided to include Sweden and Finland in the army scheme of maneuver, the army would probably control the landing operation on the Norwegian coast. The navy would probably control the landing operation if the General Staff determined not to include Sweden and Finland as a ground battle area but only Norway. In either event, the Soviet navy would conduct great, predominantly naval amphibious operations from Vardo in the north to Narvik or possibly even Bodo in the south. In such a naval operation, the Soviets would face a situation almost unique for them. They would have to factor in the conduct of an almost independent naval operation on the blue water flank of the landing not only to protect the landing but to prevent the penetration of NATO naval forces into the Norwegian Sea.

NATO would have a strong naval presence both in the North Sea and the North Atlantic that would be an immediate threat to a landing operation against Norway. NATO naval forces would also be a threat to the naval basing area of the Northwestern TVD (TSMA) and the Strategic Rear of the Soviet Union through missile and aircraft strikes over Scandinavia. And if this were not enough, the Soviets would be imperiled in the Arctic nuclear bastion by potential NATO naval forays or pressure through the Norwegian and Greenland Seas. NATO normally has two carrier battle groups in the North Atlantic armed and ready to the degree that the Soviets would have to take account of them at the beginning of an extended conventional war. We can assume that the Soviets would mount a Soviet naval fleet operation with the often noted anticarrier warfare (ACW) mission. The operation would be a combined one with the navy clearly in control but employing air force weapons as well as naval to defeat the closest or most dangerous NATO carrier battle group. In addition to this great fleet operation, the Soviets would intensify the day-to-day operations of the ASW forces defending the Arctic strategic nuclear bastion and the Barents Sea naval bases. The Soviets, similarly, would intensify day-to-day operations of the submarine and support forces having the mission to interdict the NATO SLOCs between North America and Europe.

In the event of a Soviet ground offensive in Central Europe, there is not much doubt that the Soviet navy would contribute to the fight with all of its assets in the Baltic and northern areas. The question is: how would the Soviets organize the naval part of the war? The answer is that they would integrate it into the overall military strategy and apply naval operational art to the conduct of the naval operations required to support the strategy. Analysis above supports a conclusion that the Soviets would plan and conduct at least three offensively oriented naval operations. If such is the case, we should be able to take any one of the potential operations and use it as a vehicle to describe Soviet naval operational art *and* to forecast the activity and outcome of the fighting. Probably the most important operation that the Soviets would execute would be the ACW operation required to ensure the strategic goal of denying the Norwegian Sea to NATO surface naval forces. The Soviets would use the same operation to protect the naval amphibious landing in Norway with all of its strategic goals and to support the submarine operation against the NATO SLOCs.

By focusing on the Soviet ACW naval operation and relating it especially with the amphibious landing operations against Norway, we should be able to get close to the spirit and style of the Soviets in naval operational art. Interesting high level considerations come into play immediately if we focus on the Soviet principles of operational and naval operational art. In the Western TVD (TSMA), if the Soviets decided to launch a great, all-out offensive, they would apply above everything else the principles of concentration and surprise and the supporting mechanisms of deception. The Soviets, with awe-inspiring consistency claim that war will

only come through a NATO attack. The Soviets, using the principle of military operational art described as readiness, would immediately respond with a great, coordinated counteroffensive of their own. We must assume, however, that the Soviets would exploit one of innumerable possible pretexts to claim that they were in immediate danger of attack and launch the vaunted counteroffensive noted so often in the literature. In effect, we must assume that the Soviets would be capable of launching an all-out offensive which would not necessarily be in response to any NATO attack. The end result--the Soviets reserve to themselves the initiative to attack independently of any NATO action and the resultant capability to achieve surprise in addition to concentration of effort along the main axis of advance.

In the land war, in the Western TVD (TSMA), the Soviet army would move against NATO forces fixed on given ground. In the war in the Northwestern TVD (TSMA), the Soviet navy would move against NATO forces similarly fixed on a given coast. In the war in the Arctic TVD (TSMA), assuming the Norwegian and Greenland Seas to be part of it, the Soviet navy would execute the naval operation having the strategic mission to defeat the NATO carrier task group in the vicinity of the Norwegian Sea. In succeeding in that mission, the Soviet navy would stabilize the great seaward flank of the ground advance in Western and Northwestern Europe. To succeed in that mission, the Soviet navy would apply the principles of operational art to the plan for the naval operation against the NATO carrier task forces. As a matter of both science and faith, the Soviets would apply the principles of operational art. Literally first and momentarily foremost among the principles in any offensive is that of surprise. The Soviets would labor to achieve surprise. How would they do this at sea?

The Soviets would face a fundamental stumbling block in achieving surprise not unlike the interservice one faced by the Germans at the beginning of a similar great conventional offensive. In Barbarossa, the following debate over the timing of the attack developed between the German army and air force, elements of which are analogous to the Soviet situation in any great offensive today: the German army insisted on attacking at first light and prior to the crossing of the border by aircraft of the air force; the air force pointed out that under such circumstances with its targets located well within Soviet Russia, the Soviet air force would be forewarned and the air attack fail to catch the Soviet air force deployed in peacetime aspect on the ground; the German army completed this fundamental quandary by noting the complete validity of the air force argument but emphasizing that as the attacking aircraft roared over the border, the Soviet ground forces would be alerted and the German army would fail utterly to achieve tactical surprise with the resultant possible strategic failure.

For the Soviets, on the maritime flank, the question would be one of timing between the navy on the flank and the army in Central Europe. Soviet military operational art *dictates* the achievement of surprise both at sea, through application of naval operational art, and on land. In Central Europe, on land, fixed geographic ground terrain would predetermine front axes of advance and the location of the defense. Under these circumstances, the attacking Soviet ground forces would have the opportunity to attack at almost any time of its choosing using a wide range of deception to contribute to surprise. In stark contrast, the naval "terrain" of the North Atlantic permits a deployed NATO carrier battle group to be virtually anywhere and constantly on the move. Through the use of deception, the Soviets might be able to achieve temporarily a concentration of Soviet naval forces about and around a NATO carrier battle group. If the Soviets could time this to take place when the carrier group was well within the Norwegian Sea, they could add a special additional concentration of aviation and patrol boat assets that could achieve an annihilating massed strike against a firmly located carrier battle group. It is difficult to imagine the Soviets successfully orchestrating such a situation. Add the necessity for naval operational art to time the situation to occur simultaneously with the army selection of the best time for an attack on the ground in Central Europe, and we must admit the practical impossibility of the Soviets achieving tactical surprise simultaneously at sea and on the ground.

What would the Soviets do in such a quandary? Use of the historical method is valuable to begin to answer this query. In Barbarossa, the German army, the senior German service attacked at first light simultaneously with the overflight of the Soviet Russian border by the massed first wave of the German aerial strike. Even the powerful political

figure, Hermann Goering, and his special support of the Luftwaffe could not accomplish a timing of the attack more favorable to the German air force. The historical lesson, albeit supported by only one historical "data point"--the army of a continental power set the timing of a great surprise offensive to the potential disastrous detriment of a sister service. The army and Luftwaffe worked together to overcome the fundamental contradiction, as follows, and achieved in the actual offensive about as much success as conceivable. The Luftwaffe trained an elite element of 50 aircraft bomber crews in night navigation to overfly the Soviet border in full darkness and attack the richest and most dangerous Soviet air fields simultaneously with the attack of the army at first light. In addition to this tactical stratagem and tactical surprise, the Germans surprised the Soviets technically with the first massed employment of cluster bomblets--the German SD-2 weapons. The historical case suggests that the Soviet army would dictate the timing of the attack even though a unified military strategy would be functioning, and that the Soviet navy would substantially overcome its problem of timing to achieve surprise.

In support of an army offensive in the Western TVD (TSMA) and the necessary defense of the Strategic Rear and the naval strategic nuclear rocket forces in the Arctic bastion, the navy would mount an ACW operation in which surprise would be the single most important factor in the destruction of the carrier battle group (or groups) at the beginning of a war. In planning the ACW operation at the Atlantic edge of the Arctic Oceanic TVD (TSMA), the Soviets would employ what they would term as a scientific approach including the systematic application of the principles of naval operational art.

In this framework, the Soviet commander of the prospective naval operation would get a lot of scientifically styled, mathematical assistance from the general and special staffs around him to include even mathematical probabilities of the chances of success in projected strikes, engagements, and maneuvers. The Soviet naval commander would be particularly sensitive to the overall correlation of forces and means in the zone of operations. He would make demands through the Northern Fleet to the General Staff for reinforcement and even changes in missions in accordance with his evaluation of the naval balance of forces. Outside of this initial fundamental evaluation of the overall balance of force in the zone of operations, the Soviet naval commander would probably arrive at a concept of operations based largely on his personal experience of fleet exercises, reading of military and naval history and resultant vicarious experience of war itself. In effect, the Soviet commander would be bound largely by the principles of naval operational art, and he would apply them based on his "sense" of the reality of the success of the planned combat engagements, strikes, and maneuvers.

Constrained by a unified military goal and subject to almost complete dependence on the army for the time of beginning of the war, the naval commander would be forced to extract everything possible from the principles of naval operational art in conceptualizing, planning, and executing the naval operation. The Great Fatherland War unfortunately does not give us a nicely analogous case of extremely blue water naval operations on a maritime flank by Soviet naval forces. The Soviet naval operations in the Black and Baltic Seas were severely limited in scope, conducted against nonexistent (Black Sea) or relatively weak (Baltic Sea) naval forces, and conditioned by the immediate convenience of the army along a gray water coast. We can use the Great Fatherland War with a little imagination, however, to provide us with valuable clues to the Soviet Russian mentality in naval situations.

Particularly in its big amphibious operations, the Soviet navy displayed a natural aptitude for cunning, resultant deception, achievement of surprise, and effective concentration of effort. We can detect in the Soviet Russian style an intriguing boldness and tactical aggressiveness lying right alongside of very different formalism and rigidity in military and naval operations. The personality of the Soviet naval commander would be probably the key factor in breaking the code of the ACW naval operation in the Arctic TVD (TSMA) at the beginning of a conventional offensive in the Western TVD (TSMA). Given the general mission that he would have to deny the Norwegian Sea to NATO carrier battle groups, a bold, pugnacious Soviet naval commander could practice a variety of deceptions (camouflage, misinformation, and feints), new tactics and weapons for naval use, and choice of axis or even location of attack that would force NATO carrier battle groups into an exploitable reaction.

What parts of Soviet naval operational art would encourage the Soviet naval commander to exploit the initiative associated with the decisive seizing of the initiative by the army in a surprise attack in the west? Soviet naval operational art demands the practice of deception and the achievement of surprise but how can these factors be applied in a military strategic situation in which the timing of the beginning of the war lies with the army in its ground attack against fixed NATO armies in Central Europe?

In the North Atlantic, at the edge of the Arctic TVD (TSMA), the Soviets could work initially against ground terrain rather than against elusive, mobile carrier task forces forcing the latter into maneuver and action that could be anticipated by the Soviets and converted into the destruction of the carriers. The bold and unexpected seizure of Iceland at the same time as the advance into West Germany and landings along the Norwegian coast would be a dramatic surprise in terms of the axis of advance and the methods necessary to seize the place quickly. The seizure of Iceland could be timed effectively with the other ground and amphibious operations unlike a strike against NATO carrier battle groups at sea. For many fundamental reasons the great surprise naval strikes at the beginning of a war (or against neutrals) have been against naval forces "immobilized" in port, e.g., British against Danes at Copenhagen (1805), Japanese against Russians at Port Arthur (1904), and Japanese against Americans at Pearl Harbor (1941). By the surprise seizure of Iceland, the Soviets would not only deny *the approaches* to the Norwegian Sea to NATO but force its carrier battle groups into precipitate action at a time and place of Soviet choosing where naval ambush and other Soviet stratagems and actions could be prepared in advance. Figure Two illustrates the way in which Soviet naval operational art would develop under such circumstances complete with a picture of the operational area.

The Soviet naval operations projected in the preceding pages--a Soviet amphibious operation against Northern Norway simultaneously with an operation to seize Iceland and effect blue water deployment for ACW around that island--have been argued persuasively enough but the operations must be noted explicitly to be scenario dependent. The scenario projects the future course and style of the Soviet naval operation and serves as a useful tool for conceptualizing the problems facing the Soviets in the future naval warfare. This persuasive scenario depends for much of its value, however, on the projected circumstances that the Soviets would launch an attack from a standing start in the Western TVD. The Iceland scenario would appear to fit only in the case of a very short warning time and a low level of defense preparations. In the event of moderate warning time, the NATO high command would probably execute a preemptive deployment into Iceland.

Because of the risks involved for the Soviets, many defense analysts in the west view short warning scenarios against an unprepared defense as not very probable. Some western analysts believe that the Soviets do not like the concept of blitzkrieg and do not want to practice it. These analysts feel that rather than using military means recklessly to shift the political balance in Europe, the Soviets would use political and military action to reduce risk and to optimize the chances of success. From the viewpoint of these analysts, the Soviets would handle the problem of future war more conservatively. In the more conservative analysis, a prudent Soviet commander of the Northwestern TVD, i.e., Scandinavia and its seaward (maritime) approaches, might accept the need to disrupt NATO ASW and air defenses in the GIUKN (Greenland, Icelandic, United Kingdom, Norwegian) Gap. This prudent Soviet commander might even allow the naval forces under his command to give the ACW mission a high priority because of the dual capabilities of the weapons systems of the NATO carrier battle groups.

In the more conservatively argued future possibility for Soviet naval warfare, the Soviet commander would be more likely to want to bring his combined arms forces into immediate play and closer to the area and direction of the main blow in the Western TVD. This approach would involve the conquest of Northern Norway and the engagement of U.S. task forces in that area of the TVD where Soviet forces could be concentrated and where naval operations would be tied to supporting ground forces. He would remind Northern Fleet commander and his staff of Admiral Gorshkov's emphasis upon decisive combined-arms operations in the initial period of war. Northern Norway is just such an operational environment where the Soviets could use ground, land-based aviation, submarines, rocket forces, air defense forces, and surface naval forces to "localize"

U.S. naval superiority and negate its considerable blue water superiority. The objective would be to reduce the U.S. naval forces' ability to project conventional power against the shore. Certainly there would be submarine screens and mine barriers to try to inflict damage on the carrier task forces as they approached Northern Norway but the battleground would be the coastal area itself where Soviet land-based aviation could have the greatest impact. At the same time anti-SLOC operations would be conducted to draw off U.S./NATO naval assets into convoy operations and to delay maritime resupply. One could argue that such an operation comes much closer to the structure of the old mine-artillery style of the past but modernized in content to reflect the impact of new technologies and the specific nature of the maritime threat. The objective is preemption and the initiation of combat on Soviet terms.

The more adventuresome Soviet naval operation with the ACW strategic mission described previously could be identified as the blue water sea denial maneuver with the Iceland opening Gambit. Within the super scenario of an extended conventional war between NATO and the Warsaw Pact, the Soviets would be impelled to deny the Norwegian Sea to NATO carrier group operations and would almost certainly mount a naval ACW operation as part of the effort to do so. The scenario is considered, therefore, to be realistic in general and reasonable in detail. The scenario is not intended to compete with any other in the sense of being *the* operation that the Soviets would embrace in the event of war. The scenario *is* intended as a means to get further into the mentality of the Soviets in conducting a naval operation and applying the skill of naval operational art.

The less adventuresome Soviet amphibious landing operation described immediately above could be identified as the conservative, grey water sea denial maneuver in support of a conventional ground and air offensive in the Western TVD. With a joint operation having the comparatively conservative strategic goal to secure the maritime flank of the Northeastern TVD, the Soviets would be in a position to conduct ACW, AAW, and ASW operations across the northern reaches of the Norwegian Sea securely anchored on the Norwegian coast. With such an operation, the Soviets would be able to conduct grey water mine and barrier style sea denial operations in accordance with their historical style. The Soviets would throw away the element of offensively oriented strategic surprise and because of this effect, the Soviets would find themselves executing about the most conservative set of operations probable under the conditions of an all-out conventional war.

In order to verify the reasonableness of the generalities offered about Soviet naval operational art in the blue and grey water scenarios above, the primary researcher solicited the impressions of a Soviet emigre--native-born Russian, exceptionally well-educated, service as commissioned officer in the Soviet army, sensitive to the make-up of the Russian character. The Soviet expert was introduced to the point that the Soviet navy's ACW fleet operation in the Arctic TVD (TSMA) and amphibious landing operation in Norway would have timing subject to the operational necessities of the army in Central Europe. Faced with a situation in which the Soviet navy would face an enormous initial disadvantage in conducting a fleet operation in an ocean TVD (TSMA) and similar disadvantages in the timing of the Norwegian landings, the Soviet expert commented that such a situation was not unusual and that in any theater of war, the Soviets would "tilt the effort" toward the decisive instrument. The expert made it clear that the question was not one of navy versus army but of the operations being conducted and the overall "environment" of war. For the expert, it was evident that the ground attack in the Western TVD (TSMA) could lead quickly to the occupation of the entire continent of Europe. No naval operation could accomplish the equivalent.

The Soviet expert went on to elaborate that the Russians have had centuries long experience of problems with productive resources. The Russians have faced a unique combination of scanty natural resources changing to a surfeit but always chronic weaknesses in production either because of outright backwardness or more subtle, self-defeating authoritarian political controls. As a result, the Russians have had to make hard choices. It is easy for the Russians to set priorities; it is natural for them to enforce priorities. The Soviet navy could scarcely be surprised at receiving a lower priority for its fleet ACW operation in the environment of a land war close to the western border of the Soviet Union.

In terms of naval operational art, the Soviet navy would face the absolute necessity to achieve surprise in its fleet naval operation. No greater

opportunity can exist to exploit surprise than at the beginning of a war under the very special circumstances of a surprise offensive out of the political situation of peace and into war. Faced with mounting a naval fleet operation within the framework of a war "tilted" in timing and space toward the ground offensive in Central Europe, the Navy would require special stratagems indeed to achieve some element of surprise leading to the defeat of the NATO carrier battle groups deployed in the North Atlantic at a time chosen according to the dictates of a non-naval environment. The Soviet expert had a ready answer for the Soviet Russian mentality in such a situation; the Soviets would "outsmart" their opponents. They would achieve essentially a grand "mental surprise" against NATO opponents whom they continue to gauge as superior technicians. Having already been introduced to the Iceland gambit, the Soviet expert considered it well within the Soviet Russian style to apply cunning *(khitrost')* and elaborate camouflage *(maskirovka)* to the bold, surprise seizure of Iceland.

The Soviet expert implied in the arguments above and went on to state directly that the Soviet style in surprise emphasizes outsmarting an opponent rather than springing breakthroughs in military technology. The statement suggests the generalization that cunning and camouflage in Soviet deception and associated surprise in Soviet naval operational art, will be tactically oriented somewhat more than technically. It is well known, of course, that the Soviets place special emphasis on scientific technology and have come to match the west fairly closely in military technology. The point is that the Russian historical condition and Soviet technology have combined in Soviet naval operational art to make cunning and hiding uniquely important. This special importance is difficult to understand from a western perspective. This difficulty is also compounded since the Soviets will use sophisticated electronic camouflage at sea to achieve what they consider to be important, albeit primitive, tactical surprise.

The warning in accepting such a generalization is that the Soviets would take any opportunity presented to them to spring technological surprise in combat. The Soviets, for example, in the Great Fatherland War claim an element of technical surprise and superiority over the Germans that matched any other factor in importance for the repulse of the enemy at Moscow in December 1941. The Soviets claim the T-34 main battle tank as that element of technical surprise and few can doubt its importance in the fighting from October-December 1941. The T-34, however, was designed largely in an evolutionary sense as the follow-on vehicle to a large mass of Soviet cavalry-style tanks with severe weaknesses in armor protection. The Soviets produced a tank that proved to be "revolutionary" in design but the Soviets never intended that effect. Even in the case of the defense of Moscow, therefore, we see the Soviets being lucky in the earlier German misdirection of effort away from Moscow and skillful tactically and operationally in saving enough forces and mobilizing others to survive in 1941. This historical sketch suggests that even in the case of the T-34, the Soviets did not intend the tank to be a special element of technical surprise and that the Soviet style in combat revolved more around cunning, a mania for the preservation of reserves no matter what the crisis, ruthless suborning of all assets, etc.--essentially tactical factors and large numbers of good weapons.

The Soviet expert continued in the case of an opening blow against Iceland that the Soviets had the deceptive skills to achieve surprise in air and sea landings. He agreed also that they had the tactical skills in combat to make the seizure largely assured in a coup de main at the beginning of a war. In a nice insight into potential Soviet mentality in war, the Soviet expert elaborated that the big issue for the Soviets in naval operational art would be whether or not they could hold Iceland successfully. The primary researcher pointed out that the issue for Soviet naval operational art was not one of holding Iceland as if it were a continentally styled piece of ground terrain but as a lure to force the NATO carrier battle groups into a precipitous, predictable counterattack that the Soviets would exploit into quick destruction of the carriers. Such destruction would include surprise fires from Soviet ground and air forces deployed on Iceland and from commercial vessels sited in the fjords.

If and when the Soviets destroyed the initially deployed NATO carrier battle groups and the Soviet ground forces defeated the NATO ground forces on the continent of Europe, the Soviets would almost certainly make the decision to hold on to Iceland and probably be successful. If the Soviet ground forces failed to defeat the NATO ground

forces on the continent, the General Staff would face a great decision of whether to attempt to hold it in the face of a massive buildup of NATO naval forces in the North Atlantic or fight hard, but cut its losses and sacrifice the forces on the island. The Soviet expert commented unhesitatingly that the Soviets would sacrifice the forces in a hard fight, pinning down NATO forces as long as possible. The Soviet expert argued in a thought-provoking metaphor that the Russians are chess players and in chess you sacrifice. The following roughly analogous historical situation suggests itself in support of the expert opinion that the Soviets have a style of sacrificing: In June and July 1942, the Soviets faced final defeat in an exposed "island" of resistance--the fortress of Sevastopol on the Crimean Peninsula. The Soviet sacrifice of man and fortress is exemplified by fighting on 29 June 1942 in which the German 50th Infantry Division advanced over the Inkermnan Heights, and the Soviet military commanders and political commissars in vast champagne cellars on the western slopes instead of surrendering after being sacrificed in a battle lost, set off an explosion that collapsed 90 feet of rock over a length of 900 yards burying thousands of combat troops, wounded, and civilians. The style was one of sacrifice within a sacrifice.

In a general overview of naval warfare on the seaward flank of the Western TVD (TSMA), the Soviet expert tied together some inciteful observations on Soviet strategy and operations in the Baltic, Scandinavia, and out into the northern seas. He stated emphatically that the Soviet Russians with their conservative, heavy, continentally conditioned historical style could not accept the uncertainties and dangers of a neutral Sweden and Finland in a conventional war in the west. The Soviets simply could not stomach the vagaries of 750,000 well-armed Western Europeans in so critical a location as Sweden. Neutrality, diplomatic agreement, etc., would be unacceptable to the Soviets in an all-out conventional war. The expert gauged the Soviet strategic mindset as one that would demand a free rein in Scandinavia and the operational style as one in which the Soviets would not allow the mobilization of the Swedish armed forces. With the latter consideration, the Soviets could not mount their main operation through Finnmark; it would take so long to develop into Sweden and come from such a direction that the Swedes would be able to effect mobilization and present effective resistance. The Soviet expert sees the Soviets demanding something more direct, quicker, immediately paralyzing and presenting great strategic possibilities.

Based on the strategic premise that the Soviets would have to take Sweden and the operational premise that they would prevent Swedish mobilization, the scenario of a naval landing operation directed straight at Stockholm suggests itself. The landing force would have three great strategic missions. It would seize Stockholm immediately to disrupt the national command authority. It would direct forces along multiple axes into the heaviest populated areas to paralyze the Swedish mobilization. It would project a mobile force styled like an operational maneuver group out of the large amphibious bridgehead. The mobile force would advance through Sweden and then along two final axes into the Oslo area essentially breaking into the "soft underbelly" of Norway from a dramatically surprising direction. These projections are certainly interesting but what about their reality?

Two foremost questions can be asked to test the reality of Soviet naval operations against South Central Sweden. The first is: would the Soviets launch a campaign in Scandinavia that would possibly destabilize the Northwestern TVD (TSMA) to the detriment of the advance in Central Europe? The dilemma would be a cruel one with a tough campaign against the Swedes having to be balanced against the uncertain dangers from a powerful neutral force in a strategic location. The Soviet expert is probably right; the Soviets would be driven to tidy up things in Scandinavia. The second question concerns the operational capabilities of the Soviet navy, army, and air force in a major landing operation. Would the Soviets have enough strength in men and weapons and the skill especially in naval operational art to apply to the Swedish landing? Almost instinctively, the Soviet expert commented that perhaps the main strength of the Soviets was relentless emphasis on numbers and that the men, weapons, and shipping would not be an obstacle to the strategy.

The question of naval operational art is quite another. The army would be the controlling service in a Swedish operation but the navy would be more critical even than the army on the issue of the technical and tactical importance of its operations. In terms of the skill of operational art, the navy would be responsible almost entirely for successful

deception, the achievement of surprise in the entire operation, and the buildup ashore of ground forces fast enough so that the army could carry out its vast set of raiding-like operations--the coup de main in downtown Stockholm, the advances into the Swedish mobilization areas, and the seizure and holding of Oslo for follow-up forces. In effect, the navy would be responsible for the concentration of forces for the operation and the "breakthrough attack," which the successful seizure of an adequate bridgehead ashore would represent in an amphibious operation. The army, in effect, would be the force that would exploit naval deception and surprise and the concentration of specialized naval infantry in the successful seizure of a beachhead ashore.

With the immensely important strategic mission to effect a landing that would have the strategic goal to take Sweden and Norway out of the war within days, the navy would be bound to a classical application of naval operational art. The Soviet navy, for example, would have to deceive both the Swedes and NATO into believing that in the event of an extended conventional war that Sweden would not be a Soviet target but that naval activity including important landings could be expected against the Danish islands. In the bold and challenging Kerch-Feodosiya landings of December 1941, the Red Navy of the day disguised the concentration of forces and movements of shipping for the landings as part of the effort to reinforce the powerful Soviet forces besieged at Sevastopol. A similar application of navy operational art would take place in the Baltic. Not everything would be generally similar to this valuable historical case. In the Kerch-Feodosiya episode, for example, the Soviets succeeded in deception and surprise by strong landings around Kerch that forced the Germans to fight hard and rivet their attention there. Two days later, the Soviets landed even stronger forces at Feodosiya far to the west, achieving a devastating surprise as concerns the location of the main axis of the attack. In the hypothesized Swedish landing operation, the Soviets would have no such "luxury" in deception through delay of the major attack--literally every hour would count in developing the attack inland from the moment of the first landing.

In all three of the scenarios developed above, which are based on the vast premise of an all out conventional offensive in the Western TVD, the Soviets would conduct an amphibious landing operation against Northern Norway. The circumstances of geography, the demands of the Northwestern maritime and Western continental TVDs, the security of the Arctic Bastion, and the examples of Soviet landing and mine and barrier operation of recent history point unmistakenly toward such a future. The Soviet ACW operation with the Iceland gambit and the amphibious landing against Sweden and less certain but nevertheless supremely instructive in bringing into focus the Soviet style in putting together the naval operation and the strategic objective for it. Iceland would be a big gamble and would not permit optional application of the commonly envisioned Soviet combined arms operation. The question also arises for the Soviet fleet commander who would have to take on the U.S. carrier battle groups with their blue water capabilities: where and when would he find those conditions in the theater which would most degrade those capabilities, south of Iceland or off Northern Norway? The entire operational plan for the invasion of Iceland, moreover, could be negated by untimely even small prewar tactical deployments of U.S./NATO air and ground units into Iceland. Given the strengths of the Northern Fleet and the Leningrad Military District, the Soviets would have to make counterdeployments that would be quite large and assume operational scale and configuration. These forces would be difficult to find given the present correlation of forces in Europe.

In the case of all three of the scenarios above, even in the context of a global conventional war, the Soviets would have to calculate the effects of U.S./NATO peripheral operations. From a Soviet perspective, the western moves which would threaten immediate disruption of theater-strategic operations in the main continental TVD, or those which would cause a rapid, radical shift in the strategic nuclear correlation of forces (e.g., anti-Soviet SSBN operations), would be the most dangerous. From a Soviet perspective there are two maritime TVDs which potentially could see both types of operations. The first is the Northwestern TVD in support of a theater-strategic offensive in the West. Northern Fleet and the Leningrad Military District would generate forces to protect the right flank of the Western Theater of War. United States naval operations north of the Greenland-Iceland-U.K.-Norway (GIUKN) Gap could be directed against both SSBNs and Soviet naval operations developing in support of the main attack in the Western TVD. On the Soviet side the

primary task would be to control the Barents Sea, deny NATO the Norwegian Sea, and support combined arms thrusts, including airborne and amphibious landings against Northern Norway and Baltic approaches to block the GIUKN Gap. The advantages of such blocking operations are that they would bring about the rapid military-political isolation of Sweden and Finland and reduce the need to concentrate forces against them. Such operations would be concentric, the right wing of a double envelopment of Norway which would set the stage for joint naval operations with the Baltic comprising a left wing Fleet against NATO ports and bases in Western Europe. This would bring more power to bear on the immediate center of gravity in the Western TVD.

Under the centralized style of war planning affected in the Soviet Union, the timing for the initiation of Soviet naval operations against either Iceland or Northern Norway or the Western Baltic islands or Sweden would not be left to the Navy. The Navy, however, might well get the chance to put in a "seasonal" requirement, e.g., the initiation of hostilities in the late fall (October) when weather and rapidly decreasing hours of daylight are likely to impact adversely upon sortie rates for carrier air operations in theater. It should be noted that the Soviet offensive operations against Petsamo-Kirkenes in 1944 began in October 1944 and continued into November. The Soviets appreciate that during the Falklands Conflict the prospect of deteriorating weather conditions with the onset of winter in the South Atlantic drove the pace of British operations. Here we return to the real meaning of study and preparation of a TVD. The Soviets themselves mounted their Manchurian operation at the start of the rainy season and achieved surprise therein. Japanese intelligence estimates which assumed war would not come until 1946 were based, in part, upon this assumption and an underestimation of the pace of Soviet strategic redeployment of forces from Europe. Western war gaming should assume just such adverse conditions in theater and discuss methods and means of overcoming them. Frank Uhlig's recent review of Kemp's *The Russian Convoys, 1941-1645*,[1] raises the question, for example: Can we have our air operations reduced to impotency by the absence of an effective and timely way to clear snow and ice from flight decks?

Under the general rubric of timing, the Soviets face immense opportunities for successful war fighting on the basis of a ground offensive from a "standing start" at the initiation of hostilities and the Soviets face the question of what is the naval version of such an event? The Soviets could launch a ground offensive in a continental TVD (TSMA), for example, the Western, with only the forces in place. Such an offensive could be described as an attack from a standing start, and, although challenging for the Soviets, the attack must be considered to be technically feasible. The Soviet Russians showed combat skills in the Great Patriotic War--battle stratagems, peasant cunning, infiltration, improvised river crossings, etc.--that suggest natural tactical skills favoring a surprise attack with forces in place. The Soviet practice of army operational art with its emphasis on systematic meticulous planning and check list style of applying the principles of operational art, supports a view that the Soviets would be perhaps uniquely capable of such action. On the other hand, there are strong objections. In applying operational art to an attack from a standing start, the Soviets would calculate the correlation of forces. The Soviets have probably already made this calculation and may have determined that with existing balances an attack from a standing start is not a reasonable alternative for a Soviet military operation in the Western TVD (TSMA). Even more importantly, the Soviets may actually believe their own propaganda and not be prepared to launch a surprise attack at all against an intact NATO coalition. In counterpoint to these objections to a surprise attack, the Soviets probably are reserving to themselves the option to react to perceived NATO aggression with a preemptive attack which could take place no matter how adverse the correlation of force to gain time for the Soviets to save themselves from the postulated aggression.

Let us assume that the Soviets have plans to launch a preemptive style offensive in the Western TVD (TSMA). Notwithstanding the motives driving the Soviets to make such an attack, motives that could be either naked, unprovoked aggression or "preemptive reaction" to perceived, impending NATO attack, the Soviet offensive would be a real danger to the survival of NATO. Within such a scenario of surprise attack, how would the Soviet navy launch operations from an equivalent standing start in support of the army through means of a unified set of naval strategic missions and associated strategic

military goals? Two grand although straightforward possibilities for naval action surface immediately. The Soviet navy is fundamentally a sea denial instrument and would deny the Norwegian Sea to NATO naval forces by defensively oriented "barrier" operations designed to prevent the penetration of NATO submarines, carrier battle groups, aviation, and landing forces. Alternatively, the Soviet navy could carry out the same sea denial mission by offensively oriented naval operations. In this case, the Soviets would take advantage of surprise in the opening of a war by attacking the more dangerous NATO naval forces, e.g., carriers and submarines, in the Greenland-U.K. gap or concentrated and fixed in naval bases. The key issue for the Soviets in the choice of how to deny the Norwegian Sea to NATO naval forces would be the one of self-confidence and skill in naval operational art.

For the Soviets, naval operational art pivots around deception, surprise, and massing of strikes in fleet operations and concentration of force in landings. This thesis is overstated but probably correctly represents a Soviet preoccupation with those principles. At the opening of a war begun at their own initiative, it is difficult to believe that the Soviets would not do everything possible to exploit the results of surprise. This line of reasoning supports a view that the Soviets would launch offensively oriented naval operations in the event of an army attack from a standing start in the Western TVD (TSMA). The Soviets, for example, instead of just effecting a surge of naval forces from port areas of the Northern Fleet as they have been observed to do in exercises, would superimpose on the surge an additional set of engagements, strikes, and maneuvers by naval forces already on station. This set of actions by *relatively* weak naval forces on station would be the real parallel of army forces "on station" or close up against NATO ground forces in Central Europe. Unlike the Soviet Group of Forces Germany that can remain independently in close proximity to NATO ground forces, the Northern Fleet faces a naval environment in which the entire fleet cannot stay on station at sea indefinitely.

In the ocean environment, Soviet sea denial forces normally on station in the vicinity of NATO sea control forces will be relatively weaker than in the ground situation. On the ground, powerful Soviet-dominated ground forces, superior in numbers of personnel, tanks, artillery, and supporting aircraft, will be normally located next to thinner NATO ground forces conveniently fixed in position by the necessity to hold various terrain. In attacking from an unreinforced, nonsurge deployment, the Soviet navy would face epic challenge in massing strikes effectively against superior, maneuvering naval forces. The Soviets would be forced in this scenario to use surprise to compensate for the disparity in strength. They would also have to show artistry in applying the principle of coordination in naval operational art to ensure that all assets-- surface, submarine, and aviation--were factored into the surprise attack on NATO naval forces at sea.

The Soviets would be forced to work hardest in the methods of deception and the principle of surprise to expect important let alone decisive results in a naval attack form a standing start. Similarly to the scenario suggested earlier in this report, the Soviets could achieve formidable results by attacking fixed terrain of strategic naval importance in the North Atlantic. Iceland is strategically located in the Greenland-U.K. gap and has two additional features that make it almost uniquely attractive for attack from the viewpoint of the skills and style of thinking in Soviet naval operational art. Iceland is an exceptionally large island in terms of being an island marked for amphibious attack, and is virtually uninhabited by the standards of Western Europe.[2] Iceland is an independent state having no armed forces and not having allowed significant ground, naval, or air defense installations on its soil. Using various deceptive stratagems and imaginative operationally orchestrated tactics, the Soviets should be able to seize Iceland almost immediately in an attack from a standing start and thus reinforce the fleet naval forces on station with a forward strategic pivot around which to develop their operation.

**Notes**

1 Frank Uhlig, "Book Review: Paul Kemp, *The Russian Convoys, 1941-1945,* (New York: Sterling, 1987), *Naval War College Review,* Summer 1988, pp. 128-129.

2 Iceland (39,800 sq.mi.) is virtually the same size as Luzon (40,814 sq.mi.) in the Philippines, the largest land mass attacked as a single island target in World War II, in contrast to operations, for example, along the coast in this case, of New Guinea. The population density in West Germany is roughly 625 persons per sq. mi. compared with 5 in Iceland.

## Section Four

### Conclusions

The Soviets have a unified military doctrine dominated by the military policy of the CPSU and the military-technical requirements of military science and military art as formulated by the General Staff. This is our challenge. As part of military doctrine and as influenced by the requirements of military science and military art, the Soviet General Staff developed military operational art in the interwar period based on the empirical experience of the Russo-Japanese War (1904-1905), First World War (1914-1917), Civil War (1918-1920), and the scientifically conditioned of the CPSU for a single centralized military doctrine. As developed by the General Staff, Soviet military art includes strategy, operational art, and tactics; and, operational art stands out as the plan to achieve strategic goals by tactical engagements, encounters, and maneuvers interlinked in time and space. Within operational art, the Soviets delineate naval operational art, noting that it conforms to the same principles that guide operational art applied however with due regard for the unique environment of war at sea. Synchronized with the CPSU, the Soviet General Staff, applying a unified military science and art, and dominated by a continental case of mind, formulates theater-strategic operations. No Soviet Navy will run off to conduct its own war. That is the bottom line.

Unlike the case of U.S. strategy for the defense of the European theater of war in which the Navy, Army, and Air Force struggle in various ways among themselves for control over the U.S. input to western strategic operations, the Stavka, VGK (Headquarters, Supreme High Command) "struggles" with the commanders of TVDs (Theaters of Strategic Military Action or TSMAs). In the situation concerning control over military operations, Stavka would assign operations planning to the General Staff, a body that includes representatives from all branches of the armed forces and the rear services. Stavka, VGK presents the plans of its working organ, the General Staff, to the Commander in Chief (CINC) of the High Command of Forces (HCOF) in a TVD (TSMA), who in turn has his own staff to prepare plans to be entrusted to the front or fleet commands as appropriate for execution. The Soviet CINC, TVD (TSMA) would have the full authority of the Stavka and probably he himself would be a member of the Stavka in some other capacity. The system of command is fully synchronized; in the event, for example, that no HCOF exists in peacetime in a TVD (TSMA), then a Representative of the Stavka, VGK, would command the TVD (TSMA) and ensure even more directly that Stavka plans were understood and executed vigorously at the front (fleet) and lower tactical levels. The ramifications for Soviet Naval Operational Art are extensive. The Soviet naval operation exists only within the framework of national and theater of war plans made by the General Staff. Soviet naval operational art marches to the drumbeat of the principles of operational art.

The Soviet naval operation is a higher level form of Soviet naval warfare that strings together combat strikes, engagements, encounters, and maneuvers into a purposeful series of actions designed to achieve centrally designated, unified Soviet strategic military goals. The Soviets apply the skill of Soviet naval operational art in the planning of the naval operation and the execution of the combat actions and maneuvers that comprise it. The Soviets will conduct naval warfare according to the dictates of naval operational art which is a skill that emphasizes principles, methods, factors, and processes, directed by a scientific, systematic approach and an historical style different from that in the west. The fact that the Soviet Russians and many of the nationalities now controlled by them "think" differently in their approach to fighting wars has caused some to characterize operational art as unfathomable and erratic. But different is not necessarily unintelligible, and Soviet naval operational art has been described, lauded, characterized, and painted enough in historical example by the Soviets to make it no longer a mystery.[1] Still relatively ill understood, the Soviet naval operation nevertheless is orchestrated through the skill of Soviet naval operational art and both demand understanding if U.S. plans to conduct naval warfare are to be effectual.

The search in this paper has been for the things that characterize Soviet naval operational art. The purpose of the search was to take the factors that characterize Soviet naval operational art and hang them out as warning and lesson before the western actors engaged in the planning and potential conduct of war involving Soviet naval forces. The Soviets claim to have developed a fundamental, new category of military art--operational art--the naval version of

which is naval operational art. Any U.S. war plan or war game with a naval scenario that fails to factor in Soviet naval operational art will be subject to catastrophic failure in any purposes that it may have, including victory in war, development of successful plans for war, education of participants, and discovery of new perspectives.

In this study, we have defined Soviet naval operational art, described it in various ways, and also attempted to show how it works by means of scenarios. The scenarios illustrated the Soviet style in applying the art to the planning and execution of the naval operation. We attempted in the scenario to present things through the minds of the Soviets according to their own thinking on naval operational art. We are not alone in this. The attempt to understand Soviet ways of thinking has expanded over the years and is one of the most important areas of defense analysis in the west. The activity should be reinforced and must be continued. The attempt to be Soviet is filled with wisdom but also fraught with pitfall. Perhaps the most important hazard is that Western Europeans and Americans can only pretend to be Soviets; and, emigres and defectors will lack the immediacy and responsibilities of the real thing to be fully satisfying in compensating for our own foreign mentality vis-a-vis Soviets in war games and scenarios. The result is that in the most popular scenarios--those showing the Soviets attacking and with Soviet style and motive so important--we must have strong reservations about having adequately considered the factors judged by the Soviets as being really important.

**Notes**

1 For this metaphor, see Lieutenant Arthur Scott Mobley, Jr., *Beyond the Black Box: An Assessment of Strategic War Gaming,* Naval Postgraduate School Master's Thesis (Monterey, CA: Naval Postgraduate School, 1987), p. 64.

# Soviet Operational-Level Troop Control

**Lauren D. Kohn**
**John T. Banks**
**Kerry A Blount**
**SAIC**

The accelerating pace of scientific and technological change and its effect on modern warfare has haunted Soviet military leaders throughout the postwar era. Since the late 1950s Soviet military theorists have focused on this change to determine the requirements it imposes on the Soviet Armed Forces. The results have repeatedly emphasized one aspect: the critical need for effective troop control to achieve success in combat. Not surprisingly, Soviet military leaders invested substantial resources in the study of troop control beginning in the early 1960s and have continued that effort to the present.

The results of this effort represent a significant step forward in military affairs: Soviet troop control theory provides a framework for systematic investigation of both the theoretical and practical aspects of this critical branch of military science. Moreover, Soviet work in the area of troop control is a useful adjunct to the study of operational art. Because operational art had been recognized as a component of Soviet military art since the 1920s, the military theorists involved with troop control worked from the onset within the framework of three levels of military art. The perspective which these levels provide is particularly useful today to the military specialist who is engaged in defining the role, character, and methods of operational art within the context of Western military science.

This paper neither surveys the field of Soviet troop control nor provides a detailed description of troop control at the operational level. Both topics are too large to be presented here. Instead, this paper focuses on three aspects of Soviet operational-level troop control: the content and context of troop control; wartime planning procedures for operations; and the nature of modern quantitative aids used to formulate and validate decisions. These aspects provide a useful introduction to Soviet work in developing troop control as a systematic area of study. This paper also briefly addresses the requirements of troop control at the operational level and a few of the methods used to satisfy them.

## Content and Context of Troop Control

Soviet troop control theory has its roots in the Soviet concept of military science. Proceeding from 19th century concepts of scientific determinism, Soviet theory assumes that laws govern all processes in nature and society. Some of these processes (phenomena) may be complex and their corresponding laws difficult to determine. Nonetheless, these laws are held to objectively exist and to govern the interaction of the process outside of human consciousness. Because war is a process, it follows that war is governed by objective laws that exist independently of man's correct understanding of them. The laws that govern war are divided into those that decide the interactions between opposing states (laws of war) and those that govern the outcome of combat (laws of armed conflict).

This belief in the existence of laws that govern the outcome of war creates a need for an objective (scientifically-based) system to operate the armed forces in accordance with them. The former Soviet Minister of Defense, Marshal Grechko, expressed this as a need to "bring some process or phenomena in the field of military affairs into conformity with the requirements of the objective laws of war and the existing situation."[1] Identifying these requirements is one of the fundamental tasks of Soviet military science.[2] And the act of bringing these requirements into conformity with the assigned missions and situation is the content of troop control. Only this scientific approach, Soviet military theorists assert, can ensure that commanders make the most use of the combat capabilities of their forces in carrying out their assigned missions.[3]

The Soviet Armed Forces views the concept of troop control broadly. This view is immediately evident in the description of troop control in the authoritative Soviet *Military Encyclopedic Dictionary:*

> Troop control consists of the activities of commanders, staffs,

> political organs, services, and other control organs for maintaining the constant combat readiness of troops (forces), preparing military (combat) actions, and directing troops (forces) in the fulfillment of established missions.[4]

Implicit in this definition are multiple dimensions that define the scope of Soviet troop control in modern warfare. First, the concept of troop control and its underlying theory is relevant to all branches of the Soviet Armed Forces, not just the Soviet Ground Forces. The Navy and the other branches share common concepts and principles in a unifying theory of troop control. Second, troop control theory applies as a total system of control agencies, not just to the activities of a particular commander and staff. Third, troop control encompasses three major functions: maintaining readiness for combat and the fighting efficiency of the troops; planning and preparing combat operations; and leading troops during the actual conduct of combat operations and combat actions.[5]

Conducting these activities requires a process of control and an infrastructure. The process is a systematic, procedural methodology or approach; the infrastructure is the physical resources to support that process. Soviet troop control specialists acknowledge these requirements, labeling the process "control activity" and the infrastructure "control system." For simplicity, this paper will use the terms process and infrastructure. The troop control process includes all activities (including the cognitive functions) required to evaluate a situation, make decisions regarding the deployment or use of forces, plan combat activities, and monitor and adjust the execution of previously made decisions during the course of combat. The supporting infrastructure provides the people and equipment necessary to implement the control process, automated systems used for control, communications equipment and associated vehicles and aircraft. If the troop control systems is to be effective, its procedures and infrastructures must be compatible.

Changes in the character of war which sparked Soviet interest in improving its control mechanism have been magnified in recent years by the increasing range, accuracy, and lethality of weapons, improved capability for troop mobility, and advances in telecommunications.[6] These chages remain major issues that make further improvements in troop control necessary today. Under modern conditions, the increased speed and activeness of operations reduce the amount of time available to execute the control process. The need to combine aviation and air defense together with artillery and maneuver forces in coordinated, simultaneous combined arms operations has increased substantially the *complexity* of planning operations. Advances in warfighting methods which shortened the time available for planning together with the greater capability of combined arms forces have *increased penalties* for poor planning and decisions. Soviet assessments on the nature of war reveal that modern wars likely will be fought with forces readily available. Consequently, the short duration and limited mobilization time will eliminate or *decrease learning time;* the control processes and infrastructure in effect at war's onset will be those used to fight the war. Finally, the improved capability of modern weapon systems to find and destroy targets on the battlefield increases the *vulnerability of the control system* to systematic destruction.[7]

The troop control system now in use by the Soviet Armed Forces has been designed with all of these factors in mind. Within the constraints imposed by technology and by their understanding of the laws of war and armed conflict, Soviet military specialists have approached solutions by revising both process and infrastructure. Changes in the control process have followed two closely-related tracks--shortening decision making and planning time while maintaining or improving the quality of decisions and the confidence in which they are held. Both are accomplished by applying quantitative analysis techniques and improving the scientific knowledge of warfare as a whole. Changes in infrastructure have focused primarily on improving timeliness and survivability. The foundation for most of these changes rests on improvements in the areas of operations research, cybernetics, computer technology, and telecommunications.[8]

These improvements are not the result of discrete responses to specific changes in the nature of war. They are part of an integrated approach linked by the theory of troop control operating within the total framework of Soviet military science. From the Soviet perspective, only a scientific, internally-consistent theory that is rigorously applied

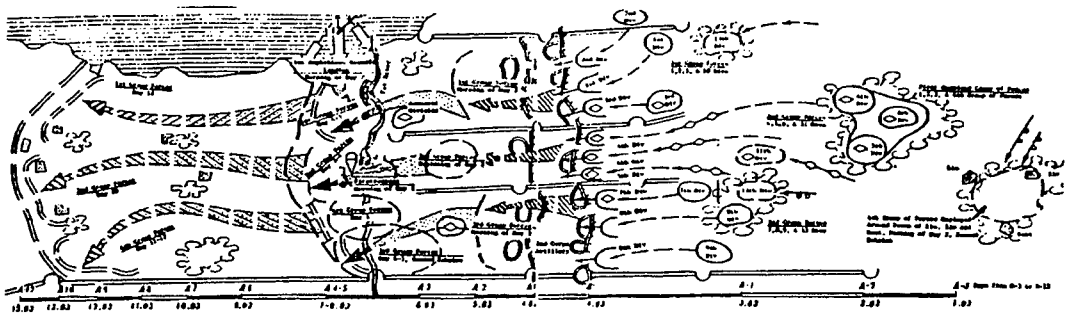


Fig. 1: Map Diagram of a *Front* Operation

can ensure coherent, coordinated planning and decision making. And only such planning and decision making can provide for efficient and timely application of the combat capability of all the branches of the Soviet armed forces in modern warfare.

## WARTIME OPERATIONS PLANNING PROCEDURES

In wartime, armies and *fronts* employ operational art in the conduct of operations. Planning for an operation is a complex task because of the multitude of actions occurring simultaneously or in carefully ordered sequence within it. In his book, *Mathematics and Armed Combat,* the military theorist K. V. Tarakanov includes a diagram of a *front* operation that the complexity of modern operational-level warfare.[9] This diagram, shown as Figure 1, contains the following operations or actions:

- Initial operational deployment.
- Three army operations lasting four to seven days in *front* immediate ission.
- Naval landing on Day 2.
- Airborne landing on Day 3.
- Commitment of a second echelon army on Day 5.

In the Soviet view, the complexity of this type of operation in an environment increasingly marked by faster operational tempos, increased lethality, and other characteristics of modern operations precludes coherent decision making, planning, and execution using older, less structured methods. The troop control process seeks to resolve these problems by providing solutions that are both timely and of a high-quality.

To reduce the complexity of the operation which Tarakanov represented, Soviet troop control theorists and other military specialists break it into more manageable chunks. The front operation is viewed as an aggregate of component operations, strikes, and combat actions that conform to the commander's common plan of action.[10] Figure 2 shows the components of the front offensive operation. Each army operation in this diagram is further subdivided into a similar functional structure comprising combat actions and strikes by the army's subordinate elements.

These structures operate in a top-down manner in accordance with the requirement for centralized control. Each superior headquarters must determine

the balance between forces assigned, and the enemy to be defeated in order for each of its subordinate elements to carry out its own missions. To do this, the Soviet troop control system has created an integrated process that links the tactical, operational, and strategic (theater) levels by design. At the same time it tailors the process at each level to conform to its special requirements. The scale of operations at the operational level in respect to both time and geography can vary widely from that at the tactical and strategic levels. Consequently, differing planning horizons and schedules are needed, and methods used at each level must be specifically designed to accommodate these variances.

**Operational Decisionmaking: Process**

The troop control process is the central element of the troop control system. In looking at this process, it is useful to keep four basic points in mind. First, the troop control process is designed to develop and carry out a *good plan fast enough.* This means it must provide for a plan that gives the highest probability of mission success at the least cost before changes in the situation either preclude it from being implemented successfully or remove the reasons for carrying it out in the first place. Soviets troop control theorists consider decisions which meet this criteria to be optimal, even though better solutions might be found if more time or information were available.[12]

Second, the commander is an integral part of the troop control process: In concert with his staff, he develops concepts of action; participates in analysis of variants; selects courses of action; and provides essential guidance in working out the decision. Troop control theory makes it clear that the commander is not expected to act solely on the basis of objective criteria. He is also expected to show creativity and cunning in devising and selecting variant concepts of action, basing these decisions on a "comprehensive and objective evaluation of the data...at his disposal *and on his knowledge and intuition...*"[13]

Third, the staff plays a critical role in both formulating and validating (substantiating) the variant concepts in conformity with objective standards grounded in models, norms, and other rules based on the laws and principles of military science. The distinction made here between the approach to formulating and validating is important. While formulating a variant, staffs prepare the situation data needed by the commander to reliably determine individual elements of the concept of action. Validation turns the process around; it consists of applying rules, algorithms, and combat models to objectively evaluate variants after the concept is developed. In practice, the distinction is not so clear cut; formulation and validation operate simultaneously during the decision making process.

Fourth, the role of mathematical methods and of automation has expanded greatly. Mathematics tools used range from simple arithmetic calculations to more advanced methods that include linear and dynamic programming, differential equations, game theory, and probability theory. "Without mathematical methods, without...substantiation," a leading troop control theorist maintains, "it is impossible to make a correct, especially an optimum, decision for modern combat."[14] Automation ranges from applying simple but rugged calculators, nomographs and other graphic decision aids to more advanced forms. These involve widespread application of computers to handle the growing complexity and volume of control tasks and to speed planning and decision making.[15]

The troop control process is continuous at all levels of command. Tasks follow a sequential pattern, but they also overlap with one another as work is updated based on changes in assumptions, missions, and the situation. For clarity, however, these basic tasks of the troop control process are divided into eight discrete functions:

- Acquiring and processing information;
- Decisionmaking and planning;
- Disseminating missions and organizing coordination;
- Organizing and directing combat support;
- Organizing and implementing political work;
- Preparing troops for combat;
- Organizing and maintaining control of troops in combat;
- Monitoring readiness for and execution of missions.

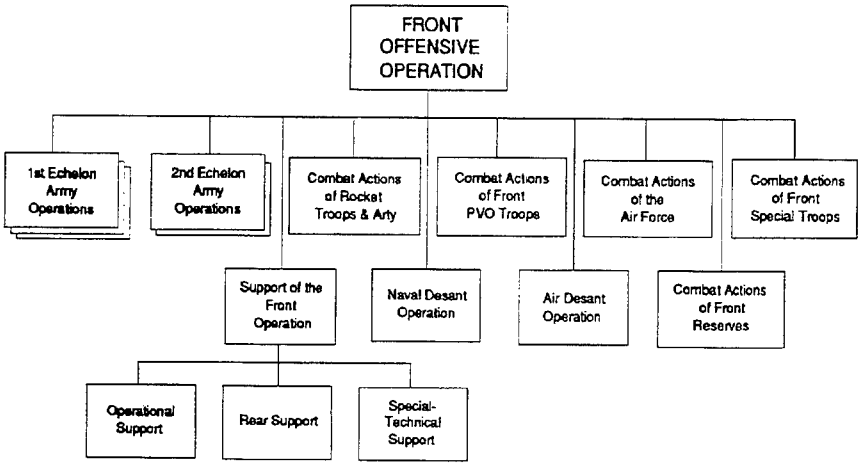



Fig. 2: Functional Structure of the *Front* Offensive Operation.[11]

All of these functions fulfill important roles in the Soviet troop control process; none is inherently superior to the others or is more critical to mission success. The effectiveness of the control process is contingent on successful execution of each of these functions. Fully recognizing this, the remainder of this paper will be devoted to decisionmaking and planning. The dominant focus will be on one aspect: the process of decisionmaking in wartime operations.

As already noted, the nature of modern warfare requires quick decisions if control is to be effective. The importance of the time factor dictates that the commander must use his staff efficiently to support the decision process. The Soviet commander usually focuses on those elements of the decision that he alone can develop, leaving the remaining elements to the staff and other supporting organizations. Regardless of the degree of staff participation in the decision, the commander alone is responsible for the timeliness and quality of the decisions made.

To accommodate the impact which time has on the decision process, Soviet troop control theory has three methods of decisionmaking: by elements of the situation; by elements of the decision; and by command.[16] Selection of a particular method depends on the time available. The most time-consuming approach is *by elements of the situation.* This involves analyzing each situational factor, and then applying conclusions drawn to the decision of how the mission will be carried out. Individual elements of the situation include the enemy's forces and probable courses of action; assigned friendly forces; friendly adjacent forces; terrain; the chemical and radiological situation; the economic situation of the area; the sociopolitical situation; and the weather. Decisionmaking by elements of the situation may require the most time, but its deliberate, detailed approach toward evaluating variants makes it ideal for war planning during peacetime. It is largely unsuited for use during the course of active combat operations.

At the other end of the scale is decisionmaking *by command.* Using this method, the commander quickly conducts an assessment of the situation and then makes an immediate decision. While this is the fastest method of making a decision, it carries the greatest risk of being wrong. Time constraints forcing adoption of this method preclude both adequate gathering of information and proper substantiation of the course selected. This method is most effective for exceptionally critical situations where a response is needed immediately, and it is best suited for use at the tactical level.

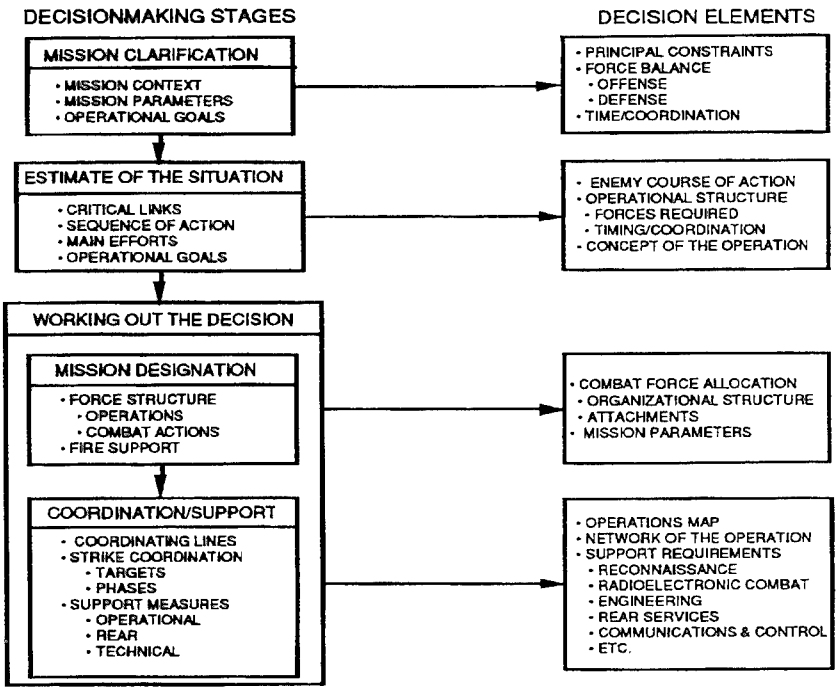



Fig. 3: Decisionmaking by Elements of the Decision.

Decisionmaking *by elements of the decision* balances the requirements for time with the need to substantiate the decision. Using this method, the commander selectively considers only those situational factors that have an immediate and significant bearing on the decision to be made. This approach is faster than decisions made by elements of the situation, and it provides more reliable decisions than those made by command. In addition, it also permits basic information needed by lower commanders to be sent early so they can plan concurrently with the higher echelon. This approach is more likely to be used at the operational and higher tactical levels (*front*, army, division) during continuous combat operations.

The steps involved in this (or any) method of decisionmaking and the elements of the decisioncorresponding to those steps are shown at Figure 3. Regardless of the method used to make a decision, sequence of steps or phases marks the process. The process begins with the receipt of a mission from higher headquarters. A sequence follows in which the mission is clarified, an estimate of the situation is developed, and the decision is made (worked out). These steps are distinct in a cognitive sense, but in practice they are not carried out in isolation. In the end, the process provides for a substantiated decision which establishes the basis for further planning by the staff.[17]

After receiving the operational directive or preliminary combat instructions which contain the mission, the army or *front* commander seeks to acquire a clear understanding of his higher commander's concept of operation. He must understand the role his own forces are playing in the larger context of the higher plan, the specific contribution they will make to the higher commander's objective, and the role of adjacent formations. Key elements of the decision at this stage include the principal constraints on the force, the balance (correlation) of forces involved in respect to the forms (e.g., offense) of combat operations

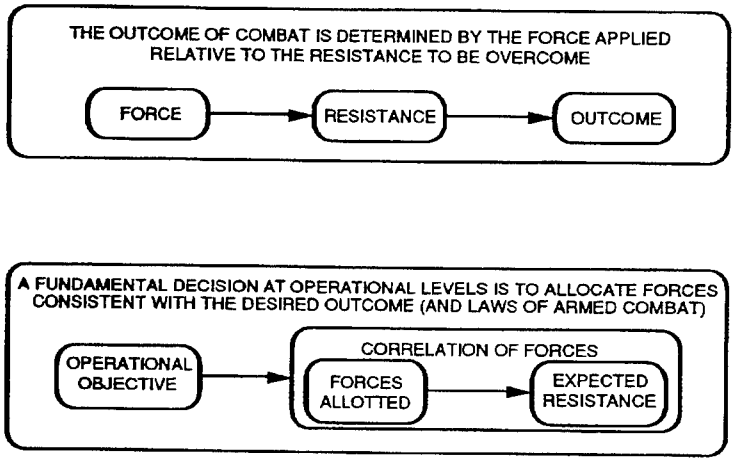



**Fig. 4: Relationship Between Force, Resistance and Outcome**

being used, and fundamental details regarding the timing and coordination needed to obtain the correct sequence of actions taken against the enemy.[18]

Once the mission is clarified, the commander can issue preliminary instructions to his subordinate commanders so they can begin concurrent planning and preparation. At this point he can inform them what must be done, but he is unable to tell them how he intends to carry out his mission. To do that, an estimate of the situation is required. The estimate attempts to determine those factors of the situation which will cause the mission to succeed or fail. The staff plays a large and crucial role in this phase, acquiring relevant information, processing it, and advising the commander on the forces required to support one or another concept of operation. Throughout this phase both the commander and staff uses a broad range of quantitative methods and combat models to formulate and evaluate variant concepts.

At the conclusion of this phase, the commander should have a concept of action that is optimal: it must assure mission accomplishment at the least cost within the constraint imposed by the time available. Major decision elements in this phase include enemy courses of action; information relevant to the operational structure of the force; and the commander's final concept of operation. This final concept contains the basic sequence of defeating the enemy, to include requirements for destroying key elements of the enemy force; the direction of the main effort; and the operational deployment of friendly forces.[19] It provides the basis for assigning missions to each subordinate element. Nevertheless, at this point the exact task organization of the force is not yet determined.[20]

The basis of this concept of action is the correct estimate of the operational structure in terms of the amount and type of forces required. A simple physical analogy for this is the relationship between the force applied and the resistance expected. As Figure 4 indicates, the relationship between force and resistance--its ratio or correlation--determines the outcome of combat. The fundamental requirement of operational-level decisionmaking is to correctly allocate forces with this relationship foremost in mind. Success in achieving the operational objective is directly related to the correct application of force relative to the resistance expected. The Soviet way of saying this is that operational success (as well as tactical and strategic success) is fundamentally tied to the concept of correlation of forces. This concept will be dressed in greater detail later. The concept of action formulated at the end of the estimate is a

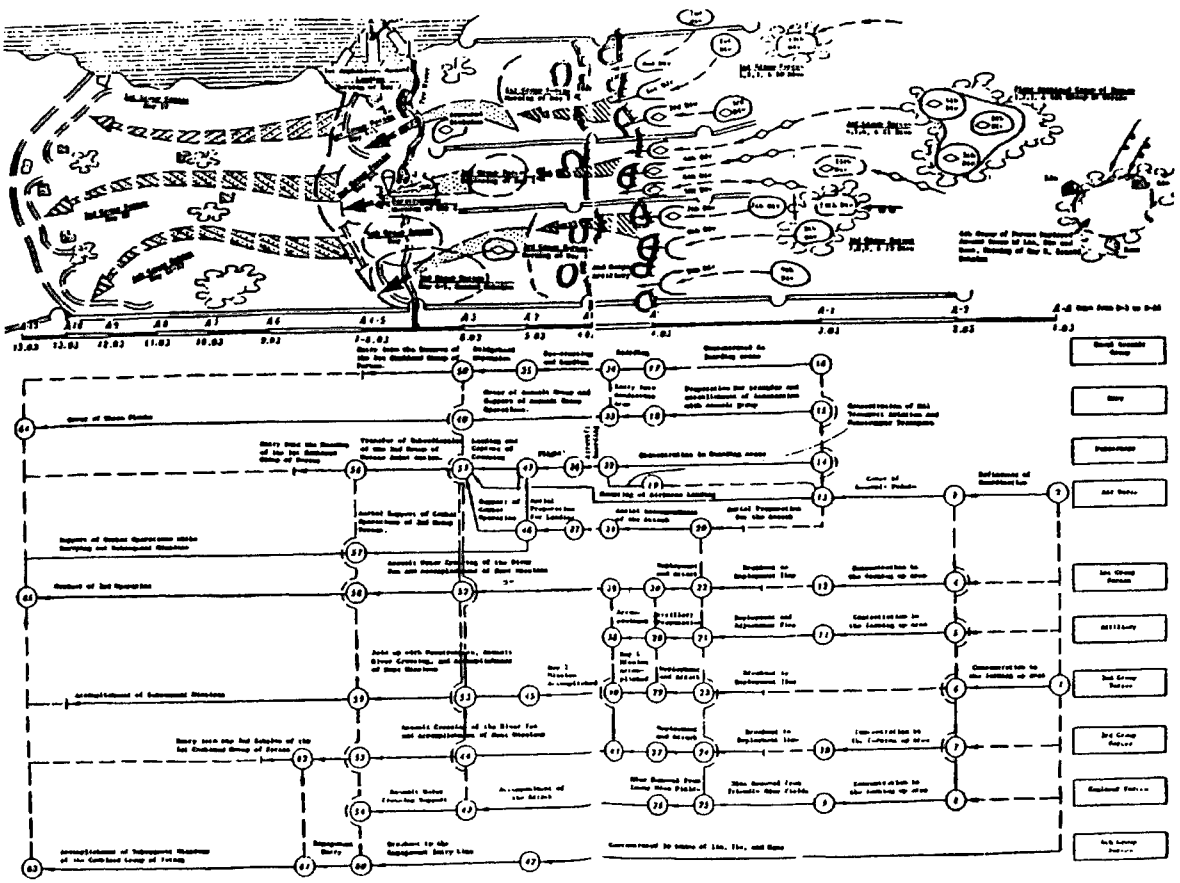


Fig. 5: Soviet Network Method of Planning and Control

substantiated, validated product. It has been evaluated by the staff using models, algorithms and calculations based on correlation of force methodologies.

During the phase of working out the decision, the commander and staff begin to develop the decision in enough detail to describe who will do all the stated and implied tasks in the concept of operation. Up to this point, the operational structure contained in the concept of operation is developed only in terms of force requirements. In theory, at least, no particular unit is associated with any individual task. Now subordinate units are assigned actual missions that correspond with these tasks. Elements of the decision relevant to this phase of the decisionmaking process are shown in Figure 3 opposite the box describing aspects of mission designation.

After missions are designated, the commander and staff focus their decisionmaking on coordination and support measures necessary to support the concept of operation. Attention is given to establishing coordination lines and measures, detailed sequencing of phases and strikes, and support measures considered essential to mission success. This aspect of the decision, together with the mission designations worked out earlier by the commander and staff, provides the detail regarding the tasks and missions assigned subordinate units, the sequencing of actions, and the requirements for support that

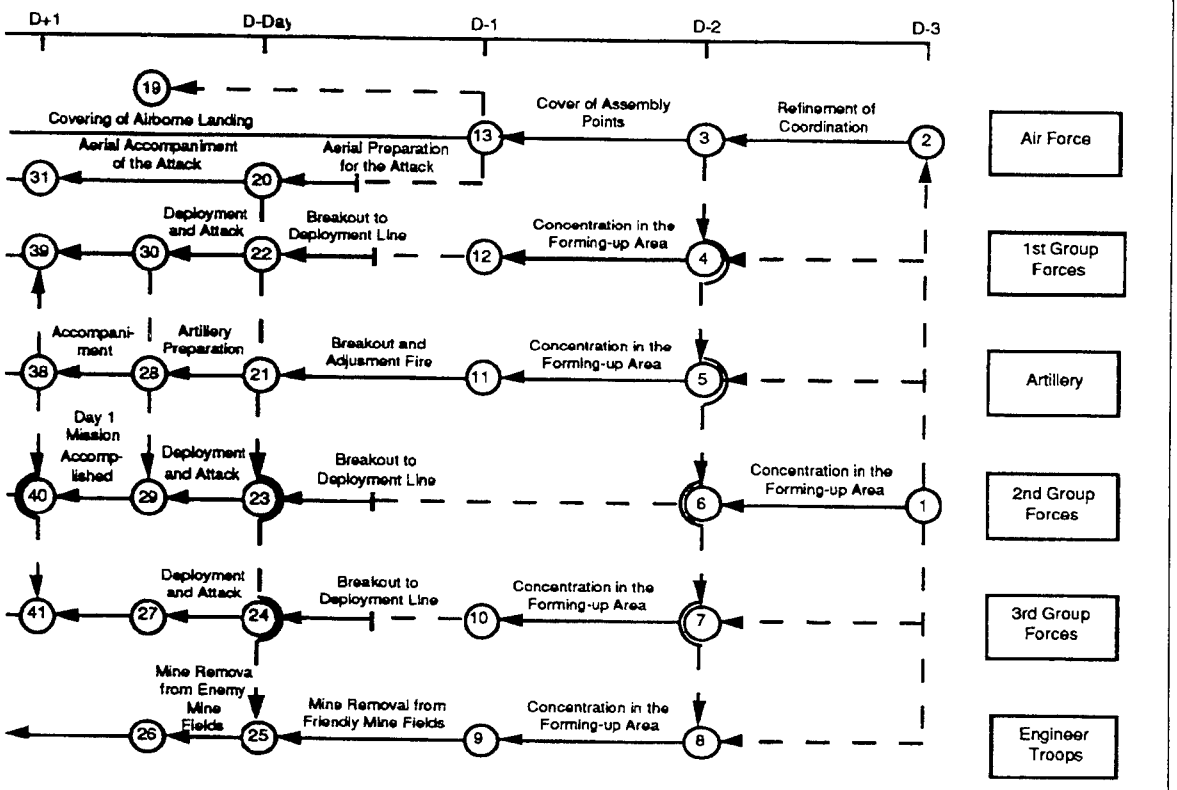



Figure 6: Example of a Time-Dependent Network (Lower Right-Hand Corner of Tarakanov's Network)

constitute the information contained inkey decision support tools such as the operations map and network of the operation.[21]

Once these tasks are resolved and missions assigned, the staff commences a process of detailed planning needed to carry out the operation. During this planning phase, the staff develops the sequence and methods used for each task, allocation of resources by sector, and priorities for coordination; it also organizes the moral-psychological preparation of the troops and comprehensive requirements for support.[22] While doing this, the staff prepares products that contain the elements of the decision. These are used later to carry out other functions of the troop control process (e.g., monitoring readiness for execution of missions). An example of one of these products is shown in Figure 5. It is a sample diagram of a network of the operation introduced in Figure 1. This network and other quantitative aids to decisionmaking will be addressed in further detail in the following section.

## QUANTITATIVE DECISION METHODS

### Time-Dependent Networks

Recognizing the overriding importance of time in preparing for and conducting combat operations, Soviet troop control specialists have developed a variety of systematic approaches to managing time. Time calculations first appear when the headquarters receives its mission from its higher command. Calculations are carried out to determine the time

available for decisionmaking and planning and the time required to conduct the operation. Based on these calculations, a decisionmaking method is selected and a schedule for planning and decisionmaking is prepared for the staff and commander to follow. This schedule often is in the form of a time-dependent network prepared using methods similar to PERT.

Other networks are also used to assist control during the execution of operations. These networks are used by the commander and staff to key on critical periods of the operation; monitor the timing for sequential actions; and detect implicit reserves of time and forces. An example of this type of network is shown at Figure 6. This time-dependent network is an enlarged section of the Tarakanov network at Figure 5.

**Correlation of Forces and Means**

The foundation of Soviet efforts to apply quantitative methods to produce reliable decisions rests within the concept of the correlation of forces and means (COFM). Not a new concept, COFM was the basis of many rudimentary calculations used by the Soviets during the 1941-1945 war. But today its sophistication and wide use make it an increasingly important aspect of the Soviet troop control system.

The Military Encyclopedic Dictionary (MED) describes the COFM as an "objective indicator of the relative combat strength of opposing forces..." used to determine the superiority of one side over another.[23] Early use of COFM was limited to rough quantitative comparisons of force strength. In the postwar years, however, Soviet military specialists became increasingly aware of the potential which this concept held for assessing the qualitative dimension of forces. They began to investigate the influence of such elements as troop morale, training levels, and qualitative differences among weapons on the capabilities of forces in combat. Other factors relating less to the composition of the force but which were connected with the situation were recognized for their potential influence on the outcome of a battle or engagement. Some of these factors included weather, terrain, and force posture.

Soviet military specialists believed (and still do) that the more accurately they could measure the COFM, the more reliably they could predict the outcome of combat. The relationship between the COFM, casualty rates, and rates of advance suggested that decision aids based on algorithms and models could capture the essence of the laws of armed conflict. This approach defined the development of COFM methods during the postwar era, as the MED clearly points out:

> An accurate determination of the COFM and its evaluation facilitates the adoption of a well-founded decision and the timely creation and maintenance of the essential superiority over the enemy on selected axes. It is determined by comparison of the quantitative and qualitative characteristics of the subunits, units, large units, and weaponry of one's own troops (forces) and those of the enemy. It is calculated at strategic operational, and tactical scales in all zones (sectors) of action for the main and other axes. To speed the calculation, various handbooks, tables and computer equipment are used.[24]

COFM serves a variety of roles today in the Soviet troop control system. It acts as a general measure of relative combat capability of opposing sides in the context of assessing the situation. It also is used frequently, however, as an input to a number of calculations and components of models used by the commander and staff to organize forces in the manner that maximizes the likelihood of success. Examples of these include calculations used to determine the size of the breakthrough sector required to conduct offensive operations; forecasts of rates of advance during an offensive; and forecasts of casualties in a given period.

**Combat Models**

Soviet wartime troop control models which use COFM as an input are now important elements in decisionmaking at both the operational and strategic levels. Mathematical calculations, simple algorithms, and other decision aids also serve a key purpose at the tactical level. But normative standards likely play a greater role at this level on account of the limited

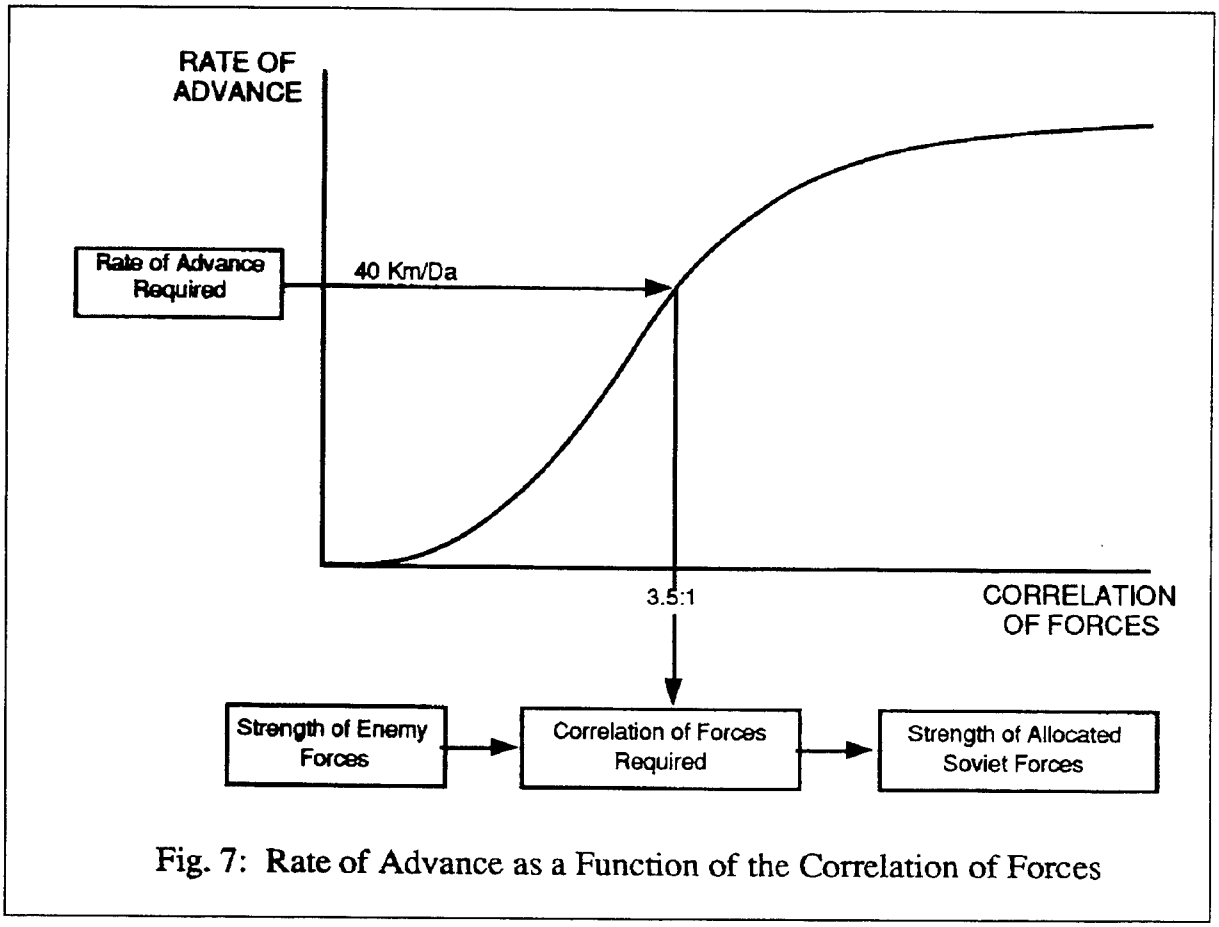



Fig. 7: Rate of Advance as a Function of the Correlation of Forces

time available to the tactical commander to use them and the many unpredictable factors which influence the outcome of tactical combat. The control models used today at the operational (and strategic) level have the following characteristics:

- Sensitive to decisionmaking processes and issues;
- Captures the Laws of Armed Combat;
- Conforms with the thought processes used in combat;
- Uses input data from available combat and reconnaissance reporting;
- Results in approximate levels of detail;
- Uses data and techniques developed in peacetime from more complex models.

Soviet troop control methods provide a variety of models used to formulate or validate one or another variant concept An example of one of these is shown at Figure 7. This function models the relationship between rate of advance and the correlation of forces. It is particularly interesting as an example of a combat model used to formulate rather than test a concept of operation.

Input data for this model is the rate of advance required as derived from the mission which the commander received from the next higher command.

To achieve a hypothetical rate of 40 kilometers/day would require a COFM of 3.5 to 1 against an enemy under the conditions assumed by the model (e.g., open, flat terrain). By relating the assessed strength of enemy forces with the COFM required, Soviet staff planners can rapidly determine the strength of forces which they must allocate in a particular sector to achieve success as defined by their mission.

The model in Figure 7 is a simple version of what the Soviet staff officer actually uses. The model he uses would provide more detail and would likely account for a range of different conditions influencing the relationship between the rate of advance and the COFM. Separate functions (models) or possibly correction factors would describe the COFM required under these different sets of conditions. These functions (or correction factors) are prepared in peacetime at research academies based on significantly more complex models. The models used in the field by the Soviet staff planner, while more complex that the one shown at Figure 7, are not difficult to use and interpret in the time constraints imposed by the decisionmaking process.

## CONCLUSIONS

Since the early 1960s the Soviet Armed Forces has devoted substantial resources to creating a system of troop control that meets the requirements of modern combined arms combat. Early efforts in Soviet troop control were triggered by the necessity to improve control in response to changes in the nature modern warfare: greater speed, complexity, and lethality coupled with decreased learning time. These efforts were also inspired by the desire to establish a coherent framework of control based on a scientific knowledge of warfare. Advances in the process of the troop control process succeeded in shortening control time and improving the quality of decisionmaking and planning.

A key measure used to reduce time in the process of troop control involves making decisions by elements of the decision. This approach provides a balance between the more time-consuming method of decision by elements of the situation and the less reliable method of decision by command. Soviet troop control specialists have devoted considerable effort to developing quantitative methods that evaluate decisions in light of what they consider to be objective standards based on universal laws and the knowledge of military science. In the Soviet view, these methods can be used to validate or substantiate concepts; they can also be used as a tool to formulate critical elements of variant concepts of action. At the operational and strategic levels, these methods largely rely on algorithms and combat models which are based on the correlation of forces and means.

Soviet troop control theory should be useful to the U.S. analysis involved in developing a framework for operational art within the context of U.S. military science. Soviet troop control specialists developed the theory of troop control in an environment that for decades has distinguished between tactics, operational art, and strategy. Their familiarity with the important distinctions between these levels is reflected in the manner which they have tailored the control process to compensate for these differences.

**Notes**

1. A.A. Grechko, *The Armed Forces of the Soviet State (Vooruzheniye sily sovetskogo gosudarstva)*, 2d ed., supplemented (Moscow: Voyenizdat, 1975), p. 254.

2. Two other concepts translate laws into requirements. The first is lay-governed patterns, whose relationships (patterns of actions) conform to the general effect of laws but are more specific and prescriptive. The second is principles of military art. These pragmatic, "basic, and guiding ideas" for conducting armed combat are derived from law-governed patterns; they "emerge as general compulsory rules and norms" for all commanders. K.V. Tarakanov, *Mathematics and Armed Combat (Matematika if vooruzhennaya bor'ba)*, (Moscow: Voyenizdat, 1974), pp. 3-4.

3. P.K. Altukhov, ed., *Fundamentals of the Theory of Troop Control (Osnovy teorii upravleniya voyskami)*, (Moscow: Voyenizdat, 1984), p. 15

4. *Military Encyclopedic Dictionary (Voyennyy entsiklopedicheskiy slovar')*, 2 ed., (Moscow: Voyenizdat, 1986), s.v. "Troop Control (Upravleniya voyskami)."

5. The first of these three factors--maintaining readiness--is particularly important, especially in its contrast to commonly-understood Western definitions of command and control. The process and science of

Soviet troop control extends beyond the scope of military actions to other areas often considered conceptually removed. For example, issues affecting decisionmaking and control in the areas of training, education, and force organization must be addressed as important factors affecting the troop control process. The result is a more comprehensive, unified theory. M.A. Gareyev, *Soviet Military Science (Sovetskaya voyennaya nauka)* (Moscow: Izdatel'stvo Znaniye, 1987), p. 17.

6. M.M. Kir'yan, ed., *Military Technical Progress and the Armed Forces of the USSR (Voyenno-tekhnicheskiy progress i vooruzhennyye sily SSSR)* (Moscow: Voyenizdat, 1982), pp. 311-326; N.V. Ogarkov, *History Teaches Vigilance (Istoriya uchit bditel' nosti)* (Moscow: Voyenizdat, 1985), p. 51; V.N. Rodin, ed., *Development of the Rear Services of the Soviet Armed Forces 1918-1988 (Razvitiye tyla sovetskikh vooruzhennykh sil 1918-1988)* (Moscow: Voyenizdat, 1989), pp. 269-175.

7. Altukhov, *Fundamentals of the Theory,* pp. 197-199.

8. K. Kobets, "Do Not Run Away From Problems *(Ne ukhodit' ot problem),*" *Military Herald (Voyennyy vestnik),* no. 10 (1989) p. 10.

9. Tarakanov, *Mathematics,* p. 58-59.

10. An operations is an "aggregate of battles, engagements, strikes, and maneuvers, coordinated and interlinked in objective, tasks, place, and time by various force organizations, conducted...according to a common concept and plan..." *Military Encyclopedic Dictionary* (1986), s.v. "Operation *(Operatsiya)*" Strikes are brief, powerful attempts to destroy the enemy with fires (nuclear or conventional) or troops. *Ibid.,* s.v. "Strikes *(Udar)*" Combat actions are "forms of employment of large formations *(ob'edineniye)*" and large units *(soyedineniye)* of the armed forces within the framework of an operation (or between operations) as an element of a larger force." *Ibid.,* s.v. "Combat Actions *(Boyevyye deystviya)*"

11. Based on *Military Encyclopedic Dictionary* (1986), s.v. "Front Offensive Operation *(Frontovaya nastupatel'naya operatsiya)*" The Russian-language term *"desant"* is used here to describe specially trained troops landed or dropped on enemy territory by either sea or air. Troops inserted by air can include heliborne, air assault, or airborne (parachute) forces.

12. Altukhov, *Fundamentals of the Theory,* p. 126.

13. *Ibid.,* pp. 126-127. Emphasis added.

14. D.A. Ivanov, V.P. Savel'ev, and P.V. Shemanskiy, *Fundamentals of Troop Control in Combat (Osnovy upravleniya voyskami v boyu)* (Moscow: Voyenizdat, 1977), p. 244.

15. Kobets, "Problems," pp. 10-11.

16. Ivanov, *Fundamentals,* pp. 224-233; Altukhov, *Fundamentals of Theory,* pp. 127-130.

17. Ivanov, *Fundamentals,* pp. 202-217.

18. Altukhov, *Fundamentals of Theory,* pp. 127.

19. Operational deployment includes the amount and type of forces required and details on timing and coordination.

20. *Ibid.,* p. 129.

21. *Ibid.,* pp. 129-131.

22. *Ibid.,* pp. 137-140

23. *Military Encyclopedic Dictionary* (1986), s.v. "Correlation of Forces and Means *(Sootnosheniye sil i stredstv)."*

24. *Ibid.*

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*Military Encyclopedic Dictionary (Voyennyy entsiklopedicheskiy slovar').* (Moscow: Voyenizdat, 1986), 2d ed. S. v. "Troop Control *(Upravleniye voyskami)."*

*Military Encyclopedic Dictionary (Voyennyy entsiklopedicheskiy slovar').* (Moscow: Voyenizdat, 1986), 2d ed. S. v. "Operation *(Operatsiya)"*

*Military Encyclopedic Dictionary (Voyennyy entsiklopedicheskiy slovar').* (Moscow: Voyenizdat, 1986), 2d ed. S. v. "Strikes *(Udar)"*

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# THE EVOLUTION OF SOVIET OPERATIONAL ART: THE SIGNIFICANCE OF "STRATEGIC DEFENSE" AND "PREMEDITATED DEFENSE" IN THE CONDUCT OF THEATER-STRATEGIC OPERATIONS

**Dr. Jacob W. Kipp**
**Soviet Army Studies Office**

## Introduction

This paper will examine Soviet military theorists' renewed interest in strategic defense in a theater-strategic operation, note the trend toward a "leveling" of offense and defense in tactics and operational art in the same period and examine the renewed concern with the "steadiness" *[ustoichivost']* and "aggressiveness" *[aktivnost']* of the defense under the impact of a new military-technical revolution, making for a "moving, mobile, and maneuver defense." It will further consider the relationship between the concepts of "premeditated defense" and the much-discussed "maneuver by fire" employing reconnaissance-strike and reconnaissance-fire complexes in deep operations as they might be applied to the so-called Kursk "counteroffensive" and KhalKhinGol/Late Korean "counter-strike" paradigms laid out by Soviet military and civilian analysts. The relation of these changes in military art will be examined with regard to their impact on Soviet force structure, posture, tactics, and conventional arms control proposals.

## THE ARMS CONTROL CONTEXT

On December 7, 1988, before the General Assembly of the United Nations, General Secretary Mikhail Gorbachev announced a series of unilateral reductions over the next two years in the Soviet armed forces, beginning with a cut of 500,000 men and including an overall reduction of 10,000 tanks, 8,500 artillery systems, and 800 combat aircraft. Furthermore, he announced cuts of 50,000 men and 5,000 tanks from among those deployed with Soviet forces and the removal of air assault and river-crossing units in Eastern Europe. In addition, he noted that Soviet combat formations were undergoing a reorganization which make their "defensive" nature evident to all. This announcement brought into sharp relief the connections between military doctrine and conventional forces in Soviet "new thinking" on international security issues and arms control.[1]

Until recently, military doctrine and the military-technical revolution affecting conventional forces have figured only tangentially in arms control issues. This inattention to doctrinal and conventional force considerations in the larger arms control process has been all the more curious because the perception of the USSR's conventional superiority in Europe, along with Soviet force posture and military art, has for more than four decades been a fundamental influence on the U.S. and NATO strategic posture. Concepts such as extended deterrence and flexible response owe much of their origins to a single persistent reality: the threat posed by the Soviet Union's potential capability, using conventional forces, to overrun Western Europe.

In this age of candor and glasnost, the Soviet government has acknowledged the truth of long-held, Western assertions concerning the offensive orientation of Soviet and WTO military doctrine and force posture and the associated asymmetry in conventional military capabilities favoring the Soviet Union and Warsaw Pact.

A new series of multi-lateral negotiations on conventional forces in Europe [CFE] are now underway in Vienna, involving 23 states and encompassing the entire continent from the Atlantic to the Urals. As a senior U.S. official observed, "For the first time in the postwar period, negotiated reductions of conventional forces in Europe have emerged in public disclosure as a real possibility."[2] In the months preceding these negotiations, NATO and the Warsaw Treaty Organization have been preparing their positions and maneuvering to influence public opinion. In November 1988, NATO published its own assessment of the status of conventional forces in Europe, emphasizing Soviet/WTO superiority in manpower, tanks, armored personnel carriers, and artillery. And on December 7, 1988, President Mikhail Gorbachev announced his unilateral troop reductions over the next two years. He pledged that Soviet units were undergoing a restructuring which

would make them "exclusively defensive."[3] At the same time, the Soviet government announced the resignation of the Chief of the Soviet General Staff, Marshal Sergei Akhromeyev and then his appointment as a "civilian" advisor to Gorbachev on defense policy.

In January 1989, the Soviets published their own figures on the current conventional balance of forces in Europe and announced that these figures established a "rough parity" between NATO and the WTO. The CFE talks seem to be moving toward an agreement, based upon substantial cuts on the Soviet side. Yet, the test of such an agreement lies in two simultaneous, mutually-interconnected aspects: on the one hand, the political-military climate against which, and the security system upon which, such an agreement will be made, and on the other hand, the trends and directions in the development of military capabilities.

**The Evolution of the Role of Conventional Forces in Europe: the Operational-Maneuver Group, Airland Battle, and Follow-on Forces Attack**

While the nature of alliance relations in Europe calls into play the entire range of military capabilities, strategic nuclear, theater nuclear, and conventional and raises issues of the employment of forces outside of the theater as part of both general and immediate deterrence, the cornerstone of that posture under NATO's concepts of "Flexible Response" and "Forward Defense" have been conventional forces. To understand the military-technical ramifications of the CFE talks, it is necessary to get some appraisal of the changing role of such conventional forces and the forces which are reshaping their role, structure, and composition.

Within both NATO and WTO forces in Europe, the military center of gravity has been tank heavy forces. However, while the form of these forces has evolved since their World War II counter-parts, there has been a radical change in the content of these forces, which has in turn recast their role on the battlefield. In the early 1980s, the Soviet Union gave a new content to an old form of combined-arms, offensive operations by experimenting with and then adding the air assault and support capability to the mobile group, and set off a profound debate about the implications of the so-called "operational maneuver group" as a modernized means of conducting "deep operations." This, in turn, set off a search for effective counteractions. In the case of the U.S. Army, the answer was the articulation of AirLand Battle in FM 100-5 in 1982 and then its refinement in 1986. For NATO General Bernard Rogers it called for the use of emerging technology to defeat the Soviet/WTO second strategic echelon by the use of deep interdicting fires. This proposal, which became known as the Rogers Plan, highlighted the appearance of a new generation of advanced weapons on the conventional battlefield. At the present time, we seem to stand at another turning point in military art, affecting conventional forces.[4]

**The Dialectics of Future War and War Prevention**

The Soviet General Staff, which is charged with making such military-technical forecasts, has a well developed set of categories which it employs to aid it in this process. To understand what the Soviets foresee regarding the nature of future war and the changing role of conventional forces in such a conflict, we must understand their methodology for military foresight and forecasting. While the newly reformulated Soviet military doctrine does stress war prevention and reasonable sufficient defense, it still retains the requirement to understand both the political and military-technical features of a probable future conflict in order to guide "military construction."

The terms "future war" *[budushchaya voyna]* and "initial period of war" *[nachal'nyy period voyny]* have long pedigrees within Russian/Soviet military science. Both are categories employed by Soviet military analysts when they seek to engage in the difficult process of foresight and forecasting the evolving nature of military art in all its interconnected aspects; i.e., strategy, operational art, and tactics. Future war has, since the 1920s, been used by Soviet analysts to address the process of using past experience to define the trends and contradictions reshaping armed conflict and bringing about qualitative shifts in military doctrine. In the Soviet case, it has fallen to the Soviet General Staff to provide guidance, which will affect the nature, course, and outcome of a future war. As General Colonel Shavrov and Colonel Galkin asserted in 1977, "*In its essence, military science is the science of future war.*"[5]

Colonel-General M. A. Gareyev, former Chief of the Directorate of Military Science of the Soviet

General Staff, has laid out the compelling logic for studying the law-governed patterns *[zakonomernosti]* which have affected past wars in order to assess their impact upon future war.

Each new war is not like the previous one. But one can clearly see the law-governed pattern: at each of the turning points in the development of military affairs remaining viable and affirmed by practice are only those newly elaborated ideas, which along with considering the new prospective phenomenon, also include the germs of previous experience which have still not lost their capacity for further development and for this reason act as particles of incipient new methods of conducting armed combat. The ignoring of this law-governed pattern and particularly the underestimating of new trends, leads, as a rule, to major mistakes.[6]

Furthermore, such mistakes can have their most profound and damaging consequences at the very start of hostilities. Speaking to the problem of the nature of the initial period of war of a potential world war between the capitalist and socialist systems, Gareyev has noted that such a global clash can develop into a war unprecedented in spatial scope, fierceness, and destructiveness. While such a clash might begin conventionally, it could quickly turn into a nuclear war. For this reason Gareyev has asserted: "The role of the initial period of war will increase further, and this may be the main and decisive period which largely predetermines the outcome of the entire war."[7]

The centrality of the problem of "initial period of war" to Soviet military science's study of future war is immediately apparent in the remarks of Generals S. P. Ivanov and M. M. Kir'yan, two leading analysts in the study of this problem:

> Historical experience demonstrates that the individual features common to the initial period of past wars can retain their significance under contemporary conditions for those wars in which conventional weapons are employed. At the same time, one must take into account the profound changes which have taken place in the arrangement of forces in the international arena as well as in the development of the means of armed struggle since the end of the Second World War. Based upon the experience of the world wars, the most powerful states or coalitions maintain mighty armed forces. Their capacity to initiate combat actions immediately conditions the ability to conduct intensive armed struggle from the very first hours of a war. Under these conditions, the first operations can have a decisive influence on the course of the war.[8]

Gareyev and Kir'yan are both in solid agreement that "insufficiently deep theoretical examination of the problems of the initial period of war" had a profoundly negative impact on the initial period of the Great Patriotic War; i.e., June 22 - July 10, during which Soviet covering forces along the Northwestern and Western axis were smashed by the initial German offensive. Moreover, in spite of a major mobilization of the nation and its economy and the sacrifices of men and materiel, the Red Army was not able to overcome all the advantages gained by Germany during the initial period until November 1942 and the Stalingrad counter-offensive. Kir'yan has further stated, "In connection with this [problem] under contemporary conditions their systematic examination on the basis of the experience of the World Wars, as well as subsequent local wars and conflicts unleashed by imperialist governments, have a special importance."[9]

The process of planning military construction in an era of rapid and persistent technological, political, and socio-economic change fostered a requirement to provide scientific forecasts of changes in the correlation of forces and regarding three trends affecting military- technical developments:

> The first is the determination of the direction of military-technical progress, of the ways of modernizing existing weapon systems and the appearance of qualitatively new types of armaments. The second is the search for ways of further changes in the structure of the armed forces,

> of the correlation of the branches of the services, of the means of attack and defense. The third is the determination of future tasks, which are directed towards raising the combat readiness of troops to correspond with the nature of future war. The resolution of these tasks is the theoretical precondition for the long range planning of the development of the armed forces.[10]

Such scientific-analytical foresight embraces the use of forecasting techniques based upon applied mathematics, probability theory, and cybernetics/information science *[kibernetika/informatika]*. It encompasses operations research, systems analysis, and the design of large systems and is informed by the use of expert opinions. It makes extensive use of historical materials to provide the phenomenological bases for modeling combat and has been based upon the close collaboration among Soviet civilian and military cybernetians since the early 1950s.

The General Staff must seek out the interconnections and inter-penetrations within all categories and sub-categories of military art, while acknowledging the very complexity of war itself. On the one hand, this requires of military analysts an acknowledgment of Lenin's reinterpretation of Clausewitz's dictum that "War is a continuation of politics by other; i.e., violent means." Lenin's recasting involved a cardinal redefinition of politics to include class struggle within the polity itself and the recognition that the military, like the state, was not an instrument of mediation among competing social groups but a manifestation of the dictatorship of one social class over others. Thus, the military cannot be above politics but must be penetrated by them to ensure control. A truly revolutionary government cannot inherit its military establishment but must smash it and create a new one in keeping with its class base, social characteristics, and political program.[11]

In the Soviet context "unified military doctrine" *[edinaya voyennaya doktrina]* must be based upon an explicit acknowledgement of the geo-strategic, economic, social, party, and ideological character of the Soviet state and of its potential adversaries. The Marxist-Leninist theory of just war has rested upon the explicit assumption that the very nature of finance capitalism, uneven development, and imperialism have caused various types of wars; i.e., wars of social revenge against socialist states, wars of national liberation between imperial powers and their colonies, and wars among capitalist powers, in the modem era.

This theory of just wars has been recast from time to time to take into account changes in the Soviet system and international environment, but its core assumptions on the social causes of war have gone unchallenged until recently. They provided the political indices by which the Party could examine the character of future war. For Soviet military analysts, war fighting capabilities and the threat of mass war have been seen as means of war prevention since these military-technical policies would impose upon their adversaries unpalatable societal choices. The objective has been to make war an irrational choice for foreign powers, while at the same time recognizing that such an irrational choice is quite possible in practice. Such deterrence by war fighting capabilities has also carried with it the benefits of political influence and suasion short of war. In this fashion, the political and military-technical aspects of military doctrine have placed before military science the problem of future war and the nature of the initial period of war.

The search for the law-governed patterns which will affect the military-technical aspects of future war and define the nature of the initial period of war begins with past military experience. As General-Major V. K. Konoplev has observed, "Praxis *[praktika]* is the basis and motive force of foresight.[12] The Soviets define military praxis broadly to include:

> ...the production of weapons and military equipment, combat and political preparation, training and indoctrination of personnel and, finally, that which makes up its main element--armed struggle.[13]

Armed struggle encompasses Russian and Soviet military experience at the tactical, operational, and strategic levels of war. It extends to the combat experience of other powers, including the major and local wars of probable opponents, wars of national liberation, and local wars. It also includes exercises and maneuvers conducted by Soviet and WTO forces,

the forces of probable opponents, and those conducted by foreign powers in general. This rich mosaic of practical experience points towards one critical conclusion regarding future war: The pace of change in the content of military affairs has imposed a need to engage in forecasts of the nature of war itself. As Marshal S. F. Akhromeyev, current Chief of the Soviet General Staff, observed in 1984:

> One must remember that changes in the nature of warfare now take place more rapidly and this means that our reactions to those changes, to the demands of Soviet military art and to the structure of the Armed Forces must be more energetic.[14]

**Scientific-Technical Revolutions in Military Affairs: Past, Present, and Future**

Past military experience is to be interpreted through an ideological prism shaped by dialectical materialism and historical materialism and conditioned by Marxism-Leninism. The military analyst is expected to be both "objective" and "party-minded" *[partiinost']*. Their methodology has proven well-suited to anticipating radical breaks in military art as in the late 1920s and early 1930s in the development of the concepts of maneuver warfare; i.e., operational art, deep battle, successive operations, deep operations, and land-air operations, and the associated development of force structures; i.e., shock armies, mechanized corps, tank corps, air armies, and tank armies, to execute such concepts.[15] In the 1950s and early 1960s, Soviet military analysts formulated concepts of nuclear warfighting based upon a new scientific-technical revolution in military affairs. By the early 1980s, the Soviet military was speaking of another revolution associated with new means of automated troop control and advanced, high-accuracy munitions. These same analysts were also anticipating yet another revolution in military affairs when "weapons based upon new physical principles" made their appearance in sufficient numbers to recast military art over the next decade or two. In general, Soviet concepts have been much more mature than fielded capabilities and have tended to guide the process of weapon research and development, procurement, and integration into the force.

In its mature form, this search for revolutionary leaps also embraces an acknowledgement that changes in military art can take the form of a reassertion of old forms with a new content. Such "negation of the negation" has been applied by General-Colonel M. A. Gareyev, the Chief of the Directorate of Military Science of the Soviet General Staff, in his critique of *Voyennaya Strategiya [Military Strategy]*, the classic work on nuclear war edited by Marshal V. D. Sokolovsky, former Chief of the Soviet General Staff. Gareyev has argued that Soviet views on future war under the influence of the nuclear-rocket revolution in military affairs took extreme positions, in which previously accepted principles, norms and rules were no longer relevant. Among these were such principles as concentrating forces and means on the decisive direction, economy of forces, and partial victory. Some authors had proposed that a host of strategic concepts; i.e., strategic deployment, strategic offensive, strategic defensive, strategic maneuver, had lost their relevance.[16] The logic of such assumptions rested on the fact that past military experience had become simply irrelevant to the study of future war. As the authors of *Voyennaya Strategiya* had asserted:

> The distinctive feature of the development of the means of armed struggle under contemporary conditions is contained in the appearance of qualitatively new types of weapons and military equipment and in the rapid mass introduction of them into the armed forces which has radically increased the combat capabilities of the latter and brought about a fundamental break in the organizational forms of the armed forces and the means of conducting combat actions on all levels. In military strategy and military art a complete revolution has occurred.[17]

That revolution which had seen the formation of the new Strategic Rocket Forces, the missile-arming of the Navy, Air Forces, Air Defense Forces, and the Army, and the decline in the size of the ground forces, has stood military art on its head, transforming the traditional relationship in the evolution of military art; i.e., from tactics, to operational art, to strategy, into a strategically-driven paradigm. Future war and

the initial period of war were to equate so that the former became the latter and, it was assumed that victory would be total and inclusive. In an article, carrying the ironic title, "Lessons of the Initial Period of the Great Patriotic War," Chief of the General Staff, Marshal S. S. Biryuzov described how different such a nuclear-rocket war would be from any past military experience:

> It is clear that in a future war, the sides will immediately mount the most decisive and violent military actions, which will encompass the front and deep rear. The imperialist aggressive blocs, preparing a new world war, have made their first goal the destruction of the economy of the socialist countries and the defeat of our forces by means of massive nuclear strikes. Under these conditions, the Soviet Armed Forces must themselves by means of timely retaliatory strikes fulfill no less decisive objectives--to defeat the aggressor, annihilate his armed forces, destroy the most important military objectives, undermine his economic potential, seize the strategic initiative and create conditions for the achievement of complete victory over the enemy in the shortest possible time.[18]

Foresight in this case was completely divorced from military praxis, since there was no empirical evidence from military experience upon which to forecast the origins, course and outcome of such a conflict. Instead, Soviet military science relied upon modern forecasting techniques in determining the form and content of such a total war. As one Soviet military theorist observed at the time:

> As a result, Soviet military science has been able to provide a coherent, scientifically-based concept of the character of contemporary war, as opposed to what has happened in the past, based not so much on the experience of past wars, as on scientific/foresight and a forecast of a possible future.[19]

Not all Soviet commanders or theorists accepted these conclusions in the early 1960s and subsequent experience in form of changes of force posture and operational concepts have challenged both the content and mode of analysis of this particular paradigm of future war.[20]

The Soviet achievement of strategic nuclear parity by the early 1970s made it possible for Soviet military theorists to reexamine the implications of such a paradigm and culminated in a series of political declarations which have steadily moved over the last decade to an explicit acknowledgement that the political-military utility of such weapons is limited to deterring the use of such weapons by the probable opponent. From Brezhnev's admission at Tula that there would be no winner in a nuclear war, through the declaration of no first use, to the current position that nuclear war would represent an ecological catastrophe which would threaten all of humanity, Soviet declaratory policy has emphasized a rejection of nuclear war as a rational extension of politics. Gareyev sees in the evolution of Soviet views on a future nuclear war since the 1960s as a "reflection and application of the dialectic, the law of the negation of the negation." The evolution of nuclear weapons, the growth of powers' arsenals, and the development of means of delivery have made the mass employment of such weapons tantamount to catastrophe for aggressor and defender.[21]

At the same time, the experience of local wars over the last two decades has demonstrated the possibility of a future war fought initially or entirely with advanced conventional weapons.[22] In a major war such operations were assumed to take the form of a theater-strategic operation, featuring high speed, great depth, and high intensity and requiring a further development of the means and methods of troop control. The application of automated troop control to multi-front operations carried with it the need to organize an effective system of command; i.e., the creation in peacetime of a theater command, which would direct the actions of multiple fronts, and act as the operational-strategic nexus between the fronts and armies and *Stavka* the Supreme Headquarters of the High Command. A particular requirement of such conventional operations under modern conditions was the deliberate targeting of enemy nuclear weapon and delivery systems.[23]

Keeping such a conflict conventional in the presence of large arsenals of tactical and theater nuclear weapons has posed a formidable problem. The Soviet decision to modernize their theater-strategic arsenal in the mid-1970s with the SS-20 missile, which could be seen as an attempt to maintain escalation domination at the theater-nuclear level and thereby reducing NATO incentives to escalate a future conventional war into a nuclear one, provoked NATO into undertaking its own theater-strategic modernization. This modernization, which was intended to maintain linkage from conventional through theater-nuclear to strategic nuclear deterrence, was part of a two-track NATO program to enhance deterrence while seeking political means to bring about increased confidence and security between the two alliances. The deployment of the new theater-nuclear weapon had two profound results: by raising the issue of nuclear deterrence it encouraged efforts to improve NATO conventional force capabilities to raise the nuclear threshold, and stimulated a political search for new force postures which would open up prospects for conventional arms control, confidence-building measures, and reduce the possibility of war by replacing offensive force postures and doctrines with ones based upon "non-provocative defense."[24] At the same time, Soviet intransigence over the theater-nuclear issue and the breaking off of the INF negotiations with its ensuing political isolation of the USSR raised with the Soviet leadership serious questions regarding the balance between a military-technical solution to security problems and a political approach to such issues. Under Gorbachev, the former approach has been given much more play than in the past to create a well-integrated effort. Lev Semeyko, a senior researcher at *ISKAN* and a former officer with an expertise in military foresight *[voyennoye predvideniye]* has written:

> The conclusion from this is evident: a political approach to military confrontation is more rational than a military-technical [approach]. Precisely by timely political measures one can and must prevent the jumps in the arms race and at the same time reduce the level of military confrontation to such a degree, under which both sides feel themselves really secure. The optimal variant is not a one-sided gamble on political measures.[25]

The acceptance of such a political answer to a military-technical issue, however, depended upon the emergence of a new political leadership and a reassessment of the military-political climate in which the Soviet Union was then operating. Under a weak and ineffective national leadership the Soviet Union had seen its relations with the West deteriorate since the late 1970s when detente finally collapsed. Its military intervention in Afghanistan had turned into a protracted, local war with no prospect of immediate victory. Isolated internationally, confronted by a stagnant economy, and engaged in a high-technology arms race across the spectrum of forces from SDI to FOFA, the USSR faced a national crisis of significance and magnitude to rival that of the late 1920s. In this case, there was considerable doubt whether the conventional Stalinist answers of a militarized, centrally-planned economy could deal with the crisis. To escape from this dilemma, a young and dynamic leadership needed answers to a series of inter-related questions: an objective assessment of the international situation and the probability of hostilities in the near future, the implications of answering the U.S. program of "competitive strategies" with a new round of the arms race for the Soviet economy, the viability of using arms control to slow the process of force modernization. The conclusions reached by the new Soviet leadership rejected a quantitative answer in favor of quality and rested upon reducing tensions to provide the USSR with a breathing space *[peredyshkh]* from the military-technical competition by means of reducing the evident threat to the West.[26]

## THE CURRENT CONTEXT OF CONVENTIONAL FORCES

While this process of reassessment was underway, a basic change in the tempo of the modernization of conventional weapons took place.[27] The evolutionary course of the last four decades gave way to "qualitative" leaps. New weapon systems, especially highly-accurate precision-guided weapons, have radically increased in combat effectiveness until the so-called reconnaissance-strike and reconnaissance-fire complexes have acquired capabilities analogous to low-yield nuclear weapons in their destructive power against enemy combat potential.[28] As officers from the Warsaw Pact have observed, their ability to engage in the real-time

reconnaissance, vectoring, target-acquisition and destruction of a wide set of stationary and mobile depth behind the forward edge of the battle area has changed the very character of deep battle.[29]

While there has been a significant body of literature regarding tactical-operational countermeasures to reduce the effectiveness of such NATO weapons systems when used to attack follow-on forces, the potential impact of such capabilities are seen as working another revolution in military affairs, affecting future war and the initial period of war. General-Colonel Gareyev has observed:

> Now we can speak about a turning point in the development of military science and military art. In general, a new qualitative leap in the development of military affairs, which is connected with the modernization of nuclear weapons and, especially, with the appearance of new types of conventional weapons, is ripening. In connection with this [process] there has arisen a need to rethink the basic political and operational-strategic problems of the defense of the socialist fatherland.[30]

What was not yet clear in 1985 was the direction Soviet military policy would take at this turning point. By 1987 Soviet military authors were announcing that the XXVII Congress of the CPSU had marked the beginning of a new period in Soviet security policy, in which the USSR would seek to escape a technologically-driven "action-counter-action" arms race.[31]

Some indications of the shift in the balance of combined-arms forces required under the "leap" in this latest military-technical revolution can be seen in recent trends in Soviet military production. The most noteworthy feature here is the sharp decline in Soviet tank production between 1988 and 1989--from 3,500 to 1,700 units--prefiguring the reduced role for the main battle tank in its deep maneuver role. The number of artillery pieces and MRLs systems also declined in the same period from 2,500 to 1,850 units, or a little over 25%. At the same time, the number of "lighter armored vehicles," which would include BMPs and other armored personnel carriers, actually went up by 500 units to 6,500 and the number of antiaircraft artillery increased from 100 to 250 units and the number of short-range ballistic missiles [SRBM] increased from 650 to 700 units in the same period. Production of military helicopters remained the same at 400 units per year, while tactical aviation [fighters/fighter-bombers] declined by 75 aircraft to 625 per year.[32] High-accuracy, deep-strike systems have thus already had a profound impact on what has been the keystone of Soviet deep maneuver forces. Such sharp changes in production figures might be seen as politically-imposed cuts, unrelated to any changes in military art under the logic that fiscal constraints and economic problems have mandated reduced military spending.

However, well before the current economic crisis, some Soviet military writers were already calling for fresh approaches to the deep operations on the basis of the problems posed by the revolution in conventional military capabilities. Well before the XXVII Party Congress had articulated its new defensive military doctrine, emphasizing war prevention and based upon "reasonable sufficient defense" these discussions had addressed the military-technical revolution affecting conventional forces.[33] The discussions began with a reconsideration of the utility and viability of strategic defense *[strategicheskaya oborona]* in the initial period of a future war. This theme began to receive attention as early as 1979. General-Major V. V. Turchenko raised the issue and noted the existing "dialectical unity and close inter-connect" between strategic offense and strategic defense. He went on to delineate two types of strategic defense: "imposed" and "premeditated." In the former, the defender was compelled by military or political circumstances to adopt a defensive posture. In the latter, the defender chooses and plans to be on the defense. He noted as a successful example of such a premeditated defense the Soviet defense during the Battle of Kursk in July 1943 and implied that under modern conditions the defender could use artillery and air "counter-preparation and the wider employment of offensive actions" in the defense to maintain steadiness *[ustoychivost']*. In this manner, he discussed the growing offensive character of the defense, its dynamism *[aktivnost']* and stated that a successful strategic defense could "change the strategic situation in the theater to one's own advantage and create the conditions for seizing the

strategic initiative and going over to the counter-offensive."[34]

In 1981, General M. M. Kozlov, Chief of the Voroshilov Academy of the General Staff, also addressed "strategic defense" as a topic which deserved greater study at the academy.[35] Such views were not broadly accepted in the early 1980s and remained a topic for debate and discussion within the Soviet General Staff. Until 1984 Turchenko and other authors, who addressed strategic defense, did not question the primacy of the offense in fulfilling those tasks and missions necessary for successful war termination, but they did see profound changes in the impact of "the fire factor" upon the conduct of operations in the initial period of war. Linked with new requirements in intelligence for timely estimates of enemy plans and intentions, the employment of fire strikes by the defense could increase its stability and dynamism to the point where a maneuver defense was possible and potentially effective. General-Major I. N. Vorob'yev pointed to a certain "leveling *[nivelirovka]* of offensive and defensive actions."[36]

Given the scale, scope and intensity of such operations, the tasks before the defense had become more difficult and would require even greater depth in the layout of defending forces in a theater of military actions. The task before Soviet military science was the construction of both a theory and practical force requirements required to conduct such a defense. The capital issue guiding the entire discussion of strategic defense in the early 1980s was the relationship between offense and defense under modern conditions, especially the appearance of long-range, high-accuracy, advanced, conventional munitions. Even those military scholars engaged in the study of strategic defense as a problem did not question the supremacy of the offense, and couched their calls for the study of strategic defense as being a matter of prudence. General-Major Turchenko reminded Soviet officers of the terrible costs paid in 1941 for not mastering strategic defense, and saw as hubris any assertion that one would have overwhelming superiority at all times and in all directions to permit one "to conduct only active, offensive operations." The most crucial problem facing strategic defense was the development of countermeasures to deal with a breakthrough of enemy mobile forces into the depth of the defense. Turchenko looked to engineering support and mobile obstacle-laying means to provide greater stability.[37]

Both Turchenko and General-Colonel I. G. Zav'yalov expressed a strong preference for a well-constructed, premeditated defense, possessing great stability and based upon aggressive, tactical counter-strikes and attacks, as the preferred defensive posture in the initial period of war.[38] Yet, on the competition between offensive and defensive combat potentials, Zav'yalov stressed the continuing hegemony of the former over the latter.

> In this confrontation, superiority always goes to that side which better uses the combat, and primarily offensive potential, who has the higher level of military art, better works out the methods of combat actions in the offense and defense, and has the higher morale among the troops.[39]

He reminded his readers that while the significance of the defense was on the rise,

> ...it does not follow to conclude that it should be given preference over the offense. One can only speak about increasing the ability of the defense to conduct decisive actions leading to the destruction of major groupings of enemy forces and the achievement of a temporary superiority over him. In the final analysis only the offense can deliver final victory in war.[40]

In this regard, the discussions of strategic defense in no way undercut the long-established emphasis upon "decisive offensive methods of combat action" within Soviet military doctrine.[41]

However, in 1984 on the eve of his appointment to the post of Chief of the General Staff, Marshal Sergei Akhromeyev used an article on an historical theme to open a public reconsideration of strategic defense, premeditated defense, and the counter-offensive, using the Battle of Kursk in July-August 1943 as an historical example of concepts which were still relevant to military art.[42] More recently Marshal Akhromeyev attributed the shift to the defensive as a response to Western concerns about Soviet offensive capabilities:

> Guided by the experience of WWII, we considered the offensive to be the main method of warfare for our armed forces. Until recently, we planned to rebuff an aggression by using both defensive and offensive operations. We have addressed the Western concerns on this score and modified our military strategy. In the event of an aggression, the Soviet armed forces will initially be engaged in retaliatory defensive operations.[43]

The feasibility of a strategic defense, based upon premeditated defense, had been a topic of hot debate in the Soviet military during the two years preceding the WTO Political Consultative Committee's announcement of doctrinal change. Down to 1984 strategic defense had been no more than an alternative posture in keeping with the realities of warfare in continental TVDs, where the strategic defense would be no more than a temporary measure, imposed by political or military conditions and based upon the need for economy of force in some sectors of the theater. But in 1984-1985 Soviet officers began to address the radical implications of technological change. Regarding the threat to the USSR, Marshal N. S. Ogarkov, Chief of the General Staff, 1977-1984, was quite explicit:

> The concept [AirLand Battle] proposes the surprise initiation of combat actions simultaneously by air, naval and ground forces with the extensive use of the latest conventional, precision-guided means of armed struggle and of reconnaissance-strike complexes at great depth with the objective of inflicting maximum losses on enemy troops, the achievement in the shortest possible time of overwhelming superiority against him, and a subsequent offensive for the seizure of his territory.[44]

What Ogarkov described as a NATO first-strike concept for using precision fire in the initial period of war other Soviet military authors discussed in more general terms two years later, reflecting dominant trends in the evolution of the defense. Here some authors pointed to a "leap" in the means of conducting an operational defense, which had radical implications:

> In national and foreign literature it has been noted that the modern defense has begun to carry a defensive-offensive character. Defending large formations and formations at the present time are able to confront the massed fire actions and strikes of powerful enemy tank groups, to successfully counter, and in favorable conditions to break the offensive. Foreign military specialists have noted that by means of powerful fire strikes, stubborn holding of important lines and areas in conjunction with the launching of powerful counterattacks and counter-strikes, actions in the rear of the attacking forces by raising detachments, assaults of sabotage, reconnaissance groups can inflict upon him a defeat, which will force the enemy to give up active prosecution of the attack and, in turn, allow the defending forces to go over to the attack.[45]

These authors thus linked together front, rear, and deep battle in such a fashion so as to suggest that new technologies, especially high-accuracy, deep-fire weapons with the ability to strike targets on a real time basis, were transforming the nature of deep operations to increase the role of maneuver by fire and to reduce the effectiveness of tank-heavy forces in such a combined-arms offensive operation. Reconnaissance-strike and reconnaissance-fire complexes were noted as weapons which had the effective destructive power of tactical nuclear weapons. The authors also noted the possibilities of using a wide range of systems and platforms "to create an anti-tank defense throughout the entire operational depth by equipping them with large quantities of anti-tank systems, used in conjunction with the mass employment of mine fields and other types of obstacles."[46] The stability and dynamism of such a premeditated defense held out the prospect of at least negating an attacker's ability to sustain a seamless deep operation without regrouping his

forces. Moreover, the defender might by counter-attacks and counter-strikes rob the attacker of the initiative and create the preconditions for the mounting of a counteroffensive to achieve the annihilation of the attacking force.

General-Major V. V. Larionov, one of the original authors of *Voyennaya Strategiya* of the 1960s, a professor at the Voroshilov Academy of the General Staff, and presently a senior researcher at the Institute for the Study of the United States and Canada, used the Battle of Kursk to link together past Soviet military art and the present concept of premeditated defense in an article for *Voyennaya Mysl'*, published in July 1987. Larionov called the Battle of Kursk "the birth of the idea of premeditated defense." He described that process in the following terms:

> The originality and novelty of our plans consisted of the fact that *Stavka* of the Soviet Supreme High Command, possessing a general superiority in forces, consciously, temporarily gave up the initiative in actions to the enemy. More than that, the idea of loss of some part of the defended territory was accepted in order to give the enemy the opportunity to introduce into the engagement not only the main forces of first echelon but also reserves, and then by launching powerful counter-strikes to annihilate his basic grouping of forces. Here in the Kursk salient, in essence, the problem of organizing and conducting a premeditated defense was resolved for the first time in the history military art on such a scale.[47]

As Larionov noted, the culmination of such a successful premeditated defense was a regrouping of forces in order to bring about the shift from defense to counter-offensive.[48]

In August 1987 Larionov joined his colleague at *ISKAN*, A. A. Kokoshin, to publish an article proposing that the Battle of Kursk serve as the model for an evolving "counter-offensive" posture in Europe and serve as the foundation for a new force posture in keeping with the newly proclaimed "defensive military doctrine."[49] A few months later Kokoshin put this process of doctrinal shift within the context of a newly emerging "military-political science" and linked the search for new postures with Soviet efforts to find a more stable strategic posture covering the conventional forces now deployed in Europe. In this process he asserted that military-political approaches were now influencing further changes in Soviet military doctrine, even in its military-technical aspects.[50]

In a recent article, Kokoshin and Lieutenant-General Larionov returned again to the problem of conventional force postures and their contribution to strategic stability.[51] The article, which was a further manifestation of the cooperation between academic analyst and military specialist for which Aleksandr Yakovlev had called as the Politburo member charged with overseeing the development of Soviet social sciences, postulated four distinct force postures. General-Lieutenant Larionov later described them as a "de-escalation ladder" to be applied to NATO and WTO forces in Europe as part of an effort to increase stability and reduce the risks of surprise attack.[52] Returning to the problem of preventing a conventional war in Europe, General-Major Larionov has provided an initial discussion of mathematical techniques which might be employed to establish the combat potentials of the contending sides, using "coefficients of combat commensurability" to determine a situation where the opposing sides were each superior on the defense but had insufficient combat power to mount successful offensive operations.[53]

These developments have coincided with the reformulation of Soviet/WTO military doctrine and have provided a military-technical rationale regarding the increased feasibility of premeditated defense. General of the Army, Dmitriy Yazov, the newly appointed Soviet Minister of Defense, addressed this problem in 1987. In his presentation, it was clear that the so-called "Kursk paradigm" for a successful premeditated defense and a subsequent counter-offensive had infused new content into an old category. In this case, a net assessment of the balance between offense and defense had made it possible to consider standing on the defense in the initial period of war, provided a sufficiently deep defense, based upon modern conventional weapons and relying on dynamic tactical and operational counter-strikes could

be created. Yazov stressed the utility of conducting "a surprise counter-preparation" by launching fire and aviation strikes against the entire depth of the attacker's operational deployments and conducting intense electronic warfare to disrupt the enemy's ability to control his troops and forces. Such actions could bring about the defeat of the attacker and create the conditions for the counter-offensive. He described these tasks as "more decisive" than in the past and stated that the increasing fire and strike capabilities of fronts, armies and divisions as redefining the content of these tasks.[54] They did, however, only set the stage for the decisive counter-offensive.

Thus, General of the Army Yazov still kept strategic defense in a theater-strategic operation subordinated to the offensive, which remained the instrument of war termination. Deep offensive operations carrying the war into enemy territory and destroying the enemy force throughout the depth of his dispositions were still intended to impose a military solution in a future war.

Soviet military doctrine looks upon *defense* in the capacity of the basic type of military actions to repulse aggression. It must be reliable and steadfast, stubborn and active, calculated to stop the enemy offensive, to drain it, to prevent loss of territory, to strive for the destruction of the invading enemy groupings.

However, it is impossible to destroy an aggressor by defense alone. Therefore, after the repulse of the attack troops and naval forces one must be able to mount a *decisive offensive,* which it will be necessary to conduct in a difficult and tense situation of confrontation with a well-armed enemy.[55]

Given what was correctly perceived by NATO to be a substantial superiority of Soviet/WTO conventional forces in Europe, such a counter-offensive posture could not negate NATO's fears that the USSR and its allies were still committed to deterrence by warfighting.

In recent discussion of defense during the initial period of a future war, General of the Army Salmonov emphasized two mutually related rationales. First, the defending force could, under favorable conditions, bleed the enemy and create the pre-conditions for the above-mentioned counter-offensive. Second, the force could serve as means of making the enemy think before attacking by precluding the attacker's ability to achieve decisive military-political results in the initial period of war. Accepting the utility of premeditated defense, moreover, seemed to be only prudent in the face of what he identified as NATO's enhanced combat capabilities; i.e., "completely new quality in the enemy's fire capabilities, a sharp rise in mobility of his strike groups, and the main means chosen by him to initiate hostilities, surprise attack."[56]

According to General of the Army Salmanov, the appropriate answer to these capabilities is the application of advanced fire systems; i.e., reconnaissance-strike and reconnaissance-fire complexes, and for the defense to apply long-range, high-accuracy fire against the attacker from the start of hostilities.

We must have the ability to create in a very short time such a system of fire, by which in answer to the initiation of aggression the enemy would receive an immediate and crushing retaliatory massed fire strike, capable of sharply weakening [his] offensive potential even before that moment when he introduces his strike groups of the second echelon into battle.[57]

To accomplish this task Salmonov has called for the study of the best means for seizing fire superiority and command of the air at the very start of hostilities.[58] Thus, in this fashion two historic aspects associated with the Kursk paradigm; i.e., a preemptive fire preparation and an anti-air operation, designed to break up the opponent's combined arms offensive before it can begin, were given a new content. In this case, advanced conventional weapons would make possible a decisive use of maneuver by fire to accomplish this task, permitting the defender to exercise the initiative by striding preemptively throughout the depths of the supposed attacker. Under such circumstances, the transition to the counter-offensive could, indeed, be rapid, almost instantaneous.

In the past the strength of the defense has been a function of choosing the terrain, but the defense had to give away the initiative. Modern deep-strike systems hold out the prospect of permitting the defense to engage a would-be attacker before his forces can reach the line of contact and by such fire strikes inflict devastating losses during the approach march. The outcome of such an operational-tactical

situation would depend upon the comparative abilities of the opposing sides to adjust to the radical increase in the dynamics of combat, brought about by such new capabilities. These dynamics would manifest themselves in the form of rapid and frequent shifts by tactical units from offense to defense and back. Joined with the infusion of air mobile and air mechanized concepts of deep raiding, the further intensification of the struggle between tank and anti-tank systems, the advent of practical battlefield lasers, and the introduction of new means of automated troop control, these developments would produce a very "unconventional" conventional warfare.

As Colonel Stanislaw Koziej of the Polish Armed Forces has pointed out, these trends will reshape tactics along five mutually connected lines:

> ...the transformation of traditional ground combat into air-land combat, broadening the role of mobility in all troop actions; the development and generalization of taking combat actions within enemy formations, especially raiding actions; the initiation of battle at increasingly greater distances; [and] the growth of the significance of the "information struggle," which has as its objective to steer the enemy in the direction of one's own plans and intentions.[59]

Taken together, these concepts imply a major recasting of tactics and operational art to reflect the enhanced role of maneuver by fire and a simultaneous "leveling" of offense and defense. The conventional combined-arms solutions adopted to enhance maneuver in the depths of the enemy's dispositions had hinged on the echelonment of forces to provide shock in a breakthrough sector and then a mobile group to engage in exploitation. New circumstances were making it possible to use a combination of maneuver by fire and an air second echelon to conduct deep battle and deep operations in a context where offense and defense had melded together.

The accelerating processes of change have assumed the character of a new revolution in military affairs, in which the classic order of innovation in military art was radically transformed. The dominant model of technological change beginning at the tactical level and generalizing from there to operational art and strategy had been based upon the struggle for technological initiative, in which each innovation took on its full import when the weapon had reached maturity of design and been acquired in mass, when troops had been trained in its employment, and when concepts for its used in combined-arms combat had reached full development.[60] This approach had given way in the late 1950s to one dominated by technological changes at the strategic level, associated with the nuclear-rocket revolution in military affairs. In the 1980s, Soviet analysts have assumed that the current "leaps" had set the stage for interconnected changes in military art, simultaneously affecting tactics, operational art and strategy, and raising a host of issues relating to force posture and structure.

Only three such periods have been experienced by the Soviet military in the past: the first was the military revolution associated with deep battle and deep operations and the militarization of the Soviet economy under Stalin; the second case was in the 1950s with the emergence of nuclear-rocket weapons, which initially seemed to recast military strategy, reduce the role of operational art and reduce tactics to maneuver on an irradiated battlefield. The very expansion of the arsenals on such weapons on the opposing sides had, however, negated any military utility associated with nuclear weapons. The third revolution, associated with the developments in automated troop control, long-range precision-guided munitions, radio-electronic warfare, and even more advanced "weapons based upon new physical principles," by the early 1980s was simultaneously reshaping tactics, operational art and strategy, not only calling into question the long-established hegemony of the tank in deep maneuver, but also radically changing the calculations associated with density of forces and means. Moreover, this military revolution, like the mechanization revolution in the early 1930s, would have profound consequences for the economy and require a very different approach than Stalin's war economy.

Recently Soviet authors writing on the evolution of military art described the current situation in the following terms:

> New means of armed struggle have brought about a transformation in

> views simultaneously in all areas of military art. The accelerated development of the material-technical base, which the scientific/technical revolution has provoked, has sharply curtailed the period of changes which take place in military art. New means of conducting military actions rapidly produce new requirements in armaments, the perfection of their tactical-technical features, and the organization of troops, and at the same time produce an urgent order for their further development, which, in turn, leads to real changes in military art.[61]

These authors point to the application of such new weapons and concepts with such established forms as the "theory of deep operation" and the "tactics of deep battle," but note that this has taken on a new content because massing of means has replaced massing of forces and maneuver by fire has superseded maneuver by combat forces.

If in the past the objective was to encircle and destroy an enemy operational grouping, current concepts speak of attacking an enemy force from within, maneuver by fire, and simultaneous destruction throughout the depth of the enemy's dispositions by a combination of fire, penetration, and aerial envelopment.[62] Such tactical and operational concepts depend upon the ability of units and subunits to make rapid transitions from attack to defense and back, and underscore the need for restructuring of such units to fight the combined-arms battle more effectively. Such restructuring, as Colonel David Glantz has pointed out, will pose a significant challenge to the Soviet military system.

> Purely military considerations, in particular the accelerating pace of technological change and the evolving battlefield environment, necessitate fundamental changes. For a decade the Soviets have gradually adjusted their force structure to accommodate these new realities, but today the existing force structure has evolved as far as it can. Clearly, new forms of forces are required which will permit further accommodation.[63]

Additional evidence of recent changes in Soviet tactics, operational art, force-structuring, mobilization, and training underscore the beginnings of the profound shifts in the Soviet military system in keeping with the latest revolution in military affairs.[64] For the last year, there has been an open discussion of a crisis in tactics. As General-Lieutenant V. Khazikov pointed out the exercises conducted in 1988 demonstrated that tactical concepts in several branches of the armed forces were so conservative that they had become a break on the development of tactics.[65] Recently, General-Major I. N. Vorob'ev, whose writings on the need for "a moving, mobile, maneuvering defense" we noted above, joined the discussion on revitalizing tactics and focused on the "tactics of formations." Vorob'ev described the situation as a crisis and outlined a number of actions which would break the current stagnation in the tactics of the division.[66]

Regarding new concerns in the area of operational art, it is worth noting the appearance of an article by General-Major I. N. Manzhurin on fighting in encirclement, a theme long neglected in Soviet military writings. Manzhurin noted that such a situation was very likely to arise while "conducting the first defensive operations of the initial period of war."[67]

In this context, the Soviet military's current "defensive" restructuring deserves to be treated in the same manner as Moltke the Elder treated military history: The declarations are "the truth, only the truth, but not all the truth." Defensiveness at a time when there has been a leveling of offense and defense seems to be no more than a prudent adaptation to the emerging, postmechanized battlefield. A declared counter-offensive posture in this context cannot be reassuring by itself. Force reductions, the removal of certain types of forces, and greater transparency, however, are certainly promissory notes. What is required are military-to-military discussions such as those recently conducted in Vienna which move beyond Moltke's disclaimer to A. A. Svechin's call for "the truth, the whole truth and nothing but the truth."[68]

Gorbachev's announcement of unilateral Soviet force reduction in late 1988 and the Soviet/WTO

willingness to accept asymmetrical force reductions have been key steps toward this process. Now we need to discuss candidly those trends which will reshape the future battlefield so that in a post-CFE environment strategic stability can be maintained and defensive "steadiness" enhanced without making Europe safe for conventional war. Lower densities of forces in Central Europe in the context of such a revolution in military affairs will require prudent adjustments in military art, further arms control and confidence-building measures, if this is to be achieved. It remains to be seen whether the pace of political changes on the continent won't outstrip the process of negotiating such military-technical adjustments. Military disengagement may overtake the mutual efforts to maintain strategic stability at lower force levels, leaving serious problems should another crisis ensue, bringing military forces back into contact in the context of the latest revolution in military affairs.

**Notes**

1. *Krasnaya Zvezda*, December 8, 1988

2. Michael R. Gordon, "Talks on Conventional Arms to Open," *The New York Times*, March 5, 1988, p. A-10

3. *Krasnaya Zvezda*, December 8, 1988.

4. For a review of these developments, see Jacob W. Kipp, "Conventional Force Modernization and Asymmetries of Military Doctrine: Historical Reflections of AirLand Battle and the Operational Maneuver Group." in Carl G. Jacobsen, ed., *The Uncertain Course: New Weapons, Strategies, and Mindsets* (Oxford: Oxford University Press, 1987), pp. 150 ff.

5. I.E. Shavrov and Galkin, *Metodologiya voyenno-nauchnogo poznaniya*, (Moscow: Voyenizdat, 1977).

6. M.A. Gareyev, *M. V. Frunze: Military Theorist* (Washington, D.C.: Permamon-Brassey's, 1988), p. 215.

7. *Ibid.*, p. 214.

8. *Sovetskaya Voyennaya Entsiklopediya* (Moscow: Voyenizdat, 1976-1980), V,p.

9. M.M. Kir'yan, *"Nachal'nyy Period Velikoy Otechestvennoy Voyny," Voyenno-Istoricheskiy Zhurnal* No. 6, June 1988, p. 9; and Gareyev, pp. 208-210. In contrast with S.P. Ivanov's *Nachal'nyy Period Voyny* (Moscow: Voyenizdat, 1974), these authors place greater emphasis upon the role and place of defensive operations in the initial period of war.

10. Shavrov and Galkin, p. 67.

11. Jacob W. Kipp, "Lenin and Clausewitz: The Militarization of Marxism," *Military Affairs*, XLIX, No. 4, October 1985, pp. 184-190.

12. V. Konoplev, *Nauchnoye Predvideniye v Voyennom Dele* (Moscow: Voyenizdat, 1974), p.6.

13. *Ibid.*, p.13.

14. S.F. Akhromeyev, *"Rol' Sovetskogo Soyuza i ego Vooruzhennykh Sil v Dostizheniya Korennogo Pereloma vo Vtoroy Mirovoy Voyne i ego Mezhdunarodnoye Znacheniye," Voyenno-Istoricheskiy Zhurnal* No. 2, February 1984, p. 24.

15. Jacob W. Kipp, "Soviet Military Doctrine and the Origins of Operational Art, 1918-1936," in Philip Gillette and Willard Franks, Jr., ed., *Soviet Military Doctrine* (forthcoming book).

16. Gareyev, p. 216.

17. M.D. Sokolovsky, ed., *Voyennaya Strategiya* 2nd Edition, (Moscow: Voyenizdat, 1963), pp. 237-238.

18. S.S. Biryurov, ed., *"Uroki Nachal'nogo Perioda Velikoy Otechestvennoy Voyny," Voyennaya Mysl'*, No. 8, August 1964, p. 21.

19. M. Kozlov, *"K Voprusu o Razvitii Sovetskoy Voyennoy Nauki Posle Vtoroy Mirovoy Voyny," Voyennaya Mysl'*, No. 2, February 1964, p. 64.

20. During the second tenure of M.V. Zakharov as Chief of the General Staff, 1964-1968, there was some modification in this nuclear-only proposition. In response to U.S. and NATO shift to "Flexible

Response" the Soviet general staff began to consider the possibility of an initial conventional period, in which initial conventional operations would influence the subsequent course and outcome of the conflict. Gradually, over the next decades, a nuclear-scared conventional posture emerged which aimed at achieving victory in a major continental theater by means of a theater-strategic operation, involving all branches of the armed forces and consisting of air and anti-air operations designed to support multi-front deep operations by shock, thank and combined arms armies. On Zakharov's views, see M.R. Zakharov, *"Molnenosnaya Operatsiya (Iz Opyta 2-go Ukrainskogo Fronta v Iassko-Kishinevskoy Operatsii)," Voyenno-Istoricheskiy Zhurnal*, No 8, August 1964, pp. 15-28. For the full-blown presentation of the theater-strategic operation as it was understood in the mid-1970s, see Graham Turbibille, Jr., ed., *Lectures from the Voroshilov Acedemy of the General Staff*, (Washington, D.C.: National Defense University Press, 1989).

21. Gareyev, pp. 215-216.

22. I.E. Shavrov, *Lokal'nyye Voyny: Istoriya i Sovremennost'*, (Moscow: Voyenizdat, 1980).

23. V.G. Reznichenko, *Taktika;*, 2nd Edition, (Moscow: Voyenizdat, 1984), p. 44.

24. Jacob W. Kipp, "Military Doctrine and Conventional Arms Control," *Military Review, No.* 12, December 1988, pp. 2-23.

25. Smeyko, p. 36.

26. On the decision of a new Soviet leadership to use the process of adjusting the military-technical and political sides of military doctrine to support a major shift in Soviet foreign, defense, and domestic policy, see Jacob W. Kipp, "Soviet Military Doctrine and Conventional Arms Control," *Military Review*, No. 12, December 1988, pp. 2-23. The shift from quantitative to qualitative indices of military power, see Jacob W. Kipp, "General of the Army Vladimir Nikolaevich Lobov: One of Gorgachev's *Genshtabisty," The Journal of Soviet Military Studies*, 2, No. 3, September 1989, pp. 403-416.

27. Babakov, *Vooruzhennyye Sily SSR Posle Voyny (1945-1986 g.)*, (Moscow: Voyenizdat, 1987), p. 241.

28. *Ibid.*, p. 238. See also Milan Vego, "Recce-Strike Complexes in Soviet Theory and Practice," *Soviet Army Studies Office Paper*, Ft. Leavenworth, K.S.: Soviet Army Studies Office, 1990)

29. W. Knorr, *"Automatisierte Afklaerungs-und Schlagkomplexes der NATO," Militaerwesen*, No. 11, November 1984, pp. 66-67.

30. Gareyev, *M. V. Frunze*, p. 437. On counter-measures to reconnaissance-strike and reconnaissance-fire complexes, see M. Belov and V. Shchukin, *"Razvedivatel'no-porazhayushchiye Kompleksy Armii SShA," Voyennyy Vestnik*, No. 1, January 1985, pp. 86-90; and S.V. Grishin and N. Tsalenko, *Sovedineniya i Chasti v Boyu*, (Moscow: Voyenizdat, 1985), pp. 32-40, 45-50.

31. Babakov, *Vooruzhennyye Sily SSR Posle Voyny*, p. 242.

32. "Soviet Military Production," February 22, 1990, p.1.

33. *Kommunisticheskaya Partiya Sovetskogo Soyuza, Materialy XVII s'yezda Kommunisticheskoy Partii Sovetskogo Soyuza*, (Moscow: Izdatel'stvo Politicheskoy Literatury, 1986), pp. 20-21, 67, 136,177.

34. V.V. Turchenko, *"Tendentsii Razvitiya Teorii i Praktiki Strategicheskoy Oborony," Voyennaya Mysl'*, No. 8, August 1979, pp. 13-21. Soviet scholars analyzing the initial period of war. Defensive operations in the initial period of war, as historical experience had shown were always "imposed" upon the victim of aggression. The aggressor had both the initiative and the ability to concentrate his forces on a decisive axis where the defender had no prepared defensive positions or large concentrations of forces. This situation, in turn, imposed huge losses of men and equipment upon the defender in the initial period of war and influenced both the course and outcome of the conflict. [See: S.P. Ivanov, ed., *Nachal'nyy Period Voyny (Po Opytu Pervykh Kampaniy i Operatsiy Vtoroy Mirovoy Voyny* (Moscow: Voyenizdat, 1974), pp. 248-249.

35. *Akademiya General'nogo Shtaba: Istoriya Voyennoy Ordenov Lenina i Duvorova I Stepeni Akademii General'nogo Shtaba Vooruzhennykh Sil*

*SSSR Imeni K. E. Voroshilova* 2nd edition, (Moscow: Voyenizdat, 1987), p. 185.

36. I.N. Vorob'yev, *"Sootnosheniya i Vzaimosvyaz' Nastupleniya i Oborony"*, (Correlation and Interconnection of the Offense and Defense), *Voyennaya Mysl'*, No. 4, April 1980, p. See also I.N. Vorob'yev, *"Podvizhnaya, Mobil'naya, Manevrennaya..."* (Mobile, Maneuver...), *Krasnaya Zvezda*, 27 September 1989.

37. V.V. Turchenko, *"O Strategicheskoy Oborone," Voyennaya Mysl'*, No. 7, July 1982, pp. 16-27.

38. I.G. Zav'yalov, *"O Roli Voyennogo Potentsiala Vooruzhennykh Sil v Nastuplenii i Oborone,"* (On the Role of Military Potential of the Armed Forces in the Offense and Defense), *Voyennaya Mysl'* No. 3, March 1983, pp. 133-14.

39. *Ibid.*, p. 9.

40. *Ibid.*, p. 13.

41. *Ibid.*

42. S. Akhromayev, *"Rol' Sovetskogo Soyuza i Ego Vooruzhennykh Sil v Kostizhenii Korennogo Peroloma vo Vtoroy Mirovoy Voyne i Ego Mezhdunarodnoye Znacheniye," Voyenno-Istoricheskiy Zhurnal* No. 2, February 1984, pp. 11-26.

43. *The New Political Thinking and Soviet Military Doctrine*, presentation of the Chief of the General Staff of the Armed Forces of the USSR Marshal of the Soviet Union S. F. Akhromeyev at the Council of Foreign Relations, July 11, 1988.

44. N.V. Ogarkov, *Istoriya Uchit Bdigel'nosti, (History Teaches Vigilance)*, (Moscow: Voyenizdat, 1985), p. 69. In an earlier discussion of trends affecting the evolution of military art, Marshal Ogarkov discussed the ever increasing role the "air sphere" was playing in modern combat actions, giving to operations a "large, deep character." See N.V. Ogarkov, *Vsegda v Gotovnosti k Zashchite Oteshestva*, (Moscow: Voyenizdat, 1982), p. 44.

45. I.F. Rachok and V.M. Tolmachev, *"Osnoyye Tendentsii Razvitiya Operativnoy Oborony,"* (Primary Trenda in the Development of Operational Defense), *Voyennaya Mysl'*, No. 2, February 1986, p. 18.

46. *Ibid.*, p. 25.

47. V.V. Larionov, *"Triumf Prednamerennoy Oborony," Voyennaya Mysl'*, No. 7, July 1988, p. 14.

48. *Ibid.*, pp. 17-18.

49. A.A. Kokoshin and V.V. Larionov, *"Kurskaya Bitva v Svete Sovremennoy Obronitel'noy Doktriny," Mirovaya Ekonomika i Meshdunarodnye Otnosheniia*, No. 8, August 1987, pp 32-41.

50. A.A. Kokoshin, *"Razvitie Voyennogo Dela i Sokraschchenie Vooruzhennykh sil i Obychnykh Vooruzhennii," Mirovaya Ekonomika i Mezhdunarodnye Otnosheniia*, No. 1, January 1988, p. 29.

51. A. A. Kokoshin and V.V. Larionov, *"Protivostoyaniye sil Obshogo Naznahceniya v Kontekste Obespecheniya Strategicheskoy Stabul'nosti," Mirovaya Ekonomika i Mezhdunarodnyye Otnosheniya*, No. 6, June 1988, pp. 24-31.

52. V.V. Larionov, *"Sovetskaya Voyennaya Doktrina,"* a presentation at Old Dominion University Conference on Soviet Military Doctrine, Norfolk, VA., June 2, 1989. Author served as Larionov's translator for this session.

53. V.V. Larionov, *"Problemy Predotvarshcheniya Obychnoy Voyny v Evrope," Mirovaya Ekonomika i Mezhdunarodnyye Otnoscheniya*, No. 7, July 1989, pp. 37-43.

54. D.T. Yazov, *"K Voprusu ob Ustoychivosti i Aktivnosti Oborony," Royennaya Mysl'*, No. 2, February 1987, pp. 27-28.

55. D.T. Yazov, *Na Strazhe Sotsializma i Mira*, (Moscow: Voyenizdat, 1987), pp. 32-33.

56. G.I. Salmonov, *"Sovetskaya Voyennaya Doktrina," Voyennaya Mysl'*, No. 12, December 1988, p. 9.

57. *Ibid.*, p. 10.

58. *Ibid.*

59. Stanislaw *Koziej, "Przedwidywanie Kierzunki Zmian w Taktyce Wojsk Ladowych,"* (Anticipated Directions of Changes in Ground Force Tactics), *Przeglad Wojsk Ladowych*, No. 9, September 1986, p. 9.

60. A.A. Svechin, *Strategiya* (Strategy), 2nd Edition, (Moscow: Voyennyy Vestnik, 1927), pp. 69-70.

61. V.V. Larionov, et. al., *Evolyutsiya Voyennogo Iskusstva: Etpy, Tendentsii, Printsipy,* (Evolution of Military Art: Stages Trends, Principles), (Moscow: Voyenizdat, 1987), p. 9.

62. *Ibid.*, p. 233.

63. David M. Glantz, "Soviet Force Structure in an Era of Reform," *The Journal of Soviet Military Studies,* 2, No. 3, September 1989, p. 388.

64. On these topics, see the following recent articles: Graham H. Turbiville, Jr., "Restructuring the Soviet Ground Forces: Reduction--Mobilization--Force Generation," *Military Review*, No. 12, December 1989, pp. 17-31; Lester W. Brau, "Changing Soviet Objective Depths in Future War," *Military Review*, No. 12, December 1989, pp. 44-53; James F. Gebhardt, "Soviet Battalion in the Defense," *Military Review*, No. 12, December 1989, pp. 54-64; Lester W. Grau, "Reorganizing for Battalion-Level Combat," *Military Review*, No. 12, December 1989, pp. 65-72; and James F. Holcomb, "A Commander's Guide to the Soviet Forward Detachment," *Military Review*, No. 12, December 1989, pp. 73-81.

65. A. Petrov, *"Vozrodit' kak Iskusstvo," Krasnaya Zvezda,* January 7, 1989.

66. I.N. Vorob'ev, *"Pochemu Taktika Okazalow' v Zastoiu? Voyennaya Mysl',* No. 1, January 1990, pp. 37-44.

67. I.N. Manzhur*in, "Deistviia Voisk v Okruzhenii," Voyennaya Mysl',* No. 2, February 1990, pp. 14-21. On early Soviet works devoted to this topic, see Jacob W. Kipp, "Barbarossa, Soviet Covering Forces and the Initial Periods of War: Military History and AirLand Battle," *The Journal of Soviet Military Studies, I,* No 2, June 1988, pp. 188-212.

68. A. Svechin, *"Trudy Komissii po Issledovaniiu i Ispol'zovaniia Opyta Voiny 1914-1918 gg,"* (Works of the Commission for Studying and Using the Experience of the 1914-1918 War), *Voenno-Istoricheskiy Sbornik*, I, 1919, pp. 3-8. Svechin in this case was evoking Clausewitz's dictum for a military historian who "must spare no time or effort, fear no earthly power or rank and rise above his own vanity or false modesty in order to tell, in accordance with the express of the *Code Napoleon. the truth. and nothing but the truth."* Carl von Clausewitz, *On War*, edited and translated by Michael Howard and Peter Paret, (Princeton: Princeton University Press, 1976), p. 174.

# III - Papers on the Historic Perspective

Eugene P. Visco, FS, US Army MISMA, Chair

# HISTORICAL PERSPECTIVES SESSION

## Eugene P. Visco, FS, Chair

**Summary Comments**

The session consisted of five papers:

*Operational Art Anthology,* COL Michael Krause, US Army Center for Military History

*Gettysburg and the Operational Art,* COL Art Grant, National War College

*Thinking About Warfare,* Lt Gen Philip D. Shutler, USMC-Ret, Syscon Corporation

*Master of the Operational Art: General Kenney's Early Campaigns,* Lt Col Charles M. Westenhoff, The Air University

*Iraqi Power and U.S. Security Interests in the Middle East,* LTC Douglas V. Johnson and Dr. Stephen C. Pelletiere, US Army War College

The papers by COL Krause and General Shutler were generic, providing schema useful for looking at and classifying historical descriptions of operational-level events. The remaining papers focused on specific military actions now described as examples of the operational level. The concept of operational art or level was not in the military language during the U.S. Civil war (COL Grant's paper on the Gettysburg example) and still not in the U.S. lexicon in World War II (Lt Col Westenhoff's paper on General Kenney's campaigns). These papers represent a *post-hoc* interpretation of earlier events against a modern framework--nonetheless useful in providing examples of creative military thought and practice that illustrate modern concepts. The last paper by LTC Johnson and Dr. Pelletiere put campaigns of the Iran-Iraq war into an operational level perspective.

Although this session was designated to emphasize The Historical Perspective, there was great dependence on historical examples throughout the symposium. Other sessions , as well as the daily keynote addresses, all relied on descriptions and analogues drawn from military operations of the past.

Because history is so important, not only for its examples of operational art, but for the entire field of military operations analysis, it is exquisitely important to be careful and rigorous in applying historical analysis to present and future domains. Richard E. Neustadt and Ernest R. May, *Thinking in time: The Uses of History for Decision Makers* (The Free Press, New York, 1986), provide a framework for determining the applicability of particular historical events to specific present or future problems. Neustadt and May emphasize the importance of identifying similarities and dissimilarities between the historical events and the new problems, as the basis for objective determinations of the usefulness of the events as analogues to guide decisions.

The changing military environments and threats lead to a future of military operations and force projections that includes smaller, more lethal forces with rapid reaction capabilities. Meaningful sources for analogues are 19th century experiences of the U.S. Army with nation building on our own frontier, the Philippine operations early in this century, and the Central American operations of the 1920s.

A final word of caution derives from a 1949 film about the frontier Army. The film depicts the final active duty days of **Cavalry** Captain Biddles, winding up some 30 years of service (is retiring as a captain after 30 years an analogue for the future Army?) The film features a company sergeant played by the solid character actor Victor McGlagen. The sergeant provides deportment instructions to troopers escorting military wives out of danger. He concludes the instructions by saying: "And watch them language!" Quick as a flash comes the retort from the ranks: "And watch them grammar!" The caution here, as we assess the applicability of historical examples, is: "And watch them analogues!"

# OPERATIONAL ART
# ORIGINS, EVOLUTION AND APPLICATION
## A Forecast

**COL Michael D. Krause**
**US Army Center of Military History**

**Center of Military History Plans to Publish Work on Operational Art**

The Center of Military History plans to publish *Operational Art: Origins, Evolution and Application* in 1991. The purpose of the work is to lead toward understanding of the perspective and logic of operational art. It is designed for the professional officer, soldier, airman, sailor. Appended to this paper is the book's table of contents.

**What is Operational Art?**

We are used to thinking of the spectrum of conflict as a continuum. We essentially see strategy and tactics within a prism of being large and small. I offer the thought that operational art is different in perspective and logic. Operational art holds to a different logic than strategy and tactics. It is a different way of thinking. Simply stated operational art is in-between strategy and tactics. And while in between--to set it apart--it must be thought of as different. If strategy is the articulation of political and military objectives--setting the end goals, and allocating the means--then operational art is the ability to attain military objectives which contribute to the political goal by the use of force. This use of force to bend an opponent to one's will. The use of force to intimidate, force choices on an opponent which are not in his interest, to psychologically unhinge an opponent. To force an opponent to quit. Sun Tzu's aphorism "Better to win without the use of force than win in one hundred battles" but the use of force nevertheless, the threat and necessary application of the use of force. Use of force, by threat--the show of force--the deterrent use of force.

Operational art is the connection between strategy and tactics. Strategy is the conduct of warfare to accomplish political and military aims. Tactics is the conduct of battle to overcome and destroy the enemy. Operational art is the ability to continue towards the conduct of strategy by the achievement of the military aims.

Operational art is the translation of strategic goals into tactical events on the battlefield.

Our Army's doctrine defines operational art as: "the employment of military forces to attain strategic goals in a theater of operations through the design, organization, and conduct of campaigns and major operations. A campaign is a series of joint actions designed to attain a strategic objective in a theater of war. Simultaneous campaigns may take place when the theater of war contains more than one theater of operations. Sequential campaigns in a single theater occur when a large force changes or secures its original goal or when the conditions of the conflict change."

Our doctrine has focused on the plains of Central Europe This is also where most soldiers see the application of operational art. Large scale, conventional, successive, planned, and executed campaigns composed of a series of operations, each composed of battles and engagements. Certainly this is still with us. But the future dimension of operational art is such that the logic and perspective must be understood as different from the strategic and tactical perspective. Operational art must be applied throughout the blueprint of conflict, including conflict short of war.

**Origins and Evolution**

Where did operational art come from? What are its origins? How did it evolve?

Sovietologists want us to believe that the term operational art is a distinct Soviet development. Undoubtably the Russian-Soviet development is unique. But operational art is international in origin and evolution. Undoubtably the contribution of the industrial-revolution enhanced mobility, communication and lethality. With the ability to mass and conduct simultaneous and successive operations, the late 19th century brought to fruition a process which we now recognize as operational art. The real

debate is whether that new term can be applied retrospectively to other campaigns. For example, is operational art applicable in our Civil War? How about the Napoleonic war? What about pre--Napoleonic Europe? In each case I'd argue that it is professionally rewarding to study a Napoleon as an operational commander at Jena, a Grant at Vicksburg or a Meade and Lee at Gettysburg. Indeed, we may go back to Sun Tzu as an ancient philosopher of war citing principle examples of operational art.

In the 19th century, the German Field Marshal, Helmuth von Moltke, began to differentiate between military strategy, operations and tactics. He recognized that strategy in war is inherently linked with the attainment of the political objective, and that operational art defined military objectives which underpin the political objective. His conduct of operations--his practice of the operational art--has been studied ever since. General Ulysses S. Grant practiced operational art in the same way during our Civil War. But it was German usage and practice which led to Russian-Soviet adoption of the operational art concept in the 20th century and, in consequence, the recent U.S. rediscovery of the importance of operational art for American and Allied Forces.

Massing of large forces in simultaneous, successive and concentric operations took place in pre-industrial Europe during the French Revolution and Napoleon. Centralized direction for the attainment of military objectives which contributed to the political and military aim was practiced. Napoleon was conducting operational art without using the term. Hence, so one may argue, he was an operational commander. The perspectives of planned successive operations to defeat an opponent are all inherent in his conduct of campaigns. The Germans through von Moltke improved on Napoleonic method through their ability to mass forces over time in such a way as to force the opponent to accede. Moltke, seconded by General Von Schlichting, understood the different aspect of uniting force on the battlefield to achieve the desired aim. At the same time Russians emulated the German example. Meanwhile our own campaigns in the Civil War illustrated the framework, concepts, and the issue of simultaneity and successive campaigns, particularly through Grant's conduct of operations with Sherman and Meade.

Hence the origins and evolution of operational art are multi-national and retrospectively applied. The "founder" of modern operational art may be said to be von Moltke because of his usage of the term and clear differentiation between roles as strategist and operational commander. Thus, after Moltke's application, other nations--Russia, Soviet Union, France, and the United States--all re-looked at what was involved in operational art.

Our present day conceptualization of operational art is really derivative from multi-polar origins and evolution.

**What is Different?**

There is a different logic in operational art. There is a different way of thinking.

The dimensions of war change between strategy, operations and tactics. For example, the strategist aims at the center of gravity of the enemy, be that the nation's will or the delicate seam of an alliance or a key resources. The operational artist's center of gravity is the mass of enemy military forces and its control. At the third level, the tactician has a more limited perspective. For example, tactical commanders are concerned with how to fight. Operational commanders define where and when to fight, strategic commanders decide whether to fight or not. In tactics, maneuvers and fires are partners. At the tactical level, one uses fires to enhance maneuver, maneuver to enhance fires. At the operational level, maneuver and operational fires are used to create imbalance against the enemy and achieve momentum and tempo for ourselves. In tactics, intelligence is concerned with capabilities. At the operational level, intelligence is more concerned with intention. Deception is used by the tactical commander to hide forces. In the operational conduct, deception is used to hide intent and cause the enemy to reveal his intent, thereby placing the enemy at the horns of a dilemma.

To the operational commander operational fires are used as a maneuver force. To the tactical commander fires are used to destroy enemy forces.

To the operational artist, the use of reserves is critical, but they are not the reserves--an inactive force on the bench--thought of at the tactical level. Reserves at the operational level should be thought of as the future use of forces which may or may not be

presently engaged over time. Reserves are future forces. Logistics can also be considered reserves because logistics--at the operational level--is different from the tactical feed and fuel concept. At the strategic level, force generation capability and logistics are the reserves. At the operational level, logistics is another form of reserve. At the tactical level, logistics is used to affect the battle in progress.

Geography is different viewed by the strategist: continents, oceans and space are his horizon. To the operational commander, water becomes an approach, air the ability to transport, ground one of movement. To the tactical commander, specific mediums include key terrain, under-and above water and air-means of delivery of fire. Geography has a different perspective to each of the three level commanders, literally a different way of seeing the theater, campaign, or battlefield.

At the strategic level, the commander looks toward the outcome of campaigns of the war as a means of achieving policy objectives. His time horizon is distant. At the operational level, the commander looks to the future; he looks beyond the outcome of battle. He is concerned with several moves ahead in days, weeks, and even months. The tactical commander looks toward the outcome of engagements and battles in hours, probably tomorrow.

Using a gaming analogy the strategist plays Japanese chess termed "Go"; the operational commander plays several games of chess, the tactical commander plays PACMAN.

Put very simply, perhaps too simply, the strategist formulates aims and generates capabilities; the operational commander seeks unity of effort over time; the tactical commander orders immediate action on the field of battle.

Operational art is the same in war and peace. In situations short of war, the same military aim is to unhinge the opponent with the implications of the use of force. This is the Sun Tzu concept of the winning without battle. This is different from a tactical commander fighting the enemy. And again different from the strategists' view of attaining political aims.

Operational art holds to two parts: planning and execution. Planning a campaign in all of its phases, either sequential or simultaneous, is relatively straightforward and easily understood. Different at operational level is the sum of its parts. The synergism of its parts. MacArthur at Inchon is an example. Inchon enveloped the enemy and cut the North Korean line of communication precipitating a withdrawal to the Yalu. Commitment of the same force, X Corps, to an envelopment in the vicinity of the Pusan perimeter would not have had the same effect. The other synergism is in the simultaneity of planned and executed action. Like the judo expert, a moving body is easier to dislodge than a stationary body. Hence, planned actions must be executed with the sum-part concept in mind.

In summary, operational art is different in sum and part. It is more than tactics writ large or strategy practiced small. Operational artistry is not tactical proficiency. It must be seen from the top down. The operational artist must create a vision of unity of action which carries out the strategic objective. Hence, operational art must be understood as having a different logic.

Operation JUST CAUSE--the American campaign in Panama--is an example of operational art. First, objectives were set by the National Command Authority, clearly articulated by the President, reinforced by the Secretary of Defense and the Chairman of the Joint Chiefs of Staff. The four objectives included political objectives which were then translated into military missions. The theater contained forward deployed forces which were reinforced by strategically deployed forces. The concept of operation was formulated and executed by the Theater Commander. National and operational intelligence perspectives and deception were used with advantage and remarkable foresight. Schemes of ground and air maneuver were clearly planned and executed. Operational fires were disciplined. Use of centrally deployed reserves was critical to the unfolding concept of operations. Operational logistics brought mobility to the entire scheme of maneuver. Campaign termination was thoroughly thought through. Lastly, and perhaps most importantly, the entire campaign held to a firm concept of command. In short, JUST CAUSE typifies the use of a framework of analysis for understanding the logic and perspectives of operational art.

**Framework of Analysis**

A way of looking at what the operational artist does and how he does it, is to use a framework of analysis in constructing and evaluating a campaign. The operational artist is like the composer writing a score--a campaign plan--and then executing his composition when he mounts the podium. He must understand, for example, that the brass section--operational fires--will not perform as the string ensemble--maneuver. In short, an operational artist must understand how to compose, write and conduct music. This framework is designed to underscore the different logic and perspectives for the operational commander.

OBJECTIVES: Clausewitz tells us that policy dominates the conduct of warfare, in his much used phrase, "Warfare is the continuation of politics by other means." Every state's reason for going to war must have a political and military objective. The definition of a national and political objective, and the determination of the means to achieve them, is strategy. The translation of military and political objectives to military objectives in a theater of war is operational art. One should be attentive to the differences between military and political objectives and sensitive to the differing levels of warfare as one conducts a campaign analysis. In this regard, the term, center of gravity, will be important in defining objectives. The center of gravity may be the "will of the enemy," the "seams of the alliance," or the "enemy's territory and capital."

Contemporary thinking postulates that warfare is conducted through the interrelationship of three levels; strategic, operational, and tactical. The strategic view of a theater of war holds to the political and military objectives being realized. The strategic commander sees the theater as a whole. He views the primary nature of its geography and the general nature of forces in the theater. The operational commander may be the theater or sub-theater commander. He holds to a different view. He has to realize certain military objectives. These objectives concern the nature of the force he opposes. The center of gravity for the operational artist will be the "hub and power" of this force, its mass, and most importantly its control. (This is not just C3; but the mind of the opponent commander and his methodology of control of the mass of forces.) Hereby, the operational commander will also look to the geography of the theater to determine broad plans of action which will facilitate his concept of operations.

CONCEPT OF OPERATIONS: What makes for a successful campaign? How does a commander integrate and synchronize the diverse forces under his command and direct them to carry out the mission. A commander should have thought through the plan which will accomplish the operational objective which will realize the strategic goal. The concept must convey his intent and insure unity of effort.

INTELLIGENCE: The ability to see. This is not just what meets the eye, but rather the ability to visualize the opponent's intent and capability. The commander who, in this contest of wills, thinks through what his opponent's interests and actions are, the commander who does an hypothesis of enemy intentions, will be better prepared to accomplish his own course of action. Look for this ability in successful commanders. Also, a commander may focus on answering the questions: where are the enemy's reserves? When can they move? Does the enemy force commander have any? If not, is there an indication of main effort which can realize the creation of forces in future time.

DECEPTION: The ability to fool and not be fooled. Deception is best when it causes the opponent to convince himself of the certainty of his own actions; it is best when it causes him to make choices, placing him on the "horns of the dilemma." Deception is not merely "cover and concealment." Deception aims at causing surprise, and creating ambiguity, both of which can cause the psychological breakdown of the enemy commander.

MANEUVER: This is more than just movement. It is a concept of the integrated use of various forces and functions to unhinge the enemy. Maneuver creates leverage which generates opportunity. Maneuver is placing the right forces at the right place at the right time for the right purpose. There must be a scheme of maneuver. See how various commanders throughout history applied this concept.

OPERATIONAL FIRES: This is a new term in today's setting. It is the integrated application of land, sea, and air fires to attain an objective. The term can be seen as the concentration *of fires* creating leverage. But operational fires are not just the massed application of artillery and air fires, or naval fire

support; rather it is the application of fires on critical components of the enemy which cause him to quit. This is not just "fire and movement" writ large; rather it is an understanding of the combination of speed of movement with delivery of fire. Special operating forces, heliborne and air delivered forces, one could argue become operational fire in application, and that may be maneuver understood differently!

RESERVES: The strategist generates them, the operational artist creates them through future force capabilities, and the tactical commander has them at the ready. In each case reserves are critical to the outcome of the war, the campaign and the battle. Forces in reserve placed at the right time and place, created from extant or generated forces, decide the outcome.

LOGISTICAL FUNCTIONS: It's more than bullets, beans and fuel. Logistics means the ability to mass and sustain combat power. It can be a flexible reserve. It is a way of structuring a battle, campaign, or strategy. Logistics must be efficient and effective. It must be calculated to create possibilities for future force utilization.

COMMAND: A methodology for the integrated, orchestrated, synchronized application of force. The commander is a composer and conductor; he is a chess player, playing multiple games on different boards. The commander must have vision, purpose, balance, and concentration. Methodology of control may be different still. Communication of intention through simple, crisp, common sense direction is the key. When you analyze the commanders, look for some of these traits.

**Practical Application**

An operational commander really doesn't have to do much. All he has to do is decide when to start, where to place the decisive effort, when to create and commit a reserve, where and when to re-constitute a force, when, where and for how long to accept pressure--to stand the pain--and then to know when its finished. That is all! Not much for him to do! He must be able to visualize days, weeks, months into the future and see the way to influence the opponent, to force him to make more and more choices that will yield to the opponent's undoing.

An operational commander must husband strength. His own and that of his force. He must be able to see and feel intuitively the trials and tribulations of his tactical commanders--in a sense to be able to ignore their pleas for help while understanding their situation. He must be able to lead from the front while holding to the reflective safety of position echelons or miles from the front line. In short, he must have a sixth sense, a *"Fingerspitzengefuehl."* An operational commander must be able to know when to continue to expend strength--lives--in order not to waste strength and lives.

Clausewitz used the term creative genius. Moltke used the term flexible direction. Other military leaders have given different expression to a sense of vision which an operational commander must possess.

Practical application of operational art will increase in conflict short of war. The operational commander's vision must practice the leverage against an opponent with the use of force liberally without fighting. Operational vision is the use of force to so limit an opponents options that fighting will be futile.

How does one inculcate vision in an operational commander? I was privileged to ask a number of four-star operational level commanders that question, including several with wartime experience. How did you get to be good at this job? Many replied by relating their previous experience at the tactical level. Others stepped back and replied in all candor that they were not yet educated to be operational commanders. Others indicated that only through their experience, nurtured by critical historical analysis and study where they were fitted to the operational task of command. Hence education and training through historical analysis.

Learning by doing through the use of history.

**Future of Operational Art**

If the perspective and logic of operational art holds true as argued above then it is the linkage of operational art between strategy and tactics which will continue to dominate the conduct of war and conflict short of war. Indeed, one could make the argument that with a smaller Army, less of a threat from our former primary opponent the Soviet Union, that more not less operational artistry is needed.

Vision and imagination will be even more necessary in future conduct of campaigns.

## APPENDIX

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**Epilogue**

# Gettysburg and the Operational Art

**Colonel Art Grant, USA**
**National War College**

Gettysburg is a fascinating battle to study. Recounting Colonel Josh Chamberlain's efforts to check Longstreet's furious assault on the slopes of Little Round Top on July 2d is always worthwhile for students of leadership. For many Southerners, the battle represents the turning point of the American Civil War as seen in the Confederate "high water mark" in front of a little clump of trees on Cemetery Ridge. For them, if the Confederacy ever had a chance, it was forever lost at Gettysburg. But this is not a study of the battle. Students of war will have to turn elsewhere for the tactical details of Robert E. Lee's first major defeat as the commander of the Army of Northern Virginia. Instead, this is a study of the Gettysburg Campaign as viewed from the operational level. Chamberlain and the clump of trees were tactically important, but they were not the most crucial issues to be considered by the operational commanders. The intricacy of the operational art is the focus here.

It was nearly unanimous: the Army of Northern Virginia would take the war to the enemy. With the exception of the Postmaster General, the Confederate Cabinet voted on and approved in May 1863, Robert E. Lee's proposal to invade Pennsylvania. Confident of success, the Government placed its hopes in the South's most successful commander. He would redeem the Confederacy's declining fortunes and preserve the new nation's future. The hope for a successful military strategy was now in the hands of the operational commander.[1]

As a concept, the operational level did not exist during the American Civil War. Strategy and tactics were frequently used terms, but even they lacked the precise meanings we ascribe to them today. Having rushed into a war for which neither side was prepared, both Northern and Southern leaders were more interested in finding out what worked than in academic discussions about levels of war. Nevertheless, by May 1863 both sides were aware of the acute relationship between politics and war at the theater level. They understood that operational successes and failures determined their nation's respective political futures.

In the previous September, the commander of the North's principal eastern army--the Army of the Potomac--was relieved from command partly for misunderstanding that relationship. Major General George B. McClellan had been involved in political arguments with the President of the United States, but he had been unable to deliver the military victories that might have made his political positions more important. Similarly, early the next Spring, a different commander of the Army of the Potomac also had made strong political statements, mentioning that the nation needed a good dictatorship to pursue its goals successfully. Abraham Lincoln told that general that if he could deliver military victories, the President was prepared to worry about the threat of dictatorship. Politics were on everybody's mind.[2]

Only in the western theater was the North collecting military victories that might provide political hope for the future of the United States. Major General Ulysses S. Grant started a virtually uninterrupted series of victories at Forts Henry and Donelson in February 1862, and, by May 1863, his army stood at the gates of Vicksburg, Mississippi. Everyone understood the political importance of Vicksburg. To the United States, Vicksburg represented the only remaining impediment to reopening the riverborne trade from the northwest. Its seizure would open the Mississippi River, cut the Confederacy in two, and provide important political capital for continuing the war. To the Confederate States, Vicksburg was a link to the west and the scene of four previous Northern failures. As Grant's ring of troops tightened their hold around it, Southern leaders argued over its importance and Confederate strategy. Many of the strategic discussions hinged on the issue of the political outcome that could be expected. Politics and war were closely intertwined.

**Strategic Setting**

The Confederacy was in a difficult strategic position. The South's resources were severely strained by the three major fronts along which the Northern armies operated. Grant was hammering at Vicksburg. In central Tennessee, Major General William S.

Rosecrans aimed the Army of the Cumberland at the heart of the deep south. Only in northern Virginia was there hope. Robert E. Lee had checked, then outmaneuvered, and finally driven a much larger Army of the Potomac back across the Rappahannock River near Chancellorsville in early May 1863. Lee's brilliant victory seemed to offer opportunities. But the strategic meaning of those opportunities was not clear.

In mid-May, Lee discussed alternatives with President Jefferson Davis, Secretary of War James Seddon and other members of the Confederate Cabinet. As in many important strategic discussions, much of the talk focused on priorities.[3]

There was a strong move afoot to shift some troops from Lee's Army to the Confederate forces in front of Vicksburg. Lee's resounding victory at Chancellorsville bolstered this argument because most of the corps under James Longstreet had been on operations in southeastern Virginia during the battle. Even without this sizeable force, Lee had been able to humiliate his Federal opponent, Major General Joseph Hooker. It appeared, therefore, that Lee could adequately defend northern Virginia without a portion of Longstreet's corps which then could be sent to the west to help the situation there.[4]

Lee would not hear of it. To him, the choice was clear. Northern Virginia was the most important theater of operations. A Federal army that outnumbered his by three-to-one stood ready to seize the Confederate capital at Richmond if the situation presented itself. While Chancellorsville had been a great victory, it had not been an easy one. On several occasions an opponent more aggressive than Joe Hooker might have defeated his army in detail. Not only should he not send forces from his army to the west, Lee argued that forces from other areas of the Confederacy should be sent to reinforce the Army of Northern Virginia. Resurrecting a concept discussed on several previous occasions and tried once before, Lee urged an invasion of the North.[5]

An operational commander must be concerned with the political objectives of his campaign. Lee's participation in the governmental level discussions of his proposal should have provided him with an unique opportunity to understand the goals that his political masters wished to be achieved. During the lengthy discussions, he had the chance to detect all of the nuances about the military conduct of the war which were troubling the South's leading politicians. Moreover, he was in a position to gain great insights into the thinking of his commander-in-chief, President Jefferson Davis, while Davis was articulating his positions on issues to both Lee and the Confederate Cabinet. Several of the participants later either wrote about or discussed the results of the meetings as they concerned Lee's campaign objectives. When analyzed carefully, it is clear that there is disagreement between their views of Lee's objectives. There are some objectives that are troubling because they display a lack of clear thinking. This tells a lot about why the battle of Gettysburg occurred as it did. The lengthy discussions may have contributed to the foggy condition concerning *exactly* what Lee was supposed to accomplish.

Lee was explicit about his desire to invade in order to draw the enemy away from its excellent defensive positions behind the Rappahannock River in northern Virginia. In its present location along the river, the Army of the Potomac was not vulnerable to a frontal assault. Additionally, an invasion around a flank would force a response from Federal forces threatening other areas of the South. Lee reasoned that reinforcements would have to be shifted north from Federal operations along the coasts of South Carolina, Georgia, and Florida in order resist his invasion. Thus, an invasion would relieve Union pressure against other fronts, retain the initiative in northern Virginia, and draw Lee's enemy away from natural defensive barriers.[6]

Lee was greatly concerned about feeding his army. Northern Virginia farms had been supporting the war effort almost from the first days of combat. An invasion would allow Northern farmers to share the burden of supplying two opposing armies as they marched through the countryside. In addition, Lee would be able to gather sufficient supplies not only to subsist, but also to stockpile for future operations. It was an attractive objective for a commander constantly concerned about where sufficient supplies could be gathered.[7]

A peace movement had been gaining momentum in the North. Lee hoped that an invasion might divide the United States even further than it had been divided by the secession crisis of 1861. Northern farmers, seeing their crops being traded for

worthless Confederate money, might demand an end to the war to eliminate the deprivations they were suffering. Northern peace parties might also be persuaded that ultimately the South only wished to be left alone in peace. A politically divided and weakened enemy was a worthy objective.[8]

Less clear was the issue of when and where to fight the Army of the Potomac. Lee had no intention of fighting it along the Rappahannock River. It was also clear to him that the Federals would pursue him if he successfully crossed the Potomac River and marched northward into Pennsylvania. A battle would be virtually inevitable. But one witness to the Cabinet discussions wrote that Lee's mission was to "threaten" Washington, Baltimore, and Philadelphia. Lee said after the campaign that he had hoped to "occupy" Philadelphia. A senior member of his staff later said that Philadelphia was not a campaign objective. Instead, Lee intended to fight a major battle west of the Susquehanna River in Pennsylvania. A victory there would give him virtual control of Maryland, western Pennsylvania and western Virginia.

Even a cursory examination shows that these objectives create decidedly different military missions. Threatening, occupying, or bringing the enemy to battle in a specified region are not necessarily objectives that support one another. Each mission could create very different requirements for the disposition of the Army of Northern Virginia. Perhaps Lee's confidence in the abilities of his army overshadowed his considerations about the precise circumstances under which he would accept battle.[9]

Lee was certain of his army's great abilities. In its two most recent major battles--Fredericksburg in December 1862 and Chancellorsville in May 1863--the Army of Northern Virginia had performed exceptionally well. Stating that, "There never were such men in an army before," Lee knew they were invincible if they were properly led and organized. Believing this, then, Lee might not be too concerned about the enemy's army. Whenever and wherever the Army of the Potomac chose to fight, the men of the Army of Northern Virginia would be ready to beat them once again.[10]

Proper organization of his army had been an issue bothering Lee for some time. Each of the two Confederate corps comprising the Army of Northern Virginia had grown too large for a single commander to lead effectively. Always sensitive to his subordinate's sense of honor and dignity, Lee had been reluctant to appear dissatisfied with his subordinates' performances by dividing their two corps into three. During the Battle of Chancellorsville, however, one of his corps commanders, T.J. "Stonewall" Jackson, was killed. A shocking loss on the one hand, it also gave Lee the opportunity to reorganize his major units on the other.[11]

Lee's reorganization did not only affect command of his corps. As officers were moved upward into their new positions as corps commanders, they left vacancies at the division level. When these new vacancies were filled by officers from lower echelons, additional commanders had to be found to replace them. The net rippling effect of the reorganization was that approximately two-thirds of the major units of the Army of Northern Virginia were under new leaders when it embarked on its invasion of the North.[12]

For the Army of the Potomac in positions along the Rappahannock River, the problems were equally difficult. Major General Hooker's excellent plan for the spring campaign had ended in disaster at Chancellorsville. Most historians view the Army's failure during the battle principally to be a failure of Hooker's confidence in himself. Lee had achieved a moral ascendancy over him. The Federal forces could not compensate for the vacuum in top level leadership through any amount of hard fighting at the tactical level. Nevertheless, President Lincoln retained Hooker in command after the battle, and the Army's leadership crisis at the top would create some difficult days ahead.[13]

As Commander-in-Chief, Lincoln, and his General-in-Chief, Henry W. Halleck, visited Hooker's headquarters soon after the battle at Chancellorsville. Lincoln asked Hooker what he intended to do, mentioning that an early move against Lee could restore some of the Army's morale that might have been adversely affected by the recent battle. Hooker's reply was defensive, stating that the performance of one of his corps in the battle might cause that corps to be discouraged or depressed but that the rest of the Army was ready to fight. He further indicated that he would continue to operate along the same line toward Richmond that he had chosen before the battle.[14]

Hooker then developed plans to move south of the Rappahannock River once again. On May 13th, he notified Lincoln that he was going to move on the following day. Alarmed that the move might be premature, Lincoln called Hooker to Washington. Upon Hooker's arrival on the following day, the President handed him a letter giving him his objectives.

> I therefore shall not complain if you do no more for a time than to keep the enemy at bay and out of other mischief by menaces and occasional cavalry raids, if practicable, and to put your own army in good condition again.[15]

Thus by the end of May, Lee was preparing the Army of Northern Virginia for an invasion of the North while Hooker maintained the Army of the Potomac in its positions along the Rappahannock. Lee intended to gather supplies, threaten some major northern cities, promote the northern peace movement, draw the Army of the Potomac away from the Rappahannock River and fight a battle somewhere at sometime. Hooker had his orders to keep Lee out of mischief and to rebuild his army.

**Invasion!**

Major General James Longstreet's Confederate Corps left its positions near Fredericksburg on June 3d. Two days later, Major General Richard Ewell's Corps also marched westward for the Shenandoah Valley. Lee kept Major General A.P. Hill's Corps deployed near Fredericksburg. Keeping Hill in position as a rear guard, Lee also hoped that Hill's presence would deceive Hooker into believing that the Army of Northern Virginia's dispositions were unchanged.

Hill's position helped Lee address a bothersome course of action open to Hooker. One of Lee's intentions was to draw the Army of the Potomac northward. Hooker, however, could choose to advance *southward* and attempt to seize Richmond. If that threat developed in his rear, Lee could not afford politically to continue an advance into Pennsylvania and leave the Confederate capital open to capture. He would have to follow Hooker southward, who would then have seized the initiative. Hill's presence at Fredericksburg helped to prevent Hooker from choosing that alternative.[16]

Lee's concern for Richmond extended beyond Hooker's potential moves at Fredericksburg. Southeast of Richmond, more than two Federal corps were operating in the vicinity of the York and James rivers. Probably too small to capture the capital, the Union force nevertheless represented a potential threat that could also upset Lee's plans. It could become a covering force for a major enemy operation along the James River. While Lee's army was in the Shenandoah Valley moving northward, Hooker might shift his army rapidly by water to the James and fall in behind the two corps. McClellan had made a similar move in 1862 during the Peninsula Campaign. Fortunately for Lee, this threat never materialized. The Federal force under Major General John A. Dix never became a more serious threat than a force to be watched carefully.[17]

Lee's moves puzzled Hooker. By June 5th, Hooker had decided that the Army of Northern Virginia was up to something. Some of the Confederate camps had been abandoned, and Hooker surmised that Lee might be embarking on another invasion of the North. In order to test the strength of Lee's remaining force, he ordered the VI Corps commander to conduct a reconnaissance in force in front of some pontoon bridges south of Fredericksburg.

Major General John Sedgwick, the VI Corps commander, already knew the answer. He quickly responded to Hooker's order and reported that the Confederates had strengthened their picket line and moved some additional artillery into forward positions. If the Federals attempted to advance more than 200 yards they would be decisively engaged . Apparently, Lee's directive to A . P . Hill was being carried out effectively; to the VI Corps commander, the Army of Northern Virginia's positions were as strong as ever.[18]

Hooker was not convinced. He believed that if only a rear guard existed at Fredericksburg he had an excellent opportunity to destroy this smaller force. Asking Lincoln's permission to cross the Rappahannock, Hooker added that there were some distinct disadvantages to his proposal. His advance might make the supply lines along the Orange and Alexandria Railroad vulnerable near Warrenton.

Furthermore, Lee's army could end up located between his army and a Union force at Harpers Ferry. Exposed, the force at Harpers Ferry might be defeated in detail while Hooker was south of the Rappahannock.[19]

Lincoln quickly rejected Hooker's idea. He told Hooker that by advancing southward toward Richmond, the Army of the Potomac would be fighting an entrenched force--a very difficult task. While the Federal army fought the smaller force at Fredericksburg, the remainder of Lee's army would have freedom of action elsewhere. In a separate note, Halleck supported Lincoln's views and told Hooker that the enemy's march column was his proper objective. He added to Hooker's doubts about the Confederates' dispositions by suggesting that perhaps the enemy force at Fredericksburg was Lee's main army and a smaller, but still strong force had departed for a raid into Maryland and Pennsylvania. Hooker responded appropriately by sending his main reconnaissance force, the Army of the Potomac's cavalry corps, on a raid against the Confederates.[20]

Complying with Hooker's directive, Major General Alfred Pleasonton led his cavalry across the upper Rappahannock River on 9 June. He intended to advance on Culpepper Court House and destroy any Confederate supplies that he might find there. He never reached Culpepper, instead striking a large force of Confederate cavalry under the famous Jeb Stuart at Brandy Station on the Orange and Alexandria Railroad. A seesaw mounted clash occurred with the Confederates eventually getting the upper hand. But the Battle of Brandy Station had many consequences for the campaign, some of which were not immediately obvious.

First, Pleasonton returned with some of the information that Hooker thought he needed. Pleasonton reported that he had caught Stuart's cavalry prepared to mount a raid. This seemed to support Halleck's suggestion to Hooker and confirm Sedgwick's report on June 6th; Lee's army was still at Fredericksburg and only a raiding force was being assembled to threaten Maryland and Pennsylvania. Second, the Federal cavalrymen completely surprised Stuart's force and although finally driven back across the river, gave an excellent account of themselves. To them, the famed Confederate cavalrymen were no longer invincible. Third, Stuart was embarrassed by having his cavalry surprised by the Federal attack. This would later be important when Stuart sought a means to redeem his reputation.[21]

After examining Pleasonton's report of the battle at Brandy Station, Hooker resurrected his previous plan to march south and seize the Confederate capital. Wiring Lincoln on 10 June, Hooker again asked permission to seize Richmond if it was determined that a sizeable infantry force was accompanying Stuart on his raid. Lincoln's response was immediate and to the point.

> I think Lee's army, and not Richmond, is your sure objective point. If he comes toward the Upper Potomac, follow on his flank and on his inside track, shortening your lines [of communications] while he lengthens his. Fight him, too, when opportunity offers. If he stays where he is, fret him and fret him.[22]

While Hooker fretted over his next move, Lee's campaign continued to unfold smoothly. Ewell's Corps captured almost half of the sizeable Federal force located--and isolated--at Winchester on June 14th. Over 4,400 officers and men, 200,000 rounds of small arms ammunition, and 23 artillery pieces fell into Confederate hands. Hooker was unaware of the magnitude of the disaster until Major General Robert H. Milroy and 1,200 of the remainder of his force straggled into Harpers Ferry on the 15th and reported the extent of the debacle. To further confuse Hooker, Lee ordered Longstreet's Corps to move northward and remain east of the Blue Ridge Mountains. This might give the impression to the Federal commander that Lee was threatening the Orange and Alexandria Railroad in an attempt to turn Hooker out of his positions along the Rappahannock River. Three cavalry brigades covered Longstreet's front and flank. Lee attempted to deepen the deception by having Ewell advance his corps toward the Potomac. This could cause Hooker to vacate his positions along the Rappahannock in order to contest Ewell's crossing of the Potomac. If Hooker took the bait, A.P. Hill's Corps would then be able to leave its positions at Fredericksburg unopposed and rejoin the main Confederate army. Stuart assigned one brigade of cavalry to cover Ewell and two brigades formed a link between Hill's corps and the main army.[23]

After arranging his corps dispositions to confuse Hooker as to his true intent, Lee then developed a plan to place his opponent on the horns of a dilemma. The Confederate commander asked President Davis on June 23d for assistance in executing the plan. Lee proposed that Davis assemble units from the Confederate forces in North and South Carolina and Georgia and reinforce General P.G.T. Beauregard's command at Richmond. Beauregard should then take this new army and march to Culpepper Court House. From that location, Beauregard's force would be in a position to threaten Washington. Davis turned down Lee because there was not enough time to organize the force. Moreover, Beauregard's own units could not afford to leave the vicinity of Richmond because of Dix's Federal forces operating between the York and James rivers near Yorktown.

If implemented, Lee's proposal would have had a tremendous psychological impact on Hooker. Eventually, Hooker would have sifted through all of the conflicting evidence and determined the true nature of Lee's invasion. By that time, however, Beauregard would have been in Culpepper. For Hooker, it would have been a profound dilemma. Should he go after Lee's army in Pennsylvania, attack Beauregard's smaller force at Culpepper, or remain in a defensive posture to try to protect Washington, Baltimore, and Philadelphia from both Lee and Beauregard? If he kept his army massed and attacked one of his two opponents, a clear possibility would have been that the ensuing battle would have been indecisive. The unengaged Confederate force would then have a free hand to accomplish much operationally. If he piecemealed his army to try to engage both his opponents, he would have stood a strong possibility that another Chancellorsville would occur; personal ruin and disaster for the Union cause would have been very reasonable outcomes. By this stage in the campaign, the true genius of Robert E. Lee was quite clear. Hooker was clearly coming out second best in a race of two people.

Ten days after the Army of Northern Virginia had left its positions along the Rappahannock River, Hooker responded with an order to the Army of the Potomac. He shifted his line of communications to the Orange and Alexandria Railroad and directed his corps to positions making Centreville the center of mass. Albeit a relatively cautious move, nevertheless it was long overdue. Even some of Hooker's corps commanders already had surmised that Lee was off on a major invasion of the North.[25]

Hooker's frame of mind is discernible from some of his correspondence. On the day after he ordered his army to shift to Centreville, he sent a letter to Lincoln indicating the focus of his attention. Hooker asked the President if he knew whether Winchester had been seized by the Confederates. Obviously this was an important question because it was at this time that Milroy's command was passing into ignominy. Hooker concluded his message with a comment that makes it clear that he was less concerned for Milroy's men than he was for himself.

I do not feel like making a move for an enemy until I am satisfied as to his whereabouts. To proceed to Winchester and have him make his appearance elsewhere, would subject me to ridicule [emphasis added].

Clearly, Hooker was not focusing on acting aggressively or decisively. He was focused on his own appearance.[26]

From June 17th to the 24th, Hooker continued to feel his way forward in the direction of Lee's line of communications. He consolidated his army's positions east of the Blue Ridge Mountains and ordered Pleasonton's cavalry division to learn more about the Confederates. Stuart's Confederate cavalry, however, had erected an effective screen, and several large clashes occurred as Pleasonton aggressively tested the Confederate cavalry's strength.

Intelligence information other than that being provided by Pleasonton reached Hooker from several sources. Probably the best information came from Major General Darius N. Couch. Couch had been a corps commander under Hooker during the Chancellorsville Campaign. Following that battle, he had left the Army of the Potomac in disgust and was appointed the head of the newly created Department of the Susquehanna. Headquartered in Harrisburg, he controlled only militia forces. Nevertheless, he became the focal point for much of the information that was being collected by agencies outside of the Army of the Potomac as Lee advanced through Maryland into Pennsylvania.

The Pennsylvania Central Railroad played an important part in this network. Probably acting as much out of self interest as out of a sense of patriotism, it organized scouting parties that worked initially out of Williamsport, Maryland, and also conducted activities from Chambersburg and from the region west of the Cumberland Valley in Pennsylvania. Couch assembled information from sources such as these and forwarded them to Hooker and to the War Department.[28]

Hooker was not inspiring confidence. Beginning to shift his forces in the direction of Lee's apparent line of communications, he reported his moves to Washington on June 24th and added, "I don't know whether I am standing on my head or feet." He seemed unaware that his own fortunes were declining because he then became involved in fatal arguments with Lincoln and Halleck.[29]

Harpers Ferry was the issue. Almost since the beginning of Lee's campaign, Hooker had been concerned over the fate of that important location. Not only was it located at the confluence of the Potomac and Shenandoah rivers, astride the Chesapeake and Ohio canal and along the Baltimore and Ohio Railroad, it lay directly along the invasion route of any Confederate force marching down the Shenandoah Valley toward Maryland. Early in the campaign, Hooker wanted to be in charge of the garrison there so that he could withdraw the forces to his own army at the opportune time. Lincoln and Halleck retained control of the garrison and told Hooker that Harpers Ferry must be held. In a personal meeting in Washington on June 23d, Lincoln and Halleck again told the general to hold the town. Upon his return to the army, Hooker sent a corps in the direction of Harpers Ferry, but it was not the end of the issue.[30]

Hooker was also having a feud with Halleck over reinforcements. Convinced that Lee's army outnumbered his, he peppered the War Department with requests for additional troops. After his meeting with the President on the 23d, he sent his chief of staff, Major General Daniel Butterfield, to Washington to seek additional reinforcements from the troops manning the capital's defenses. Over 25,000 soldiers already had been sent either to Hooker or to Dix's forces near Yorktown, so Halleck told Butterfield that no more troops were available. But Hooker still saw Harpers Ferry's 10,000 men as a ready source.[31]

Hooker did not abandon the Harpers Ferry issue. On June 26th, he wired Halleck:

> Is there any reason why Maryland Heights [at Harpers Ferry] should not be abandoned after the public stores and property are removed?...It must be borne in mind that I am here with a force inferior in numbers to that of the enemy and must have every available man to use on the field.

After again being told to hold Harpers Ferry, Hooker wired Halleck on the 27th:

> I have received your telegram in regard to Harper's Ferry....Here [those troops] are of no earthly account...Now they are but bait for the rebels.[33]

Later that same day, Hooker, looking for more troops--and perhaps in his continuing mental struggle over what to do, looking for reassurances from the capital, brought matters to a head.

> My original instructions require me to cover Harper's Ferry and Washington. I have now imposed upon me, in addition, an enemy in my front of more than my number. I beg to be understood, respectfully, but firmly, that I am unable to comply with the condition with the means at my disposal, and earnestly request that I may at once be relieved from the position I occupy.[34]

Halleck quickly replied:

> Your application to be relieved from your present command is received. As you were appointed to this command by the President, I have no power to relieve you. Your dispatch has been duly referred for Executive action.[35]

Action was forthcoming.

Very early on the morning of June 28th, the V Corps commander, Major General George G. Meade, was awakened by an officer from Halleck's staff. Colonel James A. Hardie told Meade that he brought trouble. Quickly, the V Corps commander searched his memory for any misdeed that might warrant his relief from command or his arrest. Finding none, he told Hardie that his conscience was clear. Hardie handed Meade a message. Indeed there was trouble in store for Meade; Hooker was relieved from command of the Army of the Potomac and Meade was to replace him.[36]

Hooker's performance truly had been lackluster. When compared to Lee, he clearly was second best. By this stage of the campaign, Hooker had shown himself unable to master his own fears, to create any uncertainties in his opponent, or to cement strong ties with his own political leaders. At first, Lincoln did not blame the defeat at Chancellorsville on Hooker. But during May he received letters and visits from generals who convinced the President that Hooker owned much of the blame for the defeat. This assessment was reinforced by Hooker's cautious response to Lee's movements in June. There is no record to show that Hooker ever had a clear campaign objective in mind for his army. Certainly he had never outlined it to his seniors or to his subordinates. He positioned his forces as though prepared to react but not to seize the initiative. His statements that indicated Lee possessed the psychological advantage over him added to a picture of a general bewildered by his opponent and afraid to fail. The final argument over the fate of the Federal garrison at Harpers Ferry was anticlimactic. Lee had seized operational control of the theater, and Lincoln had to do something.[37]

On the other hand, Lee showed that he had mastered his opponent. Skillfully positioning his corps so as to provide maximum security for his army while it moved northward, he continued to try to deceive Hooker. Some of his efforts were so complex that it is doubtful if Hooker ever understood the false picture, let alone the true one. Regardless of their effect, Lee used Stuart's cavalry so well that even if the Federals could see through the deceptions, they still would not know exactly what was happening. All of this occurred behind terrain that Lee used effectively to his own advantage. The comparison of the two generals is remarkable in the starkness of the contrast.

Colonel Hardie remained with the Army of the Potomac for several hours to determine the effect of the change in command. He reported that a sense of satisfaction ran through the army. The situation appeared to be under control. Halleck's orders handed to Meade by Hardie helped to achieve that control:

> Your army is free to act as you may deem proper under the circumstances as they arise. You will, however, keep in view the important fact that the Army of the Potomac is the covering army of Washington as well as the army of operation against the invading forces of the rebels. You will, therefore, maneuver and fight in such a manner as to cover the capital and also Baltimore, as far as circumstances will admit.[38]

Meade moved quickly to reassure the War Department that he had a firm grasp of the situation. Four hours after being notified that he was in command, he wired Halleck:

> Totally unexpected as it has been, and in ignorance of the exact condition of the troops and position of the enemy, I can only now say that it appears to me I must move toward the Susquehanna [River], keeping Washington and Baltimore well covered, and if the enemy is checked in his attempt to cross the Susquehanna, or if he turns toward Baltimore, to give him battle.[39]

To Lincoln and Halleck the contrast of this message to Hooker's previous indecision must have been remarkable. Here was a general who was talking about fighting Lee after being in command for only four hours!

Meade was an excellent choice to command the Army of the Potomac. A Regular Army officer, he had been a commander at every level from brigade through corps. He had led the V Corps at both

Fredericksburg and Chancellorsville, and at the latter battle, had urged Hooker to remain south of the Rappahannock River and continue the fight. Quick to criticize himself if he made mistakes, he was equally hard on those who fell short of his high standards. Swiftly, this experienced, combat commander set about organizing his army to find and fight the Army of Northern Virginia.[40]

He asked several officers to be his chief of staff. It was customary for a commander to appoint his own chief of staff, and Daniel Butterfield was Hooker's man. Twice turned down, Meade accepted the advice of his second choice, Brigadier General Gouverneur K. Warren who said it was a bad idea to change chiefs of staff in mid-campaign. Butterfield stayed on as chief.[41]

Many historians have examined Lee's reorganization of the Army of Northern Virginia and concluded that it had an adverse effect on Confederate performance during the Gettysburg Campaign. Meade, however, faced circumstances at least equally as difficult. He assumed command of an army in mid-campaign, not knowing the dispositions of the enemy and unaware of his predecessor's intentions. One of his corps, the II Corps, received a new commander on May 22d. His own corps, the V, received a new commander when Meade assumed command of the army. The Cavalry Corps came under the direction of Alfred Pleasonton on May 22d and the XI Corps received a new commander in April. Finally, the artillery also recently had been reorganized significantly. Each of these factors created some organizational turmoil for the new commander, but Meade proceeded with confidence.[42]

Meade attached the First Cavalry Division under Brigadier General John Buford to the trusted I Corps commander, Major General John Reynolds. Meade told Reynolds to advance northward into Pennsylvania and seek out the enemy. If Reynolds could find suitable terrain, he was to fight Lee; Meade would reinforce Reynolds' effort with the remainder of the army. If a good battle position could not be found, Reynolds was to withdraw toward the Army of the Potomac as it was advancing northward on a wide front in the direction of York, Pennsylvania. According to this alternative plan, Meade would bring the Army of the Potomac together along Pipe Creek in Maryland. It is clear from Meade's orders that he deployed his forces for an offensive operation which embodied the important elements of what today would be called a movement to contact.[43]

June 28th was a momentous day for Robert E. Lee as well as for George G. Meade. On that day, Lee was surprised to learn that the main Federal army was north of the Potomac River, and its exact dispositions were unknown. The source of Lee's information was a man named James Harrison who had been hired by Longstreet to spy on the Union army. It may seem strange that Lee received his best information about the enemy from a privately hired spy instead of from his cavalry, but an unusual turn of events had occurred that had put Lee in the dark.[44]

A week previous to Harrison's report, Jeb Stuart proposed a daring plan to Lee. Hooker's forces were stationary and Pleasonton's cavalry had been unable to penetrate the Confederate cavalry screen. The lull in action at the operational level gave Stuart the opportunity to try to convince his commander that a large Confederate cavalry force under his supervision could ride eastward around the Army of the Potomac and then head north, joining the remainder of the Army of Northern Virginia in Pennsylvania. It would duplicate a much-heralded feat that Stuart had performed similarly against McClellan's army a year ago during the Peninsula Campaign. Not only would this dashing ride regain some of the prestige lost by his cavalry surprised at Brandy Station, it would allow Stuart's men to gather supplies separate from the main army. Lee gave his conditional consent.[45]

Lee indicated that he preferred that Stuart bring his cavalry across the Potomac River at Shepherdstown west of Harpers Ferry. But if Stuart felt that he could pass around the Federal Army "without hindrance", he could do so while "doing them [the Federals] all the damage you can." After crossing the river, Stuart was to proceed north and "feel the right of Ewell's troops" which would put him in proper position to screen the most vulnerable flank of Lee's northernmost force. Stuart was authorized to take with him three of the five available cavalry brigades. The remaining two brigades were to guard the passes leading into the Shenandoah Valley. As the main army moved northward, these remaining brigades were to leave pickets to guard the passes and then close up on the rear of the army as it proceeded north.[46]

Stuart determined that he could pass around the Army of the Potomac "without hindrance". This decision effectively removed him from the mainstream of the campaign until July 2d. He skirmished with some Federal troops, created some consternation within the Federal ranks, and captured some supplies. But his real value to the Army of Northern Virginia was not any of these things. Over the past year in which he and Lee had worked together, Stuart had built up a rapport and understanding that had worked extremely well. Stuart had the ability to anticipate his commander's intent. He had the capability to analyze the intelligence information his cavalrymen collected and to provide Lee with an accurate appraisal of the enemy. These characteristics were missing when the army commander needed them most. When the Federal army finally got moving and crossed the Potomac, Stuart was not around to detect the importance of the movements. Lee's surprise on June 28th was real and important.[47]

Lee apparently anticipated that he would learn of a Federal pursuit when the Union forces started to cross the Potomac River, the major obstacle between his army and the Army of the Potomac. It seems that he assumed that while the enemy's troops, artillery, and long supply trains crossed the river on pontoon bridges, he would have ample time to reassemble his army spread out over the Pennsylvania countryside. Harrison's report therefore caused consternation over the effectiveness of his cavalry reconnaissance. It also required that Lee respond quickly to avoid having his forces defeated in detail.[48]

Ewell's Corps was spread between Carlisle and York, with some of his forces probing Harrisburg's defenses along the west bank of the Susquehanna. At first, Lee directed Ewell to assemble his corps and rejoin the main army at Chambersburg, but upon realizing that the congestion at Chambersburg might be overwhelming, he changed Ewell's orders and told him to march to Heidlersburg. From there, Ewell could advance on either Gettysburg or Cashtown, depending on circumstances. Lee had decided that since the Federals were approaching from the direction of Frederick, Maryland, their route of march would force them through Gettysburg or Cashtown on 30 June or 1 July. With Ewell at Heidlersburg, he would be in a position to respond accordingly. Ewell was disappointed at not being allowed to continue with his efforts to seize the capital of the North's second most politically powerful state, but he moved rapidly to comply with Lee's orders.[49]

Most of Lee's two remaining corps spent two days resting in camps along the turnpike between Chambersburg and Gettysburg. On June 29th, Lee ordered Hill's Corps to advance to Cashtown and Longstreet was to follow soon behind on the 30th. Although surprised by the Federals appearance north of the Potomac River, Lee responded quickly. By the evening of 30 June, his corps were mutually supporting. The Army of the Potomac would not find his army vulnerable to defeat in detail.[50]

Meade's actions were equally decisive. Halleck initially tended to confuse the situation by providing Meade with inaccurate and conflicting information. Early in the afternoon on which Meade assumed command, Halleck informed the new commander that the Confederates probably would mass their forces east of the Susquehanna River. Later that same afternoon, Halleck added to the confusion by informing Meade that a large force of Confederates was still south of the Potomac River. Fortunately for Meade, neither of Halleck's reports proved correct. He moved his corps northward through Maryland into Pennsylvania, keeping Halleck informed of his movements.[51]

Meade's messages must have convinced Halleck of the soundness of Lincoln's decision to appoint Meade. Responding to Halleck's analysis of Confederate dispositions and intentions on June 28th, Meade told the General-in-Chief that if Lee was enroute to Baltimore, he would get his army between Lee's and the city in time to cover it. If Lee tried to cross the Susquehanna in Pennsylvania, Meade told Halleck that he was relying on Couch's forces to delay the Army of Northern Virginia until he could catch it and defeat it in detail. For the time being he was prepared to ignore Stuart's irritating but strategically and operationally harmless Confederate cavalry raid. He reassured Halleck that he would keep his army massed and prepared for any eventuality. It was clear that Halleck was dealing with a competent, confident commander. Meade reminded his Washington superior that: "My main point being to find and fight the enemy..." Although to us today this may seem like a very obvious statement, it is well to remember that *every* commander of the Army of the

Potomac who had found and fought Lee in a major battle in the past had lost.[52]

By the evening of June 30th, Meade was responding to a reasonably accurate picture of the locations of Lee's corps. Reports indicated that Ewell was in the vicinity of York and Harrisburg, Longstreet was at Chambersburg, and A.P. Hill was somewhere between Chambersburg and York. Major General John Reynolds now commanding a "wing" of three corps, was pushing northward toward the crossroads town of Gettysburg. His attached cavalry commander, John Buford, already was in the town and at 2230 hours gave Reynolds a detailed account of the movements of Lee's corps and told Reynolds that Lee's army probably would assemble at Gettysburg sometime during July 1st. Reynolds informed Meade of the unfolding events and continued to push his troops hard. Although his army's grueling pace concerned Meade, he continued the effort in the hopes of catching Lee.[53]

**Gettysburg**

On June 30th, Brigadier General James Pettigrew took his Confederate brigade to Gettysburg to get some shoes. Part of Major General Henry Heth's Division of A.P. Hill's Corps, Pettigrew was continuing his mission of gathering supplies. On a ridgeline west of Gettysburg, however, he ran into some dismounted enemy cavalry. Unsure of whether this was only another brush with militia or if it was a more organized resistance by veteran soldiers, Pettigrew withdrew. He certainly had no orders to bring on a decisive engagement with the Army of the Potomac. He returned to camp at Cashtown without the shoes.

Pettigrew briefed Heth on his encounter at Gettysburg. During the session, Hill, the Corps Commander, rode up and Pettigrew briefed him on the situation. Hill replied that he felt that there were no large enemy forces in the vicinity of the town and that Pettigrew probably had just run into a cavalry vidette. Heth recommended that he take his entire division to Gettysburg and get the shoes. Hill told him to go ahead.[54]

Lee was unaware that contact with major Federal forces was imminent. Stuart's absence from the main army on June 30th and July 1st was extremely important. Although Lee was in the process of gathering his corps so that they were within supporting distance of each other, he had not positioned them for an engagement. Stuart's presence and aggressive cavalry work by his troopers probably would have revealed that a major battle was in the offing. This would have caused Lee to position his corps in a manner different than they were on the morning of July 1st: Longstreet's Corps in camps near Chambersburg, one of Hill's divisions out looking for shoes, and Ewell's Corps approaching from Heidlersburg. Five of Lee's nine divisions were west of South Mountain and only one road through the pass at Cashtown could support a movement to Gettysburg. Although as confident as ever, Lee was poorly positioned to meet an opponent conducting a movement to contact and looking for a fight.[55]

Hill's decision to send an entire division to Gettysburg for shoes--and also to bag a few Federal prisoners perhaps left exposed by a careless commander--was a fateful one. It essentially left Lee out of the picture at a time when his presence would have been important; Lee would arrive on the battlefield long after his corps commanders had seized what appeared to them to be an excellent opportunity and had committed his army to a major engagement. The opening phase of the battle is an example of how an operational commander can rapidly lose control of a campaign when tactical circumstances overtake his plans.

When Heth tried to force his division through the Federal cavalry screen under Buford west of Gettysburg, he ran into a formidable opponent. Buford skillfully deployed his badly outnumbered cavalrymen and turned to Major General John Reynolds for help. Quickly, Reynolds brought the I Corps forward and in the process of leading them into battle, was shot and killed. Federal command passed to the next senior corps commander on the battlefield, Major General Oliver O. Howard. Repeating Reynolds' earlier call for assistance, Howard sent messages both to his nearby corps commanders and to Meade located at Taneytown. Heth, his Confederates now fighting infantry as well as cavalry, deployed both to the right and to the left to try to find a weak flank in the Union positions.

Ewell's Confederate Corps had left Heidlersburg enroute to Cashtown when Ewell received a message from A.P. Hill indicating that he was advancing to Gettysburg. Ewell redirected his

corps to that same location and about four miles from the town the men heard the sound of battle. Swiftly, Ewell responded typically by marching to the sound of the guns. It was this very strength upon which the reputation of the Army of Northern Virginia was built. Commanders were expected to assist one another and to seize the initiative whenever the opportunity presented itself. Ewell's corps thus appeared north of Gettysburg and moved into position opposite both the Federals deployed west of the town and those now beginning to arrive on the low ground on its northern edge. Ewell's initiative further committed Lee to battle.

When he heard the sounds of sustained combat coming from the direction of Gettysburg, Lee rode to A.P Hill's headquarters on the Chambersburg Pike east of South Mountain. Hill described Heth's advance on Gettysburg and explained also that he had sent Pender's Division in support. Lee rode down the Pike behind Hill's two divisions. Upon his arrival on the battlefield at about 1430 hours, he initially tried to slow down the development of the battle. Unsure of the size of the force his army was facing, he did not want to bring on a general engagement until all of his combat power was available. Unfortunately for the Confederates, Hill's third division and Longstreet's entire corps were being delayed by the single road that was available to support the movement of two corps. It would take a long time for all of his army to arrive at the scene of battle. In the meantime, after hearing several strong proposals from his corps commanders, Lee approved their requests to drive the Federals off the field north and west of Gettysburg. With the primitive communications available, it was normally wise to trust the judgments of valued subordinates and seize opportunities when they appeared.[56]

Meade, still located at Taneytown, sent two of his most able subordinates to assess the situation reported by Reynolds from Gettysburg earlier in the day. Reynolds had indicated that he might be driven from his initial positions north and west of the town, but he added that he was prepared to barricade the streets in order to hold off the inevitable Confederate onslaught. Meade sent his chief engineer, Warren, to assess the terrain and, following Reynolds' death, sent Major General Winfield S. Hancock, the II Corps commander, to take charge of the battlefield. Upon later hearing that the Union dispositions near Gettysburg appeared favorable, Meade directed all of his corps to assemble there. His earlier assessment of the operational circumstances and the deployments he made to meet them were being vindicated. In today's terms, he quickly shifted his operations from a movement to contact to a meeting engagement. Although tactical circumstances were about to overwhelm the Federals at Gettysburg, Meade had the operational situation firmly in hand.[57]

The collapse of the Federal lines at Gettysburg started on the right. The battle which had begun on the west side of the town had been building northward and then eastward throughout the day. The Confederates, searching for an exposed flank, found the Federal left too difficult to turn. For each short term success in that direction, they were countered by an effective Union move as the Federal troops arrived on the battlefield from the south. Ewell's appearance north of the town near Oak Hill also tended to shift Confederate hopes for success in that direction. For the Federals, then, it became a race to extend their lines northward and eastward as additional enemy units arrived to threaten their right. The Federals ran out of troops before the Confederates did. Outflanked, outgunned and outmanned by about 28,000 to 18,000 on the entire field, the Union right unraveled and fell back toward new positions already being prepared by a division of the XI Corps, south of Gettysburg on Cemetery Hill. There, Hancock carefully aligned the retreating troops from the XI and I corps which had been ordered to withdraw following the collapse on the right.[58]

From his vantage point on Seminary Ridge, Lee watched the disorganized Yankees fleeing up and over Cemetery Hill at about 1630 hours. It appeared that the time was right for another blow. Lee told Ewell "to carry the hill occupied by the enemy, if he found it practicable, but to avoid a general engagement until the arrival of the other divisions of the army." Five of Lee's nine divisions still were not on the field. Piecemeal attacks carried the high risk of sustaining large casualties without achieving anything substantial because insufficient combat power was available. Pursuit of a beaten foe might have been admirable, but Federal troops on Cemetery Hill were quickly occupying and preparing new positions to meet anything that Ewell might throw against them.[59]

While Lee waited for Ewell to attack--if practicable--Longstreet rode up and joined him on

Seminary Ridge. His corps had been delayed by the passage of Hill's Corps at Cashtown, so Longstreet had ridden ahead to find out the situation facing the Confederates at Gettysburg. On Seminary Ridge, he learned that Lee was planning to attack the enemy. Longstreet argued against the plan. Before the start of the campaign, he had proposed that when the Confederates had brought their invasion to the point where the Yankees confronted them, the Southerners should adopt the defensive. Remembering the resounding defensive success achieved at Fredericksburg in the previous December, Longstreet believed that the tactical defensive offered the best hope for success. Lee, of course, had just completed his most brilliant tactical victory at Chancellorsville in May while on the tactical offensive. The previous discussion had ended unresolved, and now on Seminary Ridge, Longstreet reopened the debate. Lee, however, was adamant. He was going to attack the enemy. Longstreet rode off to rejoin his corps as it approached Gettysburg.[60]

In one of the more important controversies surrounding the battle, Ewell decided not to attack. It took a long time for Johnson's division to get into position to launch an assault and suitable artillery positions were difficult to find. Moreover, the Confederates captured a message that indicated that the Federal V Corps was approaching Gettysburg from the direction of Ewell's left rear. If his corps was locked in a struggle on the summit of Cemetery Hill when this Federal corps appeared in their rear, disaster was sure to follow. In Ewell's view, a successful assault that avoided a general engagement just was not "practicable."[61]

Lee, however, still held the initiative. So far, the battle had been a resounding success. The Yankees had been driven from every position that they had occupied. The Army of Northern Virginia may have been caught unprepared for a battle with the entire Army of the Potomac, but in its finest tradition, it had responded vigorously and effectively.

After dark, Lee rode to Ewell's Headquarters and explained his concept of operations for the next day. Ewell's Corps was to exploit their success of the first day and attack early the next morning to drive the Federals off Cemetery Hill. One of Ewell's division commanders, Jubal Early, argued against the idea because the Yankees were continuing to improve their defensive positions. By morning, they would be well prepared to receive an attack. Early added that in his view, the keys to the entire battlefield were the Round Tops located to the south. From these hilltops, artillery could dominate much of the terrain to the north, to include the rear of Cemetery Hill. Based on the arguments presented by the commanders who had seen the ground, Lee changed his mind and directed Ewell to shift his corps around toward the Confederate right. Concerned over the length of his lines, this movement would permit Lee to mass forces at the critical point much move quickly and also shift the focus of the battle southward.

Ewell again remained silent as Early disagreed once more. If the corps shifted southward, Early was concerned that morale would suffer because the severely wounded who were quartered in the town and the hotly contested ground of the fighting on July 1st would be given to the Yankees without a fight. Lee reversed himself once again. He told Ewell and his division commanders that Longstreet's Corps would make the main attack against the Federal left. Ewell was to remain in position and then make a demonstration to support Longstreet. Hearing no argument against this plan, Lee rode back to his headquarters located northwest of the town along the Chambersburg Pike.[62]

When he reached his headquarters, Lee changed his mind once again. He sent a courier to Ewell ordering him to move his corps around toward the Confederate right. Longstreet's corps still was not on the field and tightening up the lines of Hill's and Ewell's corps on the west side of town would form a solid base from which to launch an attack. Ewell responded to Lee's instructions by riding to his commander's headquarters and personally arguing in favor of his corps making a demonstration from its present location to support Longstreet. It appeared that Culp's Hill to the east of Cemetery Hill might be vulnerable and, if captured, Confederates located there would dominate the Union positions on the lower hill to its west. Lee approved Ewell's proposal, ordering him to make a demonstration against the Federal right; the demonstration was to be turned into a full assault if an opportunity looked promising. Ewell was to open his part of the battle when he heard the sounds of Longstreet's guns commencing the attack against the other flank.[63]

Ewell's and Early's concerns about the strength of the Union positions on Cemetery and

Culp's hills were well-founded. Casualties had been relatively high for both sides. The Confederates had lost about 8,000 and the Yankees about 9,000, including 4,500 captured during the hasty retreat to Cemetery Hill. But more Union troops were arriving every minute. At about 1700 hours, there were 12,000 Yankees on Cemetery Hill. An hour later, the number had grown to 20, 000. By about 2100 hours, there were 27,000 Federals in positions along Cemetery and Culp's hills. Union strength continued to build throughout the night and at 0300, Meade arrived on the battlefield.[64]

In the early morning darkness, he met Generals Slocum, Sickles and Howard at the cemetery gates on Cemetery Hill. Only Sedgwick's VI Corps was still not present, but Meade, before leaving Taneytown earlier in the evening, had ordered Sedgwick to march the thirty miles to Gettysburg as quickly as possible. The generals now facing Meade assured him that their positions were strong. He informed the assembled officers that once Sedgwick's Corps arrived, he intended to attack on the right. In the meantime, each corps was to continue to prepare its positions and rearrange their lines so that unit integrity--thoroughly mixed up during the momentous events of the previous afternoon and evening--would be restored.

Geary's Division of the XII Corps, was to move from the vicinity of Little Round Top and rejoin its parent unit now positioned on the Federal right at Culp's Hill. Sickles' III Corps was directed to extend the Federal line southward from the left flank of the II Corps and anchor its left flank on Little Round Top. Meade rode to a small house located in the immediate rear of the center of his lines and set up headquarters. It was now a matter of waiting until all of his army was assembled.

As the morning of July 2d wore on and there were no discernible movements from the Confederate lines, Meade grew concerned that Lee was up to something. After Lee's resounding success on July 1st, it would be unlike him to lie dormant and only stare through the early morning hours at his Yankee foe. At about 0930 hours, Meade asked Slocum if the XII Corps could launch an attack on the right. Undoubtedly this would cause a response from Lee, and it might upset any plans that Lee had set in motion. Slocum replied that while the terrain in his corps area favored the defense, it was unsuitable for an attack. Meade abandoned the notion and soon after wired Halleck in Washington that the Army of the Potomac was in good defensive positions and if driven from them, would fall back to its supply base at Westminster, Maryland.[65]

Indeed, Lee was up to something. He did not complete his final plans for the attack on July 2d until that morning. All through the previous night, Longstreet's Corps had been hurrying toward Gettysburg. Since the First Corps was to make the main attack, an early morning assault was out of the question. Nonetheless, Lee continued with his plan, and in an early morning conference on Seminary Ridge, he explained his concept to Longstreet and two of his division commanders, Hood and McLaws.

Lee indicated that the First Corps was to advance up the Emmitsburg Road and strike the Federal left flank south of Cemetery Hill. Because of the difficulty of control of a corps-sized maneuver, the road offered an excellent terrain feature along which to guide an attack. Longstreet again opened his old argument that the Confederates should be adopting a tactical defensive. Instead of attacking the Federal left directly, he argued that the Army of Northern Virginia should slip around the enemy's left and position itself so that the Yankees would have to attack to dislodge them. Lee reiterated that the army would attack at Gettysburg. He turned to McLaws and showed him precisely how to position his line of battle--perpendicular to the Emmitsburg Road with a direction of attack northeastward up the road. Lee added that he wanted McLaws to move by a concealed route so that the enemy only would learn of the impending attack too late to be able to respond effectively.

McLaws asked permission to conduct a personal reconnaissance. Lee mentioned that staff officers were already doing so. Longstreet interceded and denied McLaws permission, telling him to remain with his division. He then pointed to the map and indicated the position for McLaws's Division to occupy. This was different than Lee's earlier location; he indicated a line parallel to the Emmitsburg Road and facing eastward in the direction that Longstreet felt the attack should proceed in order to bring it around the enemy's left . Lee immediately retorted, "No, General, I wish it placed just the opposite." Longstreet stood off to one side as Lee continued to explain how the attack was to unfold.[66]

During the discussion, Lee asked Captain Johnston of his staff to brief the group on the results of his reconnaissance around the Federal left. Johnston explained that he personally had climbed to the crest of Little Round Top and found the southern end of Cemetery Ridge unoccupied by the enemy. Satisfied that an attack up the Emmitsburg Road would bring the First Corps against the Yankee left flank, Lee concluded the meeting, emphasizing that the attack must start as soon as possible. Longstreet and his commanders returned to their staffs to get their units started.[67]

Johnston's report is puzzling. As soon as Meade had a clear understanding of the terrain, the Federal commander had directed units to occupy all of Cemetery Ridge, to include anchoring the left flank on the Round Tops. From a vantage point on Little Round Top, Johnston had viewed the portion of the line assigned to the Union III Corps. Since Johnston saw a vacant area, he must have made his hasty reconnaissance during the time when Geary's Division of the Federal XII Corps had left its positions on Little Round Top and Cemetery Ridge. It had been ordered to return to its parent unit on Culp's Hill. For a brief period the area was unoccupied because the III Corps had not moved from its bivouac in the rear to its assigned front on Cemetery Ridge. Johnston's report is significant because it reinforced Lee's completely inaccurate knowledge of Meade's intended dispositions.

Lee completed the issuing of his orders by riding to Ewell's Headquarters to explain personally his final plan. Ewell was on a reconnaissance of his corps positions when Lee arrived. Lee, however, waited to make sure that there was not going to be any misunderstanding about the day's activities. Upon Ewell's return, Lee explained again that Ewell's Corps was to conduct a demonstration in support of Longstreet's attack. If the demonstration indicated that an assault would succeed, Ewell was to proceed with a full scale attack. Again, hearing no arguments against the plan, Lee rode to a position on Seminary Ridge from where he could see most of the enemy's apparent positions.[68]

He was disappointed to find on his arrival that Longstreet's Corps still was not in position to attack. The First Corps commander wanted to have Pickett's Division available during the attack, but that was impossible because Pickett still had considerable marching to do before his troops would reach Gettysburg. Law's Brigade of Hood's Division also had not arrived, and Longstreet asked to delay the move to his attack positions until Law arrived. Granted permission, he did not begin the approach march until a little after noon. Time was growing short.[69]

Time played against Meade as well. At about mid-morning, Major General Dan Sickles, the III Corps commander, arrived at Meade's headquarters to request permission to move his corps to a new position. Assigned the role of tying the left flank of the II Corps to Little Round Top, Sickles believed that the area along Cemetery Ridge was "unfit for infantry, impracticable for artillery." Large boulders and trees covered the ground to the west of his area of responsibility which sloped gradually upward toward the Confederate lines. Sickles proposed that he move his corps to the higher ground in the west at a place where a peach orchard bordered on the Emmitsburg Road. Meade explained the army's dispositions, hoping to convince Sickles of the soundness of his assigned position. Sickles left Meade's Headquarters with the army's chief of artillery, Brigadier General Henry Hunt. The next time that Meade talked with Sickles, the III Corps commander had gained sufficient time to move his corps into new positions, well in advance of his assigned area.[70]

Lee's attack started at about 1600 hours. Longstreet's approach march was bedeviled by bad luck and poor reconnaissance. By the time he had moved by a concealed route and was ready to attack, the Federals were deployed considerably differently than they were at the time when Lee developed his plan. As a consequence, the First Corps did not strike the Federal left flank near Cemetery Hill. Instead, Longstreet's men swung around the enemy's flank that stretched northwestward on a line from near the foot of Little Round Top to the Peach Orchard near the Emmitsburg Road. On the opposite flank, Ewell started his demonstration with a bombardment conducted by artillery located on Benner Hill. In his typical style, Lee had decentralized the execution and remained mostly an observer throughout the remainder of the day.

Meade, on the other hand, was extremely busy. He had called a council of war for about the time that Longstreet's artillery opened up in support

of the First Corps assault. He grabbed his chief engineer, Gouverneur Kemble Warren and rode to the Union left to find out the reason for the heavy firing. He reached Sickles' assigned position and discovered that the III Corps was well out of line and had advanced into a poorly defended salient at the peach orchard. Warren rode off to find reinforcements for the defense of Little Round Top, and Meade rode forward to find Sickles.

By the time he reached Sickles' Headquarters, Meade had decided that it was too late to withdraw the III Corps. If they withdrew under pressure, the entire Federal left might collapse. Meade told Sickles that he would send help from the artillery reserve and the II and the V corps; he rode back to Cemetery Ridge to coordinate the effort.[71]

Fortunately for the Yankees, Longstreet's and Ewell's attacks were uncoordinated. Although Ewell's artillery started firing at the right time, his infantry did not attack until almost three hours after Longstreet's infantry. But even with the poor coordination, the infantry assaults drove the Federals back and pierced their lines in several places. Reinforced by the units from the II and V corps, the III Corps fought desperately but finally retreated to Cemetery Ridge. Two Confederate brigades from Hill's Corps gained a foothold in the II Corps line near a "clump of trees" in the center of Cemetery Ridge. Meade started funneling troops from the XII Corps on the right to reinforce the deteriorating situation on the left. The timely arrival of Sedgwick's VI Corps on the left also prevented a collapse. On the opposite flank, Ewell's infantry eventually attacked. They seized the trenches just vacated by the XII Corps on Culp's Hill and also briefly penetrated the XI Corps front on the northeast slope of Cemetery Hill. The fighting continued until well after dark.

Lee was convinced that success still could be achieved if his army's efforts were coordinated better. From his perspective, on the enemy's left the Yankees had been driven back a considerable distance from their positions in the peach orchard to their final lines on Cemetery Ridge. The penetration of the enemy's center near the clump of trees on Cemetery Ridge also looked promising. These results, combined with Ewell's penetration on Cemetery Hill and seizure of portions of Culp's Hill, indicated the continued dominance of the Army of Northern Virginia. Moreover, Stuart and the Confederate cavalry finally had arrived on the battlefield during the day. Although unhappy that his army had not achieved more, Lee believed that a more concerted effort on July 3d offered excellent opportunities for ultimate success.[72]

Lee did not meet simultaneously with all of his corps commanders. Instead, he dealt with them individually. He directed Ewell to continue the attack against the Yankee right on Culp's Hill. He ordered Longstreet to continue the attack started on July 2d. He assigned Hill a supporting role.

On the morning of July 3d, Lee rode to Longstreet's Headquarters to determine how his attack was going to be made. Almost before Lee was able to begin the conversation, Longstreet told the Commanding General that First Corps scouts had conducted a reconnaissance around the Union left flank. It was still possible to slip around the enemy and position the army so that the Federals would have to attack the Confederates. He was organizing his units to begin the move to the right. Amazed that Longstreet had interpreted his orders to mean that he could make a flanking march before conducting his attack, Lee rejected the idea and told Longstreet that the plan was to have the First Corps attack the enemy's center on Cemetery Ridge.

Longstreet argued that while Pickett's Division was fresh, Hood's and McLaws' divisions were not. Moreover, if Hood and McLaws attacked the center, the Confederate right flank would be exposed to a counterattack. This could endanger the entire Southern position. Lee agreed with Longstreet's analysis and said that Heth's Division and half of Pender's Division--both from A.P. Hill's Corps--would support an attack by Pickett. Hood and McLaws could remain in position to protect the right. The generals then rode to a position where they could see the enemy's center. The discussion became heated as Longstreet argued that a frontal attack could not succeed. When asked how many soldiers he intended to commit to the attack, Lee replied 15,000. Longstreet answered that there were not 15,000 men alive who could successfully attack across the open field that had been selected as the avenue of approach. Furthermore, Yankee artillery now positioned on Little Round Top, could sweep the entire line of attack as it advanced across the open field. One of Lee's staff officers replied that these Federal guns could be silenced. Lee was adamant and

Longstreet acquiesced. The Commanding General added that Stuart's cavalry would make a supporting attack by riding around the Federal defenses and attacking the center of the rear of the enemy's line. The instructions for "Pickett's Charge" were complete.[73]

In the meantime, Johnson's division of Ewell's corps had followed Lee's earlier instructions and at first light had opened the attack up the slopes of Culp's Hill. Instead of finding vacated trenches as they had on the previous afternoon, they now discovered that the XII Corps had returned in strength. Moreover, the Federal commanders were anxious to regain the positions that had been lost so easily the day before. Federal artillery, unanswered by Confederate guns, supported furious counterattacks. Not only did Johnson's attack falter, his soldiers were driven from the ground that they had held at first light. It was an inauspicious start for Lee's plan.[74]

Meade's commanders were confident that their positions were strong. During the previous evening, Meade had called a meeting of his principle commanders. He gave each of them an opportunity to express his opinion on the course of action to be followed next. Only John Newton, the acting I Corps Commander, indicated that the current positions were poor. The rest seemed determined to stay and fight. The three-hour meeting tended to ramble. Finally, Meade's chief of staff, Butterfield, posed three alternatives to the group and asked the commanders to vote on each one. Essentially, the alternatives were to attack, defend, or withdraw. Meade was surprised by his chief's interjection but allowed the vote to proceed. The vote was overwhelmingly in favor of defending the current positions and waiting for at least a day to see what Lee would do. Meade closed the meeting by commenting, "Such, then, is the decision." As the commanders filed out of his headquarters, Meade stopped the acting II Corps Commander, John Gibbon. He told Gibbon that since Lee had attacked both the right and left flanks, his next move probably would be against the center, the location of Gibbon's corps. Everyone returned to their headquarters to await the next day's events.[75]

Twice during the morning of July 3d, Lee rode with Longstreet along his attack positions. He wanted to make sure that the artillery and infantry were properly positioned and ready for the decisive blow. Approximately 172 Confederate guns were on line to deliver a massive cannonade. After the guns had demoralized the Federal infantry and suppressed the enemy's artillery, the approximately 13,500 soldiers from Longstreet's and Hill's corps who finally had been massed for the attack would charge across a mile wide open field. At a little after 1300 hours, the Confederate artillery opened fire.[76]

Pickett's Charge is probably the most famous attack of the entire war. Its fame was achieved by the heroism displayed by the Confederates who had to withstand the furious Federal artillery and musket fire and by the belief that the few men who finally stumbled over the stone wall marking the Union front line had reached the "high water mark" of the Confederacy. While all of this is true, it is equally important to remember that Meade's defense was extremely effective because of strong Union leadership, creative command and control, and the fighting spirit of the soldiers. The Army of Northern Virginia could not do *anything* that Robert E. Lee asked. The Army of the Potomac was its equal and the Battle of Gettysburg finally demonstrated this beyond a reasonable doubt. While very famous. Pickett's Charge was futile.

Stuart's cavalry attack against the Union rear was equally futile. On a field approximately 2 miles east of Gettysburg, Federal cavalry easily turned back Stuart's troopers in a mounted clash. July 3d was a Confederate defeat of immense proportions.[77]

Back on Seminary Ridge, Generals Lee and Longstreet rallied the remnants of Pickett's Charge as they streamed back across the field under intense artillery fire. Both officers exerted a calming influence on the men, and within an hour, the Army of Northern Virginia had gotten itself back together again. Longstreet tightened up his lines, pulling McLaws' and Hood's divisions westward across the Emmitsburg Road to a shorter line. He also shifted the artillery so that it was ready to receive any counterattacks that Meade might attempt. Throughout the remainder of that day and night--and for most of July 4th, the Confederates awaited a Federal counterattack that never materialized.

Meade's units were jumbled together as a result of all of the plugging and filling that had been going on for three days. In addition, his soldiers were exhausted. Having been assigned the mission of covering Washington and Baltimore, Meade occupied

positions that clearly accomplished his goal. He also had successfully defeated Robert E. Lee and the Army of Northern Virginia. None of his predecessors had achieved such a clear cut victory. Obviously pleased with the performance of his units, Meade reassembled his army and awaited Lee's next move.

When Lee began to withdraw in a driving rainstorm on the evening of July 4th, Meade started off in pursuit. It was not a Napoleonic pursuit of a badly defeated army; it was a wary pursuit of a dangerous enemy. When the Army of Northern Virginia reached the Potomac River and was forced to wait for the rain-swollen river to fall, Meade carefully maneuvered to cover Washington and Baltimore and to maintain contact with Lee's army. By the time Meade had his army in a position from which it could attack Lee's formidable defensive works at Williamsport, Lee had crossed the river.

Lincoln and Stanton were furious. In Washington, it appeared that Meade had missed the opportunity for which everyone in the North had been waiting--the complete destruction of the Army of Northern Virginia. Lincoln was quoted as saying that Meade looked like an old lady trying to shoo her geese across a creek. The Joint Congressional Committee on the Conduct of the War later held hearings hostile to Meade, accusing him of cowardice. Meade was taken aback by this attitude in the capital. Instead of being a great hero, he was being characterized as just the opposite. The final proof of Meade's excellent abilities, however, was the ultimate honor bestowed on him. The Northern leadership stopped looking for a new commander for the Army of the Potomac. When Lee surrendered the Army of Northern Virginia at Appomattox Court House almost two years later, Meade still commanded the army that ultimately trapped and defeated him. The Army of the Potomac was to be his for the duration of the war.[78]

**Operational Artists**

Many commentators on the Battle of Gettysburg have focused on the tactics of Meade and Lee. For these analysts, the campaign only provides the backdrop from which to understand the events of July 1st through 3d. They have examined the commanders' battlefield decisions--often in excruciating detail--in order to discover the reasons for the successes and failures by both sides. They have identified key tactical events and decisions that shaped Lee's ultimate failure. Often in these analyses, Lee's subordinates appear as important reasons for the Army of Northern Virginia's defeat. Richard Ewell and James Longstreet most often appear on their list of villains. The commentators contend that Ewell was indecisive throughout much of the battle; his failure to follow up the initial success on July 1st made it very difficult for Lee to regain the upper hand that his army initially had gained at great cost. They have turned to Longstreet's infatuation with his concept of an offensive-defensive and believe that this hampered the First Corps commander's performance. Some have characterized his actions as bordering on outright insubordination. By focusing on the battle, however, they have misunderstood the importance of expert performance at the operational level. The conduct of the campaign provides more than a backdrop. It provides many of the reasons for the success of George G. Meade and the failure of Robert E. Lee.

At the center of the entire campaign lies the issue of objectives. Lee developed his objectives in consultation with the Confederate President and the Cabinet. It was an excellent forum for mixing the military's views--as expressed by Lee--and the political views--as expressed by the members of the Cabinet and the President. There should not have been any question in Lee's mind as to what he was trying to achieve during the invasion. Indeed, it appears that he was quite clear on those things that his army must accomplish during the campaign. The objectives reflect an interesting mix of political and military goals. On the military side, his army was to gather supplies from Northern farmers, draw the Army of the Potomac away from defensive lines along Virginia's river lines, and win an important battle on Northern soil.

This last military objective contained important political implications as well. A great victory in the North might still convince some European nations to recognize the Confederacy as an independent nation. Furthermore, if Lee effectively threatened Philadelphia, Baltimore, or Washington, the potential for European recognition might be increased. Other political goals supported the concept of an invasion. The invasion could increase Northern war weariness and thus foster some initiatives from a peace movement. Additionally, either a successful battle or the threat to Philadelphia, Baltimore, and Washington might reinforce Northern feelings of war

weariness. This blend of military and political objectives were reasonable and feasible goals for the use of military power.

Meade's objectives were much more narrowly focused. His objectives were given to him without him being consulted, but General Halleck's participation in Washington insured that the military as well as the political view was well represented. Meade was told to operate against the invading force of Rebels and to screen Baltimore and Washington. Although the accomplishment of each objective would have clear political results, both objectives represented precise military objectives. The results of the application of military power against them could be easily measured.

Applying these objectives to the theater setting provides an interesting contrast between Lee's and Meade's orientation. Lee's objectives did not automatically focus either him or his army on the enemy. In fact, in order to gather supplies, the Army of Northern Virginia had to operate out of the range of the Army of the Potomac. Therefore, it was important not to operate in the enemy's presence. Naturally, Lee knew that the Federals would pursue him once they had determined the extent of his operations. During the Maryland Campaign in September 1862, even the overly cautious George B. McClellan finally pursued Lee's invading army. Lee knew that once the Yankees had substantial combat power in Pennsylvania, widespread foraging was out of the question among the hostile population and in unfamiliar territory.

To accomplish both the objective of gathering supplies and the objective of fighting a battle, Lee needed at least to know the Yankees' movements if not their intentions. Lee's poor use of his cavalry during the latter half of June was devastating. His substandard use of his cavalry meant that he did not know the enemy's dispositions and had no way of discovering their intentions. Even after Hill's Corps had engaged the vanguard of the Army of the Potomac on July 1st, Lee still not know the extent of the damage that he could inflict or that could be inflicted upon him.

There is no evidence to suggest that he prioritized any of the conflicting objectives that he was trying to accomplish during the campaign. There also is no evidence to suggest that either he or his staff analyzed the consistencies and inconsistencies between the objectives. Because of the complex relationships between his political and military objectives, an analysis to prioritize and to determine inconsistencies was absolutely essential. At the time, this probably was not seen as being particularly important because everyone knew that the Army of Northern Virginia could do virtually anything that it wanted to do when confronted by the Army of the Potomac. Unfortunately for the Confederacy, past experiences were irrelevant. The Army of the Potomac had a new commander on June 28th.

Meade's objectives focused him only on the enemy. Within the theater setting, the objective to cover Washington and Baltimore for political reasons still meant that he must remain oriented on the locations and movements of the Army of Northern Virginia. His aggressive intent, excellent combat command experience at all levels of command, and absolute attention on the enemy meant that the Army of the Potomac was not going to be distracted by anything like Stuart's cavalry raid. In addition, Meade's political guidance translated quite readily into military terms: find and fight Lee's army.

Initially, Lee's concept of operations masked the weaknesses in his plan. It was excellent up to the point where it was put to the test by an aggressive opponent. He had integrated alacrity and deception together, and as long as Joe Hooker was opposite him, his operational vision was as brilliant as ever. But it was a concept that depended on poor performance by the enemy army's leadership. When that leadership changed, the whole concept was in danger of being upset.

During the march northward through Maryland into Pennsylvania, it appeared that Lee masterfully synchronized his forces. He outmaneuvered Joe Hooker and kept the enemy commander constantly in a state of uncertainty. The full meaning of Stuart's absence just prior to the battle was not obvious at the time because some Confederate cavalry still screened the Army's movements and Hooker was in a quandary about what to do. But other trusted subordinates were not clear about Lee's intent. With the general knowledge that a battle with the Yankees was inevitable, it is no wonder that first Heth, then Hill, and finally Ewell piled on the Federals when they saw an opportunity on July 1st. Integration of forces at all levels of

command was not achieved. Moreover, operational intelligence did not play a role in Heth's, Hill's, or Ewell's decisions. They were simply trying to achieve tactical success. When Lee finally arrived on the battlefield, he sensed the operational problem and tried to slow down the tactical development of the battle. By then it was too late. His subordinates already had committed him to battle, and they were urging further aggressiveness. The extent of the tactical commitment was too much to allow him to slow down the operational development of the campaign.

Meade's concept of operations was borne out by events. But he had an easier task than Lee. By the time he assumed command, Meade knew what the enemy was doing. He did not know all of the important details, but he had the capability to find the answers that he needed to get. His army was operating on friendly territory--intelligence collection was much easier than it had been in the past when operating in Virginia. Meade, however, personally brought something to the campaign that had been lacking so far. He had an acute knowledge of the capabilities of the Army of the Potomac, learned during his earlier years in command at various levels. He knew that it was a good army. Thus, the scanty intelligence did not hinder his aggressiveness. His conduct of the movement to contact was brilliantly conceived and flawlessly executed.

In the opening stages of the battle, operational maneuver played an interesting role. Lee was caught unaware, and Meade was looking for a fight. But Lee had numerical superiority throughout July 1st. His army won the battle. Aggressive leadership by Hill and Ewell drove the Federals off the field. Even though unprepared, Lee won because his forces were deployed for successful maneuver at the operational level. If Lee had decided to withdraw on July 2d instead of July 4th, we might be analyzing the Battle of Gettysburg as another Confederate victory. Lee had outmaneuvered Meade, driven the Federals off the battlefield at Gettysburg, and then, having gathered substantial supplies and won a battle, withdrew southward. The extent of the victory certainly was equal to the victory at Chancellorsville. But once Lee decided on the evening of July 1st that the tactical victory was not great enough, Meade outmaneuvered him operationally. Rapidly, Meade brought superior combat and logistical power to bear at the operational decisive place and time.

Meade's ability to generate operational reserves permitted him to achieve superiority at the critical points. During the movement toward Gettysburg from June 28th to July 1st, he deployed his corps on a wide front but kept them close enough together to avoid defeat in detail. Covering his supply base at Westminster, Maryland, Meade could respond in any direction and reasonably expect success. More importantly, his dispositions meant that even if he made unexpected contact with Lee's army, the campaign would still unfold in accordance with his, long range vision. He effectively operated against the invading force of Rebels. Furthermore, he also was in a position to shift eastward to cover Baltimore and Washington, his other primary objective. The positioning of his corps in relation to each other and in support of his two objectives, allowed Meade to use uncommitted forces to respond flexibly and creatively, regardless of the Confederate reaction to contact with the Army of the Potomac.

The Army of Northern Virginia's immediate reaction to the unexpected contact with the Army of the Potomac on July 1st also demonstrated Lee's understanding of the effective use of operational reserves. Even though he was only vaguely aware of the location of the enemy, Lee had deployed his army sensibly so that combat power could be built up wherever it was needed when battle occurred. Perhaps an argument could be made that his forces were deployed too well, because when battle was joined it was too difficult for Lee to slow down its development. Aggressive subordinates made use of the operational reserves that Lee should have kept firmly under his control. Nevertheless, Lee's understanding of the importance of operational reserves and their effective use was a hallmark of his repeated successes throughout the war. Gettysburg demonstrated once again his understanding of their importance.

Of particular interest is the comparison between the operational reserves available to Lee and Meade on the evening of July 3d. Lee had run out of them. Meade still had operational reserves available. Faced with this reality, Lee only had one alternative: withdraw back to Virginia. Meade, on the other hand, possessed numerous alternatives. He could attack Lee directly. He could maneuver against Lee's line of communications. He could remain on the defensive and cover Washington and Baltimore. As it turned out, Meade chose to remain on the defensive,

undoubtedly influenced by the tactical realities of the Civil War. Having experienced combat command at all major levels, Meade knew that attacks against prepared positions were extremely costly. This attitude caused him problems with the leadership in Washington. They wanted Lee's army destroyed in place. They believed that Meade had the forces available. While they were correct--Meade had the operational reserves, they did not know the tactical realities that Meade knew so well.

Tactical realities also demanded logistical feasibility. At the operational level, both Lee and Meade understood the profound influence of logistics. For this reason, in most histories of the campaign, one finds little comment on operational logistical constraints. Each commander's long range logistical vision permitted him to operate creatively. But it is operational logistics that lends an air of incredibility to Longstreet's repeated proposal for an offensive-defensive. From a purely tactical standpoint, Longstreet's concept made good sense. But it suffered from a blind spot on logistics. Operating on foreign soil, Lee could not afford to separate his army from its logistical tail for an extended period. If he did and Meade chose not to attack, Lee would be in an impossible operational situation. It is hard to find a location between the Army of the Potomac and Washington to which Longstreet urged Lee to move. Longstreet's vague references to such a location avoided the crucial questions. What location would be so important that Meade would be forced to attack? What would Lee do logistically if Meade chose not to attack? Operating in hostile territory, Lee had to assess operational logistical considerations with which his subordinates were not accustomed.

Lee's relationships to his subordinates during the battle trouble many people. It is in those relationships that many observers find the most fault. They argue that Lee should have been more decisive with Ewell and firmer with Longstreet. And Lee should not have reorganized his command structure just prior to a type of campaign with which no one had any previous successful experience. These arguments, however, concern Lee the tactician because off the field of battle, both the command structure and Lee's relationships with his subordinates were highly effective. Obviously, the campaign was lost at the tactical level. Lee felt that he could only accomplish his campaign objectives by winning a battle more spectacular than his defensive stroke at Chancellorsville. He believed that this required him to attack if he was going to win a more clear cut victory. But it is by no means obvious that a firmer, more decisive Robert E. Lee would have made any tactical difference. The experience of the commanders in the Civil War repeatedly demonstrated that an attacker was at a severe disadvantage. Technology favored the defender. Furthermore, in the area where there can be a search for alternative outcomes by suggesting alternative courses of action for Lee, one can overlook the importance of the enemy in determining the original outcome. The Army of the Potomac was led by a competent commander.

George G. Meade's relationships with his subordinates were highly effective. Throughout the campaign, he selected trusted subordinates to command several corps in order to reduce his span of control. Reynolds commanded a "wing" of the Army of the Potomac while it was moving in the direction of Gettysburg. After Reynolds was killed and Meade had received word that a battle was in progress at Gettysburg, he directed Hancock to ride to the scene and take charge, even though Hancock was junior to some officers already on the field. He used "councils of war" to cement relationships. Rather than being signs of weakness and a lack of command presence, they tended to ensure that his senior commanders understood that Meade understood and valued their views on key decisions. Meade demonstrated effective operational command.

In the final analysis, making an overall evaluation of the two opponents is very difficult. Each commander faced very different problems, not the least of which is that they faced each other. Measuring performance against objectives, however, narrows the evaluation considerably. Meade accomplished the objectives given to him by his military commander, Henry W. Halleck. He operated effectively against the invading force of Rebels and effectively covered Washington and Baltimore. But he did not achieve total success. He did not achieve the objective of his political leaders: the destruction of the Army of Northern Virginia. It is possible to argue that this was an implied task of his specified task to operate against the invaders, and therefore he should have pursued this objective without specific instruction. It is interesting to note, however, that the experienced combat leaders, Halleck and Meade, did not identify this implied task. Perhaps, their previous

Civil War experiences taught them that it was an impossible task.

Even though he lost the battle and thus lost the campaign, Lee also almost accomplished everything he set out to do. He had gathered supplies from Northern farmers. He drew the Army of the Potomac away from the natural defensive barriers in northern Virginia. By the evening of July 1st, he had won a battle on Northern soil. At the cost of 8,000 casualties, his army had captured 4,500 Yankees, had killed or wounded another 4,500 enemy, and seized all of the terrain that the enemy held at the outset of the battle. But Lee decided to continue the fight. That decision changed the statistics significantly. Outnumbering the Federals on July 1st, 28,000 to 18,000, Confederate relative combat superiority was reversed by July 3d. By then, the Union mustered 85,500 to the Confederate 75,000. Casualty figures were even more dramatic. Confederate losses were over 28,000, more than 37% of the forces engaged. Federal casualties were more than 23,000, or 26% of Meade's force. Lee's decision to pursue the implied task of destroying the Army of the Potomac cost him dearly--both in terms of casualties and the overall outcome of the campaign.

Implied tasks for both commanders produced an interesting turn of events. Lee's implied task hurt him militarily. Meade's implied task hurt him politically. As is always the case, if a commander does not precisely know all of his objectives, any road will lead him to them, including the road to ruin. Clearly defined and attainable objectives are crucial for the operational commander.[79]

**NOTES**

1. Histories of the Gettysburg Campaign abound. Because this article is only a synopsis of the more important events that shaped the campaign at the operational level, many details have been omitted. I have used citations that will direct the reader to sources helpful for "filling in the blanks" where a more complete understanding of the events is desired. For a description of the Confederate Cabinet discussions with Lee, see for example, John H. Reagan, *Memoirs, with special reference to secession and the Civil War* (New York, 1906), 121. The single best overall source for the Gettysburg Campaign is, Edwin B. Coddington, *The Gettysburg Campaign: A Study in Command* (New York, 1968). This was published in a paperback edition in 1984 and at the time that this article was published, was widely available.

2. Stephen Sears, *George B. McClellan: The Young Napoleon* (New York, 1988), 339-40; T. Harry Williams, *Lincoln and His Generals* (New York, 1952), 212.

3. It is interesting to note that these discussions reflect precisely what Clausewitz advocated in one section of On *War. Lee,* the commander, was participating in strategic discussions with the cabinet. Did the results of these discussions support or refute Clausewitz's admonition? Instead of adding clarity, the discussions may have contributed to cloudy strategic thinking. See Carl von Clausewitz, *On War,* edit. and trans. by Michael Howard and Peter Paret (Princeton, 1984), 608.

4. Archer Jones, *Confederate Strategy from Shiloh to Vicksburg* (Baton Rouge, 1961), 199-200.

5. Douglas S. Freeman, *R.E. Lee: A Biography* (New York,1934), II, 19; *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (Washington, 1880-1901), Series I, XXV, part 2, 782 (Hereafter cited as *O.R.*). Jones, *Confederate Strategy,* 205-206.

6. *O.R.,* XXV, part 2, 791-92; Armistead L. Long, *Memoirs of Robert E Lee* (New York, 1886), 267.

7. J. William Jones (ed.), *Southern Historical Society Papers IV* (Richmond, 1877), 153.

8. Clifford Dowdey and Louis H. Manarin (eds.), *Wartime Papers of R.E. Lee* (Boston, 1961), 508.

9. Reagan, *Memoirs,* 121-122; Jones, *Southern Historical Society Papers, IV,* 153. Long, *Memoirs of R.E. Lee*, 268-69.

10. Dowdey and Manarin, *Wartime Papers of R.E. Lee,* 490; Jones, *Southern Historical Society Papers, IV,* 160

11. *O.R.,* XXV, part 2, 810.

12. Douglas S. Freeman, *Lee's Lieutenants: A Study in Command* (New York, 1942), II, 712; *O.R.,* XXV, part 2, 840.

13. Herman Hattaway and Archer Jones, *How the North Won: A Military History of the Civil War* (Urbana, 1983), 382-83.

14. *O.R.*, XXV, part 2, 438.

15. Williams, *Lincoln and His Generals*, 243-46.

16. Dowdey and Manarin, *Wartime Papers of R.E. Lee*, 501-503. On June 7th, Lee asked President Davis to return to his army Pickett's Division of Longstreet's Corps. Even at this late date, the unit that had been proposed to be sent to help the situation at Vicksburg still had not returned to Lee's control. It is impossible to tell the importance of the role that the reinforcement of the west proposal played in Lee's recommendation to invade the North. Detaching forces away from Lee's army had been a strong possibility, supported initially by the Secretary of War. Lee had to do something spectacular to convince the government that he needed more forces than he previously had available to him at Chancellorsville. A proposal simply to continue to defend along the Rappahannock River would not provide him with enough evidence to prove that he could not afford to send part of his army to someone else. Invasion of the North provided him with that evidence.

17. Dowdey and Manarin, *Wartime Papers of R.E. Lee*, 496. In Washington, General-in-Chief Halleck hoped Dix would accomplish much more than he did. Dix believed that his force was too small to accomplish much. He burned some bridges near Ashland, Virginia, and captured some supplies at Hanover Court House, but that was the extent of the threat. See *O.R.*, XXVII, part 1, 18-19.

18. *O.R.*, XXVII, part 3, 12-13.

19. *O.R.*, XXVII, part 1, 30.

20. *O.R.*, XXVII, part 1, 31-32.

21. *O.R.*, XXVII, part 3, 27-28; *Ibid.*, part 1, 904; Henry B. McClellan, *The Life and Campaigns of Major General J.E.B. Stuart* (Boston, 1885), 264-69, 294; Freeman, *Lee's Lieutenants*, III, 813, 19.

22. *O.R.*, XXVII , part 1, 34-35.

23. *O.R.*, XXVII , part 2, 297-98; Kenneth P. Williams, *Lincoln Finds a General: A Military Study of the Civil War* (New York, 1959), II, 630; John W. Thomason, *Jeb Stuart* (New York, 1930), 413421; Coddington, *Gettysburg Campaign,* 69-70.

24. *O.R.*, XXVII, part 3, 924-25; *Ibid.*, part 1, 77.

25. *O.R.*, XXVII, part 3, 88. George Meade (ed.), *The Life and Letters of George Gordon Meade* (New York, 1913), I, 385.

26. *O.R.*, XXVII, part 1, 40.

27. Coddington, *Gettysburg Campaign,* 119.

28. Williams, *Lincoln Finds a General,* II, 668-69; Edward J. Stackpole, *They Met at Gettysburg* (Harrisburg, 1956), 22-23; Coddington, *Gettysburg Campaign, 139-40.*

29. E.B. Long and Barbara Long, *Civil War Day by Day: An Almanac 1861-1865* (New York, 1971), 371.

30. Williams, *Lincoln and His Generals,* 258.

31. *Ibid.*, 258; Williams, *Lincoln Finds a Gener*al, II, 641-42.

32. *O.R.*, XXVII, part 1, 58.

33. *Ibid.*

34. *Ibid.*

35. *Ibid.*

36. Meade, *Life and Letters of George G Meade,* II, 11.

37. Williams, *Lincoln and His Generals,* 247.

38. *O.R.*, XXVII, part 3, 374; *Ibid.*, part 1, 61.

39. *O.R.*, XXVII, part 1, 61.

40. George R. Agassiz (ed.), *Inside Meade's Headquarters, 1863-1865: Letters of Colonel Theodore Lyman* (Boston, 1922), 25; W.A. Swanberg, *Sickles the Incredible* (New York, 1956), 195.

41. Emerson G. Taylor, *Gouverneur Kemble Warren* (New York, 1959), 119-20.

42. Frederick H. Dyer, *A Compendium of the War of the Rebellion* (New York, 1959), I, 287, 301, 323, 318; Meade, *Life and Letters of George G. Meade,* I, p. 389; *O.R.,* XXV, part 2, 471-72.

43. Freeman Cleaves, *Meade of Gettysburg* (Norman, 1960), 129-30; *O.R.,* XXVII, part 1, 65.

44. James Longstreet, *From Manassas to Appomattox: Memoirs of the Civil War in America* (Philadelphia, 1896), 346-47.
45. Tho.- -24.

46. *O.R.,*

47. Much controversy surrounds the misuse of the Confederate forces at this stage of the campaign. The safest is to say that Lee bears some share of the blame. Lee had sufficient calvary with him to keep him informed. Their orders, however, did not tell them specifically to maintain contact with the Union army and report its movements. Stuart's share of the blame is that he actually did not pass around the Union army without hindrance. Soon after setting out, he ran into part of Hancock's II Federal Corps and had to make a detour. Arguably, he also took the best brigade commanders with him. Moreover, he captured 125 supply wagons which he decided to take with him. This seriously decreased his rate of march. Clearly, the Confederate cavalry was not used properly during this stage of the campaign.

48. *O.R.,* XXVII, part 2, 316.

49. Coddington, *Gettysburg Campaign,* 186-193.

50. *Ibid.,* 194-95.

51. *O.R.,* XXVII, part 1, 62-63.

52. *Ibid.*

53. Edward J. Nichols, *Toward Gettysburg: A Biography of General John F. Reynolds* (University Park, Pa, 1956), 196; *O.R.,* XXVII, part 1, 69.

54. James L. Morrison (ed.), *The Memoirs of Henry Heth* (Westport, 1974), 173.

55. During a courtesy call at Chambersburg by one of Longstreet's division commanders, John B. Hood, Lee exclaimed, "Ah! General, the enemy is a long time finding us; if he does not succeed soon, we must go in search of him." See John B. Hood, *Advance and Retreat* (New Orleans, 1886), 55; Coddington, *Gettysburg Campaign,* 195.

56. Coddington, *Gettysburg Campaign,* 309-310.

57. Nichols, *Biography of General Reynolds,* 200-202; Cleaves, *Meade of Gettysburg,* 134-35.

58. Coddington, *Gettysburg Campaign,* 294-297; Oliver O. Howard, *Autobiography of Oliver OtisHoward* (New York, 1908), 417-18.

59. *O.R.,* XXVII, part 2, 318.

60 . Shelby Foote, *The Civil War: A Narrative* (New York, 1963 ), II, 479-80; Jones, *Confederate Strategy,* 207-08.

61. After the battle, many Southerners searched for opportunities that were missed during the battle--opportunities that would have turned the defeat into a victory. Ewell's decision not to attack was generally viewed as a missed opportunity. See for example, Henry Kyd Douglas, *I Rode with Stonewall* (Chapel Hill, 1940), 247. It is impossible to say with any degree of certainty that Ewell's attack would have been successful. The report of the approach of the Federal V Corps later turned out to be false. But the positions on Cemetery Hill were formidable. It is useful to remember that Ewell and his division commanders were experienced combat leaders. In their view, at that time, an attack was not practicable. See also, Jubal A. Early, *Autobiographical Sketch and Narrative of the War Between the States* (Philadelphia, 1912), 270.

62. Foote, *The Civil War,* II, 487.

63. Freeman, *Lee's Lieutenants,* III, 103.

64. Coddington, *Gettysburg Campaign,* 321.

65. Foote, *The Civil War,* 486, 494.

66. Hood, *Advance and Retreat,* 56; Foote, *The Civil War,* II, 491-93.

67. Harry W. Pfanz, *Gettysburg: The Second Day* (Chapel Hill, 1987), 104-111; Freeman, *Lee's Lieutenants,* III, 113.

68. Pfanz, *The Second Day,* 111.

69. Hood, *Advance and Retreat,* 57-59.

70. Swanberg, *Sickles and Incredible,* 208-11.

71. Coddington, *Gettysburg Campaign,* 347-49; Taylor, *Warren,* 122-23.

72. *O.R.,* XXVII, part 2, 320; Douglas, *I Rode with Stonewall,* 249; Coddington, *Gettysburg Campaign,* 446-48.

73. Freeman, *Lee's Lieutenants,* III, 144-45; Coddington, *Gettysburg Campaign,* 454-464.

74. Early, *Autobiographical Sketch,* 275.

75. John Gibbon, *Personal Recollections of the Civil War* (New York, 1928), 140-45.

76. E. Porter Alexander, *Military Memoirs of a Confederate* (Bloomington, 1962), 418-421

77. Coddington, *Gettysburg Campaign,* 520-23.

78. T. Harry Williams, *Lincoln and His Generals,* 288.

79. Coddington, *Gettysburg Campaign,* 249-50; Thomas L. Livermore *Numbers and Losses in the Civil War in America, 1861-1865* (Boston, 1901), 103.

# THINKING ABOUT WARFARE

**Philip D. Shutler**
**Lieutenant General, USMC (ret.)**
**SYSCON Corporation**

The text of General Shutler's presentation is not available for inclusion in these proceedings. However, interested parties are directed to an earlier version published as a MajGen Richard C. Schulz Memorial Essay in the *Marine Corps Gazette,* November 1987. The introductory paragraphs from that essay read:

> Changing technology alters the pattern and form of warfare. To accommodate change it is necessary to think in new ways and then to adjust doctrine and modify organizations in order to fight in new ways. My purpose is to offer a fresh approach to assess change and to determine what should be done about it.
>
> It is not that change is unknown in the military, a great deal of research and subsequent application of new technology in weapons systems is actively sponsored by the Services. What is not clear is the way in which new and old technologies can be combined by an imaginative enemy or what steps should be taken in technical development, policy, doctrine, training, and organization to counter those combinations.

General Shutler goes on to suggest a framework for appreciating the "combined effects of technology changes." The framework starts with a matrix relating regimes of combat (space, land, air, sea, and undersea) to aspects of combat (production, logistics, operations, and tactics. The regime/aspect matrix is used to trace paths to combat. For example, for amphibious landing (combat) forces in the path...start with equipment in production and troops in training (land regime/production aspect), move to embarkation (land/logistics, sea/logistics), conduct a rehearsal (sea/production), reembark and repair equipment (sea/logistics), steam to the objective area (sea/operations), and make a water and air assault (sea/tactics, air/tactics, land/tactics).

By comparing the regime/aspect five by four matrices of opposing forces, General Shutler defines modes of combat. By definition, there are five blocks to shoot *from* (tactical aspect across the five regimes) and 20 blocks to shoot at (for each force). Thus, there are 100 modes per side. Five modes are called *symmetric tactical* (forces engaged with like deployed forces ready to shoot back). Fifteen modes are *symmetric nontactical* (forces engaged with like forces not deployed and not ready to shoot back). Twenty modes are asymmetric tactical (forces engaged with unlike deployed forces ready to shoot back). The remaining 60 modes are asymmetric nontactical (forces engaged with unlike..forces not deployed and not ready to shoot back.

This analysis highlights the effects of new technology and new weapons. "While new technology has increased the lethality of the symmetric modes..., the lethality ln the asymmetric and nontactical modes has increased by many orders of magnitude....(T)he combination of capabilities inherent in technological advances has given many of the asymmetric and nontactical modes ferocious killing power at great distances. Forces are at great and increasing hazard to attack from different regimes for which they are ill-prepared, and there are fewer places to hide."

General Shutler uses this stage of analysis to define combat shields to "...deny an enemy the opportunity to shoot at a force or otherwise disrupt its operations." Shields have three things in common: (1) they consist of active fire interposed between friendly and enemy forces to include attacking the enemy at the source or on the paths; (2) timing and position related to friendly actions and location are of major importance; and (3) the measure of success is the survival of the shielded force, that is, enemy attrition and territory taken in shielding action are secondary. An exhaustive array of shields for particular campaign classes (e.g., amphibious landing) can result

from the regime, aspect, path, modes, and shields sequence.

A set of historical examples are used to illustrate the application of the sequence. The examples are drawn from the French experience in WW I, the Rabaul campaign *in* WW II, and Israeli cross-canal operations in the 1973 war.

General Shutler focused on the operational dimension in his contextual update of his earlier paper. The penultimate paragraph of the published paper is useful to close out this altogether too brief summary:

> Words are essential to the process of thinking. If you don't have a word for it, you can't think about it. If you have a word but there is no agreed meaning, you can't communicate your ideas to someone else. The regime/aspect/mode diagrams and the shield sketches are designed to encourage the search for new words and ideas, and to discourage the search for "the very best," which then supersedes all others and...sows the seeds of disaster.

# Master of the Operational Art: General Kenney's Early Campaigns

**Major Charles M Westenhoff, USAF**
**The Air University**

## Introduction

The principal activities that comprise the operational art, according to the U.S. Army's official definition, are "employment of forces to attain strategic goals" and "design, organization, and conduct of campaigns."[1] (The unstated assumption is that adequately trained, organized, and equipped forces will be available to command). The space scale of the operational art is the theater; its time scale is the campaign, perhaps lasting weeks or months.

It's easy to picture a commander at a big map board, assigning missions, moving pieces, and defeating an enemy with skills developed in war games. But this picture misses an important feature of war at the operational level: the operational commander may have sufficient time and space, authority, and imagination to alter the parameters and assumptions of the "game."

The early campaigns of General George C. Kenney in World War II provide a good example of this aspect of the operational art. General Kenney was the commander of the Allied air forces serving under General Douglas MacArthur in the Southwest Pacific Area (Figure 1).

Kenney used his authority as a major force commander to adapt his assigned forces to the circumstances of the theater. He reorganized, retrained, and re-equipped them, and then employed those forces in novel ways.

Kenney changed many simple operating parameters; while each discrete change was unremarkable by itself, their combined effects proved sufficiently effective to surprise the enemy repeatedly. These small changes produced greater collective

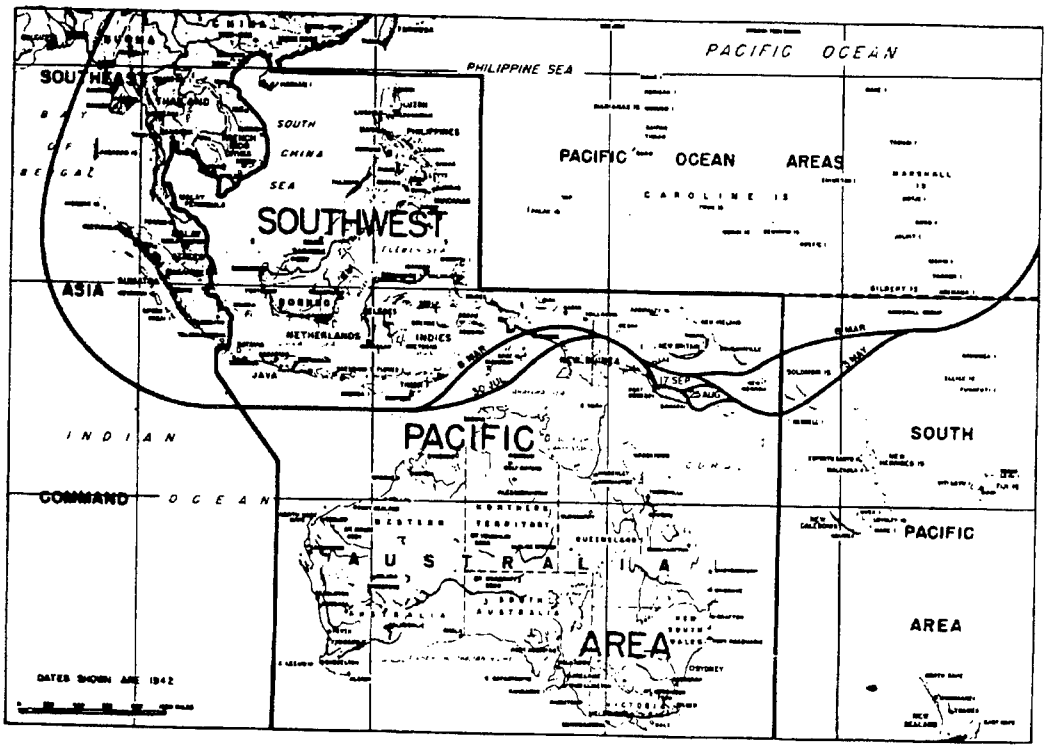



***Figure 1: Southwest Pacific Theater, showing Japanese limit of advance. SOURCE: Reports of General MacArthur Vol I, 32.***

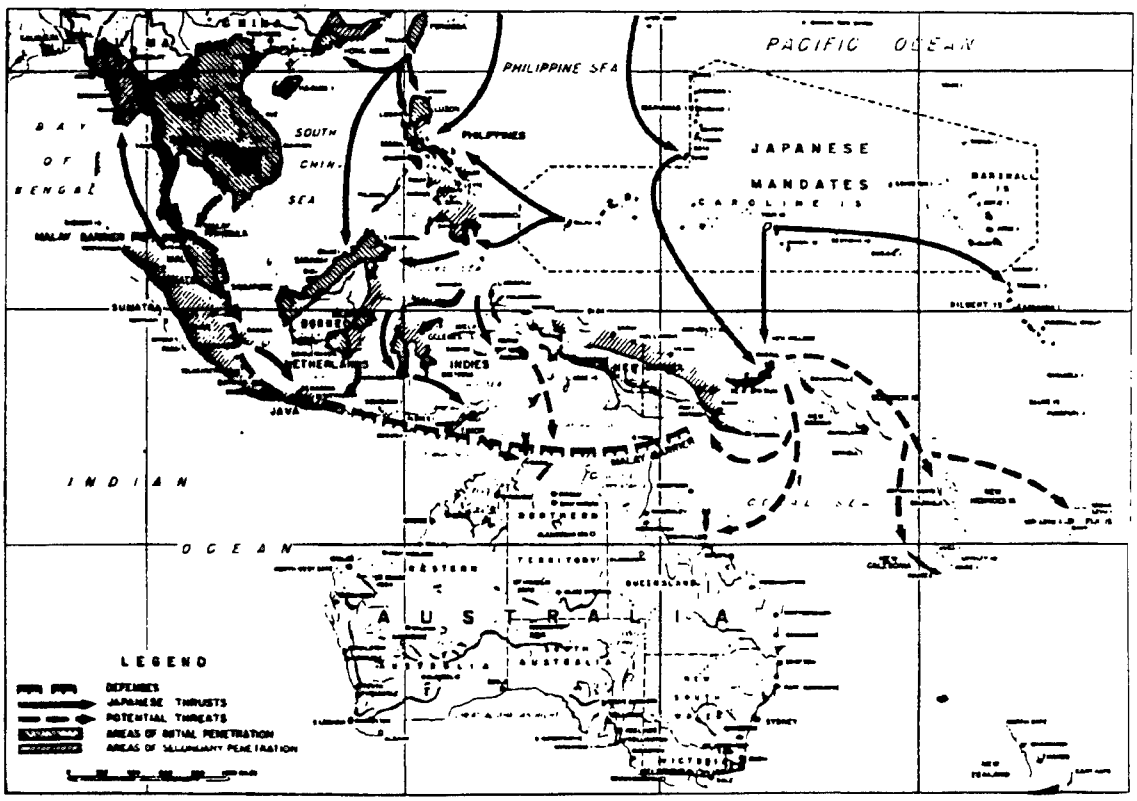



***Figure 2: Japanese advances and threats of 1942. SOURCE: Reports of General MacArthur Vol I, 24.***

results because they were internally consistent. Kenney's perception, his vision if you will, of how he wanted to fight guided these changes, directing them toward a coherent goal.

Kenney's campaigns show us that at the operational level of warfare new possibilities may emerge; the range of options available can increase as the commander discards unnecessary assumptions--and perhaps dogmas. As variables increase, commanders may make effective choices based on the remaining factors beyond their control--what Sun Tzu called "the art of studying circumstances."

**The Southwest Pacific Campaigns, July 1942-July 1943**

After Japan's early successes of 1941 and 1942, Allied forces were spread thin defending the islands on the route between the United States and Australia. In the summer of 1942, Japanese forces attempted to cut this route by establishing bases in New Guinea and the Solomon Islands. Japanese forces were inside the long arc of the South Pacific trade route, and had relatively short supply lines.

Japanese leaders viewed the attacks on New Guinea and the Solomons as a single campaign,

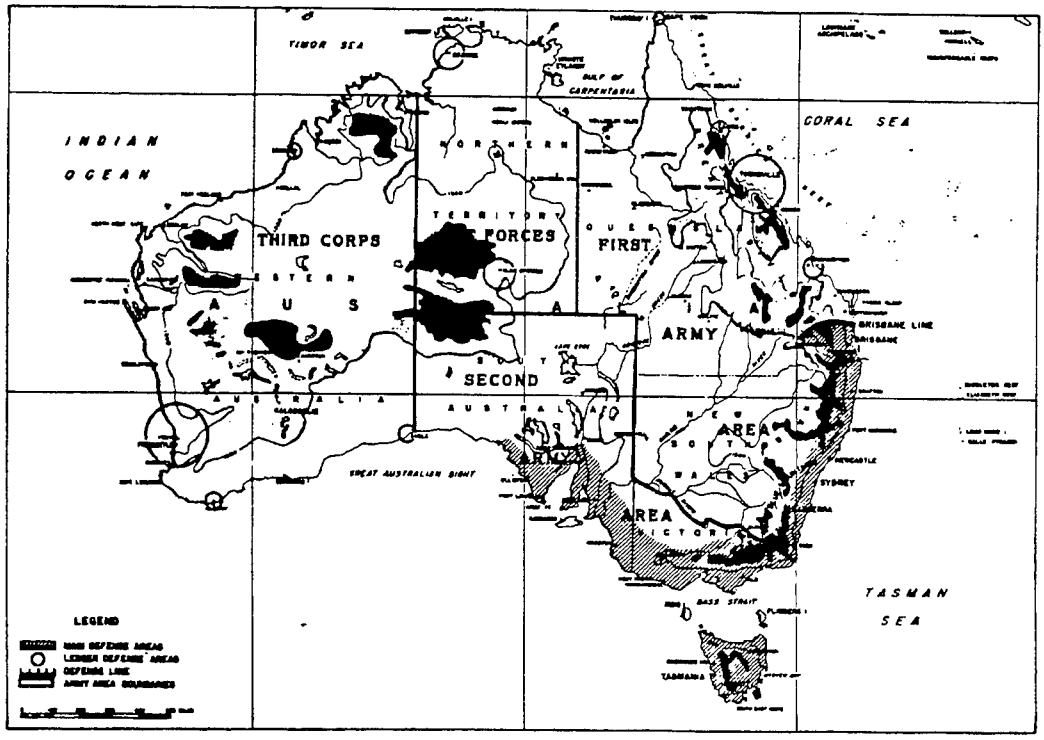



***Figure 3: Plan for the defense of Australia. SOURCE: Reports of General MacArthur, Vol I, 36.***

originating in Rabaul, but proceeding along mutually supporting lines. The initial objectives were Guadalcanal and the town of Port Moresby. Follow-on objectives were New Caledonia, Fiji, and Samoa.[2] (Figure 2).

Japanese air forces attacked northern Australian towns repeatedly in 1942, while submarines raided as far south as Sydney. (Figure 3) Many people talked of abandoning northern Australia and concentrating forces on the Brisbane Line to defend the populous south.[3] In these circumstances, the apparent task of the theater air commander was to defend Australia, which is about the size of the continental United States.

By July, 1942, Japanese forces were building an air base on Guadalcanal and beginning to move south from Buna to Port Moresby. (Figure 4) At the end of July General MacArthur's new air forces commander, General Kenney, reported for duty. After a whirlwind tour to get a feel for the situation, Kenney requested approval to pursue one primary goal: to gain command of the air in the theater. MacArthur agreed, but the Allied air force lacked the means to directly challenge the Japanese air force at that time.[4]

**First Campaign: Defense of Port Moresby**

In August, 1942, a Japanese infantry division began to push south to take Port Moresby. Japanese air strength threatened maritime reinforcement of New Guinea, so Kenney used every transport, bomber, and civilian airplane available to fly reinforcements into Port Moresby. Airlift on this scale was improbable at the time: even General MacArthur's staff thought airlifting reinforcements was infeasible.[5]

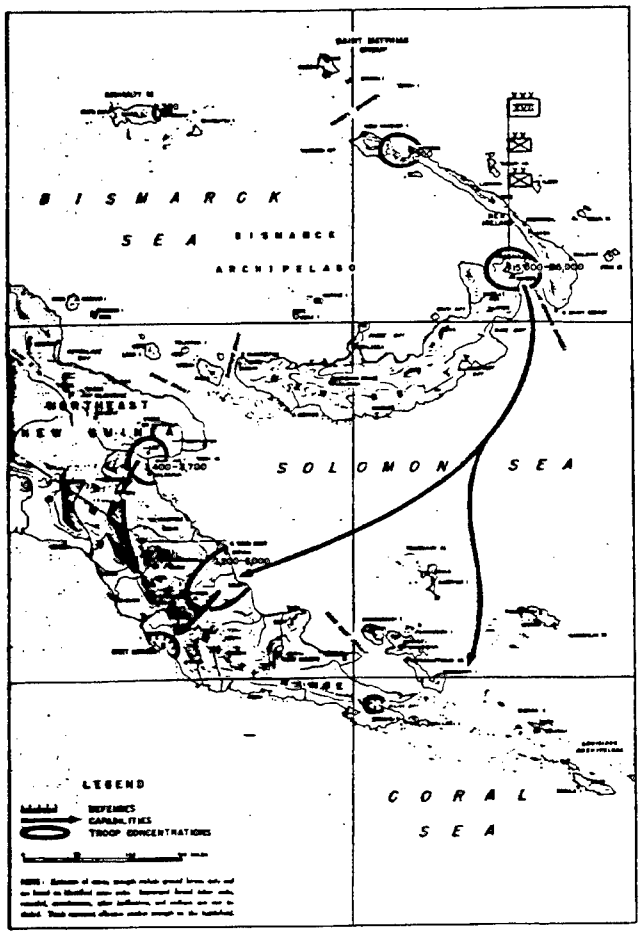



***Figure 4: The Japanese advance to seize Port Moresby, July-September 1942. SOURCE: Reports of General MacArthur, Vol I, 69.***

As the Japanese forces closed in on Port Moresby, Kenney's fighters and light bombers based at Port Moresby flew up to 12 sorties a day to interdict the attackers. Finally, in a two-week battle only 32 miles from Port Moresby, Australian infantry stopped the Japanese offensive and counterattacked; the Japanese forces withdrew towards Buna. (Figure 5) The airlift and interdiction efforts of the Allied air forces were essential components of this reversal.

**Second Campaign: Counterattack and Siege of Buna**

As the Japanese army withdrew, Kenney established a forward resupply airfield on the northern coast of New Guinea, less than 15 miles from Buna. The siege of Buna became a race for time, as disease disabled Allied soldiers faster than they could be replaced. Japanese air strength still threatened Allied shipping, so Kenney again used every large airplane available to supply the fighting forces. Even with bombers carrying supplies and troops, so little airlift was available that the Allied soldiers wasted away on as little as one-sixth of a C-ration per day. When the Allied ground forces captured Buna in January they were exhausted, the Allies would not mount another large ground offensive for eight months.[7]

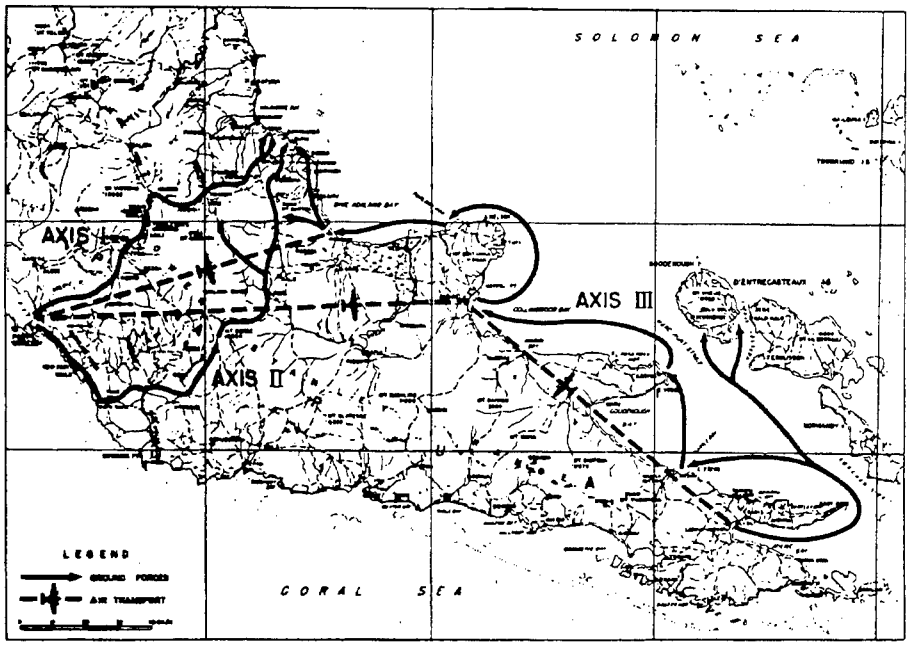



*Figure 5: The Allied advance to Buna: October-November 1942. SOURCE: Reports of General MacArthur, Vol I, 76.*

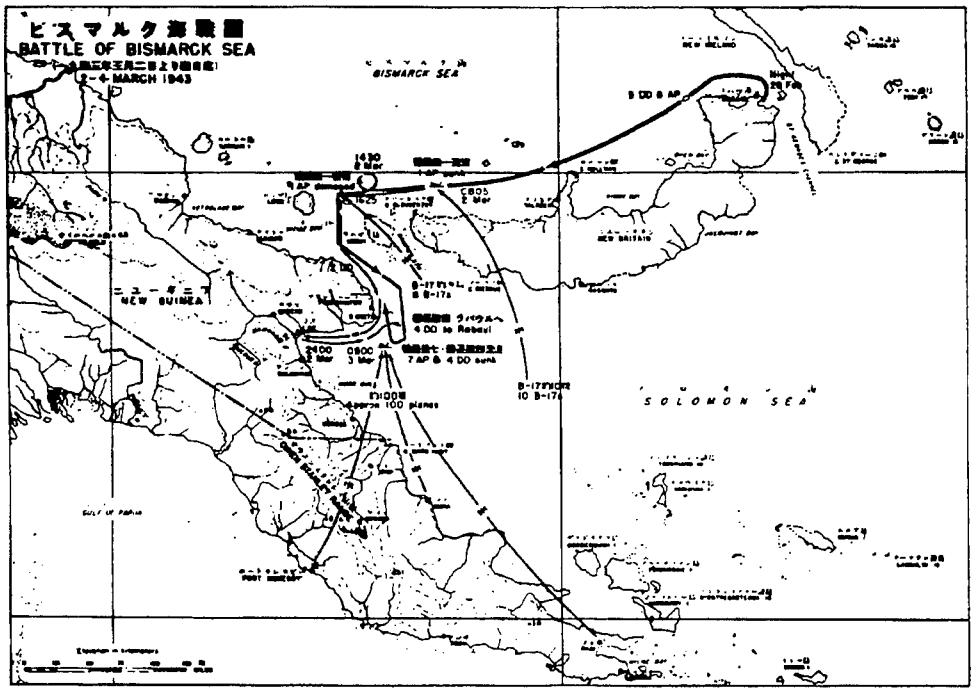



*Figure 6: Battle of the Bismarck Sea, showing convoy route from Rabaul and Allied air attack routing. SOURCE: Reports of General MacArthur, Vol II, 203.*

At the same time, in January 1943, the Japanese high command chose to abandon Guadalcanal and concentrate forces for a major counterattack in New Guinea. Throughout the Buna siege, the Allies had maintained only a bare resupply base on New Guinea's northern coast. With the prospect of a major Japanese counterattack, Kenney concentrated his efforts on building a strong network of mutually supporting bases near Buna.

**Third Campaign: Battle of the Bismarck Sea**

A large Japanese force, (16 ships carrying an infantry division) assembled at Rabaul and shortly before midnight on 28 February sailed for New Guinea. (Figure 6) Superior intelligence and reconnaissance led Kenney's air forces to the convoy; they attacked in strength on the morning of March 3rd. In the ensuing Battle of the Bismarck Sea, Allied airmen sank 12 of the 16 ships.[8]

**Results**

At this point, nine months after assuming command, Kenney had finally set the stage for gaining control of the air over New Guinea. He had done so by engaging in a land defense, a counterattack, a siege, and a naval battle.

However, action had so depleted the air forces that it would be several months before they could resume the initiative. (Figure 7) Kenney's successes had consumed air strength faster than replacements arrived, from the beginning of the Buna siege through the Battle of the Bismarck Sea.[9] According to the U.S. ground forces commander, General Eichelberger, the Bismarck Sea battle was fought "at a time when strength was already dangerously low in our particular theater."[10]

The Battle of the Bismarck Sea proved decisive, starting a complex chain of events leading to Allied control of New Guinea. Japanese naval authorities never risked another convoy near Kenney's air forces; instead they relied on destroyers, small boats, and submarines to replenish their forces in New Guinea. The army withered, and without bulk supplies Japanese air operations dwindled. Moreover, because Japan's submarines were performing priority supply missions,[11] Allied shipping became better able to build up supplies for surface and air operations.

**Generalizations About the Operational Level of War**

It's possible to claim that Kenney simply did what he had to do; that is, he reacted to circumstances and used the people and equipment available to him appropriately and effectively. This simplifies the operational art and misses an important perspective: at the operational level, a commander, given sufficient authority and audacity, may impose new structure on operations and resources. Operational developments may have profound military value when they defy easy prediction, upset assumptions, and create new conditions.

**Some Assumptions**

In the United States Army Air Forces in 1942, the following assumptions were common: the critical task for an air commander was selecting targets for his bombers; fighters were effective primarily in the air defense role; airlift was for speeding critical resources to secure bases; and, because of the differences in their performance, transports, bombers, and fighters were best used separately. The circumstances General Kenney faced compelled him to discard all these assumptions.

**Variable Factors at the Operational Level of War**

The variable that dominated most airpower planning in World War II, and still does, was choice of targets. The ability of aircraft to go anywhere within a reasonable operating radius, carrying any available weapons, gives airpower its tremendous flexibility. With air forces of finite size, it's easy to conclude that there will always be more targets than aircraft to attack them, and the operational commander's key decision is where and what to attack. The hidden assumption is attack missions will be worthwhile and prudent.

Commanders at the operational level have far more options than the tactical leaders they command. Kenney not only could choose how to fight, he could also choose how to not fight. Flying with combat loads, in marginal aircraft and through violent weather, over half of Kenney's attrition was due to accidents rather than enemy action.[12] (Figure 8) It was, therefore, essential to undertake only worthwhile operations.[13]

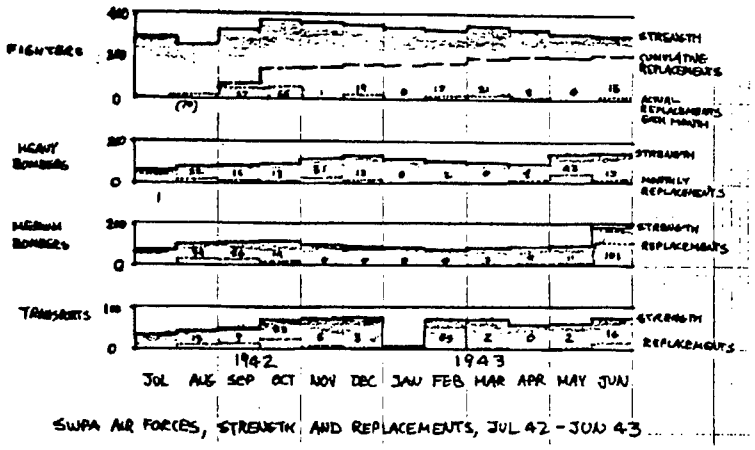



***Figure 7: Southwest Pacific Area Air Forces strength, July 1942 to June 1943, with replacement and loss figures indicated. SOURCE: Report, "Aircraft Attrition Southwest Pacific Area," in USAF Historical Research Center (USAFHRC) collection.***

Examining the sortie figures for Kenney's air forces in 1943, we find that less than three percent of the fighter sorties were attack missions.[14] We can say that one option at the operational level is to deny or limit battle until a positive object or opportunity makes the effort worthwhile. One important variable the operational commander may control is tempo.

In the face of the Japanese air attack threat, Kenney adopted a flexible basing posture. He established a theater reserve which reduced vulnerability and also enhanced offensive potential. Normally he kept about one third of his forces at forward bases, another third in reserve, and the remainder training or recovering from operations. For major efforts, the reserve forces could move from Australia to New Guinea for brief periods.[15] An audacious operational commander, then, may modify or discard established organizational norms to fit circumstances. Kenney's actions suggest a second variable at the operational level which we can call posture.

Kenney also modified aircraft and weapons to change his air forces' capabilities. He directed modification of A-20 attack aircraft to increase their range, local development of medium bombers packed with forward-firing guns ("commerce destroyers"), low-altitude skip bombing, and attacks with "parafrag" bomblets (which foreshadowed modern cluster bombs).

Significantly, Kenney introduced each development on a large scale to reap the full benefits from its initial use. Had these developments been tried out on a tactical scale, surprise might have been lost, and Japanese forces could have adjusted their plans for the new threats. While tactical commanders might have had the means to develop these techniques on a small scale, only the operational commander had the means to gain decisive results from their employment. The operational commander, then, has the authority to direct, guide, and exploit technical and tactical developments to create success on a large scale.

The options available to the operational commander are relatively unbounded. This may best be seen by considering the effects of an attack on the enemy. As Colonel Warden has emphasized in *The Air Campaign,* an attack is a stimulus; it can agitate the recipient, possibly to make mistakes.[16] The kind of reaction an attacked commander makes is

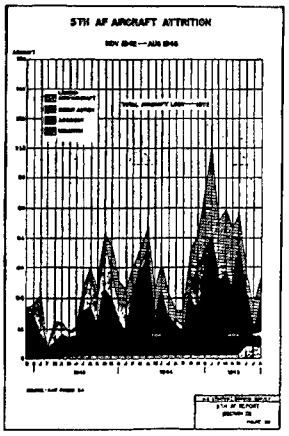



*Figure 8: Fifth Air Force aircraft attrition, November 1942 to August 1945, with cause indicated. SOURCE: United States Strategic Bombing Survey, Military Analysis Division, The Fifth Air Force in the War Against Japan, 46.*

fundamentally uncertain, simply because it is a human response.

**Relative Strength**

While the direction or nature of a commander's reaction may be generally unrestricted, the magnitude of the response will be necessarily constrained by the available means. But resources and forces can be structured to create novel values at the operational level.

Throughout the campaigns under discussion, Kenney developed operational-level solutions to compensate for his shortfalls in resources. Tactically, Japanese forces could have massed locally based aircraft to raid any Allied air base in New Guinea on any given day during these campaigns. Kenney's answer was to disperse, camouflage, and protect his forward based aircraft. Operationally, Japanese air commanders could use their shorter lines and available reserves to concentrate and attack in overwhelming strength, in a concerted campaign, at any given time. In response, Kenney ordered extensive daily search and reconnaissance missions.[17] (Figure 9) Strategically, however, the overall Europe-first plan limited Kenney's resources in a different manner: not only were replacements few, they were also uncertain in number, schedule, and quality.

One feature of Kenney's response to this uncertainty was to reject a widely held assumption of contemporary airpower doctrine. In early 1943, when other air commanders considered fighter escort impractical, over half of Kenney's fighter sorties were escort missions. Fighter escort tended to preserve forces by massing them together, and increased the likelihood of success of the mission being flown. In the months of offensive operations, escort operations accounted for over 75 percent of his fighter sorties.[18] (Figure 10) The Allied fighters escorted not only bombers, but transports as well. Kenney's use of a disparaged employment option, fighter escort, shows that the operational commander can influence events by combining tactical forces and departing from accepted doctrine.

**Necessary Bounds**

Kenney's perception of the constants he faced--geography, enemy capabilities, space, and time--was the basis for his campaign plans. Areas suitable for military bases in this theater were few and remote. (Figure 11) Those areas where large forces can subsist are essentially isolated by rugged mountains, jungle, or ocean.

The most economic means of supplying large forces in the theater was by ship, but ships are relatively slow and require time to unload and are susceptible to air attack. Accordingly, given the aircraft ranges and airspeeds of the time, in the Southwest Pacific theater no base or battlefield could be logistically supported without air superiority. Kenney's operations reflect the understanding that this was a maritime theater, but one that could be dominated by airpower. (The nominal figure for attack range with fighter escort used in the United States Strategic Bombing Survey report on Kenney's Fifth Air Force is 200 nautical miles. A contemporary map showing the 200 nautical mile fishing limit shows how much of the ocean areas in the theater could be reached by land-based aircraft with just that range. [Figure 12]).

Airpower took on added significance in New Guinea in the fall of 1942 when the action at

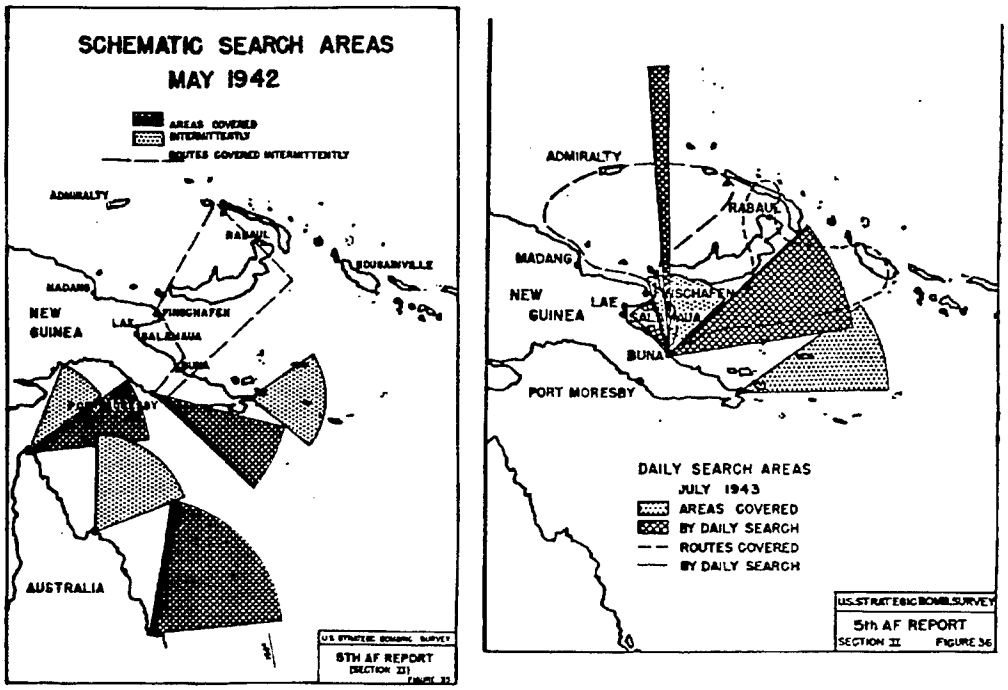



***Figure 9: Typical daily search requirements, August 1942 and July 1943. SOURCE:*** United States Strategic Bombing Survey, Military Analysis Division, ***The Fifth Air Force in the War Against Japan, 79, 80.***

Guadalcanal, culminating in the Battle of Santa Cruz, had cost the Allied navies heavily. As a result, the only capital ships immediately available to the Allies in the Pacific were one battleship and one damaged aircraft carrier.[19] The lack of military alternatives made control of the air particularly important in this theater at that time, and compelled preserving forces.

The doctrinal answer of the time was to intercept enemy air attacks, as the RAF demonstrated in the Battle of Britain. This didn't work for Kenney; his forward base at Darwin was on the coast; insufficient depth made effective early warning impossible. In New Guinea, terrain and jungle made any radar warning network largely ineffective. Both Japanese and Allied bases were vulnerable.[20] Kenney not only perceived this fact, but acted on it, attacking Japanese bases in mass, and reattacking only when the bases were almost recovered from the previous raid. Kenney perceived that the relative vulnerability of air bases was the key to controlling New Guinea, and persuaded MacArthur that a drive to establish new bases was a worthwhile theater aim.[21]

Space and time are unalterable, but they can have relative values. In the siege of Buna, time favored the Japanese defenders who occupied dry coastal land, while Allied soldiers fought from swamps and succumbed to disease at horrendous rates; as MacArthur put it during the siege "...time is working desperately against us."[22] In 1942 and early 1943, space generally favored Japanese forces, who enjoyed depth and relative immunity from air attack along New Guinea's northern coast. But when, in late 1943 and 1944, MacArthur's forces bypassed and isolated many of these garrisons under air cover from forward bases, time and space began to work against the Japanese forces. (Figure 13)

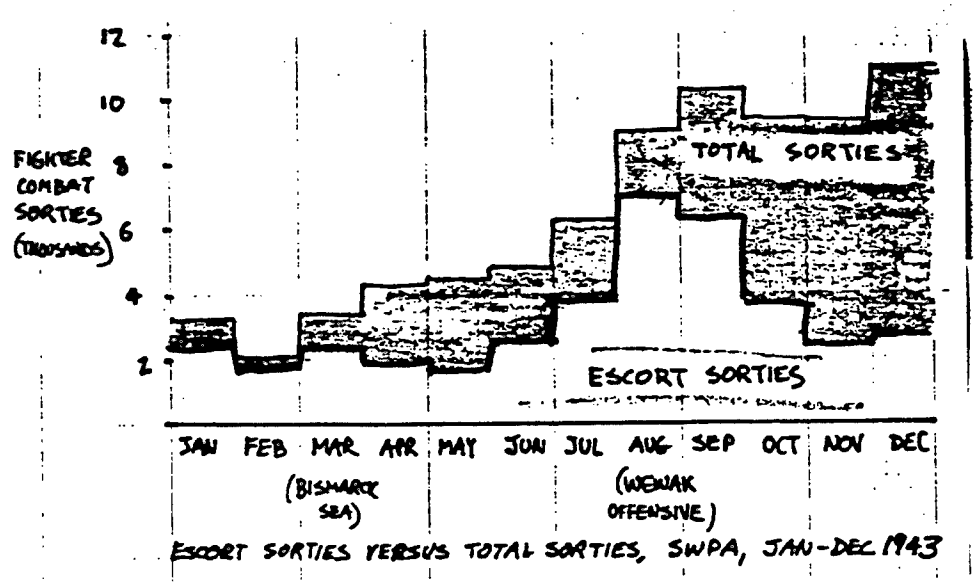



*Figure 10: Fighter combat sorties: total sorties and escort sorties, SWPA, 1943. SOURCE: Office of Statistical Control,* Army Air Forces Statistical Digest, World War II, *230.*

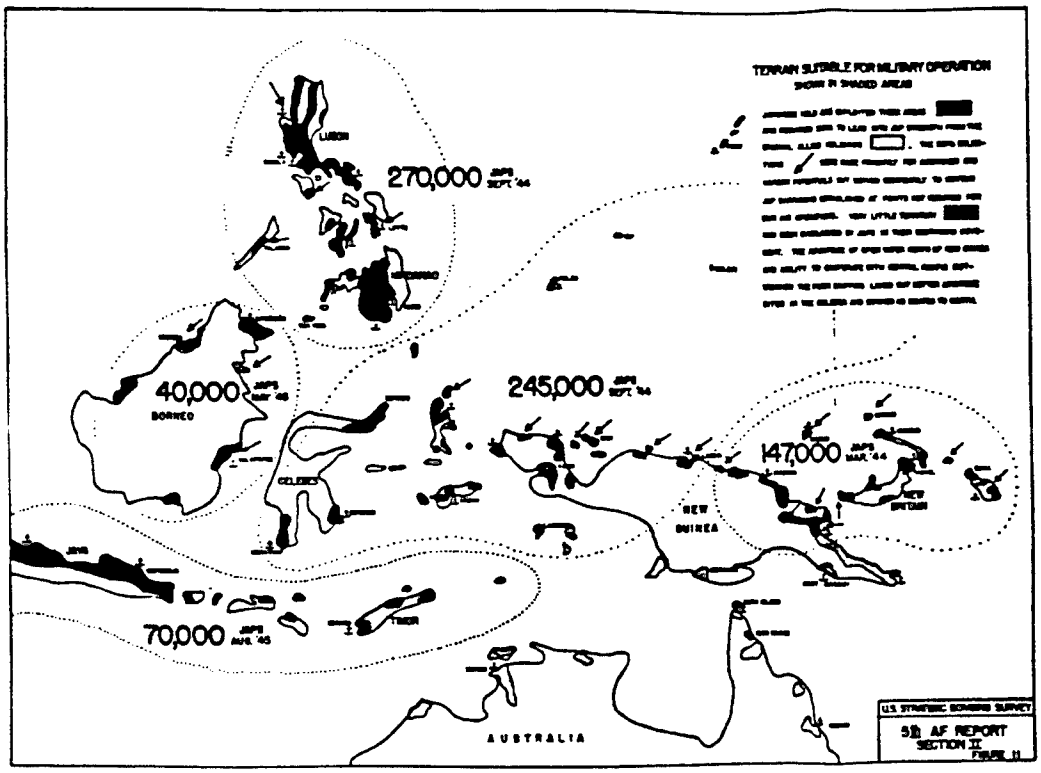



*Figure 11: Terrain suitable for military operations in Southwest Pacific Area. SOURCE:* United States Strategic Bombing Survey, Military Analysis Division, *The Fifth Air Force in the War Against Japan, 18.*

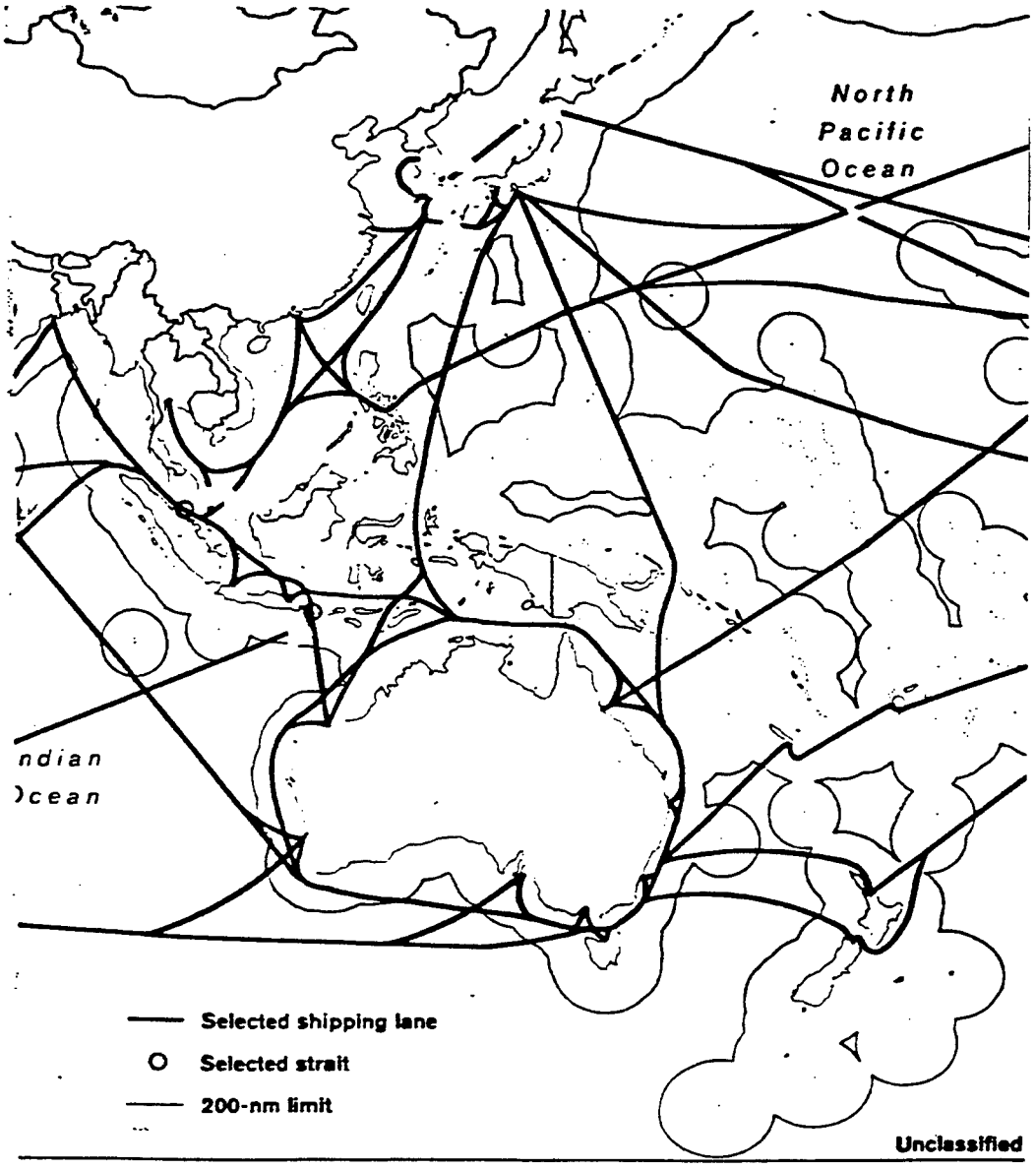



*Figure 12: Southwest Pacific ocean areas within 200 nautical miles of land. SOURCE: CIA Publication 505003 (unclassified map).*

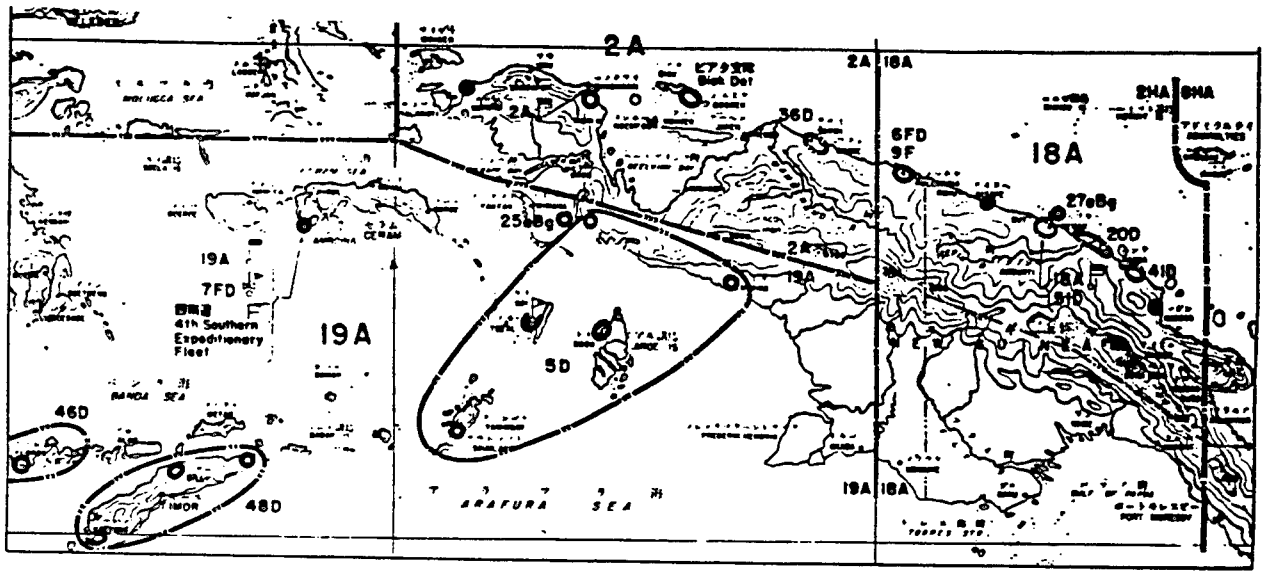



*Figure 13: Japanese garrisons isolated by Southwest Pacific Area forces operations, April 1944. SOURCE: Reports of General MacArthur, Vol II, 254.*

**Summary**

The pertinence of Kenney's campaigns is that they illustrate the potential of the operational level commander to transform theater conditions. This process depended on Kenney's perception of friendly and enemy capabilities, geography, and untried military potential.

The imperatives of fighting with limited means compelled Kenney to discard numerous assumptions. To put it another way, Kenney treated many prescriptions of contemporary military doctrine as hypotheses; he abandoned those hypotheses that proved unnecessarily restrictive, non-functional, shortsighted, or--most importantly--inappropriate to existing circumstances.

To modify the terminology of Alfred Korzybski, Kenney abandoned much of the "map" of contemporary military theory and reexamined the "terrain."[23] Of course he constructed new conceptions--new "maps"--but these worked better, since they reflected the "terrain" of existing theater conditions better.

Kenney's actions, in short, demonstrate that the constants, variables, and value ranges we assume are conveniences. At the operational level of war, great gains may be made by doing the "unfeasible," by upsetting imagined limitations.

The particular conditions of the theater and campaign make more specific conclusions questionable. Inevitably, an understandable analysis of a military campaign must simplify dynamic events, and may present a picture of rationality and order that was not present at the time. A look at the variety of missions flown by Kenney's forces indicates the complexity of the actual operations. (Figure 14) The only claim I can make for this analysis is that it is plausible; even if it identifies cause and effect accurately, it does not demonstrate that Kenney's actions were optimal--just that they worked.

Those of us who have played in war games and command post exercises might recall having tried to win, and coming to realize that the most effective way of gaining our desired results was not insightful thinking but understanding the rules. Kenney's campaigns demonstrate that the operational scale of war gives the commander scope to change the "rules," to alter established parameters, and to question assumptions. Games played according to rules and the operational art are of two different logical types. The "visions and revisions" that epitomize operational art are more like the design, evaluation, and modification of war games than their play.

**Notes**

1. U. S. Army Field Manual 100-5, *Operations,* May 1986, p. 10. Raoul Henri Alcala, "The United States and the Future of Land Warfare: The Airland Battle," in *Emerging Doctrines and Technologies,* ed. Robert L. Pfaltzgraff et al. (Lexington, Mass: Lexington Books, 1988) is a detailed discussion of the operational art based on the same definition.

2. Lt Gen Miyazaki Shuichi, Deputy Chief of Staff, Japanese Imperial General Staff, "Personal Experiences During the Solomons Campaign," in United States Strategic Bombing Survey, Military Analysis Division, *The Effect of Air Action on Japanese Army Logistics* (Washington, D.C.: Government Printing Office, 1947), 175.

3. Ronald H. Spector, *Eagle against the Sun: The American War with Japan* (New York: Random House, 1985), 190. D. Clayton James, *The Years of MacArthur,* vol. 2, 1941-1951 (Boston: Houghton-Mifflin Company, 1975), 203. See also Gavin Long, *The Six Years War: A Concise History of Australia in 1939-1945 War* (Canbara: Australian War Memorial and the Australian Government Publishing Service, 1973).

4. James, 198-199, Gen George C. Kenney, *General Kenney Reports: A Personal History of the Pacific War* (New York: Duell, Sloan and Pearce, 1949; Washington, D.C.: Office of Air Force History, 1987), 44.

5. James, 231, Kenney, 94-100.

6. Fifth Air Force Report, Air War Against Japan, 2.

7. *Reports of General MacArthur*, vol. 1, *The Campaigns of MacArthur in the Pacific* (Washington, D.C.: Government Printing Office, 1966), 89; Gen Robert L. Eichelberger with Milton MacKaye, *Our Jungle Road to Tokyo* (Washington, D.C.: Zenger Publishing Co., 1982), 11, 34-44.

8. Considerable controversy arose over the size of the convoy and the number of ships sunk as a result of exaggerated battle reports. The most comprehensive discussion of the controversy is James, 297-303. Interestingly, the conservative results, used here, are also cited in *Reports of General MacArthur*, vol. 2, *Japanese Operations in the Southwest Pacific Area* (Washington, D.C.: Government Printing Office, 1966) 183-197, 201-206.

9. Wesley F. Craven and James L. Cate, eds., *The Army Air Forces in World War II*, vol. 4, *The Pacific: Guadalcanal to Saipan, August 1942 to July 1944* (Chicago: University of Chicago Press, 1950; Washington, D.C.: Office of Air Force History, 1983), 152; Kenney, 185.

10. Eichelberger, 89.

11. United States Strategic Bombing Survey, Military Analysis Division, *The Effect of Air Action on Japanese Ground Army Logistics* (Washington, D.C.: Government Printing Office, 1947), 38-41, details the Japanese submarine logistical effort--including the development of army submarines.

12. "USAF Tactical Operations World War II and Korea with Statistical Tables," USAF Historical Division Liaison Office, 1962, Table 67 (p. 109) shows that from 3 Sep 1942 to 22 Apr 1944, 371 aircraft were lost to enemy action, and 668 to "operational causes." United States Strategic Bombing Survey, Military Analysis Division, *The Fifth Air Force in the War Against Japan* (Washington, D.C.: Government Printing Office, 1947), Figure 22 (p. 46) depicts the preponderance of losses to accidents graphically. Interestingly, in United States Strategic Bombing Survey, Military Analysis Division, *Japanese Air Power* (Washington, D.C.: Government Printing Office, 1946) Exhibit B (p. 33), it appears that Japanese losses to accidents were only half their combat losses--and most of these were ferrying accidents.

13. Attrition due to flying "in insignificant operations" is a major theme of Williamson Murray, *Strategy for Defeat - The Luftwaffe 1933-1945* (Maxwell AFB Al: Air University Press, 1983); see for example 156-7, 182-8.

14. *Army Air Forces Statistical Digest, World War II* (Washington, D.C.: Office of Statistical Control, 1945), Table 129, Combat Sorties Flown By Fighters in Theaters vs Japan, by Theater and by Type of Sortie: Jan 1943 to Aug 1945 (p. 230).

15. Maj Gen Charles A. Willoughby and John Chamberlain, *MacArthur 1941-1945* (New York: McGraw-Hill Book Company, Inc., 1954), 76; James, 198-200.

16. John A. Warden III, *The Air Campaign: Planning for Combat* (Washington, D.C.: National Defense University, 1988), 56.

17. Willoughby (p. 122) indicates that Japanese air strength peaked in September 1943 at 1071 aircraft. Edward T. Maloney, ed., *Fighter Tactics of the Aces SWPA* (Corona Del Mar, Calif.: World War II Publications, 1978) quotes many Allied fighter pilots who considered their aircraft outclassed. *Papuan Campaign: The Buna-Sanananda operation, 16 November 1942 - 23 January 1943,* (Washington, D.C.: War Department, Military Intelligence Division, 1944), 18, indicates that during the Buna operations almost half of all fighter and bomber missions (224 of 502) were flown to perform some kind of reconnaissance or patrol. *Army Air Forces Statistical Digest, World War II,* (Washington, D.C.: Office of Statistical Control, 1945), Table 129, Combat Sorties Flown By Fighters in Theaters vs Japan, by Theater and by Type of Sortie: Jan 1943 to Aug 1945, pools patrol, interception, sweep, and sea-search into one category. Summaries of Operations, SWPA Air Force, Aug 42-Jun 43, in US Air Force Historical Research Center (USAFHRC) collection, Maxwell AFB, Alabama, indicate that search and reconnaissance comprised a large portion of missions flown; for example, 920 sorties in March 1943 (report dated 13 April 43).

18. *Army Air Forces Statistical Digest, World War II* (Washington, D.C.: Office of Statistical Control, 1945), Table 129, Combat Sorties Flown By Fighters in Theaters vs Japan, by Theater and by Type of Sortie: Jan 1943 to Aug 1945 (p. 230).

19. T. Dodson Stamps and Vincent J. Esposito, eds., *A Military History of World War II with Atlas, vol. 2, Operations in the Mediterranean and Pacific Theaters* (West Point, N.Y.: United States Military Academy, 1956), 369. See also Samuel Eliot Morison, *The Two-Ocean War: A Short History of the United States Navy in the Second World War*

(Boston: Little, Brown and Company, 1963), 184, 196.

20. United States Strategic Bombing Survey, Military Analysis Division, *The Fifth Air Force in the War Against Japan* (Washington, D.C.: Government Printing Office, 1947), 87; *Reports of General MacArthur,* vol. 1, 42.

21. *Reports of General MacArthur,* vol. 1, 98; James, 282; Willoughby, 101; Samuel Eliot Morison, *History of United States Naval Operations in World War II, vol. 6, Breaking the Bismarcks Barrier, 22 July 1942 - 1 May 1944* (Boston: Little, Brown and Company, 1950), 255.

22. Eichelberger, 43.

23. Explained in S. I. Hayakawa, *Language in Action* (New York: Harcourt, Brace and Company, 1940), passim. This discussion is greatly informed by Hayakawa's discussion of the idealized assumption of science--that all hypotheses should be treated as temporarily true. Hayakawa used the terms "map" and "territory;" "territory" can be assumed to have boundaries, so I have elected to use the word "terrain" to better convey the difference between the actual thing studied and the conventions of thought and theory. Another clear explanation of Korzybski's distinction is Gregory Bateson, *Mind and Nature* (New York: Bantam Books, 1988), 30, 117.

# IRAQI POWER AND U.S. SECURITY IN THE MIDDLE EAST

**Stephen C. Pelletiere**
**LTC Douglas V. Johnson II**
**Strategic Studies Institute**
**U.S. Army War College**

[The cited authors made a joint presentation, drawing from their report of the same title. A third author, Leif R. Rosenberger, contributed to the report. The Summary of the report, published in 1990, is presented here for these proceedings.]

This report is an examination of the Iraqi defeat of Iran in the 8-year-long Iran-Iraq war and the implications of that outcome on future U.S. Middle East policy. It concluded that Iraq's achievement in forcing Iran to accept a truce represents an authentic victory. The victory was attained because the Iraqis planned for and successfully executed complicated large scale military operations and shrewdly managed their resources. Claims that they won simply by using massive amounts of chemical weapons cannot be substantiated.

Iraq's success was facilitated by the collapse of Iranian civilian morale. The collapse, however, was not entirely fortuitous. Iraq's breakthrough in developing long-range missiles opened the way to strategic bombardment of the Iranian capital, which ln turn produced the collapse.

The report further concludes that--contrary to general belief--Iraq's rulers enjoy significant popular support. The authors base this conclusion on the Ba'thists' ability to order a general call-up during what was perhaps the darkest period of the war. The willingness of the population to comply with the regime's order in effect confirmed its legitimacy.

In the specific sphere of military operations, the study concludes that a cadre of genuinely competent professional officers exists *within* the Iraqi military, This group is fully capable of keeping pace with the latest innovations in weapons technology. The officer corps understands and is committed to the conduct of combined arms operations to include the integration of chemical weapons. It commands soldiers who, because of their relatively high education level, are able to carry out such operations.

The authors believe that the future of the Iraqi military will be conditioned by the performance of the economy. Iraq is a potentially wealthy country with huge reserves of oil, a highly trained work force, and a manageable population. Nonetheless, it went deeply into debt to defeat Iran. Its debts must now be paid, and the regime is striving with all its energies to reach accommodation with its creditors. For the foreseeable future, debt repayment will fully occupy the regime; it will have neither the will, nor the resources to go to war. In addition, although the regime claims that it is in the process of developing a national arms industry, the authors do not believe that it has the resources for this at present.

Iraq's leaders see their country as beleaguered. On one side is Iran, which almost certainly will seek revenge for its humiliating defeat. This will take time, however; at present Tehran is militarily prostrate. The Ba'thists will need to keep a close watch on the Eastern Front, but ln the near to midterm they seem secure from that quarter.

To the north is Syria, which like Iran, does not pose a serious immediate threat. Because of their Lebanon involvement the Syrians are currently too preoccupied to threaten anyone. Still, the Syrians and Iraqis are implacable foes, and here, too, the Iraqis dare not totally let down their guard.

The real threat, as the Ba'thists perceive it, is Israel. The Israelis have been impressed with Iraq's victory, which they did not anticipate. Moreover, the development of long-range missiles by Baghdad somewhat offsets Israel's previous advantage in these weapons. There is no doubt that Tel Aviv will try to maintain superiority over Iraq by developing newer, more lethal arms, and there is even the possibility

that it will seek to wreck Iraq's bid for technological parity by destroying Iraqi missile sites and research facilities. The report concludes that any such pre-emptive attack on Iraq by Israel would be a most dangerous gambit, and could precipitate a major war in which U.S. interests would be jeopardized.

Given this high degree of tension, Washington needs to decide whether its present policy towards Iraq is well judged. The policy certainly renders comfort to the Israelis, but it could provoke bitter consequences from Baghdad. A divisive quarrel between the two countries could impinge on U.S. Security In the Persian Gulf, and that--given the growing scarcity of oil in the 1990s--could impose serious hardship on the American public.

The report also suggests that the United States needs to give more attention to Soviet moves in the Gulf. Some of Moscow's recent maneuvers have been quite adroit. Unlike Washington, Moscow is now on fairly good terms with every one of the Gulf states.

The report concludes with several recommendations addressed to U.S. policy makers and to military leaders. It reemphasizes the importance of preserving stability in the Persian Gulf, and asserts that this is--and rightly should be--the main aim of U.S. Middle East policy. In line with this we see it as essential that the United States improve relations with Iraq, the most powerful state in the Gulf.

In the military sphere, it is urgent that we reassess our Middle East strategy. There is, we conclude, the possibility of a major military blowup, In which case the United States would almost certainly have to intervene to restore stability, particularly if there is a cutoff of oil to the West. We should ask ourselves whether we are prepared for such action--in our view we are not. The style of warfare in The Middle East has changed, radically, which means that, to perform competently, our forces must be reconfigured, retrained and reequipped.

## IV - Papers on Models, Games, Simulations and Analyses

Peter Byrne, The Joint Staff (J8), Chair

# TOOLS--MODELS, GAMES, & SIMULATIONS--AND APPLICATIONS

**Peter Byrne, Chair**

The papers in this section suggest possible responses to General Hosmer's challenge "to work the operational art problem." Each of the papers either suggests one or more tools with potential application in studies or analyses bearing on the operational level, and/or it presents an actual application with operational level implications. Some of the papers may, in fact, give the reader both ideas for useful tools and valuable insights into operational level aspects of combat.

This section includes eight papers:

*Tactical Fighter Force Planning Analyses--The Two Things Wrong and How to Fix Them,* W. Leon Goodson, B/Gen, USAF (Ret), STR Corp

*Limited and Focused Operational Level Campaign Planning Against Fuel,* Maj Edward J. Felker, HQ USAF

*Ground Forces Casualty-Rate Patterns--The Empirical Evidence,* George W. S. Kuhn, Logistics Management Institute

*A Bilateral US-Canadian Response to the Threat of Soviet Attack in Norway,* Lt Col Adolph Carlson, US Army War College Fellow

*Command and Control in the RAND Strategy Assessment System* (RSAS), Dr. Paul K. Davis and Mr. Robert D. Howe, The RAND Corporation

*Air Campaign Games: Direction and Decision Aids for Commanders,* Edward P. Jordan, Frontier Technology, Inc.

*War Gaming with Graphics,* Zaven C. der Boghossian, CACI Products

*Wargaming in Support of Operational Art and Analysis,* Lt Col Alan Dunham (USAF), DARPA

In order "to work the operational art problem," one must deal with longer time scales and higher level measures of effectiveness than at the tactical level. Accordingly, useful tools for incorporating operational art in studies and analyses must meaningfully accommodate the extended scales and higher measures. For any choice of tool, this is a challenging requirement.

If one chooses models and simulations, their structure and the input data must represent a relevant campaign and not merely a battle. Less quantitative political-historical analysts must still take the appropriate campaign perspective. To capture relevant *concept of operation,* war games may help to tap the creativity of the mind of a commander. One needs fast running war games, however, if one is to explore an adequate spectrum of scenarios and options.

Given the above demands, it is natural that no one tool has all the advantages The analytic community uses many types of tools, and continues to devise new hybrids. The eight papers of this section span the spectrum. The first four of the list above illustrate various operations research or historical political approaches. The other four use or emulate or support war gaming approaches. Categories are not as distinct as simple labels, however, and careful reading of the papers rewards us with a better appreciation of the blends and shadings.

Dr. Goodson urges a "top down" approach to tactical fighter force planning analyses. His paper merits very careful reading, first of all to understand what he means by "top down." He insists on the "Scientific Advisory Board/Kent framework for force planning analyses," and as *the* "fundamental driving engines within the analysis framework" the use of multi-stage, zero sum, two person games. To illustrate the overall methodology he gives an example based on an European scenario using unclassified data and "levels of forces corresponding roughly to 'normal' force projections with no conventional force reductions."

Maj Felker Illustrates focused *operational level* campaign planning for a notional BLUE force that seeks to slow or inhibit a breakthrough of an ORANGE antagonist. His example uses a concentrated BLUE fuel campaign against ORANGE "fuel stored at the operational level and distributed to

engaged forces at the tactical level." The *Center of Gravity* is the offensive tempo of the ORANGE Army. It is vulnerable because BLUE can reduce the ORANGE fuel flow to a rate that supports defensive operations but not fill requirements for a heavy offensive. The "fuel campaign is part of a greater whole to 'buy time'...for BLUE to become fully reinforced, thereby increasing the correlation of military force to be more favorable to BLUE."

Dr. Kuhn uses statistical analysis of empirical evidence from historical records of combat and recent field exercises to evaluate casualty rate projections. His analysis illustrates differences between what is expected for specific units in individual battles and what can be expected for a campaign. His divisional casualty data, for example, exhibit distinct pulses associated with marked daily variability. Moreover, his data give no evidence that "casualty rates *for a given situation* have increased significantly, if at all, since World War II."

Lt Col Carlson uses historical-political analysis to explore possible remedies to a NATO problem posed in 1987 when Canada announced other plans for an air-sea transportable brigade group and two fighter squadrons that had previously been committed to the defense of Norway. His paper argues that a plan to defend Norway is essential to the success of NATO (as originally conceived), and proposes bilateral U.S.-Canadian initiatives that would provide such a defense.

Dr. Davis and Mr. Howe describe important aspects of the RAND Strategy Assessment System (RSAS) that was originally devised to improve the inclusion of strategy and operational level considerations in analysis. Its specifications required it to incorporate some of the advantages of traditional war gaming but to seek greater reproducibility of results and more rapid play. The RSAS response to this demanding challenge is to use expert systems and analytic war plans (where traditional war gaming would use human players). The paper indicates by examples what this approach involves.

Recalling General Hosmer's challenge to find ways for commanders and their staffs to "war game every day," Mr. Jordan sees the answer in the "recent burgeoning of capabilities In microcomputers, coupled with techniques used in the design of commercial games." They give "an opportunity for personalized and realistic, but fast running games to be hosted on microcomputers, providing the feedback, reinforcement, experimentation, and graduated learning for self education in the operational art." He also speaks of possible modification of an education-aid game to a decision-aid version.

Using as an example the project of modifying the Tac Thunder simulation to be an interactive war game, Mr. der Boghossian examines the contribution of graphics to war gaming. He asks rhetorically, "Is a picture worth a thousand words?" Clearly, as he gives numerous examples, he would answer with a resounding "Yes."

Lt Col Dunham describes the use of interactive and distributed (netted) wargaming for training commanders and their staffs, using the example of the ACE-89 exercise. He compares the advantages and disadvantages of wargames with those of combat simulations. Then, noting that the time and personnel requirements of wargames may inhibit their use, he introduces the concept of "Episodic Wargaming" as a possible remedy, and describes some experiments.

Taken together, the above papers describe many promising techniques for the greatly needed improvements in our ability to do good analysis at the operational level. Moreover, their examples further enhance our appreciation of the differences between analysis at the tactical level and analysis at the operational level.

# TACTICAL FIGHTER FORCE PLANING ANALYSES
## (The Two Things Wrong and How to Fix Them)

**W. Leon Goodson, B/Gen, USAF (Ret)**
**STR Corporation**

**Abstract:**

Our tactical fighter force planning analyses are generally:

- too late to do anybody any good, and
- wrong anyhow.

The only cure for "too late" is to start before the question is asked and work in a structured and disciplined way, creating a set of parametrics for force planning much like engineers create a set of design parametrics when building a new airplane. Rather like building a "JMEM for force planning," this demands a structured top-down approach and a suitable framework for analysis.

The primary specification to the charge of "wrong anyhow" is that analysis methods used at the theater campaign level do not analytically treat the "Operational Art--theater level concepts of force employment." This is a problem of fundamental importance, and much of the paper is dedicated to the discussion of it. Following the top down approach, this paper uses the first known end-to-end analysis within the Scientific Advisory Board/Kent framework for force planning analysis (which demands methodologies which analytically treat the Operational Art) to illustrate how top-level questions of fighter force planning can be properly addressed.

The bottom lines are:

- An operational example of the "strategies to task" evaluation framework has been created.
- The glue that binds the entire framework together is the "Operational Art--theater level concepts of force employment."
- Methodologies such as TAC SAGE, TAC ALLOCATOR, or OME-III, which analytically treat the "Operational Art" must be used as the fundamental driving engines within the analysis framework if our analyses are to have any credibility.
- The evaluation framework was exercised to yield a useful set of force effectiveness parametrics for the air-to-surface tasks in the European scenario.

**Introduction**

Since some of the judgments I'm about to render may strike you as being rather harsh, I feel obliged to specify my personal biases on operations analysis in order to set the context within which these judgments are made.

First, I believe that the only purpose of operations analysis is to help someone decide something better. If all decision makers always reached the same decisions on such matters as fighter force structure and composition, munitions, C3I and support etc., regardless of the inputs of the analysis community, I would think it self-evident that such analyses are fundamentally useless.

Secondly, I believe that we in the analysis community have not done a particularly good job of helping decision makers decide the important things better. Our successes have been confined primarily to the lower levels of decision making, generally at the engineering or engagement levels--for example, in choosing among alternative ways of performing some specified function, like increasing air-to-ground delivery accuracy. Our positive contributions at the higher levels--what forces should we procure, how should we train and for what purpose--are rare.

I hear a lot of complaints on the matter from the analysis community. "We perform these elegant sophisticated analyses, and the decision makers don't pay any attention to them. They make their decisions based on their own biases or perhaps for political reasons, or whatever. They seldom pay much attention to analysis."

While it is true that I myself would prefer that decisionmakers paid more attention to analyses, my experience from observing the products of such analyses from the decisionmaking side of the fence have convinced me that we analysts have provided

very little reason for decisionmakers to pay much attention to us.

My experience has been that the decision makers have a far greater appreciation for the problems inherent in most of the higher level analyses that are served up to them than we give them credit for. They often have a better appreciation than the analysts themselves for the fatal flaws in the top level analyses that are supposed to help them.

From that perspective I consider an analysis wrong when it:

- fails to address the specific decision to be made, or

- does not adequately treat the major driving factors which influence which decision option should be chosen.

If an analysis is to address the higher level questions such as force structure, force composition, etc., then inevitably the analysis must be performed at the theater level. The question then becomes, "How good are our theater level analyses?" Stated another way, "How adequate is our analytical treatment of the major factors which influence the outcome of theater level campaigns?"

It is common knowledge among decision makers that the primary factors which drive the outcome of theater level campaigns is Operational Art--theater level concepts of force employment. Decision makers are also painfully aware that almost without exception our analyses fail to analytically treat this absolutely dominant factor. It is not that we treat it poorly--it is that we do not analytically treat it at all! Our analyses take Operational Art as input!

We rely on expert judgment. As an analyst you may feel quite comfortable in doing so, but the decisionmakers who have some considerable experience in the matter of how forces ought to be used in conflict have a deeper understanding of just how tenuous relying on expert judgment on this absolutely vital factor can be. In consequence, they are far less likely than commonly supposed to pay attention to analyses based on the inputs of expert judgments concerning how the forces ought to be used in a protracted campaign--particularly if that expert judgment is not their own (and in some cases, particularly if it is their own!).

It is therefore not without good reason that a common element of wisdom among upper level decisionmakers is that, "theater level analyses are hazardous to your health." We have carefully taught a whole generation of upper level decision makers that our analyses designed to support them in their decision making are fatally flawed. Is it any wonder that they don't pay a great deal of attention to us? Should they?

Therefore, there are two specifications to my charge that our force planning analyses are "wrong anyhow." One is of colossal importance--analysis methods used at theater campaign level do not analytically treat the "Operational Art--theater level concepts of force employment." Another is of lesser but still major importance--analysis methods used at the engagement level do not analytically treat tactics. Only the former will be addressed in this paper, with the subject of tactics left for another forum.

The cure for "wrong anyhow" is to use analysis methods which analytically treat the Operational Art. Unfortunately, there are very few such methods in existence. To my knowledge, only two are operational in the U.S. today: TAC SAGE possessed by the RAND Corporation, and OME-III possessed by STR Corporation. Another has been in development by Air Force Studies and Analysis since 1983. It is TAC Allocator, and to my knowledge is not yet ready for production.

The cure for "too late" is to perform the work up front. We should perform a highly structured set of parametric analyses and capture the results in a set of nomograms or simple computer codes. We must build a "JMEM for Force Planning."

To perform this highly structured set of parametric analyses demands a structured top-down approach, and a suitable framework for analysis. Without elaborating on the principles involved in top down analysis (see "Top-Down Analysis," Scott K. Meyer, The Executive Analyst, Vol 1, Number 1,

STR Corporation, Reston, VA, May 1986), we can simply state that the fundamental principle of top-down analysis is always to start with the particular decision or decisions to be made. Following this top-down approach the remainder of this article will address the following questions:

- What are the top level decisions to be made?
- What is the nature of the analysis product which can help the decision maker decide?
- What is the proper framework for analysis?
- How do we treat the "Operational Art" within it, and what is the impact?
- What does the product look like in this example?

**Decisions and Analysis Products**

Some of the more important top level decisions are:

- How much should the U.S. and allies spend on fighter forces and supporting infrastructure?
- What should be the composition of the fighter forces?
- What should be the design characteristics of the next fighter aircraft (ATF, MRF, etc.)?
- What is the best complement of munitions to provide the fighter force--what kinds and how many?

This is the level of decisions that are being addressed by the top level decision making body in the United States Air Force almost continuously. Our analyses typically have very little to do with these top level decisions. The few that do use methods which fail to analytically treat the Operational Art.

What kind of analysis products would be helpful if you were a decision maker wrestling with these sorts of top level decisions? Based on the principle that the analysis ought to directly address the questions being posed in the decisions being made, I suggest that the deliberative bodies and decision makers at the highest levels in the Air Force and the Defense Department would be delighted to have a set of analysis products such as that depicted conceptually in Figure 1.

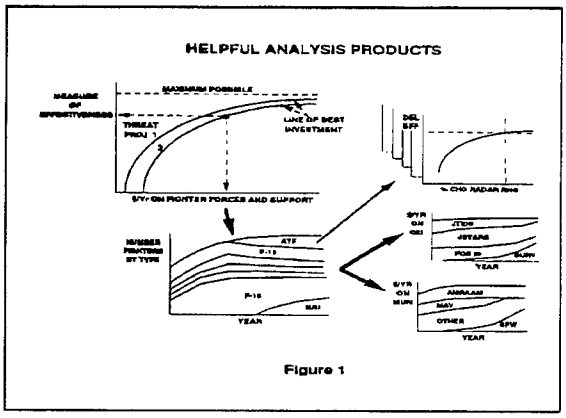


Figure 1

At the very top level the analysis should produce a line of best investment such that some measure of effectiveness varies with how much money is spent on fighter forces and support, given that the money is spent in the best way. The analysis also should provide such a line of best investment for several levels of threat projections in order to span the uncertainties (now very large uncertainties) in where the threat is likely to go in the future. Corresponding to every point on the "lines of best investment," there is a set of analysis products which depict the fighter road map as well as the road map on C3I and munitions, all of which are tied together. Finally, if a new aircraft were involved, there is a corresponding best set of characteristics for that aircraft at the given budget and force levels, as depicted in the upper right hand corner.

The differences between this analysis product, and current "road maps" are:

- In this product, there are many such road maps, each corresponding to some level of budget and threat projection, not just one--a take it or leave it proposition.
- Each road map represents the best investment strategy for the stated budget level and threat projection--it is not arbitrary.
- Each of these road maps in the various categories (force structure, aircraft characteristics, munitions,

C3I) is intimately tied together through the analysis which provides the best investment strategy. They are not independent.

Generating such analysis products is admittedly difficult. In my twenty-five plus years of Air Force experience I have only seen two examples of analyses which even remotely adhere to the specifications outlined above. Nevertheless it can be done, as will be explored in this article. Furthermore, when it is done properly it will be recognized by the decision making body. In the two examples mentioned above the analyses had profound impact not only on U.S. decision making but on the decisions reached in every NATO capital.

Certainly to generate such analysis products demands highly structured and disciplined framework for analysis, which leads to the next question: "What is the proper framework for such top level analyses?"

**Force Planning Analysis Framework**

What constitutes a reasonable force planning analysis framework? What should such a framework look like and what should its characteristics be? The only adequate framework for force planning which I have seen written down in detail is the one described by Glenn A. Kent, Lt. General, USAF (Retired) of The RAND Corporation--"A Framework for Defense Planning", Glenn A. Kent, R-3721-AF/OSD, The RAND Corporation, Santa Monica, August 1989. This particular framework is being espoused by the Air Force Scientific Advisory Board and is gaining considerable momentum within the Air Force. It is sometimes referred to by the shorthand, "strategies to task" framework. It is uncompromising in requiring that the question of Operational Art --theater concepts of force employment--be analytically treated by the methodology which operates within that framework. Some important elements of the "strategies to task" framework will be described in the following.

While the framework itself covers the spectrum from national objectives down through and including concepts for performing militarily significant tasks, this article will enter at the level of regional strategy, and concentrate on Operational Art--the level that is of concern to the OPARTAN conference (and the level at which our analyses are most deficient). The example chosen will be a European scenario, using unclassified data and levels of forces corresponding roughly to "normal" force projections with no conventional force reductions. The framework begins by explicitly stating a regional military strategy and the primary military objectives for the region in question.

For the European region, a suitable statement of military strategy might be:

> "Deter Soviet/WP attack against the NATO alliance by demonstrating a military capability to prevent massive breakthrough or penetration past the Rhine for at least 30 days, with the final force strengths more favorable to NATO than at the beginning."

The primary objectives to be achieved by NATO military forces could be:

(1) "Prevent friendly ground force units in contact from being overwhelmed."

(2) "Meter the flow of WP follow-on forces to a level that NATO ground forces can manage."

(3) "Reduce the strength of WP forces (firepower and infrastructure) relative to NATO."

Notice that there is no mention specifically of any airpower objectives. These are objectives for the entire set of NATO forces--air, ground and naval. The question then becomes, "What about the fighter forces? How do they play in this set of objectives?"

It may be taken as an article of faith that the only purpose of tactical fighter forces is to support the ground forces. However, as it turns out both from experience and from analytical results, there doesn't seem to be much possibility of achieving the primary objectives without the tactical fighter forces achieving the following derivative objective:

> "Generate maximum net (NATO - WP) ground support sorties, subject to minimum NATO constraint." Implies--gain air superiority early in the campaign, and maintain it throughout, at all points achieving the proper balance among the destruction of the enemy's air

potential, the preservation of our own, and the direct support of our ground forces.

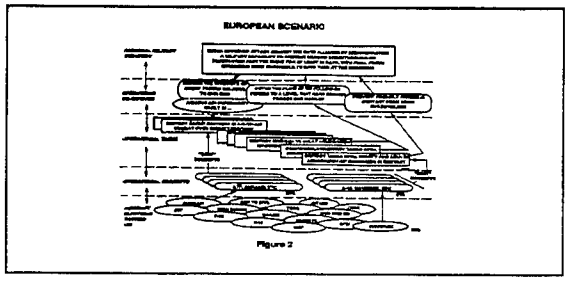


Figure 2

The applicable portions of the SAB/Kent Force Planning Analysis Framework are shown in Figure 2. Below operational objectives come operational tasks. Operational tasks consist of a militarily useful packet of work which when combined with others leads to the accomplishment of the operational objectives. Operational concepts in the SAB/Kent framework are rigorously defined and consist of the selection of a delivery vehicle, a munition, a tactic and the requisite C3I to enable the task to be performed. In this instance, the C3I is primarily concerned with, "How do I find the target and where are the defenses?"

Figure 3 splits Figure 2 apart and lists the implied demands of a sound operational strategy or a sound "theater level concept of force employment." For example, the Kent framework demands that one use analytical methods which evaluate how the selection and timing of objectives impacts the ability to underwrite the regional military strategy, and that

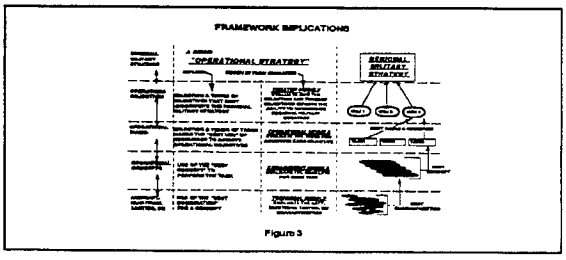


Figure 3

one use operational models which evaluate the importance of the task and the timing required for each task, in order to make the best use of all resources for achieving the operational objectives. In short, the framework demands the integration of a set of procedures and models which directly address the question of how the forces should be used throughout a protracted conflict in order to best achieve operational objectives, and therefore best underwrite the regional military strategy.

Unfortunately, as previously stated, the number of methodologies available to the community to perform this is rather restricted--TAC SAGE and OME-III. All other methodologies rely on the inputs on how the forces ought to be used--expert opinion--and make no attempt to perform optimization, particularly optimization of the use of forces when faced by an intelligent and informed opponent who is attempting to assure that you do not reach your objectives!

It is therefore important to address the question of the adequacy of expert opinion on the question of how future forces of unknown characteristics ought to be used in the face of a future unknown opponent having unknown decision making skills but with conflicting objectives. How adequate is this procedure of relying totally on expert opinion on future Operational Art? This will be addressed in the next section.

**The Impact of "Operational Art"**

The various uses to which tactical air power may be employed.throughout a campaign may be viewed conceptually as diagrammed in Figure 4. Here, for simplicity we have depicted only offensive missions for Blue and defensive missions for Red, but of course all tasks are available to both antagonists. While experts may disagree on precisely which tasks Blue should employ his air power on what schedule and, similarly, they may disagree on how Red might employ his fighter forces, there should be far broader agreement on what really counts. What really counts is the amount of support provided to the ground forces (CAS, BAI and directly applicable Interdiction), and when it is provided--the schedule of ground support sorties. Of equal importance, of course, is keeping Red air off our own ground forces by preventing Red from performing CAS, BAI, and Interdiction against our own ground forces.

The problem is that the outcome measured in terms of how much ground support may be provided our own forces while at the same time denying Red the Opportunity to put ground support sorties at the disposal of his ground forces is very strongly

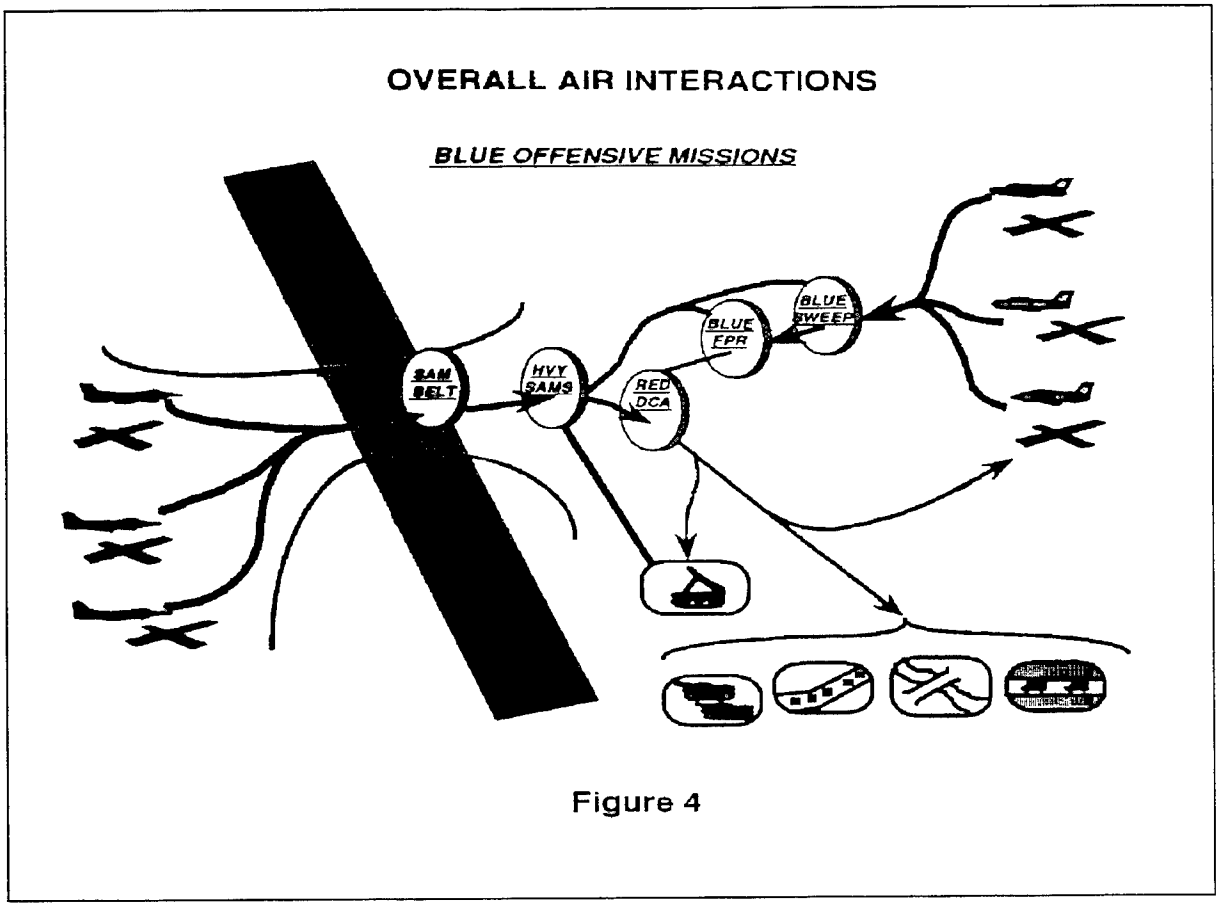



Figure 4

dependent on how the forces are used--on the tasks chosen for Blue on what schedule and upon enemy counteractions. Should one, for example, configure all F-16s in defensive counter-air on the first day of a campaign or should one load them up to go against the heavy SAMs? Should one have the ATFs perform sweep against Red interceptors or should one include a healthy dose of standard air defense for the ATF? How much difference does it make anyhow? Are the experts sufficiently united in their opinions that the range of outcomes spanning the range of expert opinion is acceptably small? An experiment on this subject was actually performed by the Air Force in the late sixties and early seventies. At that time there was a grand argument going on concerning whether or not the Warsaw Pact fighter forces were superior to or inferior to the fighter forces of NATO. One position was that the Pact forces were inferior to NATO--cut two fighter wings. Another was that NATO forces were inferior to those of the Pact --send money. The argument raged.

Different analysis techniques were tried to no avail--both sides continued to come up with opposing analytical results. The heads of the two organizations involved eventually grew weary of the argument and enjoined the analyst to get to the bottom of why they were coming up with different results, eventually culminating in instructions to both parties to use the same model and the same data.

We did, to no avail--we still got different answers. Back to the drawing boards with instructions to get to the bottom of it. We finally traced the matter to rather insignificant-looking differences in how the forces were presumed to be used by both sides throughout a ninety-day campaign. The situation was still unresolved and therefore unsatisfactory.

Those in charge found difficulty believing that the outcomes could be so widely divergent when the differences in assumption concerning how the forces were used throughout the campaign were so seemingly insignificant. The thought was that there was something going on down in the internal works of the models being used that the analysts did not understand and were not taking into account. Hence, instructions were given to build a new model, a simple one, one which had simple differential equations describing the outcomes of the interactions that could take place. The interaction set was very restricted.

A model was built in a very short period of time that everyone alleged they now could understand. One could draw up on a single chart the outcome of the various interactions as functions of the input parameters. It was all very simple and straightforward. Left open was how the forces would be used on both sides.

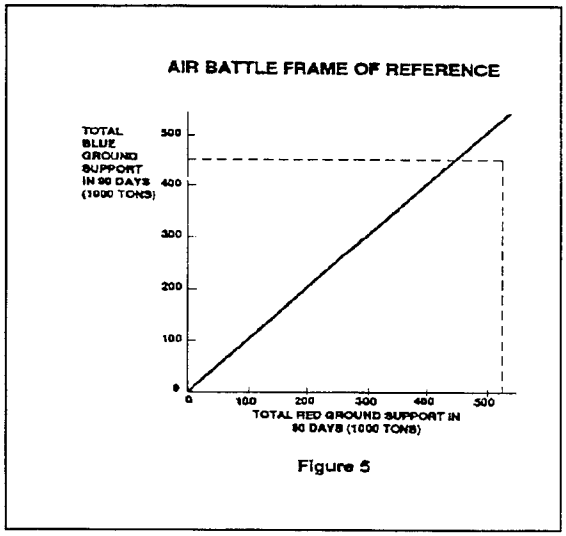



Figure 5

An experiment was run to determine the impact of using expert opinion for this critical variable. The outcomes were plotted on a chart as shown in Figure 5. On the horizontal axis total Red ground support in the period of ninety days in thousands of tons, on the vertical axis similarly for Blue. The solid 45 degree line depicts parity. The horizontal and vertical dash lines represent the realm of physical possibility for Blue and Red. In short, it represents the limiting case in which both sides agree not to interfere with the operations of the other side. (For reference the amount of ordnance delivered in ground support in a period of ninety days during the height of the bombing campaign in Southeast Asia was approximately 150,000 tons. On this chart, the Blue capacity in a NATO battle, given that Red does not interfere, amounts to about 3 US. Southeast Asia efforts worth of ground support.)

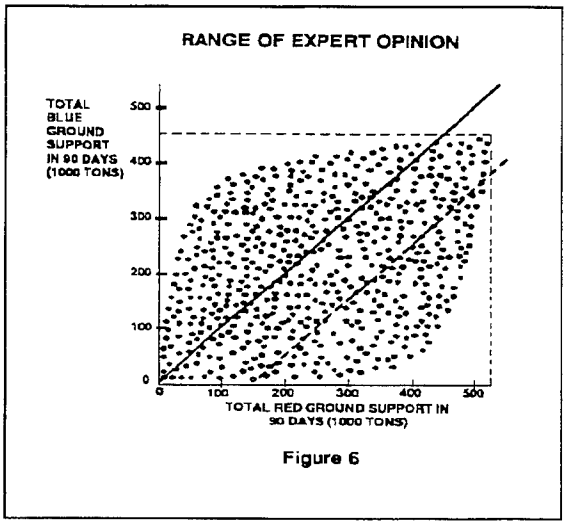



Figure 6

Having agreed to the terms of reference, and having created a model which everyone agreed that they understood, the next part of the problem was to secure the range of expert opinion. The first step was to interview a large number of experts both for Blue and for Red. Experts from the Pentagon, Tactical Air Command, USAFE and PACAF were interviewed. Red experts were secured from the intelligence community--CIA, DIA., and AF/IN. Ultimately, nearly 200 expert opinions and associated variants of these opinions were obtained. Then the various combinations of Red versus Blue concepts of force employment were played against each other within the same model and using the same data. The hope was that a small grouping of outcomes would be obtained and plotted on Figure 5 so that one could draw a fairly heavy "X" through the centroid of that set of outcomes, the situation would be resolved, and all would be well in the world of objective analysis. Unfortunately, it was not a small range. The outcomes corresponding to the range of expert opinion were as depicted in figure 6.

This is a disaster of the first order for analysis. This outcome suggests that as long as we are using

expert opinion for how the forces ought to be used in combat, then we can literally get any answer we want (or don't want as the case may be). A new widget or aircraft that we are contemplating purchasing for our forces may represent the salvation of western democracy or it can be counterproductive, depending on which particular set of expert judgments are used in the analysis!

This range of outcomes corresponding to the range of expert opinion on how forces ought to be used obviously will not yield any analytical results on which any reputable decision maker would base any decisions. While most decision makers may not have such a precise notion concerning just how soft our theater level analysis results are when based on such expert opinion, they nevertheless have a far firmer feel for that softness than most analysts are willing to admit. In consequence, since the overwhelming majority of our theater level analyses have been based on inputs for the Operational Art, it is understandable that decision makers would be quite reluctant to base any decisions on those analysis results.

When this experiment was done, the follow-on analysis effort was aimed specifically at finding an analytical treatment for how the forces should be used in combat. The development effort concentrated on creating a methodology that would find the best way of using the forces against the best opposing way of using the opponent's forces--with "best" defined in accordance with a specific criterion. The criterion used in that case was the MIN-MAX criteria--What's the best that Blue could do against the best that Red could do? An approximate solution was found at that time using techniques upon which I will not elaborate here, but will allude to shortly. The result was an analytical technique which enabled us to identify the small open circle as the "mutually enforceable solution."

"Mutually enforceable solution" implies that Blue could write Red a letter outlining his projected use of the forces throughout the 90-day campaign, and there is nothing that Red could do to secure an outcome lying to the lower right hand side of the 45 degree line through the open circle. The converse is also true. If Red should reveal his plans to Blue, there is nothing that Blue could do to secure an outcome lying to the upper left hand side of the 45 degree line through the open circle.

That methodology was named TAC CONTENDER. Those who are familiar with the TAC CONTENDER methodology may also be familiar with the subsequent fate of it. Rather than improve on the methods by which the "mutually enforceable solution" is found, the thrust of subsequent effort was to add detail to the battle description model. The ultimate consequence was that the model grew far too large and complex to be of any use. The interaction set had grown so complex that no one could rightfully allege that he knew what was going on in the model. It was destroyed peacefully in the early eighties.

Since that time improved methodologies have been reinvented in three places--TAC SAGE at The RAND Corporation, OME-III by STR Corporation, and TAC ALLOCATOR by Air Force Studies and Analysis. The former two are operational, the latter is still in development. All three use the same concepts that were developed by Dresher and Berkowitz in the mid-fifties at The RAND Corporation.

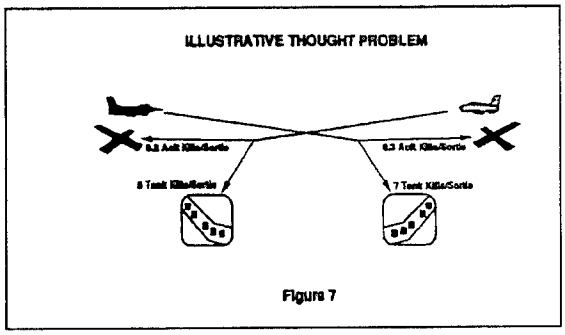


Figure 7

I will not elaborate on the methodology but will illustrate the concept with a thought problem which is far simpler than actually occurs in real life but nevertheless useful. The thought problem is diagrammed in Figure 7.

Suppose you are the Theater Air Commander for Blue. At a given point in a campaign, Blue and Red both have 1000 fighters, the purpose of which is to kill as many of the opponent's tanks as possible throughout the remainder of the campaign (or of equal benefit, preventing the opponent from killing friendly tanks). These fighters can only perform two tasks--kill opponen'ts tanks, or kill the opponent's aircraft on the ground . Best staff estimates are that Blue can kill 7 tanks, or 0.3 enemy aircraft per sortie and that Red can kill 5 tanks or 0.2 aircraft per sortie.

Your best estimate is that the campaign will last another 4 days.

**Questions:**

- As Blue commander, what should you do today --kill Red airplanes, or kill his tanks?

- What should you expect Red to do if he is smart?

- What would be the answers if you believed the campaign would last at least another 20 days?

Regarding the first question, as Blue commander you might reason as follows: If I allocate my fighters to killing tanks, I kill 7 per sortie. In order to make a rational decision I have to make an estimate of the worth of killing a Red airplane. In short, I must know the military potential of the Red aircraft. Notice that each Red aircraft can kill 5 tanks per day if that Red aircraft survives. If the campaign is to last another 4 days then each Red airplane is, in essence, worth 20 Blue tanks. For each of my aircraft that I send to kill Red aircraft, I expect to kill 0.3 x 20 = 6 tanks worth of military potential. Since 6 is less than 7, Blue should send his aircraft to kill tanks--given that he really believes that the campaign is only going to last another 4 days, and further, that this is the last campaign of the war so that his airplanes are, in essence, worthless after the campaign ends.

The same logic applied to Red yields a different result, that is, Red should kill Blue aircraft.

With respect to the third question, it is clear that both sides should attack the opponent's aircraft in a campaign of this longer duration.

Military potential clearly is a function of how long one envisions a campaign to last and how far one is from the end. The question then becomes, for force planning purposes, how long should one assume the campaign to last? The correct answer is that one should use "long" campaigns. What constitutes a long campaign? A long campaign is one in which the campaign is at least two and probably three times the length of the mean lifetime of the losing side's critical assets participating in the campaign. In this instance the mean lifetime of fighter forces ranges somewhere between 5 and 10 days. Hence, in estimating the impact of fighter forces on campaigns (and the effect of changing the force characteristics on outcomes) one should choose campaign durations greater than 20 days. For current fighter forces in high intensity campaigns, one can feel quite comfortable with 30-day campaigns, fairly comfortable with 20 day campaigns, not at all comfortable with 10-day campaigns. Anything shorter than 20 days is a crippled case which cannot be relied upon to provide the correct lessons.

One can see then conceptually from this illustrative thought problem that if one can develop a good estimate of the military potential of the assets, one can employ powerful and elaborate mathematical search algorithms to the question of, "What's the best thing for Blue to do with his resources today and what's the best thing for Red to do with his resources?" Said another way, we can see conceptually how to figure out what tasks should be performed with what resources today by both sides, given that we know the military potential of the resources.

The problem is further complicated by the fact that the military potential depends on where we are in the campaign, and on how the forces are used from now on! The problem becomes, how do I find the elusive military potential? In this case it was rather straight forward. We start at the end and go backwards simply adding up the military potential from one day to the next as we get further and further from the end of the campaign.

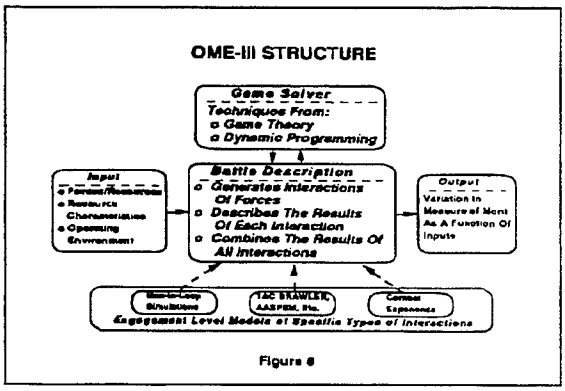


Figure 8

In essence, that is precisely what is done with all methodologies which treat the Operational Art correctly. The only complication comes when we add

tasks such that the outcome of one particular allocation strategy for one side depends on the allocation strategy of one's opponent. In real life, this is always the case, in stark contrast to this illustrative thought problem. Nevertheless, the search algorithms that we currently have in our arsenal are adequate to deal with this problem.

Hence, the critical component of any force planning analysis framework is a methodology that adequately treats the "Operational Art--theater level concepts of force employment." The OME-III structure devised by the STR Corporation provides this treatment. The structure of OME-III is as shown in Figure 8.

OME-III consists of a general purpose game solver which uses techniques from game theory and dynamic programming and the logic just described, hooked up to a battle description which controls the interactions of the forces, describes the outcomes, and combines the results of all of those interactions.

What makes the OME-III structure different from the previous incarnations such as TAC CONTENDER is that it features a high degree of separation between the game solver and the battle description. In TAC CONTENDER, for example, the battle description and the game solver were intimately related through a group of algebraic equations. When one changed the battle description, one had to make very substantial changes in the method of solving the game. In the OME-III structure the game solver itself is highly separated from the battle description and, in fact, has been used with a large variety of battle descriptions.

One additional point needs to be made. It is important to keep the battle description as simple as possible. There should be a very strong separation between the battle description employed in the campaign level analyses, and the lower level simulations which generate the outcome of interactions. One should not attempt to embed sophisticated simulations in the battle description at all. One should rather look at the results of engagement level simulations, come to some conclusion regarding how the outcome of the engagement level interactions depends on the various input parameters under consideration and use these relationships in the battle description itself.

In short, it is important that the analyst view the intermediate level results. The primary reason for this is that most engagement level models are themselves very noisy. TAC BRAWLER and AASPEM (air-to-air simulation models), for example, are very strongly dependent upon tactics. One should be able to convince oneself of the adequacy of the tactics or of the range of tactics that are applicable before using these results in the campaign level analysis.

Given the conceptual outline of the force planning analysis frame-work suggested by the SAB/Kent, and given the tools necessary to adequately treat the Operational Art, how do we put it all together into a concrete system?

**Illustrative Example**

The following example is from a project to evaluate the contributions of various types of air-to-surface munitions to fighter force effectiveness. In consequence, while these evaluations are performed within the context of a full up campaign with all tasks exercised (including the air-to-air tasks), only the air-to-surface tasks were treated parametrically (the customer is not in the business of building air-to-air missiles). This particular example uses only the European scenario. Other scenarios would demand different regional strategies and different objectives.

The first step is always to write down the regional strategy and the appropriate objectives to be achieved by all of the forces. That was done previously for the European scenario. The next step is to describe the menu of operational tasks which might be performed by the fighter forces in achieving those objectives. This is the menu of tasks from which selections will be made in solving for the best use of forces--the Operational Art. We began with the derivative objective discussed earlier for fighter forces and repeat it here for convenience. The derivative objective is:

> "Generate maximum net (NATO-WP) ground support sorties, subject to minimum NATO constraint." Implies--gain air superiority early in the campaign, and maintain it throughout, at all points achieving the proper balance among the destruction of the

enemy's air potential, the preservation of our own, and the direct support of our ground forces. These are the candidate operational tasks associated with the derivative objective, arrayed by category.

**Tasks--Suppress Enemies Sorties Category:**

"Destroy enemy aircraft on the ground--in the open, in revetments, and in shelters--distributing the attacking sorties among these categories so as to maximize the number of enemy aircraft destroyed."

"Damage takeoff and landing surfaces."

"Damage or destroy maintenance facilities."

"Destroy air munitions stocks."

"Destroy fighter POL supplies."

"Destroy other fighter related supplies."

"Incapacitate maintenance and support personnel."

**Tasks--Offensive Air-to-Air Category:**

SWEEP--"Destroy enemy fighters in air-to-air combat over enemy held territory, with the offensive air-to-air force elements operating free of responsibility for the protection of friendly penetrators."

FORCE PROTECTION -- "Destroy/abort enemy fighters in air-to-air combat over enemy held territory, with the fighters which protect the friendly penetrators being only loosely tied to the penetrating force. They achieve the protection goals through coordination of arrival in time and space."

ESCORT--"Destroy/abort enemy fighters in air-to-air combat over enemy held territory, with the fighters which protect the friendly penetrators being closely tied to the penetrating force."

RAID DISRUPTION COUNTER-AIR -- "Destroy/abort enemy would be penetrating fighters in air-to-air combat over enemy held territory, while the enemy aircraft are just forming up after takeoff."

We will discuss the three primary objectives and the tasks associated with those primary objectives later. But first, while we are on this particular derivative objective, we will discuss briefly the hierarchy of steps in the analysis framework.

The next step in the hierarchy is to develop concepts for accomplishing each of the tasks. Recall from the definition that a concept consists of the selection of a delivery vehicle, munition, tactics and C3I necessary to accomplish the task. The concept for destroying aircraft in shelters, for example, might consist of putting together a flight of four F-16s each equipped with two improved 1,000-pound bombs, having them ingress through corridor as a part of a massed raid at low level, specifying pop to dive tactics in the target area following some defense suppression effort, finally egressing at low altitude. The command control arrangements are simple in this case since we already know the location of shelters to considerable accuracy. That is one concept. There are

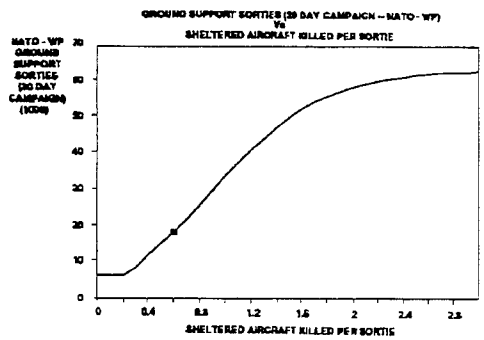



Figure 9

others--probably better. This is given merely for illustration.

Such concepts must be developed for each of the tasks. In some cases, how well these concepts work must be evaluated by some engagement level model such as TAC BRAWLER, or by using the JMEM, etc. In any case, one must have information concerning how well the tasks can be performed as a function of the parameters describing the concept in order to choose from among the best concepts.

Simply selecting the best concept, however, does not necessarily imply that the task itself will be used at the level of effectiveness that the concept generates. For example, let's take the task of destroying enemy aircraft in shelters. There is some level of our effectiveness in destroying aircraft in shelters below which it is not worthwhile to allocate any resources to that task. As shown in Figure 9, this occurs in our case at about 0.2 sheltered aircraft killed per sortie. Below this level of effectiveness it is not worthwhile to put any weight of effort against killing aircraft in shelters. The resources are better spent in accomplishing other tasks. Above 0.2, however, there is great leverage for killing aircraft in shelters and the more effective the concept the more ground support sorties can be generated throughout the campaign. The baseline concept (F-16s with improved bombs, etc.) is shown by the box at an expected kills per sortie of about 0.6.

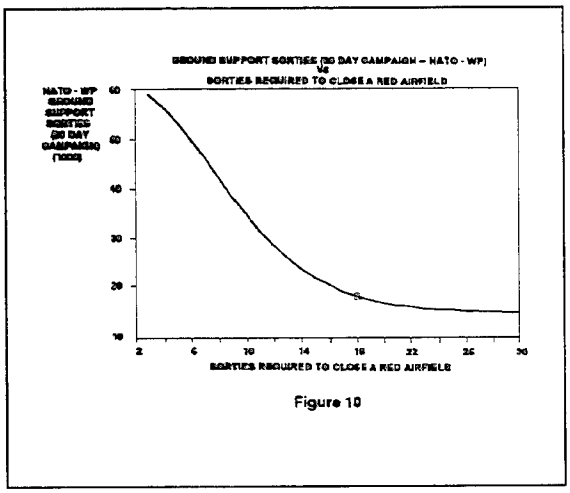



Figure 10

A second illustration is shown in Figure 10 in which NATO minus Warsaw Pact ground support sorties in a 30-day campaign is plotted against sorties required to close a Red airfield. At a baseline of 18 sorties to close a Red airfield for 24 hours, this is a very marginal task indeed. Requiring more than 18 sorties yields the result that no resources should be applied to that task. It is a high leverage task if one can find concepts such that only 5 or 6 sorties are required to close a Red airfield for 24 hours.

Next we turn to the primary objectives. A small preamble is necessary in order to easily understand what has been done in the remainder of the illustrative problem. We will start with the second objective of metering the flow. The degree to which Objective 2 can be accomplished directly influences the number of resources (ground support sorties) that must be expended in Objective 1--stopping the attack at the FLOT. Furthermore, the efficiency with which one can achieve Objectives 1 and 2, as well as the derivative objective, will directly and dramatically influence the number of sorties available to draw down the strength of the Warsaw Pact by the end of 30 days. Objective 2 and the associated tasks follow.

**Objective 2**

> (2) "Meter the flow of WP follow-on forces to a level that NATO ground forces can manage."

**TASKS--BAI and AI Categories:**

> "Destroy (or damage sufficiently to delay) tanks in Armor and mechanized Infantry companies in march formation on their way to battle, or in assembly areas, taking credit for incidental destruction of APCs, artillery, air defense units, and trucks."
>
> "Destroy bridges ahead of advancing Armor and Mechanized Infantry units to delay their arrival in battle.
>
> "Distribute smart mines appropriately to delay advancing WP ground force units."

**Criteria:**

Limit the arrival rate of reinforcing armor at the FLOT to fewer than "T" tanks per day on the first day of the campaign, tapering linearly to zero tanks per day on the last day, while killing the appropriate fraction "K" of follow-on tanks to maximize the global measure of merit.

(Baseline: T = 800 tanks/day, K =approx. 0.3)

Provide the capability of destroying some fraction "B" of the 78 major bridges crossing the Elbe/Vltava rivers during the campaign.

(Baseline: B = 1.0)

Figure 11 shows the initial force deployments of the Warsaw Pact in a typical scenario.

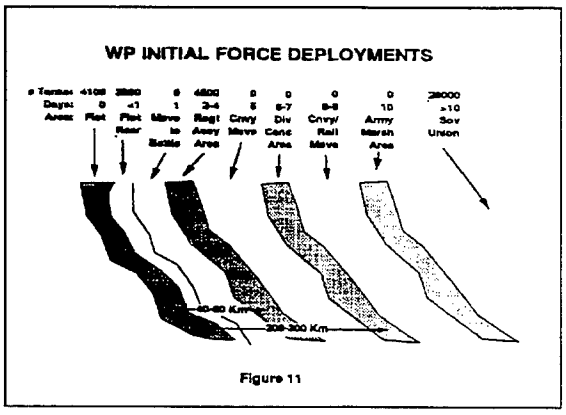


Figure 11

The Pact force strength initially on line is such that they will have approximately 7000 tanks either engaged at the FLOT or immediately behind the FLOT ready to engage. Normal estimates are that about 60% of these, or 4100, would be engaged on the first day of a campaign; 2900 roughly would be within 5-20 kilometers maneuvering to engage under favorable circumstances. About 40-60 kilometers behind the FLOT is a regimental assembly area containing about 4500 tanks and further back--200 to 300 kilometers--is the division concentration area. Even further back is the Army marshalling area and further back is the Soviet Union itself.

While this deployment shows the disposition of the forces in space, it is necessary to plot the Soviet game plan on a time scale to gain full appreciation or the power of the Soviet doctrinal use of the ground forces. The Soviets attempt to deploy their forces in time in such a way as to hit the weak spots in the defensive line with overwhelming force so as to break

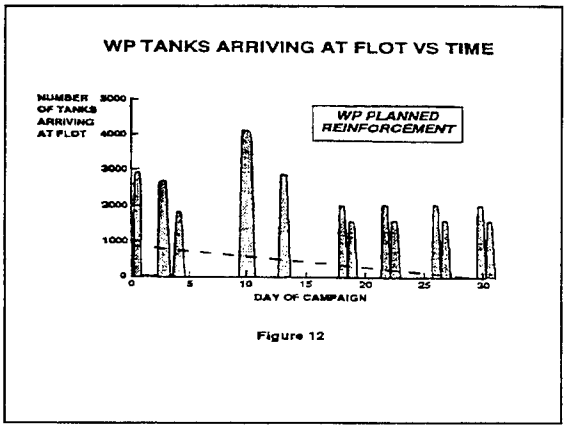


Figure 12

through then to pour forces through the breach. Plotted as a function of time the arrival rate of tanks at the FLOT is as shown on Figure 12.

Notice that Soviet doctrine will have armored units arriving at the FLOT in overwhelming strength followed by periods of time in which not much happens. The problem in the attack of these forces is to attack them in such a way that this game plan is destroyed. It is to redistribute those peaks in time to a level such that NATO ground forces can handle that arrival rate.

Such a criterion is sketched on Figure 12 and runs from approximately 800 tanks a day down to zero at the end of the 30-day campaign, the suggestion being that if we can limit the arrival rate of tanks to something below that line, our other off-line estimates tell us that we have a good chance of preventing a massive breakthrough or penetration past the Rhine for the duration of the campaign. (This, of course, assumes a given level of support from close air support to be discussed later, and other indirect fires.)

The question then becomes, can the metering objective be achieved with the available air power and available munitions? The short answer is that with only conventional point attack munitions K-Kill munitions such as Maverick (and all other campaign level parameters at their base case values) it cannot be done. However, top attack munitions such as SFW

or SADARM offer an opportunity for success in meeting this criterion.

From the Chicken Little I results, an important characteristic of attacking units with top attack munitions emerged. Damaging a significant number of armored vehicles in an armored company has a very strong impact, and repair times associated with getting the larger numbers back into operation are far greater than simply the sum of the repair times normally associated with a single vehicle.

The reason for this has to do with spare parts and the fact that the damaging hits tend to be in the same spot from tank to tank. This leads to a correlation among the components that are damaged. Soon the tank company runs out of radiators. Soon they run out of engine blocks, etc. When that occurs,

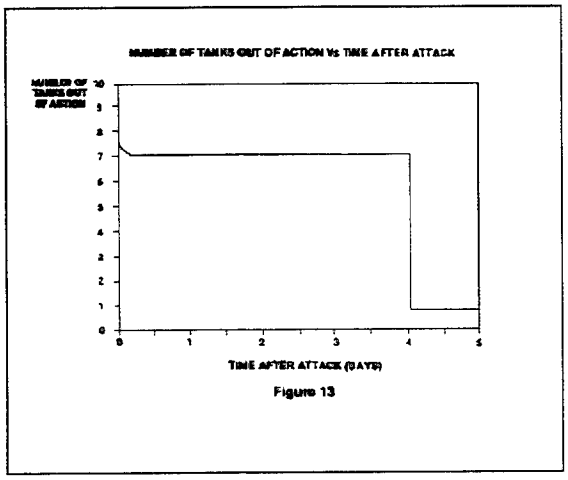


Figure 13

the times required for the recovery of significant number of the damaged vehicles can be very large.

The recovery of a unit attacked by a couple of sorties of aircraft equipped with top attack munitions is depicted schematically in Figure 13.

After an attack some number of tanks will be found to be damaged (call the baseline in this case, 8, as shown in Figure 13). At a short time after the attack some fraction of those, tanks will be repaired so that, in essence, these tanks come back to life and can be used on a time scale that is militarily insignificant--it is as though they were not hit at all. Call this fraction in the base case about 10%. The remainder, however, take a long time to repair per the discussion in the previous paragraph. In the Chicken Little results we ran the reconstitution simulations typically for 4 days and the unit typically was far from recovery at 4 days.

In any case there is some significant period of time that will elapse before the majority of the tanks will come back into service. For argument sake in the base case let's simply assume 4 days is the requisite period and at the end of 4 days all of the damaged tanks will return to service, except that fraction catastrophically destroyed, say 10%.

In summary, there are 4 parameters necessary to describe the use and effectiveness of attacks against armored companies using top attack munitions. They are:

- How many vehicles in the company received damaging hits? (Base Case = 8)
- What fraction come back to life immediately? (Base Case = 10%)
- How long before the rest come back to life? (Base Case = 4 days)
- What fraction are catastrophically killed (never come back to life)? (Base Case = 10%)

The essential problem then is to take the ground support sorties and the sortie schedule delivered up by OME-III and apply it in the best way so as to meter the flow of tanks. We have the choice of loading up some sorties with top attack munitions which we can use to redistribute the peaks in the arrival rate of tanks or loading up some sorties with MAVERICK (or some other appropriate K-Kill munition) so that we can catastrophically kill whomever we can find. The tradeoff is between catastrophically killing a smaller number of tanks and the efficiency of generating delays against a far larger number of tanks but with the penalty that we must eventually come back and kill them. The analysis problem is how best to use the sorties that are put at the disposal of the ground forces for accomplishing this task while at the same time accomplishing the related task of providing close air support at the FLOT for those that we allow through (those that flow in under the metering criterion line of Figure 12).

This is a classical linear programming problem, and can be addressed in a fairly straightforward way. It has been implemented in a program at STR which we call METER. METER provides the solution in terms of the best weight of effort to be applied against the metering task, the distribution of that effort between top attack munitions and catastrophic kill munitions of the MAVERICK class as well as identifying where the follow-on forces should be attacked. Without going into detail, it turns out that the greatest weight of effort is between the FLOT and the regimental assembly area.

The overall weight of effort is, of course, a function of how well one can perform the task. For illustration, one element of how well one can perform the task is in terms of the total number of tanks damage delay per sortie (parameter 1 of the 4 parameters listed above from the Chicken Little 1 program). A plot of the weight of effort on "meter by damage" sorties against tanks damaged delayed per sortie is shown in Figure 14. There are similar plots

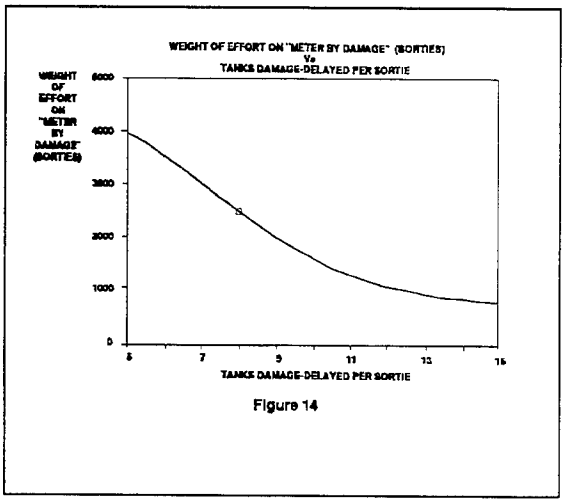


Figure 14

for all the other parameters describing the effectiveness of the top attack munitions as well as the parameters describing the performance of the catastrophic kill class of munitions. Objective 1 is intimately connected with Objective 2. The tasks and the criterion for success are as follows:

**Objective One**

(1) "Prevent friendly ground force units in contact from being overwhelmed."

**TASK--"Primarily CAS" Category:**

> "Destroy Tanks, APCs, artillery, and air defense units in massing Armor and Mechanized Infantry companies engaged with or sufficiently close to friendly ground troops that control by the ground commander's designated representative is required."

**Discussion**

Some fraction "M" of the enemy ground units allowed to get through the interdiction "metering" to the FLOT will be able to maneuver and achieve a force ratio unfavorable to friendly ground forces who are themselves unable to maneuver to meet the massing threat. Close Air Support is provided across the front to supplement the organic firepower as needed.

**Criterion**

Sufficient Close Air Support will be provided to destroy a fraction "f" of the tanks, APCs, artillery and air defense units in the arriving Armor and Mechanized Infantry companies able to achieve local massing.

(Baseline: M = 0.5, F = 0.3)

For the close support tasks one can use simple JMEM calculations to estimate the effectiveness. The

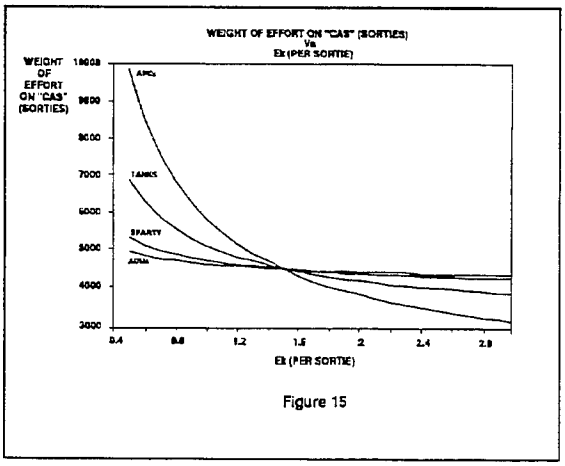


Figure 15

result of weights of effort as a function of the

effectiveness of each concept is as shown in figure 15.

Finally Objective 3 is:

**Objective Three**

(3) "Reduce the strength of WP forces (firepower and infra structure) relative to NATO."

**TASK--BAI and AI Categories**

Destroy the remaining WP firepower element (tanks, APCs, artillery, air defense units, surface-to-surface missiles), and support/infrastructure elements (command posts and C3 nodes, trucks, trains, railroad marshalling yards, POL storage areas, supply storage areas and fixed military installations).

**Criterion:**

Group each of the elements associated with objective three into entities that can be attacked by a single sortie using the appropriate concepts. Pending the establishment of relative leverage effects among these remaining elements of WP strength, distribute the remaining ground support sorties evenly among all the targetable entities.

The overall measure of effectiveness for the analysis framework when applied to the EuropeanScenario is then the fraction of enemy force strength destroyed by the end of 30 days, given the Objectives 1 (STOP enemy at FLOT) and 2 (METER follow-on forces) have been accomplished.

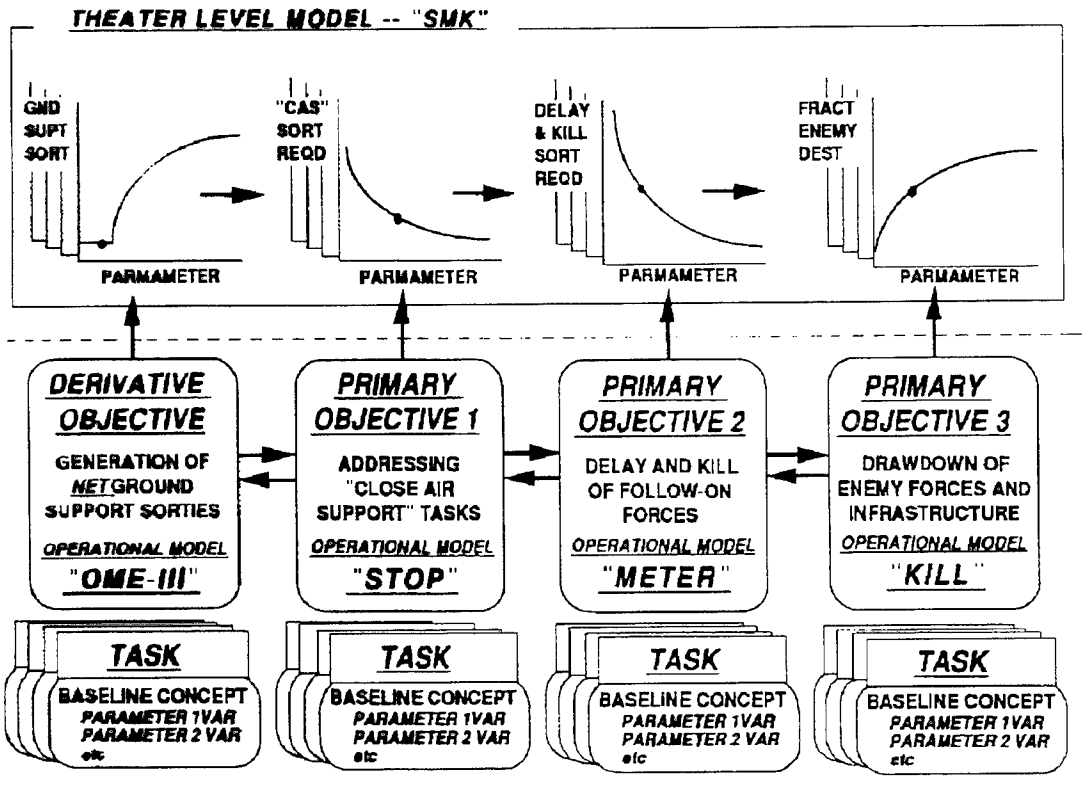



Figure 16

The entire end to end scheme is as illustrated in figure 16.

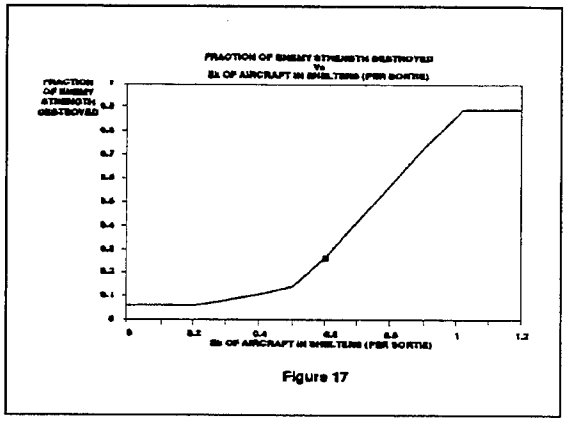



Figure 17

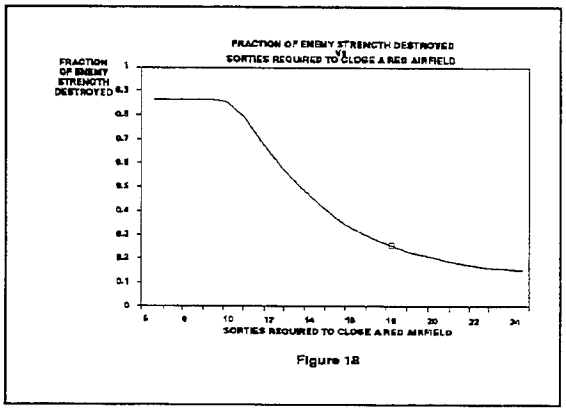



Figure 18

The typical outcomes, in terms of the above described overall measure of effectiveness, for the parameters described earlier are illustrated in Figures 17 through 19. Of course, the functional dependence of the outcome on the parameters describing each of the 30+ air-to-surface tasks was also established but is not shown here.

**Summary**

The Bottom Lines are:

An Evaluation Framework has been created--Based on the work of Lt.Gen. Kent, a conceptual framework for evaluating the contributions of tactical airpower has been developed. It spans regional strategy, operational objectives, operational tasks, and operational concepts.

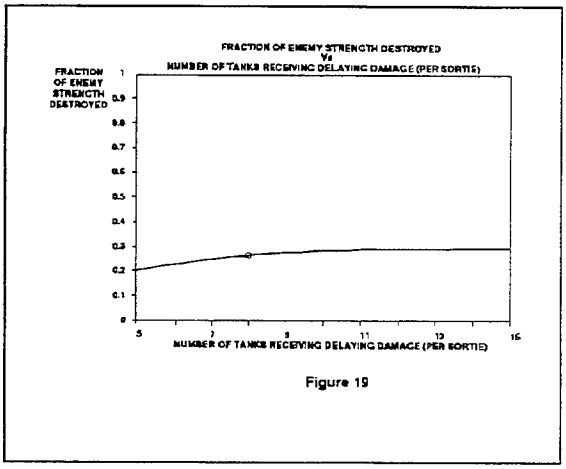



Figure 19

As shown, the glue that binds the entire scheme together is the "Operational Art--theater level concepts of force employment." Theater level concepts of force employment are absolutely dominant in controlling the outcomes of campaigns--and the lack of analytic treatment by most theater level analyses is a fatal flaw which cannot be forgiven. Methodologies such as TAC SAGE. TAC ALLOCATOR, or OME-III must be used as the fundamental driving engines if our analyses are to .have any credibility. Sensitivities Have Been Established--This unclassified illustration addressed the contribution of fighter delivered air-to-surface munitions. The evaluation framework was exercised to estimate how the overall effectiveness of the NATO tactical fighter force varies with the per-sortie effectiveness and attrition when performing each air-to-surface task, yielding a set of force effectiveness parametrics for the air-to-surface tasks in the European scenario.

# LIMITED AND FOCUSED OPERATIONAL LEVEL CAMPAIGN PLANNING AGAINST FUEL

**Major Edward J. Felker, USAF**
**HQ, USAF**

## INTRODUCTION

U.S. Air Force doctrine advocates the inherent flexibility of airpower across the breadth and depth of the battlefield[1]. In actual practice; however, operational planners have concentrated their efforts in planning the application of that airpower at a tactical level. There seems to be a certain emphasis on allocating missions to "eaches"; that is, individual aircraft attempting to kill individual tanks; "each" aircraft versus "each" tank.

This study takes an in-depth look at one aspect of campaign planning at the operational level and how one subset of operational level targets, namely fuel, might enter into the scheme of planning. It assesses the inter relationships of prepositioning, movement methods, and fuel storage vulnerabilities. Although an entire notional theater is examined, the primary focus is a sub-operational area of that notional theater.

But, the study is not about fuel. Fuel is used as the medium to discuss operational art. The targets could be ammunition, motor transport, or any other commodity an adversary might consider as crucial to his own operational art. What is important in this discussion is the application of the concept and not just the target array selected for illustration purposes.

### Statement of the Issue

In the past, Air Force targeting options have concentrated on destroying actual combatants and reinforcing combatants as they enter the flow. Essential logistic nodes supporting the combat's center of gravity have not been given the same relative degree of importance. Specific studies against opposing force's operational level fuel stocks have been regarded as "too hard to do" because of assets available to perform the attack and the breadth and width of the target set[2].

### Adversarial Operational Art

Most planning and the development of U.S. military doctrine focuses on the Soviet Union as our primary adversary. The tendency has been to develop concepts that are Eurocentric, and respond to hostility in Europe's Central Region. Many have regarded this as planning for the most stressful, but least likely, military scenario[3].

Given a changing political environment in Europe, on the surface it might appear that changing Soviet military strategy and its resultant change in the application of operational art make all previous doctrine null and void. This is simply not the case. A European crisis might be characterized by military forces in more "defensive postures"; however, should the military instrument be selected as the means to achieve political victory, a military strategy similar to "classic" Soviet military doctrine might emerge. An offensive with more limited objectives could easily be substituted for the "classical" theater strategic objectives of the past[4].

The Soviet military planner would probably say that only the offensive will yield military victory[5]. Seizing the initiative at the outset of hostilities before NATO is fully deployed would still offer the Soviets the best opportunity to avoid the danger of massing for a breakthrough of a NATO prepared defense[6]. The force of choice for this operation is still combined-arms and tank formations, advancing in dispersed formations, on multiple axes within the region where the limited objective is to be reached, to fully engage deployed NATO forces. The multiple axes would still be a primary consideration, even with lower concentrations of forces than pre-CFE *Army* structures, to conceal the location of the main battle area thereby delaying NATO's ability to laterally reinforce[7].

In a post-CFE environment, the Soviets would hope to have bought sufficient time to allow technological "catch-up" to NATO to have occurred. To fully exploit the potential of a conventional offensive by ground maneuver formations, the Soviets will no doubt restructure their forces to emphasize speed, shock, and maneuver[8]. They would attempt to optimize the synergistic combination of old, but valid operational concepts (isolation of the battlefield, surprise, mass, shock power, speed, and echelonment), with modern weaponry[9].

A successful deep operation requires simultaneous fire suppression of the enemy throughout the entire depth of the defense; rapid penetration by the first-echelon divisions[10]; and high speed deep attacks by specially organized forces to achieve the objective as quickly as possible. Motorized rifle, tank, and air assault forces characterize the maneuver. Hitting the enemy swiftly are not characterized as attacks, but as "troop strikes" *(udar voysk)*[11].

To successfully penetrate, destroy, and achieve the objective, the Soviet's forces are organized in four mission areas. First, an advanced penetration and raiding element (up to 30 percent of the force). Secondly, the first or attack echelon with up to two-thirds of the force. Thirdly, comes the second echelon that might contain a third to half the force[12]. Finally, special reserves. These special reserves might contain the Operational Maneuver Groups (OMG)[13].

The first echelon's mission is to achieve the breakthrough. They would have sufficient weight and force in numerous locations that all defending commanders all along the FEBA would think they are the "main attack"[14]. The Soviets consider the penetration process as the single most critical element of the operation. All war planning is dependent on the success of the breakthrough. From a Soviet point of view, the breakthrough would be their center of gravity in achieving the objectives[15].

The second echelon exploits the breakthrough and advances into the enemy's deep rear area. It is these forces that destroy the enemy, seize the major objectives, and consolidate the gains. The activity of the second echelon constitutes the final decisive plan; however, its linchpin is the breakthrough achieved by the first echelon[16].

Given the speed, momentum, and coordination needed to consolidate the echelons and OMG movements, the logistics (Rear Services) system will be heavily stressed[17]. Fuel, in particular, and the Soviet's ability to move that fuel, is particularly vulnerable to disruption[18]. Since the pace of combat at the point of breakthrough is fragile to the outside influence of logistics resupply, both the Soviets and the Allies have used the lessons learned from the past in planning fuel and motor transport.

**Historical Perspective**

*SOVIET:* During the Soviet's Great Patriotic War (World War II), a critical lesson was learned regarding the relationship among their mobile groups, deep offensive operations, and the ability to resupply while on the move. The single greatest contributor to stopping mobile operations was the lack of fuel. The major factors disrupting fuel movement were: distance from supply bases, lack of motor transport, poor lines of communication, inadequate rail construction, and enemy action[19]. The last element was the catalyst exacerbating the effects of those preceding it. As a result, it seems consistent that prepositioning large quantities in the forward area would decrease the resupply distance and enhance the flow of motor transport to and from the supply depots.

The Soviets are as concerned today as in the past with supporting engaged units during a dynamic, tactically varying environment. They recognize the importance of preplanning, but also recognize the need for flexibility in meeting the tactical challenge. In an article appearing in *Tyl i Snabzheniye* (Rear and Supplies) in Dec, 1985, Maj Gen A. Lopatin, Deputy Chief for Rear Services of the Kiev Military District stated:

> "Modern combat makes it necessary ... to develop plans... and to implement them...according to the nature of the development of events on the battlefield. The smallest error in the deployment and movement, in the sequence and time of delivery of materials, can result in significant cost. To move the mass of equipment and special stores of the rear [services]... to change anything in the rear support

system in the course of the battle, is difficult or even impossible."[20]

*ALLIED ("Red-Ball Express"):* The US learned lessons about the complexity of operating long line motor transport during World War II in operating the "Red Ball Express". To meet logistics demands of the Allies' late Aug 1944 eastward advance across the Seine River, the planners required more effective marshalling of transportation resources. An initial target of placing 100,000 tons of supply in the Chartes-La Loupe-Dreux triangle by 1 Sep was established. One fifth was to move by rail, leaving 82,000 tons to move by truck.[21, 22]

The "Red Ball Express" was planned as a fast motor transport "through freight", having exclusive use of a one-way loop highway, operating around the clock and using all available motor transport. With no trial run and only two days of planning, it began to roll convoys eastward on 25 Aug 1944.

By 29 August, it had 132 companies and 5,958 vehicles. On that day, it delivered 12,342 tons of supplies, a record never again equaled. The tonnage target was increased because railways could not move their allocation. Although originally scheduled for termination on 5 Sep, the planners decided to operate the express indefinitely.

The Red Ball route consisted of two parallel highways between St. Lo and Chartres; one outbound, one return. The entire route was marked with the characteristic "red ball" marker. On 10 Sep 1944, the route was altered and extended, the outgoing route diverged at Versailles, bypassing Paris northward to Soissons (First Army). The other continued eastward to Sommersous (Third Army). The total mileage was 924 miles; northern route round trip was 686 miles, 590 miles on the southern. The average trip took 71.2 hours.

In its 81 days of operation, the express carried 412,193 tons of supplies (5,088 tons per day average). It averaged 8,209 tons in 1,542 trucks each day (average 5.3 tons per truck). Operating the Red Ball Express was a complex affair. It required MPs to regulate traffic movement, engineers to maintain the roads, units to repair vehicles, Signal Corps to provide comm between bivouacs and diversion points, and finally, medics to establish aid stations and ambulance service. The main operations difficulty was traffic control. Shortages of MP's made it next to impossible to reserve routes for exclusive use by Red Ball trucks. 1st and 3rd Army, and 9th AAF all ran convoys without clearance. Both military and civilian vehicles attempted to move against traffic. Red Ball drivers regularly exceeded the speed limit. Vehicles were often used uneconomically, for example, loaded less than capacity. Vehicle maintenance fell far short of ideal. Continuous use of vehicles resulted in 100% increases in maintenance and spares requirements. Fatigue led to accidents, but sabotage and malingering were also factors with which to contend. There were numerous examples of drivers becoming so tired they sabotaged their vehicles or feigned illness to buy precious additional rest time.[23]

Red Ball was a gamble that had prospects of great rewards. In the light of the optimistic tactical outlook at the time, the all-out logistics effort was undoubtedly justified despite its great cost. But the result debilitated logistics structures for several months. The US Army was *very fortunate that the Germans did not choose (or did not have the ability) to interdict the Routes.* Had they done so, it is doubtful that the operation would have succeeded.

*ALLIED (Strategic Bombing campaign):* The Allied strategic bombing campaigns against POL in Germany (May 44 - May 45) and Japan (May 45 - Aug 45) have given us a lesson regarding fuel's vulnerability. Although the main objective of both campaigns was to destroy refining and synthetic fuel production, rather than stored stocks specifically; nevertheless, the record provides us rich information on the vulnerability of storage.[24]

Targets had to be restruck over and over again as the enemy repaired the facilities. Leuna (Germany) Refinery, for example, was struck 22 separate times with a total of 6,552 bomber sorties and 18,328 tons of bombs over a year's period of time. The production still averaged 9% throughout the entire period.

Japan's output capacity was reduced to 15% and half the tankage destroyed with fewer than 1500 sorties. German production of aviation fuel fell to 42% in the first three weeks of the campaign with no more than 100 tons of Allied bombs hitting the plant structures. After 4 months, the campaign against German POL reduced aviation fuel production to less than 10% of preattack levels.

Analyses of the German campaign show very low per sortie effectiveness. This was due to high altitude (10-30,000 ft) night bombing under poor visibility. Effectiveness was more a characteristic of bombing accuracy than weapon effectiveness. It is significant that the 42% percent reduction in German aviation fuel production in the first 3 weeks of the oil offensive was achieved by *1%* of the bombing effort, and *100 tons* of bombs.

The major cause of destruction to tankage was secondary fires. In Germany secondary damage was a multiplier, with 2 to 3 times the tanks destroyed compared to the number of bombs achieving hits. The amount of ordnance needed, therefore, was modest compared to the substantial damage resulting from secondary fires and explosions.

Had the Allies more deliberately planned weapons effects, using more time delays followed by incendiaries, damage would have been even more catastrophic. Interviews after the war with German plant managers revealed many of the incendiaries dropped simultaneously with the GP bombs were "snuffed" out by the blast from the HE bomb detonation.

**Factors Bearing on the Issue**

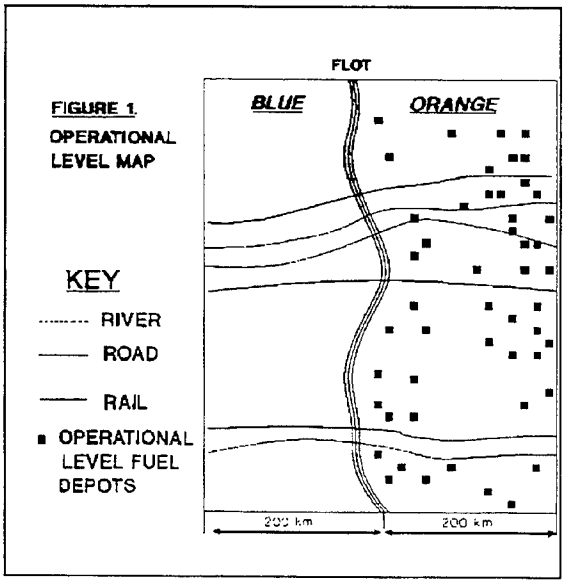
The purpose of this paper is not to detail specific Soviet *FRONT* level fuel support requirements; information relative to the exact numbers is classified. What will be attempted is to create a notional idea, a set of nominal factors, to analytically evaluate interdiction options that might be possible given limited objectives that are not theater-wide in scope. The illustrative example that is used in this paper is not intended to be representative of any specific area of the world. Inferences to reality are withheld because what is evaluated is the thought process in identifying targets to support limited and focused objectives; not to find THE "war-winning" final blow. Throughout this paper Soviet ideas in employing forces are used in applying combat power of the ORANGE forces.

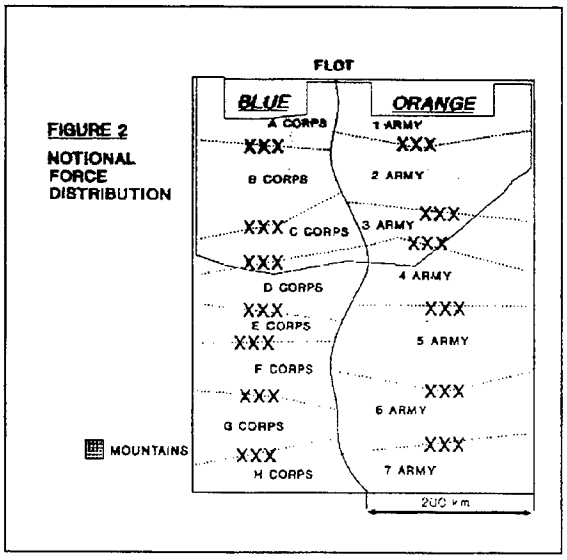
**Notional Geographic Depiction**

Figure 1 is a notional operational map. The heavy line in the center is the notional border between the forces. When offensive actions begin, this boundary also becomes the D-Day Forward Line of Troops (FLOT). Major lines of communication. (rails and roads) are indicated. The squares in the ORANGE territory represent notional locations of operational fuel stocks that have been prepositioned to support ORANGE tactical units.

**Notional Operational Map**

Figure 2 depicts notional boundaries between the various ORANGE and BLUE forces. For purposes of the illustration, Orange forces are assumed to have three maneuver divisions per *ARMY*. Additionally, 4



divisions are not committed and are retained by the *FRONT* commander as an operational reserve. This yields an overall operational commitment of 25 ORANGE divisions.[25] The area indicated as high terrain favors the BLUE defense forces.[26]

The relative combat potential in terms of equivalent measures of firepower[27] are as depicted below for the various forces:

TABLE 1.

**BLUE CORPS/ORANGE ARMY FIREPOWER EQUIVALENTS**

| BLUE | | ORANGE | |
|---|---|---|---|
| A CORPS | 6.5 | 1 ARMY | 8.3 |
| B CORPS | 7.9 | 2 ARMY | 6.9 |
| C CORPS | 3.8 | 3 ARMY | 2.8 |
| D CORPS | 4.8 | 4 ARMY | 4.2 |
| E CORPS | 1.2 | 5 ARMY | 7.9 |
| F CORPS | 1.7 | 6 ARMY | 8.6 |
| G CORPS | 2.4 | 7 ARMY | 4.9 |
| H CORPS | 3.2 | | |

### Blue Corps/Orange Army Firepower Equivalents

Given these relative correlation of forces, ORANGE forces attacked on four FRONTS (figure 3). The northern most FRONT contained tactical elements of the 1st and 2nd ORANGE ARMYs. Two central frontal operations were formed by elements of the 3rd, 4th, and 5th ARMYs. The mission of these

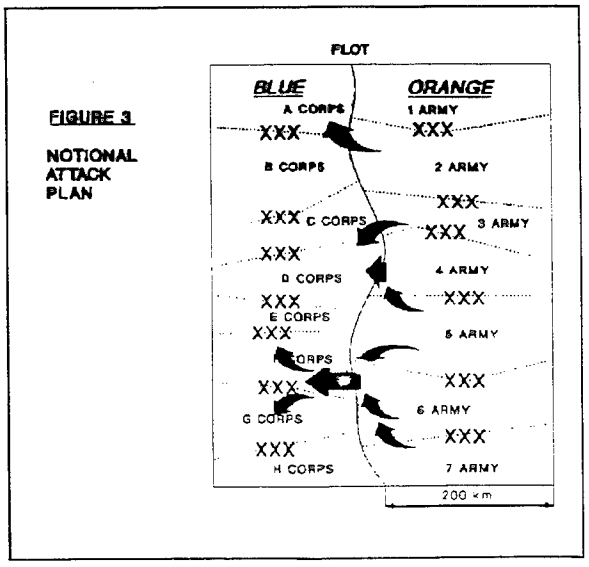



FIGURE 3

NOTIONAL ATTACK PLAN

prevent lateral reinforcement of the main battle area on the southern FRONT. With a needed correlation of force of roughly 1 to 1,[28] this mission could be easily achieved by these forces.

The southern most FRONT was the main battle area given the mission breaking through BLUE forces. The overall correlation of force necessary to achieve the breakthrough would be roughly 6.5 to 1.[29] The actual correlation in this area is slightly less that ideal; therefore, achieving the breakthrough will be a difficult task for the ORANGE forces shown. On all FRONTs, ORANGE massed firepower at the time and place of their choosing to achieve tactical surprise.[30] All the ARMYs indicated are echeloned, with two echelon forward and one back. Not depicted are echeloned follow-on forces, of ARMY size.

For the purposes of this analysis, the ORANGE reinforcing forces consisted of seven ARMYs, one in each ARMY sector depicted. Given the force disposition as noted above and in Figure 2, the planned ground picture by day 20 is that a breakthrough had occurred in the BLUE F, G, and H Corps sectors.[31] Figure 3 is a notional depiction of what the ORANGE force commander would hope his day 20 picture might look like.

### Orange Attack D+20

A key necessity to achieve the movement norms given the theater commander by the national command authority, is the ability to resupply forces effectively to maintain momentum.[32] An essential element of BLUE counterattacks, in addition to "killing the ORANGE warfighting force," are attacks on the ORANGE force's support structure.

The remainder of this paper will address considerations of ORANGE's operational fuel system to support their scheme of maneuver. All planning factors, consumption norms, convoy requirements and prepositioning are notional ideas only. The main objective of this paper is explore targeting options, not validate normative planning factors to real force structures, along with their inferences to actual Soviet practices.

### Orange Force Fuel Planning Factors

Throughout this report all fuel quantities will be expressed in metric tons (mT). For purposes of comparison, *1 mT = 2246 lbs or 374 gals.*

Stocks of fuel are allocated to units based on mission, duration of combat, and expected consumption rates. The actual allocation is driven by the internal capacity of combat vehicles, distance they and their support convoys would drive, and how long fuel powered equipment would operate.[33]

The seven ORANGE ARMYs (25 divisions) depicted in this exercise would consume roughly 530 mT per day per division on the main axis of attack,[34] given a consumption norm for "heavy attack." The *FRONTAL* daily fuel consumption planning factor is 25 divisions X 530 mT/division/day,[35] *OR, 13,250 mT* of fuel needed to support the breakthrough operation.

In calculating this factor, ORANGE planners used a 15-day operation as the planning cycle. For purposes of comparison, an RAF Sandhurst study used a notional Soviet Motorized Rifle Division to calculate a notional consumption model. This MRD consumed 1200 mT of combined ammunition and fuel each day. Assuming ammo and fuel consumption are relatively equal (600 mT each), the 25 divisions used in the example would consume roughly 15,000 mT per day[36] of fuel.

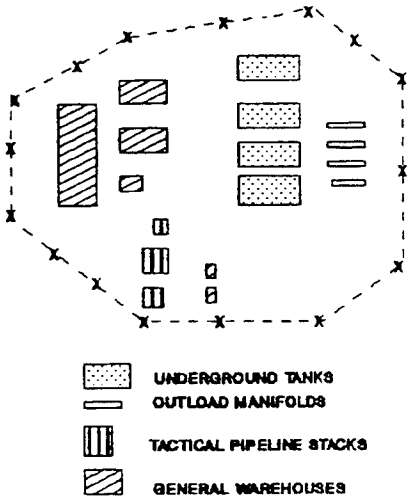
On a heavily opposed axis, open sources indicate that fuel consumption in defensive operations are roughly 45.7% of that of offensive operations for a motorized rifle division (320 mT divided by 700 mT[37]). This 45.7% will be the focus of the Blue anti-fuel campaign discussed later.

### Orange Notional Operational Level Fuel Storage Site Description

There are 50 operational level fuel storage depots in this study available for ORANGE forces[38] use (Figure 4).

Most of the fuel (approximately 75%) stored is in earth-buried tanks. Earth is a very good blast attenuator and; therefore, the tanks may not be the most critical destruction node within the site.[39] The sites with greatest vulnerability to attack are the pumping stations, on-load and, off-load facilities.

**FIGURE 4.**
**NOTIONAL FUEL STORAGE SITE**




The primary means of fuel distribution from these operational level sites to the tactical level is motor transport. Distribution and resupply would take place mostly at night.[40]

## DISCUSSION

### Fuel Campaign Considerations

Any fuel campaign needs to be analyzed in terms of the objective, time frame to achieve the objectives, available resources, and the threat environment in which the campaign will be waged. Key to campaign planning is the sequence to be followed to achieve the desired outcomes. A fuel campaign will require targets to be restruck repeatedly.[41] To have any measurable effect, the fuel campaign will have to be intensive, prolonged, and redundant.

BLUE aircraft availability of the type and numbers to achieve the probable damage is an important consideration in the success of the campaign. The campaign must recognize competing

priorities for deep interdiction assets (close battlefield, or Follow-on Forces Attack) and the relational effect of other operations. The synergistic effect of other interdiction plans needs to be analyzed for their additive effect on the fuel campaign.[42]

The last consideration pertains to which sector of the defensive "layer cake" would have the greatest payoff in a fuel campaign. If the BLUE A, B, and C Corps are able to defend in depth, perhaps a greater emphasis on forces opposite the BLUE E, F, G, and H Corps would yield greater results. This makes the ORANGE 5, 6, and 7 ARMYs as the primary targeted forces. Disrupting the fuel flow to these forces will have the greatest effect on the ORANGE's scheme of maneuver.[43]

Tactical units within 40-60 km of the FLOT have widely dispersed fuel stores. Additionally, the fuel is usually uploaded on the unit's organic POL lift assets on a daily basis. Since these units would be on the receiving end of close battlefield interdiction, there would be little payoff in additional sorties being tasked to disrupt fuel within the tactical level. The major goal of a fuel campaign would be to effect combat operations at the operational level of war. The attacks would be focused against the offensive's center of gravity to have the offensive forces reach a culminating point prematurely.

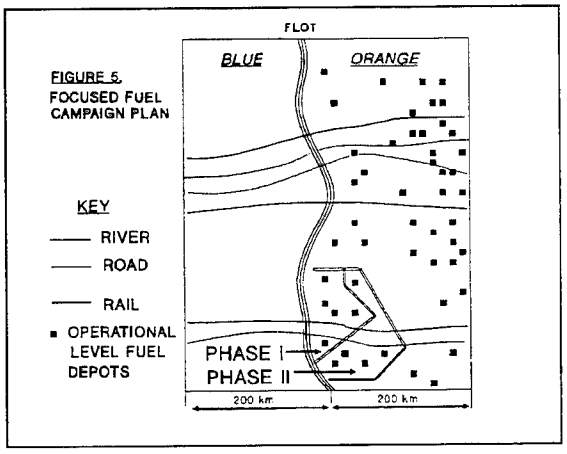
The most dramatic effect that a concentrated fuel campaign might have is against fuel stored at the operational level and distributed to engaged forces at the tactical level. Disruption of this flow would require ORANGE to reassess their pace of combat and movement norms. Since the operational level depots described in this study are fixed, they make lucrative targets. As pointed out in the Allied lessons learned from operating the "Red Ball Express," convoy operations are extremely complex. The "fog and friction" of the changing battlefield situation makes the preplanning and execution of fuel convoy operations even more difficult.[44] Maj Gen Lopatin's December 1985 quote regarding the ability of the rear services to respond (or more properly, not respond) dramatizes how well rear services may be able to respond. Any interdiction options need to capitalize on these factors.

**The Fuel Campaign Plan**

The *Center of Gravity* would be the offensive tempo of the ORANGE ARMYs in the Southern FRONT of this study.[45] The fuel campaign is part of a greater whole to "buy time," up to 30-40 days, for BLUE to become fully reinforced, thereby increasing the correlation of military force to be more favorable to BLUE.

The *specific objective is to reduce fuel resupply to the ORANGE tactical level divisions opposite the Southern FRONT's area of operation.* As previously discussed, ORANGE defensive operations consume fuel at a rate 45.7% less than that of a heavy offense.[46] If BLUE could focus attacks against fuel depots directly supporting the ORANGE forces on the breakthrough in the Southern Front of our example, and reduce the resupply flow by 54.3% (rounded up to 60%), ORANGE would be presented with a dilemma. ORANGE expects fuel to be distributed at a rate that supports offensive consumption.[47] BLUE reduced that flow to a rate that would support defensive operations, but not fill requirements for a heavy offensive. ORANGE now has to decide whether to slow the pace of combat, and perhaps not continue the penetration, OR, continue the breakthrough and run the risk of running out of fuel.

The tasks to reduce fuel flow from operational level depots to the tactical units supporting a breakthrough operation would include:



(1) identifying the operational level storage sites that most directly affect the flow of fuel to ORANGE 5, 6, and 7 ARMYs;

(2) within the sites above, identifying the critical nodes (internal and external) whose interdiction would contribute to reducing resupply by 60%;

(3) prioritizing the importance of the sites above into groups of five. (Groupings of five were selected as the most manageable from a targeting and interdiction assets availability standpoint);

(4) determining the number of sorties (given the interdiction assets available) and the weapons needed to reduce a group of five sites' flow by 60%.

The campaign might be conducted in phases.

*Phase I:* interdict the five most important operational level fuel depots opposite the Southern FRONT.

*Phase II:* interdict the next five most important depots in the same area as mentioned above. In addition to coupling these attacks with LOC interdiction, this phase should also include attacks against the massed forces as a result of the LOC interdiction in Phase I.

*Phase III:* repeat Phase I and II attacks as necessary, with emphasis on destroying repaired pumps. Continue LOC interdiction and attack LOC repairs and forces working to reopen the LOCs.

### Campaign Feasibility

Campaign feasibility is directly related to the viability of the objectives, assets available, the cost of achieving those objectives, and the price in terms of attrition and nonavailability of assets to perform other missions. The fuel campaign is feasible provided:

(1) a relative degree of local air superiority has been achieved by BLUE forces[48] when the attacks are to be made;

(2) sufficient interdiction assets are available on a daily basis[49] to continually attack fuel assets;

(3) attrition is low enough to not change the objectives of the fuel campaign;[50] and,

(4) objectives of the fuel campaign are focused against specific forces, where the breakthrough is most likely, and with the limited and focused objectives of causing a strategic pause. Changing the objective to "kill all the fuel" is too hard to do given the size of the target set, hardness of the storage, and the assets it would take to accomplish that objective.

## CONCLUSION

Given the scope of the hardness of ORANGE operational level prepositioned fuel stocks and their redundancy, limiting the campaign objective to causing a strategic pause in an isolated area of the battle, and considering the assets available; it is feasible to slow an ORANGE breakthrough with a focused fuel campaign.

The elements of this study identifying ORANGE's heavy reliance on motor transport fuel resupply coupled with the LOC vulnerability make the related contribution focused attacks the key to the probable success.

Since it is virtually impossible to shutdown the flow of fuel resupply, disruption of delivery where it is most needed to support the breakthrough will yield the greatest payoff.

Focusing the objectives of a campaign will yield greater results than treating anti-LOC, anti-fuel, anti-Command and Control, anti-force, etc. as separate campaigns. By integrating related parts of all of these, planners can take advantage of interrelated effects. This would truly use the inherent flexibility of airpower at the operational level of war. The result can be economy of effort with the saving of interdiction sorties.

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35. AWC, p. 78.

36. Sandhurst, p. 231.

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39. Erickson, pp. 59-62.

40. *AWC*, p. 78.

41. Hawthorne, p. 127.

42. Warden, pp. 62-79.

43. FM-100-5, p. 112.

44. FM-100-5, pp. 179-180.

45. FM-100-5, pp. 180-181.

46. FM-100-5, pp. 181-182_

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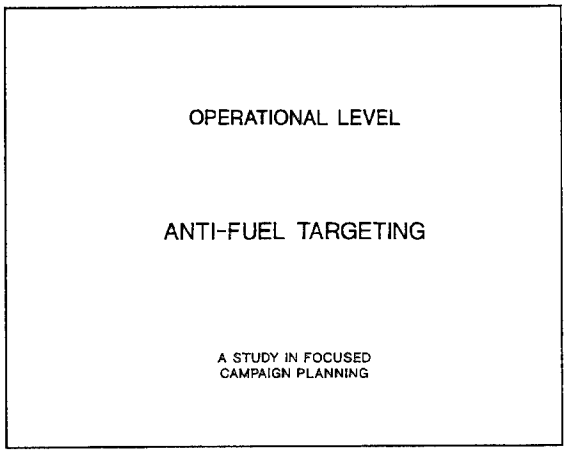
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**Operational Level**

**Anti-Fuel Targeting**

**A Study Outline in Focusing Campaign Planning Objectives**



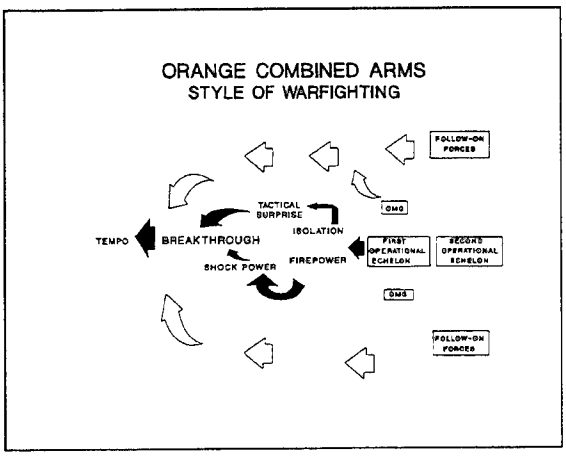

SLIDE 1 (TITLE) Purpose of study is to examine one example of applying
airpower at operational level of war

- Concept is notional

- Uses Soviet military doctrine as basis for adversarial factors

- Force laydown is notional and not based on any specific area of world

- corps and ARMY identifications are alphabecically and numerically arranged and bear no intentional resemblance to actual units




SLIDE 2 (STYLE OF WARFIGHTING)

- Only offensive will yield victory (Isby, pg 12)

- At operational level, speed, shock, maneuver decisive (Isby, pg 12)

  -- Concentrate & mass firepower (Isby, pg 12)

  -- Battlefield isolated & surprised by attacking at time and place of choosing (Isby, pg 12)

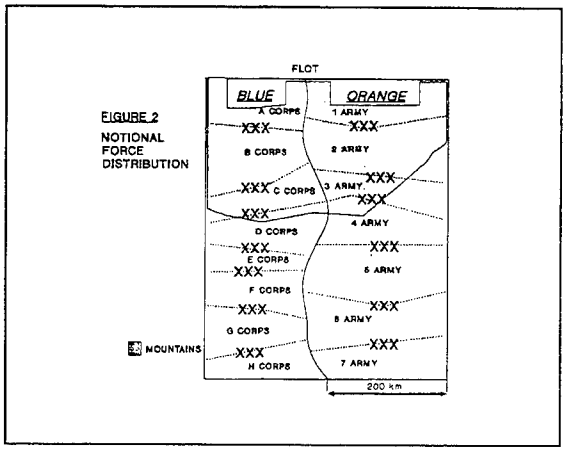
- Forces echeloned (Army War College [AWC], pg 46)

  -- First echelon breakthrough, 2nd echelons exploit (AWC, pg 47)

    --- OMG supports main attack (AWC, pg 47)

    --- Subsequent echelons exploit breakthrough (AWC, pg 51)

    --- Goal to envelope defensive forces (Army FM 100-5, pg 101)

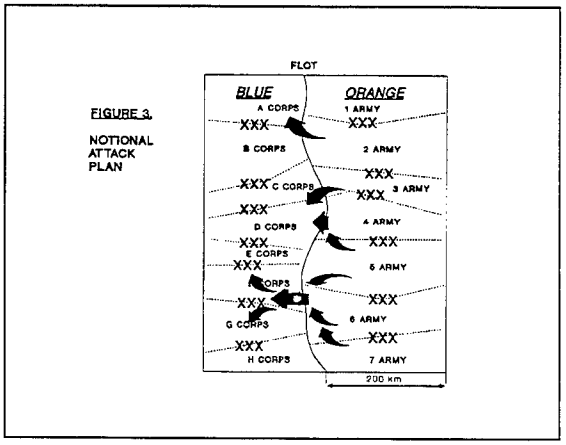



SLIDE 3 (NOTIONAL FORCE DISTRIBUTION

- Notional only (Author determined)

- ORANGE assuming 3 divisions per army + 4 divisions noncommitted yield operational commitment of 25 divisions (AWC pg 98)

- Portion of geographical area mountainous-terrain favors defense (Army FM 100-5, pg 80)



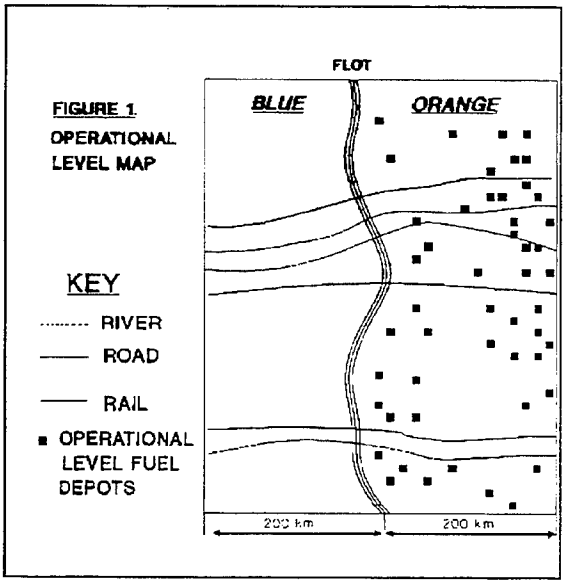

SLIDE 4 (NOTIONAL ATTACK PLAN)

- Assumes ORANGE forces in south correlation of force exceeds blue (Sandhurst, pg 98; Manthorpe 6-9)

-- Correlation of force would be roughly: ORANGE to BLUE 6.5 to 1 (Sandhurst, pg 99)

-- North area difficult terrain and COR closer to parity so permanent breakthrough not possible (Sandhurst, pg 119-121)

- Breakthrough occurs in south (Sandhurst pp 97-107; Manthorpe, pp 1-3; AWC 52-56)




SLIDE 5 (OPERATIONAL LEVEL MAP)

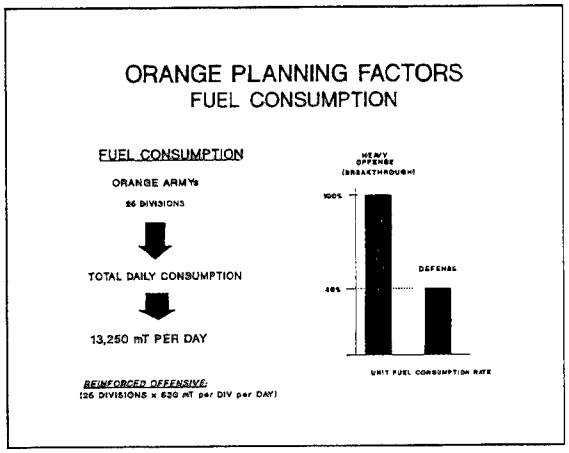
- Notional look at how ORANGE might stockpile to support the offensive (Erickson, pp 61-62)

-- Operational level depots within 200 km of FLOT (AWC, pg 77)

-- Fuel moved from operational to tactical level (AWC, pg 75)

--- 60 % of total volume all war material moved is fuel (Donnelly, pg 56)

- Number of sites shown is notional (This example uses 50. Erickson, pg 61, lasts paragraph states "34 existing fuel depots have been expanded and seven new ones added." That total yields 41 but for illustrative purposes the example rounds this off to 50.) (Erickson, pg 61)




SLIDE 6 (ORANGE PLANNING FACTORS)

- Looks at fuel consumption doctrinal norms for offensive illustrated

  -- Assumes 25 divisions (AWC, pg 98)

  -- Assumes 530 mT per division per day consumed on the main axis of attack given a "heavy attack" consumption norm (AWC, pg 78)

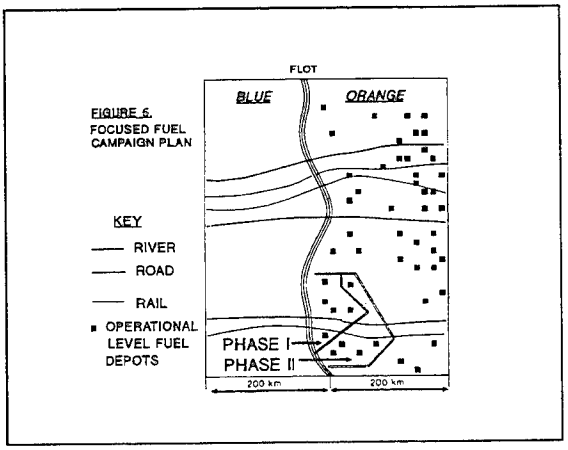
    --- Total ORANGE daily consumption = 25 divisions X 530 per division per day 13,250 mT of fuel per day needed to support breakthrough (AWC, pg 78) Soviet notional consumption for a Motorized Rifle division is 1200 mT ammo and fuel per day. Assuming equal ammo & fuel (600 mT per day each ammo/fuel) 25 divisions could be 15,000 mT per day fuel consumption (Erickson, pg 61, next to last para that page) AWC estimates Soviet FRONT at 25,000 mT POL per day (AWC, pg 75) Sandhurst agrees with 25,000 and since "frontal equipment has increased by at least 50%,...this figure should be upped accordingly." (Sandhurst, pg 231)

  -- Comparing fuel consumption on a heavily opposed axis to that consumed by forces on defense, defense 45.7% of offense for motor rifle division (230 Defence divided by 700 breakthrough = .457) (Sandhurst, pg 231)

- Goal of focused campaign planning will be to reduce flow from operational depots directly supporting breakthrough by 54.3%, rounded up to 60%.

  -- Uses the ratio of defense to breakthrough consumption

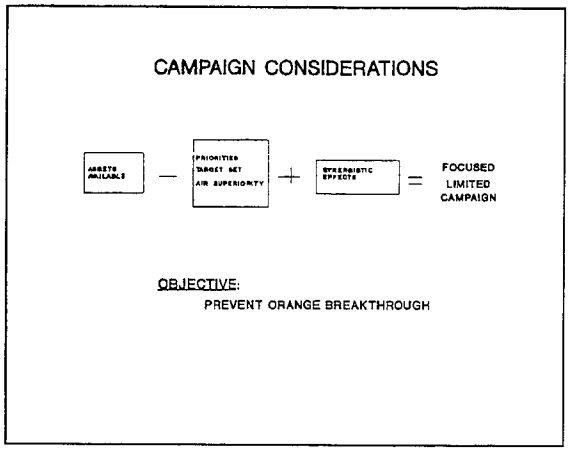
    --- If wants to have fuel at breakthrough level, but defensive forces allow it to flow at defense consumption rates, offensive forces need to reevaluate movement objectives in terms of sustainment (Army FM 100-5, pp 59-74)




SLIDE 7 (FOCUSED FUEL CAMPAIGN PLAN)

- Focuses attacks against fuel depots supporting forces on breakthrough from slide 4

  -- Two phases of 5 each (5 is an arbitrary number, seems to be a manageable target set number)




-- Goal = reduce flow from each group of 5 by 60% (based on ratio of breakthrough consumption to defensive (Sandhurst, pg 231)

SLIDE 8 (CAMPAIGN CONSIDERATIONS)

- Formula to determine whether assets are available for a focused and limited campaign

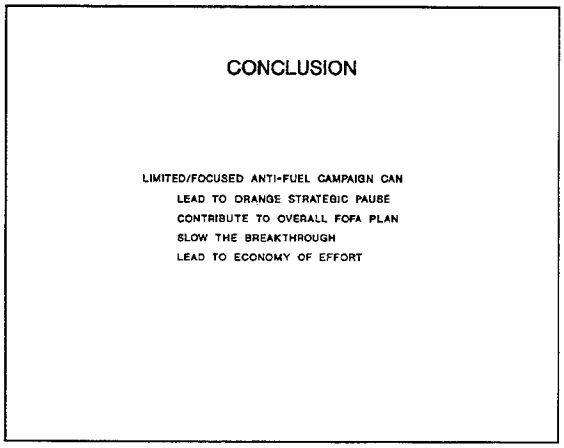
-- Recognizes competing priorities for air (Army FM 100-5, pg 48-49)

-- Breath and depth of targets (Army FM-100-5 pg 49)

-- Air freedom of action/superiority (Army FM-100-5, pg 48)

-- Synergism of other attacks that affect fuel outloads

- Intention of focusing to prevent the breakthrough (Army FM-100-5, pps 147 & 150)




SLIDE 9 (CONCLUSION)

- Contributes to overall interdiction mission

- Efficient use of the inherent flexibility of airpower

# GROUND FORCES CASUALTY RATE PATTERNS
## The Empirical Evidence

**George W. S. Kuhn**
**Logistics Management Institute**

Personnel casualty rates drive planning requirements for medical force structure, replacements, and the training base. They also play a primary role in assessing a force's potential effectiveness in various scenarios, hence its likelihood of success in pursuing national policy.

This task's purpose is to evaluate the reasonableness of battle casualty rate projections by the Services and theater commands. We will issue three reports on ground forces casualty rates. This first one presents findings about ground forces casualty rates gleaned from a large body of newly developed empirical data, and compares current U.S. Army and U.S. Marine Corps projections for a European scenario to those findings.

The task grew out of longstanding uncertainty within the Office of the Secretary of Defense (OSD) about whether casualty rate projections are reasonable and, if not, as to how far and in what direction (low or high) they may be outside a reasonable range.

We find that many current projections of battle casualty rates are inconsistent with the empirical evidence of rates for modern ground forces--evidence from both actual combat and recent field exercises. First, peak rate periods in certain major projections appear consistent only with a theater scenario radically altered from the one assumed in policy planning. Such peak rates suggest a U.S. sector within the NATO front that has probably been broken by attacking forces, rather than one whose defensive integrity remains basically intact despite being hit hard.

Second, most current projections show either stable or declining rates after an initial peak rate period. Yet the empirical evidence is clear that if significant combat continues after an initial period, it will result in multiple peaks.

Finally, current projections show wounded-in-action hospital admissions as a relatively constant proportion of total battle casualties. Yet the evidence shows that, in key combat scenarios now envisioned for Europe, the proportion of wounded admissions would decline significantly while that of missing and captured would rise equally dramatically.

Any one of these inconsistencies between current projections and the empirical evidence represents a serious breach with planning assumptions, with equally serious implications for requirements. The principal U.S. Army projections for Europe exhibit all three inconsistencies. U.S. Marine Corps projections for Europe are mixed. One shows consistency with the empirical evidence for a single peak rate period, but is otherwise inconsistent; the other major projection is inconsistent both with the first projection and with the empirical evidence.

Our conclusions rest on data from Allied and German experience in World War II, from the Korean and Middle East wars, and from contemporary field exercises pitting U.S. against Soviet-style units.

The data clearly show two things. First, daily casualty rates in modern conventional ground warfare exhibit distinct pulses associated with significant daily variability. Figure-1 illustrates the kind of pulse and variability patterns seen in divisional casualty data from actual combat. Rates for corps and armies show, as expected, lower peaks and variability but similarly dramatic ones.

Current projections generally fail to reflect these real-world patterns, either explicitly or implicitly. Consequently, they often show 10-day peak rates for a theater-size force of divisions that are higher than the scenario warrants. Yet, at the same time they do not account for the fact that some divisions in the force will experience considerably higher peak rates than projected, while all divisions in the force will experience many more lower 1-day rates than projected.

Second, the data provide no evidence that casualty rates *for a* given situation have increased significantly, if at all, since World War II. This is

contrary to common intuition, which focuses on obvious increases in weapons' lethality but usually understates or ignores other developments that counteract such increases. The fact is that casualty rates for ground combat have reduced by a full magnitude over the past 400 years. That the evidence shows they have not increased since World War II simply fits the longer trend.

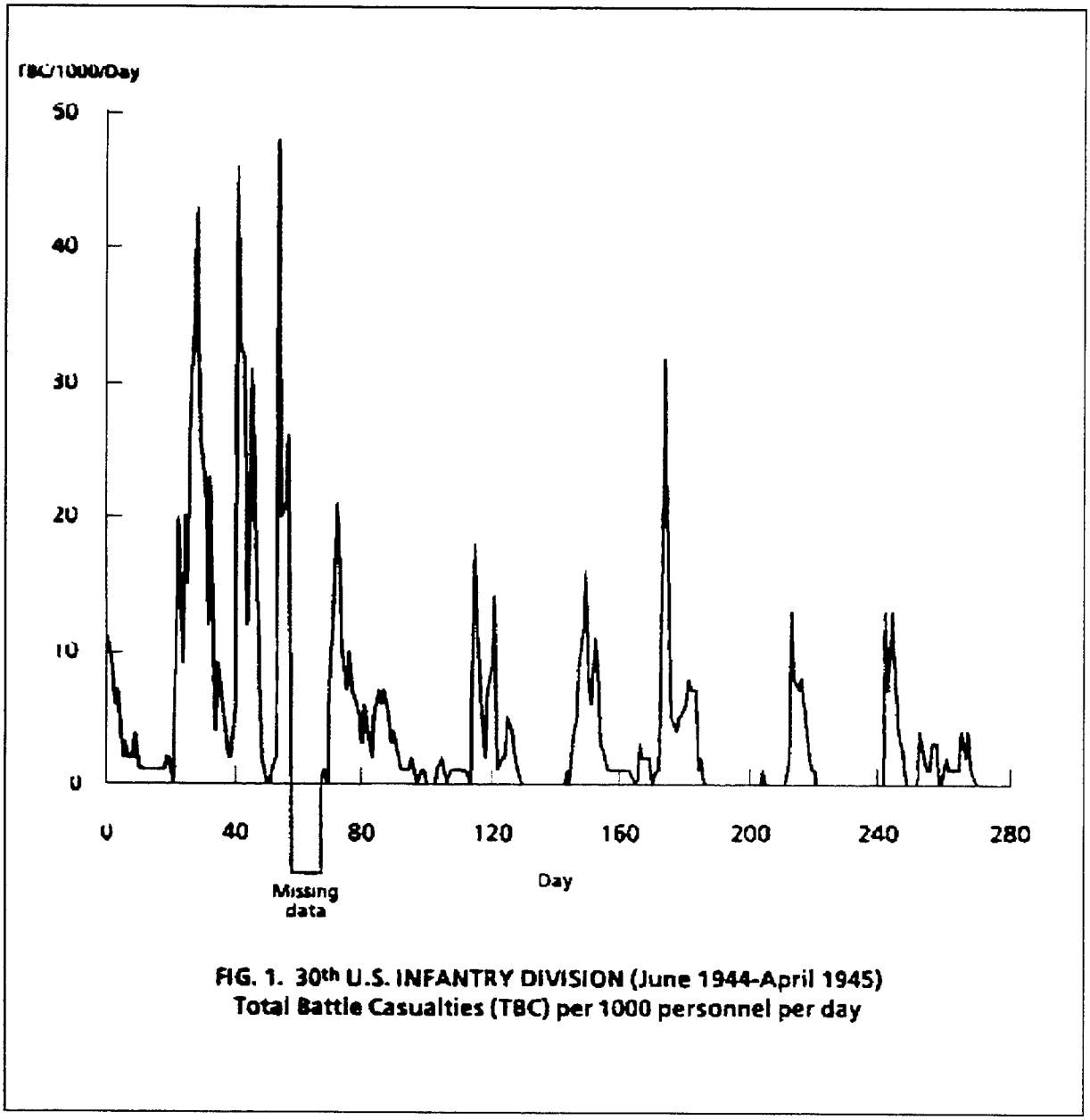



**FIG. 1. 30th U.S. INFANTRY DIVISION (June 1944-April 1945)**
**Total Battle Casualties (TBC) per 1000 personnel per day**

# A Bilateral US-Canadian Response to the Threat of Soviet Attack in Norway

**Lieutenant Colonel Adolph Carlson, USA**
**US Army War College Fellow**

## I INTRODUCTION

Since the late 1960s, the Canadian land forces' commitment to European defense have forced Canada to divide its efforts between two widely separated regions. The 4th Canadian Mechanized Brigade and the 1st Canadian Air Group stationed in West Germany are deployed and designed to participate in the battle for NATO's Central Region. The Canadian Air-Sea Transportable (CAST) Brigade Group and two Rapid Reinforcement fighter squadrons, stationed in Canada, were until recently committed to the defense of Norway.

The divergence of these two commitments has posed virtually insurmountable problems for Canada. Questions about the timing and circumstances under which Norwegian reinforcement would be ordered raised grave doubts that the CAST brigade would arrive in time to deter a Soviet attack or to defend against such an attack once launched. The maintenance of widely separated, trans-Atlantic lines of communication called for strategic transport, naval and air forces which exceed the fiscal constraints imposed upon Canadian defense planners.

This regional divergence also imposed divergent force design requirements. A Canadian land force tailored for combat in the Central Region must be designed around tanks and armored fighting vehicles if it is to play a role in the mechanized war envisioned for that region. Such a force, on the other hand, would not be able to deploy to Norway in a timely manner, nor could it operate effectively in the rugged terrain which characterizes that region. Further, a wartime theater in Germany would have a much more mature support infrastructure for military operations than Norway, hence theater logistics and medical capabilities must be fielded for a Norwegian deployment which are to a degree already in place in Germany. In sum, to support both commitments would require two different armies, neither one of which is well suited to assume the role of the other. For the Canadians, the requirement exceeds the resources public policy will provide.

In its 1987 White Paper on Defence, Canada announced its resolution to this dilemma by deleting its commitment to Norway and consolidating its land force commitment in Germany. The task of the forces previously committed to the CAST Brigade will shift from Norway to reinforcement of the Brigade in Germany, providing in theory a division-sized Canadian force in the Central Region.[1] This move is intended to double the size of NATO's Central Army Group (CENTAG)'s operational reserve (the role of the Canadian Brigade) and, with the prepositioning of major items of equipment, to alleviate the sealift requirements.

The White Paper claims that Canada consulted NATO prior to dropping the Norwegian commitment, and that "satisfactory alternative arrangements for the defense of northern Norway are in hand."[2] Other sources, however, indicate that while NATO allies may have been informed, their response was mixed.[3] Earlier proposals to consolidate all Canadian efforts in Norway were strongly opposed by the U.S. and the FRG, after initial signals of concurrence, which undoubtedly led Canadian defense analysts to views the German consolidation as the option of least diplomatic resistance.[4] As of this writing plans are still being finalized to replace the Canadians, with a composite force of European, US, and Canadian units.[5]

This paper will argue that a strong, decisive plan to defend Norway is essential for the success of NATO. Soviet occupation of any significant portion of Norwegian territory would greatly enhance their ability to interdict NATO reinforcements coming from North America, and Norway's World War II experience suggests strongly that the whole country could fall into enemy hands before the Norwegian forces could mobilize in response. Furthermore, technological advances may well allow Soviet forces operating from Norwegian bases to negate much of the U.S. capability to deter or retaliate against an attack on Central Europe, especially if further theater nuclear arms control agreements reduce the numbers of available theater nuclear weapons. Thus the CAST

Brigade's redirection to Germany is inconsistent with the capabilities NATO will require in the 1990s and beyond.

Nor is the consolidation in Germany consistent with the rest of Canadian strategy. Canada claims to have a strategic interest in the Security of the Arctic region.[6] If the Soviets were to take Norway, the Canadian Forces charged with Arctic security, mainly ASW and coastal patrol craft, would find themselves in direct confrontation with the entire Soviet Northern Fleet and tactical air forces of the Soviet Northwestern theater, easily capable of negating Canada's pretensions to Arctic security and the Canadian contribution to the security of trans-Atlantic Sea Lines of Communication (SLOCs).

Finally, the 1987 White Paper's approach to the employment of land forces is not consistent with the Conventional Forces in Europe (CFE) arms control initiatives being negotiated. If those negotiations are successfully concluded, over 100,000 English-speaking troops could eventually be moved from continental Europe,[7] and it is reasonable to assume that the Canadian public will put extreme pressure on its government to ensure that some of the 7100 Canadian troops in Europe are included in that withdrawal. In that case a threat to sever the Sea Lines of Communication between North America and Europe could in essence cease Canada's contribution to European security.

This paper will examine these issues and propose bilateral U.S.-Canadian remedies to the strategic dilemma posed by an undefended Norway. It will explore the insights provided by the World War II experience, survey the strategic situation as it exists today and as we can reasonably expect it to look in the 1990s, and conclude with an overview of possible North American responses. Significant problems will always remain. As shall be shown, Norway's geography poses extreme difficulties for maneuver, and its relatively undeveloped infrastructure makes logistical support problematical under the best of circumstances. Coupled with the constraint imposed by Norwegian defense policy, the country represents a challenge worthy of even the most capable and well-resourced military planners. Nonetheless this paper will contend that it is within the capabilities of the North American countries to jointly prevent Norway from becoming NATO's undefended flank and an attractive target for Soviet aggression.

**Background: Geography, Demography, and Politics**

A country 1,610 km (1,000 miles) long, 430 km (270 miles) across at its widest, 7 km (4 miles) across at its narrowest, with 3,220 km (2,000 miles) of coastline indented with narrow fjords up to 161 km (100 miles) long, Norway's geography poses difficulties for all types of military maneuver.[8] From the coastline the terrain rises abruptly to about 2,000 feet, with some peaks above 4,000 feet. Communications from the coast to the interior are extremely sparse, and those which do exist tend to follow river beds dominated by mountains on each flank.

In Finnmark, Norway's northernmost province, bordering on the Soviet Union, high cliffs render much of the coastline inaccessible, with landing sites located only at improved jetties at the settlements. Rivers running to the north made east-west movement and communication extremely difficult. The many lakes freeze hard enough in the winter to support vehicular traffic.

One third of the length of Norway lies above the Arctic circle, and in November these areas typically experience seven hours or less of daylight. The climate is tempered by the warming effects of the Gulf Stream; nevertheless, the extremes of cold and darkness in North Norway have a greater influence on military operations than any where else in NATO. The ground is frozen from mid-October to May, and snow as deep as 152 cm (60 inches) typically covers the ground during that period. Snow during the winter and soft ground during the thaw make vehicular movement very difficult, and these factors are exacerbated by the steep cross compartments which preclude off-road movement in many areas. Temperatures as low as minus 58 degrees F have been recorded. From November to March gales are common, and during the summer months fog is often encountered. In the south, milder temperatures, flatter terrain, and better communications make the terrain more conducive to military maneuver, especially around Oslo lowlands. In sum, each season poses its challenges, and none can be seen to be favorable to military operations, but in general the months of March and April seem to offer the best combination of factors for attack. With its 321,000 square km (124,000 square mile) area and population of 4.1 million, Norway is one of the least densely populated countries in the world. Most of the

people live in the coastal areas, with the largest concentrations in the south. Norway's cities contain an extremely high concentration of wooden buildings which in some cases have suffered severe fire damage throughout their history. This architectural characteristic increases the vulnerability of the Norwegian people in the event of all out war.

In Finnmark the population is extremely sparse, with a total population only about 80,000. The small population and remoteness of this region have resulted in an underdeveloped network of roads, communications, and medical services. Elsewhere, where the population is more dense, these services are well developed.

Norway's economy is characterized by full employment and steady growth. As one might expect, Norway maintains one of the world's largest merchant fleets, which carry its exports of oil, electro chemicals, electro metallurgical products, pulp and paper, and canned fish and fish oil. Norway imports grain, raw materials, textiles, iron and steel, machinery, and fuel. Norway currently has a large trade deficit which, it is hoped, will be diminished by the export of North Sea oil.

Norway is fortunate in having one of the world's most homogeneous populations, with no significant ethnic or political minorities. The government is a constitutional monarchy, with an executive consisting of a king who is advised by a cabinet of ministers chosen from the member of a 155 person parliament (Storting). A minority government has ruled Norway since 1981, with power passing this year (1989) from the Labor-Socialist Left party coalition to a coalition of Conservatives and Christian Democrats. It is too early to predict whether this new government will last long enough to have any significant effect on foreign or defense policy.

## II WARTIME EXPERIENCE

Norway's only significant experience with modern war was the German attack in the spring of 1940 and the subsequent wartime occupation. As early as October 1939, the Chief of Hitler's Naval Staff, Grossadmiral Erich Raeder, considered the options available to the German Navy in anticipation of war against the Western democracies brought on by the invasion of Poland.[9] The German Navy remembered ruefully its ineffectiveness during the First World War and its inability to break the hunger blockade imposed by the Allied navies. The problem, as he saw it, was to keep the fleet from being bottled up in the Baltic Sea, and dictated that Germany control both flanks of the Danish Straits and seize operating bases on the open ocean. Hence the German Navy pressed for the invasion of Denmark and Norway prior to the invasion of France.

Raeder's urgings were insufficient in themselves to persuade Hitler, chiefly because in 1939-40 the German concept of war was that a repetition of the 1914-18 experience was to be avoided at all costs. Rather than a protracted World war, Hitler in 1940 envisaged a war limited to the European continent in which German objectives could be accomplished before the British Navy could impair Germany's industrial base or war making potential. His concern with Scandinavia was more oriented around the post-war Europe of his imagination, in which Scandinavia's mineral wealth, especially Swedish steel, would enhance the strength of Germany's European empire.[10]

Like Sweden, Denmark and Norway were neutral in 1940, and this neutrality made Hitler anxious. He feared that Britain, using diplomatic or military means would be able to compel the Scandinavian countries to suspend trade with Germany.[11] But a German invasion of Norway and Denmark would be fraught with the greatest risks. It would involve joint Army-Navy-Air Force coordination on a heretofore unheard of scale, and amphibious landings for which there was no historical German precedent. Worse, German landings would have to be accomplished and sustained under the very nose of superior British naval forces operating in the North and Norwegian Seas. Rehearsal was out of the question for it would have compromised surprise and, besides, time was not available.[12] The most favorable time for the attack was April 1940, and the major objectives would have to be seized prior to May, the time scheduled for the main attack in the West.[13] If the Norwegian campaign were bogged down during the campaign in France no forces could be spared to reinforce it, and there was a real possibility that German units in Norway would be isolated and written off.

Surprise was seen as the key to success. If the Germans could consolidate their beachheads prior to the mobilization of the Norwegian Army, it was

hoped that the government in Oslo would find itself faced with a *fait accompli* and be compelled to accept generous German terms in exchange for the rights to use airfields, ports, and communications links. To this end, elaborate deceptive measures were taken to support and sustain the landings. Key commanders were sent into Norway on tourist visas prior to the invasion to conduct reconnaissance. Their uniforms were sent separately in diplomatic pouches.[14] Merchant ships were secretly outfitted for support of military operations, so-called Tanker and Export Echelons. These were dispatched prior to the invasion fleet to enter Norwegian ports under false pretenses to be in place when the troops landed.[15] Further attempts were made to maintain the appearance of normal relations between Germany, Norway and Denmark, attempts that were in large part successful due to the targeted countries' policies of offering no provocation for attack. After all, neither country saw itself involved in the continental crisis or as having offended the Germans in any way. That indications were not taken seriously even after the German attack began was revealed by the fact that the chief communications officer of the Norwegian Naval Staff was a dinner guest of the German Air Attache the evening prior to the landings, when German troops were entering Norwegian waters, and was not called away to his post until 2330 hours, local time.[16]

One aspect of the German invasion of Norway which has received more attention than its historical significance merits is the role played by the traitor Vidkun Quisling. Although he had a potential propaganda value and was certainly a major embarrassment for the Norwegian government, Hitler never seriously considered his National Union party, the Norwegian Nazis, as having the popular support Quisling claimed. Thus the Germans rebuffed Quisling's attempts to get them to support a fascist coup-de-etat, assessing prudently that the loss of surprise which they would risk by including Quisling in their planning was a much more important factor than the limited and unproven political leverage he claimed he could give them. Besides, German control of the government recognized by the Norwegian people would probably be more useful in attaining concessions than a puppet regime with no legitimacy.[17]

Perhaps the most remarkable aspect about the German plan for the Scandinavian campaigns was the boldness of its scope. Allied analysts suspected that the Germans were capable of operations against Denmark and Southern Norway, but were shocked into disbelief when they learned that the Germans had landed all up the coast as far north as Narvik.[18] Yet, the German plan from the beginning called for the seizure of bases in Narvik and Trondheim, for use in submarine operations, to control all access to Swedish iron and steel, and to pre-empt any British attempt to seize a continental base.[19] The German analysis concluded that if a campaign in Norway were to be undertaken, the seizure of the whole country (as opposed only to its southern part) would not increase the risk appreciably and would pay significant dividends.

The German assault began on the morning of 9 April, consisting of simultaneous landings at seven locations, ranging from Oslo to Narvik. What is immediately striking about these landings is the smallness of the forces involved. The German fleet employed 21 surface combatants and 28 submarines in the face of a Royal Naval force that would eventually number 34 surface combatants (including two aircraft carriers, one of which was sunk by a German battleship) and some two dozen submarines. The landings were carried out by fewer than 10,000 troops, the assault echelons of seven divisions.[20] At no point was the landing force greater than 2,000 troops.[21] The Germans also employed one parachute battalion, the first combat use of airborne troops, which proved very successful.[22]

The one area where the Germans did not scrimp was in air power. Some 500 combat planes and 500 transports were employed in seizing Norway.[23] These forces were assigned two tasks. First was the neutralization of Norwegian air units, a minor difficulty considering the small number of obsolete aircraft in Norway's Air Force. Second, and most importantly, these planes were to neutralize the threat of the Royal Navy, both by attacking British ships and by flying resupply missions in lieu of resupply ships, in order to deny the British easy targets. The air force was the decisive factor. In surface engagements the Royal Navy destroyed 13 major surface combatants and six submarines, and were virtually able to destroy the Export and Tanker echelon.[24] Nonetheless, German air power prevented effective British counter-landings and kept German forces supplied.

All the German landings were successfully completed before nightfall on the first day, with the only serious opposition encountered around Oslo. Even the Norwegian coastal batteries were ineffective, as the landings were essentially complete before the troops could man the guns. Beachhead consolidation and the landing of follow-on echelons continued over the next few days, while Norwegian forces in the interior mobilized and prepared to prevent the German conquest inland.[25]

The Norwegian Army boasted an equal number of divisions, but their strength was almost totally in reserve. Without the time needed to mobilize, they existed for all practical purposes only on paper.[26]

The first landings of Allied troops began at Narvik on 14 April, which eventually would involve three British and three French Battalions to reinforce the four Norwegian Battalions fighting the 3 reinforced battalions of German troops landed five days earlier. On 17 April two British brigades landed at Andalsnes, to assist the Norwegians defending the valleys running from Oslo to Trondheim, where the Germans were attacking against the only serious Norwegian resistance of the campaign to gain control of the Norwegian heartland.[27]

The Allies were able to land troops in Norway so quickly because at the time of the German invasion they were about to launch their own operation intended to occupy Norway and deny its ports and Swedish iron ore from German use. Once Norwegian neutrality was violated, operations in Norway in a sense became a race between the Germans and Allies to see how fast the units in place could be reinforced. Because of their superior air power, the Germans were able to win that race, by deploying some 80,000 troops compared with 45,000 Allied troops.[28]

Still, however, Allied operations in Norway caused the Germans some serious problems. Allied troops landed at Andalsnes and sent southeast to reinforce Norwegian units fighting north of Oslo prevented the Germans from consolidating their conquest of the interior until the first week in May. With better coordination between Allied and Norwegian units, and with increased air support, these units might have been able to keep the Germans penned into a defensive pocket centered around Oslo, thereby preventing the link up of German forces with those landed in Trondheim, which thereby would have been vulnerable to defeat.[29] Allied forces landed at Narvik, captured that town, and forced the Germans defending there into a situation so dire that they actually contemplated the humiliation of internment in Sweden in lieu of surrender. Signs of impending attack in France caused the Allies to evacuate their forces, however, and for all practical purposes the campaign was over by mid-May.[30]

The conquest of Norway brought the German military immense prestige, secured its supply of iron ore, and gained submarine and air bases from which it could loosen a British blockade. The infliction of serious losses upon the Royal Navy demonstrated the vulnerability of naval vessels to air power, although the German Navy was also seriously crippled.

Over the long run, however, the Germans largely chose not to exploit Norway's operational advantages. The fall of France provided submarine bases that were used far more extensively than those in Norway. The need for combat aviation in other theaters, especially after the invasion of Russia, stripped away many of the air force units originally deployed in Norway. Despite a continued Norwegian resistance, a relatively benign occupation policy prevented any organized partisan threat to Germany's primary military use of Norwegian territory, the establishment of a route through which its Finnish ally could be supported in the war against Russia.[31]

Still, however, events would demonstrate Norway's potential as a base for convoy interdiction. In the fall of 1941 the U.S. and the U.K. began to dispatch convoys (designated with the code letter "PQ") on the so-called Murmansk run to support their new Soviet ally. The Arctic convoy was a contingency the Germans had not adequately prepared for, and in the spring of 1942, due to the pressing requirements in other theaters, only 12 German submarines in Norwegian waters operated against convoys.[32] The air assets, however, were more substantial -- 60 twin-engine bombers, 30 dive bombers, 30 single engine fighters, and 15 torpedo bombers. In mid-March, Hitler ordered these planes to begin extensive anti-convoy operations. In April, PQ13 and 14 sailed. PQ14 encountered pack ice and most of its ships turned back. PQ13 was attacked, and lost 5 of its 19 ships plus a cruiser escort. In May,

torpedo bombers attacked PQ15 and sunk 3 ships. With the longer periods of daylight, favoring air attack, the air force units were reinforced with over 100 bombers. PQ16 was attacked late in May and lost nine ships. In June, PQ17 sailed, and a combination of clear weather and good intelligence provided ideal conditions for air attack. The Germans attacked with a total of 264 combat aircraft of all types. The Germans claimed to have sunk every ship of the convoy; British figures concede a loss of 23 out of 34 ships.

The PQ17 disaster was the zenith of German anti-convoy activity in Norway. It caused the British to suspend convoys for two months, and assigned an aircraft carrier escort to the next convoy, PQ18. Using submarines against the carrier to support the air attack against the convoy, the Germans attacked PQ18 in mid-September and sunk 13 of 40 ships. The cost to the German air force was heavy -- 20 bombers lost. From that point on, German air, surface, and submarine forces were instructed not to attack convoys with carrier escorts.

After PQ18, Arctic convoys were suspended due to the requirements of the North African invasion. Similarly, all German torpedo bombers and most of the twin-engine bombers in Norway were redeployed to the Mediterranean. The German Air Force in Norway would never again be able to muster such devastating strength in the Arctic. The next convoys, sailing in December 1942, were attacked by remaining submarine and air forces, but the attacks were unsuccessful. The German inability to exploit the potential of its Norwegian bases resulted in a largely undisturbed supply line to its Soviet enemy across the Arctic run.

From Norway's World war II experience, a number of lessons suggest themselves:

- First, the boldness of the German conquest, in the face of the superior Royal Navy, suggests that we today should prepare for the possibility that the Soviets will try to seize the whole country, and not just its northern regions. The risks involved are minimal compared to the advantages that could be gained. Furthermore, a Soviet attack south would be the inverse of a German attack north -- the Germans were extending themselves into regions ever more desolate; the Soviets would be moving into regions ever more able to sustain war.

- Second, Norway's political stability and its unoffensive foreign and security policies do not constitute a deterrent. The attempt to demonstrate peace loving through weakness caused the failure in 1940, and not Quisling's traitors.

- Third, for an aggressor concerned with interdiction of sea lines of communication, Norway offers tremendous potential. An aggressor who focuses and doesn't waste his assets on secondary efforts may be able to replicate the PQ17 debacle all over the North Atlantic. Furthermore, NATO's defense of the Central Region would deny the Soviets the use of submarine bases elsewhere on Europe's coast, leaving Norway as its only option.

- Finally, intervention to reinforce Norwegian forces must be timely, must have the flexibility to respond to attacks initiated any where in the country, and must be an integrated part of a coordinated and rehearsed Allied plan. The troops involved must be extensively trained for Norway's climatic demands, transport must be earmarked and available, and the decision making and chain of command relationships must leave no room for ambiguity.

## III THE NORTH FLANK: THE CURRENT MILITARY BALANCE

### Norway

Norway emerged from the war divested of its pre-war illusions of neutrality and became one of NATO's charter members. As a member of NATO, Norway's security is today guaranteed by the treaty obligations of its North Atlantic allies.

Norway retains conscription and is at least on paper capable of a mobilization strength of 285,000, remarkable in light of its small population of military-aged (18-32) males, 500,000. Norway's standing forces amount to only 34,100 (19,000 Army; 5,300 Navy; 9,100 Air Force; 700 others).[33] Because of its World War II experience, when some reservists received their mobilization orders through the ordinary mail, all currently serving officers and NCOs of Norway's reserve forces are sworn to regard any attack on the country as the authority to mobilize, even if the king and government has fallen into enemy hands and irrespective of any subsequent threats or orders to the contrary. Similarly, the

standing forces are ordered to fight on their own initiative if attacked.[34] Plans call for full mobilization in 72 hours, although deployment to the battle area could take considerably longer, especially in the face of a determined effort to impede it. Much of the army's heavy equipment is prepositioned in key areas to reduce the time required for deployment.

The bulk of standing army units are stationed in North Norway. The Brigade North (a 5000 man formation consisting of three infantry battalions, an artillery battalion, and a tank company) is the largest and most combat capable of these units. It is stationed at Heggelia Rusta, near Bardufoss airfield. Further to the east is an infantry battalion manning the garrison at Porsangermoen, and another infantry battalion near Kirkenes, which provides the troops who guard the border with the Soviet Union. Norway's standing army also includes the Royal Foot Guards Battalion (700 men), a tank squadron, an artillery battery, and a rapid deployment company, all stationed near Oslo. These units are kept in a high state of readiness and are supposed to be deployable any where in the country in 24-48 hours.[35]

Upon mobilization, Norway's Army would expand by ten brigades, each 5000 men strong, and five reinforced infantry battalions of 1000 men. Each brigade is organized similarly to the Brigade North. When mobilized, they would be integrated along with the standing forces into 4 divisions for deployment where necessary. Since most ground operations are anticipated in the North, while most reserve units are in the South (where the population is greatest), and since the communications from South to North are so underdeveloped, deployment is the most critical factor in any of Norway's ground defense plans.[36]

Norway's Air Force can field 5 fighter squadrons (4 F-16, 1 F-5) in support of ground operations. About half of these are in the south, meaning that re-deployment and support in case of an attack in the North is a concern for the Air Force as well as the Army. In addition, Norway maintains two transport squadrons (1 C-130, 1 DHC-6 and UH-1B),[37] various maritime patrol and air rescue elements, and four Nike-Hercules air defence batteries (1 active, 3 reserve) around Oslo. These air defense assets are provided early warning and direction by the NATO Early Warning Command, which has a forward operating location (FOL) at Orland airfield, and NATO's Air Defense Ground Environment System (NADGE), into which Norway's assets are integrated.[38]

The Navy comprises 5 frigates, 2 corvettes, 2 mine-layers, 14 coastal patrol submarines, 5 LCTs, and approximately 40 fast attack and coastal patrol boats. In addition, Norway has 26 coastal fortresses with 50 coast artillery batteries, with guns up to 150 mm in caliber, most of World War II vintage. Some coastal fortresses have a cable mine-laying and torpedo capability. All coastal defenses are integrated with a shore-based radar and command and control system, and are further secured by Bofors air defense missiles and guns.[39]

As a part of NATO, Norway is assigned to Allied Forces North (AFNORTH), one of four major subordinate commands comprising Allied Command Europe (ACE). The area commanded by AFNORTH, called the Northern European Command (NEC), includes Norway, Denmark, and the Federal Republic of Germany north of the Elbe river (Schleswig-Holstein and Hamburg). Adjacent sea areas are also assigned to the NEC. The NEC itself is divided into three tactical commands, Allied Forces North Norway (AFNON), Allied Forces South Norway (AFSONOR), and Allied Forces Baltic Approaches (AFBALTAP).[40]

AFNORTH is headquartered in Kolaas, Norway, and is commanded by a British 4-star general. AFNON is headquartered near Bodo, and is commanded by a Norwegian Army 3-star general. AFSONOR is headquartered in Oslo, and is commanded by a Norwegian Air Force 3-star general. AFBALTAP is headquartered in Karup, Denmark, and is commanded by a Danish 3-star general.[41]

AFNON's wartime mission is the defense of the NATO northern flank in North Norway. AFSONOR has a threefold mission: the defense of its command area, the deployment of Norwegian reinforcements to AFNON, and the reception and employment of foreign reinforcements. AFBALTAP's mission is the defense of the Baltic approaches to the North Sea. In wartime, it will exercise operational command over Danish and German land, sea, and air forces.[42]

Although AFNORTH exercises command authority over the coastal waters adjacent to his command, the area of the Norwegian and North Seas

proper is not assigned to AFNORTH nor to ACE, but rather comprises AFNORLANT, headquarted in Rosyth, UK, a sub-area of EASTLANT, also headquartered in the UK, which in turn reports to ACLANT, headquartered in Norfolk, VA.[43] Thus integration of ground activities in Norway with naval activities in the Norwegian Sea requires coordination between headquarters in Norway, Belgium, the UK, and the Eastern USA.

Unlike the central and southern regions of NATO, the northern region imposes serious constraints on strategic planners because of the Norwegian and Danish prohibition against foreign troops or nuclear weapons on their soil. Furthermore, Norway prohibits any allied training in Finnmark and allied air and naval activity operating from or to Norwegian bases east of 24 degrees E longitude.[44] These prohibitions are intended to prevent the Soviet Union from seizing on any provocation for launching an attack. Given the need for Norwegian troops to mobilize and deploy, however, and the critical role that foreign reinforcements could play in providing time for that mobilization and deployment, these Norwegian political prohibitions make the timely arrival of reinforcements problematical, and put the defense of the northern flank at serious risk.

**Finland**

Norway shares land borders with two countries besides the Soviet Union: Finland, and Sweden, both neutrals. Finland's foreign policy is characterized by a western cultural orientation coupled with friendship with the Soviet Union, which is to say that non-provocation of the Soviets receives even more emphasis in Finland than in Norway. Finland is tied to the Soviet Union through a Finno-Soviet Treaty of 1948, which is due for extension into the next century.[45] This treaty calls for mutual assistance in case of an attack on Finland or on the Soviet Union through Finnish territory. Article 2 of this treaty, which calls for consultations in case of a threat of such an attack, was invoked by the Soviet Union during the Berlin crisis of 1961. The result was a pledge extracted from Finland to mind Soviet interests in Scandinavia. Other examples of Finnish acquiescence was their signing a 15 year trade agreement with the Soviet Union, to balance their 1973 Free Trade Agreement with the EEC, and their abstention from voting on the 1980 UN resolution condemning the invasion of Afghanistan.[46]

On the western side, Finland is a member of the Nordic Council and enjoys close relations with the rest of Scandinavia, especially Sweden. It has been a member of the EFTA since 1961 and, as mentioned, has signed a Free Trade Agreement with the EEC.[47]

Finland's geography is flatter than Norway's, and includes many expanses of bogs, lakes, and forests which impede mechanized maneuver. The only mountains are in the north, in the so-called "Finnish Wedge" along the Finnish-Swedish-Norwegian border. The climate is not appreciably different from that of Norway.[48]

Perhaps the key feature of Finland's geography from this study's perspective is the 1200 km (750 mile) border with the Soviet Union. Any Soviet attempt to seize territory in Norway would be greatly facilitated if Finnish territory could be used.[49] Finland's security policies reflect an attempt to balance a need to resist Soviet aggression with a need not to appear hostile to the Soviet Union. Finnish standing forces are extremely small (31,000 men), virtually all (27,800) of which are ground forces equipped with very few (less than 200) tanks. Under full mobilization that force could expand to about 500,000 troops, supported by a small navy (21 combatants, mostly patrol boats) and air force (about 75 combat aircraft).[50] Finland's strategy is to deter aggression not with the threat of defeat at the border but rather with the threat of long term attrition, using hit-and-run tactics in the forests and bogs, on enemy lines of communication.[51] Still, in a short war scenario, an attack through Finland, justified under the pretext of compliance with the Finno-Soviet treaty obligations, could be a very attractive Soviet option which the Finns probably could not prevent.

Norway's other neighbor, Sweden, is also neutral, but Sweden's neutrality is much more credible than Finland's. With geography, climate, and population similar to her neighbors, Sweden's defense establishment is organized along similar lines, with a small (64,500 men) active force capable of rapid expansion when mobilized. Unlike Norway or Finland, however, Sweden maintains one of Europe's largest and best equipped air forces, approximately 420 combat aircraft of the most modern types.[52] Although Sweden is often critical of U.S. policy, and was especially critical of the Vietnam policy under the administration of Olof Palme, the Soviet attempts

to intimidate the Swedes have been largely ineffective, and have often been counterproductive. The discovery of Soviet submarines in Swedish waters spurred an increase in defense spending.[53]

In sum, the Scandinavian region is one which the Soviets view as generally non-threatening, and which they intend to keep that way. President Gorbachev has praised the Scandinavian countries for their "non offensive" defense policies, and continues to pursue initiatives to persuade them to "demilitarize" the Nordic region.[54] Scandinavian policies have succeeded in keeping Finland independent, and a legitimate argument could be made that a more assertive defensive stance, especially in those border areas bordering the USSR, might compel the Soviets to deploy even more powerful forces in or near those regions or, in the extreme, invoke the 1948 treaty as a pretext for annexing Finland.[55]

Nevertheless, however, the Scandinavian position is extremely vulnerable, and the region could be viewed by an aggressive Soviet government as an attractive target. The key to attacking Norway would be seizing strategic objectives before mobilized Norwegian troops or foreign reinforcements could be brought to bear, and it is likely under the proper circumstances to be viewed as an acceptable risk.[56] Although a Soviet attack in Southern Sweden could drive that country's forces into the enemy camp, it would provide the capability to outflank NATO defenses in Finmark, and, though unlikely, must be considered. No such penalty would be associated with an attack through Finland. Such an attack must consequently factor largely in NATO's defensive planning.

**Soviet Postures**

The major threat to Norway are the Soviet Forces stationed on the Kola Peninsula, including the forces of the North Western Theater of Military Operations and the Northern Fleet. At the time of NATO's formation this region did not pose anything like the current threat, with the build-up of Soviet nuclear forces and naval forces in the 1960s and 70s, however, the Kola was transformed into one of the world's most powerful and congested military bases.[57] (See Figure )

The reason for the military development in this area is geographic. Located on the Barents Sea and warmed by the Gulf Stream, the Kola provides a number of ice-free inlets suitable for naval installations. Furthermore, these bases are located as close as Soviet geography will allow to the Norwegian Sea, affording passage for the Northern Fleet into operating areas in the North Atlantic.[58] For a Navy constrained elsewhere by narrow straits controlled by hostile powers, this passage is of extreme strategic importance. As a result, over 170 submarines (some 39 strategic SSBNs and 116 tactical attack submarines), or about 40 percent of the total submarine fleet, operate out of the Kola. In addition over 70 surface combatants are in the Northern Fleet, including 2 CVVs (Kiev class with 13 Yak-38 V/STOL aircraft), 13 cruisers, 13 destroyers, and 42 frigates.[59] The new Soviet Tbilisi-class carrier, scheduled for sea trials within a year of this writing, will also likely be assigned to the Northern Fleet.[60] Two additional carriers of this class are under construction. Significantly, 15 amphibious craft and 4 battalions (3,000 men) of Naval Infantry are also stationed in the Kola. Naval aviation includes 60 Badger and Backfire bombers and over 140 ASW aircraft (65 afloat, 80 land based).[61]

Air defense for the Kola Peninsula is provided by 350 interceptors of all types (MiG-23, 25, 31; SU-15, 27) and 100 SAM complexes (SA-2, 3, 5, 10). These weapons are tied into early warning radar sites deployed throughout the peninsula, complemented with the Il-76 Mainstay, an AWACS type aircraft.[62] Kola air defenses are high priority units for receiving the latest equipment, and were the first to receive the MiG-31.[63]

The main task of the air defense forces on the Kola is to counter the nuclear threat posed by U.S. aircraft and cruise missiles. Key to the accomplishment of this mission is the ability to intercept U.S. long range bombers over the Arctic Sea, prior to their release of ALCMs. In addition, high priority is placed on the interception of carrier based aircraft and of SLCMs launched from the Norwegian Sea. Finally, Kola based air defense forces are also targeted against NATO ASW aircraft operating in the Arctic and Norwegian Seas in support of the Northern Fleet's submarine forces.[64]

Other air units stationed in the Kola include elements of the Leningrad Military District Air Force,

a force of 160 attack and reconnaissance aircraft (MiG-21, 25, 27, Su-17) and 180 attack and utility helicopters (MI-24, 8, 17) tasked with the support of the Leningrad MD Ground Forces.[65] In addition, elements of the 36th and 46th Air Armies, long range bomber units (Bisons, Badgers, and Backfires), have been known to conduct refueling exercises on the Kola.[66]

Ground Forces on the Kola come under the command of the Leningrad Military District, and include 11 motorized rifle, 1 airborne, and one artillery division, plus an air assault brigade.[67] These forces could be reinforced prior to hostilities, especially with airborne divisions (the Soviets have 7) and air assault brigades (the Soviets have 10). Norwegian military estimates conclude that these units would require 14 days of preparation in order to posture themselves for an attack, and that this activity could be kept secret from Western reconnaissance for about four or five days.[68] Therefore, it would appear that a Soviet attack on North Norway would be preceded by a nine to 10 day period in which Norwegian forces could be reinforced. If, however, Soviet intra-theater transport capabilities continue to improve large forces could be placed on the Kola in a shorter time, thus reducing the time required for attack preparations to as little as six or seven days.

The main vulnerability of the forces on the Kola is their extreme density. All the military assets described above occupy an area just 1600 km (1000 miles) long and 800 km (540 miles) wide. The naval bases and airfields in particular are the most densely concentrated in the world. While they represent significant military assets, described as the Soviet Military's "crown jewels," they are also strategic liabilities in the sense that since they comprise such lucrative targets, any plan involving military action must provide for the safety of the Kola.[69]

Significantly, the Soviet military system of command of its northern forces is simpler than NATO's. Unlike the situation involving NEC and NORLANT, the Soviets assign the territory of Norway and the Norwegian Sea to the Northwestern Theater of Military Direction (TVD). Thus coordination among elements of the Northern Fleet (HQ Severomorsk) the Northern Front (HQ Leningrad), and the high command requires shorter links of communication and is potentially more responsive to developments on land and sea. Unlike NATO, Denmark does not fall into the same military planning area as Norway in the Soviet system, being assigned instead to the Western TVD as is West Germany.[70]

**NATO Reinforcements**

Allied reinforcements to Norway include a number of fighter/ground attack and close air support aircraft. About 10 squadrons are available, if the ACE Mobile Force and USMC air units were deployed to Norway.[71] Ground reinforcement is less certain. The Canadian CAST Brigade was the only unit exclusively earmarked for Norwegian reinforcement. This 5-6000 man formation, deployed by air and sea transport, would have taken about 30 days to arrive in Norway. As conceived, the CAST Brigade's air and sea deployment plans may not have been feasible and could not guarantee their timely arrival.[72]

A U.S. Marine Expeditionary Brigade (12-16000 troops) has exercised in Norway on many occasions, and in 1989 completed the prepositioning of heavy equipment in Norway to facilitate deployment by air alone, within 8-10 days of the decision to deploy them. This unit has a number of other deployment responsibilities, however, and it cannot be said for sure that it will be available for Norway. Likewise, the Brigade's efforts in the area of cold weather training have been viewed by many as insufficient, and its mechanization may not make it suitable for deployment from its arrival airfields in South Norway to the North or for combat in Norway's rugged terrain.[73] Other units which could reinforce Norway include the ACE Mobile Force, a composite light infantry formation of brigade size, available by air within seven days; and the UK/NL Amphibious Force, comprised of 6-7000 British and Dutch Marines, deployed by sea within 10 days. None of these units is exclusively earmarked for Norwegian reinforcement, of all NATO's reinforcement continqencies, Norway remains the most probable.

Of all the allied units committed to Norwegian reinforcement, only the US Marines have taken the steps necessary to preposition heavy equipment in Norway and thereby facilitate deployment. This equipment is located some 800 kilometers to the south of Finmark, so the problems associated with tactical deployment to face a threat in

the North apply to the US Marines as well, and seriously degrade their amphibious capability.

Similarly, the ACE Mobile Force is planned to land at airfields in southern Norway, and is likewise faced with the problem of northward deployment. The UK/NL Marine Force afford the only truly amphibious capability and the only capability to be inserted directly in the vicinity of a North Norwegian battle area. As the force most reliant on the survival of sea port facilities and transatlantic sea borne transport, the CAST Brigade's capability to contribute in a significant military way was always the most questionable of all NATO reinforcements.

Self-evidently, a program to pre-position the CAST Brigade's equipment in Norway, as the US Marines did, would have gone a long way toward establishing the credibility of that force, but Canada's government deemed the expenses associated with prepositioning as excessive, and the Norwegians offered no help. In light of its policies regarding the Soviet Union, Norway considered a US financed initiative to preposition equipment as acceptable, as not implying Norwegian complicity in what could be construed as an aggressive NATO move. To help finance a Canadian prepositioning program was for the Norwegians unacceptable. In the words of J. J. Holst, Norwegian Defence Minister, Norway's allies should be "within reach, but at arm's length."[75]

The Soviet defense media suggest that concerns about deployed US Marines being provocative are well founded. The Soviets have historically envied the US Navy/Marine Corps capacity for power projection, and the relative capabilities of carrier groups and marine expeditionary forces is one area where the Soviets admit inferiority. Regarding the US Marines in Norway, the March 1989 edition of the *Soviet Military Review* commented that, "The construction of stationary depots of heavy weapons in North Norway has made it possible to airlift a Marine brigade from the US to, say, the polar frontiers of the Soviet Union in a matter of days." This concern has been reinforced by previously articulated statements of the US forward naval strategy, and has led to crudely crafted propaganda condemnations of the US Marines. One Soviet politician attributed to the USMC CH-53 helicopter the ability to transport Pershing II missiles, and other publications have called the Marines the "SS men on the dollar" and "the spearhead of aggression."[76]

NATO's response to the Canadian cancellation of the CAST Brigade's commitment to Norway has been the organization of a composite force, with US, West German, and Canadian contributions.[77] The effectiveness of this force has yet to be demonstrated, but the concept poses significant difficulties. The polyglot nature of the command relationship existing between multinational combat and support units is self-evident, and would require extensive exercises to overcome. The Canadian contribution, an infantry battalion, is required to participate in other non-related deployment missions, such as peacekeeping duty in Cyprus. In the words of one Canadian defence studies expert, "Despite continued budget cuts, they are being asked to do more with less."[78]

The participation of German units poses additional problems. In the past, the Norwegians have limited German participation in ACE mobile force exercises in Norway to support units (signals, medical, and helicopter units). On the eve of a West German infantry battalion's participation in exercises in Norway in 1970, Norwegian Defense Minister Rolf Hansen announced that German participation had reached an "appropriate level," and arranged for the infantry battalion not to deploy. His motive was communication from President Kekkonen of Finland, that said the USSR indicated the full West German participation in the ACE Mobile Force exercises in Norway would cause problems in Finno/Soviet Relations.[79] Under any circumstances, West German troops in Norway would revive lingering World War II resentments, and would be a new mission for the Bundeswehr, one for which it is ill equipped and inexperienced.[80] Finally, a foreign deployment of German troops would weaken NATO forces in the Central Region.

**The Military Situation In the Norwegian Sea**

In the event of hostilities, the Norwegian Sea will be crucial to the operations of the Soviet Northern Fleet. The significance of this area derives from two strategic imperatives which shape Soviet naval strategy--the security of their strategic nuclear deterrent force, and their need to interdict NATO's transatlantic SLOCs.

Among the main elements of the Kola Peninsula's military facilities are the ports of the Soviet ballistic missile submarine fleet. Very conscious of its inferiority to the US Navy in anti-submarine warfare, the Soviets have developed classes of submarines and SLBMs capable of striking targets in the United States without deploying very far from their home bases in the Kola. Constrained by the narrow passages through Greenland, Iceland, the UK, and Norway, the Soviet employment concept for modern SSBMs is not to risk losing them to NATO ASW forces in attempting to cruise through the GIUK gap, but rather to deploy the remainder of the Northern Fleet into that area and keep the SSBMs closer to home, forcing NATO ASW forces to run a strongly fortified gauntlet to get to their SLBM deterrent.[81] Also protected under this strategy are airfields capable of supporting strategic bomber operations. Finally, Soviet interceptors and ASW aircraft (operating from the Kola) provide a degree of strategic air defense and ballistic missile submarine defense.[82] Protection of these elements on the Kola is the first strategic imperative of Soviet northern strategy.

The other goal of the Northern Fleet is to eliminate NATO's freedom of action in the North Atlantic, to prevent the reinforcement of Europe. Of gravest concern here is the threat posed by the Soviet attack submarine fleet, who would have to cross through the GIUK gap in order to strike NATO convoys on their way to Europe. To detect Soviet submarines in transit to the North Atlantic the United States has installed the so-called SOSUS line, a system of sensors stretched along the Greenland-Iceland-United Kingdom (GIUK) gap in order to detect enemy submarines in transit to operating areas in the North Atlantic.[83]

Although the SOSUS line would certainly be an aid to anti-submarine defense, it will not in itself sink enemy subs. If the Soviet submarine fleet defeats the SOSUS line, either by deploying well prior to the outbreak of hostilities or by neutralizing NATO's ASW assets with land or carrier-based air cover, NATO's naval forces might find themselves patrolling the line after their quarry had escaped with inadequate forces left to defend the convoys. This possibility has caused the U.S. Naval strategy of forward defense to come into question. As early as 1983 the US Chief of Naval Operations (CNO), Admiral Watkins, announced that the Soviet threat to the Sea Lines of Communication (SLOCs) would compel him to concentrate his naval forces south of the GIUK gap, and precluded him from sending any carrier battle groups into the Norwegian Sea.[84] Without the tactical air capabilities provided by U.S. carriers to counter the Soviet air threat, NATO's ASW efforts in that region may be severely diminished.

**Likely Scenarios for Soviet Attack on Norway**

The circumstances and objectives of a Soviet attack into Norway would be determined in a larger strategic context, but in general terms one of two scenarios is most likely: either an attack to seize North Norway, specifically the province of Finnmark, or an attack to seize the whole country.

A Soviet attack on North Norway would have as its goal the security of the "northern bastion," the military facilities in the Kola peninsula. The attack would involve amphibious landings and a ground attack through the Finnish wedge, to outflank Norwegian forces deployed near the border, and airborne/heliborne assaults to seize key airfield and choke points along ground attack routes. Such an attack would provide coastal protection in the fjords for Soviet submarines, and additional airfields for Soviet air defense and ground attack aircraft, which would extend their operating areas and permit dispersion and defense in depth of the forces in the Kola peninsula, thereby enhancing their survivability. Further, such an attack would also enhance the strategic defense of the Soviet Union by extending the range of the interceptors and ASW forces tasked with the destruction of US ALCM armed bombers and SLCM armed submarines.[85]

Norway's response to such an attack would be to order the Brigade North and its associated active units to resist the Soviets, while simultaneously ordering the reserves to mobilize and perhaps calling for some, if not all, of the NATO troops earmarked for reinforcement. Realistically, allied forces' best chances for defense would be a line established on the southern banks of the Lyngenfjord, which essentially would cede the province of Finnmark to the Soviets.[86] In the event that the Soviets were to try to outflank this line by an attack through northern Sweden, a course of action which would probably bring Sweden into the war on NATO's side, the arrival of the USMC Expeditionary Brigade would provide a potent counter.

Such a scenario has become the one most commonly accepted by analysts of NATO's North flank. Its limited objectives make it one with an outcome imaginably acceptable for both the Norwegians and the Soviets; a defense oriented on the Lyngenfjord would cede Finnmark but would secure the survival of the rest of Norway, an attack which captures Finnmark would enhance the Soviet ability to protect its own northern flank. Under these circumstances it is difficult to conceive that the Norwegians would agree to NATO counter measures which might escalate the conflict, especially to a nuclear level, making it difficult to justify US missile strikes against either the attacking Soviets or their bases on the Kola peninsula. Without such options, NATO might just have to live with the loss of Finnmark.[87]

The second Soviet attack scenario is one with the objective of seizing the airfields in southern Norway. Historically, this scenario has been viewed as a follow-on to a Soviet/East German/Polish attack to seize Jutland and control the Danish Straits.[88] Recent developments in East Germany and Poland make such a scenario unlikely because the complicity of these two countries can no longer be assured and, once Soviet troops leave, they might actively resist such an incursion. Today's most likely scenario for an attack on Southern Norway is a follow-on from a north Norway attack, using the newly captured bases for support. Such an operation would strain the power-projection capabilities of the Soviet Union to their limit,[89] but the appearance of the Tblisi-class carriers may provide them the edge needed.[90]

Soviet seizure of North and South Norway would pose grave danger to NATO's transAtlantic reinforcement capability. Tactical aircraft operating out of south Norway would be able to neutralize NATO's ASW efforts along the SOSUS line all the way to Iceland, allowing Soviet attack submarines to escape into their operating areas. Soviet land and carrier-based air could cover Northern Fleet operations and enhance the protection provided to their own northern flank, enhancing their ASW operations against US SLCMs and their air defense against US ALCMs.[91] Finally, and perhaps most significantly, Soviet aircraft operating from South Norway could attack port facilities along the Belgian, Dutch, and French coasts without having to fly through the dense air defenses in Germany or Sweden. Such a capability would gravely increase the vulnerability of North American reinforcements.

US Naval analysts estimate that units deploying by sea to reinforce in Europe would follow the following timetable: 2-9 days to get to port, 1-5 days to load, 5-11 days at sea, 1-5 days to unload, 2 days to travel to an assembly area, and 3-5 days to organize for combat and to deploy. Therefore, seizure of southern Norway would enhance the Soviet submarines' ability to attack troops loading in US ports, facilitate air and submarine attacks on convoys (similar to the PQ convoy experience), and attack reinforcements at their European ports.[92]

An effective Norwegian response to such an attack is difficult to imagine. The mobilized forces fighting in the north would be engaged and outflanked, thereby unable to respond to threats in the south. Reservists in the process of mobilizing or enroute to their assigned battle areas would be vulnerable targets. Norwegian air and coastal defenses could be destroyed by submerged missile firing submarines, leaving the country's ports vulnerable to attack.[93] Under those conditions, whatever NATO reinforcements, if any, already in the country would be all that were available. Further reinforcement would be rendered impossible because of the threats to the ports. A benevolent Soviet occupation strategy would encourage the Norwegians not to accede to NATO counter measures which might be escalatory, such as missile strikes on Soviet forces or Soviet territory. Norway, then, would find itself isolated from the rest of NATO, and Western Europe would find itself isolated from North America.

A Soviet strategist planning any military operation would have to choose between these two attack options, or whether to invade Norway at all, based on his estimate of the US response. If the action contemplated will evoke no direct military response from the United States (such as the invasion of Afghanistan), no attack in Norway will be necessary. If the action contemplated could involve a direct confrontation with the US military (such as intervention in a future Mid-East war), a contingency for attack in North Norway must be planned for because the US/Soviet confrontation could escalate to a US strike on the Kola peninsula. If the anticipated US response is reinforcement or support of its forces in Europe (either an all out European attack or a localized Berlin-type crisis), planning would have to

include provision for the seizure of north and south Norway. Even in a short war, such sealift would be crucial to NATO's success. The SACEUR, General John Galvin, has articulated a requirement for 1,000 shiploads of reinforcement and resupply in the first 30 days of a European war.[94]

That Soviet strategists take these attack options seriously is indicated by continued construction of air bases, prestocking of supplies, and the improvement of road and rail links along the Kola peninsula from Leningrad to the Norwegian border.[95]

A Soviet strategic analysis would, of course, be complicated if measures could be taken to make Norway a less tempting target. Timely, resolute reinforcement of Norwegian standing forces, before the outbreak of hostilities, with combat capable, non provocative allied forces, could deter such an attack by making its success less likely. Here the choices available fall short. The ACE Mobile Force can be deployed quickly, and is a symbol of allied resolve, but its multinational composition renders its combat capabilities questionable. The UK/NL marine force is not as timely, but it would demonstrate resolve and is regarded as more combat capable. It only increases the standing force in North Norway by 5,000 troops, however, and once landed, lacks the mobility necessary to confront threats elsewhere in Norway. The US Marines are moderately timely and have a well demonstrated combat capability (although their winter warfare skills are disputed by some), but the Soviet perception of them as assault troops means their deployment could provoke, rather than deter, an attack. The CAST Brigade was non provocative and combat capable, but could not arrive quickly enough and was unlikely to make any difference in any Norwegian-scenario. The multi-national force being created to replace the CAST Brigade has yet to be tested, but its concept suggests it will be a watered-down ACE Mobile Force.

In the final analysis, what has prevented a Soviet attack on Norway is not the conventional deterrent of Norwegian or allied forces, but rather a clear understanding between the Soviets and the United States as to what response to military activity one can expect from the other. Whatever its shortcomings, the current world military situation seems to be stable in that regard, and one of the most important features is the balance that exists in Central Europe. Ironically, Norway, which prohibits nuclear weapons or foreign troops on its soil, is secure because of the nuclear weapons and foreign troops deployed in Germany.[96]

In this context, the Canadian decision to consolidate its ground force commitment in West Germany is logical. Rather than devote resources to a commitment unable to deploy in time to deter or defeat a Soviet attack, it made sense to contribute to the credible deterrent in West Germany, which was a much greater factor in deterring the Soviets from actions which would lead to a US/Soviet confrontation, and thereby did more for the viability of Norway, as well as for the rest of Canadian strategy, than did the commitment to Norway.

Underscoring the validity of the Canadian analysts was the experience of the 1986 exercise BRAVE LION. A large air and sea deployment of CAST Brigade elements to Norway, BRAVE LION demonstrated the combat capability of the forces deployed, but called into question the timeliness of the resources devoted to sealift and the ability of the military establishment to support the units deployed.[97] With the nation's resources devoted totally to the German commitment, the forces deployed there were to be expanded, modernized, and, in the words of General Paul D. Manson, Chief of the Defense Staff, "the ultimate result will be solid, militarily viable commitment to NATO's deterrent forces in Europe of which Canadians can be proud."[98]

Unfortunately, developments fell short of General Manson's hopes and of the promise of the 1987 White Paper. The two-brigade Canadian mechanized division in Germany, promised in the 1987 White Paper, has already been virtually emasculated by the Canadian government's refusal to procure modern main battle tanks for the combat units, and adequate strategic transport for the reinforcing units. In addition, the Canadian government has revealed no plan for the fielding of a division base, the combat support or service support elements to make it a viable, cohesive fighting force.[99] Without significant investment and modernization the contribution of this Canadian "demi-division" would be chiefly symbolic--its battle field capability would be insignificant.

Some Canadian analysts discount the importance of these diminishing military capabilities. As the current CDS, General John de Chastelain, put

it, "Numerically, our forces stationed in Europe are less significant than the political message of their being there. General de Chastelain continued that "[having Canadian troops in Europe] does work in our interest. It gets us seats that we would not otherwise be invited to."[100] The problem with that thinking is that at some point the deterioration of the Canadian ground force's capability will render it unable to play a realistically significant military role, and at that point the Canadian opinion on European security matters will carry no weight. The search for a meaningful mission, in line with Canada's resources, is essential for the pursuit of Canadian European security policy.

It would be unfair, however, to fault Canada for indecision in this period of rapidly changing security relationships. Conventional Forces in Europe (CFE) negotiations, combined with the stunning reforms in the Warsaw Pact countries pose urgent demands for operational analysis and force planning. While these changes are generally regarded as beneficial, it must be recognized that the break-up of the European alliance system takes with it most of the certainties of operational planning which have lent stability to crisis situations up until now. If a future Soviet government finds it necessary to resort to military force against a newly established democracy in Eastern Europe, for example, what would be the NATO response, especially considering that the area of conflict would not correlate with the security shares so clearly delineated today by the troop deployments of the opposing alliances? Could Western Europe or the United States stand by, especially if the new democracy thus threatened had put its faith in the collective security promises of the North Atlantic charter. It would be imprudent not to realize that possible outcomes of current trends include some which would make conflict more likely, which might require Soviet strategists to take actions in the absence of a clear understanding of the response of NATO or the US, and which could put Norway at risk.

From this analysis of the current military situation in Norway, the following insights are suggested:

- Norway's nonprovocative foreign and defense policies are inadequate to insure its security. In the final analysis, Norway's fate is inextricably bound to the strategies of the Soviet Union and the United States. In that sense, its dilemma is similar to that of World War II.

- A Soviet attack to seize the North Norwegian province of Finnmark, or to seize the entire country, could provide decisive military advantages. Without timely, combat capable reinforcement, the Norwegians could probably not defeat such an attack.

- There is no current credible allied deterrent force that could be dispatched to Norway in time to discourage such an attack. Further, the most combat capable reinforcement element, the USMC Expeditionary Brigade, may actually provoke, rather than deter, a Soviet attack.

- The general military situation, and in particular the balance in Europe, has been the main guarantor of Norway's security. Without that balance, security crises might be more likely to involve armed conflict, and thereby heighten the danger to Norway.

**A Projection: Norway's Strategic Situation in the 1990s and Beyond**

The advent of the 1990s promises to bring change of an unprecedented role in arms control, political pluralism, and technology. In general, these changes are viewed optimistically in the United States and Canada, but in truth it remains to be seen if their eventual outcome will bring more or less security and stability, especially in Europe.

Probably the most complicated of the arms control issues is the reduction of conventional forces in Europe. These complications derive from a number of factors--the geometrical asymmetries between NATO and the Warsaw Pact, the complications posed by reliance on non-similar weapons between the two blocs, the diplomatic inconsistencies typical of changing western governments, reluctance to permit intrusive verification mechanisms, and the diplomatic unknowns posed by the emerging self-expression of eastern governments, to name but a few. Nonetheless, conventional forces in Europe (CFE) agreements are closer to fruition than anyone could have possibly predicted in the pre-Gorbachev era, probably because of the improved political atmosphere and the generally recognized economic needs of all parties to reduce military expenditures.

The full scope and complexity of conventional arms control go well beyond the limits of this paper, but the proposed limits on so-called "stationed forces," i.e., those non-indigenous forces stationed in Germany, are relatively straightforward and relevant to the situation on the North Flank. NATO has proposed reduction on US and Soviet manpower to a level of 275,000 troops from each stationed outside its own territory, in Europe. For the US and USSR these reductions would remove 30,000 and 300,000 troops respectively. NATO has proposed similar limits on "stationed" tanks (32,000), artillery pieces (1,700), and armored troop carriers (6,000), which would require rather modest reductions from US forces in exchange for five-fold reductions from the Soviet Union.[101] Key negotiating points yet to be resolved include the Warsaw Treaty Organization's insistence that stored equipment be included in any limitations on "stationed" forces, and that the other nations which have "stationed" troops be included in addition to the United States.[102] As has been previously mentioned, this latter provision would require a total reduction of US, British, and Canadian troops on the order of 100,000.[103]

It is unlikely that NATO will readily accede to the WTO proposal on troop reductions without further concessions, but individual member countries will certainly consider being included in expanded manpower reductions in order to justify military cutbacks they hope to make for economic reasons,[104] despite the SACEUR's urgings to avoid cuts in military spending unassociated with CFE negotiations.[105]

More than any other single event, progress in conventional arms control was made possible because of President Gorbachev's unilateral military force withdrawals and reductions announced at the United Nations on 7 December 1988. Gorbachev said that by 1991 the Soviet armed forces would:

- withdraw six tank divisions from the GDR, Czechoslovakia, and Hungary and disband them.

- From the same countries, withdraw assault landing troops, assault crossing units, and several other offensive units.

- Reduce Soviet forces in these countries by 50,000 troops and 5,300 tanks.

- Reduce Soviet forces elsewhere in the Western Soviet Union by 10,000 tanks, 8,500 artillery systems, and 800 combat aircraft.

- Reorganize remaining Soviet forces in Eastern Europe into a clearly defensive structure.

- Reduce the overall size of Soviet forces by 500,000 troops, with reductions in the eastern USSR as well.[106]

In the Fall of 1988, Gorbachev announced reductions in the Soviet submarine fleet, to include a withdrawal of all SLBM submarines from the Baltic.[107]

The reductions Gorbachev proposed have greater symbolic than military significance. Most of the equipment (to include the submarines) proposed for elimination is obsolete. Many of the units to be mobilized are not high priority formations. Many, if not most, of the cuts were driven by economic weakness or by strategic changes (such as in the Baltic) which remove the rationale for researching military options no longer available.

What must not be overlooked is the relative capability of the Soviet armed forces after these reductions. No reductions have been proposed or discussed for the Northern Fleet.[108] Although the Soviets have proposed that the Arctic be converted into a nuclear free zone, they maintain the largest nuclear arsenal in the region and the only one with an offensive posture.[109] Their modernization programs proceed unhindered by reductions elsewhere. The TBLISI class carriers and AXULA class submarines, both apparently intended for the Northern Fleet, have already been discussed. The naval BLACKJACK bomber continues to be fielded and development continues on the look-down/shoot-down capability required in the MiG-35 to engage cruise missiles.[110] All these developments will, of course, be accompanied by the reorganization of a smaller but more combat capable Soviet army, with higher quality soldiers and less deadwood, supported by a stronger economy and a more legitimate political system.

A reduction in tactical nuclear weapons will likely follow close on the heels of any successful CFE agreement. The Warsaw Pact has already proposed such limitations to follow, or perhaps to be

contingent upon, CFE accords.[111] In the United States, the House Armed Services, Chairman Les Aspin has singled out short range nuclear artillery as "the most dangerous and destabilizing weapons." The pressure in a conflict is to "use them or loose them," implying they should be among the highest priority nuclear weapons to be eliminated.[112] Soviet analysts also favor nuclear artillery as the next class of weapons to be eliminated. Soviet arms control expert Vladimir Beronovsky told the American Association for the Advancement of Science that after a CFE agreement is reached "Nuclear artillery deserves special attention because it is integrated into the conventional forces and would start escalation."[113] Furthermore, the concept of employment for tactical nuclear weapons is no longer as politically valid as it once was. The longest ranged of the US systems, the Lance, would launch 1 to 10 kt warheads a distance of less than 150 km, meaning they would impact in East Germany, Czechoslovakia, or Hungary, countries no longer considered hostile in the West. Already the West Germans have expressed their opposition to the deployment of Lance II, and have indicated a desire to rid both Germanies of all nuclear weapons.[114] Ironically, this stance correlates with Warsaw Pact proposals for a nuclear free zone on either side of the former iron curtain, and casts doubts on NATO's ability to stand its ground against such a proposal in the face of the West German position. Such a removal of tactical nuclear weapons could remove a serious constraint on aggressive Soviet policies.[115]

In addition, although NATO has resisted Soviet pressure to include naval forces in CFE talks, the increased requirement for deployability inherent in the reduction of North American troops in Europe in the face of shrinking budgets will likely drive a shift in shipbuilding priorities toward troop transport, to the detriment of the US Navy's forward defensive strategies.[116] In effect, the CFE process imposes non-negotiated constraints on the US Navy's offensive capability while leaving the Northern Fleet unimpaired.

Complicating the security picture is the dramatic political change in Eastern Europe. Aspirant democracies are already being established in place of the communist regimes, looking for their support to the US, Canada, and Western Europe, rather than to the Soviet Union. Impatient with the Soviet troop withdrawal timetable, Czechoslovakia, Hungary, and Poland have called for the imminent withdrawal of all Soviet troops from their territory, and there are reasons to expect a similar East German demand in the near future.[117]

These developments cast doubt on the future of the Warsaw Pact. Although the Hungarian defense minister has suggested that the Pact continue as an alternative to an unordered security environment, prone to cause miscalculation,[118] it is certain that the nature of the Pact will change significantly. Most certainly, the new Eastern European government will not accede to a Warsaw Pact used as a rationale for Soviet troops to police them. Just as surely, the Soviet Union will not accede to a Warsaw Pact alliance which is hostile to it. Between those extremes, a number of alternative outcomes is possible, but it is probably reasonable to expect a series of declarations declaring friendship for the Soviet Union in exchange for Soviet guarantees not to interfere with Eastern Europe's ever-growing ties with the West. In this framework, it is entirely possible that Eastern European governments could conclude friendship treaties with the Soviets while simultaneously seeking security guarantees from Western Europe or the United States.

The impact of CFE reductions combined with the political transformation of Eastern Europe poses interesting problems for NATO. For the short term, CFE reductions will require no restructuring of NATO forces, but follow on reductions will eventually put greater requirements on rapid deployment and tactical maneuver than the currently fielded forces are capable of. Requirements for inspection, verification, and crisis response also call for lighter, more rapidly deployable forces, implying a need to restructure forces deployed to Europe.[119]

What should be of great concern is that the withdrawal of Soviet control sets loose a number of long standing European security issues suppressed since the end of World War II. Any one of these could lead to hostilities, and the greatest danger of all would be if these hostilities were to draw in superpower participation.[120] Here the strategist would have to deal with issues and regions for which the post World War II experiences have no precedent, and which fall outside the security spheres so clearly delineated by the current alliance system. Regardless of where the crisis occurs, superpower involvement could pose grave risks for Norway because of its proximity to the Kola Peninsula.

Further, with a reduced reliance on deployed forces and on tactical nuclear weapons, a European confrontation hinges to a greater degree on the ability to reinforce. For the United States, the currently accepted figure is 10 armored and mechanized divisions, with their supporting units, in the first 10 days of combat. This is an extraordinary requirement which can only be supported by sea lift--worse if stored equipment is included in CFE limits. Not only are US sea lift assets inadequate for the job, but also ports of embarkation and especially debarkation will be strained beyond their known limits.[121] Thus the reinforcement actions will present the Soviets with three lucrative sets of targets--congested embarkation ports on the US coast, the convoys themselves, and even more highly debarkation ports in Europe. Under these conditions, the timely arrival of a non-provocative, combat capable force to reinforce the standing forces in Norway might be a stabilizing factor, and should be considered a mobility requirement for a newly structured NATO force.

All of these events have left NATO in a state of confusion. The security situation emerging in the 1990s is one whose uncertainties are matched only by the period after World War II. One official commented that "It's the same kind of situation in that we are planning for completely new circumstances. We can make lots of mistakes that will haunt us 20 years from now."[122] NATO's defense ministers have tried to keep the alliance coherent, calling for a continuation of programmed defense improvements and for restraint on the part of member countries to effect unilateral cuts for economic gain outside of the CFE process.

The Canadian government's position has complied with that recommended by the NATO defense ministers. In his year end television interview, Prime Minister Mulroney said that a unilateral Canadian withdrawal would be "a fundamentally destabilizing initiative given the convulsive political changes" in Eastern Europe.[123] Critics of Canadian defense policy, however, have pressured the government for a reduced commitment. Retired Canadian Admiral Robert Falls, former representative to NATO and current president of the think tank Arms Control Center, called for a restructuring of Canadian forces "in the face of the inevitability of a withdrawal of Canadian ground forces from Europe."[124] Bernard Wood, director of the Canadian Institute for Peace and Security, opined that "The international climate now permits more effective influence for Canada (but) will also demand changes in the way we see and conduct ourselves in the world." Mr. Wood continued to call for consideration of the withdrawal of some Canadian forces from Europe, and increased defense researching of domestic priorities, such as control of fisheries, pollution, drug interdiction, and greater support to UN peacekeeping initiatives.[125] Perhaps the most strident spokesman for Canadian withdrawal from Europe is retired Major General L. V. Johnson, ex-commandant of the National Defence College and a current leader of the New Democratic Party, who wrote that "It is hard to demonstrate that Canada has benefited from NATO," and continued that "the costs involve the foregone opportunity to maintain surveillance and control of national territory without subordination to the US."[126] John Marteinsen, editor of the *Canadian Defence Quarterly,* proposed an abandonment of the European role and consolidation in the defense of Iceland.[127]

Within the Canadian polity, latest polls indicate a decline in support for military commitments in Europe. Although a recent opinion poll concluded that Canadians overwhelmingly support the concept of NATO (80 percent favorable response), very few Canadians think the country's most serious threats are military (65 percent of respondents), with greater concern expressed over environmental (65.8 percent) and economic (28.3 percent).[128] These indications of public opinion have prevented the government from spending the money necessary for a viable, effective military force in Europe.

The result has been an embarrassing display of governmental indecision and military "rust out." The bold proposals of the 1987 White Paper for nuclear submarines, upgraded tanks, and new airborne surveillance aircraft, have all been cancelled or put on hold. Other programs severely curtailed in the budget process were the acquisition of CF-18 aircraft and ASW equipped frigates.[129]

Of course, the Canadians are not alone in their uncertain defense policies in the face of current political developments. In the United States, debates continue over the proper roles and force levels for naval and army forces. Unlike Canada, however, recent US military activities give it a better insight into the overall deployment and combat capabilities

the new century will demand. It would seem only logical, then, that a bilateral approach might go a long way toward defining more viable roles for all North American forces in European security.

While forecasting the impact that recent events will have in the 1990s and beyond is not without risk, the following insights suggest themselves apropos of this study:

- Norwegian security policies are unlikely to change appreciably in the near term.

- None of the arms control agreements being negotiated will result in meaningful reductions in Soviet strength in the Kola Peninsula. In fact, technological developments indicate the Kola-based forces will be an even greater factor in Soviet security, thereby increasing the danger for Norway.

- CFE troop reductions will lead to greater requirements for light, highly mobile forces, structured for operational and strategic level deployments.

- Resources devoted to US and Canadian defense will be reduced.

- The new structure of Central Europe will pose risks and uncertainties which could increase the danger of regional conflict and superpower miscalculation.

**Remedies--North American Contributions to Northern Security**

At the meeting of NATO and Warsaw Pact military chiefs held in Vienna in January 1990, the Canadian Chief of the Defense Staff, Gen. Chastelain, called for a security structure for Canada and its allies "by achieving strategic stability and a military balance between East and West, at the lowest possible level of the two forces."[130] If the collective security provisions of the North Atlantic Treaty are to remain viable, and even more if the new Eastern European democracies are to be covered by those provisions, then the reduced numbers of troops and weapons call for increased reliance on strategic deployability and tactical maneuverability than the current armored/mechanized forces can provide.

In the US Army, ground force modernization plans are oriented around the Light Infantry Division, the most readily deployable to US Army formations. Developed in response to non-European contingencies these units were conceived by the army staff as completely deployable in 400-500 loads of a C-141 transport aircraft.[131] Not only are these units rapidly deployable -- as has been demonstrated in operational deployments to Central America -- but their formidable helicopter assets give them a tactical mobility which could be of decisive importance. The US Army's Light Force Modernization Plan, due to be completed by January 1991, will include provisions for light tanks, anti-aircraft weapons, helicopters and artillery to improve the capability of the light division in a European scenario.[132]

Politically, however, the deployment of US ground forces carries with it certain problems regardless of their tactical abilities, for they would immediately raise any crisis to the level of superpower involvement, which might have a counterproductive effect. The deployment of light infantry forces from smaller powers would be much more useful in such circumstance, for their arrival would communicate much more clearly an intent of restraint rather than of escalation.

Although a sharing of defense burdens is implicit in the North Atlantic charter, and although multinational combat formations such as the ACE Mobile Force have a utility in demonstrating resolve, a true combat capability will more likely derive from the formation of national rapid deployment brigades in selected NATO countries, supported by others to contribute transport and logistical support. The US light infantry forces will still have a reinforcing role, in the event a crisis exceeds the capability of the forces engaged, but they would not in all likelihood be the force of first choice for immediate deployment.

Nor should NATO expect the development of these rapidly deployable brigades from all its member countries. Turkey, West Germany, and Norway still form the front line of Western security, and would be threatened by their proximity to hostility in Eastern Europe. Events in Yugoslavia and Bulgaria could put Italy and Greece into the front-line category as well. It would probably not be realistic to require rapidly deployable forces from these countries, since they are likely to be the countries that require reinforcement or that will be identified with

one of the factions in a crisis. West Germany is further disqualified by the possibility of unification. The confidence-building required in East and West for the acceptance of a unified Germany would not be enhanced by a deployment of German troops elsewhere in Europe.

More realistic would be the development of these rapidly deployable formations in the NATO countries not in the direct line of confrontation, to include Canada. Further, efficiency and consistency with other national defense priorities would be served if the participating countries' rapid deployment brigades were oriented to respond to a specified region. Canada's geography, previous experience, and stated concern for the security of the Arctic would favor an orientation toward the Baltic and Norway. Analogous factors would favor a Balkan and Mediterranean orientation for countries like Spain, France, and (perhaps) Italy. Basing alternatives for such Canadian forces would pose some problem, but the withdrawal of US forces from Northern Germany should open up some basing options, and the possibility of being in Scotland has been suggested.[133] Either choice would facilitate deployment to Norway or the Baltic. Prepositioning of heavy equipment in Norway, resourced as a part of an overall NATO initiative to enhance crisis response capabilities, would further facilitate deployment.

As far as Canada is concerned, the light infantry structure has a number of other features which should be attractive. They can be fielded more cheaply than armored or mechanized infantry divisions. Their inherent mobility and flexibility would provide the Canadian government a much greater range of employment options such as sovereignty and environmental objectives, sure to be a part of future missions for the Canadian Forces. And if these forces were designed specific with regional operations in mind, they would be much more convergent with other broad Canadian strategic goals, in addition to maintaining their NATO reinforcement commitment. These advantages have resulted in a proposal within the Canadian sector to convert the Brigade in Germany to a light infantry structure.[134]

Recent articles in the Canadian press have decried the under funding of Canadian Forces peacekeeping contingents. Peacekeeping is a stated objective in Canadian defense policy, inadequate funds are being allocated to it, both from the UN and internally within Canada.[135] The military demands on peacekeeping forces grow in the face of an ever more sophisticated threat. Alex Morrison, director of the Canadian Institute for Strategic Studies, has cited requirements for upgraded electro-optical equipment, helicopters, light tactical vehicles, and tactical air transport (C-130 Hercules).[136] These items are inherent in a force structure oriented around light infantry, but would be curtailed if the Canadians were to continue a heavy armored force development.

Other advantages to Canada's forces become apparent when bilateral US-Canadian relations are considered. Two of the U.S. light infantry divisions, the 6th and the 10th divisions, are located close to Canada, in Alaska and Northern New York respectively,[137] the opportunities for mutual training benefits are obvious. Canadian units training with New York or Alaska based units could provide U.S. forces with valuable insights on effective operations in cold weather, and could also provide significant items of equipment which would increase effectiveness and interoperability. In return, Canada's forces could learn important lessons in deployability from their U.S. counterparts.

Another feature of these two U.S. divisions which could be attractive to Canadian Forces is their relationship with the U.S. Army's reserve components.[138] Both the 6th and 10th divisions consist of two active brigades "rounded out" by brigades coming from the national guard, brigades which must maintain a readiness standard facilitating deployment and combat operations with their active duty counterparts. The U.S. Army's lessons learned in these areas cannot help but provide insight to the Canadians on their stated objective of revitalizing their reserve forces.[139] Interestingly, some of the national guard units with contact with the Alaska based division are battalions of the Alaska scouts, made up of native Alaskans who patrol the American Arctic. The American experience with these troops might provide the Canadians with insights into the employment of native forces into their reserves, which could in turn provide security and surveillance for key facilities in the Canadian Arctic.[140]

Even without a commitment to Norway, it is possible to conceive of mutual benefits deriving from a bilateral relationship among Northern based light infantry units. Although the ground defense of North

America has not been a high priority in either country, the threat nonetheless exists of airborne amphibious, or special operations actions against key installations associated with NORAD and with the Canadian-American industrial infrastructure, e.g., oil pipelines or chokepoints along the St. Lawrence Seaway. Close bilateral relations at the tactical level, combined with Canadian-American training and exercises, would greatly enhance the North American ability to react to such threats.

Obviously, however, the development of readily deployable ground forces is a futile effort without the means to deploy them. Here especially a collective effort would seem to offer the promise of maximum efficiency. Withdrawals of U.S. forces from Europe would double the current requirement for the U.S. military to deploy forces in the event of European hostilities, so at first glance it might seem that the U.S. is not in a good position to take on the additional deployment burden which assistance to the Canadians would pose. But a closer look reveals a somewhat different picture.

U.S. forces going to the European central region are primarily heavy forces, i.e., armored and mechanized divisions. The numbers and types of heavy equipment in these units means they must rely to a great degree on sea transport, and that the pace at which they can be deployed to the battlefield is a direct function of how quickly those heavy items can be transported across the Atlantic to ports in Europe and then overland to the battlefield. Quite realistically, sea transport to deploy forces elsewhere in Europe threatens to overload the system to a degree that would make the original CAST Brigade concept problematical.

With air transport, however, the story is somewhat different. Using the air transport assets of the U.S. Military Airlift Command and the civilian aircraft of the U.S. Air Reserve Fleet, the U.S. air transport situation is a much more successful one than is the sea transport situation.[141] Moreover, the quick turn around time of these assets combined with the tactical air transport capabilities normally associated with these types of deployments means that debarkation airfields can maintain a much more rapid throughput of incoming troops than would be the case with seaports. As a result, not only are the troops deployed into combat zones more quickly, but the transport aircraft are also released for other missions more quickly. In general, the air transport system can absorb the requirement to deploy more troops than can the sea transport system, if in fact the deployable forces are configured so as to be air deployable. It would seem only prudent to design Canadian forces to exploit that capability. As stated earlier, of course, heavy items can be pre-positioned to obviate the need for their transport.

This would not, of course, be the first bilateral U.S.-Canadian requirement to deploy troops to Europe. Similar requirements existed during World War II, and were solved by coordination through the Permanent Joint Board on Defense. What this paper proposes is that similar coordination be effected to determine the optimum troop deployment requirement -- U.S. Army, USMC, and Canadian Forces -- and then develop bilateral deployment plans, using pooled air transport assets, to meet those requirements. From those arrangements will derive appropriate bilateral command and control arrangements, training and exercise opportunities, and a demonstration of a truly North American commitment to the defense of NATO's northern flank.

Could the United States do all this unilaterally, without Canadian participation? Would such a unilateral response be quicker or more effective? The U.S. Army has already fielded light infantry divisions which could be deployed, and the Norwegian defense role abandoned by Canada would be one they could reasonably be expected to do well. But the Canadian contribution would be an extremely valuable one nonetheless. Two well trained, well disciplined infantry brigades would be a welcome addition to any such plan, and would in fact constitute a larger element of a North American reinforcement to Norway, as compared to a much smaller relative commitment to Germany. With a completely non-nuclear military, the Canadians would not be seen as posing an offensive threat to the Soviets in the Kola Peninsula, and would be politically acceptable to the Norwegians. In fact, the presence of Canadian forces and their representation in a Norwegian defense high command could go a long way toward easing Norwegian concerns about an increased U.S. presence.

It is also significant that the northern light infantry concept could provide advantages to Canada's defense industry, by providing a greater US market for deployable winter terrain capable equipment.

The final area to be considered on the Norwegian strategic situation is command and control. Separated from the central region, the Norwegian operational theater requires its own characteristic command structure, independent of that found in the central region. That command structure must facilitate the tactical control of the units deployed in Norway and simultaneously provide synchronization with the efforts of SACLANT to secure NATO's sea lanes.

The tactical requirement calls for a combined headquarters with clear lines of command of all allied units once they are committed to the combat zone. Like in the Central Region, that headquarters must clearly define the missions assigned to each of the ground and air elements in Norway and specify the time or conditions those reinforcing units come under allied command. BRAVE LION suggested that certain aspects of that relationship are not clearly understood but with planning and practice those misunderstandings are well within everyone's capability to rectify.

Unlike forces in the central region, however, the requirement to coordinate ground combat operations in Norway with naval operations in the Norwegian and North Seas require the forces employed there to synchronize their activities with those of another major NATO commander, SACLANT. For that reason, this may be the appropriate time to alter the combat boundaries assigned to NATO's major commanders and transfer responsibility for Norway's defence from SACEUR to SACLANT. When NATO was formed, and the Soviet Navy was only a coastal defense force, the inclusion of Norway in ACE was logical -- the country is a part of the European land mass.

But today, from a geopolitical or a strategic point of view, Norway more resembles an island, connected to the Soviet Union by a causeway, which dominates the eastern flank of the main avenue of approach of the Soviet Navy into open waters. The time has come to consider a transfer of responsibility for the defense of that island to the commander to whom it has the most significance, i.e., to the commander charged with control of that avenue of approach -- SACLANT. Since SACLANT is located in Norfolk, VA, and since SACLANT is also the Canadian maritime command's entry into the NATO command structure, such a streamlining in command would also simplify Canada's relationship to NATO's military structure and enhance the joint forces employment of the Canadian Forces.

Though impossible to predict with absolute certainty, current developments suggest the following defense initiatives for Canada.

- Current military structures will eventually be inappropriate to European security, and for that reason no government will be able to justify their expense. New kinds of forces will have to be fielded.

- Reduced force levels and possible expended areas of security concern demand lighter, more mobile forces to respond to crises. Further, isolated regional crises will respond more positively to deployments of forces from middle powers than forces from superpowers.

- The United States has initiated studies for conversion of large elements of its force structure into readily deployable units with robust European combat capabilities. Efficiency would dictate that Canada (and other countries) collaborate with the US to develop an effective, affordable combat capability.

- Strategic and intratheater transport resources should be pooled to efficiently support the rapidly deployable forces fielded.

- Command and control relationships should be revisited in light of new European security realities, as both the tactical level (within Northern European Command) and the strategic level (possible realignment of Norwegian security responsibilities to ACLANT).

## VI CONCLUSION

The strategic impact of the current developments in Europe probably have lowered the risk of war considerably at least for the next few years. NATO should use that respite to re-evaluate its military vulnerabilities to determine where and how to readjust the efforts of its member countries most efficiently in response to the new threats posed by a smaller but higher quality Soviet ground force supported by a larger and capable Soviet navy, and to develop strategic concepts to respond to crises likely to arise from the new political imperatives in Eastern Europe. Canada's decision to drop the CAST

commitment and keep the deployment in Germany may have been appropriate for the 1987 threat scenario in which it was decided, but Norway's military importance in the 1990s and beyond, combined with the reality of Canadian policy and the impact of arms control, make it inappropriate for the out years. Now is the time to abandon the preoccupation with outdated strategies and think for the future. At the same time, however, all NATO's members must remain committed to the integrity of the Alliance. Among NATO's allies none has as long and distinguished a tradition of bilateral allied commitments than the U.S. and Canada. In this case, too, that tradition should be continued to ensure that European confidence in North America's will and ability to come to its aid when required is never shaken.

**Notes**

1. Canada, Department of National Defence, *Challenge and Commitment: A Defence Policy for Canada* (Ottawa: Minister of Supply and Services, 1987), pp. 60-63. (Hereafter cited as DND *Challenge and Commitment.)*

2. Ibid., p. 63.

3. Joel J. Sokolsky, *Defending Canada, US-Canadian Defense Policies* (New York: Priority Press Publications, 1989): 50-51. See also George Lindsey, "Strategic Stability in the Arctic," *Adelphi Papers 241* (London: Brassey's for the IISS, Summer, 1989), p. 49.

4. Sokolsky, *Defending Canada, US-Canadian Defense Policies,* p. 50. See also Danford W. Middlemiss and Joel J. Sokolsky, *Canadian Defence, Decisions and Determinants* (Toronto: Harcourt Brace Jovanovich 1989), p. 192.

5. *The Military Balance 1988-1989* (London: IISS, 1988), p. 55. See also Johanne Di Donato, et al, *The Guide to Canadian Policies on Arms Control and Disarmament, Defence and Conflict Resolution* (Ottawa: Canadian Institute for International Peace and Security, October 1989), p. 238.

6. DND, *Challenge and Commitment,* pp. 50-55.

7. CFE troop reduction proposals will be discussed in greater detail in section III of this paper.

8. These geographical demographic and political data are extracted from Armed Forces Staff College publication 2C10, *NATO Combined Operations* Vol. II, chap. III, part I (Norfolk: National Defense University/Armed Forces Staff College, May 1989) pp. III-1 - III-33. Hereafter this work will be cited as *AFC pub 2C10.*

9. Earl F. Ziemke, *The German Northern Theater of Operations* - Department of the Army Pamphlet No. 20-271 Washington, D.C.: US Government Printing Office, 1959), p. 6.

10. B.G. V Esposito, *The West Point Atlas of American Wars* vol. II, section 2 (New York: Praeger Publishers, 1964), p. 11.

11. *Ibid.* See also B.H. Liddel Hart, *History of the Second World War* (New York: G.P. Putnam's Sons, 1970), p. 56.

12. Ziemke, *The German Northern Theater of Operations*, pp. 14-15.

13. *Ibid.,* pp. 21-22.

14. *Ibid.,* p. 39.

15. *Ibid.,* p. 28.

16. *Ibid.,* p. 43.

17. *Ibid.,* pp. 7-10. See also Liddel Hart, *History of the Second World War,* pp. 54-56, where it is argued that Hitler felt he had insufficient time to wait for Quisling's subversion of the established government.

18. Liddel Hart, *History of the Second World War,* pp. 51-52.

19. Ziemke, *The German Northern Theater of Operations,* pp. 26-30.

20. Liddel Hart, *History of the Second World War,* p. 59 is the source for German strength; Ziemke, *The German Northern Theater of Operations,* pp. 44, 53, 107 for British strength. The two sources differ on some details.

21. Liddel Hart, *History of the Second World War,* p. 59.

22. *Ibid.*, p. 59.

23. Ziemke, *The German Northern Theater of Operations*, p. 37. Liddel Hart, *History of the Second World War*, p. 59 differs in some details.

24. Ziemke, *The German Northern Theater of Operations*, p. 109.

25. *Ibid.*, pp. 40-52.

26. Liddel Hart, *History of the Second World War*, p.60.

27. Ziemke, *The German Northern Theater of Operations*, pp. 65-80.

28. Esposito, *The West Point Atlas of American Wars* vol. II, sec. 2, p. llb.

29. Ziemke, *The German Northern Theater of Operations*, pp. 77-81.

30. *Ibid.*, pp. 87-108.

31. *Ibid.*, pp. 315-17.

32. This account of operations against the Arctic (PQ) convoys is from Ziomke, *The German Northern Theater of Operations*, pp. 235-241.

33. *The Military Balance 1989-1990*, (London: IISS, 1989), pp. 71-72.

34. AFSC Pub 2C10, pp. III-9-III-10.

35. *Ibid.*, pp. III-10-III-ll.

36. *Ibid.*, p. III-ll.

37. *The Military Balance 1989-1990*, p. 72.

38. AFSC Pub 2C10, pp. III-ll-III-12.

39. *Ibid.*, pp. III-12-III-130

40. *Ibid.*, pp. II-l-II-ll.

41. *Ibid.*

42. *Ibid.*

43. The North Atlantic Treaty Organization Facts and Figures (Brussels: NATO Information Service, 1987), pp. 107-109.

44. Frank Benchley, *Norway and Her Soviet Neighbor: NATO's Arctic Frontier* (London: Institute for the Study of Conflict, 1982).

4.5 Thomas Ries, "Finland's Armed Forces -- Isolated but Unbowed, (*International Defense Review*, 24 March).

4.6 AFSC Pub 2C10, p. III-62.

47. *Ibid.*

48. *Ibid.*, p. III-59.

49. *Ibid.*

50. *The Military Balance 1989-1990*, pp. 86-87.

51. James Ries, "Finland's Armed Forces."

52. *The Military Balance 1989-1990*, pp. 88-89.

53. Tomas Ries, "Combined Operations--The Swedish Approach to Defense, (*International Defense Review*, April 1983). See also M. G. Bowman, C. Richard, "Soviet Options on NATO's Northern Flank," (*Armed Forces Journal International*, April 1984).

54. Joseph Jockel, *Canada and NATO's Northern Flank* (Toronto: Centre for International and Strategic Studies, 1986), p. 13. See also Lindsey, *Strategic Stability* in the Arctic, DD. 64-65.

55. Jockel, *Canada and NATO's Northern Flank*, p. 13.

56. Benchley, *Norway and Her Soviet Neiqhbor.*

57.

58. James Ries, "Defending the Far North," (*International Defense Review*, vol. 17, no. 7, 1984), pp. 873-880.

59. *The Military Balance 1989-1990*, p. 38.

60. *Ibid.*, p. 31. See also "Soviets Testing Aircraft Carrier, Sources Say," *Globe and Mail,* 14 December 1989, p. A22.

61. *Ibid.*, p. 38.

62. *Ibid.*

63. Ries, "Defending the Far North, p. 876.

64. *Ibid.*

65. *Military Balance 1989-1990,* p. 38, and Ries, "Defending the Far North," p. 878.

66. "Kola Unveiled" (Jane's Defense Weekly, 13 September 1986, v. 6 no. 10), pp. 538-540.

67. *The Military Balance 1989-1990*, p. 38.

68. Ries, "Defending the Far North," pp. 878-879.

69. "Kola Unveiled," *Janes Defense Weekly,* 13 September 1986, pp. 538-540.

70. AFSC Pub 2C10, V-2-V-4.

71. Ries, "Defending the Far North," p. 879.

72. *Ibid.*

73. *Ibid.* See also Gen. P. X. Kelly and Maj. Hugh K. O'Donnell, *The Amphibious Warfare Strategy* (U.S. Naval Institute, January 1986), p. 3. For a discussion of USMC attempts to raise the priority of cold weather training, see Maj. Thomas S. Jones, "Cold Weather Training Takes Priority," printed in the *Marine Corps Gazette* vol. 68, no. 12, pp. 28-52. In fairness to the U.S. Marine Corps, honest efforts have been made to improve in this area.

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75. J. J. Holst, *The Nordic Balance and the Northern Flank: Norwegian Perspective* (Norsk Utenriskspolitisk Institut, November 1983), p. 9.

76. Major T.C. Linn, USMC, "Soviet Perceptions of the US Marine Corps (*Amphibious Warfare Review,* Fall 1989), p. 7.

77. Johanne D. Donato, et al., *The Guide to Canadian Policies on Arms Control, Disarmament, Defence and Conflict Resolution,* Canadian Institute for International Peace and Security, October 1989, p. 138.

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81. Robbin F. Laird and Dale R. Harspring, *The Soviet Union and Strategic Arms* (Boulder and London: Westview Press, 1984), p. 42.

82. *Ibid.*, pp. 40-41.

83. *Ibid.*, p. 42. See also Ries, "Defending the Far North," p. 874.

84. *Ibid.*, p. 875. Other more up-to-date warnings of the impact of reduced resources devoted to US Navy combatant warships are cited by David Evans, "Budget, Troop Cuts May Re-vamp Military," Chicago Tribune, 23 June 1989), and Stephen J. Shaw, "In Harms Way," (*Defense World* August/September 1989), p. 60.

85. LtCol Douglas C. MacCaskill, "Norway's Strategic Importance," *Marine Corps Gazette,* February 1981, pp. 29-31. See also Maj. Gen (Ret)

Richard C. Bowman, "Soviet Options on NATO's Northern Flank," *Armed Forces Journal,* April 1984, pp. 88-92.

86. Richard C. Bowman, "Soviet Options on NATO's Northern Flank," p. 92

87. Douglas C. MacCaskill, "Norway's Strategic Importance," p. 30.

88. *Ibid.*, p. 31.

89. Richard C. Bowman, "Soviet Options on NATO's Northern Flank, p. 92.

90. "Soviets Testing Aircraft Carrier, Sources Say," *Globe and Mail,* 14 December 1989, p. A22.

91. Richard C. Bowman, "Soviet Options on NATO's Northern Flank," p. 70.

92. Jon Kaskin, Director of the Strategic Sealift Division, US Naval Staff (OP-42), in an information briefing entitled "Strategic Sealift.

93. Hans C. Erlandsen,"USSR Modernizes Northern Fleet with Addition of Akula-class Sub," (*Defense News,* 2 October 1989), p. 16. The Akula fires the SSN21 cruise missile, which can be launched from torpedo tubes while submerged, with either nuclear or conventional warheads capable of destroying Norwegian coastal batteries.

94. Harold Briley, "Soviets will conditionally Scrap Subs," (*Defense News,* 16 October 1989), p. 14.

95. Ries, "Defending the Far North," p. 877.

96. Brenchley, *Norway and Her Soviet Neighbor: NATO's Arctic Frontier.*

97. Jockel, *Canada and NATO's Northern Flank*, pp. 39-41.

98. General Paul D. Manson, "Consolidation in Europe: Implementing the White Paper," *Canadian Defence Quarterly,* February 1988, pp. 21-30.

99. Harriet W. Critchley, "Does Canada Have a Defence Policy," *Canadian Defence Quarterly,* October 1989, pp. 7-14.

100. "Defense Chief Questions Canada's Value to NATO," *Whig Standard,* 18 January 1990, p. 7.

101. LTC David E. Shaver, et al., *On Disarmament: The Role of Conventional Arms Control in National Security Strategy* (Carlisle Barracks, PA: Strategic Studies Institute, 1989), pp. 89-90.

102. *Ibid.*

103. *The Military Balance 1989-1990* gives the following figures for stationed forces in Europe: The US - 326,400 (p. 24), Belgium - 26,600 (in the FRG) (p. 56), Canada - 7,100 (p. 57), France - 52,700 (in the FRG) (p. 62), The Netherlands - 5,700 (in the FRG) (p. 71), The UK - 69,700 (in the FRG) (p. 82).

104. Shaver, *On Disarmament: The Role of Convetional Arms Control in National Security Strategy,* p. 89.

105. Therese Hitchens, "Galvin Warns Against Jumping Gun in Trimming European Budgets," *Defense News,* 7 August, 1989, p. 3.

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108. Shaver, *On Disarmament: The Role of Conventional Arms Control in National Security Strategy,* p. 48 describes the Soviet negotiating position that reduction of US naval forces may be a bargaining chip that NATO must concede in order to win Warsaw Pact reductions in air and land forces. Symmetrical naval reductions have yet to be discussed. *The Military Balance 1989-1990,* p. 31, documents improvements in Soviet naval quality.

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110. James J. Coghlon Jr., "Soviet Air Forces: The Fighters," *Defense Electronics* October 1989): 90-96. Also, see *Soviet Military Power,* pp. 50--53 and 97.

111. Shaver, *On Disarmament: The Role of Conventional Arms Control in National Security Strategy,* p. 109 cites the expectation that the Warsaw Pact will propose serious short range nuclear force reductions upon completion of CFE agreements, or perhaps as a condition on which CFE agreements will be contingent.

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120. Charles Krauthammer, "Two World Wars Later, the Questions for Central Europe are Again the Same," *Philadelphia Inquirer,* 21 November 1989, p. 18.

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124. "Get Ready to Cut NATO Commitment, PM Urged," *The Montreal Gazette,* 4 December 1989, p. B-l.

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128. Jeffery Simpson, "Canadians and the Cold War," *Globe and Mail,* 5 December 1989, p. 6.

129. Critchley, "Does Canada Have a Defence Policy," p. 10. See also *Canada's Land Forces,* pp. 4:152-54.

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132. Calab Beker, "Army Proposal Outlines More Mobile, Flexible Force," *Defense News,* 11 December 1989, p. 4.

133. By Nils Orvik of Queen's University, cited in Jockel, *Canada and NATO's Northern Flank,* pp. 42-43.

134. Special Committee of the (Canadian) Senate on National Defence, *Canada's Land Forces,* 31 October 1989, pp. 4:146, 4:150.

135. Paul Koring, "Keeping the Peace, a Logistical Night Mare," *Globe and Mail,* 10 October 1989, p. 5.

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137. *1989-1990 Green Book* (Arlington , VA: Association of the US Army, October 1989), pp. 203-207.

138. "Divisons of the US Army," (Arlington, VA: Association of the US Army). The composition of the prototype Light Infantry Division and the actual organization of the 6th and 10th Divisions is as follows:

| **Prototype** | **6th Division (Active/NG or Reserve)** | **10th Division (Active/NG)** |
|---|---|---|
| Div HQ | Div HQ | Div HQ |
| 3 Bde HQ | 2/1 | 2/1 |
| 9 Inf Bns | 4/3 | 6/3 |
| Div Arty HQ | Div Arty HQ (not activated) | Div Arty HQ |
| 4 Arty Bns | 2/1 | 3/1 |
| Div Aviation HQ | Div Aviation HQ | Div Aviation HQ |
| 3 Hel Bns | 2 Hel Bns/0 | 3 Hel Bns/0 |
| Div Spt Cmd | Div Spt Cmd | Div Spt Cmd |
| 9 Spt Bns7/2 7/1 | | |

139 *Canada's Land Forces,* pp. 4:126-138.

140 See "The Power Projection Shortfall," already cited. Presently the air deployment assets of the United States can provide 45.4 million ton-miles per day of airlift, short of the 66 million ton-mile per day requirement, but much closer to sufficiency than the shortfall in sealift. Further, with the introduction ofnew assets, especially the C-17 and other civil aircraft, the shortfall in airlift should be significantly reduced or eliminated.

141 Ken Romain,"Timely Canadian Order Kept LAV Lines Rolling," *Globe and Mail,* 20 October 1989, p. 5.

# COMMAND AND CONTROL IN THE RAND STRATEGY ASSESSMENT SYSTEM

**Dr Paul K. Davis**
**Robert Howe**
**The RAND Corporation**

## 1. BACKGROUND

### 1.1 On the Dominating Influence of the Strategy Variable

In previous work the authors have written about the importance of *multiscenario analysis*, by which is meant examining a broad range of cases in considering issues such as the military balance, possible improvement measures, and arms control [1.1]. It is useful to think of the variables defining cases as lying along four dimensions: (1) political-military scenario, (2) strategy and tactics, (3) force structure, and (4) technical factors. Although the vast majority of defense analysis dwells on issues of force structure (e.g., the relative incremental benefits of buying weapon-system A vs weapon-system B), one gets a very different sense of priorities when looking at historical experience. As some examples here, consider:

- The role of operational surprise and combined-arms operations in the Fall of France in 1940, Operation Barbarossa, the Japanese Pacific campaign against the U.S. that began with Pearl Harbor, the Normandy invasion, the Soviet Manchurian operation against the Japanese late in WW II, and MacArthur's amphibious landing at Inchon in the Korean war.[1]

- The role of operational maneuver by Lee and Jackson in providing the Confederacy its early campaign victories in the US Civil War and later the maneuver of Grant and Sherman in determining the ultimate outcome of that war.

- The role of operational-strategic maneuver in successful Soviet Eastern Front operations in WW II[2] and the role of political level constraints (Hitler's operational and strategic-level decisions) in making the Soviet breakthrough operations feasible.

- The role of detailed operational planning and training, coupled with operational surprise, in the successful Egyptian Suez crossing operation against Israel in 1973.

- The role of tactical and operational-level maneuver in consistently giving the Israelis a 2:1 superiority in effectiveness against Arab armies.

- The spectacular role of command and control in dominating results of the air war between Israel and Lebanon.

In a similar vein, those familiar with theater-level balance assessments are sensitively aware of how dominant the role of political-military scenario can be, and that political-military scenario should not be thought of as an exogenous variable but, to a large extent, a consequence of the attacker's war strategy. As examples of how pol-mil strategy has mattered in the Central Region (using examples from Davis [1.1] and [1.4]) that predate the fundamental changes that occurred in Europe during 1989):

- NATO has had *qualitatively* different challenges in preparing for Central Region conflicts involving minimal, short, medium, and long mobilizations by NATO. At the same time, a Pact planner contemplating associated strategies would have difficult tradeoffs in terms of balancing attacking before NATO was prepared against attacking with fewer of his own forces prepared.

- The most serious problems for NATO in the event of a Central Region conflict in recent years would probably have been: (a) maldeployment, (b) rigidity of command-control, and (c) likely raggedness of mobilization--not force levels or the quality of those forces.

In thinking about such issues and the limited attention they have received, some of us have been struck by the aptness of two claims that seem to

characterize differences between US and Soviet planning styles that should strike us as worrisome:

- NATO plays checkers; the Soviets play chess.

- In NATO planning, command and control is a subordinate and "technical" issue; in Soviet planning, command and control is part of the essence.

Although the threat of a monolithic Pact attack on the Central Region no longer seems credible, the appropriateness of raising the visibility of the strategy variable remains as high as ever as we begin to contemplate the military challenges of future decades. Indeed, as we contemplate a range of nonstandard "contingencies" worldwide, we should be careful not to conceive and evaluate strategies as though we contemplated a large-scale armored slugfest as envisioned in pure attrition models. Had the British envisioned attrition warfare, the Falkland Islands campaign would never have been undertaken.

### 1.2 The Nonrepresentation of Strategy in Usual Analysis

In traditional military models the concept of operational strategy is *implicit* rather than explicit. Even when the word "strategy" appears in such models, it usually applies to something more narrow and technical than what a military strategist or historian would have in mind.[3] Further, in typical studies the employment of forces in a simulated campaign is determined in advance as input data--i.e., force employment *is scripted*, even though competent real-world commanders would adapt their strategy as the campaign developed.[4] Analysts have sought to mitigate this problem by iteratively changing the data base until the force employment throughout the simulated baseline campaign appears reasonable, but even this procedure has a fatal flaw when excursions are then run to compare the relative value of alternative force modernization packages, arms control limitations, etc. In such comparisons strategy is typically held constant, even though in the real world it would adapt to the new capabilities. This problem is real and serious and has led to wrong conclusions in a number of studies with which we are familiar.[5] Comparably serious has been the longstanding tendency in studies, and even in operations planning, to avoid fully facing up to the complications of joint and combined-arms planning in a politically constrained environment.

### 1.3 Broad Goals for Doing Better

This concern for the strategy variable was a major factor in early design of what has become the RAND Strategy Assessment System (RSAS).

- To break the mold of thinking in terms of fixed scenarios

- To compel systematic thinking about joint and combined-arms operations

- To compel explicitly treating "special issues" such as operational maneuver groups, chemical attacks, strategically significant use of airborne and special-operations forces, and even amphibious operations

- To provide a mechanism for defining and discussing command control relationships from the national command authority down to the level of theater commanders or even subordinate commanders

- To sharpen thinking about operational strategy in the context of a malevolent opponent with his own strategy (e.g., to provide an automated Red commander against whom Blue officers and analysts could try out their concepts)

- To encourage a building-block approach in which adaptive strategies could be fashioned from pieces

- To bridge the gap between analysts on the one hand, and commanders, historians, and strategists on the other

## 2. DESIGNING AN APPROACH

### 2.1 Exploiting Natural Hierarchies to Cope With Complexity

This is not the place to discuss in detail the design or content of the RAND Strategy Assessment System (RSAS) as a whole, but it is useful to provide some background before focusing on the topics of most concern in this paper.

#### 2.1.1 A Hierarchy of Objectives and Strategies

Once one begins to think seriously about how to represent strategy, it becomes important to distinguish explicitly among several levels of strategy as suggested in Figure 1. The RSAS is designed to deal with the second through fourth levels, but not long-term grand strategy. This paper is concerned primarily with theater strategy and, more specifically, operational strategy and command and control in one campaign of a war in a particular theater. Although the focus is on AFCENT, the principles embodied in the development of the plan for this command apply equally to other commands although obviously the details of terrain and force employment may vary considerably. When multiple commands are considered it is the function of the higher levels, such as EUR and JCS, to coordinate force assignments and missions among the various commands; the same function these command levels serve in the real world.

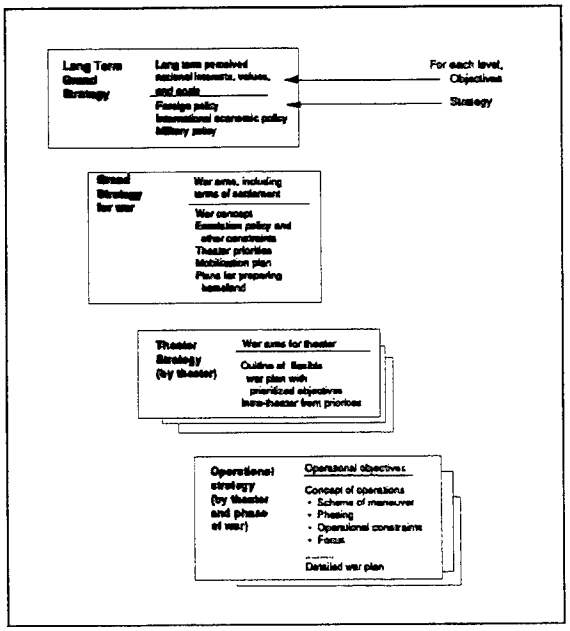



**Figure 1 - A hierarchy of objectives and strategies**

### 2.1.2 The RSAS As An Integrated System for Analytic War Gaming

The RSAS is an integrated system for analytic war gaming, by which we mean that it is a system for rigorous and reproducible analysis, but that it has much of the "feel" of war gaming. Indeed, human gaming and sandtabling are major elements of RSAS-style studies, because they provide insights such as a sense for the "real" variables.

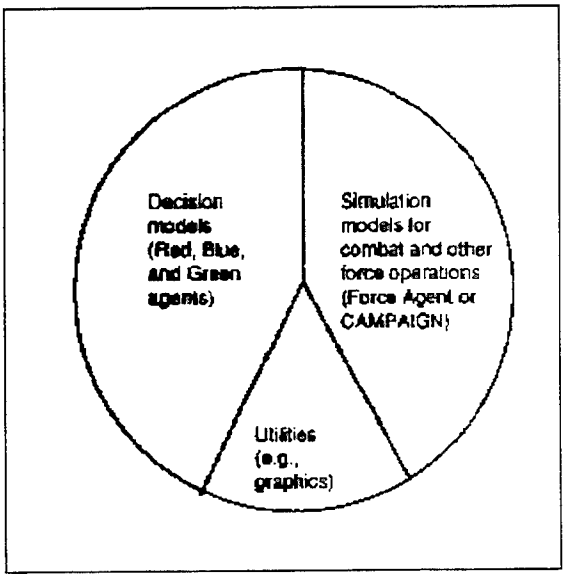



**Figure 2 - Decomposition of the RSAS**

As Figure 2 illustrates, the RSAS consists of decision models, simulation models, and utility programs [2.1]. The decision models are often called "agents," while the simulation of combat and other military operations is usually called CAMPAIGN (or Force Agent) (see [2.2]. Figure 3 shows how the various models relate to one another (in an aggregated view). The Red, Blue, and Green agents make decisions that produce orders to the military forces, which are then processed by the simulation model CAMPAIGN. Control Agent is an analyst-interface mechanism described in more detail elsewhere. As shown in Figure 4, the Red and Blue agents decompose hierarchically into a political, national command level model (NCL) and various military-command-level (MCL) models that correspond approximately to real-world command-control structures. Figure 5. shows the concrete example of this for the military command levels of Blue that are currently represented in the RSAS. The commands and the theaters they cover can be changed *relatively* easily.

**Figure 3 - Data flow among top-level RSAS models**

This paper is concerned primarily with how theater-level decision models (e.g., AFCENT of Fig.

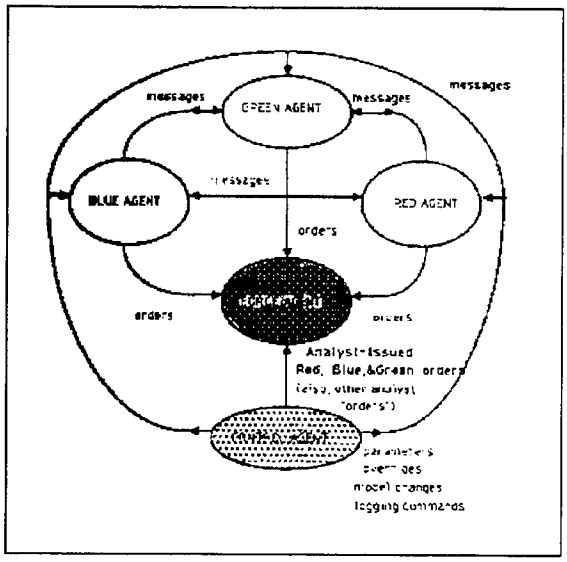



**Figure 3 - Data flow among top-level RSAS models**

5) represent operational strategy explicitly and coherently. However, there are many cross-theater issues such as the assignment of forces, allocation of airlift and sealift., phasing of operations by theater, and coordination of alert levels and rules of engagement. All of this must be done in a manner consistent with political-level objectives, strategy, and qualitative guidance.

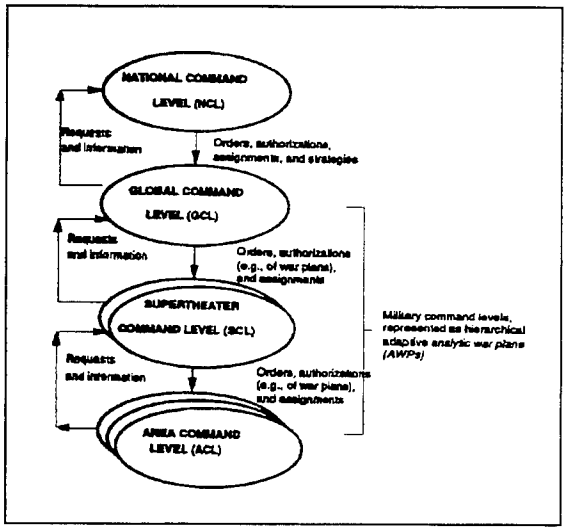



**Figure 4 - Hierarchical decomposition of the Red and Blue Agents**

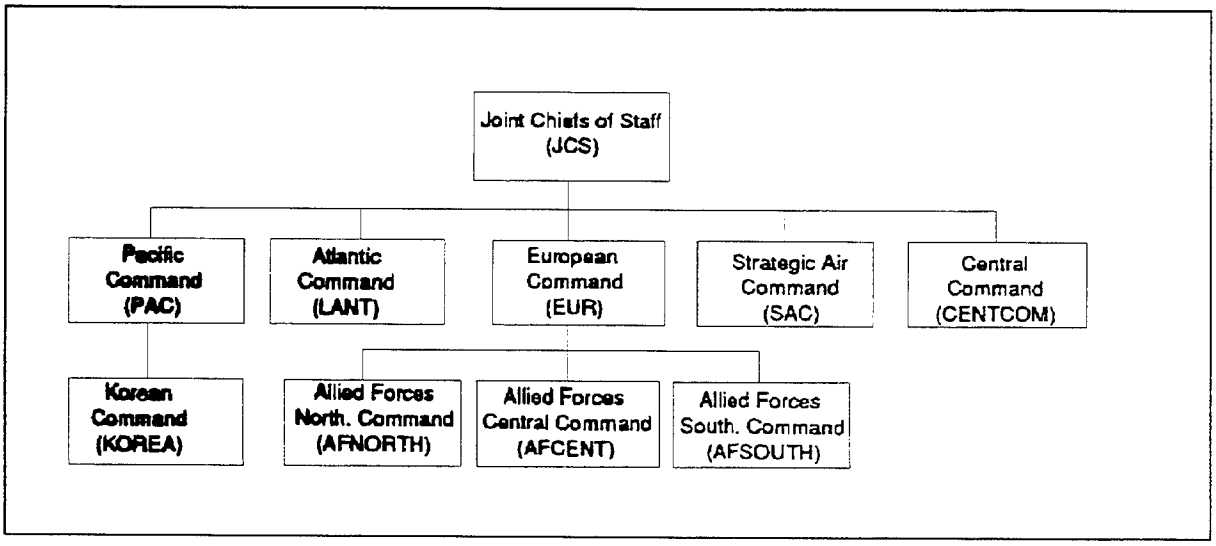



Figure 5 - Illustratative decomposition for Blue of the military command level

## 2.2 Military command Level Models and Analytic War Plans

### 2.2.1 Functions

The RSAS represents military commands at the level of theater commands and higher. Ultimately, MCL models must issue the force orders that are the inputs to the CAMPAIGN model's simulation of force operations, including combat. The rationale relating the various force orders is the plan embodied in a given MCL model.[6] Indeed, we usually call the MCL models *analytic war plans* (AWPs). It is crucial to emphasize, however, that these are adaptive decision models, not mere scripts of orders as in traditional models. Often, RSAS users will begin developing AWPs by building scripts of orders in the traditional way, but more competent users then go on to add adaptive logic representing the changes that real-world military commanders would make in the course of operations.

As Figure 5 indicates the Blue JCS model is the superior of the EUR model, which is the superior of the AFCENT model, for example. Fig. 6 describes generic inputs and outputs of the various MCL models. The JCS and EUR models have as outputs authorizations to the lower-level models. These correspond approximately to real-world authorizations (e.g., "You are authorized to trade space for time as you deem appropriate.") All of the MCL models may make requests of their superiors (the NCA in the case of the JCS model). Also, all of the MCL models may in lieu of direct and explicit force orders set parameters tuning the behavior of lower-level decision models embedded in the CAMPAIGN simulation. For example, the AFCENT decision model specifies parameter values that establish priorities for the defense of different sectors and the maximum length of certain flanks. These parameter values are set consistent with the AFCENT model's theater-level strategy. When CAMPAIGN runs, it will allocate reserves and issue orders about fallbacks based on a mix of algorithms and rules that use these parameters. The MCL models are also responsible for alerting higher level authorities when certain events occur. These are called "bounds" and range from the opponent's use of nuclear weapons, the suffering of excessive attrition, or the loss of a key ally. Some of this corresponds to real-world reporting from the field and some amounts to a technical mechanism for assuring that the RSAS' higher level models make decisions at appropriate times.

The inputs used by MCL models include: authorizations, world-state information, the bounds that are their responsibilities to watch, higher-level strategy, constraints, and directives. As an example here, a particular model of AFCENT might have the authorization to conduct a fallback defense in some sectors and the authorization to use battlefield nuclear weapons in response to enemy use of nuclear weapons (normally, such authorization would not be granted). Depending on such world-state information

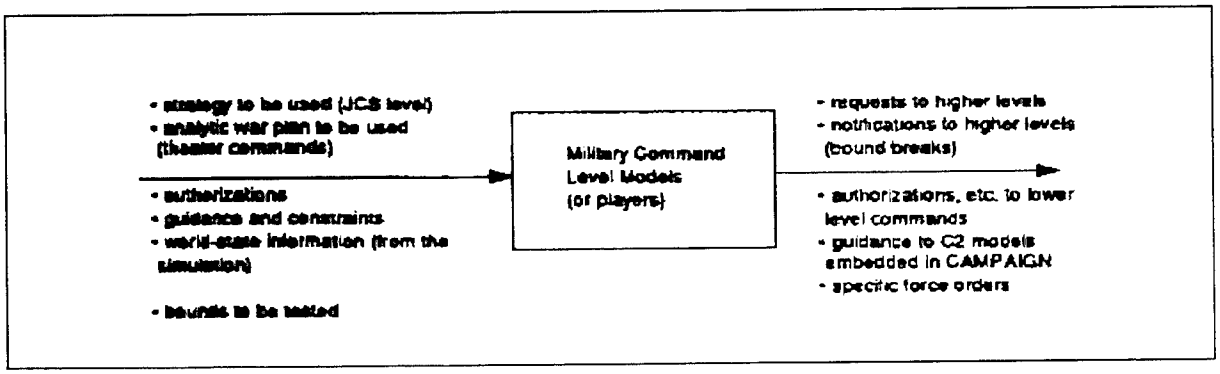



**Figure 6 - Inputs and outputs of MCL models (or players)**

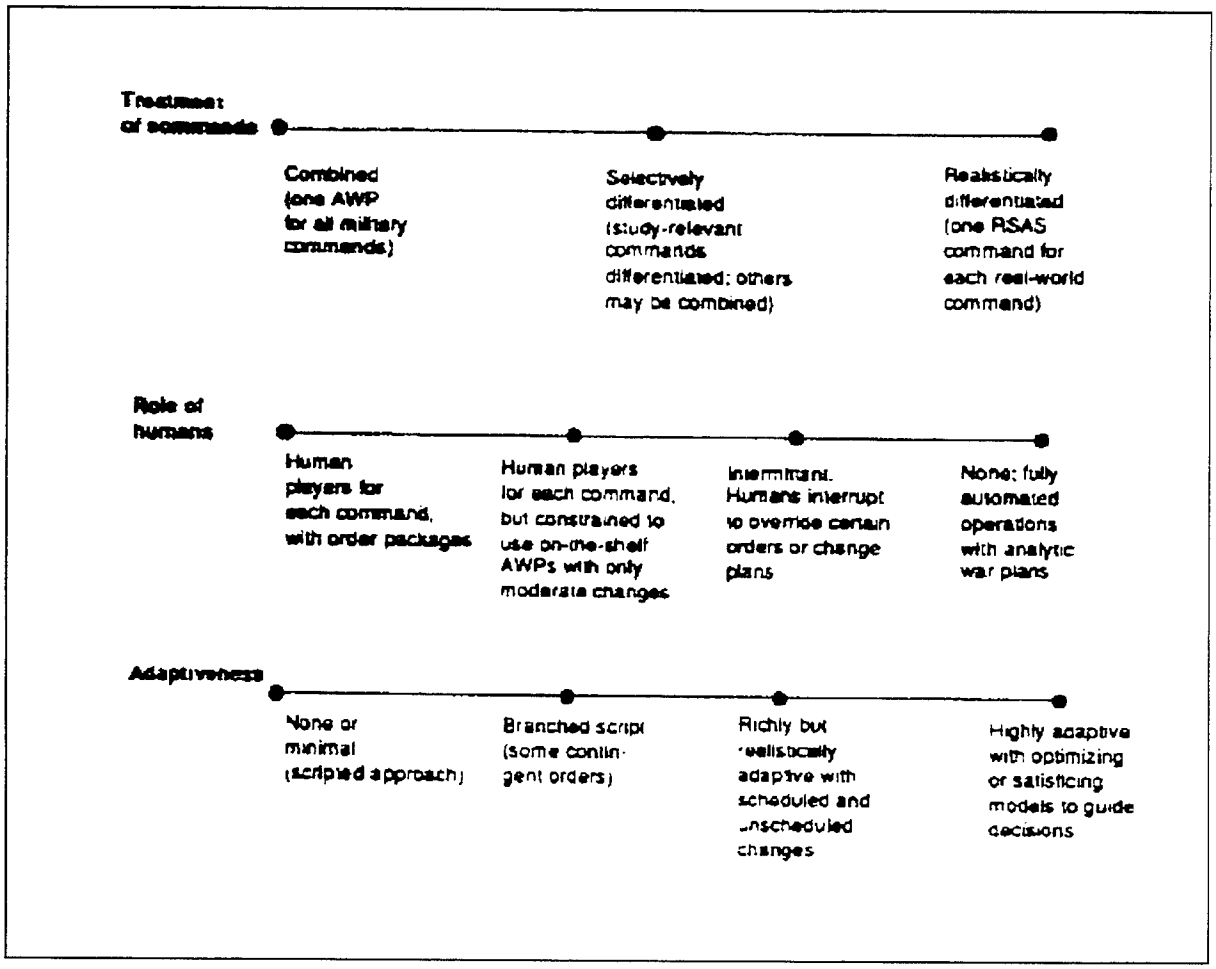



**Figure 7 - Dimensionality of user choices for military command level**

as its attrition rates and force ratios by sector, the AFCENT model might in fact conduct a fallback (or respond to nuclear use). If so, however, he would be subject to constraints (e.g., a fallback could be no greater than to a specified river line, or any nuclear use could involve no more than n battlefield weapons). Precisely what constraints and directives exist is determined by users as part of developing the analytic war plans for their particular study.

This is a good time to emphasize that the baseline RSAS analytic war plans provided to users should not be thought of as on-the-shelf reliable models to be used routinely. Instead, they should be thought of as starting points for building study-specific AWPs. The baseline AWPS come, however, with many building-block components that users can draw upon.

### 2.2.2 User Modes

There is a wide range of user modes available in representing the MCL. These may be considered to be choices in three dimensions: (a) treatment of commands, (b) role of humans, and (c) adaptiveness. Figure 7 illustrates the choices schematically. In one extreme, human players may be used for each command, and they may build simple nonadaptive baseline plans (scripts) to which they stick throughout the war game. At the other extreme MCL models may be used for all the commands, and the MCL models may be rather highly adaptive. In principle, they could call upon optimizing algorithms,

or at least good satisficing rule-based submodels, to help in making the adaptations. For example, the SAC model could use a linear program to optimize its targeting of nuclear weapons in a SIOP. To use a current example, the AFCENT analytic war plans set parameters in a CAMPAIGN model that allocates ground-unit reserves to sectors using an operations-research-style method maximizing utility as defined by the weighted sum of several measures of effectiveness, subject to numerous constraints.

MCL user-mode options are similar to those for the NCL. At one extreme, each command may be represented by a human team; at the other extreme,each command may be represented by a fully automated and significantly adaptive decision model. Much the same type of user options exist for MCL as for NCL.

### 2.2.3 Basic Concepts Underlying MCL Models

#### 2.2.3.1 Structure of Analytic War Plans

As we have already noted, the MCL models are structured as adaptive plans.[7] Thus, they are organized procedurally. Figure 8 illustrates schematically that a given AWP is hierarchically

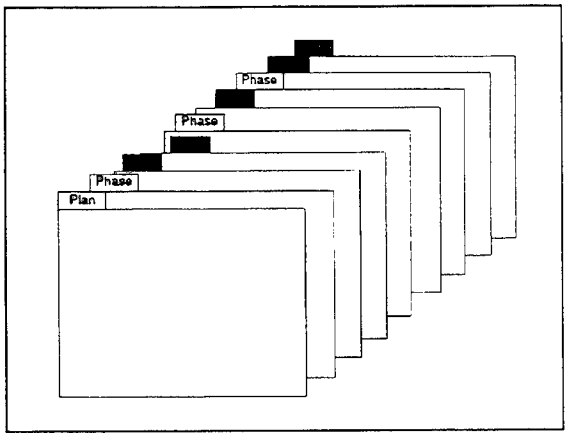



**Figure 8 - Structure of AWPs**

structured in terms of phases, moves, and order packages (not shown). Current RSAS AWPs have a phase for deterrence (e.g., for actions during crisis but before hostilities begin), various phases of combat, and a phase for termination. Within each phase there are a number of moves, which in turn consist of order packages. During a deterrence phase, for example, one might have a limited mobilization move and, later, a full-scale mobilization move. Within each of these moves there would be order packages corresponding to both mobilization and deployments. A Reforger move would consist of numerous force orders directing the deployment of named units to their warfighting positions in Europe. There would be different force-order packages for air forces, ground forces, naval forces, and, perhaps, space assets. Many of these building-block packages would be useful in a variety of different plans, and would therefore be placed in a library of functions. In a given war game or simulation, some of these might be altered on the margin or drastically.

This systematic structuring of order packages and moves is in itself a valuable contribution to analysis, because it compels users to think in terms of campaigns, building blocks, and the integration of those building blocks in a joint and combined-arms plan. To be sure, we may choose to suppress aspects of the full complexity in a particular study (e.g., ignoring the air war altogether when trying to understand the significance for ground combat of large-scale reductions in Europe). However, the integrating structure is there. Further, the structure exists also at the supertheater and global military levels. Thus, the JCS AWPs must deal with issues such as the assignment of forces and strategic

mobility assets across theaters, and the EUR AWP (representing SACEUR) must do similarly within the European theater. The RSAS therefore makes it difficult to sweep under the rug difficulties such as having three or four theater plans that make use of a particular division or air wing.

Figure 9 lists some standard building-block order packages for such problems as conducting various specific fallbacks, mounting counteroffensives, conducting the Reforger deployment, and so on. Many of the packages have subordinate packages dealing in a coordinated way with ground, air, and naval forces. These provide the nitty gritty details needed by the CAMPAIGN model (e.g., the names, destinations, and priorities for deployment of Reforger forces, or the positions back to which defenses would fall in particular options). The growing library of RSAS AWP building blocks is a basic feature of the system.

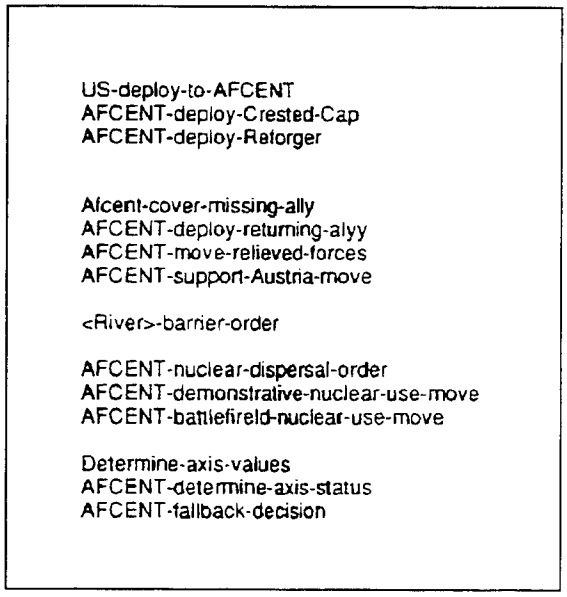



Figure 9 - Illustrative library functions for AFCENT

**2.2.3.2 Scheduled and Unscheduled Adaptations**

Fundamental to the development of military strategy is recognizing that force employment must adapt as a function of what happens in the early phases of action (the result of opponent actions and the imperfectly predictable effectiveness of combat and maneuver operations, for example). Some adaptations can be recognized and planned for in advance because if they are necessary at all they will be necessary at more or less predictable times. We call these scheduled adaptations or *branches*. Fig. 10 illustrates schematically how such branches can be represented.

Other adaptations can be anticipated in general terms, but cannot realistically be scheduled (although planners sometimes attempt to do so by focusing on stereotyped scenarios), even to the extent of being confident that the adaptations will precede or follow other major operations. We call these unscheduled adaptations. As an example of a scheduled adaptation, one might consider a commander planning an invasion. Depending on success in the first phase of operations, as well as on the coalition of forces that forms against him during that phase, he may or may not choose to continue into a second and more ambitious phase. By contrast, consider planning for nuclear use in the European theater. Commanders must be prepared to transition into nuclear operations quickly at any time. They cannot exclude the possibility of nuclear use on D-Day, nor the possibility that nuclear weapons will never be used in the entire campaign. These, then, are examples of scheduled and unscheduled adaptations. One of the most deplorable features of Western military planning is the chronic failure to systematically plan for both types of adaptations. By no means does this require rigid and ultimately unrealistic fine-tuned assumptions; instead, it requires: (a) systematically recognizing the possibilities, (b) developing building-block hedges or responses, (c) including some branching structure into basic operations plans, and (d) gaming with enough complexity and reality to develop skills in using the building block adaptations. Analysts have a somewhat different problem, because the models must make these adaptations automatically, which requires writing decision rules.

The process of writing these decision rules is by far the most complex aspect of the command and control representation. First, the analyst must determine the triggering mechanism for the decision; perhaps the criterion would be rate of advance or perceived enemy strength or some combination of events. Next must be established what information would likely be available in reality and when it would be known. The appropriate information must then be made available to the model at the appropriate time. The actual decision process is then a series of If-Then-Else statements or the more compact version of these called a Decision Table. The decision process can consider as many variables and be as complex as time available and the persistence of the analyst permit. In the end, however, the decision will always be based on purely objective data as there is as yet no way to represent the "feel" of the commander for the battle.

**2.2.3.3 Bounds and Notifications**

A particularly important technological feature of RSAS AWPs s that they contain within them the knowledge of when they are failing. The metaphor here is to the commander who notified higher-level authorities that he feels he is unlikely to succeed unless authorized to change strategies or to conduct operations that have previously been denied to him.This is accomplished in the RSAS by identifying

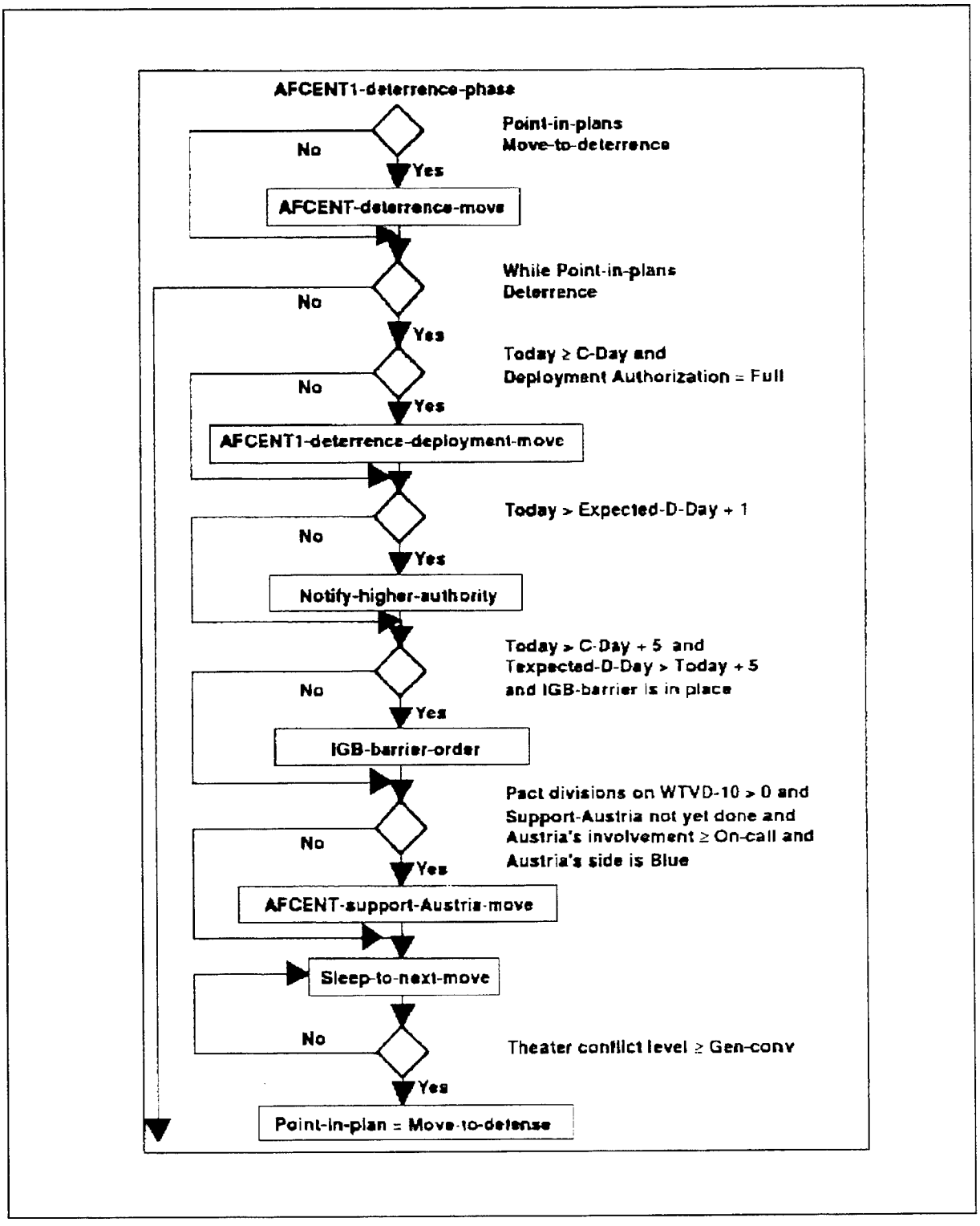



Figure 10 - An illustrative time-phased plan with scheduled adaptations

classes of problems that may be encountered, developing tests to recognize and measure the seriousness of those problems if they arise, and establishing formatted notifications and requests to higher level authorities which may be models or human players). Figure 11. indicates the most important classes of problem. When one of the problems arises, we say a *bound* breaks.

- Escalation or iminent escalation (by the enemy, third parties, one's allies, or unauthorized commanders)
- Alliance problems (one's own or of the enemy)
- Excess ive casualties or loss of ground
- Falling excessively behind schedule
- Successes providing new opportunities
- Events suggesting enemy strategy requiring actions not yet authorized or planned
- Tactical warning of nuclear attack

**Figure 11 - Generic versions of bounds tested for by AWPs**

If a bound breaks and an MCL model notifies higher authorities, perhaps requesting authorization for some contingent action or perhaps recommending a change of strategies, the higher level authorities (models or humans) may: (a) do nothing, in which case the MCL model must continue, "making do" with its current plan and authorizations; (b) grant authority for contingent actions within the framework of the current AWP; (c) either in addition or instead, take action from their own levels e.g., launching weapons controlled at their level); or (d) direct a change of strategy and, in RSAS terms, a change in AWP.

In the last case, the next move by the MCL in question will be based on a new AWP that must start operations in a way consistent with the current world state. Thus, the new AWP must be compatible with the old one. To relate this to the real world, suppose that a NATO Central Region commander had begun combat with a forward-defense strategy and was suddenly told to conduct a defense on the Rhine River combat units, but support units, supplies, and civilian population.[8]

### 2.2.4 Building and Modifying Analytic War Plans

Detailed procedures for building and modifying AWPs are given in Schwabe and Wilson [2.3]. Here our concern is more with the higher level concepts. Figure 12 summarizes the steps involved

1. Conceive and name alternative military strategies in general terms.
   a. Characterize the relevant dimensions of strategy.
   b. Define appropriate strategies within those dimensions.
2. Sketch plans for each of the strategies.
   a. Identify and name phases and moves.
   b. Identify key assumptions .
   c. Identify and sketch rules for most important branchpoints that can be scheduled.
   d. Identify and name most important bounds and notifications.
3. Identify, name, and characterize needed order packages.
4. Develop and test building blocks (order packages, move functions, etc.)
5. Develop and test first-cut AWPs in RSAS. Iterate.
6. Enrich AWPs with additional adaptive logic.
7. Assure that AWPs exist to succeed failure of initial AWPs.

**Figure 12 - Steps in building AWPs**

in actually developing and using AWPs. The starting point is to conceptualize the strategic issues for the relevant command. For an attacker the dimensions of strategy include the scope of its aggression, the tradeoff between achieving operational surprise and preparing its own forces, the scheme of maneuver, and responses to the most obvious strategic actions by the defender. During this critical conceptual phase the emphasis must be entirely on military and political-military issues rather than modeling or programming. It is best conducted with a combination of blackboards, maps, and--in some cases--simplified war games such as those sold commercially. A key element of this process is making lists and matrices with short descriptive labels for many basic concepts. The process is likely to fail if participants insist on dwelling on tactical-level issues (e.g., those with which they were most familiar in their last assignment) or if discussion focuses on models and

model limitations. By contrtast, if the concepts of operations arising from this step are militarily sound, the likelihood is high that they can be accommodated in the RSAS, although modifications may be necessary.[9]

The second step in building AWPs is more technical and should be conducted by one or a very few people. It is still necessary that military considerations dominate discussion, but the structure of RSAS AWPs serves to guide discussion by establishing requirements, checklists, and terminology. Some technical jargon slips in here, but it is less serious at this stage.

1. Conceive and name alternative military strategies in general terms.

    a. Characterize the relevant dimensions of strategy.

    b. Define appropriate strategies within those dimensions.

2. Sketch plans for each of the strategies.

    a. Identify and name phases and moves.

    b. Identify key assumptions .

    c. Identify and sketch rules for most important branchpoints that can be scheduled.

    d. Identify and name most important bounds and notifications.

3. Identify, name, and characterize needed order packages.

4. Develop and test building blocks (order packages, move functions, etc.)

5. Develop and test first-cut AWPs in RSAS. Iterate.

6. Enrich AWPs with additional adaptive logic.

7. Assure that AWPs exist to succeed failure of initial AWPs.

The remaining steps involve a mix of military thinking, modeling, programming, and simulation (or human war gaming). They are more technical and require more precision. However, the emphasis on modular building-block order packages permits specialization. Thus, in a particular analytic group different people are likely to be knowledgeable about tactical air operations, ground combat operations, strategic mobility, and so on. It is unnecessary for all to be equally facile in all the pieces. There must also be people who understand the RSAS as a whole and can pull things together. In our experience, however, it has proven possible to pull things together technically and make them work (i.e., perfect the coding and conduct the program verification runs) quickly if only the military concepts and building blocks are cleanly conceived. The limiting factor, by far, has proven to be the "substantive" part of the work. This, of course, depends on having a critical mass of in-house RSAS expertise on the decision models, combat models, and computer-system factors. Organizations that have not made the requisite and significant investment (e.g., two people working for six months mostly on gaining RSAS expertise) have been unable to exploit any but the more superficial aspects of the RSAS.

### 2.2.5 Status of Military Command Level Models

All of the basic concepts underlying analytic war plans have been successfully embodied in the RSAS and applied successfully in studies. They have proven, as anticipated, to be a powerful organizing device. Further, they have proven relatively straightforward to develop, modify, and use. They have been unequivocally successful in focusing discussion on the strategy variables and encouraging innovative thought about the operational art.

The most extensive and successful applications of AWPs have been concerned with Europe's Central Region, which RAND has studied for some years. For that region we have a significant collection of Red and Blue AWPS representing alternative strategies. Both Red and Blue Agents can not only fight baseline wars in a manner considered to be representative of actual planning, they can also adapt rather well to a variety of developments. Some of this is fully automated and some of this requires occasional analyst intervention. Further, we have a substantial library of building-block functions that are used routinely in a number of studies, thereby

providing a flexibility and efficiency that has been sorely lacking over the years.

Regrettably, the AWPs have by no means been adequately exploited as yet, especially outside RAND (and, within RAND, outside projects involving the Central Region). Most users of the RSAS so far have used them to the extent of having good representations of baseline strategies, which has in itself been very useful for developing joint and combined-arms concepts of operations and for appreciating Red doctrine. They have not, however, incorporated very much conditional logic nor faced up fully to the implications for planning of massive uncertainty. In some cases users have been less than successful in working with AWPs because they failed to do the necessary homework before plunging ahead at the computer.[10] Ironically, one of the serious adverse aspects of the technological revolution in computer friendliness is a tendency for users to avoid studying what they are working with; instead, they think they can merely sit down and make choices. Although that is altogether feasible for many activities, it is not feasible when attempting to understand and plan seriously for possible wars.

In the years ahead we anticipate that AWP methodology will be more creatively and widely exploited and that it will be considered to be one of the principal innovations represented by the RSAS. There are encouraging signs of progress: RAND studies that increasingly recognize the importance of adaptive strategies within system analysis of defense program options; war college activities (classes and war games) in which operational art is emphasized and innovative strategies developed; and a new emphasis on examining diverse scenarios and threats (a consequence of the demise of the Cold War). We also believe that facility in using AWPs as decision aids and building blocks within war gaming will improve substantially in the relatively near future.

## 3. ILLUSTRATIVE APPLICATIONS FOR EUROPE'S CENTRAL REGION, THEN AND NOW

Until quite recently, the principal military problem facing the US was defense in Europe's Central Region. Given the fundamental changes that have occurred in Europe and the process of mutual reductions that has begun, this problem is rapidly becoming obsolete. The analysis that has been conducted on the Central Region, however, is an excellent illustration of what can be accomplished more generally with the approach described here.

### 3.1 Dimensions of Strategy

One of the good features about the process of conceiving and building analytic war plans is that one has to identify the dimensions of strategy. For the Pact attacker in a Central Region campaign, some of the main dimensions involved [1.4]:

- Main sectors (number, choices of, force ratios on)
-Among nominal choices
-Unconventional choices (flanking operations through a neutral Austria...)

- Reserve fraction

- Force ratio on non-main sectors

- Tradeoffs between achieving surprise and one's own preparations; mechanisms for having one's cake and eating it (e.g., premobilization training that arouses suspicions and some reactions, but not cohesive full-scale reactions)

- Options for LOC cutting (special operations, bombing, mining,...)

- Air suppression

- Strategy for forcing termination

Some of the instruments available to the Pact included concentration of ground forces, a massive "air operation, the use of airborne, heliborne and other special-operations forces, chemical attacks, and deceptive diplomatic efforts. The use of chemical weapons is yet another important instrument.

For NATO as the defender some of they key dimensions of strategy involved:

- Force deployments and related command-control structures (e.g., the layer-cake) Operational strategy (e.g., forward defense vs fallback options)

- Reserve fractions

- Proactive vs reactive approach to the use of reserves

- Counteroffensives
- Preemption
- Interdiction
- Escalation options

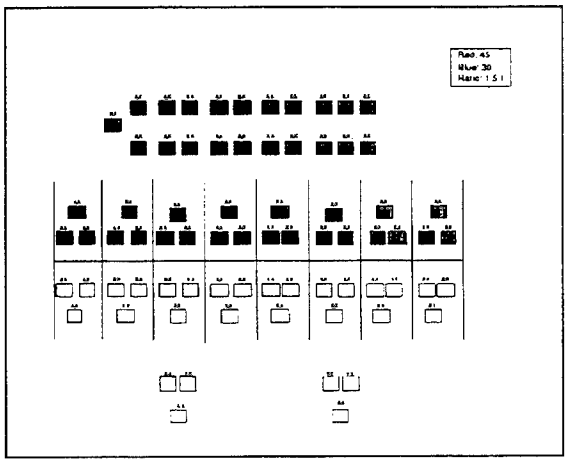


**Figure 13 - A notional pre-campaign lineup with an attacker advantage of 1.5:1**

To illustrate a few of these, consider Figures 13 and 14, which show schematically how the Warsaw

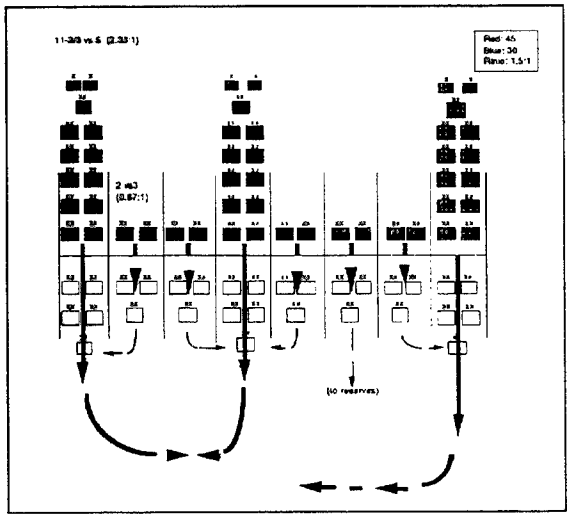


**Figure 14 - A planned encirclement operation at the theater level**

Pact of years past might have concentrated forces consistent with an attack giving it only a 1.5:1 force ratio initially. Were the Soviets to reinvade Europe in the future, a similar set up might apply, although the figures are merely illustrative. We see that the strategy envisions operational-strategic encirclements after breakthroughs are achieved on the main sectors on which most of the available forces are concentrated. A simple mathematical model of the concentration/counter-concentration process is given in Davis [1.4] and [3.1].

Figure 15 illustrates a hypothetical situation in Europe following massive reductions to parity. Here the attacker strategy still emphasizes concentration of

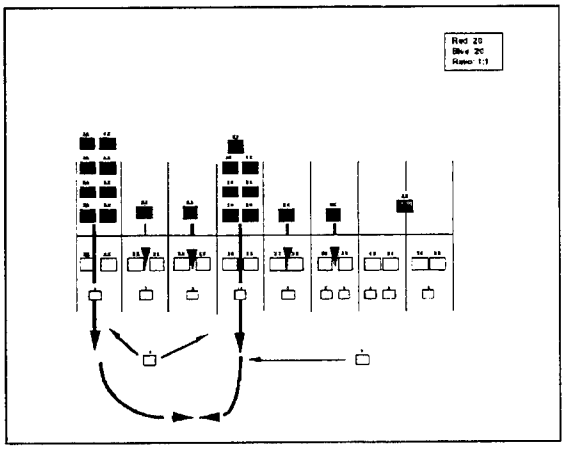


**Figure 15 - A poor defender strategy at low force levels and parity**

forces, but the more defense-favorable force ratio makes it much more difficult for the attacker to achieve desired force ratios or multiple main sectors. However, because the defender's force posture (a reflection of implicit strategy) is so poor, even a glance at the schematic suggests that the attacker may be more successful than he perhaps "should be." The defender is severely maldeployed and has minimal reserves. By contrast, Fig. 16 shows an operational strategy for the defender in which he preferentially defends some sectors, either on the grounds of strategic vulnerability and importance, or on the basis of intelligence collection during the attacker's preparation for battle.

Precisely these issues are at the heart of current analysis on such issues as the effects on large-scale

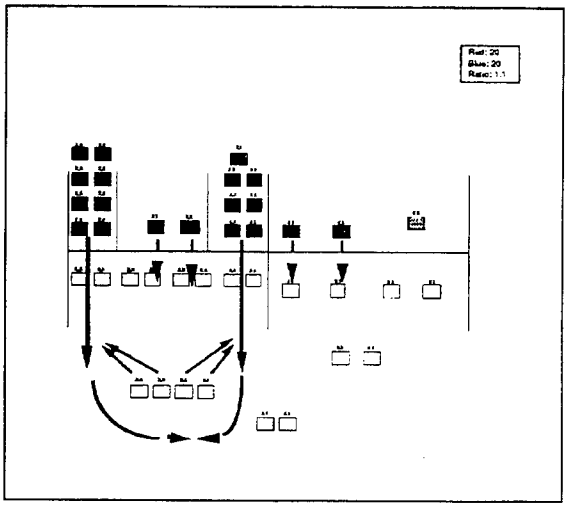


**Figure 16 - A preferential defense with a large reserve fraction**

reductions on military stability in Europe (putting aside the more dramatic effects on overall stability of Eastern Europe's growing independence). Only a year or so ago, analysts and policymakers were concerned about an "operational minimum" below which defense

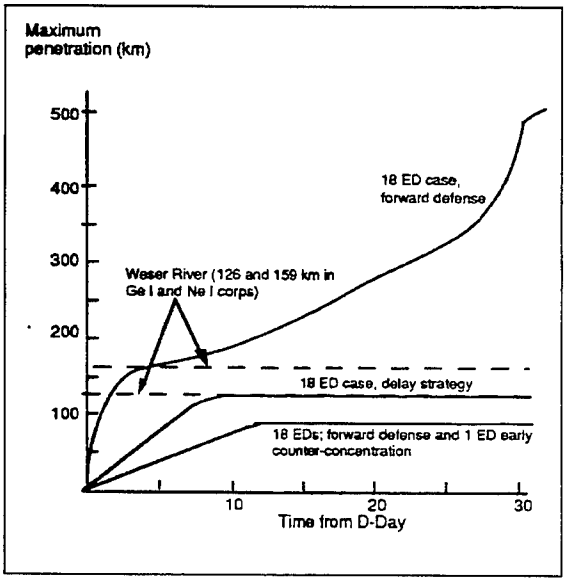



**Figure 17 - Illustrative simulation results as a function of defender stategy**

levels could not be allowed to fall because of force-to-space-ratio concerns. Today, we recognize that there is no real operational minimum, but that the defender's prospects at low force levels would be highly sensitive to issues of strategy. Fig. 17 illustrates this for hypothetical Central-Region conflicts in which both sides have 18 equivalent divisions each, but the defender adopts quite different strategies from case to case.[11] Following the classic version of forward defense, the defender suffers a sudden and catastrophic defeat. In the other cases, which involve either contingent forward defense that allows selected fallbacks to defensible lines if necessary or proactive reinforcement of weak sectors on the basis of judgment and early intelligence indicators, the defense holds very well indeed--especially if the defender has prepared defenses on D-Day.

These, then, illustrate at a simple level some of the many strategy issues that must be considered to analyze current defense issues involving conventional arms control and NATO's future defense options. Such strategy-sensitive study must, of course, be in addition to analysis looking at weapon and force tradeoffs, and at force levels per se. Further, in practice, our assessment must be much more complex because of the complications added by multiple nationalities, combined arms processes, the effects of terrain and prepared defenses, and so on. In our experience, however, the process of using analytic war plans to represent strategies has added substantially to the quality, depth, coherence, and efficiency of our work.

## NOTES

1 For discussion of the role surprise has played in military operations see References [1.2] and [1.3]. Reference [1.4] describes ways to use arms control to avoid surprise.

2 See DuPuy [1.5] for considerable historical discussion of these matters.

3 In studies of conventional warfare, "strategy" typically corresponds to a stereotyped employment of forces according to doctrine, official planning scenarios, or, in the case of the opponent, observed exercise practice. Such strategies are unencumbered by the problems real-world commanders would have with allies, political constraints, and deception.

4 Some of the theater-level combat models have

simple decision rules adaptively allocating reserves among sectors, but such models are working on the margin rather than adapting at the operational or theater level. For example, a model may follow the rule of reinforcing success for the attacker and reinforcing failure for the defender, establishing a rate at which divisions can be committed from the reserves in accordance with this rule. However, such models do not allow for more basic chances of strategy such as a large-scale fallback, counteroffensives, and restructuring of corps boundaries. Such issues do arise in certain forms of human gaming (e.g., with the IDAHEX model, which emphasizes maneuver), but have not until recently been highlighted in simulations.

5 In one egregious example a study concluded that the "Gorbachev unilateral reductions" would greatly reduce the threat to the Central Region. Our own analysis concluded that they would greatly reduce the short-mobilization threat, but have relatively little impact on longer-mobilization cases because there were logical ways for the Soviets to restructure their operational strategy to compensate for the dislocations and "holes" caused by the reductions, which will not be particularly large in an aggregated sense.

6 See Schwabe and Allen [2.3] for documentation of the RSAS military command level models.

7 Taking this approach was a nontrivial decision, with some of the project team envisioning instead a type of model that would systematically "search" for the "best" strategy, somewhat as do checkers or chess-playing programs (which in fact are quite different from one another). We chose not to take that approach, because neither the technology nor our intellectual concepts were strong enough yet to make such an approach feasible unless great sacrifices were made in military content. Warfare is an extraordinarily complex phenomenon in which there is little room for "optimizing." The approach of basing MCL decision models on the concept of adaptive plans would allow us to (a) make direct use of the considerable military expertise that already exists, (b) conceive issues in natural terms, and (c) confront the full dimensionality of the problems theater commanders face. The hierarchically modular approach we took in developing plans is consistent with theories of bounded rationality discussed by Simon, Newall, and others.

8 Some of the interesting issues of synchronization and how they are dealt with in the RSAS are described in Shlapak, Allen, and Schwabe (1986?), based on earlier theoretical work by the author.

9 The earliest discussion of many of these issues is in an unpublished 1983 work by Davis and Schwabe, which dealt with the concept of "scenario spaces" and "strategy components." One of the most important conclusions from that work was the recognition that the decision models would have to be written with a general class of scenarios in mind, because the alternative was to develop decision rules at a level of abstraction that would make them inappropriate for nearly all practical applications, and that would be very hard to fully comprehend as well. By and large, the existing RSAS AWPs were developed to deal with classic Europe-only, Southwest Asia only, or global wars involving the superpowers and their alliances.

10 A chronic problem is the tendency of analysts to undercut RSAS concepts by finding ways to do what they have done in the past faster with the RSAS, rather than to exploit the opportunities to do things differently and better. This is manifested by focusing on the combat models and using scripts of orders rather than full analytic war plans.

11 All analytic results are taken from [3.1] and [1.4]

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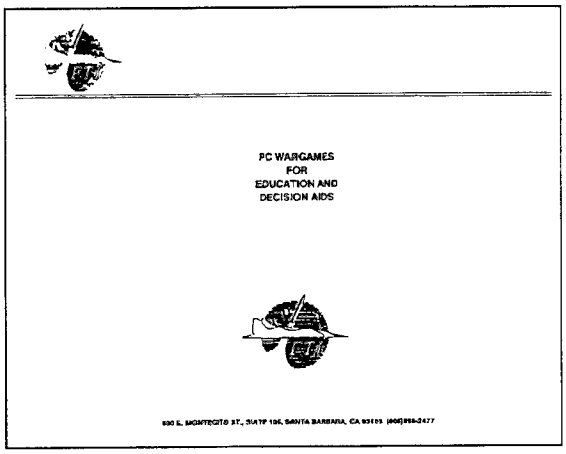
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# AIR CAMPAIGN GAMES: EDUCATION AND DECISION AIDS FOR COMMANDERS

**Edward P Jordan**
**Frontier Technology, Inc**

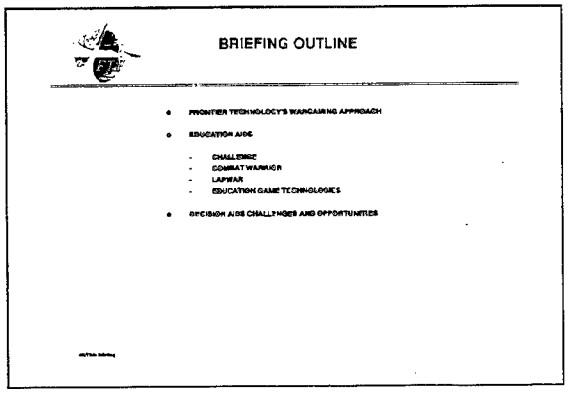



**Summary**

Command of air forces in a theater campaign must not only be very well orchestrated but also highly skilled in warfare at the "operational" level - the level between "strategy" and "tactics" associated with the application of large-scale forces over the course of several days or weeks. The complexities involved in managing such air operations demand preplanned and well-practiced procedures for control, communication, logistics, etc. Effective employment of air power also requires proficiency in the operational art of theater-wide direction of forces in concert with the land and sea components. Most Air Force officers have very limited opportunities to develop either of these skills in the course of their assignments. Procedural training has improved in quality and availability during the 1980's, but education in the operational art is minimal.

Wargames are not being used very successfully as part of some exercises and training programs oriented to the operational level of command to add a sense of realism and challenge the players. These programs are excellent for familiarization with the C2 environment and for procedures training but are too complex, slow-running, and infrequent to provide the players feedback on their decisions, opportunities for experimentation or reinforcement all of which are necessary for education in operational art.

The recent burgeoning of capabilities in microcomputers, coupled with techniques used in the design or commercial games. offers an opportunity for personalized and realistic, but fast-running games to be hosted on microcomputers providing the feedback reinforcement, experimentation and graduated learning for self-education in the operational art. An education-aid game can easily be modified to a decision-aid version into which actual combat results from the early days of a campaign would replace the assumptions and planning factors imbedded in operations plans and theater strategies. COMBAT WARRIOR, now, being developed by Frontier Technology, Inc., Santa Barbara, CA., through a Small Business Innovation Research award from AF Systems Command, Electronic Systems Division, is the first such game. It is focused on the operations decisions made by the Commander, Allied Air Forces Central Europe. Evolutionary developments of this concept are planned for decision-aid applications, other scenarios, other command echelons, logistics, two-player competitive versions, etc.

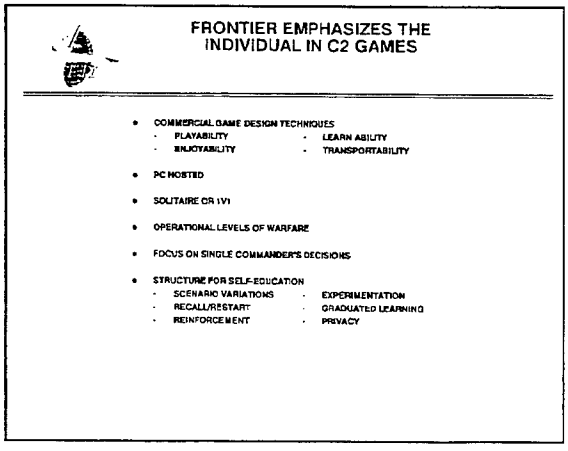


**The Education Challenge**

USAF basic doctrine emphatically says that attainment of air superiority is required to prosecute the air-to-surface campaign effectively. It does not attempt to prescribe how a commander shall use his forces to attain air superiority or exploit air superiority once gained.

Operational doctrine, which applies to theater-level management of forces states a few general principles: orchestrate offensive and defensive counter-air operations suppress enemy air defenses and coordinate various support actions. To implement these ideas regional or theater air commanders must make many judgments and reach many decisions. How much of the force should be dedicated to air superiority and for how long? How should "air superiority" resources be apportioned among defensive counter-air, fighter sweep, escort, airbase attack, suppression of surface-to-air defenses, etc.? Should airbase attacks be concentrated on runways, shelters, aircraft, support infrastructure, or on some combination of these, and in what sequence? Should cross-FEBA attacks be concentrated in a surge or spread out in a constant-pressure mode? What are the highest payoff "targets" for intelligence collectors, particularly RECCE aircraft?

In answering these questions, the commander must out think and counter a clever enemy who is concurrently managing his own air war. Because the commander is attempting to defeat an active human intelligence, in many different possible battle situations, there is no "cookbook" solution to managing an air campaign. Operational doctrine and training must stress development of judgment and insight, rather than rote procedures. Education ideally should require that participants make decisions under conditions of uncertainty, and allow them to evaluate their decisions by the ultimate test victory or defeat.




But operational doctrine and training have not kept up with this need. Most manuals of operational doctrine (the 2-X series of USAF publications) have not been revised for fifteen or even twenty years. USAF tactical training through the four-ship level has long been excellent, and has been enhanced by special composite mission live exercises, such as Red Flag, Green Flag, and Maple Flag. Most $C^2/C^3$ training programs (e.g Blue Flag, Air/Ground Operations School's Battle Staff Course, and the Warrior Preparation Center at USAFE) however, are oriented toward middle and lower command echelons. Moreover, they must emphasize training in procedures, rather than education in the acts of commanding air forces, because of time constraints and because most students have only one or two opportunities in a career to attend such programs. Exercises are too thoroughly prescripted -- especially in NATO -- to allow any learning of battle-management lessons at the upper command echelons, and there is no opportunity for experimentation or feedback. Widespread formal training in higher-level air battle-management has generally been limited to Air University's Combined Air Warfare Course (and an equivalent block in the Air War College curriculum), supported by the Theater Warfare Exercise (TWX) multi-player computer game; although very valuable, this program is time-constrained to providing familiarization with the air battle-management environment and issues. It is a onetime opportunity for the student and cannot offer sufficient experience to develop the necessary insight and understanding. Although the Warrior Preparation Center and various CINC exercises are now beginning to address higher-echelon decisions, they also are unable to provide the frequency, reinforcement, feedback, and opportunity for experimentation needed for true education.

In 1985, General Gabriel. then the Air Force Chief of Staff, established the Innovation Task Force, composed of government and industrial executives of government and industrial executives and of active and retired general officers. He chartered them to look well into the future and to generate and implement ideas to prepare the Air Force for that future. Their report, Air Force Innovation: Shaping the Future, endorsed by the USAF, identified "Combat Leadership Preparation" as one of the seven

major challenges for Air Force innovations. This challenge was described, in part as follows:

> "How can the Air Force best prepare its combat leaders to fight future conflicts?"
>
> "The best preparation for combat is warfighting. However, as we are more and more successful at deterring conflict, we face declining levels of combat experience, a critical element of effective combat leadership..."
>
> "The best preparation for combat, short of war, is to simulate it. The Air Force has many excellent programs, such as field exercises, operational readiness inspections, and "Flag" programs, and professional military education, that increasingly focus on the combat environment. Most of the benefits derived from these programs, however, accrue to our more junior commanders, not to our general officers. Above the wing level, the Air Force has historically relied on personal experience to meet the demands of combat command, but that experience will be limited or nonexistent in the future."

The Task Force recommended drawing upon two resources--experienced combat commanders and wargaming--and establishing a "Senior Officer Combat Employment Course."

> "The...approach capitalizes on recent advances in wargaming, advances which can now provide more realistic scenarios and greater opportunities to learn than before. USAFE's Warrior Preparation Center is one example of how we can use this capability to prepare senior commanders for combat. Another is the development of the Air Force Wargaming Center at Air University..."
>
> "...Using current threats and forces, wargaming should offer varied scenarios that emphasize the role of the commander. These wargames should offer insight to the demands of combat and a view to the potential problems of conflict in the future. At some point, these wargames could focus on the specific theater each commander is assigned to."

A course was established in response at the Center for Aerospace Doctrine, Education and Research (CADRE) at Air University, starting as a seminar in a style along the lines of the Harvard Business School, and incorporating, as recommended, a flexible format and use of experienced commanders and other high-level experts. It has evolved into the Joint Flag Officers' Warfighting Course, and now includes a wargame exercise.

Nevertheless, even the rare opportunity for an individual to participate in one exercise each through the Flag Officers' Course, Air War College, Blue Flag, and Warrior Prep Center does not "offer varied scenarios...(and) insights," nor does it offer feedback, continuity, and reinforcement. The potential of wargaming has not yet been fully exploited as envisioned in the recommendation of the Task Force.

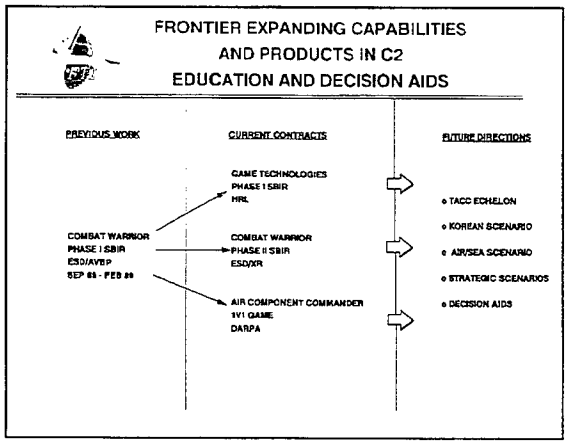
**The Opportunity**

Judgment and insight into operational decision making can indeed be developed through experience gained in simulation games. (Competitive simulations designed to teach war fighting skills are often called "games." The vast majority of games ever played by mankind, including "recreational" games have been designed to develop either physical or intellectual martial skills.) Such games can teach the player essential dynamics of a situation, compel him to think through basic strategic and operational issues, and give valuable experience in out thinking an opponent, even without large amounts of detail in the simulation. To be suitable for developing judgment and insight into campaign dynamics and top-level air battle-management, a game must be designed for a single player, realistic, compact, accessible, fast-running, and very easy to learn and use. Until recently, this appeared to be an unattainable set of requirements.

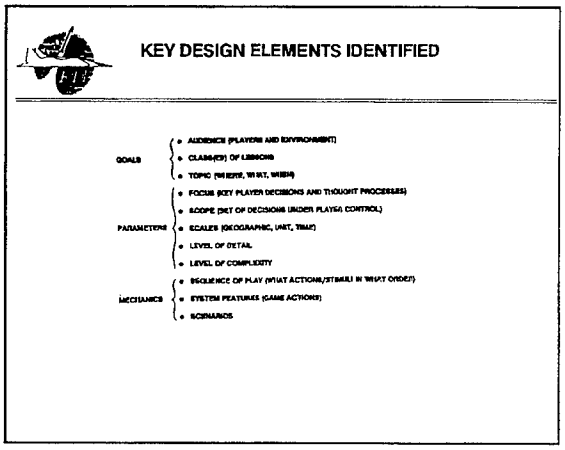
A recent article by Lt Gen B.C. Hosmer USAF ("Operational Art: The Importance of the Operational Level of War", MORS *PHALANX*, Vol 21, No 3) has underscored the need for simple wargames. Gen Hosmer says that commanders "... must be able to wargame every day, without overburdening their staffs. Current tools are too cumbersome to achieve this goal." In Gen Hosmer's view, games should act as "...extensions of the commander's concepts for attacking the enemy's strategy, exploring questions of "what is best to do" rather than "how to do it best". Gen Hosmer calls for wargames to provide "...many replications in a short period of time, achieved with the minimum manpower."

The goals are now achievable due to three factors: the greatly enhanced capabilities of microcomputers; the wide distribution of advanced microcomputers throughout the Air Force; and the evolution of design techniques for commercial games, which are becoming more realistic, sophisticated, playable, and enjoyable. Frontier has synergized these opportunities into the COMBAT WARRIOR game.

**Combat Warrior**




Combat Warrior is being developed as an IBM compatible PC-hosted, theater-level air campaign game by Frontier and is funded through a Small Business Innovation Research Program award from the Electronic Systems Division (ESD) of Air Force Systems Command. Phase I, which represented about 10% of the planned development effort, was completed in February 1989 with a demonstration of a functional (but incomplete and unrefined) version of the game at the Hq USAF Command Post. Hq USAF/XOC recommended continued development of the game to ESD. The Phase II proposal to complete the development of the full operational version of the game was awarded a contract by ESD in August 1989 with product delivery in 1991.




Within the scope of the Phase II effort now planned by ESD, Combat Warrior is being designed as a self-education aid for senior air commanders and their operations staffs who are concerned with the theater-level management of an air campaign. The game focuses on the daily decisions of mission apportionment and forces allocation and the impacts of these decisions on the progress of the ground war and on air forces attrition. The game is set in a central European scenario, with the player in the role of Commander, Allied Air Forces Central Europe (COMAAFCE). (Other air-land battle scenarios can be installed with relative ease, but alternative scenarios are not included in the Phase II development.)

Three graduated levels of player challenge are being designed into COMBAT WARRIOR, commensurate with three desired levels of learning.

The first level is concerned with the basic "arithmetic" of air campaigns. The player becomes familiar with the air orders of battle, his options and constraints regarding apportionment and allocation, the short and long-term effects of emphasizing various counter-air missions, the basic implications of warning time and levels of reinforcement, etc., etc. Perhaps most importantly, the player learns to

recognize and control trends in attrition over several days of action. At this first level, all battle outcomes are deterministic, and enemy strategies are pre-selected and fixed. This allows the player to conduct controlled, repeatable experiments with his operational strategy. He can repeat a scenario to determine the effects of different strategies, or can recall a particular situation from a previous game, make a different decision and observe the difference in results.

At a second learning level, the player will experiment with different scenario assumptions, operational assumptions, and planning factors. The game allows him to "edit" a scenario to change any of these items and then replay with all other elements remaining the same. The player may experiment readily. He learns the effects of the assumptions and planing factors built into war plans and develop a feel for the implications of those assumptions not proving valid.

At the third training level, "Monte Carlo" events are introduced and the player discovers some of the subtleties of operational art. He will learn to cope with uncertainty and randomness, and to out think an enemy whose plans are unknown and who reacts to his moves. The player's experience gained in thinking through such problems is, in and of itself, the learning benefit. To enable this level of learning, a "strategy generator" for the non-player side will be created in Phase II.

**Planned and Potential Developments**

COMBAT WARRIOR, in the form currently under development, is an educational aid specifically directed to the scenario faced by COMAAFCE and his immediate operations staff. However, it could easily be adapted to several other air-land scenarios and purposes. Other games can be designed in the same vein, but with different focuses and structures for a variety of scenarios and applications. Alternate scenarios may include other air-land scenarios, air-sea, and air-land-sea scenarios, both specific and generic, and other command echelons. Applications, other than as a self-education aid, might include decision aids for command centers and course aids for a formal academic environment.

Frontier is working on a FY89 Phase I SBIR contract for AF Human Resources Laboratory to investigate, demonstrate, document, and validate techniques for game design and for evaluation of games as educational aids. This project will guide future game developments, make them more efficient, and make their educational values more quantitatively demonstrable.

LAPWAR is a game currently being developed by Frontier under contract with DARPA to develop and demonstrate a two player game, based on COMBAT WARRIOR, in which the competitors play on linked laptop computers.

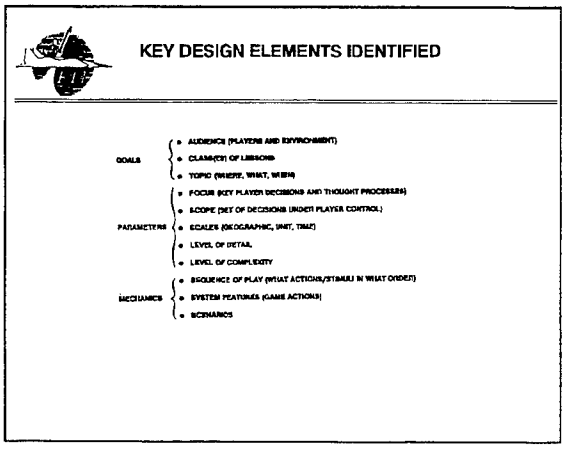
*Korea and Southwest Asia Versions.* The Phase II version of COMBAT WARRIOR will simulate the NATO Central Region. Korea presents a similar military situation: primarily an air-land campaign fought by extremely dense forces over a short frontage. Thus, a Korean version of COMBAT WARRIOR could easily be constructed. Some Southwest Asian scenarios could also be readily adapted.

*Joint Air-Sea-Land Operations.* The operational version of COMBAT WARRIOR will simulate the NATO Central Region, and air-land scenario in which naval forces play a minimal direct role. However, as Gen John R. Galvin USA recently wrote, "...an understanding of joint and combined operations is quint-essential in developing strategists. Today's military map is not a flat piece of paper; it is a cube; it has three dimensions land, sea, and air". (Defense 89, Jan/Feb 89, page 27.) It would be highly desirable to provide a version of COMBAT WARRIOR in which naval forces--including naval air forces--were integrated. An air-land-sea version would allow players to develop insights and understanding into PACOM and NATO Northern/Southern Region scenarios.

*Decision Aid.* There are needs for fast-running simulations as a decision aid, for air commanders and their staffs, to be used in actual war or exercises. A decision-aid version of a campaign game would allow commanders and staffs to simulate several days of combat and determine whether current trends are likely to lead to success or failure. They could make quick projections of trends which could be expected from interactions of various possible enemy and friendly strategies, and thereby foresee key problems that might arise in actual operations. Air Force staffs

currently have no tool for this purpose which is nearly as fast running or easy to use as COMBAT WARRIOR.

If COMBAT WARRIOR were adapted for this purpose, an important feature would be added: the ability to insert operational data from real/exercise engagements. Observed kill probabilities, exchange ratios, logistical consumption, etc. would replace original planning-sector values. Observed trends in enemy strategies could also be incorporated which would greatly enhance the credibility and validity of the decision aid.




*Academic Aid.* A game designed as a self-education aid would obviously be adaptable to a formal academic environment (e.g., intermediate/senior service schools), whether as an adjunct to resident, seminar, or correspondence programs. An innovative variation would be to use head-to-head, competitive two-player games to foster spirited student participation and interest, perhaps in a tournament form.

**Reader Feedback**

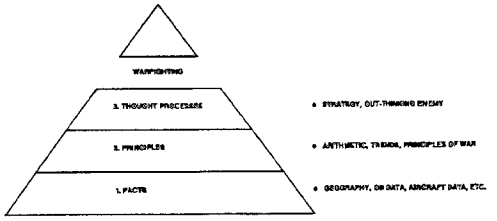
Frontier would appreciate your responses and ideas regarding the concepts addressed in this paper. We are particularly interested in definitizing requirements and applications for games as education/decision aids and in identifying Government organizations which might support further game developments.

We are pleased to provide a demonstration of COMBAT WARRIOR to any Government agency.

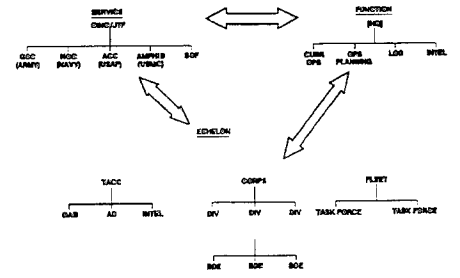
Please contact Ed Jordan, Brian Wintz or Clark Rich at (805) 965-2477 or write us at:

Frontier Technology, Inc.
530 E. Montecito St., Suite 105
Santa Barbara, CA 93103

## THREE CLASSES OF INTELLECTUAL LESSONS IDENTIFIED




## SCOPE, SCALE AND FOCUS ANALYZED BY SERVICE, ECHELON, FUNCTION




## THE TRAINING CHALLENGE: SELF-EDUCATION FOR BATTLE MANAGERS/STAFFS

- DEVELOP JUDGEMENT AND INSIGHT INTO KEY WARFIGHTING ISSUES
- EXPERIENCE ESSENTIAL DYNAMICS OF THEATER AIR CAMPAIGN
- EXPERIMENT WITH EFFECTIVE STRATEGIES AND COUNTERS
- DEVELOP OPERATIONAL ART

## CURRENT TRAINING PROGRAMS LIMITED

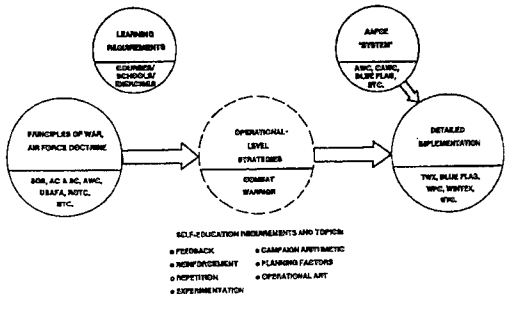
- MOST ORIENTED TOWARDS LOWER ECHELONS
- EXERCISES HEAVILY PRESCRIPTED--LITTLE DECISION MAKING
- NO FOLLOW-UP TO COURSES
- NO EXPERIMENTATION OR FEEDBACK
- INSIGHT AND UNDERSTANDING NOT DEVELOPED

– CONTINUING EDUCATION AT PERSONAL LEVEL IS NEEDED

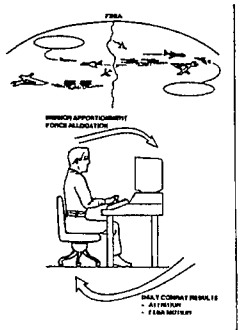
## EDUCATIONAL GOALS ACHIEVED THROUGH GAME DESIGN TECHNOLOGIES

- PROGRESSIVE LEVELS OF LEARNING OBJECTIVES
- FOCUS PLAYER ATTENTION ON CRITICAL DECISIONS
- EASY LEARNING, HIGH PLAYABILITY, SHORT PLAY TIME
- USE START/STOP/RECALL TO STUDY CHANGING STRATEGIES, SCENARIOS, AND ASSUMPTIONS

## COMBAT WARRIOR FILLS CURRENT LEARNING VOID -- CONVERTING PRINCIPLES OF WAR TO STRATEGIES



## "COMBAT WARRIOR" GAME - EDUCATION AID FOR AIR COMMANDERS




CONTRACTOR: FRONTIER TECHNOLOGY

CUSTOMER: AIR FORCE SYSTEMS COMMAND ELECTRONIC SYSTEMS DIV. (ESD/AVSP)

STATUS: PHASE I DEMO, FEB 89
PHASE II CONTRACT START, SEP 89

OVERALL OBJECTIVE: DEVELOP WAR GAME OF TWO SIDED THEATER-LEVEL AIR CAMPAIGN FOR SELF-EDUCATION AIR BATTLE MANAGERS

GAME FEATURES:

- PLAYER COMMAND AT AAFCE/ATAF LEVELS
- FOCUS ON ALLOCATION/APPORTIONMENT DECISIONS AN ATTRITION MANAGEMENT
- HOSTED ON PC
- SOLITAIRE
- EASY TO LEARN, QUICK TO PLAY, HIGHLY ENJOYABLE
- GREAT VARIATION OF SCENARIOS, PLANNING FACTORS
- RECALL/REPLAY
- STRAIGHTFORWARD DEVELOPMENT INTO DECISION AID

## PLAYER OPTIONS ALLOW STUDY OF DIFFERENT SCENARIOS AND KEY PARAMETERS

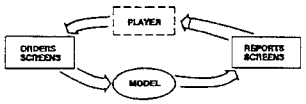
PLAYER OPTIONS: DATA ITEMS OR PARAMETERS NOT UNDER REAL COMMANDER'S CONTROL, BUT WHICH PLAYER MAY VARY TO EXPERIMENT WITH DIFFERENT SCENARIOS OR ASSUMPTIONS

- SCENARIO FACTORS: ORDER OF BATTLE, REINFORCEMENTS, LOGISTICS, ETC.
- PLANNING FACTORS: AIR COMBAT EXCHANGE RATIOS, LETHALITY, SURVIVABILITY, SORTIE RATE, ETC.

## PLAYERS ADVANCE THROUGH PROGRESSIVE LEVELS OF LEARNING

| | LEARNING OBJECTIVE | SIMULATION FEATURES |
|---|---|---|
| LEVEL 1 | ARITHMETIC OF CAMPAIGN MANAGEMENT<br>o MISSION APPORTIONMENT STRATEGY<br>o ATTRITION MANAGEMENT | o FIXED AND SELECTIVE ENEMY STRATEGIES<br>o DETERMINISTIC BATTLE OUTCOMES<br>o ORDERS MAY BE FIXED TO STUDY TRENDS<br>o START/STOP/RECALL |
| LEVEL 2 | APPRECIATION OF PLANNING FACTORS<br>o EFFECTS OF SCENARIO/AOB ASSUMP.<br>o EFFECTS OF OPERATIONAL AND LOGISTICS ASSUMPTIONS<br>o REACTION TO VARIATIONS | o SELECTABLE OPERATIONAL PARAMETERS AND SCENARIO<br>o FUZZY INPUTS FROM INTELLIGENCE |
| LEVEL 3 | ART OF OPERATIONAL COMMAND<br>o DAILY VARIATIONS VS. UNPREDICTABLE ENEMY<br>o ACCOMMODATING UNCERTAINTY<br>o EMPLOYING DECEPTION<br>o REACTION TO SURPRISES | o REACTIVE OPPOSITION—MODELS HUMAN OPPONENT<br>o RANDOMIZED BATTLE OUTCOMES, WEATHER, ETC.<br>o CONTROL OF INTEL RESOURCES |

## PLAYER COMMUNICATES WITH UNDERLYING MODEL THROUGH "ORDERS" AND "REPORTS"




ORDERS MENU
1. FORCE POTURE/AIR-TO-AIR ALLOTMENT
2. ATTACK ALLOTMENT
3. ATTACK APPORTIONMENT
4. SPECIAL ASSETS ALLOTMENT
5. RECONN ALLOCATION
6. TIMESYNC
7. LEVEL OF EFFORT

REPORTS/DIRECTIVE MENU
1. MISSION SG DIRECTIVE
2. TARGET SUMMARY
3. SITUATION MAP
4. OPERATIONS ASSESSMENT
5. AIR STATUS REPORTS
6. INTELLIGENCE SUMMARY
7. REVIEW AIR DIRECTIVE

## "ORDER SCREENS" SIMULATE AIR DIRECTIVE DEVELOPMENT

ATTACK APPORTIONMENT

GENERAL, HOW DO YOU WISH TO APPORTION YOUR ATTACK FORCES?

Please indicate your desired priorities by entering number shown - as listed at left - for each mission and ATAF.

| PRIORITY ORDER | APPORTIONMENT Mission | 2ATAF | 4ATAF |
|---|---|---|---|
| 4 - Very High | ORS | 4 | 4 |
| 3 - High | OCA | 3 | 3 |
| 2 - Moderate | AI | 2 | 2 |
| 1 - Low | | | |
| 0 - Zero | | | |

FORCES AVAILABLE

| | FTR | SAh | LAh |
|---|---|---|---|
| 2 ATAF ONLY | 30% | 0% | 0% |
| 4 ATAF ONLY | 42% | 33% | 0% |
| WITHIN ATAF | 28% | 67% | 100% |

YOUR ALLOTMENT
2 ATAF 50%
4 ATAF 50%

Press 'P' to enter attack apportionment by percentages

ORDERS | REPORTS | ASSISTANCE | RESCUE | QUIT/SAVE

- PLAYER MAY GIVE ORDERS BY PRIORITIES OR PERCENTAGES
- "REPORTS SCREENS" SIMULATE ACTUAL NATO REPORTS, GIVE DETAILED INFORMATION

## "REPORTS SCREENS" PROVIDE OPS/INTEL/LOG STATUS

INTELLIGENCE SUMMARY

WARSAW PACT AIR ORDER OF BATTLE
This screen shows current estimates of Warsaw Pact aircraft totals, forecast deployments, and forecast effort.

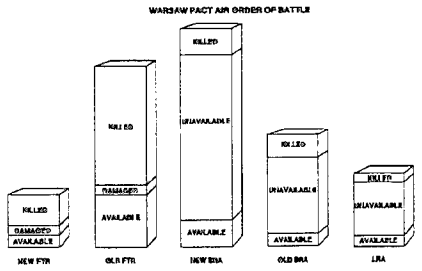
| Type | Aircraft Available | Aircraft Under Repair | Aircraft Waiting to be Repaired | Fraction Sorts Open |
|---|---|---|---|---|
| NEW FTR | 81 | 15 | 0 | 100% |
| OLD FTR | 250 | 45 | 0 | 100% |
| NEW SRA | 1131 | 6 | 0 | 14% |
| OLD SRA | 494 | 8 | 0 | 14% |
| LAh | 169 | 3 | 0 | 14% |
| TOTAL | 2124 | 73 | 0 | |

FORECAST WARSAW PACT WEIGHT OF EFFORT

| | | | |
|---|---|---|---|
| OCA: | Heavy | AI: | Low |
| OAR: | Moderate | SCA: | Moderate |

PRESS <ENTER> TO PROCEED

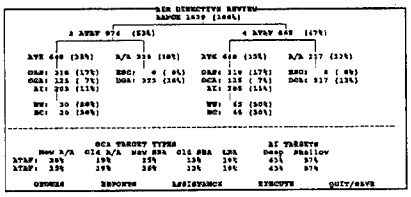
## ORDERS/REPORTS TEXT REFLECTED IN GRAPH FORM




## DEMO AT HQ USAF HIGHLY SUCCESSFUL

- XOO, XOX STAFF ATTENDED
- MSG FOLLOWED FROM MG WEBB (XOO) TO ESD:
  - "COMBAT WARRIOR HAS BEEN DEMONSTRATED TO MY STAFF WITH EXCELLENT RESULTS. . .SHOULD BE EXPANDED PAST THE DEMONSTRATION PHASE."
  - "I ENCOURAGE CONTINUED DEVELOPMENT. . .AND OFFER MY STAFF'S EXPERTISE AND ASSISTANCE."
  - "IT SHOULD BE GIVEN TO THE USER COMMANDS FOR EVALUATION."

## PLAYER CAN REVIEW CURRENT DECISIONS AT ANY TIME




- NUMBERS OF AIRCRAFT AND PERCENTAGES DISPLAYED
- AIRCRAFT AGGREGATED INTO SIX TYPES

## AIR COMPONENT COMMANDER GAME (DARPA): DEVELOP AND DEMO TWO-PLAYER COMBAT WARRIOR

- DARPA/ITO CONTRACT
  - SUB THROUGH STI
  - AUG - DEC 90
- DEMONSTRATION OF COMBAT WARRIOR VARIANT
  - 1 vs. 1 PLAYER ON LINKED LAPTOP COMPUTERS
  - AIR COMPONENT COMMANDER ROLES
  - GENERIC, FLEXIBLE SCENARIOS
  - SCORING SYSTEM FOR TOURNAMENTS
- NUMEROUS POTENTIAL APPLICATIONS
  - PROJECT WARRIOR
  - SCHOOL/SEMINAR SUPPORT
  - COUNTERMOVE DECISION AID
  - MOTIVATOR FOR SOLITAIRE GAME PLAY
  - ETC./TBD

## GAME TECHNOLOGIES (HRL): DEVELOP AND DEMO TECHNOLOGIES FOR DESIGN, EVALUATION

- PHASE I SBIR AWARD
  - SPONSORED BY HRL/LRG, WPAFB
  - AUG 89 - FEB 90
- DEVELOP TECHNOLOGIES FOR GAME DESIGN:
  - FIDELITY vs. PLAYABILITY TRADEOFF
  - MULTIPLE/GRADUATED LEARNING OBJECTIVES
  - GENERIC vs. THEATER-SPECIFIC LESSONS
  - COMBINATION OF PLANNING AND CURRENT-OPS ROLES
- DEVELOP METHODS FOR EVALUATING EDUCATIONAL BENEFIT OF SIMULATIONS
  - EVALUATION THROUGH CONTROLLED EXPERIMENT
  - TESTING THROUGH HIGHER-ORDER GAME

## FEASIBILITY DEMO CONCLUDED FIRST OF THREE PHASES

**PHASE I: 40K, AUG 89 - FEB 90**

OBJECTIVES

- DEVELOP CONCEPTUAL DESIGN
- DEMONSTRATE POTENTIAL LEARNING UTILITY AN PC HOSTING
- PLAN PHASE II DEVELOPMENT

LIMITED DEMO AT HQ USAF/XOO, FEB 90

**PHASE II: 600K, 18 - 24 MOS, SEP 90 -**

OBJECTIVES

- PRODUCE "TURNKEY" SELF-EDUCATION AID
- DEVELOP NEW UNDERLYING MODEL
- ENABLE ADVANCED LEARNING

PRODUCT-LICENSED SIMUL FOR AAFCE/USAFE USE

**PHASE III: POTENTIAL FUTURE DEVELOPMENTS**

- AWC APPLICATIONS - - IN COURSES OR TAKE-HOME
- DECISION AID
- OTHER THEATERS, AIR/SEA/LAND SCENARIOS

## THE AIR BATTLE DECISION AID CHALLENGE: FAST, LOW-COST TOOLS NEEDED

- LTG HOSMER (PRESIDENT, NDU) CALLED FOR WARGAMES TO COMPARE OPERATIONAL CHOICES, USING LITTLE TIME OR MANPOWER
  - COMPARE DIFFERENT CONCEPTS OF OPERATIONS.
  - ADDRESS OPERATIONAL ISSUES PARAMETRICALLY
  - NARROW SCOPE OF ALTERNATIVES AND EVALUATE ALTERNATIVES RELATIVE TO EACH OTHER
- CINCS LACK TOOLS TO EVALUATE WAR PROGRESS/TRENDS
  - USE ACTUAL CONSUMPTION/EFFECTIVENESS/LOSSES
  - FORECAST: ON WINNING OR LOSING TRACK?
- CURRENT TOOLS TOO CUMBERSOME, TIME/MANPOWER INTENSIVE

## AID DECISIONS BY EXAMINING EFFECTS OF OBs

- ACTUAL OB (FRIENDLY FORCES + WARTIME INTEL) CAN BE USED IN GAME
- MAY DIFFER FROM PREWAR HYPOTHESES
- TEST PLANNED STRATEGIES WITH CURRENT OB
- TEST NEW STRATEGIES TO MEET CURRENT THREATS

## AID DECISIONS BY EXPLORING STRATEGIC EFFECT OF CRITICAL PARAMETERS

- PREWAR ESTIMATES OF CRITICAL PARAMETERS OFTEN WRONG
- USE COMBAT REPORTS AND INTEL TO FORM NEW ESTIMATES
- USE WARGAME TO ESTIMATE EFFECTS ON CURRENT STRATEGIES AND TEST ALTERNATIVE STRATEGIES
- WARGAMING REVEALS WHICH PARAMETERS CRITICAL UNDER WHICH CONCEPTS OF OPERATIONS

## AID DECISIONS BY TESTING EFFECTS OF DIFFERENT OPERATIONAL CHOICES

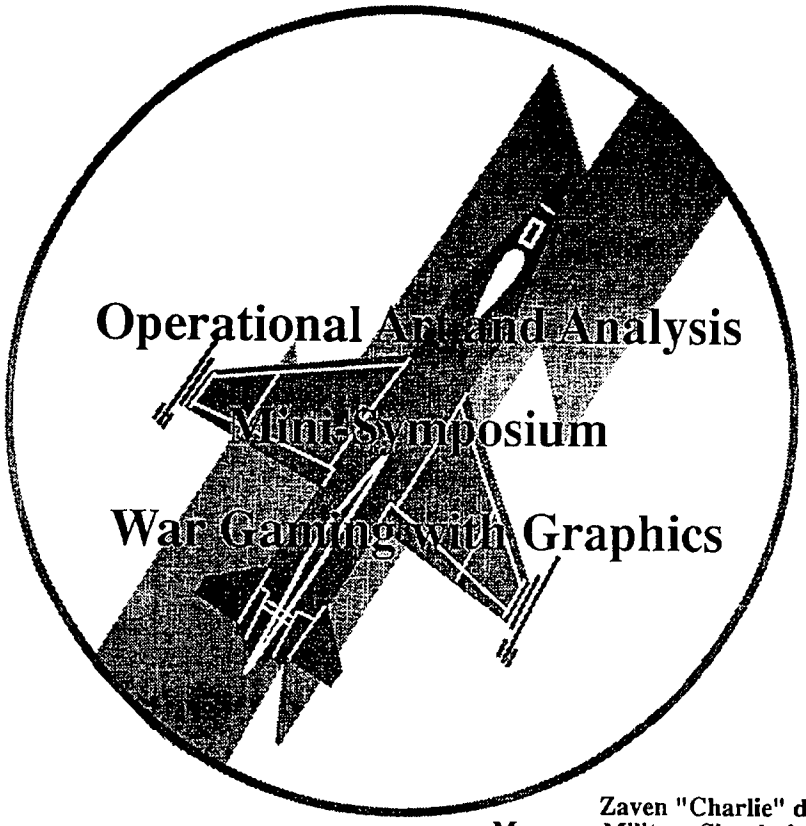
- CAN PREPROGRAM ENEMY AND FRIENDLY STRATEGIES, RUN ACTION FOR SPECIFIED NUMBER DAYS
- RUN MANY TIMES WITH DIFFERENT SELECTIONS TO ESTIMATE EFFECTS OF DIFFERENT CHOICES
- ADDRESSES OPERATIONAL ISSUES PARAMETRICALLY

## COMBAT WARRIOR DERIVATIVE WOULD AID AIR BATTLE DECISIONS

- TEST EFFECTS OF OPERATIONAL CHOICES
  - PLAY OUT NUMEROUS FRIENDLY/ENEMY OPERATION OPTIONS THROUGH SEVERAL DAYS
- DETERMINE REACTIONS TO ACTUAL SCENARIO AND BATTLE RESULTS
  - INPUT REAL OPERATIONAL DATA AND WARTIME INTEL TO GAME
    - ADB
    - ATTRITION
    - ETC
    - EXCHANGE RATIOS
    - MISSILE EXPENDITURE
  - DETERMINE DIRECTIONS OF TRENDS
  - TEST EFFECTS ON CURRENT STRATEGIES, POSSIBLE COUNTERS
  - PROJECT SHORTAGES
    - AIRCRAFT
    - SUPPLY
    - PERSONNEL
    - MUNITIONS
  - ALTER AIRLIFT FLOW

# Title: War Gaming and Graphics

The following Charts were used to brief the topic. No text was provided by the author for publication.




**Zaven "Charlie" der Boghossian**
**Manager, Military Simulation Department**

## War Games

- Many players -- Real time
- Computer simulation

## Analytical Model

- Few players -- More than 10 times faster
- Stochastic
- User control of all decisions

## War Game

- Few players
- Quick turn
- Change decision values
- See results and test again

*"This development method reduces the risk when compared to developing the 'artificial intelligence' needed to convert a manual war game into an interactive game containing the subordinate commander's decision rules.*

*Both WPC and NDU have concluded that the simulation that provides a complete theater-level conflict, has been accepted by the analytical community for use on major studies, has enough detail to allow commanders to request data at a level commensurate with the decisions being made, and is capable of running on their current computers in TAC THUNDER.*

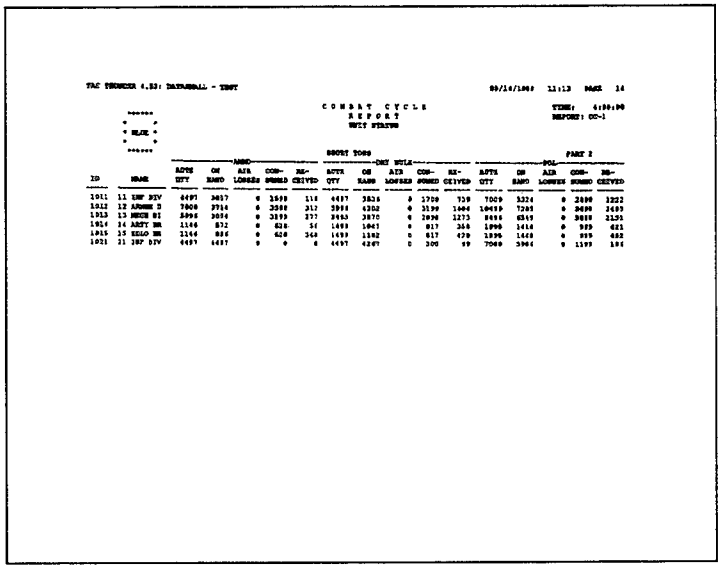
*In a separate study of current conflict models , the AF Human Resources Laboratory came to the same conclusion. Therefore, TAC THUNDER has been chosen to be modified to permit interactive war gaming."*

*"The National Defense University (NDU), the joint USAFE/USAREUR Warrior Preparation Center (WPC), and the Air Force Human Resources Laboratory (HRL) have identified the need for an interactive, joint service theater war game. The war game must permit decisions to be made by commanders of forces at the operational level of war.*

*In addition, there is a need for a war game that permits research and training in command and control in a joint service environment. However, neither of these war games should require a large number of people to play the subordinate command levels.*

*An interactive war game would provide an environment for senior commanders to make decisions and allow analysts to study numerous alternatives without dedicating excessive manpower to the project.*

*One method of developing this type of war game is to modify a systematic simulation that does not currently require human intervention. By externally modifying the decision rules that are in the model, a gamer can achieve the desired level of intervention."*



TAC THUNDER 4.53: DATABALL - TEST 09/16/1989 11:13 PAGE 14

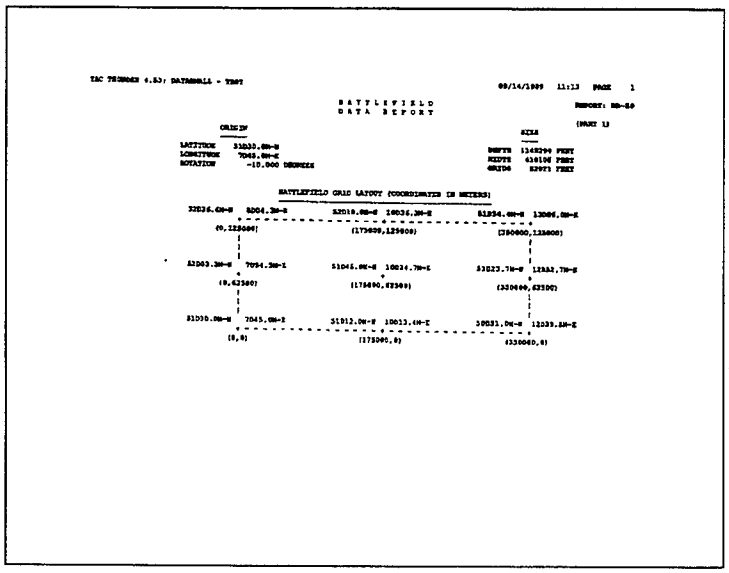
COMBAT CYCLE
REPORT
UNIT STATUS

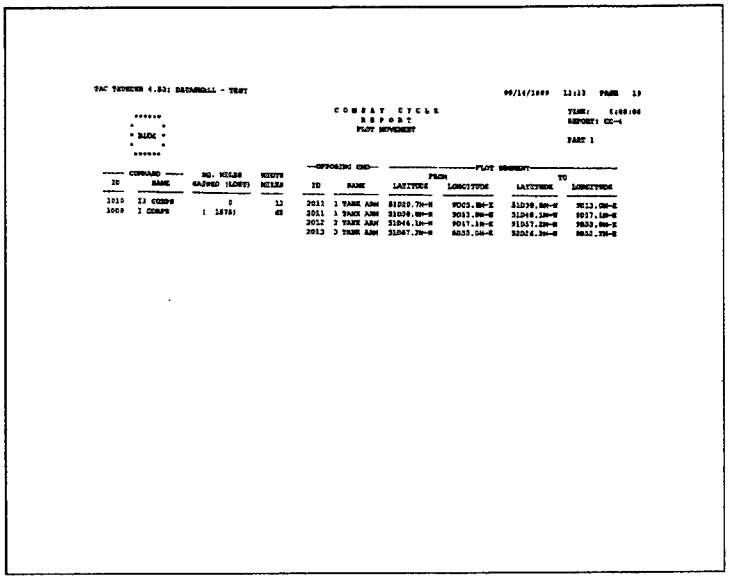
TIME: 4:00:00
REPORT: CC-1

BLUE

| ID | NAME | ARMD APTS QTY | ARMD OH RAMO | ARMD AIR LOSSES | ARMD CONSUMED | ARMD RECEIVED | SHORT TONS DRY BULK APTS QTY | SHORT TONS DRY BULK OH RAMO | SHORT TONS DRY BULK AIR LOSSES | SHORT TONS DRY BULK CONSUMED | SHORT TONS DRY BULK RECEIVED | POL APTS QTY | POL OH RAMO | POL AIR LOSSES | POL CONSUMED | POL RECEIVED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1011 | 11 INF DIV | 4491 | 3457 | 0 | 1698 | 118 | 4497 | 3836 | 0 | 1720 | 739 | 7009 | 5324 | 0 | 2898 | 1222 |
| 1012 | 12 ARMOR D | 7908 | 7714 | 0 | 3098 | 317 | 3988 | 6202 | 0 | 3139 | 1466 | 10439 | 7265 | 0 | 3698 | 2493 |
| 1013 | 13 MECH DI | 5898 | 3854 | 0 | 2198 | 177 | 3983 | 3870 | 0 | 1998 | 1273 | 8498 | 6549 | 0 | 3818 | 2135 |
| 1014 | 14 ARTY BR | 1146 | 872 | 0 | 626 | 54 | 1493 | 1041 | 0 | 617 | 368 | 1998 | 1418 | 0 | 929 | 621 |
| 1015 | 15 ECLO BR | 1146 | 884 | 0 | 626 | 348 | 1499 | 1182 | 0 | 617 | 479 | 1995 | 1448 | 0 | 959 | 682 |
| 1021 | 21 INF DIV | 4497 | 4487 | 0 | 0 | 6 | 4497 | 4247 | 0 | 300 | 99 | 7088 | 5984 | 0 | 1197 | 181 |

## Is a Picture Worth a Thousand Words?





TAC THUNDER 4.80: DARDANELLE - TEST 09/14/1989 11:13 PAGE 19

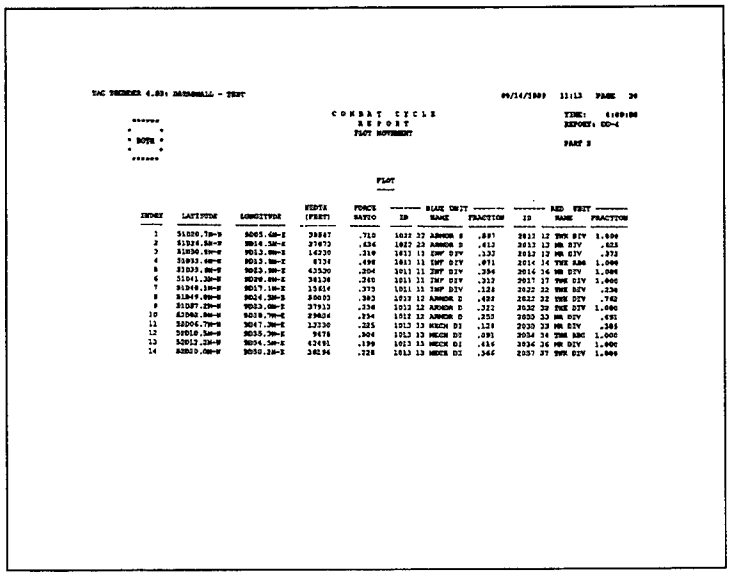
COMBAT CYCLE REPORT
PLOT MOVEMENT

TIME: 6:00:00
REPORT: CC-4

PART 1

BLUE

| COMMAND ID | COMMAND NAME | SQ. MILES GAINED (LOST) | MILES MOVED | OPPOSING END ID | OPPOSING END NAME | PLOT SEGMENT FROM LATITUDE | FROM LONGITUDE | TO LATITUDE | TO LONGITUDE |
|---|---|---|---|---|---|---|---|---|---|
| 1010 | II CORPS | 0 | 12 | 2011 | 1 TANK ARM | 31D20.7N-E | 9D05.6N-E | 31D30.8N-E | 9D13.0N-E |
| 1009 | I CORPS | ( 1675) | 62 | 2011 | 1 TANK ARM | 31D28.9N-E | 9D13.9N-E | 31D48.1N-E | 9D17.1N-E |
| | | | | 2012 | 3 TANK ARM | 31D46.1N-E | 9D17.1N-E | 31D57.2N-E | 9D33.9N-E |
| | | | | 2013 | 3 TANK ARM | 31D47.3N-E | 9D33.0N-E | 32D14.3N-E | 9D32.7N-E |



TAC THUNDER 4.80: DARDANELLE - TEST 09/14/1989 11:13 PAGE 20

COMBAT CYCLE REPORT
PLOT MOVEMENT

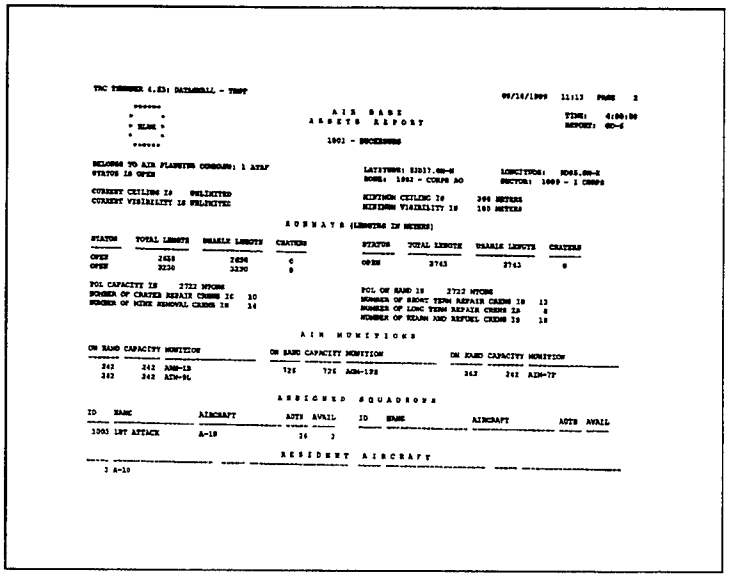
TIME: 6:00:00
REPORT: CC-4

PART 2

BOTH

PLOT

| INDEX | LATITUDE | LONGITUDE | WIDTH (FEET) | FORCE RATIO | BLUE UNIT ID | BLUE UNIT NAME | BLUE UNIT FRACTION | RED UNIT ID | RED UNIT NAME | RED UNIT FRACTION |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31D20.7N-E | 9D05.6N-E | 39847 | .710 | 1022 | 22 ARMOR D | .887 | 2012 | 12 TNK DIV | 1.000 |
| 2 | 31D24.5N-E | 9D14.5N-E | 37672 | .636 | 1022 | 23 ARMOR D | .613 | 2013 | 13 MR DIV | .623 |
| 3 | 31D30.8N-E | 9D13.0W-E | 14230 | .319 | 1013 | 13 INF DIV | .133 | 2012 | 12 MR DIV | .372 |
| 4 | 31D33.4N-E | 9D13.5E-E | 8134 | .498 | 1013 | 11 INF DIV | .871 | 2014 | 14 TKE ARM | 1.000 |
| 5 | 31D39.8N-E | 9D23.9N-E | 43520 | .204 | 1011 | 11 INF DIV | .394 | 2014 | 14 MR DIV | 1.000 |
| 6 | 31D41.2N-E | 9D29.8N-E | 34138 | .340 | 1011 | 11 INF DIV | .313 | 2017 | 17 TNK DIV | 1.000 |
| 7 | 31D48.1N-E | 9D17.1W-E | 15814 | .373 | 1011 | 15 INF DIV | .128 | 2022 | 22 TKE DIV | .234 |
| 8 | 31D49.0N-E | 9D24.5N-E | 80003 | .383 | 1033 | 12 ARMOR D | .492 | 2022 | 32 TKE DIV | .742 |
| 9 | 31D57.2N-E | 9D33.9N-E | 37912 | .234 | 1012 | 12 ARMOR D | .322 | 2032 | 32 TKE DIV | 1.000 |
| 10 | 32D02.0N-E | 9D39.7W-E | 29824 | .254 | 1012 | 12 ARMOR D | .255 | 2030 | 33 MR DIV | .691 |
| 11 | 32D06.7W-E | 9D47.3W-E | 12230 | .225 | 1013 | 33 MECH DI | .128 | 2030 | 33 MR DIV | .386 |
| 12 | 32D10.5N-E | 9D33.7W-E | 9478 | .304 | 1013 | 13 MECH DI | .091 | 2034 | 34 TNK ARM | 1.000 |
| 13 | 32D12.2N-E | 9D34.5W-E | 42491 | .199 | 1013 | 13 MECH DI | .616 | 2034 | 34 MR DIV | 1.000 |
| 14 | 32D19.0N-E | 9D50.2E-E | 36296 | .228 | 1013 | 13 MECH DI | .566 | 2037 | 37 TNK DIV | 1.000 |



TAC THUNDER 4.83: DAYLIGHT, - TROP

99/14/1999 11:13 PAGE 2

TIME: 4:00:00
REPORT: SD-6

AIR BASE
ASSETS REPORT

1902 - DOCKSIDE

BELONGS TO AIR PLANNING COMMAND: 1 ATAF
STATUS IS OPEN

LATITUDE: 52017.00-N
ZONE: 1902 - CORPS AO

LONGITUDE: 0065.00-E
SECTOR: 1000 - 1 CORPS

CURRENT CEILING IS UNLIMITED
CURRENT VISIBILITY IS UNLIMITED

MINIMUM CEILING IS 300 METERS
MINIMUM VISIBILITY IS 100 METERS

RUNWAYS (LENGTHS IN METERS)

| STATUS | TOTAL LENGTH | USABLE LENGTH | CRATERS |
|---|---|---|---|
| OPEN | 2438 | 2438 | 0 |
| OPEN | 3230 | 3230 | 0 |

| STATUS | TOTAL LENGTH | USABLE LENGTH | CRATERS |
|---|---|---|---|
| OPEN | 3743 | 3743 | 0 |

POL CAPACITY IS 2722 MTONS
NUMBER OF CRATER REPAIR CREWS IS 10
NUMBER OF MINE REMOVAL CREWS IS 14

POL ON HAND IS 2722 MTONS
NUMBER OF SHORT TERM REPAIR CREWS IS 12
NUMBER OF LONG TERM REPAIR CREWS IS 6
NUMBER OF REARM AND REFUEL CREWS IS 10

AIR MUNITIONS

| ON HAND | CAPACITY | MUNITION |
|---|---|---|
| 262 | 262 | AMM-13 |
| 262 | 262 | AIM-9L |

| ON HAND | CAPACITY | MUNITION |
|---|---|---|
| 726 | 726 | AGM-17B |

| ON HAND | CAPACITY | MUNITION |
|---|---|---|
| 263 | 262 | AIM-7F |

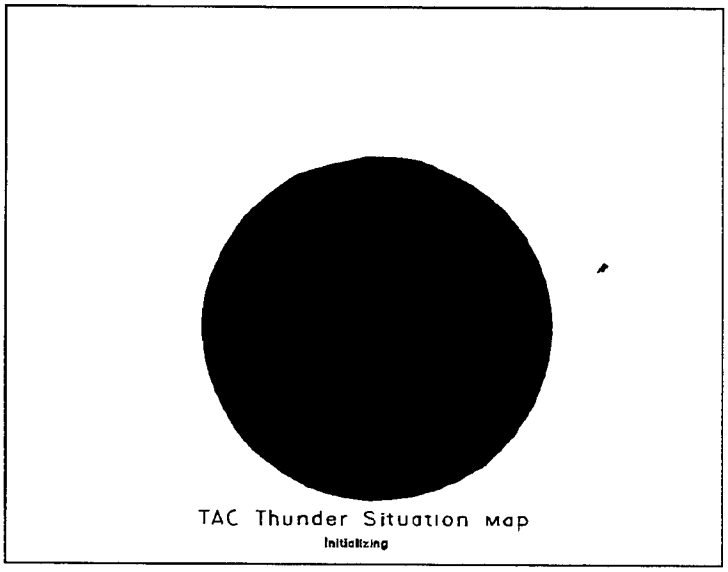
ASSIGNED SQUADRONS

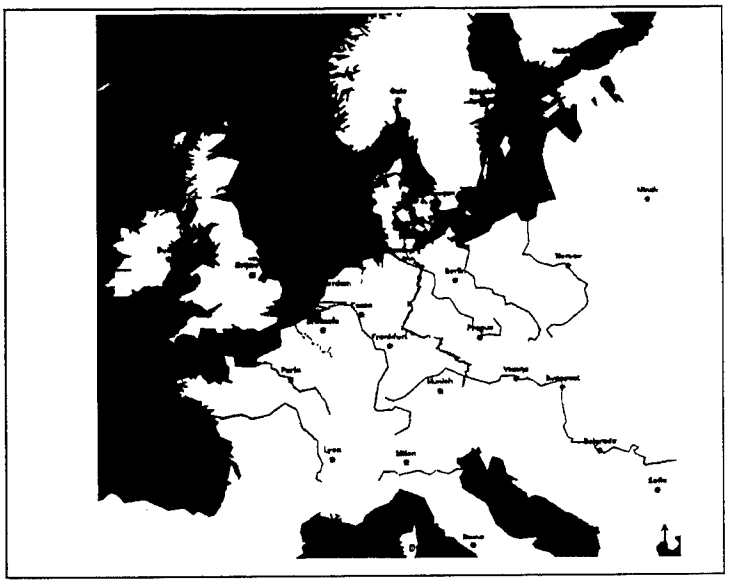
| ID | NAME | AIRCRAFT | ACFT | AVAIL |
|---|---|---|---|---|
| 1003 | INT ATTACK | A-10 | 16 | 2 |

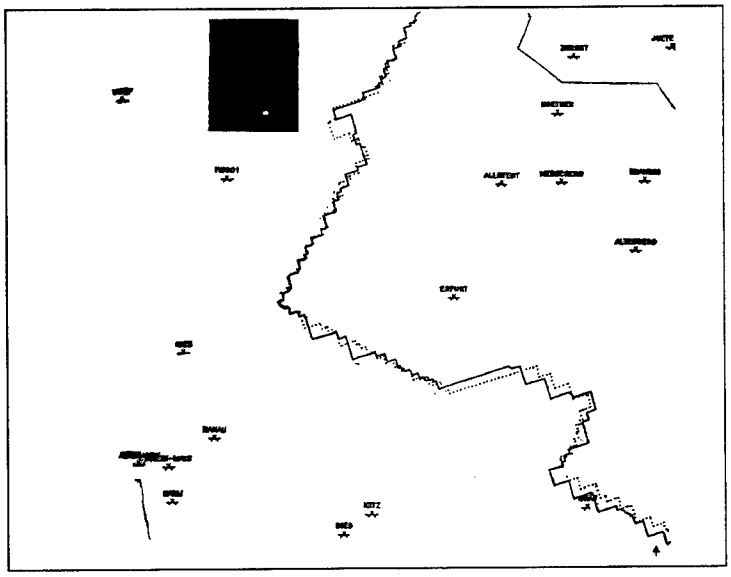
| ID | NAME | AIRCRAFT | ACFT | AVAIL |
|---|---|---|---|---|

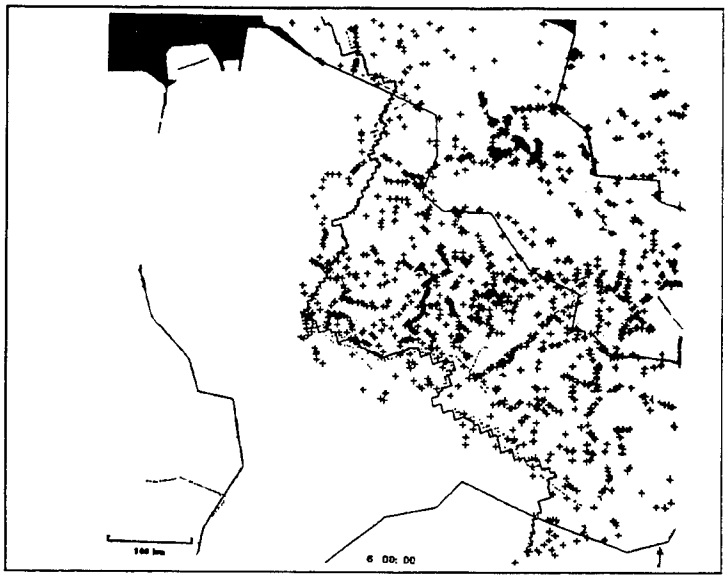
RESIDENT AIRCRAFT

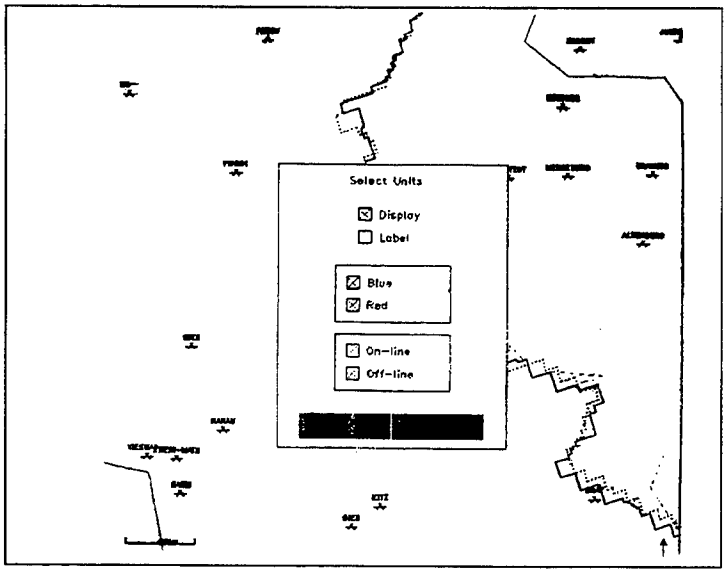
3 A-10





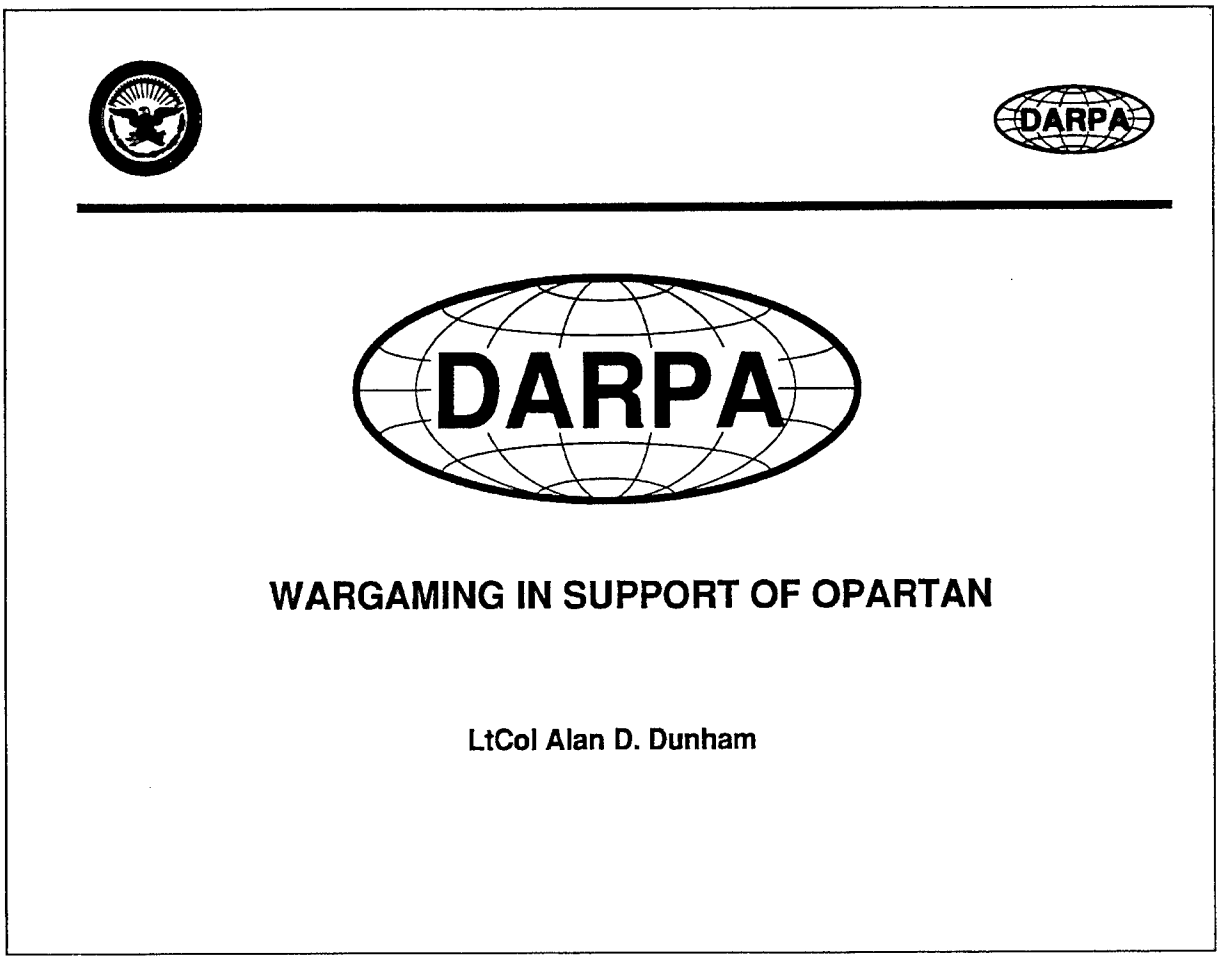





Select Units
Display
Label
Blue
Red
On-line
Off-line

# Title: Wargaming in Support of Operational Art and Analysis

The following charts were used to brief the topic. No text was provided by the author for publication.



## AGENDA

- Glimpse of ACE 89
- Pure Simulation vs. Wargame
- Current OPARTAN limits in wargaming
- A FEW IDEAS

## WARGAME CONTEXT

The type of wargame referred to in this briefing is used primarily to provide an environment for commanders, their staffs, and other individuals to learn operational art.

## Overall Objective




## KEY SUPPORT

| | |
|---|---|
| GEN GALVIN | USCINCEUR |
| GEN KIRK (GEN DUGAN) | CINCUSAFE |
| GEN SAINT (GEN OTIS | CINCUSAUER |
| DR COSTELLO | USD (A) |
| DR DUNCAN | DDR&E |
| MG BOICE | JCS/J-7 |

## WARGAME MEASUREMENT

### Interactive Wargames for Commanders

- Focus is on training objectives
  - Not a symmetric game
  - No winner or loser
- Unpredictable, non-scripted, free play
  - Many decision variables
  - Stochastic, dynamic process
  - Cannot be replicated as experiment

Measurements provide support

- Lessons learned
- Operational insights

### Modeling / Simulation Requirements

- **Training Commanders and Staffs**
  - Interactive (human vs human)
  - Continous play
  - Theater specific C2, data
  - Models less precise, more functions
- **War/Staff Colleges**
  - Sometimes interactive
  - Interruptable
  - Multiple theaters
  - Flexible C2
- **Analysis (weapons, sensors)**
  - Sometimes interactive
  - Experimental design/replication
  - Select hogh detail, resolution
  - Nonessential functions ignored

USCINCEUR DISTRIBUTED WARGAMING SYSTEM

## BROAD TECHNICAL APPROACH

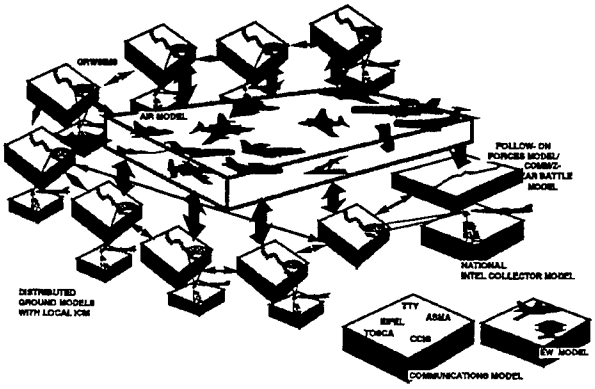
- BUILT ON WPC
- SIGNIFICANT WPC HARDWARE UPGRADE
- CORPS WARGAMING KITS EXPANDABLE
- FLEXIBLE OPERATIONAL APPROACH
- MODEST SOFTWARE ENHANCEMENTS
- ACCOMODATE FUTURE SOFTWARE UPGRADES

USCINCEUR DISTRIBUTED WARGAMING SYSTEM

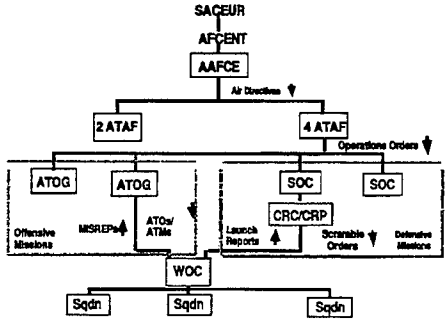
## FLEXIBLE OPERATIONAL APPROACH

- WPC CONTROLS GAME GROUND TRUTH AT WPC
- INTELLIGENCE AT WPC
- AIR WAR AT WPC
- GROUND WAR AT CORPS OR WPC
  - CORPS WARGAME CAN BE ANYWHERE
  - CORPS CAN BE SEPERATED OR RELOCATED
  - CORPS HAVE MORE PERCEIVED CONTROL
  - SIGNIFICANT STAND-ALONE CAPABILITY

## ACE 89 Overview
## 8 Corps




## Representative Command and Control Structure



**Example 42. SITREP Command**

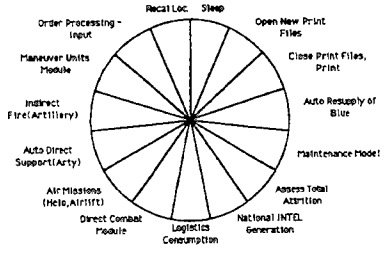
Press RETURN.

The following screen should appear:

```
SITUATION REPORT:  Unit #    50          ART PLAT/BN2GE-A    [TIME = H+ 164.63]

                POSITION          |  RTA
 CURRENT     :  32U PA50897144          0.00
 NEXT MOVE   :
 DESTINATION:                                 POSTURE     :  UNIT AVAIL
 ORIENTATION:  NE                             STRENGTH    :  1452.1  (  144.6
               MISSIONS                       MOPP LEVEL  :  0
 START TIME  :                                CONTAMINATED?  NO
 ORDNANCE    :                                THRESHOLD          :    0.0 %
 PRIMARY TGT :  32U PA50897144                MAX OVERLAND SPEED:   30.0 MPH
 ALTERNATE TGT:                               CARRYING CAPACITY :  431.0 TONS
 ART/AIR RNG :      77.7 MILES                NUMBER OF AIRCRAFT:    0.0
                                              AIR SPEED          :    0.0 MPH
 DAMAGE/VOLLEY:     10.0 %
                                              ENTER:  (CR) - for MAIN MENU
                                                      1 - for SUPPLIES
                                                      2 - for WEAPONS
                                                      3 - for PERSONNEL
                                                      4 - for RELATED MSNs
                                                      5 - for PENDING ORDERS
                                                INPUT:
UNIT TYPE:  ARTILLERY  / LANC / PLT
FOFA      :  NO
```

## Ground Model Subcycles



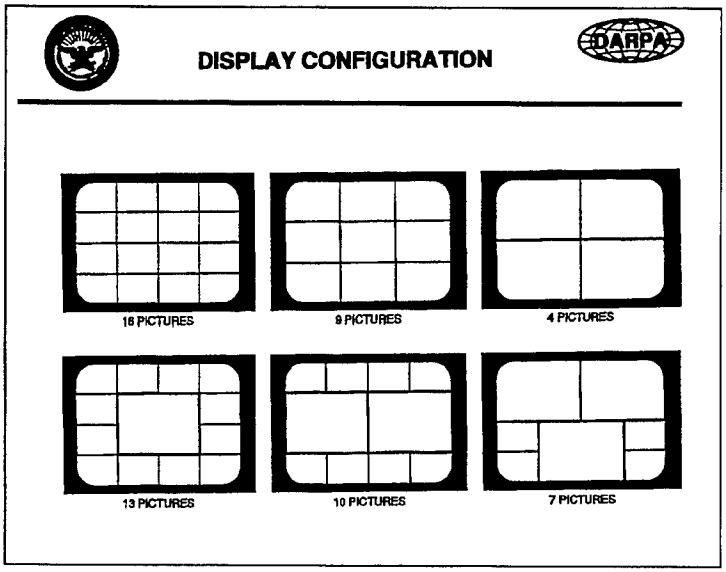
Now that we have reviewed all of the options available from the SITREP Submenu, we need to return to the Main Menu. In order to return to the Main Menu, just press the RETURN key.

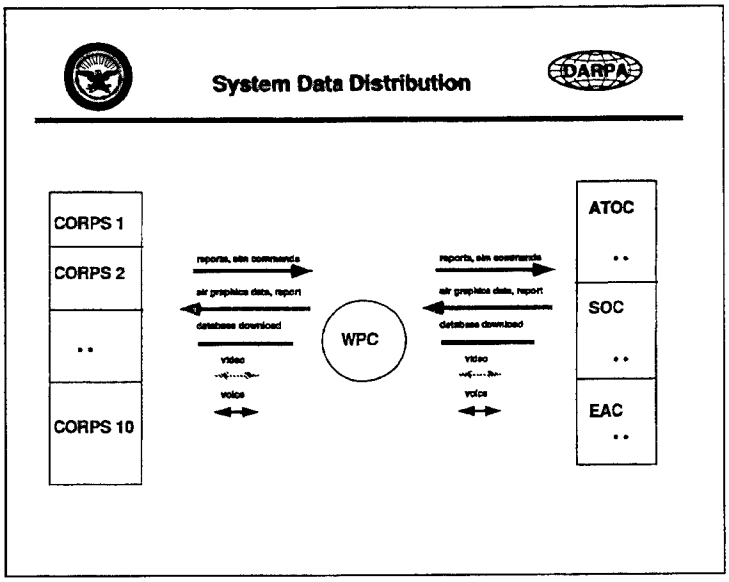
9.2 *Main Menu.*

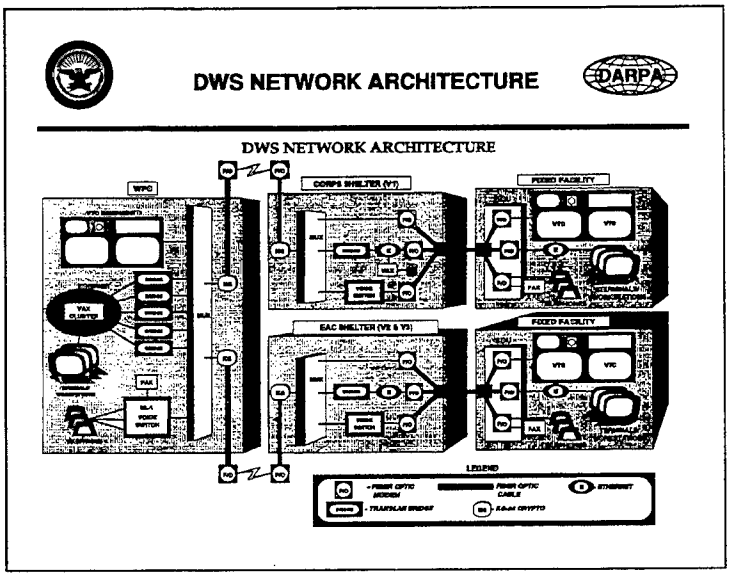
```
 BLU COMMANDER, Commanding NATO, What is your command SIR?
(Time is H+ 121.79 hours, or EXERCISE Day   2 0347 hrs; NITETIME - CLEAR   )


                              Joint Warrior Simulation
NATO                                                                    BLUE
Available Player Orders:                  * = Order can be entered with line number
\\\\\\ 1.              8.DECON              15,MOVE      *     22.
 Type \ 2.AIRLIFT   *     9.ENGAGE    *     16.MOPP            23.SITREP
 ##   \ 3.AUTO RESUP *  10.                 17.ORIENT          24.TERRSHOLD*
 for  \ 4.CANCEL        11.FIRE      *     18.REPORT          25.TRANSPORT*
 MASS \ 5.DEFEND        12.POFA      *     19.PRINT MSG NAME*26.
 Order\ 6.DISENGAGE     13.GROUND ROUTE *  20.RECON           27.ATKHELO
 Menu \ 7.              14.INTEL/EW *      21.RESUPPLY        28.STOP
```

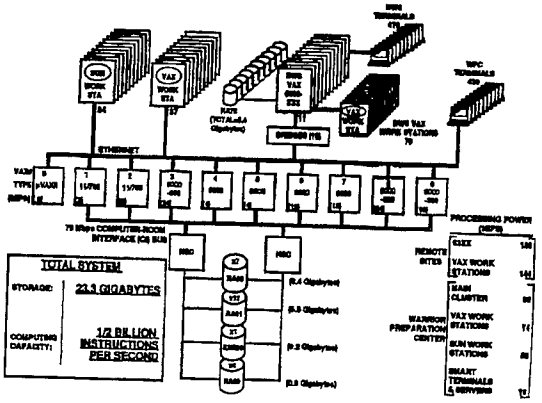
**Example 50. Main Menu Screen**




System Data Distribution
DARPA
CORPS 1
CORPS 2
CORPS 10
WPC
ATOC
SOC
EAC
reports, site commands
air graphics data, report
database download
video
voice

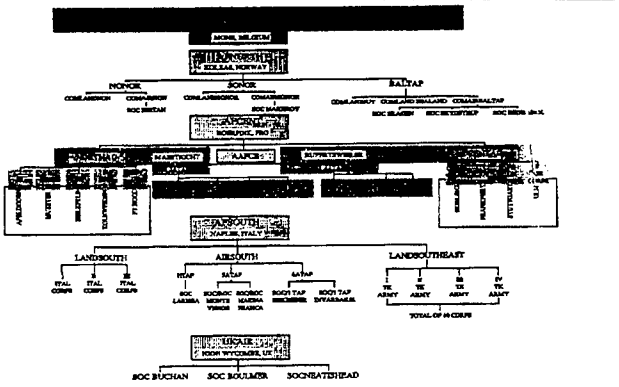

DWS NETWORK ARCHITECTURE
DARPA
DWS NETWORK ARCHITECTURE
WPC
CORPS SHELTER (V7)
FIXED FACILITY
EAC SHELTER (V5 & V3)
FIXED FACILITY
LEGEND

## ACE 89 DWS CONFIGURATION




## ACE 89 ORGANIZATION

DARPA



## SENIOR COMMANDER WARGAMING

- INTERACTIVE (HUMAN OPPONENT)
- APPEARS TO BE WAR
- RECEIVE SITREPS, INTELSUMS, ETC., THROUGH NORMAL CHANNELS
- ISSUE ORDERS THROUGH NORMAL CHANNELS
- VALUE ENCHANCED BY VTC

## POST HOC ANALYSIS - ACE 89

- Demonstrated the need for some tactical intelligence data at the operational level
- Interactive nature of the wargame demonstrated need for flexibility and coordinatin of OA during a coalition war
- Illustrated need for vertical dissemination of operational concepts] and impart OA training to their subordinates
- Surfaced the importance of political interactins at the OA level

## OPERATIONAL ART ANALYSIS COMMENTS

- Uncertainty dominates war: No plan works as planned
- Commander's AD HOC planning can be helped by science, but is still art
- OPARTAN focus should be on planning before combat and aiding AD HOC planning during combat
- Opportunities to learn OPART are called wargames, exercises, combat
- Simulation can play a major supporting rle in wargames, exercises, data collection, analysis, and even during combat

## OPARTAN OBJECTIVE

- Support OPART decision making
  - War Plans
  - Force Structure
  - CONOPS
  - Real-time assessment of Force-On-Force combat resolution
- Further knowledge of OPART
  - Support prediction of future combat
  - Post-HOC analysis of combat, wargames, and analytic combat simulation
  - Data Collection
  - Analysis

## CURRENT WARGAME SHORTFALLS FOR OPARTAN

- Commanders have limited choice on level of play
- Expense
  - Manpower to support players
  - Communications
  - Time
    - Current systems run 1:1 in real-time
- "What If" excursions for compaign analysis
- Quality of OPFOR varies
- Data collection difficult and inadequate to support analysis
- Limited availability

## ANALYTIC COMBAT SIMULATION vs. WARGAMING

| | ANALTIC COMBAT SIMULATION | WARGAME |
|---|---|---|
| ADVANTAGES | - Controlled experiment<br>- Small staff to support<br>- Faster than real time | - Human C2<br>- Human OPFOR<br>- More realism for players<br>- Focus usually OPART, not systems<br>- More OPART data available<br>- Exercises real world systems |
| DISADVANTAGES | - Human influence on war difficult to represent<br>- Real world C2 absent<br>- Inflexible focus on subset of war<br>- Results often difficult to interpret for commanders | - Not controlled experiment<br>- Performance of opposing forces depends on "quality" of participants<br>- EW, EC, C3CM poorly done<br>- Large amount of manpower required<br>- Time often limited to1:1 |

## CURRENT WARGAME SHORTFALLS FOR OPARTAN

- Commanders have limited choice on level of play
- Expense
  - Manpower to support players
  - Communications
  - Time
    - Current systems run 1:1 in real-time
- "What If" excursions for compaign analysis
- Quality of OPFOR varies
- Data collection difficult and inadequate to support analysis
- Limited availability

## EPISODIC WARGAME A CONCEPT

- **EPISODE DELIMITERS**
  - **ELAPSED TIME**
  - **SEQUENCE OF EVENTS**
  - **MOVEMENT OF GOAL**
  - **FORCE STATUS (ATTRITION)**
  - **LOGISTICS STATUS**
- **VARIABLE SPEED**
  - **UP TO 30:1**
- **REWIND**
- **RESTART**

## EPISODIC WARGAME A CONCEPT (cont'd)

- FULLY INTERACTIVE
  - LOCALLY
  - DISTRIBUTED
- OBJECT ORIENTED
  - SELF SUFFICIENT OPERATION FOR SINGLE COMMANDER
- KNOWLEDGE BASED
  - "LEARNS"
- GRANULARITY
  - NOT AS DETAILED AS STAND-ALONE
  - HIGH DETAIL WHEN INTERFACED WITH OTHER MODELS/WARGAMES

## EPISODIC WARGAMING EXPERIMENTS

- JAWS FOR AFSOUTH DURING ACE 89
  - STAFF BARELY ABLE TO SIMULTANEOUSLY "WARGAME" AND ACT AS STAFF
  - SUCCESSFULLY RAN 6:1 EPISODES
  - STAFF ACTIONS BETWEEN EPISODES

# LAPWAR

LAPWAR
Fighter Pilots
One-on-One

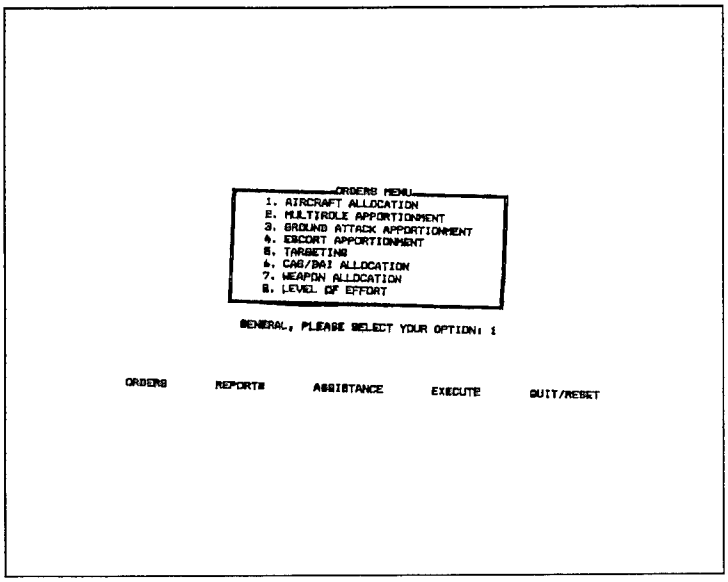
Gorillas (Fighter Pilots)

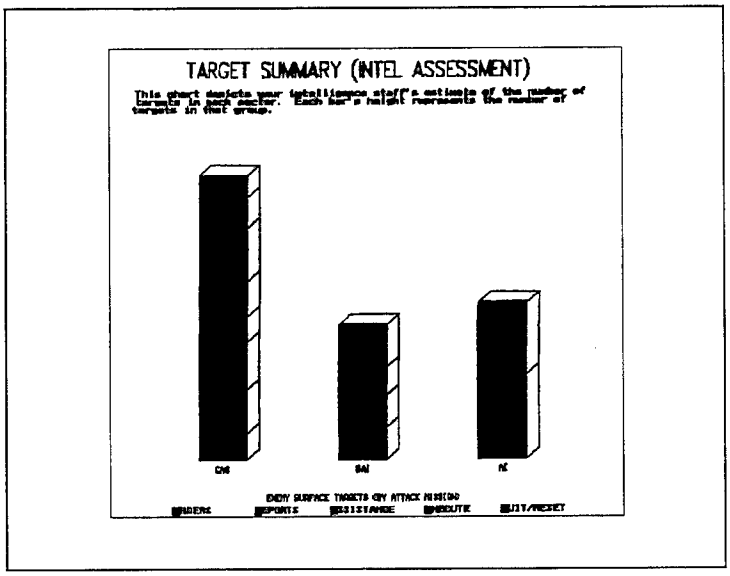


Bananas
(Reward)

# EPISODIC WARGAMING EXPERIMENTS

- LAPWAR
- AIR FORCE OFFICERS HAVE FEW OPPORTUNITIES TO LEARN OPERATIONAL ART
- CONCEPT INTENDED FOR FIGHTER PILOTS
  - 1 V 1
  - IDENTICAL FORCES
  - IDENTICAL TERRAIN
  - IDENTICAL ARMY/NAVY ORDERS
  - PERFECT INTEL and C2
  - NOT RELATED TO ANY REAL SCENARIO
  - ONLY INDIVIDUAL RESPONSIBLE FOR WINNING/LOSING
- RELAXED ASSUMPTIONS
  - SIDE-BY-SIDE JOINT WARFARE ( 2 vs 2 or 3 vs 3 )
  - IMPERFECT INTEL/C2
  - CONTRIVED SITUATIONS
    - - HEAVILY OUTNUMBERED FOR X DAYS
    - - TOTAL AIR SUPERIORITY FROM H-HOUR
- EASY TO COLLECT DATA FOR TEACHING PURPOSES


ORDERS MENU
1. AIRCRAFT ALLOCATION
2. MULTIROLE APPORTIONMENT
3. GROUND ATTACK APPORTIONMENT
4. ESCORT APPORTIONMENT
5. TARGETING
6. CAG/BAI ALLOCATION
7. WEAPON ALLOCATION
8. LEVEL OF EFFORT
GENERAL, PLEASE SELECT YOUR OPTION: 1
ORDERS
REPORTS
ASSISTANCE
EXECUTE
QUIT/RESET


TARGET SUMMARY (INTEL ASSESSMENT)
This chart depicts your intelligence staff's estimate of the number of
targets in each sector. Each bar's height represents the number of
targets in that group.
CAS
BAI
AI
ENEMY SURFACE TARGETS CAY ATTACK MISSIONS
ORDERS
REPORTS
ASSISTANCE
EXECUTE
QUIT/RESET

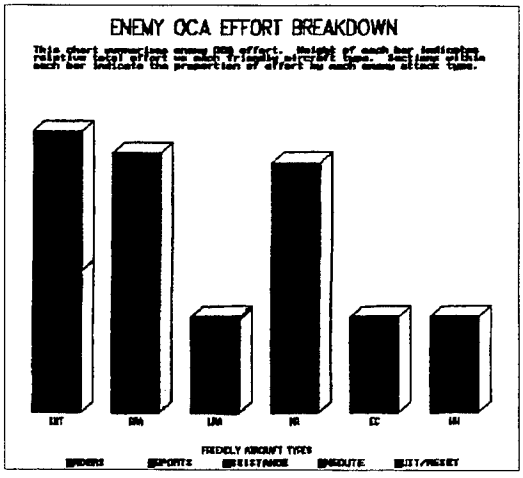
INTELLIGENCE SUMMARY

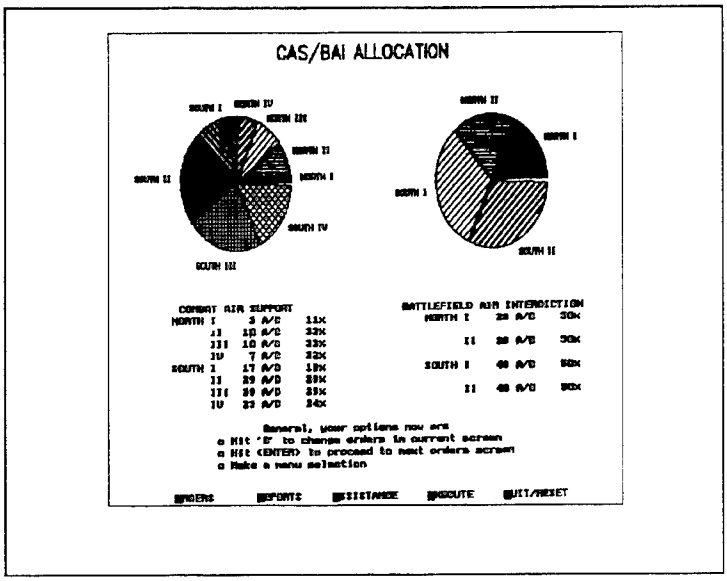
ENEMY ORDER OF BATTLE SUMMARY

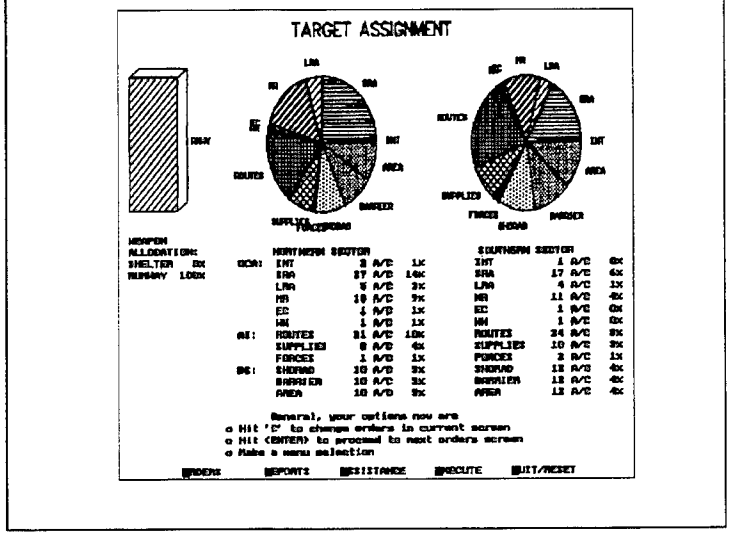
This screen shows current estimates of enemy aircraft totals, forecast deployments, and forecast effort.

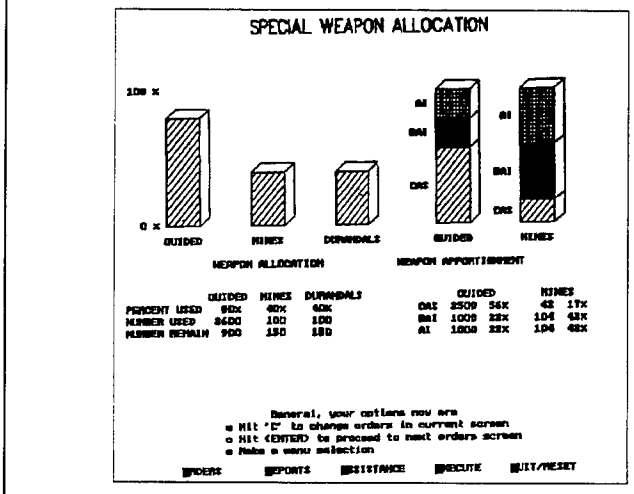
| | INT | BRA | LRA | MR | MW | EC | Total |
|---|---|---|---|---|---|---|---|
| Aircraft | | | | | | | |
| Available | 163 | 228 | 80 | 176 | 21 | 18 | 691 |
| Under Repair | 7 | 19 | 6 | 13 | 1 | 2 | 48 |
| Bases | | | | | | | |
| Fraction Open | 97% | 60% | 73% | 72% | 94% | 96% | 82% |

PRESS <ENTER> TO PROCEED




CAS/BAI ALLOCATION
SOUTH I
NORTH IV
NORTH III
NORTH II
NORTH I
SOUTH II
SOUTH IV
SOUTH III
NORTH II
NORTH I
SOUTH I
SOUTH II
COMBAT AIR SUPPORT
NORTH I 3 A/C 11%
II 10 A/C 33%
III 10 A/C 33%
IV 7 A/C 22%
SOUTH I 17 A/C 18%
II 29 A/C 30%
III 30 A/C 35%
IV 23 A/C 24%
BATTLEFIELD AIR INTERDICTION
NORTH I 28 A/C 30%
II 30 A/C 50%
SOUTH I 40 A/C 50%
II 40 A/C 50%
General, your options now are
o Hit 'E' to change orders in current screen
o Hit <ENTER> to proceed to next orders screen
o Make a menu selection
ORDERS REPORTS ASSISTANCE EXECUTE QUIT/RESET


TARGET ASSIGNMENT
RAW
LRA
NR
SRA
EC
INT
ROUTES
AREA
SUPPLIES
BARRIER
FORCES
SHORAD
WEAPON ALLOCATION:
SHELTER 8%
RUNWAY 100%
NORTHERN SECTOR
BCA: INT 3 A/C 1%
SRA 37 A/C 14%
LRA 9 A/C 3%
NR 19 A/C 9%
EC 4 A/C 1%
NM 1 A/C 1%
AI: ROUTES 81 A/C 10%
SUPPLIES 8 A/C 4%
FORCES 1 A/C 1%
BG: SHORAD 18 A/C 9%
BARRIER 18 A/C 9%
AREA 18 A/C 9%
SOUTHERN SECTOR
INT 1 A/C 0%
SRA 17 A/C 6%
LRA 4 A/C 1%
NR 11 A/C 4%
EC 1 A/C 0%
NM 1 A/C 0%
ROUTES 24 A/C 9%
SUPPLIES 10 A/C 3%
FORCES 2 A/C 1%
SHORAD 12 A/C 4%
BARRIER 12 A/C 4%
AREA 12 A/C 4%
General, your options now are
o Hit 'E' to change orders in current screen
o Hit <ENTER> to proceed to next orders screen
o Make a menu selection
ORDERS REPORTS ASSISTANCE EXECUTE QUIT/RESET






# OPINION




- Totally New War Models
  - Modular
  - Object-oriented
  - Knowledge based/AI/ES
  - Variable granularity
  - Selectable level of command play
  - Designed for interface
- Totally new EW/EC/C3/C3CM Model
  - Parallel processing
  - –Dynamic domain
  - Interface with real-world systems

# OPARTAN WRAP-UP

Clayton J. Thomas, FS

# OPARTAN WRAP-UP

**Clayton Thomas, Chair**

Responding to Lt Gen Hosmer's challenge "to work the operational art problem," OPARTAN set two main objectives:

First, to alert analysts to the importance of that challenge, and

Second, to sample what is now available to analysts to help meet that challenge.

I believe that OPARTAN has made significant contributions toward reaching both objectives, though much remains to be done.

**Attacking the First Objective**

The OPARTAN Announcement and Call for Papers began an attack on the first objective by forcefully bringing Lt Gen Hosmer's article in PHALANX (Sep 1988) to the attention of additional numbers of the analytical community, and emphasizing some of its pungent lines:

> For the past few decades we in the United States military have been so absorbed working the problem of understanding and improving tactical engagements, we may have lost sight of the importance of operational art and the importance that new technologies have on the concept of operations...
>
> The issue is NOT how does a new weapon system change the tactical effectiveness of the force, but rather: How does it allow the CINC to change the concept of operations to more effectively accomplish the mission.
>
> ...to work the operational art problem, the analytical community must change its perspective from 'bottom up' to 'top down.' This is...essential. Most current models, games and simulations do not allow the analyst to address the operational issues parametrically....
>
> ...the analytical community has been preparing for the 'How to do it best' questions, and not the 'what is best to do' questions. Both are essential, but without the answer to the latter it is difficult to effectively respond to the former.

The Announcement resulted in some 75 active OPARTAN participants and began to sensitize many others to "operational art." The process continued, as the 58th MORS Symposium included a session on OPARTAN (with a summary in the Proceedings), and PHALANX (June 1990) included a summary article. The present OPARTAN Proceedings deepens the process by giving the text of most of the papers.

From my personal experience, I *know* that OPARTAN has had some success in achieving the first objective, and I *suspect* that far more should be done. In 1986, I had already been exposed to an excellent paper (*Catching Up With Operational Art,* LTC L. D. Holder, c 1985), but it had not yet "sunk in" deeply enough to sensitize me to the importance of operational art. My exposure came in connection with the 1986 MORS Workshop MORIMOC (More Operational Realism in the Modeling of Combat), which I chaired. One of our planning committee had suggested LTC Holder's paper for the MORIMOC "read-ahead" package, and I suspect that many in the workshop found it interesting, as I did.

However, we must have been overcome by the immensity of other challenges to realism in the modeling of combat. Or maybe it was the *difficulty* of making the "paradigm shift" from a tactical mindset to the mindset of operational art. In any event, the only occurrence of the phrase "operational art" in the MORIMOC Report is in the list of the papers in the read-ahead package!

Two of LTC Holder's paragraphs give an excellent statement of his concerns:

> "The signs of our steady fixation on the tactical side of war are all around us. We have fielded superb organizations and equipment for that kind of fight, but even our best units and material reveal our tactical bias and operational inexperience. Although excellent in battlefield skills, our units and staffs are much less capable in the tasks of getting to the fight in the first place and moving rapidly on to the next one.
>
> A number of specific problems come easily to mind. The roles and organizations of corps and armies need clarification. Our new armored vehicles are optimized for close combat, but deficient in the operational virtues of cruising range, fuel economy, and mechanical simplicity. Our infantry concentrates exclusively on small unit excellence and cannot articulate its operational role. Our air defense and intelligence systems emphasize static, shallow coverage and are not mechanically suited or doctrinally attuned to large scale mobile operations."

In retrospect, noting the similarity of LTC Holder's concerns and those of Lt Gen Hosmer that inspired OPARTAN, it is hard to understand my relative *insensitivity to* operational art in early 1986 as compared to fall 1988, two and a half years later. If any others require the same "gestation period" for their ideas, then the "alerting" that OPARTAN has begun may require much additional reinforcement.

**Attacking the Second Objective**

The final section of papers (on tools and applications) is the locus of the main OPARTAN attack on the second objective. Though this section consists of only eight papers, it nevertheless illustrates the principal options so far suggested, including those that Lt Gen Hosmer mentioned. It includes four papers that combine an "analytic" approach with an operational level *perspective*, and four papers that give techniques to emulate, enhance, or support a "war gaming" approach.

Each of the eight papers is either itself concerned with campaign analysis, as opposed to mere battle analysis, or it supports such campaign analysis. Thus these papers give a variety of ways to facilitate the treatment of longer time scales or higher level measures of effectiveness than are typical of battle analyses at the tactical level. None, however, comes without its price.

If one takes an "analytic" approach to operational level investigations, then one must in some way make sure that the analysis incorporates relevant campaign aspects. The approach that Dr. Goodson urges, for example, requires the use of multi-stage, two-person, zero-sum game theoretic analysis, as well as much supporting analysis to provide suitable input data. It is his judgment that only two models are now available to address the particular class of problems that his paper treats. The other three "analytic" papers demand less model development, but require careful thought and data collection to enable the "campaign perspective."

If one takes an alternative "war gaming" approach, in order to tap the creativity of the well prepared human mind, then one must either use human players or one must substitute for them, as, e.g., by using expert systems to represent human decision making. The paper by Davis and Howe describes the latter choice as taken by RSAS. The other papers describe ways to speed or enhance war gaming through use of personal computers, computer graphics, tele-communications, or some combination. To implement any "war gaming" approach to operational level investigations, however, one must still think through the concepts and prepare the data required to yield relevant results.

Therefore, it is fair to say that the OPARTAN papers on tools and applications offer approaches of promise and value, but approaches that require not only much effort but also much thought--thought at the level of operational art. Attaining this required perspective may be the most difficult step of all.

# Annex A - Announcement and Call for Papers

# ANNOUNCEMENT AND CALL FOR PAPERS

## MINI-SYMPOSIUM

## OPERATIONAL ART AND ANALYSIS

## (OPARTAN)

## DATE: 6-9 MARCH 1990

## LOCATION:

## NATIONAL DEFENSE UNIVERSITY

## FORT MCNAIR, WASHINGTON, DC

**PROPONENTS:**

- **THE ASSISTANT CHIEF OF STAFF, STUDIES AND ANALYSES, HQ US AIR FORCE**
- **THE DEPUTY UNDERSECRETARY OF THE ARMY (OPERATIONS RESEARCH)**
- **THE DIRECTOR FOR FORCE STRUCTURE, RESOURCE AND ASSESSMENT, THE JOINT STAFF**

---

MORS is the professional association of military operations analysts and users of military operations research from both the military and the civilian sector.

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- The Assistant Chief of Staff, Studies and Analyses, HQ US Air Force
- The Director for Force Structure, Resource and Assessment, The Joint Staff
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### Background

*General Hosmer's Challenge*

Recently Lt Gen B. C. Hosmer, USAF, then President, National Defense University, challenged the analytical community "to work the operational art problem." His article, "Operational Art: The Importance of the Operational Level of War" (PHALANX, Sept 1988) urged the importance of the operational level that links the lower tactical level to the higher strategic level of war. Tactics are designed to win battles; operations are designed to win campaigns; and strategy is designed to win wars.

Gen Hosmer observed:

> In the most aggregated form, tactical effectiveness is the sum of all capabilities that contribute to a combat unit's lethality and survivability. The manner in which the combatant commanders choose to employ this lethality and survivability is the essence of operational art: effectiveness at the operational level of war. Operational effectiveness is thereby dependent on both the tactical effectiveness and the commander's concept of operations.

Gen Hosmer suggested that both the United States' military community and the supporting analytic community need more emphasis on the operational level:

> For the past few decades we in the United States military have been so absorbed working the problem of understanding and improving tactical engagements, we may have lost sight of the importance of operational art and the importance that new technologies have on the concept of operations. . .
>
> The issue is NOT how does a new weapon system change the tactical effectiveness of the force, but rather: How does it allow the CINC to change the concept of operations to more effectively accomplish the mission.

He asks, "How does the CINC determine the best ways to improve the concept of operations given the opportunity to acquire new capabilities?," and how the CINC's staff can best support him. He concludes:

> Gaming and simulations appear to offer the most practical solution. However, to work the operational art problem, the analytical community must change its perspective from 'bottom up' to 'top-down.' This is ... essential. Most current models, games and simulations do not allow the analyst to address the operational issues parametrically. ...
>
> ... the analytical community has been preparing for the 'How to do it best' questions, and not the 'what is best to do' questions. Both are essential, but without the answer to the latter it is difficult to effectively respond to the former.

Thus Gen Hosmer reminds us of the important precept that analysis should begin with the question of effectiveness--*what* to do--and then address the question of efficiency--*how* to do it well.

## *Other Views*

Others share Gen Hosmer's view of operational art's importance. Maj Gen E. B. Atkeson, USA (Ret), devotes an entire chapter (XIII) to the subject in his recent book, *The Final Argument of Kings: Reflections on the Art of War.* He quotes the Army's first commander of its Training and Doctrine command, Gen William E. DePuy, as noting the emergence of an entire generation of officers in the Army with no personal recollection of World War II. He says of Gen DePuy:

> In his view, the group really has little understanding of the difference between military operational level matters and tactics. However, he declined to judge them harshly; he admitted that he and his multistarred colleagues in the 1970s had had trouble with this, too.
>
> 'Although FM 100-5 (the lynch pin Army battle manual) is called Operations, we (who wrote the 1976 version) were thinking tactics. That was a fatal flaw. We were wrong in not grasping that. None of us had studied the military business at the operational staff level very carefully or thoroughly or well.'

Strong, introspective words from the Army's premier theoretician."

Similarly, Col John A. Warden III, USAF, says in his recent book *The Air Campaign:*

> Many books have been written on the strategic level of war . . . Likewise, numerous books are available on the tactical level; in fact, the majority of war books are really at this level. Surprisingly--or perhaps not--almost nothing has been written since the immediate post-World War II period that deals with theory and practice at the operational level, especially for air warfare.

## *The Soviet Exception*

There is an exception--the Soviets. One of the most cited references on operational art is *The Basic Principles of Operational Art and Tactics*, 1972, by Col Vasiliy Yefisovich Savkin. Gen Atkeson writes of the Soviets:

> The Soviets take some pride in pointing out that they have been grappling with the three tiers of military art (strategy, operational art, and tactics) since 1922.

Perhaps the recent renaissance of operational art in American military literature owes something to "conceptual transfer."

## Objective

The OPARTAN Mini-symposium is a step in helping military operations research analysts "work the operational art problem." It should:

1. Enhance the analytic community's understanding of current and past thinking, both here and abroad, on operational art and its relationship to strategy and tactics.

2. Enhance the analytic community's understanding of its role in working "the operational art problem," including what has been, and should be, done to design and apply useful games, models and simulations.

The results of the OPARTAN Mini-symposium may provide the basis of a follow-on workshop.

## Subject Areas of Special Interest

This Call for Papers emphasizes work already completed, or in progress, in any of the following areas:

1. Current concepts of operational art in any of the military services of the United States.

2. Current concepts of operational art in military services of other countries, especially those likely to be allied with, or opposed to, the United States.

3. Instructive examples of historical campaigns, etc., bearing on operational art.

4. The design of models, games, and simulations facilitating parametric treatment of operational art issues, such as options for a commander's concept of operations.

5. Instructive examples of analysis at the operational level.

## Information on Paper Offerings

### *Classification, Discussants, and Proceedings*

Please note that representatives from NATO Countries will be invited to participate if they can contribute to the mini-symposium. Therefore, papers must be unclassified and approved for public release. When possible, there will be a discussant for each accepted paper. As soon as possible after the symposium, MORS will publish a proceedings volume of papers, discussion, and keynotes. This will document the state of the art and help in deciding the merits of a follow-on workshop.

### *Abstracts*

Paper offerors should submit five copies of an unclassified outline to:

*Administrator*
*Military Operations Research Society*
*101 S. Whiting Street, Suite 202*
*Alexandria, Virginia 22304*

The outline should clearly describe the proposed paper (1000 to 1500 words) and give drafts of planned viewgraphs. It should clearly indicate the basis of the paper -- completed study, work in progress, tutorial/methodological exposition, etc. A completed current paper would be welcome, of course.

### *Cover Letters*

Each abstract should have a cover letter with the following:

- Name, business address, and telephone numbers of author(s)
- Title of paper
- Assurance that the paper is unclassified, especially if it is derived from classified work
- Expected length of paper (and upper and lower bounds), in numbers of words and figures
- Expected presentation time (and upper and lower bounds)
- Presentation aids required
- Past or anticipated presentations or publications of the paper
- Names and addresses of three persons (from other than the author's organization) qualified to discuss the paper
- Indication of subject area(s) to which paper is most relevant
- Statement that if the paper is accepted, the author(s) will prepare, and their organizations will support preparation of, a formal documented version of the paper to be submitted to MORS immediately after the mini-symposium for inclusion in proceedings.

### *Disclosure Authorization*

Each paper (or formal remarks of a discussant intended for the proceedings) must have a disclosure authorization which states that the paper is unclassified and approved for public release. The MORS office will send a copy of the appropriate form to each author and discussant. Completed disclosure authorizations must reach the MORS Office prior to the mini-symposium in order for the paper (or prepared discussion) to be given.

## Mini-Symposium Agenda

Preliminary plans include an introductory session with welcomes, background of the mini-symposium, and a keynote address. The number of general sessions (and special sessions, if appropriate) will depend on the response to this Call for Papers. The intent is to have a three (or four) day program, with a banquet and speaker the second evening.

## Attendance

The mini-symposium is UNCLASSIFIED. Please note that representatives from NATO Countries will be invited to participate. Government and industry personnel who can participate and contribute effectively to the program are encouraged to complete and submit the *Request for Invitation* form attached to this Announcement. Priority for invitation will go to:

- Authors of accepted papers
- Qualified discussants of accepted papers
- Qualified workers in one or more of the areas of interest

Attendance will be selective, based on contribution(s) to the program.

## Deadlines

Abstracts of Paper Offerings -- **9 Nov '89**

Authors Notified of Paper Selection -- **15 Dec 89**

Last day to request invitation forms -- **22 Dec '89**

Applications due in MORS Office -- **12 Jan '90**

Review copy of paper for MORS review and discussant's use -- **12 Jan '90**

Authors and Disscussants turn in Final Copies of Papers and Remarks -- **6 Mar '90**

## Program Committee

Mini-symposium Chair - Clayton Thomas,
HQ USAF/SAN, The Pentagon, Rm 1E386,
Washington, DC 20330-5420 (202) 697-4300

Co-Chairs - Eugene P. Visco,
MISMA, 1900 Half Street, Room L101
Washington, DC 20009 (202) 475-2951

- Peter Byrne,
JS/Force Structure, Resource and Assessment Directorate (J8), The Pentagon, Rm 1D940,
Washington, DC 20318 (202) 697-7824

- Col John A. Warden III, US Air Force,
HQ USAF/XOXW, The Pentagon, Rm 4D1083,
Washington, DC 20330-5057 (202) 695-4466

## Administration

Executive Director/Publisher - Richard I. Wiles,
101 S. Whiting Street, Suite 202
Alexandria, VA 22304-3483 (703) 751-7290

Administrator/Meeting Planner - Natalie S. Addison,
101 S. Whiting Street, Suite 202
Alexandria, VA 22304-3483 (703) 751-7290

## Caveats

The Military Operations Research Society does not make nor advocate official policy. Matters discussed or statements made during the mini-symposium are the sole responsibility of participants involved.

All attendees and participants are expected to submit requisite registration forms and to pay the normal registration fees ($100 for Military and Government employees, $200 for all others).

Acceptance of an invitation to present a formal paper at MORS implies an obligation by the speaker to attend the mini-symposium, to provide a proper copy of the paper for the Proceedings according to the stated schedule, and to submit a timely written disclosure authorization.

E. Brady

Edward C. Brady, President

Approved:

Jerome X. Goldschmidt

Jerome X. Goldschmidt
Contracting Officer's Technical Representative

REQUEST FOR INVITATION
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• In which areas of this symposium are you expert?

_____

_____

• Describe significant work you have done or are doing which relates directly to OPARTAN

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• How do you wish to participate actively in OPARTAN?

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If you need it, use another page to answer these questions.

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Alexandria, VA 22304

# Annex B - Participants

MORS OPERATIONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19, 1990

---

Addison, MS Natalie S
Military Operatons Research Society
101 S Whiting Street
Suite 202
Alexandria, VA 22304-3813
TELEPHONE: (703)-751-7290

Allen, MAJ William
HQ TRADOC
Attn: ATDO-A
Fort Monroe, VA 23651-5000
TELEPHONE: (804)-727-4298

Alston, MR Harold E
US Army Intelligence Threat Analysis Ctr
ATTN: AIAIT-RTM
Bldg 213, Stop 314
Washington Navy Yard, DC 20374-5085
TELEPHONE: (202)-479-1936

Arbeeny, MR John
The RAND Corporation
1700 Main Street
PO Box 2138
Santa Monica, CA 90406-2138
TELEPHONE: (213)-393-0411

Atkeson, MajGen Edward B
202 Vassar Place
Alexandria, VA 22314

Austin, MRS Willa W
US Naval Oceanographic Office
Building 1002, Code MTA
Stennis Space Center, MS 39529
TELEPHONE: (601)-688-4749

Bailey, LtCol Steven S
US Army TRADOC Research Activity
RAND
PO Box 2138
Santa Monica, CA 90406-2138
TELEPHONE: (213)-393-0411

Banks, MR John T
SAIC
6021 S. Syracuse Way
Suite 300
Greenwood Village, CO 80111
TELEPONE: (303)-773-6900

Battilega, DR John A
SAIC
Foreign Systems Res Center
6021 S Syracuse Way, Suite 300
Greenwood Village, CO 80111
TELEPHONE: (303)-773-6900

Bedenbaugh, MR William H
National Defense University
5318 Crestedge Lane
Rockville, MD 20853
TELEPHONE: (202)-475-1251

Beuch, MR William R
SAIC
1710 Goodridge Drive
PO Box 1303, MS T-14-3
McLean, VA 22102
TELEPHONE: (703)-749-8793

Bexfield, MR James N
Institute for Defense Analyses
1801 N Beauregard
Alexandria, VA 22311
TELEPHONE: (703)-845-2107

Bingham, LtCol Price T
Air University
CADRE/RID, Bldg 1400
gMaxwell AFB, AL 36112-5532
TELEPHONE: (205)-293-6212 AUTOVON: 575-6214

Browning, LtCol Ronald K
National Defense University
Wargaming and Simulation Center
Fort McNair, Washington, DC 20319
TELEPHONE: (202)-475-2105

MORS OPERATIONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19, 1990

---

Burdick, MR Charles D
BDM/ITAC
7915 Jones Branch Drive
McLean, VA 22102
TELEPHONE: (703)-848-7388

Carlson, LtCol Adolf
US Army War College Fellow
Center for International Relations
Kingston, Ontario K7L 3NG CANADA
TELEPHONE: (613)-545-2385

DePuy, Gen William E
Box 523, Route 1
Delaplane, VA 20025

Dunham, LtCol Alan D
DARPA/TTO
1400 Wilson Blvd
Arlington, VA 22209
TELEPHONE: (202)-694-5738 AUTOVON: 224-5738

Ewart, MR Robert F
McDonald Douglas
1550 Wilson Blvd, Suite 550
Arlington, VA 22209
TELEPHONE: (703)-276-4662

Fonda, MR Garrett R
SAIC
6021 S Syracuse Way
Suite 300
Greenwood Village, CO 80111
TELEPHONE: (303)-648-6900

Goodson, DR Wilfred L
Systems & Technology Research
10805 Parkridge Blvd
Reston, VA 22091
TELEPHONE: (703)-648-9262

Byrne, MR Peter
Force Structure, Resource, & Assessment
Directorate, The Joint Staff (J-8/TSD)
The Pentagon, Rm 1D929
Washington, DC 20318-8000
TELEPHONE: (202)-695-9196

Davis, DR Paul K
The RAND Corporation
1700 Main Street
PO Box 2138
Santa Monica, CA 90406-2138
TELEPHONE: (213)-451-6912

der Boghossian, MR Zaven C
CACI Products Company
1600 Wilson Blvd
Suite 1300
Arlington, VA 22209
TELEPHONE: (703)-875-2900

Englander, MR Sidney
Univ of Maryland
7914 Takoma Ave
Silver Spring, MD 20910
TELEPHONE: (301)-587-5628

Felker, Maj Edward
HQ USAF/LEXX
Washington, DC 20330-5130
TELEPHONE: (202)-693-1024

Gardiner, MR Samuel B
Military Education
1308 21st Street
Arlington, VA 22202
TELEPHONE: (703)-979-3685

Grant, Col Art
National War College
Fort McNair
Washington, DC 20319

MORS OPERATONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19,1990

---

Grassey, Capt Thomas
Naval Postgraduate School
National Security Affairs Department
Code 56GT
Monterey, CA 93943-5100
TELEPHONE: (408)-656-2521

Harrison, MajGen George B
HQ USAF/SA
PO Box 46500
Washington, DC 20050
TELEPHONE: (202)-697-7546

Hosmer, LtGen Bradley C.
HA USAF/Inspector General
The Pentagon
Washington, DC 20330

Huber, PROF Reiner K
Universitat der Bundeswehr Munchen
Werner-Heisenberg-Weg 39
D-8014 Neubiberg, FRG

Hunter, MR Robert M
Douglas Aircraft Co
Military Systems Analysis, MS35-95
3855 Lakewood Blvd
Long Beach, CA 90846
TELEPHONE: (213)-496-6128

Johnson, LtCol Douglas V
US Army War College
Carlisle, PA 17013-5050
TELEPHONE: (717)-245-3010

Jordan, MR Edward P
Frontier Technology, Inc
530 E Montecito St
#105
Santa Barbara, CA 93103-3252
TELEPHONE: (805)-965-2477

Kipp, Dr Jacob W
Soviet Army Studies office
HQ USA/SAS
Attn: ATZL-SAS
Fort Leavenworth, KS 66027-5015
TELEPHONE: (913)-684-4333

Kohn, MR Lauren D
SAIC
6021 S Syracuse Way
Suite 300
Greenwood Village, Co 80111
TELEPHONE: (303)-773-6900

Krause, Col Michael D
Center of Military History
20 Massachusetts Ave, NW
Washington, DC 20314
TELEPHONE: (202)-272-0291

Kriwanek, LtCol Thomas M
HQ TRADOC
Attn: ATDO-A
Fort Monroe, VA 23651-5000
TELEPHONE: (804)-727-4298

Kuhn, MR George WS
LMI
6400 Goldsboro Rd
Bethesda, MD 20817-5886

Lee, Capt Thomas J
US Army ROTC Instructor Group
Dept of Military Science
Fenton Hall, SUNY College at Fredonia
Fredonia, NY 14063
TELEPHONE: (716)-673-3507

Lindsey, MR Kenneth
HQ TAC/WP-JSG
4525 CAS/JSG
Langley AFB, VA 23665
TELEPHONE: (804)-764-5755

MORS OPERATIONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19, 1990

---

Mahncke, MR Frank C
Naval Surface Warfare Center
Code D25
10901 New Hampshire Ave
Silver Spring, MD 20903-5000
TELEPHONE: (202)-394-1850

Might, MR Robert
George Mason University
752 Kentland Drive
Great Falls, VA 22066
TELEPHONE: (703)-764-4696

Morin, MR Michael J
US Army War College
Concepts and Doctrine Office
Box 604
Carlisle, PA 17013
TELEPHONE: (717)-245-3457

Nelson, Mr C Richard
CIA
Washington, DC 20505
TELEPHONE: (703)-482-9029

Newell, LtCol Clayton R
US Army Center of Military History
20 Massachusetts Ave, NW
Washington, DC 20314-0200
TELEPHONE: (202)-272-0303

Pace, MRS Mary GB
Consultant
7027 Polins Court
Alexandria, VA 22306

Panuska, MR Edward J
US Army Lab Command
Attn: AMSLC-TP-PA
2800 Powder Mill Road
Adelphi, MD 20783-1145
TELEPHONE: (301)-394-4650

Pelletiere, DR Stephen C
US Army War College
Carlisle, PA 17013-5050
TELEPHONE: (717)-245-3376

Pique, Col Larry
US Army CAA
8120 Woodmont Ave
Bethesda, MD 20814-2797
TELEPHONE: (301)-295-0181

Porter, MR Craig D
Simulation Technologies, Inc
111 S First Street
Suite 748
Dayton, OH 45402
TELEPHONE: (513)-461-4606

Randolph, DR William D
PRB Associates, Inc
47 Airport View Drive
Hollywood, MD 20636
TELEPHONE: (301)-373-2360

Rice, Capt Peter A
Naval War College
Newport, RI 02841-5062
TELEPHONE: (401)-841-4605

Rice, Maj Roy E
The Joint Staff (J8)
The Pentagon, Room 1D929
Washington, DC 20318-8000
TELEPHONE: (202)-693-4603

Rich, MR Clark
Frontier Technology Inc.
Program Manager
530 E Montecito St, #105
Santa Barbara, CA 93103-3245
TELEPHONE: (805)-965-2477

MORS OPERATONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19, 1990

---

Richardson, MR James C
ASD/XRY
Eglin, AFB, FL 32542-5000
TELEPHONE: (904)-882-3722

Rothrock, Col John E
National Defense University
Strategic Concepts Center
Washington, DC 20319
TELEPHONE: (202)-475-1094

Sackett, LtCol Jeffrey R
HQ TAC/XP-JSG
111 Argall Town Ln
Williamsburg, VA 23185
TELEPHONE: (804)-764-5754

Sheldon, Maj Robert S
USAF Academy
DFMS
US Air Force Academy, CO 80840-5701
TELEPHONE: (719)-472-3962

Shutler, LtGen Philip D
SYSCON Corporation
1000 Thomas Jefferson St., NW
Washington, DC 20007
TELEPHONE: (202)-342-4092

Sloan, MR John F
Defense Intelligence College
5218 Landgrave Lane
Springfield, VA 22151
TELEPHONE: (703)-321-9072

Syse, Mr David I
MSD/XRY
Eglin AFB, FL 32542-5000
TELEPHONE: (904)-882-3722

Thomas, MR Clayton J
HQ USAF/SAN
The Pentagon, Room 1E386
Washington, DC 20330-5420
TELEPHONE: (202)697-4300

Vance, LtCol James O
The Joint Staff (J8) SPED
Washington, DC 20318-8000
TELEPHONE: (202)-694-9760

Visco, MR Eugene P
US Army misma
1900 Half Street
Room L101
Washington, DC 20324
TELEPHONE: (202)-475-2951

Vogt, Gen John W
805 Holly Drive
East RFD 10
Annapolis, MD 21404

Walker, MR John K
MORS-PHALANX-EDITOR
15107 Interlachen Drive
Apt #104
Silver Spring, MD 20906
TELEPHONE: (703)-751-7290

Warden, Col John A
HQ USAF/XOXW
The Pentagon, Room 4D1083
Washington, DC 20330-5057
TELEPHONE: (202)695-4466

Westenhoff, Maj Charles M
AUCADRE/RID
Maxwell AFB, AL 36112
TELEPHONE: (205)-293-2709

MORS OPERATIONAL ART & ANALYSIS MINI-SYMPOSIUM
LIST OF ATTENDEES
AS OF: March 19, 1990

---

Whelan, DR William J
The RAND Corporation
1700 Main Street
PO Box 2138
Santa Monica, CA 90406-2138
TELEPHONE: (213)-393-0411

Wu, MRS Peili
General Dynamics
Fort Worth Division
PO Box 748 (MZ4091)
Fort Worth, TX 76101

Wiles, MR Richard I
Military Operations Research Society
203 Yoakum Parkway
Apartment 1009
Alexandria, VA 22304
TELEPHONE: (703)-751-7290

Yost, Capt Kirk A
USAF Academy
DFMS
USAF Academy, CO 80840-5701
TELEPHONE: (303)-472-4470