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FIGHTING IN THE MEDIUM OF TIME:

The Dynamics of Operational Tempo

by
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Infantry

School of Advanced Military Studies
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Fort Leavenworth, Kansas

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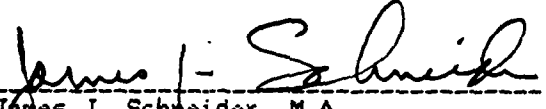
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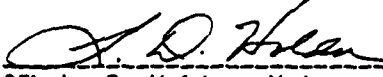
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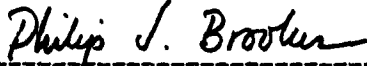
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ABSTRACT

FIGHTING IN THE MEDIUM OF TIME: The Dynamics of Operational Tempo, by Major Anthony M. Coroalles, U.S. Army, 51 pages.

This paper analyses the concept of operational tempo from the Soviet perspective. It examines the nature of high-tempo operations, the dynamics of these operations, and proposes ways to counter a future Soviet high-tempo operation in Europe.

By nature, high-tempo operations are designed to defeat the enemy primarily in the medium of time. That is, they aim at depriving the enemy of time in order to preempt his actions. Physical attrition and seizure of terrain are of secondary importance when compared to gaining of time over the enemy.

Soviet organizations, operations, and tactics all support a doctrine where time is of primary importance. Echelonment, deep operations, DMGs, deception, and the emphasis on achieving surprise are outward manifestations of this doctrine and share the primacy of time as a common denominator.

Countering high tempo operations in Europe will be difficult. The nature of the theater, the operational constraints imposed by a strategy of deterrence, and the political constraints present drive NATO forces into an operational pattern based on attrition at the operational level and maneuver at the tactical level. The implications are that in order to overcome their operational shortcomings NATO forces must be greatly superior tactically to Soviet forces.



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CONTENTS

Abstract.....	i
Table of Contents.....	ii
Chapter I. INTRODUCTION.....	1
Chapter II. THE NATURE OF TEMPO.....	3
Chapter III. THE DYNAMICS OF TEMPO.....	7
The Role of Battle.....	8
The Role of Operational Movement.....	17
The Role of Simultaneous and Successive Action...	23
The Role of Deep Operations.....	25
The Role of Surprise.....	27
Chapter IV. COUNTERING SOVIET TEMPO.....	30
Operational Requirements.....	31
Tactical Requirements.....	33
Chapter V. CONCLUSIONS.....	36

I. INTRODUCTION

Modern war is fought in a variety of mediums. Among the mediums in which we fight are the ground, air, water, space, and the electromagnetic spectrum. These mediums serve as the arena where, by the use of force, we seek to compel our opponent to do our will. However, by its very nature, the use of force implies fighting in another medium--the medium of time.

In strictly physical terms, force is the product of two coefficients, mass and acceleration. Acceleration for its part, is a rate of movement sustained over a period of time. The three variables present in this equation, mass, time, and distance can be used to understand the dynamics of any physical force and can also assist us in understanding the dynamics of operational level forces.

However, this analogy does not fit perfectly the conduct of war. Armies do not crash into each other like billiard balls, but rather, move to gain advantageous positions in relation to their enemy. From these positions they attempt to leverage their enemy out of position or to destroy him physically. This contest for positional advantage, however, does correlate nicely with the physics model. The party which can move an equal mass to an advantageous position more quickly can generate a greater force than its slower opponent. This is so because position not only generates an advantage relative to an opponent in terms of potential destructive power, but also in terms of logistics, moral effects, and disruption.

Thus, the contest turns to a great degree on the ability of each side to make superior use of time through speed of movement in order to attain a favorable positional change over one's opponent. As with terrain, time becomes a medium which both sides contest and in which they both operate. And also like terrain, the side which can take greater advantage of the common medium accrues considerable benefits towards eventually winning the contest.

Tempo is the medium of time superimposed on the medium of terrain. It measures the rapidity of movement of an operational mass over terrain against a resisting enemy mass and is expressed as a function of distance over time. Tempo thus unites mass, time, and distance into an operationally significant measure. That is, the rate at which an attacking force moves against a resisting enemy force over the medium of terrain.

High tempo operations have been, and continue to be, a central tenet of Soviet military thought. In a future war, there is little doubt that the Soviets will attempt to achieve the high operational tempos that they so often expound. Thus if we are to defeat these forces, it is important that we understand the dynamics of operational level tempo. We must understand its component parts, the relationships between these parts, and the centrality of the concept to Soviet operations.

This paper attempts to assist in that understanding by analyzing the dynamics of tempo at operational levels. Then based on the analysis, the paper will further recommend a number of possible means to counter the Soviets' projected high tempo operations.

II. THE NATURE OF TEMPO

The concept of tempo, as has been defined, is an offensive concept. It is affected by the resistance of the defender but does not apply directly to the defense. Tempo is a measure of advance against an enemy. It is not a measure of actions per hour, day, or week--although indirectly a higher cyclic rate of action can impact on tempo. Tempo is also not a measure of the intensity of combat operations. Although, as with cyclic action, intensity can, and does, impact on tempo.

Clausewitz stated that, "defense had a passive purpose: preservation; and attack a positive one: conquest".¹ Thus, it is inherent in the nature of the attack for the attacker to move forward in order to conquer. Concurrently, it is inherent in the the nature of the defense for the defender to attempt to stop this forward movement. It follows from this, that for the defender tempo is something to be slowed down and stopped, while for the attacker it is precisely the opposite.

For the attacker, the ability to achieve a high tempo of operations is a measure of that operation's success. In practical terms, it means that he is progressing toward his operational objectives quickly. He is gaining positional advantage over his opponent rapidly, which in turn means a potentially faster defeat for that enemy. In other words, the maintenance of high tempo is important to the attacker because it shortens the duration of an operation and preserves the initiative.

The quickest possible victory must be the goal of any rational operational or strategic offensive plan. This is so because short

successful operations, like short successful wars, are inherently less costly to an attacker. The longer a defender resists, the more costly and dangerous the situation becomes for the attacker. It also becomes more costly to the defender, but since defeat is the only other alternative to high cost for the defender, a costly war of attrition serves the interests of the defender to a greater degree. Viewed in this light, it is easy to see why the generation of high tempos would be appealing to a potential attacker. A high tempo of operations would ensure short duration, and short duration would ensure low cost.

In addition, high tempo operations deprive the enemy of time. At the strategic level, they deprive him of time to bring allies and other means into the war, while at the operational level they deprive him of time to reposition or reorient forces. This in turn, also serves to make the duration of the war, or the operation, shorter and less costly to the attacker. Thus, the maintenance of high operational tempos not only allow the attacker to gain territory quickly from the enemy, but also indirectly and more importantly, they enable the attacker to win time from the enemy.

An enemy is physically defeated when he runs out of space, out of forces and materiel, or out of time. The first two modes of defeat are well understood. An enemy can be defeated by occupying his territory, defeating his army, or a combination of the two. The third mode is the defeat mechanism of maneuver warfare and the goal of high tempo operations; that is, to defeat the enemy by depriving him of time. He is defeated before he can bring forces and materiel to bear to rescue the situation.

A good example of this process is provided by the operations of Army Group A and, in particular, Panzer Group Kleist during their breakout from the Meuse in the German campaign in the West in 1940. The speed at which Kleist moved through the Ardennes and forced a crossing of the Meuse River defeated the French by denying them time. The French High Command had calculated earlier that in order to make a serious attempt to breach the Meuse line from Namur to Sedan, a minimum of forty divisions with heavy artillery and ammunition would be needed. Translating these quantities into time, it was further calculated that this operational concentration would require fifteen days to accomplish.² With this in mind, Gamelin's reaction on D+1 to deploy eleven operational reserve divisions so as to arrive in the threatened area between D+4 and D+11 seems to be totally in line. The Germans, however, were not quite so congenial as to arrive when expected. The three Panzer Corps of Guderian, Hoth, and Reinhardt, arrived on the banks of the Meuse on D+2, were across the river by D+3, and were ready to attack out of their bridgeheads by D+5. Upon breaking out of the bridgeheads, Kleist and his Corps were overrunning the deployment areas of the French operational reserves well before the lead elements of these units could begin assembling. Clearly, the operational tempo of the German advance was such that it preempted the French from taking effective action. Put another way, the German operational tempo defeated the French in the battle for time.

In his book, The Basic Principles of Operational Art and Tactics,

Savkin offers a related view from the same campaign:

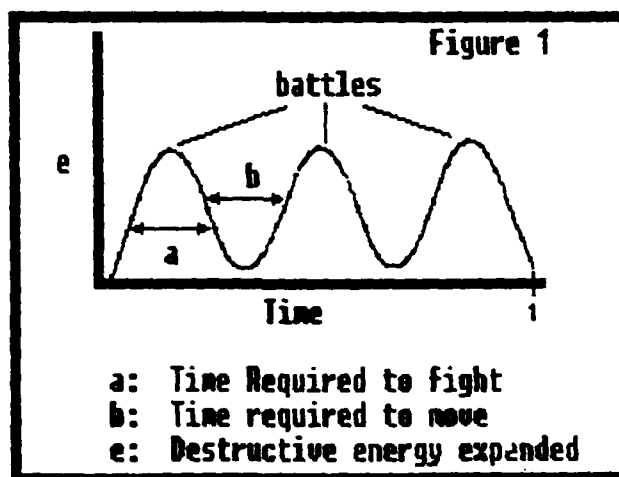
"...the high tempos of attack of the fascist German troops in the initial period of World War II very often deprived *soyedineniya* [division or corps size units] of

French and British troops of the opportunity to take up . . . lines favorable for defense in a timely manner and dig in on them. The enemy usually captured these lines from the move. The forceful advance of fascist German troops at the beginning of the war led to a situation where allied reserves which had moved up to the front line from the depth were committed to a battle or engagement piecemeal, as they approached. As a result, the enemy, with more compact groupings [denser centers of gravity] on the axes of main attacks received the opportunity to deliver defeat with fewer forces to larger forces of allied groupings acting in scattered fashion."²

III. THE DYNAMICS OF TEMPO

In the previous pages, I have attempted to two things. First, to propose a working definition of operational tempo. And secondly, to point out to the reader the benefits achieved by attaining a high tempo of operations. In this section, I will now discuss the individual elements which interact with each other to produce high tempo with the goal of developing an in depth understanding of the concept.

Operational tempo is the product of several complex interactions. Fundamentally, it is the result of the amount of time required to fight battles combined with the rate of advance achieved between these battles and the operational objective.⁴ These two dynamics, the time it takes to fight, and the time it takes to move, combine to produce a specific operational tempo.⁵ This relationship is depicted graphically below.⁶



Additionally, several other dynamics impact on the ability to move fast and fight quickly. Among these are the effects of simultaneous and successive actions, deep operations, and surprise. Below I will discuss each of these interacting actions in detail with

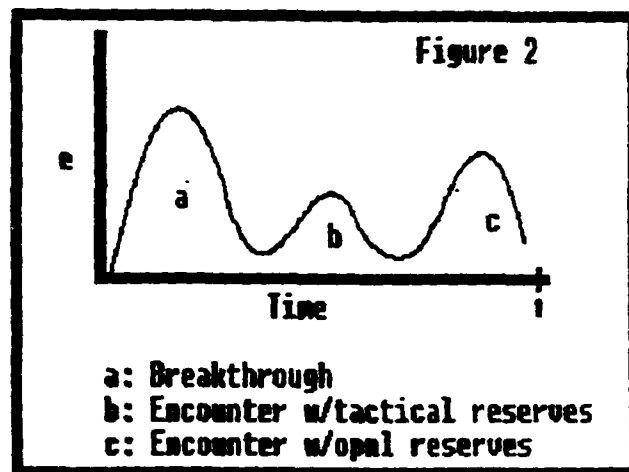
the hope that through an analysis of the fundamental elements of tempo, a clearer understanding of the total concept will emerge.

A. The Role of Battle

The operational level of war deals with the employment of military forces to attain strategic objectives in a theater of war or theater of operations. Operational art and operational planning revolve around the central question of how to go about attaining these strategic objectives. The result of this process is a campaign or major operation plan which then must be executed. This plan is an expression of how an operational commander plans to accomplish his assigned mission with the resources that he has available. In an offensive, several key operational elements are among the parts of this plan. First, the plan designates operational level objectives for the major subunits which, if secured, will lead to the successful attainment of the assigned strategic goal. Second, it identifies concentration areas for major force groupings in preparation for the attack. And third, the plan identifies the lines of operations or thrust lines along which the operation or campaign will take place.⁷

As was discussed earlier, the tempo of an operation is the distance from the initial line of contact to the rear of the final operational objective divided by the time in days from the start of the operation. However, along the line of operations from the line of contact to the final operational objectives, the major operational subunits will fight battles and engagements. To a large extent, the duration of these battles will depend on how quickly these units can attain their assigned tactical objectives. When combined, the duration

of these tactical actions will have a significant effect on the overall tempo of the operation (figure 2).



A series of factors affect the duration of these battles. Among the most important of these factors are doctrine, organizational agility, mass, intelligence, and surprise.⁸ These factors, by themselves and in interaction with each other, are the prime determinants of how quickly battles can be brought to a successful conclusion. Of course, since war is conducted against an active opponent the actions of the enemy have a significant impact on this speed of action. Thus, the factors outlined above are of use only when considered in relation to an opponent.

1. Doctrine.

All modern armies possess a body of doctrine. In a broad sense, doctrines are sanctioned precepts, guides for action, and methods for

overcoming problems in order to achieve a desired end. The aim of doctrine is to establish procedures for optimal performance.* Thus, doctrines are to a great degree prescriptive in nature and reflective of what each army believes to be important in war.

Mobility [flexibility] and High Tempos of Combat Operations is the most important principle of Soviet operational art and tactics.¹⁰ The primacy of this principle permeates Soviet operational and tactical doctrine. Inherent in this principle is the realization that time is a critical factor in the conduct of operations. By itself the seizure of terrain is of little importance. It is the fast movement over terrain with the goal of operational preemption of the enemy that is at the heart of high tempo operations. Thus, economy of time is naturally at the forefront of Soviet operations.

The most illustrative example of the importance attached by the Soviets to time comes from their definition of "combat mission". The Soviet Dictionary of Operational, Tactical, and General Military Terms defines "combat mission" as follows:

"Most compressed and clearly formulated definition of the goal to be achieved in a given type of combat operations by a definite deadline or during some period of time. In the offensive, the combat mission consists of the destruction of the most important groupings of the enemy and the winning, by the set deadline, of a definite line or area."¹¹

From this we can see that to the Soviets time is an inherent part of the mission--as equal in importance as the enemy and the terrain. Thus the mission defines the time allowed for the completion of an action. A subordinate is thus eminently aware that in order to complete his mission successfully, he must do it in time. This concept is

totally sensible and one which we, in the United States, should consider employing. After all, an objective can be seized and the enemy destroyed to no great avail if it is not done in a timely manner.

Operationally, the setting of deadlines for the completion of tactical actions greatly simplifies planning and execution. For example, sequential actions can be planned with a greater degree of precision because timelines are in effect for all actions preceding the one being planned. Additionally, "time objectives" can serve not only to synchronize actions and events, but also to provide an overall control measure for the operation. Rather than detracting from flexibility, they add immeasurably to it by giving the commander another tool by which to measure the progress of an operation.

We can see that the value that a doctrine puts on speed of movement and mission accomplishment is at the heart of how fast that army's units will actually move and fight. If time is not a consideration, organizations and tactics will not reflect the importance of speed. Rather, they will emphasize slow, deliberate action. If time is of primary operational importance, however, organizations and tactics will reflect the need for fast tactical action. Of course, it can be argued that the trade-off here is a savings in time paid for by an increase in losses at the tactical level.¹² It can be further argued that this type of tradeoff may be one which is acceptable to the Soviets but is not one which Western societies are likely to bear. This, however, is a false argument. We must recognize that it is not losses at any one level that count, but overall losses. And if greater

tactical speed brings forth a fast operational victory, then in the long run these losses may turn out to be small in comparison.

2. Organizational Agility

The second factor which impacts on how quickly battles are fought is the agility of each opponent. Broadly speaking, organizational agility is the speed at which an organization reacts to change and takes action to cope with, or take advantage of that change. As a concept, organizational agility only has utility when compared to that of the enemy. In and of itself, acting fast means nothing. Acting faster than your opponent, however, pays very tangible dividends.

As a simple illustration, consider the advantage that a boxer would have, with all other things being equal, if he could throw twice as many punches as his opponent in the same amount of time. In boxing, this advantage is so great that many times a faster, quicker boxer can defeat a stronger but slower reacting opponent. Carrying the analogy a bit further, two fast, quick-reacting and equally powerful opponents matched against each other make for an exciting fast-paced fight. But in this instance, agility does not come into play as a major factor in the decision. It is the differential in agility between opponents that makes the difference in boxing.

Similarly in war, from the strategic to the tactical level, the side which can act and react faster than its opponent accrues a great advantage in terms of time. The side which is quicker uses time more efficiently and, thereby, at some point forces the enemy to react to its

actions. A British Field Manual on Soviet operational doctrine puts the problem this way:

"Once the enemy is forced into a position where he is merely reacting, inevitably belatedly, he will be well on the road not merely to defeat but to destruction. In such a concept of war there is no place for tactical niceties. The side which acts speedily and decisively will win. Hence the Soviet enthusiasm for simple battle drills at unit and sub-unit level. By hastening the committal of units, and indeed formations, they intend to win the crucial battle for time and thus put the enemy into a position of fatal disadvantage."¹³

Organizational agility, in turn, is a product of many factors interacting with each other. Among these are: organizational design, number of command echelons, equipment, initiative, training, and the command and control system.

Organizational design determines the characteristics of fighting units. It determines at what level arms will be integrated and combined; what the proper mix of weapons should be; whether units will be square or triangular; what the ratio of leader-to-led will be; how big a logistics tail a unit will have; how much redundancy will be built into the organization; and what size units should be. All of this, impacts on the agility of an organization. A unit designed deliberately to fight positional warfare would look very different than one designed for mobile war.

The impact of the number of command echelons on agility is obvious. The larger the number of intermediate headquarters between the headquarters making a decision and the unit acting on that decision, the greater the time of execution. This is because each intermediate command level must take the time to develop implementing orders for

their subordinate units. Thus, although a greater degree of control can be exercised with a greater number of command echelons, this is accomplished at the cost of reduced agility.

The greatest contribution of equipment to organizational agility comes in the area of mobility. The mobility of a modern armored force is the product of its equipment and its organizational design. Equipment, combined with proper organizational design can give one party a mobility differential over an opponent.¹⁴ A force which can achieve such a mobility differential over an opponent is in the same position as the boxer who can punch more rapidly than his opponent. If it is as powerful as its opponent, the contest will never be in question. If it is weaker, by its ability to move faster it has a very good chance of making up for its lack of power and thereby win.¹⁵

The broad use of lower level initiative contributes to organizational agility by short-circuiting the command system. Time is saved by subordinates acting on their own without asking for, or awaiting, orders. Thus, actions are timely as well as quicker. Additionally, lower level initiative provides another benefit. It aids in coping with breakdowns in the command and control system by maintaining action in the absence of orders.

Training is the process that gives substance to doctrine. No matter how elegant or coherent a doctrine may be, it is not worth the paper it's written on if it can't be executed. Thus, doctrine and training are inextricably linked. A doctrine must be practicable. And that means that it must be realistic in terms of the demands that it places on those executing it. Thus, organizational agility is a direct

function of doctrine and of how well a unit is trained to execute that doctrine.

Command and control is at the heart of organizational agility. How fast an organization can analyze a situation, decide on an appropriate action, and convey that decision in the form of an order, to a great extent, determines how fast the action will be executed. This in turn, is a product of intelligence, the commander's personality, staff procedures, technological means, training, and doctrine. The making and relaying of the decision is the starting point for all other action. At the operational level, the procedures and actions taken to shorten this process have the equivalent effect of battle drills at the tactical level. It must be recognized, however, that there is a tradeoff to be made. An extremely fast decision, quickly conveyed that is wrong, is worse than useless--so too is a decision that is technically perfect, but late. Thus, what an organization should strive for is to make and convey appropriate decisions faster than its opponent.

3. Mass

The next factor that impacts on how quickly tactical actions can be completed is mass--more specifically, the relationship of friendly forces to enemy forces in space. The Soviets believe that there is a direct cause and effect relationship between first, the ratio of attacking forces and the width of the zone over which they attack (density) and, secondly, between the depth of objectives that they can realistically obtain and the speed at which they can attain those objectives.¹⁶ Based on empirical and historical analysis the Soviets

have developed normative data which take into account force, space, and time factors in order to develop optimum figures for the depth of objectives, relative concentration of forces, and most importantly, time to complete the mission (Table 1).

Whether the Soviet approach is totally correct is subject to debate. What does seem to make sense, however, is that there is some relationship between the qualitative and quantitative ratio of forces and means and how fast a unit can move toward its objective. Thus for example, it seems logical that an armored division attacking a prepared defense at a ratio of 1:1 can be expected to move at a rate of 2 km per day, while the same armored division attacking the same defense at a ratio of 6:1 can expect to move at a rate of 30 km per day.¹⁷

4. Intelligence

Another factor impacting on how quickly tactical objectives can be secured is intelligence. Only with accurate intelligence can the proper correlation of forces calculations be made. And as we noted above, the proper correlation of forces greatly impacts on the rate of advance. Also, accurate information about enemy strength and dispositions aid in selecting routes and axes of least resistance. This in turn, ensures rapid rates of advance.

During the Second World War, Soviet commanders always sought to exploit one of three potential areas of weakness. First, they sought to exploit terrain believed by the enemy to be unsuitable for major operations and therefore lightly defended. Second, they always deemed it preferable to strike an opponent perceived to be weak in equipment or

morale. Thus, Italian, Hungarian, or Romanian units were always attacked before German ones. And third, Soviet forces displayed a predilection for attacking formation and unit boundaries where reaction to their blow was likely to be confused and uncoordinated.¹⁸ Achieving all of this, of course, depended on accurate intelligence.

5. Surprise

The central role that surprise plays in high tempo operations will be discussed at length later. Here I wish to present the simple notion that the attainment and maintenance of surprise leads to a quicker defeat of the enemy than otherwise would be possible.

Surprise aims to take the enemy unaware. It is the application of means and methods of action unexpected by the enemy.¹⁹ Thus, the central premise behind striving to achieve surprise is that a surprised enemy is less capable of dealing with a situation than if he were not in such a state. Reznichenko states:

"An enemy subjected to surprise attack and taken unawares falls into a grave and critical position. He is forced to change his intentions suddenly, to halt his systematic combat activity and to reorganize it to conform to new, unexpectedly appearing conditions of the situation; he must act uncertainly, without a plan. Measures to counter the surprise attack must be sought hastily; consequently they are often of little effect."²⁰

The result of all of this is that the attacker accrues a benefit from the enemy's surprise. All other things being equal, his task will be accomplished faster and at less cost than had he faced an enemy physically and psychologically prepared for his attack.

B. The Role of Operational Movement

The operational movement of forces into the depths of the enemy is the second major component of operational tempo. However, although not a direct determinant of operational tempo, the movement of forces behind friendly lines into operational concentration areas is a prerequisite to operational success and a high tempo of operations. This movement of forces serves a basic aim of the operational level of war--the bringing about of combat under the most favorable conditions possible, and then the taking advantage of the ensuing tactical success to operationally exploit the victory.²¹ It is in this area that Soviet operational art excels most.

The rapid movement of forces to achieve favorable operational concentrations was a hallmark of Soviet World War II operations. By these operational concentrations they were able to set or, more accurately put, to predetermine the conditions for tactical success. For example, during the Vistula-Oder Operation the Soviets were not only able to concentrate operationally vastly superior forces in each of the three bridgeheads over the Vistula, but they were also able to deceive the Germans as to their actual strengths at these locations (Map 1). Thus, while the Germans believed that the ratio of forces against them in the Magnuszev bridgehead was roughly 3:1, in fact it was 5:1. Similarly, in the Pulawy bridgehead the Germans assessed a 3.5:1 advantage for the Soviets, while in reality the advantage was 6:1. The story was the same at the Sandomierz bridgehead where German estimates were again 3.5:1 against them, and in actuality the Soviets had concentrated a ratio of forces of 7:1 in their favor.²²

At the tactical level, the results of these operational concentrations are stark. A sample of seven German divisions facing a portion of the bridgeheads at Magnuszev, Pulawy, and Sandomierz reveals the following Soviet tactical concentrations. Against the 251st, the ratio was 6:1. Against the 6th *Volksgrnadier*, it was 16:1. In the sector of the 17th Infantry, it was 10:1. Opposing the 214th Infantry forces were at 8:1. Against the 168th the Soviets massed at ratios of 13:1. Against the 68th it was 15:1. And finally, opposing the 304th it was 10:1. Additionally, when armor is added to these figures, the ratios change to the area of 30, 35, or 40:1.²² Thus, no degree of tactical excellence by German forces in these sectors was likely to lead to success. In this example, the operational concentration of forces predetermined the success of the tactical actions. Likewise, these concentrations also set the conditions which made the subsequent high tempo of this operation possible.

As I did with tactical actions, I would like now to look at the different factors that impact on the speed of movement in the operational depths of the enemy. Predictably, some of the factors that impact on the ability to move fast are similar to those which impact on the ability to fight quickly.

1. Doctrine

The overriding concern for time is the governing factor in Soviet operational and tactical doctrine. And as we have seen from the 1940 example, in the operational depths of the enemy, the race for time is directly related to how fast units move. Soviet thinking clearly reflects this point. Savkin states:

"The decisive importance of mobility, especially of tank [exploiting] troops, for achieving success of an operation or battle is explained by the fact that swiftness and maneuverability are the main features of combat operations by these forces. These two qualities have enormously greater significance than armor protection."²⁴

The doctrinal belief that mobility is decisive is reflected in every facet of Soviet operations. This is the driving idea behind forward detachments, operational maneuver groups (OMGs), *desant* operations, and their combat tactics.²⁵ It is also the central concern of Soviet organizational design.²⁶

2. Organizational Design

Soviet equipment and organizations are designed not only to move, but to move quickly and to move far. They are thus designed to have great firepower, transportability, and sustained organic mobility. On the one hand, Soviet equipment is designed to be cheap, easy to operate and produce, available and reliable, and adequate for their function without frills.²⁷ On the other hand, organizations are designed to be mobile and viable. Thus the ratios of fire support, engineers, air defense, reconnaissance, and NBC defense units have been carefully worked out to ensure maximum organizational mobility.

The offensive bias of Soviet doctrine is evident on the resulting organizations. Soviet organizations are relatively short on anti-tank systems when compared with NATO forces. On the other hand, they are very comfortable in the artillery and mortars required to suppress NATO anti-tank defenses. The offensive bias is also manifested in the organization and echelonment of Soviet artillery and reconnaissance

units which are tailored to ensure the continuity of support required to progress into the operational depth of the enemy.²⁰

3. Logistics

Being tailored for organizational speed, Soviet tactical units have considerably less logistic capability than their western counterparts. This however, does not constitute a weakness in Soviet eyes since it is not tactical sustainment that is important to them, but operational sustainment.

The Soviet Army treats the problem of support in its operational totality rather than as separate regimental, division, and army problems. A great portion of their resupply capability is centralized at front and army level and units are supported in accordance with their needs as perceived by operational planners. Initially, priority is given to formations attacking on the main axes. When second echelon formations or OMGs are committed to secure operational objectives, support is massively switched to these units. Thus, by directing the great majority of the logistical effort in the direction of operationally significant formations the Soviets ensure that every key unit is adequately sustained.

4. Intelligence

Intelligence and reconnaissance are critical factors impacting on a formation's ability to move fast. At the operational level, the quality and quantity of operational intelligence determines the amount of operational risk assumed. Good operational intelligence reduces risk and consequently increases speed.²⁰ For example, an operational

formation moving in the depths of the enemy can be compared to a car driving on a road at night with its headlights on. The range of the car's headlights determine the speed at which the car can safely go. That is, the range of the headlights provides to the driver a safety parameter. Thus, based on the speed of the car and the quickness of his reflexes the driver can react to a hazard as it comes into view with an acceptable degree of risk. In other words the driver compares how far he can see with how quickly he can react and determines at what speed he can safely drive.

As with the range of the headlights, the quality and quantity of operational intelligence provides to the commander the parameters for his speed. The better and further that he can see the hazards in the road ahead of him, the quicker he can move and still deal safely with these obstacles. From this one can see why the Soviets place such emphasis at every level on intelligence and reconnaissance. Good tactical intelligence and reconnaissance permit good tactical speed. And good operational intelligence and reconnaissance permit a high tempo of operations at an acceptable degree of risk.

5. Terrain

If the position of a friendly force at an operationally significant location in the rear of an opposing force exerts a leveraging action on that enemy force, the speed at which that force moves toward that objective also has a significant impact on the opponent's ability to counter that action. In turn this speed, as we have seen, is a result of the dynamic interaction of many factors. The

last of these factors that I wish to consider is the role played by terrain.

Land warfare takes place on the medium of terrain. For the attacker this is a medium which must be traversed if he is to achieve his objectives. For an attacker interested in speed, what is important about terrain is where on that terrain he can move fastest towards his objective.²⁰ Thus, the high tempo attacker is most often interested in the going rather than the tactical qualities of the terrain. He is interested in selecting terrain through which he can move at a high rate of speed.

This selection, however, is not done in a vacuum but in relation to an enemy situation. The Manchurian Campaign of August 1945 showed that the Soviets many times preferred going through rough terrain rather than heavily defended terrain.²¹ At times however, they took their losses and broke through heavily defended but "fast" terrain. The common denominator to these seemingly opposite perceptions of terrain cannot be found at the tactical level but at the operational level. At this level it was not terrain, but time which was important. Thus, if going through rough terrain was calculated to be faster operationally than fighting through the enemy, then this approach was selected as the preferred alternative. The idea here is that in a projected high tempo operation the importance of terrain is measured in relation to time.

C. The Role of Simultaneous and Successive Action

Ever since the battle of Leuctra in 371 B.C., where the Theban general Epaminondas defeated a numerically superior Spartan army with

the famous oblique order, most battles and operations have been decided by the application of the same fundamental principle.²² That principle calls for the unequal distribution of forces across the front in order to be able to concentrate forces for the main attack on the decisive point.²³

In a war where there are extended fronts, the attacker will attempt to concentrate his forces in specific areas of that front in order to penetrate that front and subsequently destroy the opposing army. If he is successful in masking his intentions from the enemy, as in the Vistula-Oder Operation, this concentration will be successful and the enemy will be ill prepared to stop a penetration from occurring. However, if not prevented from doing so, the enemy can recover by shifting forces laterally across his front and thereby narrow the ratio of forces arrayed against him.

The purpose of simultaneous action is to freeze the enemy in place so as to allow the forces at the decisive point the time required to gain an operational decision.²⁴ This is done by conducting supporting attacks along the length of the front and thereby, in essence, "fixing" the entire front in place. This in turn, allows the favorable correlation of force at the decisive point to be maintained and a high tempo to be generated.

Successive actions, on the other hand, are designed in order to have their effects felt by the enemy at different times. An example of this is the execution of a supporting attack days in advance of the main attack in order to draw forces away from the intended decisive point. Another example is the staggered commitment of forces at the same

decisive point. The effect of this successive commitment of force is that it maintains the momentum of the attack by sequentially introducing greater mass.²⁵ Thus it can be seen that while simultaneous actions set up the conditions for high tempo, successive actions, in turn, serve to increase or sustain tempo.

D. The Role of Deep Operations

Deep operations and deep operations theory are a complex subject with many interacting variables. The modern roots of these ideas trace their origin to J.F.C. Fuller's *Plan 1919*, which called for an attack on the rear as a means of collapsing resistance on the front. Fuller's seminal idea was expanded upon in the Soviet Union during the 1920's and 1930's in the writings of Triandafillov and Tukhachevskiy.²⁶ In 1937 Tukhachevskiy wrote:

"During actions with earlier technical equipment, just the forward edge of the enemy disposition was disrupted and a dent was formed in the line of his front. Thanks to this the enemy was able to draw up his reserves in time and eliminate the threat of breakthrough. But modern means of combat permit us to organize the attack in such a way that the enemy is simultaneously hit to the full depth, and his reserves can be contained on their approach to the threatened sector."²⁷

In World War II deep operations theory, was put into practice and refined by both the *Wehrmacht* and the Red Army. Following the war and the advent of nuclear weapons, deep operations were further perfected and have evolved into today's Soviet concepts of operations in depth and our own deep battle.

Today, deep operations involve a complex meshing of ground, airborne, air assault, and special forces together with air forces, long

range missiles, intelligence, reconnaissance, and command and control. The scope of this paper does not permit a detailed discussion of deep operations. Rather, it focuses on the overall effect of deep operations on operational tempo.

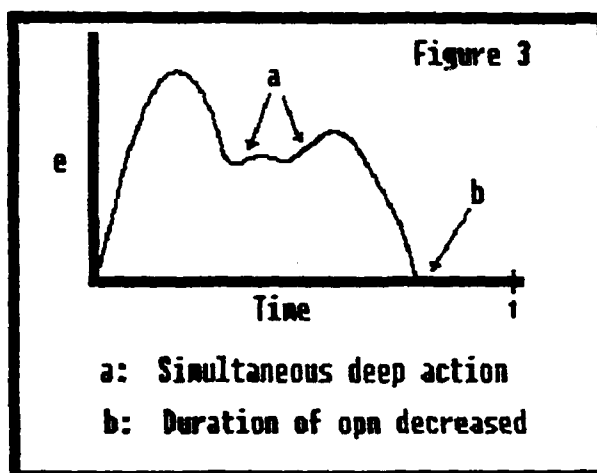
The governing idea behind deep operations is the extension of simultaneous action to the entire depth of the enemy defense. Deep operations aim at fixing forces not only across the front, but also in the depths of the an enemy defense. In essence, deep operations restrict the enemy's freedom of action by delaying and disrupting any forces echeloned in depth.

This delay and disruption accomplishes several important functions. First, in the all-important battle for time it serves to attrit an enemy's available time. It forces the enemy to use more time to accomplish an action that otherwise would be completed faster. Second, it adds an element of friction into enemy operations. And third, it allows allows the effects of a successful operational concentration of forces to take effect by preventing a timely enemy counterconcentration or counterattack.

All of this works to increase the tempo of operations by making it harder for the enemy to conduct rapid and effective maneuver in the depths of his defense. As a result, interference by the enemy to friendly actions is likely to be piecemeal, uncoordinated, and ineffective.³⁰

Lastly, in addition to hindering enemy counteractions, deep operations by airborne and airassault forces also assist in generating

high tempos by securing difficult ground forward of advancing ground forces. The effects of deep simultaneous operations can be portrayed graphically as shown below (figure 3). As can be seen these actions have the effect of cutting the time between battles and also of increasing the intensity of combat.



E. The Role of Surprise

The last factor to be considered is the effect of surprise on tempo. Surprise occurs to the extent that a victim is ignorant of, or unprepared for a condition. Thus, surprise is a matter of degree. If the victim fails to obtain any warning, total surprise occurs. If he obtains warning, but is incapable of taking proper action, the victim although not cognizantly surprised, still suffers the effects of the surprise.³⁹ The gravity of these effects will be directly proportional to the extent of the victim's unpreparedness to take effective action to counter the initial surprise action.

Operationally, this unpreparedness translates into a loss of time for the side which is surprised. This side must now expend time in an attempt to make up for faulty initial dispositions by shifting forces on the battlefield. The time that it takes to counter the surprise can be used by the enemy to exploit the unfavorable conditions to his advantage. Thus, the surprised party pays for its unpreparedness by surrendering terrain and expending forces. So in essence, surprise forces the uneconomical use of time by the victim--it forces him to use the time that he has available to move forces rather than using that time to destroy the enemy had those forces been properly positioned.⁴⁰

By definition, a surprise attack takes place at a time, location, strength, or with means or methods that the enemy is less than fully prepared to cope with.⁴¹ Surprise thus indirectly sets up the conditions for the achievement of high tempo. It enables high tempos to be generated as a consequence of the enemy's unpreparedness to meet the attack. This unpreparedness at the point of attack can be attributed to many causes, but primarily it is the result of the attacker doing that which the defender does not expect. For the defender, the result of this is that he can not adequately prepare for an action that he fails to expect or foresee. Consequently, the degree of resistance that he is able to offer is less, and as a result, a higher tempo can be achieved by the attacker.

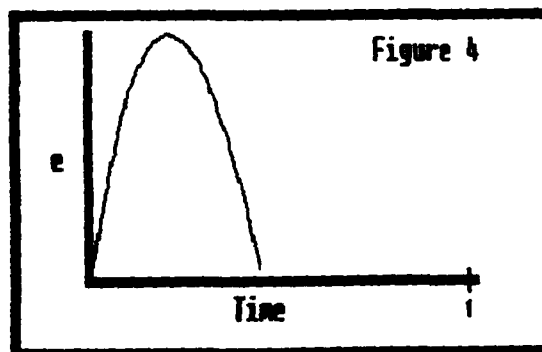
In the same manner that surprise aids in the achievement of high tempos, the maintenance of high tempos sustain the effects of the initial surprise. High tempo operations present the enemy with new and rapidly changing situations which make his counteractions untimely and

ineffective. The opponent reacting to the initial surprise is therefore presented with a series of new and unexpected situations against which his initial counteractions are not effective. The result of this is a dynamic cycle in which surprise generates high tempo and high tempo generates new surprise.

Thus, a primary goal of high tempo operations is to prolong the effects of the initial surprise. The ultimate achievement of this goal would be to maintain the effects of the initial surprise from the start to the finish of a campaign or a war. As noted previously, these effects are limited by the time necessary for the surprised party to manage to take effective countermeasures and counteractions. High tempo operations deprive the surprised party of this time. And without this time, as Savikin notes:

"...enemy groupings often generally will not manage to take steps to eliminate the consequences of surprise attacks made against them. In these cases surprise may be the deciding factor in achieving total success."⁴²

The graph of the ideal high tempo operation is shown below (figure 4). This graph portrays an operation as a single, short duration, high-intensity battle conducted simultaneously throughout the entire depth of the enemy.



IV. COUNTERING SOVIET TEMPO

Earlier, we described tempo as the rate of movement of an operational mass over terrain against a resisting enemy mass. This view of tempo suggests that a particular operational tempo is the relative product of six general variables: the size of the enemy and friendly masses, the distance moved by the enemy and friendly masses, and the time used by each combatant.⁴² Since these variables interact with each other, one can deduce that a change in any one variable will affect the other variables to some degree. Therefore, as with any resource, an opponent can manipulate these variables to suit his needs. Thus for example, a combatant may exchange terrain (distance) for time, mass for terrain, mass for mass, or mass for time.

With this in mind, the Central Front in Europe poses several problems for a defender trying to counter a high-tempo offense. First, political constraints prevent the trading of space for time or space for enemy mass. Secondly, the lack of operational reserves compounds the above by making it impossible to be operationally active in the early stages of a conflict and thereby accrue the advantages of operational maneuver. And third, the ratio of forces in the theater precludes a balanced exchange of friendly mass for enemy mass. On the surface the above would seem to be a no-win proposition for NATO. How can a force that is outnumbered, without credible operational reserves, and politically precluded from trading space for time, possibly hope to stop a high-tempo Soviet attack without employing nuclear means?

This dilemma, is strikingly similar to the one which faces our previously mentioned boxer fighting a heavier and stronger opponent.

The boxer, like the forces in AFCENT, has to stay inside the ring (little maneuver space), he does not possess a knockout punch (operational reserves), and his opponent is stronger (greater mass and firepower). The solution is the same to both the problems of the NATO Central Front and those of the boxer. The answer is to be faster and quicker than the the more powerful opponent and through a cumulative process of many sharp, but relatively light, blows wear down that opponent to the point of collapse.

A. Operational Requirements

In military terms what is required is a process of operational attrition by means of superior tactical-level agility and maneuver. To support this strategy, AFCENT must array its operational forces in a such a way as to set the conditions for tactical success--for it will be through tactics, rather than operations, that a Soviet high-tempo offensive will be stopped. In other words, AFCENT must deploy forces on the ground in such a manner as to create favorable tactical odds in the battles it chooses to fight.

We have seen how Soviet operational design in the Vistula-Oder Operation set the conditions for tactical success by concentrating overwhelming mass at each of the three bridgeheads across the Vistula. If through a combination of deception and surprise, they were able to do the same in a future war in Europe, the results would be catastrophic. We would be tactically overrun, and because of the lack of reserves, operationally impotent to counter the resulting torrent.

The above places a heavy burden on accurate and timely operational intelligence. This intelligence must provide us with sufficient warning of enemy dispositions and intentions. This in turn, will allow us to concentrate adequate forces on the projected enemy operational thrust lines so as to ensure favorable tactical ratios at the points of attack. Also, such operational intelligence will be critical in the conduct of effective deep operations designed to retard Soviet tempo. If this can be accomplished, then with superior tactical skill and agility, coupled with a balanced use of tactical maneuver, operational fires, and the advantages of the defender, a Soviet operational thrust can be stalled and a breakthrough into the AFCEM operational depths prevented.

This approach seeks the proper operational concentration of forces so as to ensure favorable tactical conditions at the vital points of attack. This approach is markedly different than that currently employed to develop the General Defense Plans (GDPs) in Europe. These plans seek to establish a favorable correlation of force on every potential avenue of approach based on an estimate of the size of forces that these avenues can accommodate. As such, they are directly driven by considerations of what the terrain can handle and only indirectly by the enemy. More importantly, however, these plans presume that the enemy will be so kind as to conform to our preconceptions of where he will mass.

As the Manchurian Campaign of 1945 shows, the Soviets in the past have preferred to negotiate tough terrain rather than fight through tough opposition. The reason for this preference has been that such approaches have served to save time. Today, with the value of time more

critical than ever, it would be prudent for us to assume that the Soviets would prefer to do the same in any future war. This is particularly apparent when one considers the lack of infantry in AFCENT. In terms of saving time, this lack of infantry, particularly in the American sectors, make an approach over rough but lightly covered terrain very inviting to a Soviet attacker.

Operational and tactical deployments based only on the capacities of avenues of approach are a recipe for disaster. Operational deployments must be made based on accurate operational intelligence immediately prior to hostilities.⁴⁴ They must conform to the enemy and not to preconceptions based on terrain. Thus, corps and division sectors cannot be fixed in concrete. They must be flexible. AFCENT corps and divisions, like any other forces in defense, must be prepared to expand or contract their sectors to generate favorable force ratios at the actual points of attack (Sketch 1). Additionally, plans must incorporate variants which free forces to execute counterconcentrations in adjacent sectors aimed at redressing force imbalances (Sketch 2). Being prepared to defend in this flexible manner will also aid us in preventing surprise and maldeployment, since without preconceptions as to where and in what strength the enemy will attack, we will be less vulnerable to enemy deception efforts aimed at feeding such preconceptions.

B. Tactical Requirements

In the preceding pages, I have attempted to present the case that one of the principal aims of operational art is to set the proper conditions for the successful execution of tactics. In AFCENT, because

of the lack of sufficient operational reserves, setting the conditions for tactical success entails the proper deployment of these forces on terrain to achieve favorable tactical force ratios. Setting the proper tactical conditions also entails a myriad of other operational requirements. Among these are the battle for control of the air, the delay and disruption of follow-on forces, air defense, rear area security, the maintenance of proper stockage levels, sustainment operations, and a host of other requirements. When combined, the results of these operational-level actions define the battlefield for the tactical level.

Given that AFCENT can avoid defeat only by being tactically superior to the Soviets, one can see easily that the tactical battlefield defined by the operational level is of crucial importance. This is so because there is some finite limit as to how much a general tactical superiority can compensate for an overall operational inferiority.⁴⁵ The limit of this qualitative balance between levels of war is extremely difficult to estimate in the absence of any recent combat experience. Thus, we are left with the uncertain task of having to be tactically superior to our opponent without the capability of determining just what level of superiority is required. Recognizing this dilemma as one that we are not likely to resolve with a great degree of certainty, it is still important for us to attempt to explore and develop the required means and methods which may allow us to increase our tactical power.

To this end, some recommendations are presented below. The thread common to all these recommendations is the belief that greater agility

combined with adequate firepower and protection provide the only means to defeat a superior enemy determined to achieve a high-tempo of operations.

* The number of command echelons must be reduced. Each added link in the chain of command causes problems. Each tends to delay transmission of orders forward and getting information back. And, each added link tends to weaken the commander's power by providing him with a more remote picture of the situation and also by diminishing the force of his personal influence on those executing his orders. Conversely, the fewer the intermediate headquarters, the more dynamic operations tend to become.⁴⁶

The most likely candidates for elimination are the brigade or division headquarters. Here, little practical difference exists. We could either have a greater number of slightly larger self-sustaining brigades under a corps or, a greater number of smaller divisions without intermediate brigade headquarters. The results would be the same--a greater number of maneuver units at corps and and a resultant increase in speed and flexibility.

Addressing the benefits of this sort of arrangement, Liddell Hart cites the following:

"It is easy to show this by comparison to the human hand. If a man had only two fingers and a thumb, he would find it much more awkward to get a properly adjusted grip on any object, or opponent, than he does with four fingers and a thumb. His hand would have less flexibility and less capacity for concentrated pressure than it actually possesses. If anyone doubts this let him put on a fingerless leather mitten, and find how hampering it feels compared with an ordinary glove. That cramping condition has been reproduced in modern military organization. It has become the custom for units to be divided into only three

maneuverable parts, while the larger formations consist of no more than two--if that."⁴⁷

* The mobility of units has to be increased. Cutting the number of command echelons will greatly increase responsiveness and, therefore, the overall agility of our forces. To compound this effect organizations must also become more mobile physically. They must be able to move, act, and react faster than their opponents. Here, combat organizations designed around the mobility and firepower of the helicopter offer great promise.⁴⁸ Such units would possess a marked differential in mobility as compared to their ground based opponents. These units could thus operate at a faster pace than Soviet ground based units. And clearly, leveraging this speed differential into increased tactical power offers a means for AFCENT to preclude a high-tempo operation from developing.

* Economy and synchronization of effort must govern every aspect of friendly operations. The inferior side cannot afford to waste mass or energy. Each must be applied in such a manner as to gain the maximum possible effect. Since as has been previously discussed, we are operationally precluded from trading space for enemy mass or time what we are left with is the necessity of trading friendly mass for enemy mass and time. Agility, economy of effort, and synchronization of power must allow us to make this exchange at ratios so favorable to us that we deny the Soviets operational success by precluding tactical success.

V. CONCLUSIONS

The Soviet obsession with high-tempo operations is the result of a logical and disciplined scientific study of how best to achieve victory

within the parameters set by their resources and constraints. This approach carefully blends weapons, organizational design, and human resources, into a doctrine and vision of war that is peculiarly Soviet. It attempts to capitalize on the strength derived from centralized control and greater numbers while minimizing the impact caused by their relative weaknesses at the tactical level and in technology.

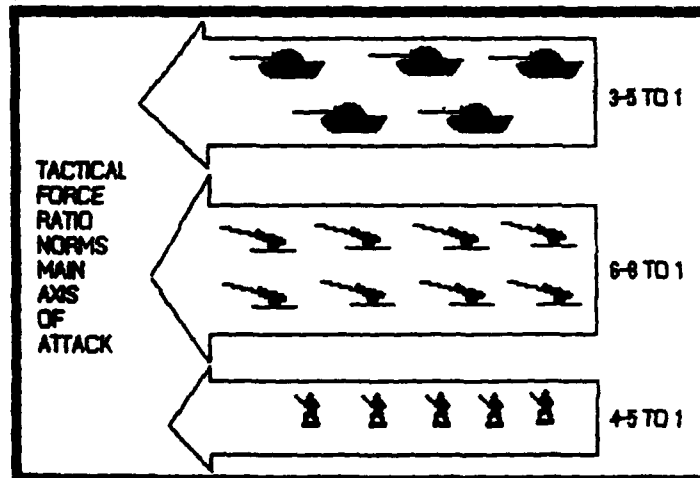
Implicit in the approach is an overriding concern for the value of time. Time is the medium that will be contested. It predominates over terrain or force considerations. In the Soviet view the seizure of terrain serves primarily as a measure of how well time is used. Operationally, this priority manifests itself in the almost phobic Soviet stress on high rates of advance. Strategically, the value of time is equally overriding, since it is only through a rapid victory that the Soviet Union can possibly hope to defeat NATO while avoiding a nuclear war.

The challenge for NATO, and AFCENT in particular, is to prevent this quick win without resorting to nuclear weapons. However, because of the nature of the theater, the operational constraints imposed by a strategy of deterrence, and the political constraints present, NATO is seriously handicapped in dealing with a high-tempo offensive. The best way to deal with these problems operationally, would be for NATO to adopt an operational pattern anchored on large and highly mobile operational reserves. This pattern would, of course, entail a higher risk but would have the benefit of providing a higher payoff if properly executed.

Short of the above, the recommendations advanced in this paper provide the next best solution. That is, an operational pattern based on operational attrition and tactical maneuver. In this scheme, highly mobile AFCEM units would wage tactical maneuver warfare with the aim of inflicting operationally unacceptable levels of attrition on Soviet forces. Here, the role of the operational level would be to set the conditions for favorable tactical action to take place--the cumulative value of which would preclude Soviet operational success.⁴⁹ Having denied the Soviets operational success in the early stages of a war, it would be highly unlikely that they would seek a decision through protracted war. Thus, the onus of nuclear escalation or of suing for peace would shift to the Soviets. Additionally, another benefit of adopting this pattern is that it would pit western strength against Soviet weakness. It would seek decision at the tactical level where our better trained soldiers and our greater propensity for independent action and initiative by tactical commanders could be counted upon to reap huge benefits.

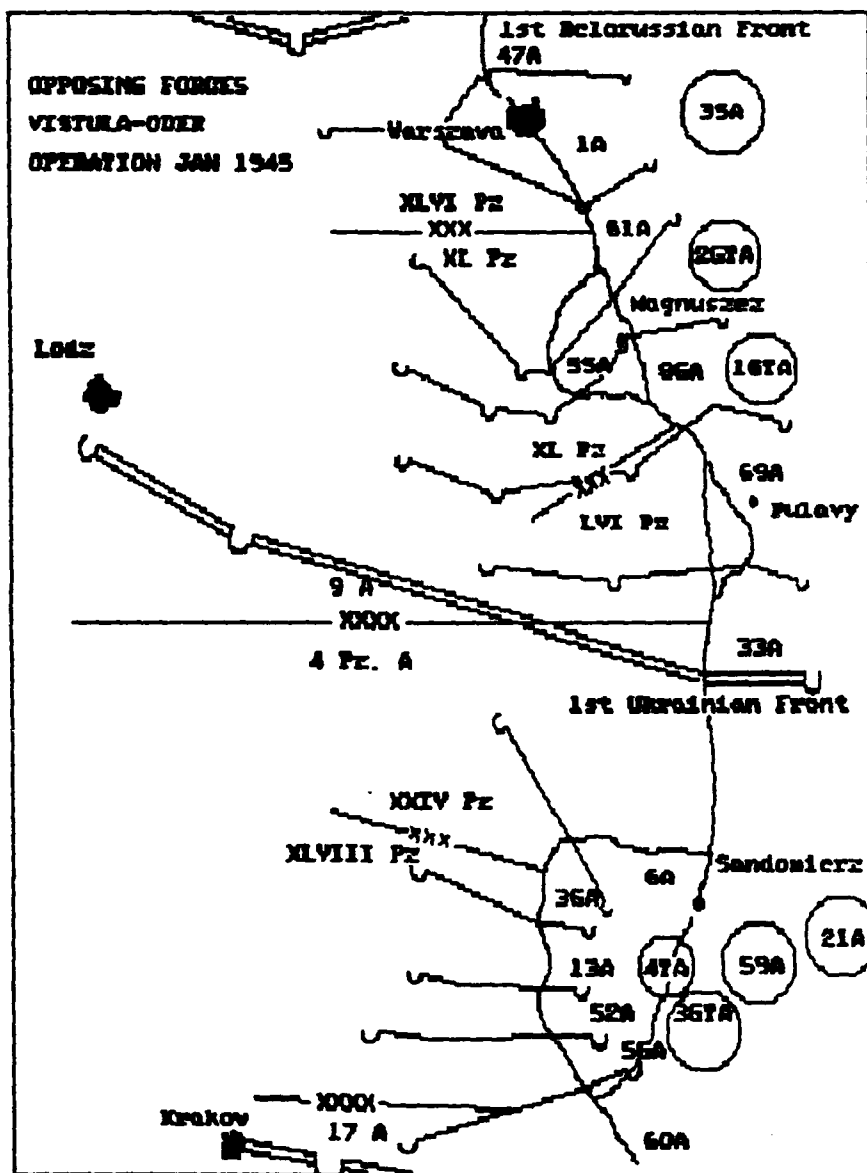
OFFENSIVE NORMATIVE DATA

FRONTAGES, OBJECTIVES, AND TIMES OF ATTAINMENT				
NORM	FRONT	ARMY	DIVISION	REGIMENT
ZONE OF ADV	150-300	60-100	20-30	2-10
ATK FRONTAGE	—	30-40	4-10	2-3
DEPTH OF 1 ST OBJ	100-150	40-60	15-20	8-15
TIME OF ATTAINMENT	D+ 3-4	D+ 2-3	H+15	H+7
DEPTH OF SUBSEQ OBJ	200-300	100-150	20-30	15-20
TIME OF ATTAINMENT	D+7(+)	D+ 3-4	D+ 2-3	H+15

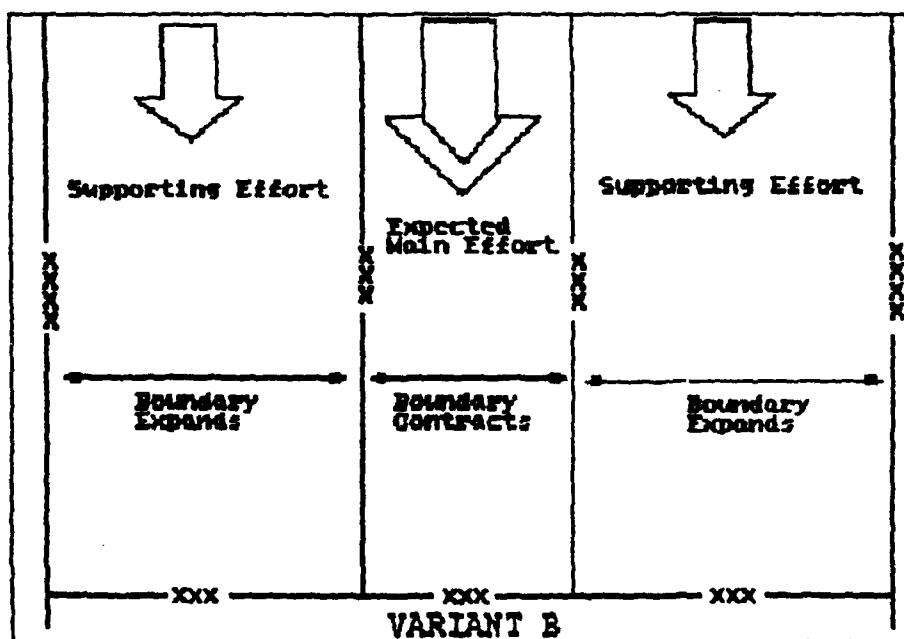
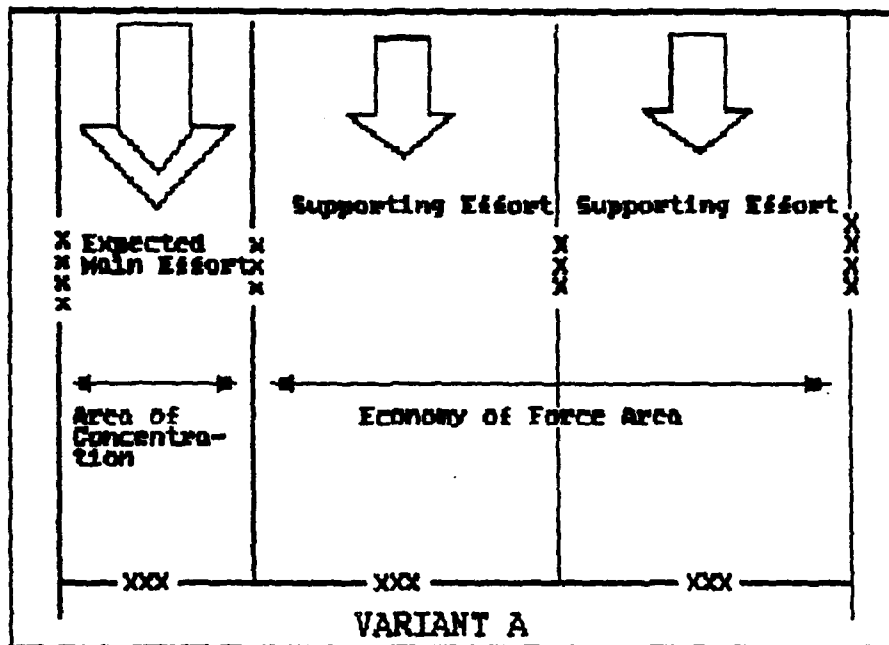


Source: Soviet Ground Forces:
An Operational Assessment

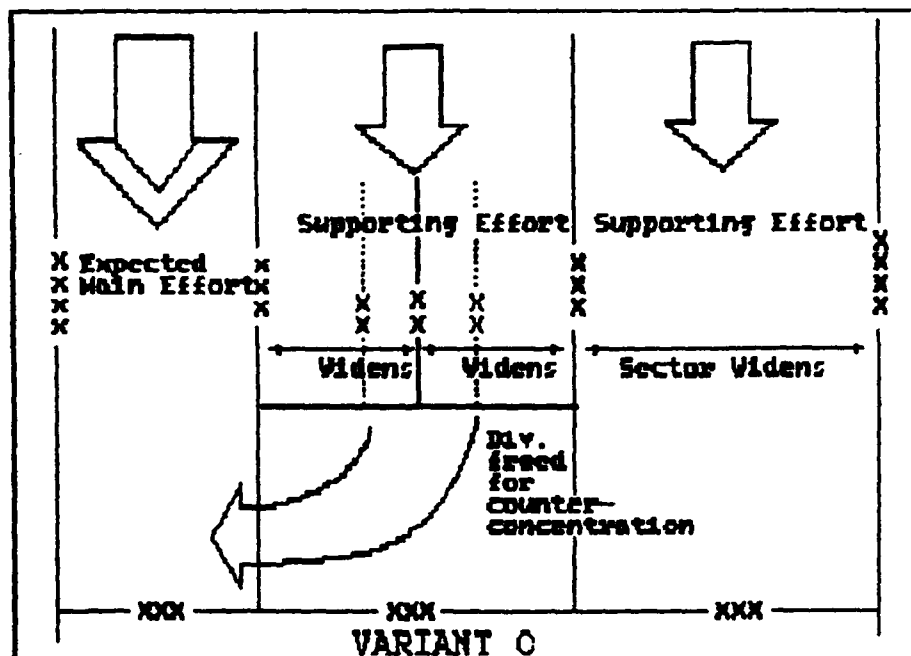
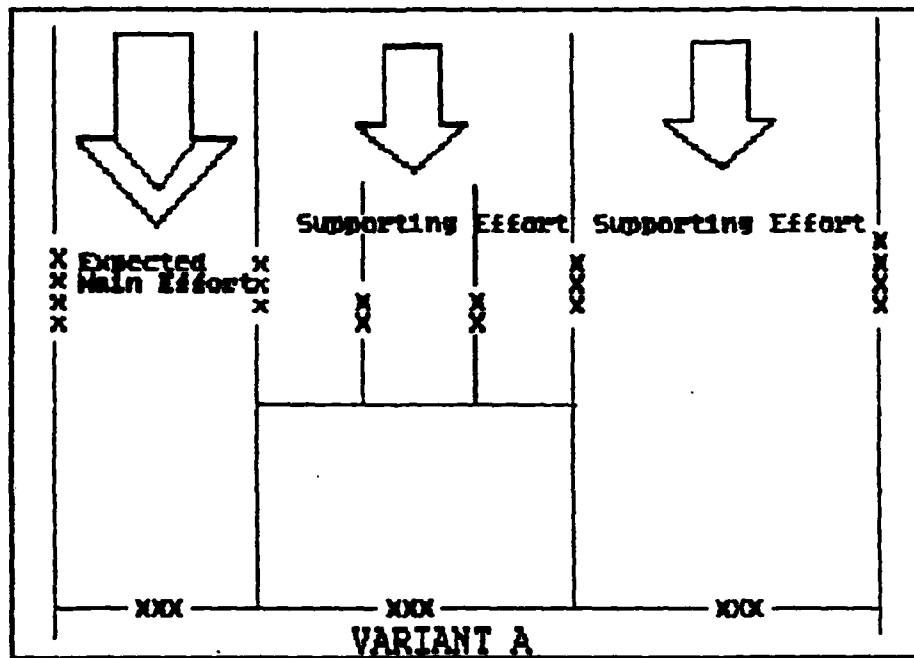
TABLE 1



MAP 1



SKETCH 1



SKETCH 2

ENDNOTES

1. Carl von Clausewitz, On War, (Princeton: Princeton University Press, 1984), p. 358.

2. Goutard, English edition, The Battle of France, 1940, p. 140; as cited in William A. Shirer, The Collapse of the Third Republic, p. 627.

3. V. Ye. Savkin, The Basic Principles of Operational Art and Tactics, (Moscow, 1972), p. 172.

4. Thus, in an attack of a strong defense, the overall tempo of the operation would be determined by the time taken to fight through the enemy's tactical depth combined with the travel time to the operational objectives, including the time taken to fight any encounter battles at operational depth. This time, divided into the distance covered by the operation will yield the tempo of the operation.

For definitional purposes, I define tactical depth as the defended zone. That is, the area within which a force is to be defeated primarily by the actions of a positionally defending enemy. I define operational depth on the other hand, as that area past tactical depth where the enemy can be defeated or contained only by the actions of a counterattacking force.

5. In Race to the Swift: Thoughts on Twenty-First Century Warfare, (London: Brassey's Defense Publishers, 1985), p.106, BG Richard Simpkin maintains that tempo is a complex of of seven mutually interacting elements: Physical Mobility, Tactical Rate of Advance, Quantity and Reliability of Information, C² Timings, Times to Complete Moves, Pattern of Combat Support, and Pattern of Service (logistic) Support.

6. I am indebted to Mr. James J. Schnieder, Professor of Theory at the School of Advanced Military Studies, Ft. Leavenworth, KS., for introducing me to the energy wave concept in the application of force.

7. The Command and General Staff School, The Principles of Strategy for an Independent Corps or Army in a Theater of Operations, (Fort Leavenworth: The Command and General Staff School Press, 1936), pp. 24-25.

8. The reader may wish to consider other factors such as: terrain, weather, time available to the enemy to prepare, morale, logistic situation, and extreme qualitative differences between forces. The scope of this paper does not permit a totally comprehensive discussion of the subject.

9. Major General I.B. Holley, Jr. "Concepts, Doctrines, and Principles: Are You Sure You Understand These Terms?", Air University Review, pp. 91-92.

10. Savkin, Operational Art, p. 168.

11. Voennaia Akademiia Imeni M.V. Frunze, Dictionary of Operational, Tactical and General Military Terms, (Moscow: Military Publishing House of the Ministry of Defense USSR, 1958), p. 43.
12. Another manifestation of this phenomenon is the American penchant for substituting firepower for closing with the enemy. Although saving lives in the short run, this approach is slow, inefficient, and costly in the long run. It usually allows an enemy the option of withdrawing and living to kill another day.
13. Army Code No. 71357 (Pt2), The Army Field Manual, Volume II, Soviet Doctrine, Part 2, Soviet Operations, (Great Britain, 1986), p. 1-4.
14. Mobility is also a function of terrain. In Korea, the less sophisticated Chinese Army possessed a mobility differential over the technologically superior, but road bound American Army. Organizational design must take into account where a force is likely to fight and then equip it to achieve maximum agility in those conditions. The air assault division, conceived by the Howze Board, was just such a blending of equipment, organization, and conditions.
15. This of course, assumes that the smaller force is able to perceive conditions, orient to those conditions, decide on a course of action, and transmit that course of action at least as fast as his opponent. In other words to set the machinery in motion at the same time as his opponent.
16. Army Code No. 71357 (Pt2), Soviet Operations, p. 5-11.
17. There is no unanimous concurrence on this point. The Soviets firmly believe in a correlation between density of forces and rates of advance. However, in a recent article Col T. N. Dupuy, "Can We Rely Upon Combat Simulations?", Armed Forces Journal, August 1987, argues that he can find no evidence for such a correlation.
18. Army Code No. 71357 (Pt2), Soviet Operations, p. 5-11.
19. V. G. Reznichenko, Tactics (The Officer's Library), (Moscow, 1966; Translated by USAF Foreign Technology Division, 1967), p. 56.
20. Reznichenko, Tactics, p. 55.
21. Colonel Wallace Franz, Large Unit Maneuver, (Unpublished Manuscript), p. 5.
22. Colonel David M. Glantz, Oral Overview of the Vistula-Oder Operation presented at the U.S. Army War College at The 1986 Art of War Symposium. Reprinted by the U.S. Command and General Staff College in, Readings in Soviet Operational Art, p. 191.
23. Ibid., p. 191.
24. Savkin, Operational Art, p. 175.

25. Ibid., pp. 189-201.
26. John Erickson, Lynn Hansen, William Schneider, Soviet Ground Forces: An Operational Assessment, (Boulder: Westview Press, 1986), pp. 209-217.
27. Army Code No. 71357 (Pt2), Soviet Operations, p. 3-1.
28. Ibid., p. 3-7.
29. Richard Simpkin, Race to the Swift: Thoughts on Twenty-First Century Warfare, (London: Brassey's Defense Publishers, 1985), pp. 199-204.
30. As we have seen, this is not just a function of terrain but also of organizational design and equipment. It is also a function of enemy resistance.
31. LTC David M. Glantz, August Storm: Soviet Tactical and Operational Combat in Manchuria, 1945, (Leavenworth: Combat Studies Institute, U.S. Army Command and General Staff College, 1983), pp. 199-200.
32. In the battle of Marathon in 490 B.C. the Athenian general Miltiades thinned his center in order to expand his line. The thinning of the center made the wings stronger and when the Persians attacked the center fell back and the stronger wings crushed the Persian attack. In practical terms, this is the first employment of the principle of uneven distribution of forces. However, it cannot be determined whether Miltiades planned on this occurring from the outset.
33. Savkin, Operational Art, p. 203.
34. At operational levels I believe that simultaneous action does not necessarily mean "at the same time." Rather, it means within one operational decision cycle. Thus, if an enemy is reacting to an action, and before he has completed this reaction another action is presented to him, then these two actions can be considered simultaneous in their effect. The enemy, in essence, has been presented with two actions before any reaction has taken place.
35. Momentum can be increased by either increasing mass or increasing speed. Successive introduction of combat power therefore increases mass, which in turn serves to sustain speed.
36. Erickson, Soviet Ground Forces, pp. xv-xviii. There is no direct evidence, however, that Tukhachevskiy was influenced by Fuller's writings.
37. Mikhail N. Tukhachevskiy, "What is New in the Development of Red Army Tactics," from Harriet Fast Scott and William F. Scott, The Soviet Art of War: Doctrine, Strategy and Tactics, (Boulder: Westview Press, 1982), p. 58.

38. Savkin, Operational Art, p. 195.
39. Richard K. Betts, Surprise Attack, (Washington, D.C.: The Brookings Institution, 1982), pp. 4-5.
40. Thus, surprise also provides a degree of protection for the attacker.
41. P.H. Vigor, Soviet Blitzkrieg Theory, (New York: St. Martin's Press, 1983), pp. 144-182.
42. Savkin, Operational Art, p. 232.
43. As the graphs have illustrated, it is the destructive energy that a mass can bring to bear which we should be concerned with. Thus, greater mass refers not to greater numbers, but rather, to greater potential destructive energy.
44. By operational deployment I am referring primarily to the positioning of corps on the ground and to the relative level of force assigned to each army group.
45. The the battle for the Golan Heights during the 1973 Arab-Israeli War is an example of how a general tactical superiority by the Israelis made up for a great operational inferiority.
46. Basil Liddell Hart, "How to Quicken Maneuver and Gain Flexibility," unpublished and undated manuscript provided by the "Art of War Colloquium", U.S. Army War College, Carlisle Barracks, Pa., p. 1.
47. Ibid., pp. 1-2.
48. For more information see: General Dr. F. M. von Senger und Etterlin, "New Operational Dimensions," Journal of the United Service Institute, June 83, pp. 11-15 and "The Airmobile Divisions: Operational Reserves for NATO," Journal of the United Service Institute, March 1987, pp. 23-30.
49. This is not meant to imply that large unit operations will never be required. These types of operations will be prerequisite for any type of theater counteroffensive. Rather, what is meant is that given all the restraints and constraints present in NATO, only by being greatly superior at the tactical level will we be able to initially stop a Soviet high-tempo operation. Once this is stopped, however, major operations will have to be conducted to regain lost territory.

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