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Counterfire: Is It Time to Rethink the Problem?

A Monograph
by

Major William H. Parry, III

Armor

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School of Advanced Military Studies
United States Army Command and General Staff College
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Current U.S. tactical doctrine is vague at best in addressing the magnitude of the problem. The counterfire dilemma demands that we solve it with a multi-functional solution. Relying solely on one branch - Field Artillery - for this mission imposes too great of a degree of risk; it is one risk the tactical commander may not be able to accept.

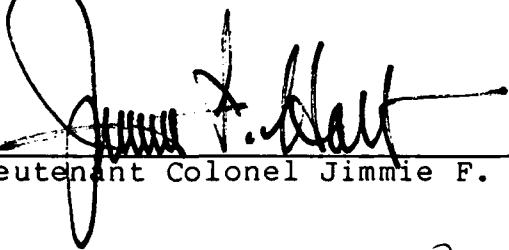
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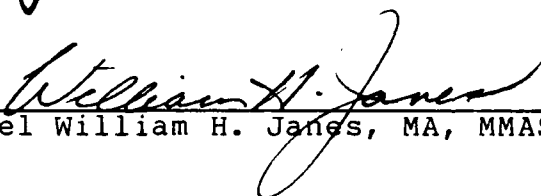
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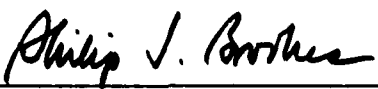
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ABSTRACT

COUNTERFIRE: IS IT TIME TO RETHINK THE PROBLEM? by MAJ William H. Parry, III, USA 61 pages.

This monograph examines how and why Soviet tactical artillery dominance threatens victory on the AirLand Battlefield. Soviet tactical/operational doctrine, as delineated in the 1987 version of Taktika, is offensively oriented, stresses combined arms, and places a premium on the role of artillery within that doctrinal framework. Soviet artillery force structure and fire support doctrine are clearly consistent with this theme. The U.S. tactical commander must not only understand the unique aspects of Soviet warfighting, but recognize the specific threat posed by each arm and how it contributes to the synergism of combined arms warfare.

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I. INTRODUCTION

Whereas one can steel oneself to fight another man, artillery is a monstrous, apparently unstoppable machine, slicing mechanically through earth, rock, flesh, bone and spirit. Furthermore it is not a clean way to die. Whereas men can sometimes come to terms with the thought of a swift bullet through the head, the sight of one's comrades blown apart, disembowelled, of bodies disinterred by shellfire and tossed around as gory playthings, is infinitely more crushing to morale.(1)

In 1986, Chris Bellamy aptly coined the name "Red God of War" for the Soviet artillery and rocket forces. It is the Soviet Army's oldest arm, and many in the West are now coming to realize that artillery may well be its deadliest one. Recent writings confirm the Soviet belief that artillery is the tactical arm of decision. Its primary mission will be to ensure the integrated destruction of the enemy's defenses by fire, thus establishing the conditions for operational maneuver.

The current U.S. Army "How to Fight" doctrine, from the capstone FM 100-5 (Operations) down to FM 71-100 (Division Operations) only vaguely addresses this vitally important area. The Soviets have a quantitative, as well as qualitative edge in available artillery. Outnumbered U.S. forces cannot win by waging an artillery battle of attrition. The requirement is clear. Soviet artillery dominance makes counterfire a combined arms imperative for the tactical commander. The purpose of this monograph is to examine the issue of counterfire from a

non-traditional (i.e. non-artillery) perspective, and propose alternative methods, techniques and procedures as a starting point to win the counterfire fight. The problem demands an all arms, functional approach that cuts across the theoretical limits of the Battlefield Operating Systems and branch roles.

Through simulations, the Army has taken an important first step in training commanders and staffs to be ready for war. Yet, no exercise can realistically replicate the destruction, disorganization and disintegration that massive Soviet artillery barrages can achieve. In its 1988 summer study, the Defense Science Board estimated that currently, the Soviet commander outguns his U.S. tactical counterpart by about seven to one. (See Figures 1 and 2, pp. 42-43.) However, we must not focus solely on numbers and/or capabilities. The Soviet Army considers artillery as more than just a support arm or combat multiplier. They have integrated it as a key component of their combined arms offensive warfare concept. (2)

Section II will focus on the evolution of both Soviet and U.S. military theory, and the influence of history on theory and doctrine. This may provide the reader with some insights on how unique interpretations of the same events, have yielded significant doctrinal differences.

Section III will examine the evolution of fire support within this doctrinal/theoretical framework. The Soviets draw a high degree of correlation between the

Great Patriotic War (including the use of artillery) with any future conflict between NATO and the Warsaw Pact. Historical vignettes will attempt to explain why. Additionally, the lack of a unique U.S. military theory, its modern war experiences, and role in international relations may lead to an appreciation of why U.S. fire support doctrine and force structure differ radically from the Soviets.

Section IV contains a discussion and analysis of Soviet doctrine for a combined arms offensive. The sequence of actions and integration of all arms is examined as a test of the hypothesis that the Soviets have adopted the conventional artillery doctrine and force structure to win a future war against NATO. Conclusions from this analysis will help identify exploitable weaknesses in the Soviet fire support system. The aim is to recommend possible methods, techniques and procedures for winning the counterfire fight.

As in other areas, terminology and interpretation make simple issues appear confusing. For example, there is a subtle, but important doctrinal distinction between counterbattery and counterfire. As defined by JCS Pub 1 and accepted by NATO, counterbattery is "fire delivered for the purpose of destroying or neutralizing indirect fire systems." (4) Counterfire, within DOD and NATO, is "fire intended to destroy or neutralize enemy weapons. [It] Includes counter-battery, counterbombardment, and

countermortar fire." (5) This latter definition stipulates that counterbattery is a subsystem of counterfire. However, the specified means and ways in both rely solely on fires. This leads to two fallacious conclusions. The first is that artillery/fire support is the only resource available for counterfire. Secondly, it implies that the responsibility for defeating Soviet artillery rests solely with the force artillery commander. Unfortunately, current U.S. tactical doctrine is consistent with this one-system solution. The tactical commander who follows doctrine and ultimately engages in an artillery duel with his Soviet counterpart, risks defeat through attrition. Counterfire is the maneuver commander's problem; to solve it demands a multifunctional approach. Finally, the tactical commander must synchronize counterfire with his concept for deep, close and rear operations. Anything less risks wholesale defeat on the future battlefield.

II. THE EVOLUTION OF THEORY AND GROUND WARFARE DOCTRINE

Too often, Soviet artillery developments, like all military developments, are seen through Western eyes, and through this mirror imaging the picture is in fact distorted. (6)

A. Introduction.

Military theory is "a structure of knowledge consisting of a set of first principles that describes and explains the processes and phenomena that lead to the

destruction, disorganization and disintegration of armies in battle." (7) Theory is not universal. Culture, experience and other circumstances contribute to the perceptions of reality that uniquely shape a nation's military theory. Doctrine is the tool that links theory with reality, or practice.

Maneuver and firepower are the two principal elements of land warfare doctrine. In this century alone, the prominence of one over the other has caused numerous vacillations between a maneuver and firepower orientation in U.S. Army doctrine. (8) However, in the 1930's, two Soviet theoreticians began to formulate theories that effectively melded the two together. The powerful synergism resulted in combined arms warfare - a concept still very much in effect today.

B. The Roots of Combined Arms Warfare: 1870-1945

The Soviets define military doctrine as a "nation's officially accepted system of scientifically founded views on the nature of modern wars and the use of the Armed Forces in them, and also on the requirements arising from these views...Military doctrine has two aspects: political and military-technical." (9) Figure 3 depicts the hierarchical relationship between the different elements of Soviet military doctrine.

Officially accepted means that the highest echelons of power in the Soviet Union influence and approve military doctrine. War, and thus warfighting doctrine

are inextricably linked with politics, a theme first emphasized by Clausewitz. The focus on requirements evolving from scientific principles is clearly Jominian. The Soviets have historically placed significant burden of proof on the quantitative aspects of warfare - a precedent that continues to influence Soviet military theory.

These two prominent European theorists and two wars within the span of eight years (Franco-Prussian and Russo-Turkish) significantly shaped military thought in pre-World War I Russia. Clausewitz's writings on concentration in space and time, the strength of the defense and the strategy of annihilation influenced Moltke's prosecution of the 1870-71 Franco-Prussian War. However, the Russians had difficulty applying Clausewitz's maxims to their Pyrrhic victory over the Turks in 1878.

The near debacle in the Balkans, coupled with the marked evolution in the lethality of firearms, prompted the Russians to seek a clear and simple solution to guide their thinking about war. Dr. Bruce Menning points out, the Russian officers "who read German found Clausewitz difficult to comprehend and subject to diverse interpretations." (11) Jomini's theories were more palatable however, because he not only served with Tsar Nicholas, but his Art of War was written in French, the "second language of choice for educated Russians." (12) It was also during this period, that Marx's Dialectical

Materialism found favor with the Russian academics. It is not surprising therefore, that the military found "the neatness and clarity of Jomini at least superficially lent his thought more scientific credibility than that of Clausewitz." (13)

The modern Soviet Army traces its doctrinal and organizational roots to the early 20th century writings of two of the Soviet Union's most prolific military theorists: Vladimir K. Triandafillov and Mikhail Tukhachevskiy. (14) Triandafillov's 1929 Nature of the Operations of Modern Armies, relied heavily on scientific analysis of the past as a means to forecast the future. He asserted that nations would wage future wars on broad fronts and could achieve decisive victory only through a series of successive operations into the enemy's depths. He based this on two hypotheses. First, Western Armies were continuing to develop and field the new technologies that he perceived produced victory in World War I. Secondly, based on his analysis of capitalist societies, he believed "mass, mechanized armies would dominate future battlefields." (15)

Triandafillov disagreed with Fuller and others in the West who believed mechanization and aviation would make large armies obsolete. He envisioned armies of the future would number more than a million men, and be based primarily on infantry and artillery. The size dictated that an army would only "be built on the foundation of a person with average gifts and average qualities." (16)

Advancing the scientific aspect of war further, Triandafillov "posited various norms, i.e. densities of fire and men"(17) required for each phase of his successive operations theory. The purpose of norms was to show the Soviet Army clearly lacked the quantity and quality of weapons systems to be successful against a Western nation in a future war.(18) However, these normative planning factors continue to be a significant tool for Soviet tactical and operational planning.

The other prominent Soviet theorist during this period of enlightened military thinking was Mikhail Tukhachevskiy. Unlike Triandafillov, Tukhachevskiy believed exploiting the capabilities of large-scale mechanization and aviation could enhance breakthrough operations.(19) He developed a concept known as simultaneous operations (subsequently known as "deep battle".) Tukhachevskiy recognized the backwards and antiquated Soviet Union of the 1930's lacked resources to implement his theory; to bring his concept of operations to fruition required extreme foreign military assistance. The Soviets found a willing partner in Germany. The Versailles Treaty had completely stifled large scale German military development. However, under the auspices of the 1922 Treaty of Rapallo, the Soviets and Germans entered into joint cooperative military efforts. This permitted Germany to develop military hardware in the Soviet Union and gave the Soviets the opportunity to test and evaluate emerging

technologies.

In his 1931 work New Problems in Warfare, Tukhachevskiy advocated a shift from Triandafillov's firepower dominated doctrine to one based on the maneuver principles of envelopment and encirclement. Tukhachevskiy asserted there were three keys to simultaneous (from forces in contact through the depths of the enemy's defenses) operations. First, forces in contact must conduct violent attacks against different sectors across a broad front to keep enemy forces, including reserves pinned. Secondly, forces needed "sufficient quantity of suppressive means, insuring not just the defeat but the destruction of large enemy units defending the front." (20) Finally, forces in contact would find and rupture a weak point in the enemy defenses for the insertion of mobile groups. The modern Soviet concept for combined arms offensive warfare is known as combat in depth [glubokogo boya]. (21) The 1987 Taktika traces its foundation to the 1936 Red Army Field Regulation (PU-36), and reflects the profound influence of Tukhachevskiy's theories on current Soviet doctrine.

"PU-36 fully reflected the main ideas about deep battle worked out by Tukhachevskiy." (22) In fact, it is likely he was one of the principal authors. It is in this regulation that the "seamless web" linking firepower and maneuver as inseparable components of combined arms warfare begins to emerge. In a 1937 Bolshevik journal commentary on PU-36, Tukhachevskiy exhorted the

soundness of

...tactical principles based on flexible strong mutual support among the various arms of the service. Secondly, he stressed the primacy of the offense, chastising those who assume that positional warfare is necessary and inevitable. (20)

The evolution of these principles has carried forward to current Soviet tactical doctrine.

Battle...is organized armed combat ...and is the principal form of tactical operations; it consists of strikes, fire and maneuver coordinated in purpose, place and time...Fire prepares for and supports attacks by the troops, it is an inseparable part of such attacks, it promotes their swift development, and it creates conditions permitting maneuver. (24)

C. U.S. Military Theory: The Truth Changes

As was the case with the Soviets, wartime experience tempered U.S. military theory. Russell Weigley asserts that Union success in the American Civil War was the American baseline experience for subsequent military thought about future, large-scale war. A blend of complete firepower domination and Clausewitz's theories led Army doctrine writers to conclude that "in the end, overwhelming American power would assure the annihilation of the enemy's strength." (25) They cited the South's complete and ultimate capitulation to Grant's superior manpower and materiel as proof. U.S. pre-World War I doctrine reflected this belief. However, World War I created a controversy for the U.S. Army (as well as most other Western nations) over the dominance of maneuver

versus firepower. "The memory of the Civil War suggested that the primary military virtue is sheer power...The memory of the Western border wars [as well as World War I] suggested that the primary military virtue is mobility." (26)

One of the prominent Western thinkers who influenced U.S. military thought during this period was J.F.C. Fuller. While the U.S. Army quickly codified Fuller's Principles of War in the December 1921 edition of War Department Training Regulation 10-5, they rejected his maneuver theories. (27) The writings of Clausewitz, perceptions of the decisive element in the U.S. Civil War, and Fuller's principle of objective, yielded a clear aim - destruction of the enemy's armed forces. The doctrine writers argued that Grant had tried to maneuver to turn Lee's flank and failed. "America's confidence in its own unparalleled physical power permitted its Army ...to contemplate the destruction of the enemy armed forces not by envelopment or similar maneuver, but by the head-on application of overwhelming power." (28) They too saw mass armies as the wave of the future, and as such, strategical combinations of maneuver would be exceedingly difficult to execute. Unfortunately, the financial crises of the 1930's denied a plausible solution to the maneuver/firepower paradox. Accordingly, a decision on the appropriate doctrine and force structure would not be made.

Another significant series of events regarding

equipment, exacerbated the linking of theory and practice for the U.S. Army. In World War I, the U.S. fought largely with borrowed equipment. To ensure that in the future, the U.S. would be self-sufficient in war materiel, initiatives began to tie branch needs to materiel design and acquisition, taking this function away from the sole control of the Ordnance Department. While this was a notable achievement, the failure to forecast accurately the future impact and role of the tank/mechanized forces would be a serious shortcoming exposed by World War II. The National Defense Act of 1920 relegated tanks to an infantry support role and pre-World War II tank design conformed - light, mobile, and severely undergunned. As World War II loomed in the near future, a self-imposed problem confronted the U.S.; it preached overwhelming firepower over mobility, but found itself with a mobile, but underpowered Army.

The blitzkrieg of 1939-40 immediately proved that armored/motorized forces were the heart of modern armies. To rectify its shortcomings, the Army developed a doctrine of fire and maneuver, suited to this type of force. However, the architect of ground force organization and General Headquarters Chief of Staff, General Lesley McNair was an advocate of mobility. He pared the number of heavy tank divisions to two and gave only minimum essential organic support assets to the infantry divisions. As needed, corps and division pools would provide needed support (such as artillery.) We can

only speculate how effective this doctrine and force structure would have been against the German blitzkrieg of 1940. However, from 1944 onward, it was the sheer weight of American manpower and materiel that secured the German's defeat. For the U.S. Army, victory in World War II validated its doctrine of fire and maneuver, and the U.S. Army would attempt to apply it in both Korea and Vietnam.

D. Military Theory in the Nuclear Age

Shortly after World War II, the primacy of atomic/nuclear weapons brought about what the Soviet's term a revolution in military-technical affairs. There is no doubt that the strategic impact of these new weapons dramatically changed the way both the U.S. and the Soviets thought about war. The discussion of their tactical contribution will therefore be superficial at best. For both superpowers, nuclear weapons created an aberration in force structure and doctrine, giving rise to the concept of war deterrence at the expense of large standing armies. The Soviets have recently reversed this trend, but since its withdrawal from Vietnam, the U.S. Army has never fully recovered its World War II "fire and maneuver" force structure.

When the Soviets achieved tactical/strategic nuclear parity in the early 1970's, the credibility of these weapons as a deterrent to future war in Europe was questioned. The Soviets applied Marx's dialectic to solve the dilemma. Their thesis was that a war with NATO

would resort to nuclear weapons. The antithesis was that should deterrence fail, war would remain conventional due to nuclear parity. The synthesis dictated a requirement for both nuclear and conventional warfighting capabilities. Additionally, the Soviets perceived many striking parallels between their Great Patriotic War experiences and any future conventional conflict with NATO. Their subsequent force expansion and doctrinal revisions clearly support this notion.

In its post-Vietnam assessment, the U.S. Army viewed these Soviet changes with alarm. We found ourselves confronted by: The defensive nature of the NATO alliance; public unwillingness to fund the conventional forces to match the Soviets; and a set of unique perspectives (mostly materiel-based) from the 1973 Arab-Israeli War. These served as catalysts to renew the debate between firepower versus maneuver. As a result, the concept of the "Active Defense" became Army doctrine in 1976. A main premise of the doctrine was that sophisticated antiarmor firepower was key to defeating a numerically superior Soviet conventional threat.

While the analysis of the quantitative imbalance was sound, critics blasted the doctrine on the basis that outnumbered forces could not win a battle of attrition solely through firepower. They charged that the doctrine cast the offensive precedence and character of the U.S. Army into a secondary role. As a result, means (forces) and ends (deterrence) did not change, but the way

(tactical concepts) did. In 1982, the maneuver-oriented AirLand Battle replaced the Active Defense as official U.S. Army how-to-fight doctrine. It remains to be seen, just as in the 1930's, whether the Army is "preaching maneuver" while it lacks the firepower to back it up.

III. FIRE SUPPORT DOCTRINE: ARE THEORY AND REALITY LINKED?

Concepts are military in nature, relating to ideas, thoughts, general notions about the conduct of military affairs...Concepts are not doctrine until tested, approved, and accepted. Doctrine generally describes how the army fights tactically; how tactics and weapons systems are integrated; how forces are ...trained...and employed. (29)

TRADOC Commander's Note No.3, 20 Feb 79

A. Soviet Fire Support

History plays a major role in Soviet military doctrine development. Soviet fire support doctrine clearly fits this same pattern. Bellamy notes that in the 1930's, "the Soviets began to think about using artillery in the way they plan to today; adapting it to a war of maneuver, using it to 'clear the way' not only for infantry but also for tanks." (30) However, at the outbreak of World War II, Soviet doctrine was anything but maneuver-oriented. They would pay a great price for this in the first phase of the Great Patriotic War (June 1941-November 1942); but they would also learn some valuable lessons about artillery that they still adhere

to today.

One of these lessons was the centralization versus decentralization of artillery. The Soviets experienced a limited degree of success in grinding down the blitzkrieg by using artillery in the direct fire role. Large, mechanized formations and the lack of cover on the relatively open steppes of Russia demanded it. Massed fires proved to be not only effective, but an absolute necessity for survival. However, deep penetrations that did occur, inflicted catastrophic Soviet artillery losses. To prevent the total destruction of their heavy artillery (130mm+ guns, 203mm howitzers, MRLs) "the amount of artillery in infantry divisions was reduced...and the equipment thus released was formed into units of the Artillery Reserve of the High Command." (31) While this led to increased mobility for the divisions [the bulk of Soviet artillery was towed] more importantly, it provided a means for concentrating artillery forces in the breakthrough sectors and for continuous support during the offensive.

This technique has carried forward to the modern Soviet Army. To achieve both flexibility and concentration in the critical sectors, artillery groups are formed at each level from regiment through army. Figure 4 depicts the artillery assets organic to each level; this is expanded in Figure 5 with a typical organization for combat that shows a technique for forming artillery groups.

The artillery organization and tasks are specified by division commanders and above. The Chief of Rocket Troops and Artillery (CRTA) exercises control of the artillery groups at regiment and higher levels. He is the fire support coordinator and planner for his respective organization; he does not command any of the artillery battalions (the basic Soviet unit of fire) under his control. "The commander of the organic artillery unit assigned to [the] maneuver unit is directly responsible for the performance of his artillery unit," and he normally collocates with the respective maneuver commander. (32)

Another key concept deeply rooted in Russian military history, that has carried forward to current Soviet doctrine is the principle of fire superiority. Simply stated, it is the

...firepower advantage over the enemy in the course of a given battle or operation...[It] is relatively assigned for the side that opens fire first; achieves surprise; renders highly accurate effective fire either through maneuver by fire or maneuver of the fire support means...In the offense, fire superiority is achieved by fire preparation and normally is maintained during the entire battle... (33)

To ensure adequate fires are provided for the entire battle, the Soviets phase their fires with the relative position of maneuver forces. While the existence of the first phase is comparatively new (circa 1982) the concept of phased fire support dates to the 19th century. The

four phases are:

I. Fire Support for a force's movement forward - long range fires to cover a force moving from an assembly area to the line of departure. To effectively deliver these fires, artillery will most likely position well forward with pre-stocked ammunition.

II. Fire Preparation - preplanned fires executed by rockets, artillery and aircraft immediately preceding the attack by ground forces. "This preparation is intended to destroy and to suppress enemy weapons systems, command and control elements and troops in the tactical and immediate operational depth of the enemy's defenses." (34) The goal is to ensure the enemy is incapable of effectively opposing Soviet maneuver forces once they are committed. These fires will commence twenty to thirty minutes before the lead regiments reach the FLOT. (35) Moving on paved roads at 20 to 30 kilometers per hour, regiments will still be in battalion column, 6 to 15 kilometers from the FLOT when the pre-planned preparation fires begin. The Soviets rely on accurate reconnaissance to pinpoint exact locations of troop concentrations, command posts and artillery, specifically nuclear capable artillery and Multiple Launched Rocket Systems (MLRS). (36) If reconnaissance is unsuccessful, the CRTA will resort to the system of norms.

The all-arms commander must be able to rely on the fact that if he says

...something should be done, it will be. He does not want to worry about whether the artillery will be able to achieve its assigned task; he must be able to rely on it totally. Norms practically guarantee the destruction of a target of given size at a given range with a given type of weapon. (37)

While the Soviets realize that significantly more ammunition will be consumed, this phase of fires is the most critical one to the success of offensive operations. A July 1989 Field Artillery School White Paper estimates that to ensure a breakthrough, the Soviets are prepared to expend "in excess of 2000 metric tons [of ammunition] during a 45 minute preparation." (38) What we in the West may view as a waste of scarce resources, the Soviets view as a necessary prerequisite for combined arms success.

III. Fires in Support of the attack - immediately follow Phase II fires and are designed to prevent the enemy from restoring the coherence of his defense. Often referred to as a "curtain of steel" forward of the attacking forces, Phase III fires will continue until the enemy front-line battalions have been overrun.

IV. Fire Accompaniment - fires placed in the enemy's depths to destroy his reserves and complete the destruction of forces that continue to resist and impede movement.

To appreciate the significance the Soviets place on the role of artillery and rocket forces in a high-tempo, offensive operation today, much of their current fire

support doctrine is drawn from the experiences of the third, and final phase of the Great Patriotic War (July 44 - May 45). It was in this phase, as Chris Donnelly points out that the "strategic offensive was established as the basic form of [Soviet] military art." (39) The Soviets conducted eight campaigns against the Germans on the Eastern Front in this span of ten months. Two specific ones, Belorussia and Vistula-Oder, are frequently cited not only by the Soviets but by many in the West as well, as bearing close resemblance to any future war with NATO. Both are discussed below, highlighting the role artillery played.

The Belorussian campaign occurred between 23 June and 29 August 1944. From it, three key points are worth noting. First, the campaign covered an area approximately 250 km deep. This roughly equates to the depth a Soviet front would attempt to achieve as the ground maneuver phase of a current Theater Strategic Operation (TSO) in Western Europe. (40) Secondly, mobile groups (an early variant of the OMG) and artillery carried out an operational maneuver covering some 600 km. Thirdly, much of the terrain, from Kiev to Minsk, is a "combination of forest and swamp" known as the Pripyet Marshes. (41) The resemblance to much of the terrain in both NORTHAG and CENTAG is striking.

The artillery parallels are equally interesting. Marshall of Artillery Kazakov and Colonel-General of Artillery Mikhalkin, writing in Voenizdat, "have both

explicitly underlined their relevance [Belorussian operations] for the employment of artillery today." (42) Over 80 percent of the 33 available artillery divisions were concentrated in breakthrough sectors that accounted for less than 20 percent of the area of operations. The 11th Guards Army, consisting of three rifle corps (eight divisions) attacked on a front of approximately 10 kilometers wide (see Figure 6). By Bellamy's account, there were some 1500 tubes organized into a variety of artillery groups in support (see Figure 7). Bellamy concludes that we should not "expect any fixed organization or command and control relationships in future Soviet [artillery] war formations." (43,

The Vistula-Oder campaign, aimed at the destruction of German forces in Poland, took place between 12 January and 3 February 1945. The relevance of the campaign is twofold. First, the density of artillery was the highest of any operation in the Great Patriotic War, with the exception of the defense of Kiev. For example, 350 tubes per kilometer of front were allocated by the 1st Belorussian Front commander to one specific army's sector. To ensure success of the breakthrough, artillery pieces were placed only three meters apart. Secondly, the Soviets learned a lesson they believe is applicable today. Artillery fired 3.25 million rounds, but "the majority were fired in the first three days of the operation, that is during the breakthrough of the tactical zone," to establish the conditions for inserting

the mobile groups. (44) Therefore, as the battle progresses and becomes more fluid, far less artillery is needed to sustain momentum. Triandafilov made this same assessment in 1929.

In the earlier discussion of the phases of fire support, much emphasis was placed on the importance of the Phase II (preparation) fires. These were not a Great Patriotic War innovation. However, what the Soviets perfected was the compression of artillery barrages in time. Whereas the Allied preparation on Verdun in 1916 lasted seven days, in the Belorussian operation it was just slightly over two hours; in the Vistula-Oder operation, it lasted only 25 minutes. Sidorenko notes that combining a high density of fire in a very short time, "tactical surprise was assured, large material losses were inflicted on the enemy at once, a strong morale effect was attained...and the defender was in no condition to restore the combat effectiveness of his troops quickly." (45) MG F.W. von Mellenthin echoes this appraisal: "the German lines were ploughed upside down and heavy weapons, in particular antitank guns were soon shot to bits, however carefully they were sited, however well they were dug in." (46)

Current Soviet doctrine continues to emphasize the significant contribution of artillery to success in combined arms operations:

Offense is the principal form of battle...The goal of offense is attained by annihilating the enemy's

nuclear and chemical weapons and his main groupings by means of strikes by missile troops, aviation and artillery fire, as well as through swift, deep advance of tank and motorized rifle subunits...

IAKTIKA 1987 (47)

Chapter 4 of Iaktika (Offensive Battle) repeatedly stresses the belief that lessons learned in the Great Patriotic War are applicable to a European, large-scale conventional conflict today. Key among these are the theories of combat in depth, the power and decisiveness of the offensive and the intensity of the "fire fight." If the Soviets intend to employ radically new operational concepts, at least initially in a future war with NATO, their warfighting doctrine certainly does not reflect it.

B. U.S. FIRE SUPPORT

Much like the Soviets, the role of fire support within the framework of the U.S. Army's warfighting doctrine has not changed radically since the end of World War II. The May 1941 Field Service Regulations, FM 100-5, Operations, cited the role of Field Artillery as contributing

...to the actions of the entire force through fire support which it renders to other arms. It has two principal missions in combat:

- a. It supports infantry (cavalry) (armored) units by fire, neutralizing or destroying those targets which are most dangerous to the supported arms.
- b. It gives depth to combat by counterbattery fire, by fire on hostile reserves, by restricting movement in rear areas and by disrupting hostile

command agencies... (48)

The current FM 6-20, Fire Support in the AirLand Battle, the capstone artillery manual states:

The underlying principles of supporting the maneuver arms with fire and giving depth to battle have origins which are rooted deep in the universal military experience;...the basic premise for why we provide fire support will remain unchanged. (49)

At this point, a critical distinction begins to emerge. The Soviets maneuver by fires, while the U.S. supports with fires. The difference is not merely a function of semantics. The unique nature of the Western versus the Eastern Front of World War II laid the foundation for the different fire support doctrines and force structures that exist today. Having examined the Soviet doctrine and force structure, an examination of the U.S. system is warranted.

FM 6-20 defines fire support as mortars, field artillery, naval gunfire, air defense artillery in its secondary mission, air delivered weapons and non-lethal means (EW, illumination and smoke). (50) These means, along with fire support C3 facilities and target acquisition/battlefield surveillance make up the fire support system. Doctrinally, there are four basic tasks of fire support:

- 1) support forces in contact - accomplished by the traditional roles of close support, counterfire and interdiction. (51)

2) support the force commander's battle plan - this enables the force commander to influence the battle with firepower...to attack designated high payoff targets whose destruction, neutralization or suppression will be most beneficial to the successful accomplishment of his mission. (52)

3) synchronize fire support

4) sustain fire support

U.S. tactical doctrine acknowledges that fire support is critical to seizing the initiative, but views it as a supporting arm for the maneuver forces and the maneuver commander.

This creates a problem for the maneuver commander, who is charged with the responsibility for fighting three battles simultaneously - close, deep and rear. The meager artillery force available to him (Figure 8) constrains his ability to seize the initiative, support all three battles and effectively counter Soviet artillery. Rather than solving the counterfire problem with a combined arms approach, doctrine has placed the burden on the Field Artillery branch - the proponent for the fire support Battlefield Operating System.

To appreciate the scope of this doctrinal dilemma, consider the following. FM 71-100, Division Operations states the divisional artillery will provide one artillery battalion in direct support of each committed ground maneuver brigade for the division's close operations. The remaining GS/GSR artillery is tasked

with the "counterfire" mission against RAGs and DAGs. (53) It can be argued that based on current definitions, this is counterbattery, not counterfire. Additionally, the preceding discussion would indicate that U.S. artillery, by itself is insufficient for the task. However, no other battlefield operating system is given a counterfire mission. The manual clearly identifies the Soviet artillery threat, and cites "Soviet norms call for 105 to 130 tubes of artillery per kilometer of breakthrough front." (54) It identifies a Soviet division breakthrough sector may be as narrow as four kilometers. Simple math indicates that if the norms are followed, between 420 and 520 tubes of Soviet artillery will be concentrated against the enemy forces defending the breakthrough sector; the narrow width is also telling - it is the frontage usually occupied by one U.S. maneuver battalion.

FM 100-15, Corps Operations, is equally vague. For Corps close operations, it states that much of the Corps field artillery will be used to augment the fires of committed units. Normally a Field Artillery Brigade of three to five battalions supports each committed division. The artillery left under the Corps control to influence the total close battle has the responsibility for counterfire to suppress enemy artillery. (55) FM 6-20 defines suppression as limiting "the ability of the enemy personnel in the target area to perform their jobs...and lasts only as long as the fires are continued." It goes

on to state that suppression is unsuitable for most targets. (56) As with the divisional doctrine, no other BOS has a counterfire mission.

Following the guidelines set down in the tactical doctrine, (employing GS/GSR artillery units for the counterfire/counterbattery mission at both the Corps and Division levels,) the current fire support means lack the range, rate of fire, numbers and resiliency to adequately perform the task. Field artillery plays a key role in solving the problem, but in an artillery duel with the Soviets, our Field Artillery will lose.

FM 6-20-30, Fire Support in Corps and Division Operations, is the "techniques" manual for tactical fire support of AirLand Battle doctrine. It devotes nine pages (three reiterate the Soviet fire support system delineated in FM 100-2-1) to counterfire in an appendix. It addresses the counterfire responsibilities for each U.S. tactical echelon, as follows:

- 1) Corps - Free Rocket and Surface to Surface Missiles.
 - 2) Division - Cannon, rocket launchers, fire support C2 and fire support logistics.
 - 3) Brigade - targets that have a low division counterfire priority, yet are targets that the Brigade commander determines to be worthy of immediate counterfire from his limited DS resources. (57)
- The manual stipulates that counterfire needs to be performed early, as once contact is gained, most of the

fire support resources will be required to provide close support to troops in contact and attack other enemy battlefield functions. (58)

While the tactical doctrine clearly identifies the magnitude of the Soviet artillery threat (i.e. numbers of delivery systems), it fails to address the systemic nature of Soviet fire support. This results in single-function solutions (artillery) that are inadequate to successfully execute the counterfire mission. For example, a defending U.S. division is expected to defeat an attacking Soviet army. The division artillery commander must provide direct support artillery battalions to two or more committed maneuver brigades for the close battle. If he is augmented with a four battalion corps artillery brigade, he will control a total of 168 tubes (seven battalions) and one MLRS battery (nine launchers) to support the close, deep and rear battles and execute a counterfire program. The Soviet army commander controls 28 battalions of organic cannon artillery (672 tubes) and three MRL battalions (54 launchers.) If he is designated as the front main effort, the army commander can be reinforced with up to 18 battalions of front artillery. However, the Soviet fire support system consists of more than artillery.

The Soviet ability to deliver massed concentrations of fires depends on the integration of reconnaissance, command observation posts, communications to command and control artillery units and a significant logistics

infrastructure to support the density of fire delivery systems. The nodes where each component interfaces with another represent potential vulnerabilities, or weaknesses. Rather than attacking the strength of Soviet numbers, attacking these weak points achieves higher payoffs and disrupts his combined arms cohesion. Success equates to understanding the synergistic nature of Soviet combined arms (the Soviet commander relies on fires in order to maneuver,) identifying the weak linkages in the fire support system and then resolutely attacking them. The Decide-Detect-Deliver sequence is ideally suited not only for determining what to attack, but also what asset to attack it with. With this framework, the tactical commander can pursue a combined arms approach to the counterfire dilemma.

IV. CURRENT REALITY THROUGH THE SOVIET LENS: COMBINED ARMS OFFENSIVE DOCTRINE

Because modern offensive combat is still increasing in complexity, display of wide initiative and creativity by commanders, staff officers and political workers in selecting the means of the enemy's destruction, the ability to organize continuous reconnaissance, dependable destruction of the enemy by fire, efficient coordination of all resources, flexible and bold maneuver...are acquiring exceptional significance. (59)

Taktika, 1987

This discussion will build on the base established in previous sections, by examining current Soviet offensive doctrine and the integration of the fire support system

within that doctrine.

Soviet doctrine delineates two offensive concepts - the attack against a defending enemy and the meeting engagement. In the former, the attack will occur either from the march (preferred method) or from positions in direct contact with the enemy. Regardless of the form, preparation for offensive combat is characterized by an extensive amount of planning. Taktika states

the more perfectly a battle is planned and the more deeply the commander predicts development of events in combat, the fewer changes would have to be made in the combat plan adopted and...coordination. (60)

For purposes of discussion, this section will focus on the specific aspects of the attack of a defending enemy. Within the NATO context, given a modicum of strategic warning, this is the most probable scenario that will confront the U.S. tactical commander.

The most important prerequisite for the attacking Soviet commander, is to determine the direction of the main effort and what means he will concentrate at the decisive moment. He will arrive at this decision based upon the higher commander's directives and his assessment of the terrain and the enemy's defenses to form a clear intelligence picture. He accomplishes this task through a thorough personal reconnaissance. He will attempt to determine the:

- approaches to the forward edge of the enemy's defensive positions.

- presence of obstacles, both natural and manmade.
- location of enemy strongpoints.
- extent of engineer preparation.
- positions of fire weapons, especially antitank weapons.
- presence of reserves. (61)

The intent is to develop an estimate of enemy and friendly capabilities that exceeds 80 percent accuracy. (62) Finally, the commander assigns clear combat missions to his subordinate elements. Reconnaissance and fires perform the two most critical functions in an attack against a defending enemy, and are discussed in detail below.

The commander will specify to the commander of reconnaissance (COR) what information must be obtained from designated objectives (targets), sectors, areas, and by what time it must be obtained. (63) Specific attention is devoted to enemy antiarmor assets. Doctrinally, the Soviet commander will attempt to destroy or neutralize 70 to 80 percent of the defender's antitank weapons. He depends on reconnaissance elements to accurately locate "every dug-in tank, gun, infantry fighting vehicle and ATGM launcher." (64)

The all-arms commander will then specify the targets to be engaged by artillery, the priority, sequence of attack and time of attack to the CRTA who develops a detailed fire plan to meet the commander's guidance. His

planning sequence for an attack is a "deliberate and precise process." (65) Due to the centralized nature of Soviet fire support, the plan must be coordinated and approved at the highest level of units involved. There is little allowance for flexibility, because as previously discussed, the all-arms commander must be able to totally rely on the fact that the artillery will accomplish its assigned mission. The organization for combat is set, tactical missions are assigned by phase, and ammunition requirements are formulated. "If time is available, it is normal to lay out on the ground the ammunition planned for use during the preparation" fires. (66) Phase III and IV ammunition will usually remain uploaded, thus permitting the artillery to remain as mobile as the maneuver forces.

Figure 9 graphically portrays how a Soviet front might doctrinally deploy for an attack against a U.S. corps in prepared defensive positions. Figure 10 depicts a doctrinal laydown of U.S. and Soviet artillery assets that would typically be available for employment in such a situation.

In accordance with U.S. tactical doctrine, the corps will normally deploy its Armored Cavalry Regiment in a covering force area forward of the main defensive positions. Its mission will be to provide early warning, determine enemy intentions and dispositions, shape the battlefield for the corps close fight and disrupt/delay the enemy as much as possible. While no doctrinal depth

is prescribed, this area is shallow in NATO. As Figure 11 indicates, Soviet artillery assets are capable of ranging approximately 25 kilometers into the defender's depths. This sequence of figures highlights the counterfire dilemma confronting the tactical commander. A significant portion of his artillery will be supporting the close battle as the defense transitions from the covering force to the main battle area. It is likely this will coincide with the Soviet Phase II fires. As a result, the tactical commander can rapidly be overwhelmed because he lacks the target acquisition assets and delivery means to simultaneously counter multiple threats. It is questionable if success is possible unless the tactical commander thoroughly prepares for and plans how he intends to execute the counterfire program.

The figures do not represent the "worst case" scenario. Consider the following:

- 1) The initial artillery correlation of forces is 6.4:1 in the breakthrough sector in favor of the Soviets. In the third phase of the Great Patriotic War they achieved a ratio of between 6-10:1. Their current doctrine prescribes that they achieve an artillery ratio between 6-8:1 to be successful. (67)

- 2) As the main effort was directed against the northern U.S. division, the bulk of available artillery was positioned to support that sector. There were approximately 1200 artillery pieces over a 20 kilometer front giving an average density of 60 tubes per

kilometer. FM 100-2-1 considers 60 tubes per kilometer as the low/average for an attack against a well prepared defense. (68)

3) In the breakthrough zone, there are approximately 800 square hectares. The Soviets could achieve a sustained rate of fire in excess of 1300 rounds per minute. Using the norms of 200 rounds per hectare, they can suppress 6 square hectares or destroy the forces within 2 square hectares in one minute, achieving a density of one round per five meters of terrain.

V. METHODS, TECHNIQUES AND PROCEDURES FOR AN EFFECTIVE COUNTERFIRE CONCEPT

It should be clear that the U.S. tactical commander must shoulder the responsibility for defeating Soviet artillery in the next war. The intention of this monograph is to emphasize that counterfire is a combined arms imperative. The commander must understand it is his responsibility to integrate it with his concept for close, deep and rear operations. This requires him to carefully, but decisively synchronize all his assets in order to win. Counterfire must be approached as a battlefield function that cuts across all the operating systems. Certainly artillery/fire support plays a major role in terms of the counterbattery function, but it cannot be the only system charged with the mission to defeat Soviet artillery.

When Soviet fire support is viewed as a "system of

systems," critical linkages begin to emerge. The slightest disruption of these links has the potential to upset the tempo of Soviet offensive operations and make the all-arms commander react to our initiative as opposed to setting the terms for battle. While these links have been alluded to, they will be summarized below, highlighting the role they play in the fires system along with potential countermeasures.

The Soviet fire support system remains highly centralized to facilitate achieving concentration and mass. It also appears to not be fully understood by the majority of all-arms commanders. This tends to limit flexibility and the ability to shift assets once the plan is underway. When Soviet fire support/maneuver plans are disrupted, key communications links have to be opened in order to pass new instructions. Electronic Warfare assets can be massed to attack these links and prevent their effective use.

The Soviets rely on detailed reconnaissance to accurately determine troop locations, C2 facilities and critical CS/CSS assets. Therefore, counterreconnaissance efforts by friendly maneuver forces can play a critical role in limiting the effects of Soviet artillery. If friendly forces cannot be located, the Soviets will have to rely on norms and saturate fires where targets would doctrinally be located. Taking away his "eyes and ears" will have a detrimental impact on the efficiency of his fire support system. If he is forced to expend

ammunition on unoccupied areas, friendly protection is enhanced. To deliver the amount of artillery dictated by the norms, the Soviets will have to pre-stock massive quantities of ammunition in forward positions. This creates two lucrative targets. First, the ammunition itself and second, the transportation/logistics system required to move it to and between artillery firing positions. Maneuver, aviation or artillery forces can attack Soviet artillery logistics - a key target for counterfire.

We can anticipate the Soviets will be as prone to deception as we are, particularly if he is denied reconnaissance. We cannot continue to follow a pattern of establishing the MBA on the first piece of defensible terrain west of the IGB. He is unable to cross the IGB to establish the initial artillery firing positions. The ranges of his system are clearly known and should be factored in to defensive plans. Deception and OPSEC are key aspects. If he cannot range our positions, once again success will be denied to him.

The tactical commander must be innovative by combining a variety of available ways and means to defeat Soviet artillery. For example, the Soviets have fewer air defense assets than artillery tubes. Many of these are tied to active ranging sources with clearly identifiable signatures. If the limited amount of artillery is already stretched thin between close support, counterfire, interdiction, SEAD, etc. it is best

to concentrate it in one area and use other assets to exploit the effects of fires. Artillery could be massed to strip away, or create large gaps in the enemy's air defense umbrella. Attack helicopters could then be committed to shallow cross-FLOT operations to destroy artillery, ammunition etc., in a relatively benign air defense environment.

There is apparently an emerging counterfire technique in which the corps consolidates the division MLRS batteries and Firefinder radars with the corps artillery commander; corps then fights the counterbattery/counterfire fight. While it would be premature to judge this as a faulty concept, this technique is not in accordance with the counterfire priorities established in doctrine and may severely impede the division's ability to fight the close battle. This should only be pursued as a last alternative; as demonstrated above, there are numerous other ways to fight the counterfire fight without jeopardizing the deep, close or rear battles.

Obviously, this abbreviated list of methods, techniques and procedures only scratches the surface of a very large and complex problem. However, defeat of the Soviet artillery "behemoth" relies on this kind of innovative thinking.

VI. CONCLUSIONS AND RECOMMENDATIONS

The research question this paper set out to answer was: What viable combinations of methods, techniques and

procedures enhance the defending tactical commander's capability to counter the potentially overwhelming Soviet artillery threat on the battlefield? The discussion of capabilities, force structure and doctrine for both the U.S. and the Soviets established the fact that there are significant differences, for a variety of reasons between the two systems. The Soviets maneuver by fires in their combined arms offensives to establish the conditions for maneuver. Therefore, we cannot fixate on one at the expense of the other when examining the counterfire problem. Currently, U.S. tactical doctrine fails to take a combined arms approach towards countering the Soviet artillery threat. Combined arms forces and doctrine are more easily defeated with combined arms forces and doctrine.

The quantity and quality of Soviet artillery are obvious strengths, compared to that of the U.S. In relative terms, the current U.S. fire support delivery means are weak. A tactical commander cannot win on the AirLand Battlefield by pitting his weakness against his opponent's strengths. A U.S. commander must seek and attack weak points in the Soviet fire support system in order to succeed.

The Soviets see a high degree of correlation between the Great Patriotic War and any future conflict with NATO. Their current doctrine, force structure, tactical methods, techniques, and procedures clearly reflect this fact. It is likely they have the means to win should

they ever resort to attaining political, economic or military objectives through war. Regardless of branch or service, tactical commanders and their staffs must educate themselves thoroughly about Soviet combined arms offensive warfare and recognize the significant threat that artillery poses on the modern battlefield.

In Section III, the role of operational concepts was discussed. Doctrine, force structure, materiel development and training are based on the parameters established by a concept. Currently, the U.S Army lacks a clearly defined counterfire concept, and each of the areas above has resulted in a marked deficiency. The Army's "How to Fight" doctrine identifies the problem but lacks clear, finite solutions. In terms of force structure and materiel, it is evident that more and better quality artillery is needed. In a period of constrained resources, we will have to be willing to give up something else in order to get more and better artillery. While this problem exceeds the scope of this paper, the Army must not risk defeat due to a narrow, direct fire focus at the tactical level. The time to start solving these problems is now.

The severe implications of this problem demand innovative solutions. FM 100-5 delineates ten imperatives that "prescribe key operating requirements" and are "fundamentally necessary for success on the modern battlefield." (69) They serve as an excellent framework for recommendations concerning solutions to the

counterfire problem, as follows:

Ensure unity of effort and conserve strength for decisive action are straightforward principles. They require leadership, an effective C2 system and solid SOPs. The commander must clearly state his intent and orient his force towards that aim. All battlefield operating systems must be synchronized to solve the counterfire problem.

Anticipate events on the battlefield means the commander must clearly envision how the battle will unfold, before his maneuver forces ever make contact. He must then develop plans that allow him to take resolute actions before the enemy sets the terms of battle. FM 100-5 charges the commander to "turn inside the enemy's decision cycle." While this will be a difficult task, the tactical commander cannot react to Soviet artillery. He must seize the initiative from the outset; defeating or negating the effects of artillery will enhance his ability to do this.

Designate, sustain and shift the main effort; press the fight; and move fast, strike hard and finish rapidly mean the commander cannot afford to piecemeal the counterfire fight and expect to be successful. He must clearly know what he is going to do and how he intends to do it. This is the essence of AirLand Battle.

Understanding the effects of battle on soldiers, units and leaders is particularly pertinent to this problem. History is full of accounts of the terror and

confusion that Soviet artillery has inflicted on the defender. He must be denied unrestricted use of this powerful combat multiplier.

The key imperative however, is concentrate combat power against enemy vulnerabilities. Combined with the two remaining imperatives (use terrain, weather, deception and OPSEC; and combine arms and sister services to complement and reinforce) this is the most viable means for solving the counterfire problem. In essence, this dictates that the U.S. commander must think proactively about how and where he intends to deny fire superiority to his Soviet opponent. He must realize that many of his most powerful assets (rocket launchers, aviation, etc.) are initially targeted for destruction by Soviet artillery. The tactical commander lacks the depth of resources to formulate his concept after the shooting begins.

Soviet artillery is a deadly force to be reckoned with. The Soviets have long recognized its destructive capability and have made it a primary combat arm in their offensive doctrine. Victory demands that U.S. commanders set the terms for battle by concentrating and synchronizing all their assets at the decisive place and time; this begins with denying fire superiority to the Soviets. Winning the counterfire fight represents a significant first step to success on the future battlefield.

CALIBER/RANGE/RATE OF FIRE COMPARISON

[refer to endnote 3 for sources of data]

U.S.				SOVIET			
SYSTEM	CALIBER	RANGE (KM) 1.	RATE OF FIRE 2.	SYSTEM	CALIBER	RANGE (KM) 1.	RATE OF FIRE 2.
M101			6-10	D-30	122MM	15.3	17-3 (75)
M102	105MM	11-15	(180)	2S1	122MM	15.3	17-3 (75)
M119				M46	130MM	27.5	15-3 (70)
M109				D-20	152MM	17.4/30	5 (35)
M114	155MM	14.6-18/	4	2S3	"	17.4/30	4 (30)
M198		19.3-30	(50)	M1976	"	28	4-5
				2S5	"	28+	4-5
M110	203MM	22.9/30	1.5	2S7	203MM	37.5+	1
			(30)				

NOTES:

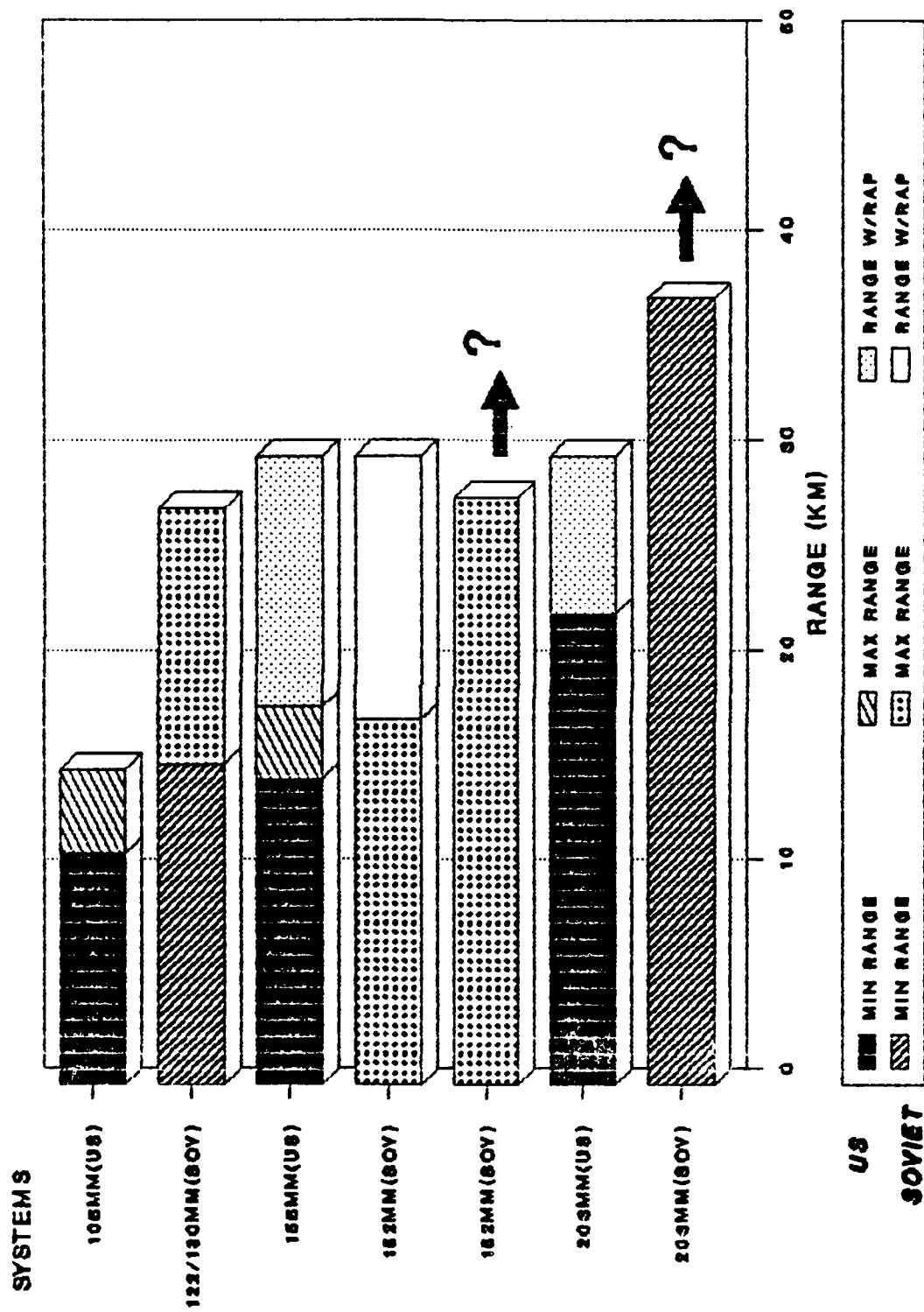
1. RANGE: __A__/_B__: A indicates range with standard charge; B indicates with Rocket Assisted Projectile (RAP)

2. () indicates sustained rate of fire: #rounds/tube/hour

FIGURE 1: US/SOVIET ARTILLERY CAPABILITIES

FIGURE 2: RANGE COMPARISON

[refer to endnote 3 for sources of data]



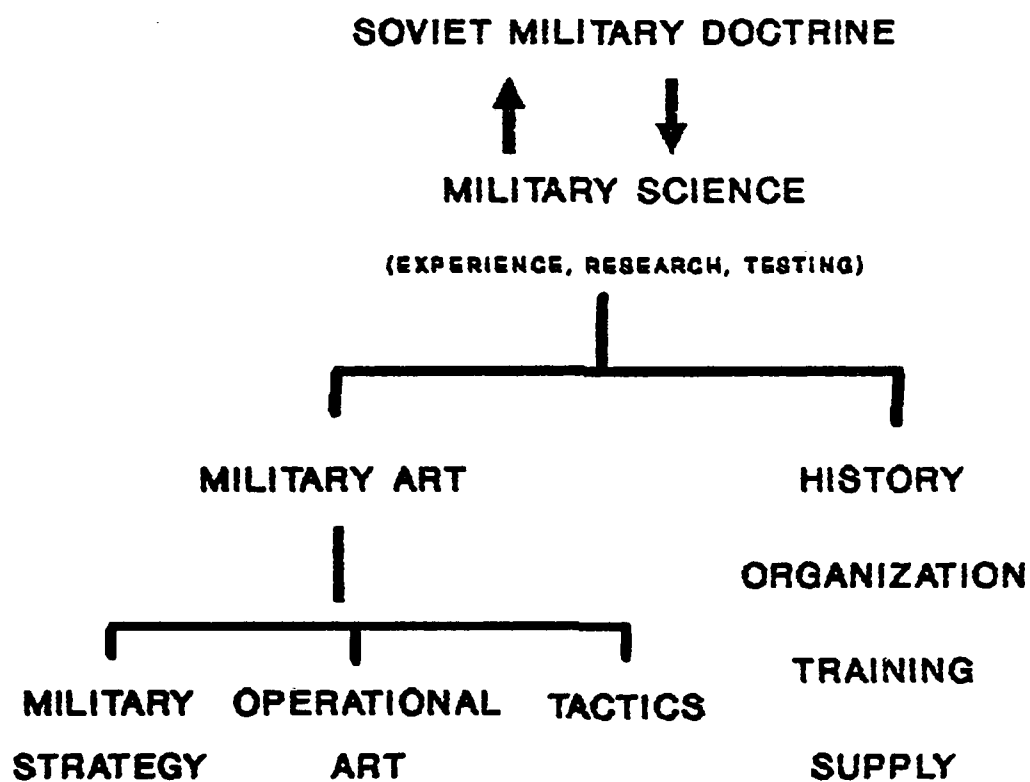
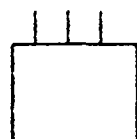
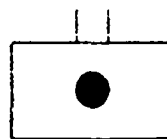


FIGURE 3: HIERARCHY OF SOVIET MILITARY THEORY

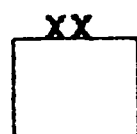
[refer to endnote 10]



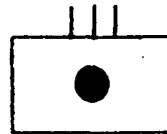
REGIMENT



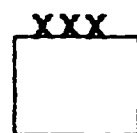
1 BN (24 GUNS)



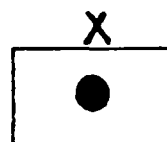
DIVISION



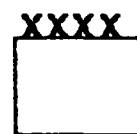
4 BN (96 GUNS)



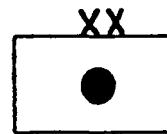
ARMY



4 BN (96 GUNS)
3 MRL BN
(54 LAUNCHERS)



FRONT



16 BN (384 GUNS)
1 HVY ARTY BDE
(48 GUNS)

FIGURE 4: SOVIET ARTILLERY ASSETS ⁽⁷⁰⁾

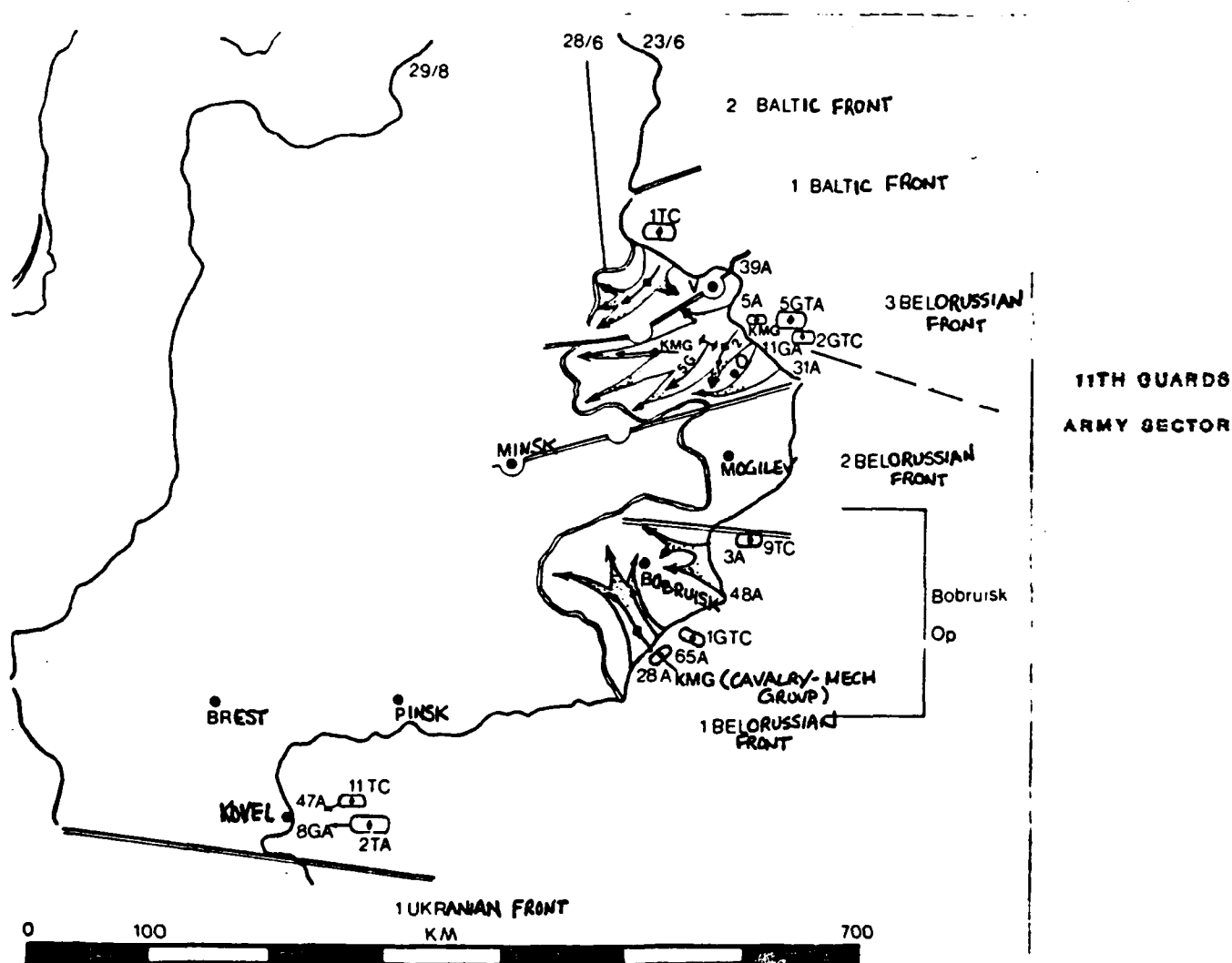


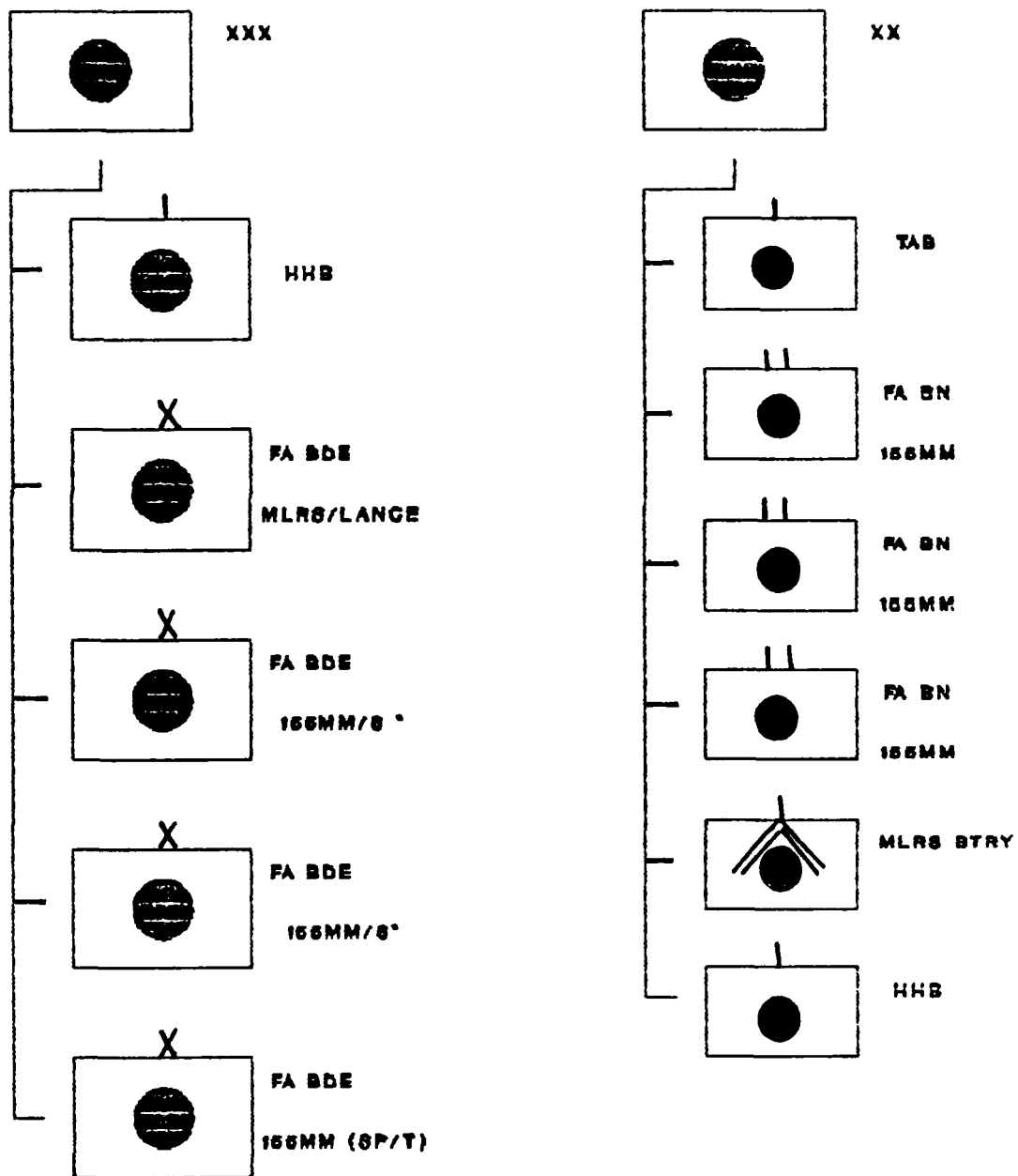
FIGURE 6: BELORUSSIAN OPERATION
11TH GUARDS ARMY ⁽⁷²⁾

1st echelon		2nd echelon		3rd echelon	
Close support: PP Groups		Breakthrough Groups		Guards Mortar (ML) Group	Long Range (DL) Artillery
Rifle Bn	Rifle Regt	Rifle Div breakthrough sub-group	Artillery of rifle div		
33 km 97 GRR 545 mortar regt 36 x 120 mm mortar 204 how artv regt 28 x 122 mm gun	PP Go 97 1 bn 64 gds artv regt 8 x 76 mm gun, 4 x 122 mm how 168 light artv regt 24 x 76 mm gun	1 gds rifle div 101 how artv regt 28 x 203 mm how, 6 x 280 mm mortar 117 hv how artv bde 316 special hv artv bn 22 x 203 mm how, 6 x 280 mm mortar	16 GUARDS RIFLE CORPS		Subgroup 16 gds rifle corps 114 gun artv bde 523 gun artv regt 18 x 122 mm gun, 34 x 152 mm gun how
99 GRR 2 and 3 bns 186 gds artv regt 16 x 76 mm gun, 8 x 122 mm how	PP Go 99 36 gds artv regt (allocated to 2nd echelon) 24 x 76 mm gun, 12 x 122 mm how				
1 km 79 GRR 218 Light artv regt 24 x 76 mm gun	PP Go 79				
0.5 km 75 GRR 2nd bn of 1 gds artv regt 8 x 76 mm gun, 4 x 122 mm how	PP Go 75 187 gds artv regt (allocated to 2nd echelon) 24 x 76 mm gun, 12 x 122 mm how	33 gds mortar bde 207 gds artv regt 28 x 122 mm how, 80 x 120 mm mortar	20 hv how artv bde 245 indep endent super hv artv bn 24 x 2.1 mm how, 6 x 280 mm mortar	18 gds rifle div Subgroup 8 gds rifle corps 317 gds mortar regt 20 x BM-13, 4 x BM-8	Subgroup 8 gds rifle corps 6 gds gun artv bde 1003 corps artv bde 148 army gun artv bde 402 independent super hv artv bn 12 x 122 mm gun, 76 x 152 mm gun-how 6 x 152 mm gun (BR-2)
1 km 11 GRR 1 and 3 bns 76 gds artv regt 16 x 76 mm gun, 8 x 122 mm gun how	PP Go 11 24 gds artv regt (allocated to 2nd echelon) 24 x 76 mm gun, 12 x 122 mm how	8 GUARDS RIFLE CORPS 5 gds rifle div			
243 GRR 1 bn 186 gds artv regt 8 x 76 mm gun, 4 x 122 mm how	PP Go 243 52 gds artv regt (allocated to 2nd echelon) 24 x 76 mm gun, 12 x 122 mm how	1158 how artv regt 1185 how artv regt 1209 how artv regt 60 how artv regt 84 x 122 mm how	hy 102 how artv bde 93 hv how artv bde independent hv bty 226 special super hv artv bn 28 x 152 mm	Subgroup 36 gds rifle corps 87 and 42 gds mortar regt, 11 gds mortar bde 24 gds mortar bde, 48 x BM-13, 280 x M-31 fixed rly launchers	Subgroup 36 gds rifle corps 53 gun artv bde 2 x bt bty, 46 special super hv artv bn 1165 corps artv regt 16 x 122 mm gun, 35 x 152 mm gun how, 4 x 152 mm gun BR-2
2.5 km 245 GRR 2 and 3 bns 64 gds artv regt 16 x 76 mm gun, 8 x 122 mm how	PP Go 245 1818 light artv regt 24 x 76 mm gun				
247 GRR 1819 light artv regt 4 x 76 mm gun reserve, 24 x 76 mm gun	PP Go 247 1 guards anti-tank artv regt 20 x 76 mm gun				
48 GRR 1 and 2 bns 44 gds artv regt 16 x 76 mm gun, 4 x 122 mm how	PP Go 48 3 bn 44 gds artv regt, 1 bn 1620 light artv regt	36 GUARDS RIFLE CORPS 244 247 250 mortar regts 120 mortar bde 80 x 120 mm mortar	gun how 24 x 203 mm how, 2 x 305 mm how, 6 x 280 mm mortar	83 gds rifle div	
46 GRR 3 bn 44 gds artv regt, 1 bn 1620 light artv regt 20 x 76 mm gun, 4 x 122 mm how	PP Go 46 3 gds anti-tank artv regt 20 x 76 mm gun				
43 GRR 2 bn 1620 light artv regt 12 x 76 mm gun	PP Go 43 6 gds anti-tank artv regt 20 x 76 mm gun				

FIGURE 7: ARTILLERY GROUPS IN SUPPORT OF
11TH GUARDS ARMY - BELORUSSIAN OPERATION (73)

CORPS ARTILLERY

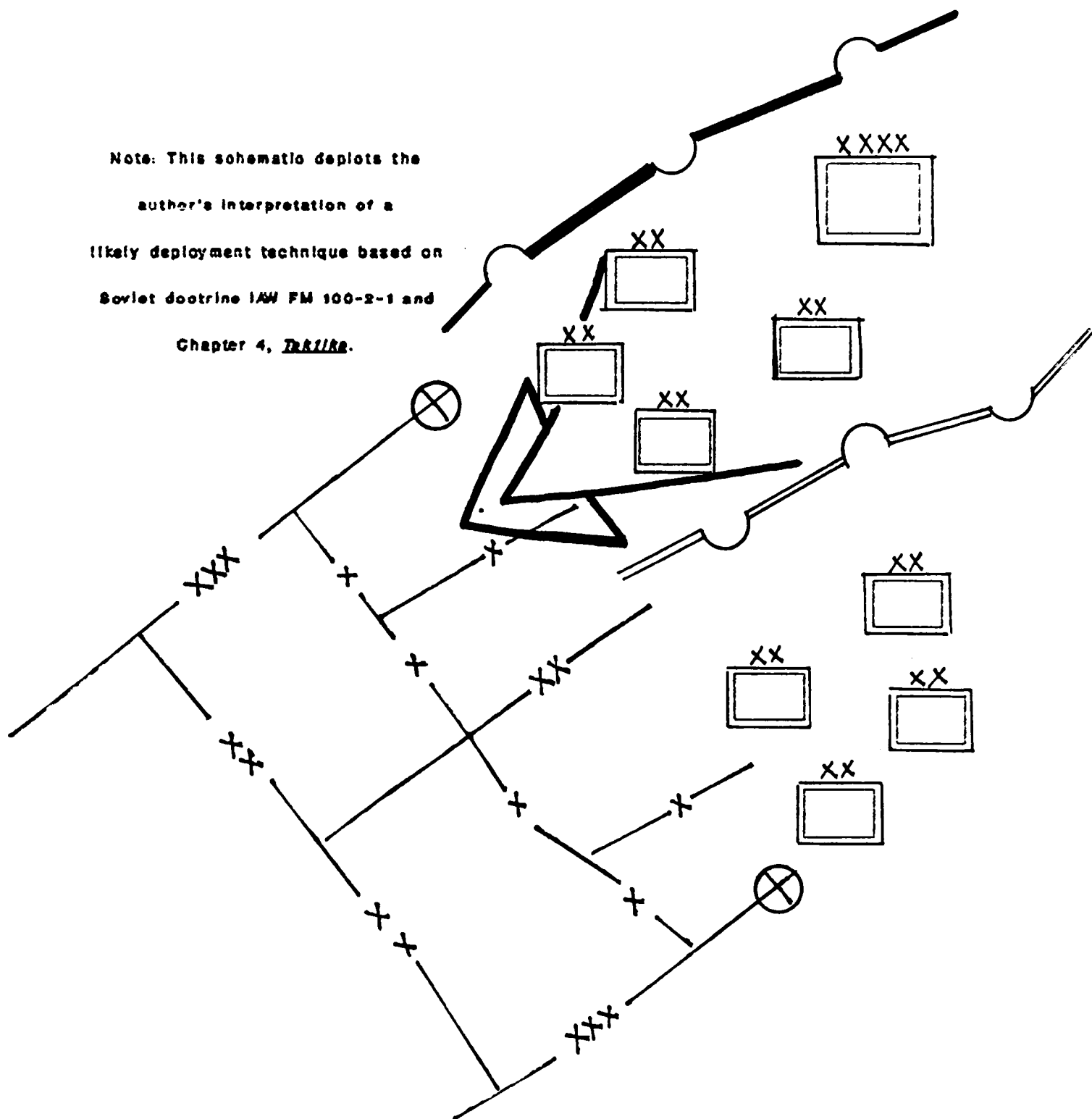
DIVISION ARTILLERY



(74)

FIGURE 8: TYPE U.S. ARTILLERY ORGANIZATION

Note: This schematic depicts the author's interpretation of a likely deployment technique based on Soviet doctrine IAW FM 100-2-1 and Chapter 4, *TRAILER*.



**FIGURE 9: SOVIET FRONT DEPLOYMENT FOR
ATTACK OF ENEMY IN PREPARED POSITIONS**

Note: The laydown depicted is one technique of organizing Artillery Groups IAW FM 100-2-1 and Figure 6. It represents the author's interpretation of how artillery would be placed in support of the offensive depicted in Figure 9.

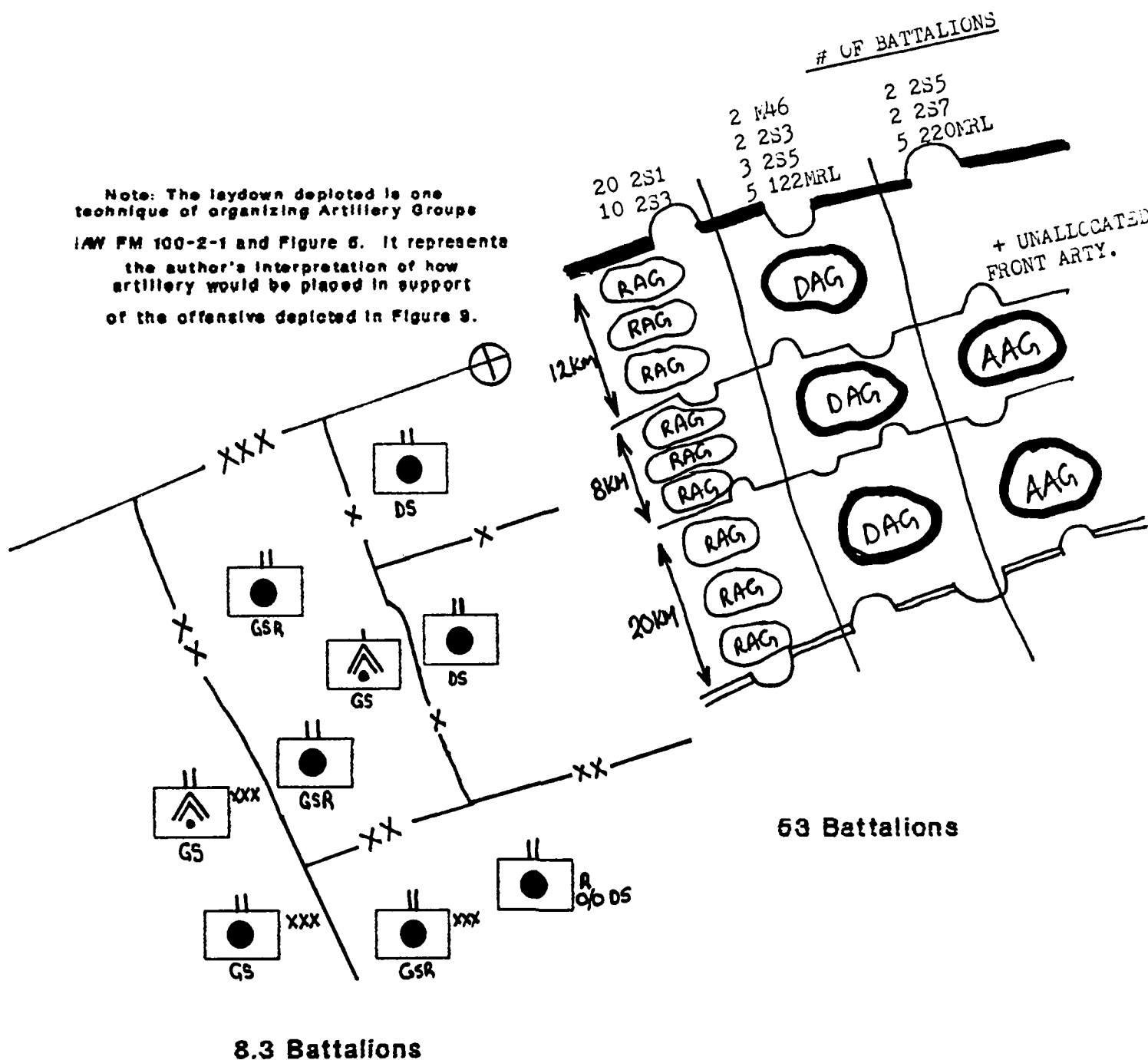


FIGURE 10: ARTILLERY IN SUPPORT

SCALE (KM)



NOTE: Range Fane for center RAGs/DAGs/AAG only
Range Fane depict MAXIMUM range capability

LEGEND:

2S1/D30 ———
2S3 - - - -
M48 ●●●●●
2S6 —●—●—
2S7 ■■■■■

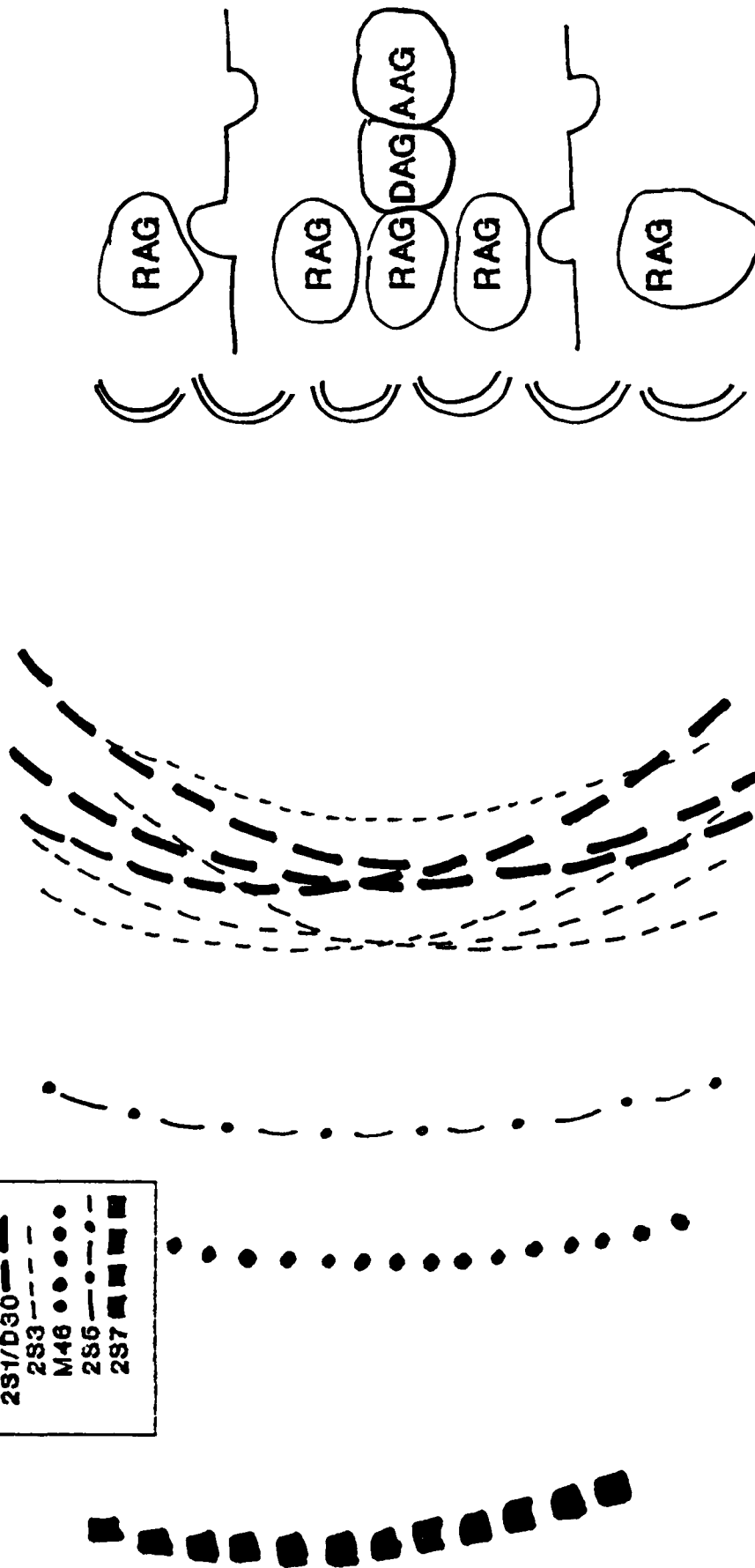


FIGURE 11: RANGE FANS FOR
AVAILABLE SOVIET ARTILLERY

Note: This figure combines the artillery organization in Figure 10 with the capabilities in Figures 1 & 2.

ENDNOTES

1. Chris Bellamy, Red God of War: Soviet Artillery and Rocket Forces, (McLean, VA, 1986), p. 1.
2. Cited by General Glenn K. Otis and BG Paul F. Pearson, "We're Being Outgunned in Field of Fire Support", Army, 39:4 (Apr 89), pp. 28-37.
3. Data for figures 1 and 2 was extracted from the following sources: ST 100-3: G-3 Battle Book. Fort Leavenworth, KS: USAGCSC, 1 Apr 89. Soviet Tactical Planning Factors (Handbook). Fort Leavenworth, KS: USAGCSC, Tactical Commander's Development Course. FM 100-2-3: The Soviet Army - Troops, Organization and Equipment. Washington, DC: HQ, Department of the Army, 1984.
4. The Joint Chiefs of Staff, JCS Pub. 1: Department of Defense Dictionary of Military and Associated Terms, (Washington, DC, 1 June 1987), p.93.
5. *ibid*, p. 93.
6. Bellamy, Red God of War, p. 6.
7. James J. Schneider, Foundations of Military Theory Syllabus (AMSP Course 1), (Fort Leavenworth, KS, 26 June 1989), p.1.
8. The U.S. Army entered World War I with a firepower-based doctrine that Weigley among others, credits to lessons drawn from Grant's overwhelming strength in the American Civil War. In the inter-war years, the doctrine shifted to one based on maneuver, largely influenced by the aversion to the trench warfare deadlock, but also by the mechanization advocates such as Fuller, Liddell Hart and Guederian. The post-Vietnam "Active Defense" was clearly a firepower-dominated doctrine, while the current AirLand Battle doctrine is one largely based on maneuver, mobility and agility.
9. US Army Intelligence Agency: Intelligence and Threat Analysis Center, Soviet Battlefield Development Plan, Volume I: Soviet General Doctrine for War, (Washington, DC, June 1987), p. 2-2.
10. *ibid*, p. 2-4.
11. Bruce W. Menning, Bayonets Before Bullets: Russia's Imperial Army, 1861-1914 (Addendum to MMAS Thesis), (Fort Leavenworth, KS, undated), pp. 4-5.
12. *ibid*, p.5
13. *ibid*, p.6

14. Vladimir K. Triandafillov was the Red Army deputy Chief of Staff and head of the operations administration staff during the Russian Civil War. A soldier, noted for his caution, he was charged to write the assessment of why the Red Army failed in its 1920 offensive into Poland during the Civil War (led by Tukhachevskiy.) SASO asserts that Triandafillov's contribution to military theory was "substantial, but his work should not be viewed in isolation...he stood on the shoulders of others." He probably was a principal author of the Field Regulations of 1929 (FU-29) which is flavored with combined arms and independent armored operations. He died in a plane crash in 1931. Mikhail Tukhachevskiy was a distinguished Red Army commander, head of the Red Army Military Academy, and a former Red Army Chief of Staff. Stalin came to believe, based on fabricated, false evidence that Tukhachevskiy had become too immersed in Western thought and was politically unreliable. He was arrested for treason and executed in 1937, setting off the Stalin purges that exterminated approximately one-half of the Soviet officer corps.

15. Soviet Army Studies Office, Soviet Future War (Draft Study), (Fort Leavenworth, KS, 27 Apr 87), p.9.

16. V.K. Triandafillov, Nature of the Operations of Modern Armies, (Moscow-Leningrad, 1929): Translated by William A. Burhans (AMSP Course I issue), p.96.

17. Soviet Army Studies Office, Soviet Future War, p. 10.

18. For example, Triandafillov, cites the 1929 Field Service and artillery regulations which stated that 21-24 artillery pieces per kilometer of front would provide a sufficient density of fire to support the attack of an infantry division. Through a series of detailed computations, Triandafillov concluded that this density of artillery would only be effective against an enemy "who has hurriedly fortified himself, lacks barbed wire entanglements and occupies more than 12 kilometers per infantry division." (Nature of the Operations of Modern Armies, p.94.) [a normal frontage was 4 to 8 kilometers] Calculating the number of artillery shells to suppress certain targets, destroy others and mount an effective counterbattery effort exceeded the regulation requirements by at least a factor of two (i.e. 42 to 48 tubes/km). To achieve decisive results, ground forces needed more (the norms stated precisely how much more) artillery; while this was a shortfall in all armies, he felt it was most acute in the Soviet Army.

19. Despite some differences in their theories, it is likely that Triandafillov and Tukhachevskiy were very familiar with each other's writings. The modern concept of the interchangeability of fires and forces (generally credited to Triandafillov) is one such example. Triandafillov hypothesized that powerful artillery in

sufficient quantities could accomplish the pinning function, thus freeing forces for deep maneuver. Furthermore, artillery could create the rupture of enemy defenses when tied to norms. The modern computation of correlation of forces is an application of Triandafilov's enhancement to Tukhachevskiy's Deep Operations theory.

20. Mikhail Tukhachevskiy, New Problems in War, : Extracted from the Art of War Colloquium, USAWC (Course I issue), (Carlisle Barracks, PA, 1 Nov 83), p. 19.

21. V.G. Reznichenko, Tactics 1987 [Taktika], (Washington, DC, 1988), p.4 (Translation by Foreign Broadcast Information Service.)

22. Bryan I. Fugate, Operation Barbarossa, (Presidio, CA, 1984), p.26.

23. Tukhachevskiy, p. 72.

24. Reznichenko, p. 21.

25. Russell F. Weigley, Eisenhower's Lieutenants, (Bloomington, IN, 1981), p.3. See also Weigley, The American Way of War, Chapter 10, pp. 192-222.

26. ibid, p. 2.

27. ibid, p. 4.

28. ibid, p. 5.

29. John L. Romjue, From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982, (Fort Monroe, VA, June 1984), p. 87.

30. Chris Bellamy, "Soviet Artillery and Rocket Forces 1940-1980," Jane's Defense Review, (Vol 4 No 3, 1983), p. 269.

31. Bellamy, Red God of War, p. 49.

32. US Army, FM 100-2-1, p. 9-3.

33. ibid, p. 8-1.

34. ibid, p. 8-2.

35. Bellamy, Red God of War, p. 169.

36. The 1987 version of TAKTIKA specifically addresses in Chapters 2 and 4, the threat posed to high tempo offensive operations by the Multiple Launched Rocket System (MLRS) fielded by the U.S., Germany, the U.K. and other NATO nations.

37. Bellamy, Red God of War, p. 177.
38. USA Field Artillery School, "Counterfire -- A White Paper," (Fort Sill, OK, 17 July 1989), p. 2
39. Christopher Donnelly, Red Banner, (Alexandria, VA, 1988) p. 86.
40. The Theater Strategic Operation (TSO) is a recent Soviet concept that provides a framework to integrate forces and strategy in a combined arms offensive within a TVD (Theater of Military Operations,) to rapidly seize deep objectives. According to the 1988 Soviet Military Power, the ground maneuver operation consists of deep strikes by aviation, rocket and artillery forces, as well as attacks into the enemy's deep rear areas conducted by Soviet OMG's.
41. Bellamy, Red God of War, p. 57.
42. Cited in Bellamy, Red God of War, p. 63.
43. *ibid*, p. 58.
44. *ibid*, p. 68.
45. A.A. Sidorenko, The Offensive (A Soviet View), (Moscow, 1970 - translated by the US Air Force), p. 23.
46. Cited in Bellamy, "Soviet Artillery and Rocket Forces 1940-1980," p. 277.
47. Reznichenko, p. 22.
48. US Army, Field Service Regulations FM 100-5, Operations, (Washington, DC, 22 May 1941) p. 8.
49. US Army. Field Manual 6-20, Fire Support in the AirLand Battle, (Washington, DC, 17 May 1988), p. v.
50. *ibid*, p. 1-2.
51. *ibid*, p. 1-3.
52. *ibid*, p. 1-2.
53. US Army, Field Manual 71-100, Division Operations, (Approved Final Draft,) (Washington, DC, 21 April 1989,) pp. 5-6/7.
54. *ibid*, p. 5-2.
55. US Army, Field Manual 100-15, Corps Operations, (Washington, DC, 13 September 1989,) p. 3-9.
56. Field Manual 6-20, p. 2-8.

57. US Army, Field Manual 6-20-30, Fire Support in Corps and Division Operations, (Coordinating Draft) (Fort Sill, OK, 1 March 1988,) p. C-4-5.
58. ibid, p. C-4-6.
59. Reznichenko, p. 76.
60. ibid, p. 80.
61. ibid, p. 88.
62. Field Manual 71-100, p. 5-2.
63. Reznichenko, p. 92.
64. ibid, p. 101.
65. Field Manual 100-2-1, p. 9-20.
66. ibid, p. 9-20.
67. Tactical Commander's Development Course, "Soviet Planning Factors Handbook," p. 4-11.
68. Field Manual 100-2-1, p. 9-21.
69. US Army, Field Manual 100-5, Operations, (Washington, DC, 5 May 1986,) p. 23.
70. Data for Figure 4 was extracted from FM 100-2-3: Front - pp. 4-123 & 4-126; Army - pp. 4-114 & 4-116; Division - pp. 4-33 & 4-47; Regiment - pp. 4-26 & 4-31.
71. Figure 5 was extracted from teaching materials from CGSC AY 85/86 Elective E614.
72. Figure extracted from Bellamy, Red God of War, p. 57.
73. Figure extracted from Bellamy, Red God of War, p. 59.
74. Data was extracted from "AOE: What Is It?," Field Artillery Journal, September-October 1985, p.49.

BIBLIOGRAPHY

BOOKS

- Bailey, J.B.A., Field Artillery and Firepower. Oxford, England: The Military Press, 1989.
- Bellamy, Chris, Red God of War: Soviet Artillery and Rocket Forces. McLean, VA: Pergamon-Brassey's International Defense Publishers, 1986.
- Bellamy, Chris, The Future of Land Warfare. New York, NY: St. Martin's Press, Inc., 1987.
- Donnelly, Christopher N., Red Banner. Alexandria, VA: James's Publishing Inc. 1988.
- Fugate, Bryan I., Operation Barbarossa. Presidio Press, 1984 (AMSP Course 4 Issue)
- Isby, David C., NATO and the Defense of the West. New York, NY: Jane's Defense Publishers, 1985.
- Lider, Julian, On the Nature of War. Aldershot, England: Avebury, Gower Publishing Company, Ltd. 1977.
- Paret, Peter, Makers of Modern Strategy. Princeton, NJ: Princeton University Press, 1986.
- Sidorenko, A.A., The Offensive (A Soviet View). Moscow: Translated and Published by the US Air Force (Soviet Military Thought Series,) 1970.
- Simpkin, Richard E., Race to the Swift: Thoughts on Twenty-First Century Warfare. McLean, VA: Pergamon-Brassey's International Defense Publishers, 1985.
- Vigor, P.H., Soviet Blitzkrieg Theory. New York, NY: St. Martin's Press, 1983.

MANUALS/GOVERNMENT DOCUMENTS

- Combat Studies Institute, CSI Report Number 13: Tactical Responses to Concentrated Artillery. Fort Leavenworth, KS: USACGSC/CSI, undated.
- House, Jonathan M., Towards Combined Arms Warfare: A Survey of 20th Century Tactics, Doctrine and Organization. Fort Leavenworth, KS: Combat Studies Institute, USACGSC, 1984.
- Marshall, William et. al., U.S. Army Operational Concept for AirLand Battle-Future (Heavy) 2004 [Revised Final Draft]. Fort Leavenworth, KS: TRADOC ALB-F(Heavy) Special

Study Group, 1989.

Reznichenko, V.G., Tactics 1987 [TAKTIKA]. Foreign Broadcast Information Service Translation. Washington,

DC: Foreign Broadcast Information Service, 1988.

Reznichenko, V.G., Tactics 1984 [TAKTIKA], A Soviet View. Canadian Department of State Translation. Ottawa, Canada: Soviet Military Thought Series No. 21, 1984.

Romjue, John L., From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982. Fort Monroe, VA: US Army Training and Doctrine Command (Historical Monograph Series), 1984.

The Joint Chiefs of Staff, JCS Pub.1: DOD Dictionary of Military and Associated Terms. Washington, DC, 1 June 1987.

U.S. Army, Field Manual 6-20: Fire Support in the AirLand Battle. Washington, DC: Department of the Army, 17 May 89.

U.S. Army, Field Manual 6-20-30: Fire Support in Corps and Division Operations. [Coordinating Draft], Fort Sill, OK: USAFAS, 1 March 1988.

_____. Field Manual 71-100 [Approved Final Draft]: Division Operations. Washington, DC: Department of the Army, 21 April 1989.

_____. Field Manual 100-2-1: The Soviet Army - Operations and Tactics. Washington, DC: HQ, Department of the Army, 1984.

_____. Field Manual 100-2-2: The Soviet Army - Specialized Warfare and Rear Area Support. Washington, DC: HQ, Department of the Army, 1984.

_____. Field Manual 100-2-3: The Soviet Army - Troops, Organization and Equipment. Washington, DC: HQ, Department of the Army, 1984.

_____. Field Manual 100-5: Operations. Washington, DC: HQ, Department of the Army, 1986.

_____. Field Manual 100-15, Corps Operations. Washington, DC: HQ, Department of the Army, 13 September 1989.

US Army Intelligence Agency (USAITAC), Soviet Battlefield Development Plan, Volume I: Soviet General Doctrine for War. Washington, DC, June 1987.

USACGSC, Tactical Commander's Development Course, Soviet

Planning Factors Handbook. Fort Leavenworth, KS, May 1989.

MANUSCRIPTS/MONOGRAPHS

Ellison, Gregory W., The Artillery Battle: Capitalizing on Available Technology. Fort Leavenworth, KS: USACGSC/SAMS, 4 December 1987.

Glantz, David M., The Soviet Conduct of War. Fort Leavenworth, KS: USACAC/SASO, 30 March 1987.

Menning, Bruce W., Bayonets Before Bullets: Russia's Imperial Army, 1861-1914 (Addendum), Fort Leavenworth, KS: USACGSC, undated.

Redlinger, Mark J., AirLand Battle and the Divisional Artillery Counterfire Dilemma. Fort Leavenworth, KS: USACGSC, 1987.

Soviet Army Studies Office, Soviet Future War (Draft Study), Fort Leavenworth, KS: SASO, 27 April 1987.

Turner, Albert F., The Direct Support Field Artillery Battalion: Counterfire or Close Support? Fort Leavenworth, KS: USACGSC, 1987.

U.S. Army, Division 86 Final Report. Fort Leavenworth, KS: US Army Combined Arms Combat Development Activity (CACDA), 1981.

USAFAS, Counterfire -- A White Paper. Fort Sill, OK: 17 July 1989.

USACGSC, Selected Readings in Tactics: The 1973 Middle East War [RB 100-2, Vol II]. Fort Leavenworth, KS: USACGSC, 1980.

PERIODICALS

Arnold, Joseph C., "Current Soviet Tactical Doctrine: A Reflection of the Past." Military Review. 57 (July 77), 16-24.

Bellamy, Chris, "Soviet Artillery and Rocket Forces 1940-1980," Jane's Defense Review. Vol 4, No.3, 1983.

Bellamy, Chris, "Destruction By Fire: Soviet Artillery in the 1980s and Beyond," Field Artillery Journal. Vol 53 (Sep/Oct 1985,) 40-45.

Bellamy, Chris, "Conventional Quick Kill," Jane's Defense Weekly. Vol.1, No.19 (19 May 84,) 781-786.

Bellamy, Chris, "Firepower Superiority," Jane's Defense Weekly. 12 January 1985, 59-66.

Bellamy, Chris, "Soviet Artillery and Missile Force Challenge." International Defense Review. 21 No. 4 (4/1988) 347-351.

Corri, Vollney B. Jr., "The Counterfire Battle: Shoot First to Win." Army. Vol 39 No.7 (July 89), 39-41.

Cutshaw, Charles Q., "Behind Soviet Force Cuts, Ominous New Directions in Posture." Army. Vol 39 No.8 (Aug 89), 16-27.

Dick, Charles J., "Soviet Operational Concepts." Military Review. 65 (Sep 85), 29-45 & 66 (Oct 85), 4-19.

Donnelly, Christopher, "Modern Soviet Artillery," NATO's Fifteen Nations. Vol. 24, No. 3 (Jun/Jul 79,) 48-54.

Hallada, Raphael J., "Fire Support Modernization." Military Review. 69 No.8 (Aug 89), 4-14.

Marty, Fred F. et al., "Counterfire: The Combined Arms Fight for Fire Superiority." Military Review. 69 No.8 (Aug 89), 37-43.

Moon, Alan B., "Silencing the 'Red God of War'," Field Artillery Journal. April 1989, 15-17.

Otis, Glenn K. et al., "We're Being Outgunned in Field of Fire Support." Army. 39 No.4 (Apr 89), 28-37.

Riley, Robert S., "AOE: What Is It?," Field Artillery Journal. September/October 1985, 46-50.

Vigman, Fred K., "The Theoretical Evaluation of Artillery After World War I," Field Artillery Journal. Vol 4 (Jan/Feb 1976,) 21-23.

----- "Counterfire (Parts I and II)," Field Artillery Journal. Vols. 43 and 44 (Nov/Dec 75, Jan/Feb 76,) 14-21/32-39.