STRATEGY RESEARCH PROJECT

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JOINT HIGH-TECH BATTLESPACE

BY

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ABSTRACT

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The twenty-first century will be the American century. Historical events tend to run in cycles of action and reaction, thesis and antithesis, yin and yang. Land warfare in the 21st century will be shaped by the cumulative and synergic effects of many revolutionary changes that have yet to emerge in a clear or predictable pattern, which will belong to America's Army After Next and its allies. This paper is about tomorrow and beyond tomorrow's warfare and the ways in which "Battlespace" will become the cornerstone of the near future military operations. Why "Battlespace"? "Battlespace" is an alluring term, at once both tangible and amorphous. In short, it conjures an image of fighting in exotic dimensions. The purpose of this paper is to analyze that concept, to provide some insights into the possible course of future warfare and to suggest how American and allied forces will fight.

High technology redefines both thought and daily life. It also redefines war.

High technology within Battlespace (understood like maximum intelligence, fire and maneuver capabilities, applied by both, friendly and enemy forces, in order to dominate the five spectrum areas-air, land, sea, space and electromagnetic field) demands Jointness.

Together these three elements create the " Joint High-Tech Battlespace", a new doctrinal concept that will complete and up-date the former "AirLand Battlefield"act at this point.

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JOINT HIGH-TECH BATTLESPACE TITLE

Three simultaneous revolutions have pushed us toward change. The first is the revolution in world affairs, the second is a revolution that projected us into the dawn of the Information Age, and third, a related revolution, is the revolution in military affairs.

According to the Dominant Battlespace Knowledge concept there are three requirements that are emerging from these revolutions, all unified under the theory of "System of Systems"[1]. This new system-of-systems capability is at the heart of the Revolution in Military Affairs (RMA).

- The first requirement is intelligence, surveillance, and reconnaissance (ISR). It involves sensor and reporting technologies associated with intelligence collection, surveillance, and reconnaissance of the enemy, as well as the means by which it is possible to keep track of what our own forces are doing.
- The second is command, control, communications, computer applications, and intelligence processing-advanced (C4I). These are the technologies and techniques by which we translate the awareness of what is occurring in a broad geographical area into an understanding of what is taking place there, and "translate" it into target identification, mission assignment, and force allocation. Here the information becomes knowledge.
- Third, is precision force that encompasses speed, accuracy, and precision in the use of force, an area in which knowledge leads to decisive action.

System of Systems is the core of "War beyond tomorrow", the cornerstone of the concept of "Joint High-Tech Battlespace" and the confirmation of what General William C. Westmoreland envisioned thirty years ago:

> "On the battlefield of the future enemy forces will be located, tracked and targeted almost instantaneously through the use of data-links, computer-assisted intelligence evaluation and automated fire control. With first-round kill probabilities approaching certainty, and with surveillance devices that can continuously track the enemy, the need for large forces to fix the opposition physically will be less important...I see battlefields that are under 24-hour real or near- real-time surveillance of all types. I see battlefields on which we can destroy anything we locate through instant communications and almost instantaneous application of highly lethal firepower."(Speech to AUSA, 14 October 1969)[2]

The transition to a new doctrine and type of forces is inevitable, but the speed at which it is completed depends on defense planning and programming decisions over the next decade. RMA is a bold vision and a controversial one, the challenge for which is heightened by the limited amount of time estimated to carry it out. That is no more than the time-point envisioned

for a future major conflict between two almost equal competitors, which is unlikely to occur anytime before 2010 or 2015[3].

On average, two decades will be necessary to achieve the goals of RMA. Until then we have to take into consideration a transition period, defined by "Tomorrow's war."

TOMORROW'S WAR

The current forces' training and organization continue to reflect the distinguishing features of the industrial age that emerged from World War II and post-war conflicts-mass mobilization and firepower with embedded recon/strike/surveillance elements that emerged through information technology.

In the twentieth century military planners came up with five different levels of war or military involvement[4]:

- Total war, a conflict in which all of the resources of the nation and its citizens are mobilized to defend against a threat perceived to jeopardize the very existence of the home country (here it includes also, the "strategic nuclear exchange").
- Unrestricted conventional war, which involves a massive use of conventional arms, also called "major theater war" or a "major regional conflict".
- Limited war or "contingency operation" which involves the use of a substantial military force brought to bear on a local crisis area to safeguard national interests.
- Low-intensity conflict, which take place in a vast gray area between peace and overt warfare.
- Operations other than war, expresses another category of military involvement, with a very complex area of issues.

Tomorrow's war will not dramatically change the way to wage the conflict, however the ends, ways and means will change to suit changing national interests and match different enemies. It is in preparing to change the way of waging war that we must take advantage of great technological innovations, which will change the nature of war itself.

In at least one decade the way to wage war will be directed by a new scheme: major air-war campaign followed by a ground-war offensive.

As a result, military forces must continue to be sufficiently large to deal with mass strike and decisive maneuvers. For several more years, each of the military services will provide the channels, organizations, and procedures for supporting it's own forces. Then the synergy of common action will be realized via the implementation of the Joint Task Force concept, developed in a combined framework.

Force XXI will configure the vision and implications for how the Army should organize to fight in the near future. These implications point to future organizations and doctrine for combat that can capitalize either on the last level of Industrial Age technologies or the beginnings of Information Age technologies in order to confer greater warfighting capabilities of more firepower and maneuverability. The importance of armed and manned reconnaissance along with unmanned surveillance assets will be strongly emphasized. The capabilities of deep strike weapons, and more survivable and mobile armored vehicles will increase considerably, and combat capabilities will be multiplied in arithmetical progression.

Unity of effort among all arms and services will be emphasized in the creation of organizations that can support, integrate, and benefit from multiservice C4ISR[5].

Forms of Maneuver will be the same, frontal attack, envelopment, penetration, turning movement and infiltration. These will assure the end state, under updated AirLand Battlefield and FOFA concepts.

In both high-intensity combat environments and Operations Other Than War, the close combat and precision engagement weapons systems employed by the U.S. Army have proven vastly superior to those of real and potential enemies. This advantage is enhanced by the Dominant Battlespace Knowledge capabilities provided by intelligence and C2 architectures, and results in a degree of superiority known as "Overmatch".

Several key systems contribute to Overmatch Capabilities. Major existing combat systems include the Abrams tank, Bradley Fighting Vehicle, Longbow Apache and Black Hawk helicopters, the Multiple Launch Rocket System (MLRS) and the Patriot air defense system plus developing systems like Highly Mobile Artillery Rocket System (HIMARS), Hornet, Land Warrior, and others. Supporting systems include precision engagement weapons such as Javelin and the Brilliant Anti-Tank (BAT) and Sense and Destroy Armor (SADARM) munitions. The U.S. Army is seeking to maintain its overmatch capabilities by funding improvements to its current fleet of tanks, armored vehicles, and helicopters, ready to fight and win Tomorrow's War, but remains unfit for the War Beyond Tomorrow.

WAR BEYOND TOMORROW

The war beyond tomorrow will be based on "Synergism of System of Systems"(S3). S3 will incorporate DBK (Dominant Battlespace Knowledge) and DBM (Dominant Battlespace Maneuver), emerging from the near-real time linkage between ISR2 (Information, Surveillance, Reconnaissance and Robotics), C4I2 (Command, Control, Communications, Computer

applications, Intelligence processing and Intangible Intelligence) and PGMF (Precise Guided Munitions and Forces).

DBK

When we discuss DBK we must pay attention to the ISR2 and C4I2.

The concept of DBK is based on a logical and cognitive hierarchy as follows: new broad intelligent agents permit large volumes of data to be collected; data correlated becomes information; information converted into situational awareness becomes knowledge; knowledge used to predict the consequences of actions leads to the "lifting the fog of the war", and thus mastery of the unfolding progression of decisions and actions.

> According to Jeffrey Cooper, DBK "allows commanders to develop an adaptive intent to unify the activities in the battlespace and let them execute simultaneous high-tempo integrated operations against the enemy's military power and will...commanders can transcend the classic problems of coping with uncertainty"[6].

If DBK is to be truly dominant, it must entail a real-time synoptic vision defined by the relationships among the strategic, operational, and tactical levels of war.

Synoptic will be defined not so much by sensors as by the commander's ability to integrate wide area information and comprehend it and by the extended planning horizon.

DBK is the key to achieving nonlinear combat results because it allows the application of force from multiple media at the right place and time. It supports both cycle-time and phase-control dominance so that agile and adaptive units (Precise Forces) can engage and defeat larger forces in rapid succession. As a consequence even tactical units can initiate operationally decisive results.

In order to understand Dominant Battlespace Maneuver, we need to understand the role of PGMF, from ballistics to brilliance and from battlefield forces to battlespace forces.

SENILITY AND NOVELTY, FROM BALLISTICS TO BRILLIANCE

The 20th century represented the apex of ballistic weaponry. "Masses of ballistics weapons mounted on masses of hydrocarbon-powered chassis, battled one another" noted George Friedman in his book The Future of War"[7].

At the heart of this ballistic age was the projectile-firing tube-the gun. The gun had many virtues, but the greatest of these was its ability to kill at greater distances. The gun also had a great defect-inaccuracy. The solution to this problem was the massed armies of the twentieth century.

Toward the end of the century the gun mounted on a weapons platform encountered a new species of weapon- smart munitions, a weapon that will fundamentally change the military culture and which prefigures a new way of waging war.

The gun dehumanized war because of its range and its inherent inaccuracy. Smart munitions, to some degree, rehumanized the fight, by consistently avoiding the collateral damage.

The inherent limits of modern combat-cost, logistical difficulties, the challenge of force projection, the "casualties syndrome"-will reveal themselves openly only when a more advanced form of warfare is encountered.

A revolutionary weapon type does not, when first introduced, need to have a decisive or even significant effect in battle[8]. Nevertheless, Desert Storm will be remembered less for its strategic significance than as the first war in which precision-guided munitions opened the dawn of a new form of war.

If we take the tank and its future into account, obviously we can see that it has reached the stage where exotic ceramic laminates covered by exploding appliques are facing shaping plasma jets and depleted-uranium rounds. Yet despite all the improvements the tank still retains roughly the same probability of lethality and vulnerability as it had before. Despite the idea of tomorrow's hypertank, an all-electric tank, equipped with revolutionary hypervelocity hyper kinetic weapon systems as the main armament and laser weapons as secondary weapons systems[9], the 20th century tank will not survive into the second half of the 21st century, because it will have a weapon too costly to risk and not deadly enough to accomplish its mission. Most probably it will be replaced by a near stealthy, stand- off, highly mobile, all-terrain light PGM delivery platform. The "armored forces killer" will definitely be a large function of PGM, delivered from varying platforms.

The advent of highly maneuverable and intelligent delivery systems will be dramatically improved by the ability of the main projectile to dispense intelligent submunitions- armed with their own sensors, computers and means of maneuvering. In this way, each projectile is able to attack anywhere from several to hundred or more targets rapidly and from great distances.

> "Eventually it will no longer be necessary to combine the weapons platform and the fire-control system, because the ability to see will be separate from the ability to shoot and practically different as well...As new technologies mature, it will make little sense to put these functions together in one slow vehicle and then drive with in a few miles of the enemy."
>
> —George and Meredith Friedman, The Future of War [10]

CENTER OF GRAVITY, CYBER-SPACE

It is well known that victory depends on being able to paralyze the enemy's power source, the capability that makes his warfighting possible.

From this perspective the Desert Storm war can be considered the first time in history when the center of gravity of a military operation was located outside the earth's atmosphere. For the United States space wasn't only about reconnaissance, it was about communication as well. If the Iraqis could have destroyed that system, most of the allied advantage would have dissipated.

> According to George Friedman, "control of space will mean the ability to command and control the complex systems that allow space-based fleet to see, to shoot, and to communicate"[11].

The ability to use weapons to attack and defend in space will increase dramatically. It is the rapidity and precision of space-based systems that will transform war. And it is no coincidence that at the very moment that space is emerging as the center of gravity of modern warfare, both land and sea combat will face important crises

The capability of conventional weapons platforms, such as tanks or aircraft carriers, to survive in a world of precision-guided munitions is relative. A new revolution will make space the domain of military power that threatens to undermine the foundation of modern warfare-the hydrocarbon-driven, gunned weapon platform. Instead of those the space-based command platform will become the operational center of gravity of future warfare.

BATTLESPACE FORCES

It is a true that the nature of the task to be performed is not only determinant of the amount of information and self-contained capabilities required for its performance; equally important is the structure of the organization itself

The issue it is to design a certain kind of combat organization in order to exploit information age technology more effectively to maximize combat power within a broader, joint military framework.

Jointness, in a classical approach, employs units from several services, but separates them in time and space, which reduces mutual interference, and allows each force to operate tactically by itself. In this manner it is more "additive" than "synergetic". And the Dominant Battlespace Knowledge's approach underlined that:

> "Synergy comes from focusing on a common tactical objective, employing common doctrine, synchronizing the tactical echelons, and providing mutual support"[12].

Despite the fact that service tradition and doctrines have proven effectiveness, this structure causes stagnation, protects the status quo, and impedes dynamic adaptation. For instance joint-command C4I is culturally and technically extremely difficult.

Culturally, this implies a more distributed command structure within Service units and much more cross-Service integration, dependence, and trust, all requiring revolutionary organizational and command responsibility changes.

Technically, most of the Services' systems have evolved independently in both hardware and software, and are integral only with efforts which can exceed the value of the systems.

Each service must develop an interlinked ISR System, Joint C4I2 Grid, Stand-off Weapons System and Close-in Maneuvers Group

Because ISR and Stand-off Weapons Systems are almost well-known, some highlights about Joint C4I2 and Close-in Maneuver Group are necessary.

> Joint C4I2 is the materialization of the idea underlined by Douglas A.Macgregor "If the need for joint and integrated C4I can be seen as an effort to exploit existing capabilities across service lines in new ways, the best approach is to provide an...organization at every level of command that can serve as a joint "clearinghouse" for information process to which all services are connected.....this organization is called the C4I battalion"[13].

> Close-in Maneuver Group is related with what MG Robert H. Scales, JR. evidenced " No amount of precision weaponry will be able to destroy robust formations divided into small increments spread over vast distances.....the enemy can be collapsed by interposing forces between and among his widely scattered formations.....a highly mobile and sophisticated ground maneuver force, capable of operating in small units.....will deny the enemy refuge and source of sustenance"[14].

Nevertheless Service roles and systems, in the perspective of Vision 2020, have to be adaptable to virtual coordination and almost continual renewal, as threats evolve and the experience grows, even in real time.

Beyond joint operations, it will be necessary to decentralize command and operations among forces, and to integrate diverse systems. This is possible to only a limited extent with traditional military roles and legacy systems. The goal must be truly integrated, unified forces and systems, and the capability to coopt non-military resources[15].

The Joint Forces (configured most probable as Joint Airspace Force(JAF), Joint High-Mobile Ground Force(JHMGF) and Joint Expeditionary Navy Force(JENF),will be designed "to accommodate land, sea, and air/space military operations and will have dual or multiple operational capabilities, e.g., air or space and land or sea, and will be rapidly deployable from regional centers located away from dense populations"[16]

These will essentially be high-tech, equipped with high-tech throwaway (biodegradable) combat weapons, communications, and transport systems, many of which are robotic. Resupply is mostly by air and space logistics units.

The Army in the 2020's environment will be organized as the arm of the Joint Forces for land warfare and will be comprised of small, self contained, highly mobile, light/medium readily deployed fighting units.

It is likely that future defense forces will be assembled in real time around specific threats, with command structures that are more ad hoc, autonomous, and networked. This form of organization, rapidly formed and reformed, is common in business today, but is antithetical to military hierarchy and military information rigidity. Those who won't understand adopting new structures, methods and technologies will fail.

On the other hand, a highly integrated and networked force can be vulnerable to a breach of critical systems, disinformed command, electronic failure, information overload, sensor blindness or deception, destruction of critical nodes, infrastructure attack or failure, and many other nontraditional failure modes.

BATTLESPACE LINES OF OPERATIONS

Due to increasing visibility, many differences between being on the offensive and being on the defensive will be altered. Traditionally, the offense could better concentrate firepower at a time and place of its own choosing. Visibility plus standoff systems nullify that capability.

Force concentration is no longer a prerequisite to fire concentration.

Military-technical developments point toward an increase in the depth, breadth, and height of the theater. The extension of the theater with fewer soldiers in it is an evolutionary trend in the conduct of war.

The continuing ability to target the enemy, combined with rapid information processing and distribution, smart systems, and smart and brilliant munitions, will accelerate this phenomenon of vacuum. As armies seek to survive, formations will be more dispersed, contributing to the "empty battlespace"

Commanders will seek to avoid linear actions, close-in-combat, stable fronts, and long operational pauses.

On the other hand, military operations, in general, will gravitate to high-density natural and artificial environments and will be a constant search for cover and thus will favor forests, mountains, and cities.

The form and structure of military campaigns will be transformed. Instead of a chain of sequentially phased operations, High-Tech Forces will possess the capability to achieve multiple operational objectives nearly simultaneously.

This simultaneity, coupled with the influence of near-real-time military and public communications, will compress the traditional division between strategic, operational, and tactical levels of war.

Zones and Lines of Operations, superbly defined by Jomini in his book "Art of War" will have other connotations.

For instance, interior and exterior lines of operations will be "undermined" by effects' stage, e.g., ISR/TA, air defense suppression, standoff strikes, C2 warfare, and so on.

Strategic, Decisive and Objective Points will loose their purely physical meaning, and will be more appropriate to Clausewitz's definition of the Center of Gravity.

The ability to complement precision fires with precision maneuver offers two essential advantages for future warfare. First is the capability to array forces across a broad area, and second is the retention of the ability to employ them quickly at the point where the enemy is most vulnerable, without complicated and vulnerable maneuvers.

The main idea is to concentrate effects, not troops.

A balanced method of war that includes both of the timeless dimensions of fire and maneuver in order to achieve desired effects will dramatically disrupt the enemy's will and determination to fight.

JOINT HIGH-TECH BATTLESPACE CONCEPT

Battlespace is a term that connotes both physical and intellectual.

Physically, the battlespace is the environment where combat is waged. The environment has multiple terrain, dimensions, measurements and fuzzy bounds. The terrain is simply land, sea, air or outerspace-the medium of the physical combat. The dimensions are the space, time and electromagnetic spectrum by which the terrain is defined and in which forces exist. The measurements of those dimensions are concrete: distance, time and frequency.

In short words, battlespace is that volume determined by the maximum capabilities of a unit to acquire and engage the enemy.

Intellectually, the battlespace is the commander's image, providing a working framework for his effort to dominate an adversary in that multidimensional terrain. That image consists of three spatial planes-breadth, height, and depth, with time and electromagnetic spectrum as a natural and artificial dimension.

Inherently involved with time, terrain, and space itself Joint High-Tech Battlespace concept is an intuitive tool by which the commander and his staff can construct the campaign plan. It facilitates the type of innovative approach to warfighting required of leaders in future battles. Its characteristics are as follows:

- Involves the ability to visualize the area of operations and the way that forces interact, be it in combat or in humanitarian relief missions;
- The special expansion of the future joint battlespace will result in service-specific functions intersecting and overlapping, which will contribute to the diminishment and even the disappearance of their independent roles;
- This conceptual construct of battlespace will give future joint commanders a coherent vision of a fully integrated, full-dimensional battlespace and will permit simultaneous engagement of targets by a greater variety of joint warfighting systems;
- In terms of visualizing an area of operations and how forces or other elements interact, battlespace has equal utility in OOTW;
- Battlespace domination will be judged by the ability to be more lethal and survivable and operate at a tempo greater than the enemy, in both symmetric and asymmetric operations;
- The size, shape, and density of unit's battlespace are variable and influenced by mission, enemy, troops, terrain, and time available, however....
- The trend in combat is toward fewer soldiers in a given battlespace; the trend in OOTW is to be manpower-intensive.

The components of Joint High-Tech battlespace are: Standoff Warfare; Depth Simultaneous and Interposing Attack; Close-in Check Combat.

STANDOFF WARFARE

According to Martin Libicki, "conventional warfare will change from force on force to hide-and seek", because "the physical battlespace will become illuminated better than ever" and "the development and refinement of precision-guided munitions (PGMs)" will allow " to hit anything that can be located"[17].

First, the extent to which operations from standoff distance can substitute for close-in warfare depends on whether long-range strike can be substituted for direct fire weapons.

Second, the superior efficacy of standoff strike depends how fast and cheaply things can be struck from a distance.

Third, targets that can be inferred but not pinpointed, may still need to be attacked with dumb rounds.

Standoff warfare is focused not on controlling territory but on destroying adversaries' centers of gravity through a cycle of 4S (scan, sort, sift, and strike), conducted from long and medium ranges, with little trace.

Long-range battle will become the dominant and independent form of combat in future war. Forces will employ electronic warfare, fixed and rotary wing aviation, long-range artillery, and cruise/ballistic missiles, to engage the enemy throughout the area of their deployment very quickly after their location is fixed by air and space-based reconnaissance assets[18].

Key to this strategy is the need to engage enemy units as quickly as possible, before they can secure initial objectives, blend into the ground, or dig in. The threat of effective rapid response could frustrate and thus deter a conventional snatch-and-grab invasion.

Maneuver has advantages: moving forces are more difficult to hit than immobile forces, can occupy superior firing positions, and by showing up where least expected, can disorient opponents and fragment their plans. But these advantages don't persist against standoff strikes, because:

- Movement generates a larger signature than sitting still, and few moving platform can outrun precision weaponry;
- Range may cease to be a reason to move. A mesh of sensors controlled from afar may provide sufficient information, and medium-range PGM's (20 to 200 kilometers) may prove cost-effective ways for engaging most ground targets;
- There is a big difference between spotting enemy concentrations and knowing the precise latitude and longitude of each platform. Information can relayed to PGM's near and far.

For both sides, survival depends on knowing exactly what the other side sees and what is unseen and thus might get through.

Most successful engagements would then arise from occasional but fatal mistakes that revealed live targets[19].

Standoff warfare should be seen as a way to limit exposure of shooters to conventional weapons and reduce their vulnerability to WMD, but it does not obviate the need to operate near the theater of conflict, and if it is necessary, in it.

DEPTH, SIMULTANEOUS AND INTERPOSING ATTACK

The domination of extended battlespace will require agile and robust deep and simultaneous attack capabilities.

Advances in this dynamic may drive a reassessment of the traditional relationship between fire and maneuver.

The means for depth and simultaneous attack vary. These means include joint naval, air, ground maneuver units, joint precision fires, and information operations. The goal of these key future operations is to overload the enemy's ability to cope by overwhelming him with a number of actions throughout the depth of battlespace[20].

Expansion of battlespace to gain an advantage such as lethal reach over enemy forces will be essential to establishing maneuver force overmatch when maneuver alone, or disabling measures, cannot accomplish the mission.

Consistent with the idea of an increasingly empty battlespace, this expansion will be achieved through dramatic improvements in manned and unmanned target-acquisition systems and precision direct and indirect fire capabilities.

While fires are not automatically necessary to win, forces must be capable of using fires to gain the advantage. The secret of success against an enemy gone to ground will be to paralyze it with precision fire just long enough to allow an early arriving ground force to simultaneously occupy multiple points throughout the enemy's area of operations and saturate the enemy's most vital areas with small, autonomous and highly lethal, mobile combat units.

Interposing allows the forces to gain and maintain maneuver dominance, and combat units will not need to physically occupy key terrain or confront enemy strong points directly. Instead, an intervening force will occupy uncontested terrain close enough to control and thus dominate these vital centers[21].

Modern precision technology strengthens the inherent "melee" of the offensive and defensive. And a new product will be configured, an offensive-defensive stratagem, operational offensive, tactical defensive. We can call this stratagem "defoff".

"Defoff", regardless of environment, will induce massive systematic shock on an enemy. Depth, simultaneous and interposing operations will be meant to force the loss or deny the enemy any opportunity to take the initiative. Full dimensional and joint these operations will systematically attack opposing force cohesion and destroy the moral will to continue the opposition.

"Defoff" will ask for Combat–in Check, the last "momentum" which will be applied in order to capitalize the concentration of joint and combined arms effects.

CLOSE –IN CHECK COMBAT

A "siege" strategy might be sustainable if the previous two "momentum" thin opposing forces through precision attrition.

An adaptive enemy will most likely counter precision strike capability by dispersing, hiding and going to ground.

While such a posture limits his vulnerability to precision, it also makes his force extremely vulnerable for exploitation by maneuver forces capable of controlling his most vulnerable points from the ground

Partitioning a battlespace into smaller and smaller cells might permit ground forces to control successive areas by sweeping through with overwhelming force. Yet controlling each cell will require dense surveillance of interstices. A ground presence without precise ground knowledge and the ability to respond and move quickly will leave thin forces exposed, a recipe for casualties or excessive collateral damage.

The effect of high-tech system integration on the battlespace of the future will be characterized by fewer forces maneuvering very quickly and dispersing over the breadth and depth of the battlefield[22]. A cohesive body of enemy forces will be divided into isolated "pockets", each a sub-critical mass severed from its main body, unable to communicate or maintain itself for very long without resupply and unable to be reinforced.

Once the interposing force gains the advantage of position over the enemy the factor of time also shifts to his favor. The enemy cannot linger very long in a fractured state.

Close combat of this sort will be decisive to be sure, but decisive from a distance. Close combat units will maintain just enough contact to surround, contain and feel out the shape and size of each enemy formation. The object of close combat will be to find and fix the enemy without closing to within decisive distance of the enemy's weapons. Decisive range is defined as the practical limit of the enemy maneuver unit's organic weapons.

These smaller forces will possess the ability to deliver a high volume of precisely aimed and indirect fires with a high first round hit probability. As precision strikes begin to wear away the will of the enemy, close combat forces converge methodically with deliberation.

By this stage of the fight time will be in favor of these. The initiative belongs entirely to them. Surrounded, unable to mass, out of touch with adjacent units and higher authority, each discrete enemy force slowly but surely will collapse.

JHTB (Joint High-Tech Battlespace) is the core of military operations in the 21st Century. In essence, joint high-tech battlespace will change the future operations from force on force to hide-and-seek, and will achieve three distinct advantages over the enemy:

- By a variety of reconnaissance and strike means, identify, disrupt, or destroy enemy forces before they can effectively engage friendly forces;
- Reduce friendly force vulnerability by increasing the dispersion and allow to deal with "empty battlespace";
- Conduct dominant maneuver by use of both fires and rapid and deep dispersion of joint forces to sense and dominate a greater battlespace and achieve an power overwhelming effect, instead of power mass.

CONCLUSION

The future of war, especially the ability to anticipate and wage it, will be shaped and influenced by how we assess and adopt the technology in the Information Age.

> "Knowledge, in short now the central resource of destructivity, just as it is the central resource of productivity", said Toffler in his book, War and Anti-War.

Information age forces will be able to locate enemy centers of gravity, especially his forces, C2 and logistics, quickly and precisely, no matter whether those enemies are agrarian war lords, industrial armies, or an information age peer.

The nature of the war will consist of fear, fog, danger, uncertainty, deception and friction. Dominant Battlespace Knowledge will diminish these conditions, to a degree.

In other words, taking advantage of the "fatal visibility" created on the battlespace, future joint commanders will shape it.

When coupled with the ability to conduct continuos, uncontingenous and simultaneous operations information age joint forces will observe, decide, and act faster, more correctly and more precisely than their enemy[23].

All these things require a realistic doctrine for winning the wars in 21st Century, based on Information Age prospective.

Word Count = 5425

ENDNOTES

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