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**OPERATIONAL FIRES:  
DO THEY REQUIRE A THEATER FSCOORD?**

A Monograph  
by

Major Michael J. Bradley  
Field Artillery

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Operational Fires:  
Do They Require A Theater FSCoord?

by

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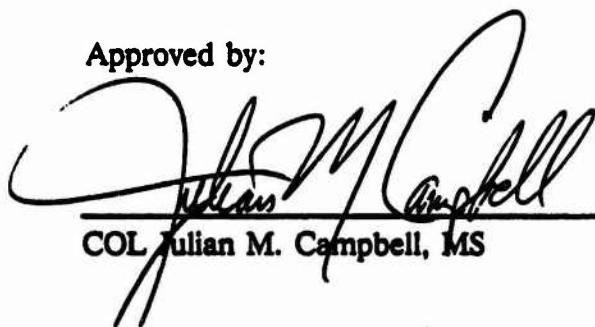
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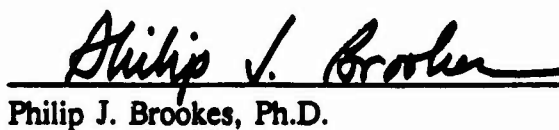
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ABSTRACT

OPERATIONAL FIRES: DO THEY REQUIRE A THEATER FSCoord? by MAJ Michael J. Bradley, USA, 49 pages.

This monograph examines the modern development of operational fires as a major contributor to the success of campaigns. Its focus is to determine the best way for the U.S. military to maximize the impact of operational fire systems. It proposes that a FSCoord is needed at the theater level to accomplish that campaign requirement.

The analysis begins with an examination of recent U.S. Army doctrine concerning the operational level of war and the Relative Combat Power Model. This model relates the combat power elements of maneuver, firepower, protection and leadership. The work then defines operational fires in light of the model and current doctrine. It then traces the use of these fires in the modern era using historical examples. Particular attention is then devoted to the current Soviet and U.S. positions on the subject. Of particular interest is the Soviet concern with "high precision warfare", which is a form of operational fires.

The study concludes that a theater FSCoord is needed to ensure that the different service systems capable of generating operational fires are used to produce maximum combat power. However, the designation of a theater FSCoord cannot be standardized due to the different types of campaigns that could arise.

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## I. INTRODUCTION

In the wake of its rediscovery of the operational level of war, as outlined in FM 100-5, OPERATIONS, the Army is evolving modern methods to plan and conduct AirLand campaigns. This effort includes writing new doctrine to bridge the operational gap between strategy and tactics. FM 100-6, LARGE UNIT OPERATIONS defines Operational Art as, "the employment of forces to attain strategic goals through the design, organization, and conduct of campaigns and major operations in theaters of war and operations." (1)

The Army defines a campaign as a series of joint actions designed to attain a strategic objective in a theater of war. (2) A major problem in the development of a methodology to plan and conduct theater operations is the loose usage of the term "campaign".

The colloquial use of the word "campaign" has led to such terms as the "land campaign," the "land-air campaign" of a ground component, the "interdiction campaign," the "Joint Suppression of Enemy Air Defense (J-SEAD) campaign," and on and on. (3)

Accepting the use of these terms confuses the determination of who should conduct campaigns and write campaign plans. FM 100-5 allows for only one campaign per theater of operations. It directs a unified campaign concept.

Though the U.S. military has had historical success at the operational level; that success is not recent. The Army believes that in order to fulfill its mission and deter war it will have to be better prepared to conduct theater operations. At this

operational level of war, certain functions allow the commander to directly influence the outcome of the operation and therefore require special consideration. These functions are intelligence, maneuver, fires, sustainment, and deception. (4) This paper will examine the integration of fires with the other functions at the operational level.

The major premise of this paper is that the integration of operational fire is a lost art in the U.S. Army. If so, then the Army's new doctrine will not be easily implemented. While a "purple suit" solution is unlikely given the history of the U.S. military, technology is rapidly overwhelming any parochial practices that have crept into the conduct of American warfighting. "Current weapons and means of massing fires make firepower devastatingly effective against troops, material, and facilities in greater depth and accuracy and with more flexibility than ever before." (5)

However, the deeper we go into the theater the more likely we are to see conflict between those services that have control over operational fires. The problem appears to be that while a campaign must be "joint", the forces that will fight that campaign are not. Presently, the U.S. plans to conduct joint operations by lashing together units from different services in a unified command or task force. Though this guarantees common participation it does not guarantee integrated action.

The principles of war still apply at the operational level. "In conventional military operations, major operational responsibilities will be delegated to subordinate commanders. In

either case unity of command is essential. Lack of unity of effort will lead to confusion, mutual interference, and the potential for piecemeal defeat." (6)

Campaign design and planning cannot be the sole purview of the Army. Modern battle will be joint in nature. The challenge is to develop an employment methodology for operational fires that is acceptable to the entire U.S. military structure. Likewise, it should be compatible with our allies since most scenarios requiring a campaign plan involving U.S. forces are likely to be combined operations.

Whatever improvements are made to the U.S. methodology for conducting theater operations, one result must be improved synchronization. Synchronization is the arrangement of activities in time, space and purpose to produce maximum relative combat power at the decisive point. (7) It requires an understanding of the capabilities and limitations of each component of the friendly force. (8) Those capabilities are in a state of unprecedented change.

"Today, surface-based missiles can command the sky, infantry weapons can decimate a tank assault, and land-based aviation can control the sea. Air, land, and seapower cannot be measured in isolation nor employed independently from one another." (9) Operational fires can be provided by Army artillery, Air Force jets and Naval gunfire. A solution devised by a single service will not suffice. We need a joint, operational level, air, land, and sea concept of operations to fight modern campaigns.

The purpose of this paper is to address the issue of how best to integrate operational fires into U.S. campaign plans. The central question is whether a Fire Support Coordinator (FSCOORD) is required at the theater level to ensure that the fires available to the operational commander are properly used. As a proposal, the operational FSCOORD may be that component of the joint force "owning" the preponderance of operational fires for the campaign. In some actions this may be an army force artillery commander. More commonly, it may be an air force or navy commander whose assets are the dominant operational fires in the theater.

The analysis begins with a detailed look at the concept of "operational fires" and how they relate to the generation of "combat power" on the battlefield. Next, presentation of historical examples of operational fires lead to a discussion of current Soviet and U.S. doctrines and methodologies for their employment. The study concludes with analysis of the evidence and conclusions regarding the synchronization of operational fires.

## II. OPERATIONAL FIRES

### The Army View

What are operational fires? Army doctrine says that "fires are considered operational when their application constitutes a decisive impact on the conduct of a campaign or major operation." (10)

Although both operational and tactical fires affect maneuver, the integration of operational fires with maneuver occurs at a higher level than that of tactical fires. In an important sense, operational

fires are not fire support at all, but rather a co-equal component of the operational scheme. . .operational fires are normally furnished by assets other than those required for the routine support of maneuver. Thus battlefield air interdiction is apportioned and planned as part of the theater interdiction effort rather than as close air support. Similarly, surface systems involved in operational fires are more likely to be found at corps level and above. (11)

This seems parochial and shortsighted. The Air Force is not the only source of operational fire. Army cannon and rocket systems have historically been capable of providing both tactical and operational fires. Systems in use today; MLRS (Multiple Launch Rocket System) for example, are capable of continuing that tradition. Adding ATACMS (Army Tactical Missile System) will only make surface-to-surface rocketry more significant at the operational level. A question that remains, however, is what happens when the same assets are needed for both tactical support and operational effect?

Finally, and most important, the planning of operational fires differs from the usual approach to fire planning. The latter is "bottom up". Fire plans are initiated at the lowest level and culminated and reconciled at each successive higher level. In contrast, operational fires are planned "top down". Objectives are established and targets designated by the operational commander, then passed to subordinate units for execution. (12)

However, this presents a problem when the same system: cannon, rocket, or airplane, is capable of "fire support" and "operational fire". Is an operational FSCOORD the solution?

JCS Pub 1, DICTIONARY OF MILITARY AND ASSOCIATED TERMS defines "Combat Power" as the total means of destructive and/or

disruptive force which a military unit/formation can apply against the opponent at a given time. (13) "Firepower" is cited as the amount of fire which may be delivered by a unit or weapon system. (14) Therefore, since firepower is a destructive force and combat power is the total means of destructive power, all firepower must be included as part of combat power.

In Army doctrine, the theater commander's ability to do his job is a measurement of Combat Power. "Combat Power is the ability to fight." (15) It is composed of four elements; Maneuver, Firepower, Protection and Leadership. As a measure of military capability, combat power is created by combining the effect of each of the elements. In his work titled, "Understanding Combat Power", Colonel Huba Vass de Czege outlined an equation called the Relative Combat Power Model. (16)

#### THE RELATIVE COMBAT POWER MODEL

$L_f(F_f+M_f+P_f-D_e)-L_e(F_e+M_e+P_e-D_f)=$  Battle Result

where;  $L_f/L_e$  = friendly/enemy LEADERSHIP effect

$F_f/F_e$  = " " FIREPOWER effect

$M_f/M_e$  = " " MANEUVER effect

$P_f/P_e$  = " " PROTECTION effect

$D_f/D_e$  = DEGRADATION of foe's LFMP effect

Key to understanding the point of the model is that the equation gives value to effects! In other words, the effect of firepower, i.e., the killing, wounding, or paralyzing of enemy soldiers and damage to or destruction of his material, is what matters in battle. The system that produced the firepower has no

impact on the balance.

#### The Air Force View

The Army believes that in a major operation the bulk of the operational fire combat power will come from the other services. "Operational fires are largely the province of theater air forces." (17) These forces, with their inherent flexibility and sustainment requirements, are normally organized to support land force operations throughout the combat zone as directed by the theater commander.

But the doctrine of these forces is different. Air Force Manual 1-1, BASIC AEROSPACE DOCTRINE, states that,

OPERATIONAL DOCTRINE applies the principles of basic doctrine to military actions by describing the proper use of aerospace forces in the context of distinct objectives, force capabilities, broad mission areas, and operational environments. Operational doctrine describes the organization of aerospace forces, and it anticipates changes and influences which may affect military operations, such as technological advances.  
(18)

In other words, operational doctrine to the Air Force is doctrine that tells you how to operate with the Air Force in different situations. It is not tied to a particular level of war and has nothing to do with the linkage of tactical actions to strategic aims. As for dealing with the Army, that's the job of joint doctrine. Unfortunately, the absence of joint doctrine and the operational gap this has created is part of the Army's doctrinal impetus. In the Army's view, the void must be filled.

#### The Navy View

Integration of naval capabilities seems even tougher. In

the joint arena, naval operational fire is, in essence, the Navy's ability to project fire ashore. However, the Navy's purpose in doing so may not coincide with the purpose of air-land (army/airforce) forces. The Navy's main interest will always be the linkage of military actions to accomplishment of its primary mission of sea control. Amphibious operations are also of concern if they have a sea control linkage and/or marine forces are involved. But even when U.S. Marines are landed, ground oriented operations and campaigns are not what the Navy considers itself best designed to conduct and support.

Accordingly, the use of Navy assets to conduct operational fires in a predominantly air-land campaign would be expected to meet resistance if the fleet is threatened. However, integration of naval assets must be included in a true joint, theater level, operational concept since naval operational fire assets; aircraft, missiles, and guns, can impact on land and affect the outcome of a campaign.

#### The Campaign View

Fires and maneuver are an integral part of the campaign plan. Thus, the coordinated use of both should be evident throughout the campaign. Fires are used to create opportunities for maneuver, and maneuver exposes enemy forces to the concentration of fires. Fires include the whole range of land, air, and naval capabilities -- conventional, chemical and nuclear. For subordinates to make valid plans, the campaign plan should specify the allocation of these fires in each phase of the campaign. (19)

Who specifies? An operational level FSCCOORD? Army doctrine intimates that one is needed to synchronize operational fire assets but does not say who it should be. Should the Air Force

have the job? Is their doctrine suitable? Army doctrine admits that, "firepower may be used independent of maneuver to destroy, delay, or disrupt uncommitted enemy forces." (20) But when the campaign plan calls for operational fire to be integrated with operational maneuver, which perspective -- air or ground -- should reign?

The question is becoming more clouded as Army systems begin to range areas of the battlefield historically reserved to other services. "Surface-to-surface weapons will become much more accurate, and their ability to deliver submunitions designed to attack a wide range of targets will markedly increase." (21) "The increasing range, accuracy, and lethality of surface delivery systems, however, promises a corresponding increase in the operational employment of such systems." (22)

If ground component system capabilities overlap air or naval component systems, who will referee and integrate their employment? How will subordinate units coordinate? How will a tactical air squadron's mission be synchronized with the SEAD (Suppression of Enemy Air Defense) mission of the MLRS battalion supporting a division artillery? If operational fires are top down in design only two possibilities currently exist. Until a joint, operational perspective is shared by all operational fire assets; either the coordination will not be done or it will be imposed on reluctant partners. Time is not on our side. The new technology is already here.

Since operational air-land doctrine must be joint, it must address how operational fires are going to be commanded and

controlled. This methodology must be the best way to integrate the assets of the different services that provide fires capable of operational effect. Only in this way will operational fires make their maximum contribution to the generation of combat power. Joint actions decide campaigns. Those actions are the result of combat power generation. Firepower is an element of combat power; its employment in the form of operational fire is an operational function. Therefore, operational fire must be a joint action based on an understanding of combat power.

U.S. military history since the DOD reorganization of 1947 has not been a model of inter-service cooperation. There is no repository of joint doctrinal development to rely on for guidance in this effort. We need to develop ways to synchronize the firepower of operational fire systems. Specifically, we want to synchronize the effects of operational fire systems, i.e., their firepower effects, not the systems themselves. In fact, the systems are irrelevant in terms of combat power. It makes no difference if the firepower was delivered by an aircraft or artillery shell, what matters is its contribution to combat power and its impact on the campaign. The theater FSCoord remains a proposal. Who that FSCoord should be is still undetermined.

### III. OPERATIONAL FIRES IN 20TH CENTURY WARFARE

#### World War I

"Both the World Wars of the 20th century have been 'artillery wars'; that is to say that, in each, artillery proved to be the decisive weapon in decisive engagements." (23) In

World War I, artillery dominated the western battlefields. Spotting for artillery became the basic function of the Royal Flying Corps. At the Somme, the British fielded 2,029 guns and howitzers deployed on a front of 14 miles; in their 8-day preliminary bombardment they fired 1,732,873 shells. (24) Unexploded British shells are still turning up in the fields around the Somme. Eleven months later at Messines, the British artillery fired 3,258,000 shells. (25) This effort was designed to achieve the operational breakthrough both sides had sought in 1914.

The Germans also used artillery extensively. In the Spring of 1918, they seized the initiative for the first time since Verdun. Using their last resources, they launched a massive blow against the British. "For this assault they assembled 6,473 guns and mortars and 3,532 light and heavy trench mortars; this was the largest number ever employed on a single occasion in that war." (26) The German artillery fired a 5-hour bombardment and destroyed the British forward positions. The German infantry was able to make a deep penetration and nearly changed the outcome of the war.

The German offensive failed strategically for a number of reasons, but the point here is that the firepower of artillery was coordinated with an operational level maneuver in an attempt to achieve more than local tactical success.

#### The Interwar Period

The interwar years saw the development of Soviet Operational Art. Many of the characteristics of modern Soviet

artillery can be traced to recommendations made at this time by Vladimir Triandafillov. From World War I experience he saw the need for artillery to accompany advancing troops through the enemy defence, "not just with fire but also with wheels". (27) Triandafillov concluded that in order to obtain the optimum balance between artillery and infantry the quantity of artillery needed to be doubled relative to the infantry. (This view is reflected in current Soviet formations.)

In preparing for the next European war, the Soviets developed their own form of Blitzkrieg. Unlike the Germans, they retained artillery as a prime component. The Soviet Field Service Regulations of 1936 stressed that artillery still provided the greatest firepower and opened the way for tanks. Artillery was formally recognized as the "main source of firepower" (28)

### World War II

In World War II, artillery was the major source of firepower in the battles of the Western Allies, despite the large and growing weight of tactical air support. Artillery accounted for 58 percent of all casualties. (29) On the Eastern Front, it is estimated that Soviet artillery inflicted 70 percent of German material and personnel losses. (30)

The role of artillery in Tunisia was significant in 1943. Montgomery relied on it heavily in the Eighth Army's battles at and beyond the Mareth Line. Though it would never reach the numbers it enjoyed in WW I, the weight of artillery in both the British and American armies continued to increase; by mid-1943

the Royal Artillery was the largest arm in the Army (22%). (31)

On 9 September 1943, the Fifth Army landed on the Italian shore in the Gulf of Salerno. "For the next week, a bitter battle raged that nearly saw the Anglo-American force thrown back into the sea. One of the key factors that prevented a disastrous Allied defeat was the effective application of Naval Gunfire (NGF)." (32) The operation showed the timeless practice of supporting landing on a hostile shore with firepower afloat. "Some historians estimate that warships fired 11,000 tons of shells supporting the Fifth Army. In contrast, the Northwest African Air Force dropped only 3,000 tons of bombs." (33)

NGF is still an important source of operational fires. The use of 16 inch guns in support of the Marines performing peacekeeping in Beirut is a contemporary example. However, even in that case the ability to integrate the supporting fires of the guns afloat with operations ashore was tenuous. These were forces accustomed to working together. How well could an Army-Navy task force operate together?

Operational air-land integration had some remarkable achievements in the drive across Europe. "From the beginning of COBRA to the end of July, fighter-bombers in the VII Corps alone claimed 362 enemy tanks and assault guns destroyed and 216 damaged, 1,337 other vehicles destroyed and 230 damaged." (34) The above figures portray the operational effect generated by the cumulative destruction of the enemy capability to mount large unit operations. They also show how the operational drive to the Seine was facilitated by aircraft conducting seemingly

tactical missions.

Under Pete Quesada of IX Tac, doctrine yielded still more to the question of how to best help the ground forces. Quesada had shocked the RAF by suspending bombs from Spitfires to convert Britain's finest fighter into a ground-support fighter-bomber. Quesada remarked, "But they're not your airplanes anymore -- they're mine. And I'll do anything I want to do with them. (35)

Despite Quesada's joint perspective,

The American Army Air Corps, though organizationally part of the army, was pushed by national history and international legalities into no such identification with the traditional army...The AAF thus developed jealously the doctrinal proposition that when giving support to the ground, the decision to fly a mission must remain with the air officer commanding the supporting aerial units. (36)

Since the war, several fundamental beliefs have remained imbedded in Air Force doctrine. Today it states that, "Airpower can exploit speed, range, and flexibility, better than land and sea forces, and therefore, it must be allowed to operate independently of these forces." (37) There is no "co-equal or interdependent" philosophy in this statement. It obviously is focused on operational fire systems i.e., the airplanes, rather than the impact of the firepower that those systems bring to the theater.

In a monograph entitled, The Normandy Campaign: Firepower at the Operational Level, Colonel Sterling Richardson analyzes the use of firepower from the Normandy invasion to the capture of Paris. He asserts that, "Firepower was multi-dimensional and multi-service as artillery, air power, and early in the

campaign, naval gunfire were coordinated by and in support of Army and Army Group operations." (38)

He views the campaign's success as the synchronized employment of an air army with one or more army groups. It was a sequenced set of military actions. As such, it is considered to be operational warfare by current standards. The importance of framing operational fire using the elements of combat power is also cited. "The product of the Eighth Air Force was firepower and this product had to be coordinated not only with the movement of maneuver of ground forces but also with the ground delivered firepower being employed by the respective army groups." (39)

#### Korean War

"In Korea nearly 60 per cent of Americans killed in action fell to blast or fragments from artillery or mortar shells - mainly Soviet made." (40) Though such fires ultimately have operational effect, it usually takes time to discern it. No such wait was necessary at one point in the Korean War. Following his unparalleled success at Inchon, General MacArthur, conducted a major joint operation to crush the retreating North Korean forces. As he described it;

The United Nations massive compression envelopment in North Korea against the new Red armies operating there is now approaching its decisive effort. The isolating components of the pincer, our air forces of all types, have for the past three weeks, in a sustained attack of model co-ordination and effectiveness, successfully interdicted enemy lines of support from the North so that further reinforcement therefore has been sharply curtailed and essential supplies markedly limited. The eastern sector of the pincer, with noteworthy and effective naval support, has steadily advanced in a brilliant tactical movement and has now reached a

commanding enveloping position cutting in two the northern reaches of the enemy's potential. This morning the western sector of the pincer moves forward in a general assault in an effort to complete the compression and close the vice. If successful this should for all practical purposes end the war, restore peace and unity to Korea, enable the prompt withdrawal of United Nations military forces, and permit the complete assumption by the Korean people and nation of full sovereignty and international equality. It is for that for which we fight. (41)

This communique is a masterful expression of a campaign plan, a major operation, and the linkages to the strategic aim. It also links the operational functions of fire and maneuver. Likewise, it talks to the importance of cutting enemy sustainment and limiting his freedom of maneuver and use of operational reserves through interdiction. All of this is done by a joint air, land, and sea operation in which each service contributes its combat power potential in a synergistic way.

#### The 1967 Arab-Israeli War

Another example of operational fire can be found in the 1967 Arab-Israeli War. The action of the Israeli Air Force (IAF) demonstrated how a modest variation in plan could elevate the battlefield effect from the tactical to the operational level

..in 1956 the IAF had attacked east to west, in effect pushing the Egyptians out of Sinai; this time it was ordered to attack traffic in the western half of Sinai in order to slow down the Egyptian retreat, thus forming the anvil for the hammer of the ground forces. ..The Egyptians could not do the same thing since their army didn't control the air forces. (42)

Though it may be smoother to conduct this type of operation if all forces belong to a single service it is not required.

However, just as in Korea, what is required is that air and ground action be integrated.

#### Iran-Iraq War

Operational fire continues to decide warfare today. In the savage Iran-Iraq War both sides exchanged Soviet made surface-to-surface missiles on a larger scale than at any time since World War II. (43) Both sides resorted to long range surface-to-surface missiles to deliver massive firepower against the cities of their opponent. The purpose of these attacks was to achieve a strategic goal. In the end, Iraq's chemical warheads turned a potential defeat into at least a limited victory by forestalling a long-awaited Iranian offensive and helped obtain a cease-fire that restored Iraq's prewar boundaries. (44)

#### Summary

Looking back over the last seventy-five years it is evident that massive firepower has often played a dominant role in the fate of nations. The impact of that firepower has been greatest when it was used to achieve operational success rather than mere tactical advantage. A challenge for the modern operational practitioner is to determine how to maximize the potential of operational fire in the campaign.

### IV. CURRENT SOVIET THOUGHT

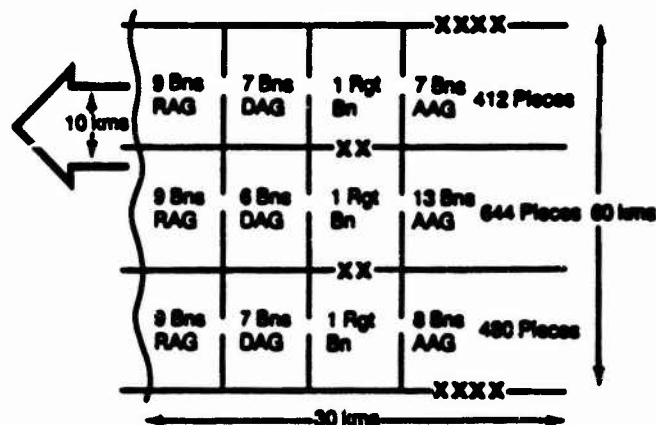
#### Background

The Soviets believe that "Fire is the decisive factor in achieving victory over the enemy." (45) They back up their beliefs with action. In their army the artillery and rocket

troops provide 80 percent of the Ground Forces' firepower. The cradle of Soviet operational fire doctrine was the Great Patriotic War. Many military commentators consider the Soviets to be the masters of operational art in the Twentieth Century. While enjoying a tradition of excellence in employing operational fire, the Soviets are not mired in outdated concepts. The Soviets, who used artillery operationally in WW II, recognize that surface-to-surface missiles can provide combat power as valuable as any aircraft.

"The Soviet view is that fire superiority in the Great Patriotic War was achieved primarily by massed artillery fire, in concert with air strikes." (46) As shown in the following diagram, the Soviets believe in massing artillery at the point of main effort. (47) The effort to mass firepower is not merely to achieve a favorable tactical outcome. Artillery can have operational effect. The Soviets will use it to quickly fracture the defending American division and to free Operational Maneuver Groups (OMGs) to drive deep into the rear. The mission of the Soviet artillery is therefore both tactical and operational.

Scenario: At the point of the main effort, the Soviets concentrate fires from 1,056 tubes and rocket launchers. These forces are in support of a Soviet Army main attack breakthrough.



A US division faces this counterfire threat.

### New Theory

The Soviets have recently begun talking in their doctrinal literature about a new type of war. They call it "high precision" warfare. In their view, modern technology is turning out "conventional" weapons that have such range, lethality, and accuracy that they will change future battlefield thinking much the way that theater/tactical nuclear weapons changed it following World War II. It describes an operational environment where improved operational fires enable an attack to the full depth of enemy formations with operational results. They envision a military force able to achieve nuclear type effects on the battlefield without incurring the political costs. This is desirable because of the possibility to achieve victory without "escalating the conflict".

The Soviets are in a good position to readily incorporate the enhanced operational effect of high precision weapons because they have a mature methodology and doctrinal framework concerning the employment of operational fires in their background.

### New Terminology

The Soviets appreciate that these developments in the range and effectiveness of their artillery weapons will be worthless, unless targets can be found for them well inside enemy lines. Target information will have to be assessed, from which priorities can be worked out and then orders given to the unit with the weapon best suited to each type of target. The Soviets use the term "Reconnaissance Destruction Complex" to describe

this. (48) The Soviets have developed subordinate terms such as "Reconnaissance-Strike and Reconnaissance-Fire Complexes" to precisely describe the same methodology for different levels of action.

At the operational level, they have the Reconnaissance Strike Complex (RUK), intended to direct SSMS and aircraft -- like the (now cancelled) American Precision Locating Strike System (PLSS). (49) At the tactical level, is the Reconnaissance Fire Complex (ROK), primarily intended to control artillery assets -- as was the (now cancelled) American Stand Off Target Acquisition System (SOTAS). (50) An army-level reconnaissance fire complex could get information from its two electronic-warfare battalions and its Long Range Reconnaissance Patrol (LRRP) Company, from in-flight reports from aircraft, from a wide range of surveillance radars and from existing drone systems. (51)

Other terms are used to describe the integrated approach of the Soviet operational mind. "Fire Destruction" is the general term used by the Russians to refer to the action of all fire weapons, including tank armament and air as well as artillery and rocket forces. It is a much more positive and aggressive belief in the killing and stunning power of all fire weapons. (52) "Integrated Fire Destruction of the Enemy" is the philosophy of integrating the fire effect of all weapons, including tube artillery, multiple rocket launchers and operational-tactical missiles to achieve maximum overall efficiency. This is not a loose phrase but refers to a specific

concept which was first enunciated in Polish and Soviet sources in 1982. (53) The use of "integrated" is new and significant.

The term "Fire Strike" had been used to refer to a nuclear blow. Now, its application to powerful, paralyzing blows by artillery, rockets and air clearly reflects the Soviets' intention to substitute conventional for nuclear fire if possible. It is fully consistent with new technology which is becoming available. (54) It also implies a massive, surgical strike to excise one element of an enemy defence, like that carried out by First Ukrainian Front's artillery in the Vistula-Oder operation.

#### New Doctrine

The Soviets have the conviction that their armed forces should aim to defeat NATO in a single, swift, Theater Strategic Operation without the use of nuclear weapons. As Ogarkov said, "the sharply increased range of conventional weapons makes it possible to immediately extend active combat operations not only to the border regions, but also to the whole country's territory, which was not possible in past wars." (55)

The Soviets see the possibility of a new type of conventional war: one more lethal in its activity over a deeper range and in shorter time scales than anything experienced in the past. The question is how do we react if we also believe this to be true? The new capabilities do not make life easier for the operational commander. As technology improves capability it concurrently demands a price. That price is increased complexity of operations and increased requirements for

synchronization of forces.

"Integrated fire destruction of the enemy has become vastly more complex with recent proliferation of weapons types and the need for closer integration of air operations with the ground action." (56) The idea is to find the most efficient use for each asset, and therefore, obtain the maximum benefit from the whole.

#### New Plans

The changes brought about by the introduction of high precision warfare cascade down to the level of conducting campaign planning. The Soviets have taken a new look at the scenario of a Warsaw Pact/NATO confrontation. A new theater concept is being fleshed out in light of changing conditions. "The overall Theater Strategic Operation would comprise four overlapping and concurrent Strategic Operations: an Air Operation, an Anti-Air Operation, a Theater Land operation and a Naval or Coastal Operation." (57)

The emphasis is on the interlinked nature of all these and of the use of different types of weaponry within them. Thus the Air Operation would use not only aircraft but also artillery and missiles to suppress enemy air defences and radars. This will be conducted under a single command and in accordance with a single concept and plan, to destroy enemy air and missile forces. Another benefit of high precision war will be speed in the Soviet view. The new concept would be to penetrate NATO to a depth of 1200 km in 22 days without resorting to nuclear weapons. (58)

### New Tactics

In connection with expanding operational concepts, a new phase of artillery and air activity has been added to the traditional three phases (preparation, support and accompaniment) which have characterized Russian artillery and, later, air support since the last century. There are now four phases, of which the first is new. It is Fire Protection of forces moving up for the attack. The last phase is different again, and merges with the extension of the battle into the enemy operational depth. (59)

The new phase is acknowledged in the definitive 1984 edition of Reznichenko's TACTICS. It involves suppressing those enemy systems which are capable of conducting Deep Battle against Soviet forces before the latter have made contact, and blinding the enemy as to Soviet movements. Its introduction is uncannily timely, as striking at the Soviet follow on forces and second echelon as they move up is the main innovation in the 1982 version of the United States manual FM 100-5. (60)

### New Weapons

Technology has in fact enhanced the utility of firepower as an operational tool. Target Acquisition from satellite imagery, remotely piloted sensors, and radars can locate targets accurately and in depth. Smart, even "brilliant" munitions make rapid accurate attack more effective at significantly greater ranges. (61)

Modern SSMs with FAE (Fuel Air Explosive) warheads, would be very effective against the soft targets presented by SAM sites and air defense radars. Conversely, Soviet aircraft which

would benefit from this would be employed most effectively in using direct gun and rocket attacks against hard targets such as tanks, which are relatively invulnerable to indirect fire. (62)

"...at present surface-to-surface missile accuracy is adequate to hit an airfield - and indeed, the threat from Warsaw Pact chemically armed SSMs is already being studied by NATO commanders." (63)

Not forgetting the lessons of their military history, the Soviets relentlessly keep increasing their ability to generate firepower. Excerpts of operational use of Soviet artillery are included at Appendix A. They have increased their artillery by 105 percent since 1973, and enjoy a 7-to-1 combat power advantage over the U.S. Army's artillery force. (64)

### Summary

The Soviets have developed a top to bottom detailed methodology to address the question of firepower's role in modern war. They consider the improvement in conventional weapons as a revolutionary change in the future nature of theater level war. From theory to hardware, they have ensured that there are no gaps in their operational level thinking.

### V. U.S. THOUGHT

#### Yesterday

In July 1943 the U.S. Army issued FM 100-20, COMMAND AND CONTROL OF AIRPOWER. Its first line stated that, "LAND POWER AND AIR POWER ARE CO-EQUAL AND INTERDEPENDENT FORCES; NEITHER IS AN AUXILIARY OF THE OTHER". (original emphasis) (65) While this may be true; it is irrelevant to the conduct of major campaigns.

Neither land power, air power nor naval power decide wars. The factor that decides armed conflict is combat power. In the combat power equation the airplane is unimportant. What matters is the firepower effect generated when that plane drops ordnance. Land power is not more important than airpower, but at times the best way to generate combat power is to give precedence to an asset owned by the land power organization over the asset owned by the air power organization. Sometimes, of course, the opposite is true. What is true all the time is that the side that does the best job in maximizing the combat power it can bring to bear in a conflict will win.

The problem that FM 100-20 sought to solve was the poor use of airplanes to generate operational fires during operations in the Kasserine Pass against the Germans in North Africa in World War II. At the time, aircraft were assigned to specific divisions as an asset to provide firepower support from the air. In fighting the battle, these assets were jealously guarded by each division commander and retained for the sole use of the division. The result was that they did a poor job of generating combat power for the force as a whole. The aircraft were employed piecemeal and defeated. As a result of this misuse of the inherent attributes of airplanes; speed, range, and flexibility, it was decided that they would taken away from the tactical land commander and centrally controlled by an air commander who could appreciate their capabilities.

In doing so it became more difficult to integrate the weapons that traveled along the earth with those that flew above

it. We degraded the generation of combat power against the enemy. Our solution protected the airplane and gave impetus to the drive to create a separate organization dedicated to maintaining that protection. We sacrificed the most efficient method of using an operational fire asset in conjunction with other elements of the campaign. We gave up integration. We did gain the means to mass one type of firepower at a high organizational level. But we lost some measure of unity of command at the operational level. We did not mandate operational FSCOODs.

#### Today

Other tenets of FM 100-20 remain in effect today. "The gaining of air superiority is the first requirement for the success of any major land operation, and, control of available air power must be centralized and command must be exercised through the air force commander." (66) The result is difficulty in getting the Air Force to commit aircraft that have dual roles to close air support when air superiority is in doubt. This may be a proper decision but it should be made from a campaign perspective. A theater FSCOOD would be in the best position to connect operational maneuver and fires.

JCS Pub 26, JOINT DOCTRINE FOR THEATER COUNTERAIR OPERATIONS, uses the term "counterair campaign". Yet counterair operations do not achieve strategic objectives; "The objective of counterair operations is to gain control of the air environment and protect the force". . . While the counterair operation contributes toward achieving the theater commander's objective by affording freedom of action to all forces of the command, the counterair effort is a mere part of the overall effort and does not constitute a campaign." (67)

Faced with a determined, powerful combined arms enemy force, U.S. and allied ground commanders need immediate support against the echeloned follow-on forces. "Currently, Air Force doctrine gives priority to air superiority missions." (68) While this might be correct doctrine, in order for its effect to be incorporated within the total force, it must be integrated doctrine.

### Tomorrow

Because of the increasing range capability of Army combat power, the services need to resolve doctrinal issues.

Major problems are looming. They have to do with interdiction targeting and with the management of airspace. And they have generated a behind-the-scenes interservice duel over BAI.... Air Force pilots have never had to worry about being hit by the Army's artillery... (with MLRS and ATACMS)... now the odds are shortening... So who will be in charge of seeing that this doesn't happen in a given combat theater? The ground-component commander? The air-component commander? The easy answer is the theater commander, but he may not be able to afford to become preoccupied with interdiction targeting and with allocating air and artillery on all occasions while coping with command and control on a grand scale. (69)

Another area of contention involves the Army's newest "maneuver" force. The Army plans on arming Apache helicopters with Sidewinder and Stinger missiles. "The Army contends that it must do this to defend the choppers against Soviet Hind attack helicopters that are similarly armed... The Air Force has no quarrel with this... which falls into the category of defensive counterair." (70) There is a thin line between defensive counterair and offensive counterair which would come into play

should the Apaches go after the Hinds or after the forward bases from which the Hinds are operating. The Air Force argues that offensive counterair is strictly an Air Force Mission. "This means that the Army in combat would have to get the resident air commander's okay to indulge in offensive counterair -- a requirement that the Air Force is bent on maintaining and that the Army almost certainly will try to get waived." (71)

We need to reach common ground. The services must be capable of modifying doctrine and organization to take advantage of new technologies and ideas. Currently, the Army would need Air Force approval to launch an ATACMS against an enemy airfield preparing an air-delivered chemical attack against front line troops. Such a restraint on combat power is unwise and unwarranted.

### New Weapons

New weapon systems capable of improving the U.S. capability to employ operational fire continue to enter the force. With its newest warhead, MLRS will be capable of attacking hardened stationary and mobile targets in all battlefield conditions. MLRS III will subject the armored formations of the follow-on Warsaw Pact forces to attack in their assembly areas to a depth of about 30 km. (72) "The MLRS' operational potential is due to be complemented by the ATACMS with a range of over 100 km and with future terminally guided munitions in planning." (73) These systems have high priority in the Army budget. "The plan calls for an increase in the procurement of MLRS launchers from 44 to 37 per year, and an additional 12,000 rockets per year. (74)

The Air Force is interested in two unmanned weapons designed to attack ground targets; Northrup's jet-powered "Tacit Rainbow" remotely piloted vehicle (RPV) and Boeing's "Seek Spinner" prop-driven RPV. (75) A ground launched variant could be launched from the Army's MLRS. The system would precede friendly aircraft into selected land or sea target areas, search out hostile radars, and then automatically track and disable those radars to clear a path for tactical aircraft. (76) "Continued improvements in terminal homing submunitions and delivery ranges of future generations of ground-launched missiles will give the maneuver commander from division to army group the ability to deliver massive lethal blows complementing more conventional artillery fires and the air war." (77)

#### New Tactics

New weapon systems require updated tactics. Air Force leadership believes, "if we put in a new surface-to-surface missile for example, we have to figure out how to integrate it with the new look of tac air and with our scheme of maneuver with the ground forces." (78) Likewise, "We can better integrate Seek Spinner with the tac air forces we have. We can launch them from the ground to open corridors for us and then follow them in with fighters and strike." (79) Having the ability to do something and having a proper perspective to do it in the most effective way are separate topics. We continue to make improvements to our potential for effective employment of operational fire as part of the generation of combat power. However, we have not matched that increase in potential with a

corresponding increase in joint understanding how best to use that potential.

"It is also intended to use Joint STARS for the command and control of the air-to-ground and of ground-to-ground weapons systems such as ATACMS and MLRS. In this connection the USAF reckons that the operational deployment of these types of weapons will enable it to cut its losses of Tactical Air Force aircraft by anything up to 80 per day." (80) Before we employ systems capable of performing the missions of another service; for example, BAI and AI; we should ensure that their use is coordinated at the proper level.

#### New Doctrine

FM 100-6 states, "The details of using maneuver, fires, and allocated support are left to the judgement and decision of subordinate commanders." (81) This could be a recipe for disaster if different commanders control the maneuver, fire, and support forces. Effective use of limited assets requires close coordination.

In large joint and combined theaters of war, normally one U.S. Tactical Air Force (TAF) is deployed and an overall theater or Joint Force Air Component Commander (JFACC) is appointed to command and control all air operations. Is the JFACC the theater FSCoord? If only air assets comprise the operational fire capability that may work. However, new technology could change that situation. While it may be most efficient to have a Naval FSCoord in a maritime theater and an Air Force FSCoord in a continental theater, in a truly

integrated joint command structure, the "home" service of the FSCoord shouldn't make a difference.

### Summary

There is not a well-articulated, mature body of joint doctrine to answer these questions. (See Appendix E) The best way to employ operation fire has been left to the individual theater commander. Each service has its own ideas on the subject which generally reflect institutional biases. However, the U.S. military may be overcome by events. The fielding of new operational fire systems and the Soviet work in the area of "high precision" warfare are likely to drive operational commanders to adopt their own "FSCoord" solution.

### VI. ANALYSIS

At the beginning of World War II, the U.S. air-land structure had divisions controlling their own supporting aircraft. This system failed at Kasserine. Our fix was drastic. We cut the Air Force loose to take advantage of their speed, range, and flexibility but in doing so cut the operational and tactical linkages in terms of integrated operations.

Due to men like Quesada, we recovered the tactical links and developed a workable CAS relationship. However, we went from integration that was poorly done to cooperation that was usually done well. What we need is excellent integration. The Air Force's view is that CAS should be integrated, EAI merely cooperative, and AI a separate campaign. Air interdiction's integration with the ground campaign has been minimal as evidenced by the results of Operation Strangle and the

Linebacker Campaigns of the Vietnam war. Overlaid on all of this however, is the dogma first put forth in 1943 that nothing happens until the counterair campaign is won.

In FM 100-5, the Army calls for synchronization. Synchronization of effects, where the effects of air delivered fires compliment the effects of ground delivered operational fires, is not yet good enough. What we need is an integrated effort like that possible before FM 100-20. Obviously the execution cannot return to Kasserine styles. The fundamental thinking should look at operational fires delivered by airplanes as fires delivered by a particular system but not a particular type of fire. Firepower is firepower, regardless of its mode of transport to the target.

We must integrate ground and air delivered operational fires while remembering the inherent advantages that each brings to the generation of combat power. We cannot afford otherwise. The Soviets see the dawning of a new age of precision weapon warfare where battle erupts throughout the entire depth of the campaign theater. There will not be time for the fusing of a cooperative or synchronized effort. Only a force which is accustomed to working as an integrated force will be able to maximize the generation of combat power in war.

If the Soviets are correct, the attack of forces throughout the theater by high precision, mass destruction (conventional) weapons will proceed at a pace of speed and destructiveness unknown before. The enemy will not wait for apportionment and allocation decisions before taking actions that require an

operational response. Likewise, operational commanders will have to be able to rely on other levels of support that do not change daily. Separate service "campaigns" and plans will not work in this environment. Only an integrated Air-Land-Sea concept is likely to succeed.

In World War II, German aircraft were integrated at the tactical level as shown by the success of Stuka dive-bombers supporting Blitzkrieg warfare. However, German aircraft were not integrated at the operational level. This was a major reason for German operational failures despite tactical prowess. The U.S., on the other hand, had adequately cooperated at the operational level as evidenced by the successful carpet bombing operation preceding the breakout from Normandy. The Soviets did the best job of integrating their operational fire assets. Had they the aircraft and pilots available to U.S. ground forces they may have been in Berlin much earlier. They accomplished operational success with massive amounts of artillery and still believe that artillery has an operational role in generating firepower.

The 1943 FM 100-20 missed the point. Land power and air power are poor terms for use in integrating combat power. There are land-based means and air-based means of delivering firepower. It is firepower that counts in fighting battles. Air, land, and naval forces all have maneuver, firepower, and protection attributes which constitute their form. Some forces are more maneuverable. Some are easier to protect. Some deliver a bigger bang. But their form is of secondary importance. Airpower is not decisive if you mean airplanes are decisive.

Landpower is not decisive if you mean tanks are decisive. Superior combat power at the point of contention is what is always decisive regardless of how it is generated.

It appears that differences in the operational focus of the military services are due, in part, to the physical mediums in which they operate. Their doctrine and weapons are designed to maximize effectiveness in those mediums of land, air, and sea. However, combat power is maneuver, firepower, protection and leadership. It is not tanks, ships, and airplanes. They are just the generators of and conduits for combat power. We need to go beyond coordinating the services, we need to integrate their contributions to the theater's combat power.

Synchronization requires that the effects of different components of the combat power equation be combined to produce a synergistic effect. Integration goes further. It demands that the purpose and intent of the different components be in concert, so that when their effects act with synergism they are accomplishing the most desirable result. The ASOC may coordinate but it does not decide. Since FSCOODs by their nature do not decide either, then what we really are looking for is someone who has the authority to integrate. We need an oracle not a referee. We do not seek a compromise, we seek a sober, rational, joint decision based on the commander's operational design to achieve strategic aims.

"The commander, Central Army Group uses the term "land-air campaign" to describe conceptual "jointness" inherent in the group's operations...Yet, the Commander, Central Army Group.

should not (and does not) write a campaign plan because he has neither the authority to compel air-land synchronization nor the scope of mission to achieve strategic results." (82) If this is true then how high must you go to integrate the capabilities of the different types of operational fire resources in the area of conflict? We seem to have so templated the area of operations that actions required by the nature of modern war and weapons: "High-precision" war as the Soviets would say, are precluded as being too difficult to integrate.

Some would argue that the protection and maneuver capabilities of modern armored forces have precluded the World War I stalemate. Their view is that the volume of fire on the battlefield will never again prevent maneuver. I am not so sure. If high-precision warfare becomes reality, we could again find ourselves digging into the earth to protect ourselves from reconnaissance destruction complexes and fire strikes.

"The capabilities of modern armies are diverse. But this diversity can diminish effective combat power unless care is taken to ensure maximum use of every asset." (83) Operational fires is one area where the risk seems evident. The historical and organizational problems in the U.S. military of getting different branches and services to integrate their efforts is magnified at the operational level. It appears that FM 100-6 is looking at operational level operations as tactical operations but only on a bigger scale while claiming they are different. We need a major change in the way we analyze the problems of operational level integration. It need not be a complicated new

thought process. The combat power model provides the most accurate and succinct method to appraise the situation and plan at all levels of conflict.

"Artillery of itself can be neither a 'battle-winner' nor a 'battle-loser', any more than tanks, infantry or air support." (84) It is simply one of the resources available to a commander, whose success or failure will depend on his understanding of its potential and limitations, and whether he uses it in a plan properly orchestrated with the other arms. This highlights the importance of understanding the elements of combat power in integrated joint reasoning and the problems caused by services coveting individual weapon systems.

#### VII CONCLUSIONS

If military conditions are the focus of operational art, then the campaign designer needs to determine how best to use the means at his disposal to achieve those conditions and fulfill his portion of achieving the strategic aim. It is evident that the principal means to achieve the desired military conditions are those military forces assigned to the theater. Those military forces have but one product and that is combat power. The task facing the theater commander is to maximize the combat power potential of his forces and most efficiently reach the desired conditions. The way to maximize combat power is to maximize the contribution that each service peculiar weapon system can bring to the combat power equation. This can be done if those systems and services are acting in an integrated effort.

In the past we have been able to cooperate and, at times synchronize, our air and ground operations. The demands of future warfare, however, portends to demand more. Unless we are able to integrate all of the assets capable of generating combat power at the operational level, to include operational fires, we stand the chance of being overwhelmed by what the Soviets have termed "high-precision" warfare. We need an operational FSCoord to coordinate that integration.

It appears that the U.S. is headed down a path to an operational fires methodology that will use theater fire support assets with the same essential mindset we use to employ tactical fire weapons. The only difference appears to be that we'll do it "deeper" with operational assets. If we adopt this approach we will squander a lead we have over the Soviets in the technology of operational fires systems.

The Soviets have the advantage in conceptualization of the employment of operational fires as a component of campaign design. They use Chiefs of Rocket Troops and Artillery at all levels of command to perform FSCoord duties. What they lack are systems as effective as ours. The U.S. has an advantage in the production of weapons and systems capable of producing operational effect in the campaign by fire. The Army recognizes the importance of operational fires as a component of the campaign design as evidenced by FM 100-6, yet appears to have progressed little in integrating the operational fire assets of the other services.

The question of who the theater FSCoord should be is

secondary. The more important consideration is insuring that all operational decision makers share a proper appreciation for what really matters in conducting campaigns and major operations. In different theaters, in different campaigns, the FSCoord may change. It would be a mistake to emplace a doctrinal prescription to fulfill the function. Better for all to have an appreciation and common understanding of the essential elements of combat power and their interrelationship at the operational level.

With such a basis for conducting joint and combined operations, it would not make a great difference what organization provided the theater FSCoord. In an Army-only scenario, it could be the force operations officer or maybe the artillery force commander. In a joint contingency it could be a staff section of any service. The more important consideration is that our thinking, not just our ordered actions, be joint.

In his novel, RED STORM RISING, author Tom Clancy describes the opening battles of a NATO/WARSAW PACT war. The first operation portrayed is an air operation involving offensive counter air and air interdiction. U.S. stealth fighters lead the attack, avoid enemy air defenses, and destroy the WARSAW PACT's AWACS coverage. They are followed by a combined strike force of F-111s and TORNADOES that bomb bridges across the Elbe river. The purpose of this fictional operation is to delay the movement of major enemy armor formations. (85)

While entertaining fiction, the operation was not explained in sufficient detail for the purpose of this paper. Was it

linked to and integrated with the other functions of campaign design and did the firepower expended make sufficient contribution to the overall combat power effect? Regardless of the attack's results, unless it contributed to the success of the campaign it was not the most efficient and effective use of fires. The mission of interdiction does not exist to provide the Air Force with an organizational purpose for being. Rather, the Air Force is designed and resourced to provide the operational firepower necessary for theater operations.

The true meaning of joint and combined operations is that the ability and responsibility for the generation of maximum combat power is shared among the services and countries involved. All services need to be capable of what could be termed the operational FSCoord responsibilities. All need to understand the implications of the combat power model as it applies to the other services and their weapon systems.

The parochial barriers to integration are formidable. "Use of the term service component, such as U.S. Air Force component, does not consider those military situations when a member of another service, other than USAF, has operational control of air assets. The issue is more than one of terminology. It is one of doctrine." (86) Services feel a moral responsibility to protect their men and machines. However, instead of ensuring that all operational commanders are capable of properly employing sister service assets, and by refusing to submit to carte blanche disqualification, we have put doctrinal and bureaucratic barriers in place to limit the control of other service assets.

We need operational FSCoord thinking to break the logjam. To get it we need joint doctrine and schooling.

"The merging of air, land and sea combat power will likely continue down to the lowest tactical levels. Just as there is no air, land, and sea war, we have passed the point where it makes sense to develop separate air, land and sea campaigns. Perhaps we should begin planning for the day when divisions, wings, and fleets no longer exist but are replaced by all-service (joint would be an inadequate description) formations." (87) In combat power generation the proper relationship of the elements appears to be that military leaders ensure combat assets are protected while they maneuver into a position of relational superiority to the enemy. Simultaneously, the destructive force, the firepower, is employed against the enemy. In the design and conduct of campaigns, leaders perform this function with theater resources to achieve operational level results leading to strategic aims. Operational fires are the firepower contributor to this result.

APPENDIX A: Selected Operations of the Great Patriotic War (88)

Belorussian Operation 23 June - 29 August 1944 The grouping of artillery was not uniform; it varied with the opposition expected, the terrain ahead and the ability of the Soviets to deploy artillery into the area and supply it. (Note: Sounds like METT-T on an operational scale.) A new type of fire was used; the double barrage. In the accompaniment phase, as the troops pushed on into the enemy depth, barrage fire was used to protect the penetration corridors against counter-attacks. In order to guarantee co-operation between artillery and the other arms as they pushed through the deep defence, commanders, at all levels were briefed together. There was also close co-operation with the air forces who were (and are) regarded as long range artillery.

Yassy Kishinev Operation 20 - 29 August 1944 Showed a lot of denuding other areas to mass artillery and use of deception to position it. At 0800 hours fighter-bombers began their attack and over 6200 guns and 460 rocket launchers opened fire. By the end of the day 37 and 46 Armies had penetrated 11 to 12 kilometers and, in a Russian General's words, favorable conditions had been created for the insertion of the Front's mobile formation 4 Guards Mechanized Corps. The defence crumbled rapidly and it became obvious that an encirclement was in the offing. The operation culminated with the encirclement and destruction of the German 6th Army and the fracture of the German-Rumanian alliance.

Vistula-Oder Offensive 12 January - 3 February 1945 The density of artillery on key sectors exceeded that in any other operation, except Kiev in 1943. On 3 Guards Army's sector of 1 Belorussian Front there were 350 pieces per kilometer of Front (that is one every three meters; literally wheel to wheel). 1 Belorussian's offensive began after a twenty-five minute fire preparation. During this period alone the Front's artillery fired 315,000 projectiles weighing nearly 3500 tons.

APPENDIX B: Recent Exercise Observations (89)

In a recent exercise, students at the School of Advanced Military Studies (SAMS), conducted an exercise involving the formation, deployment, and employment of a joint task force in a Southwest Asia contingency. After the exercise students had the following observations concerning operational fires:

- the JTF never thought about using the TOMAHAWK missile system (a ship-to-surface naval missile).
- without a joint concept, each service has developed its own on how to employ aerial firepower.
- when trying to integrate and maximize operational fire, someone has to determine when one mission is over and when assets can be transferred to another mission.
- the current service component unique C3I systems constrain the use of operational fires.
- operational fires can be accomplished by a) giving a specific force a mission, b) assigning specific targets to operational fire assets, or c) emplacing geographic boundaries to deconflict operational fire systems.

All the comments underscore the point that the integrated use of operational fires is currently precluded by parochial and narrow views of how such systems should be employed.

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