

**A Paradigm for Integrated Warfighting:  
Kinetic and Non-kinetic Solutions**

**Information Superiority/Information Operations**

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# Report Documentation Page

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## **Abstract**

Starting in 1994, the USAF was faced with two problems resulting from the Gulf War and subsequent analysis. First, the development of an integrated training program that provided training support to the entire Joint Forces Air Component Commander (JFACC) Team, ranging for the supporting command and control system of systems to the JFACC himself. The second challenge lay in how the developing arguments concerning the possible Revolution in Military Affairs (RMA) could be incorporated in tactical, theater, and strategic planning and execution.

The USAF Air Combat Command (ACC) initiated a JFACC Team training program. The center of training is the Air Force Command and Control Training and Innovation Group (AFC2TIG) at Hurlburt Field, Florida. USAF has built a substantive program around the BLUE FLAG exercise and a series of training courses; audiences ranging from airman to general officer.

This paper will review the training concept and focus on how Information Warfare/ Information Operations has been integrated into the training and exercise environment to include the general approach to integration of kinetic and non-kinetic solutions to targeting in support of theater goals and objectives. In general, this involves the use of the RAND strategies to task methodology and effects based targeting.

## Introduction

From the beginning of the Gulf War, coalition strategic posturing impressed the Soviets. Initially, many Soviet officers thought the coalition mission was impossible, given the multiethnic makeup of the forces and the distances involved. As the war went on, however, this opinion changed. The Soviets cited coalition preparation and cooperation of the forces as crucial to the victory. Further, examination of the coalition heightened their awareness of a professional force. The Soviets saw that coalition professionals performed much better than Iraq's conscript force. Many General Staff officers unanimously concluded that people controlling the technology decided a war's outcome more than the technology itself. Gen. N. Kutsenko of the General Staff expressed this sentiment best in his assessment that "more depends on the professional training of the people servicing the equipment than its quality; it is of decisive significance."<sup>1</sup>

In the midst of a continuing love affair with technology, most recently exemplified by the worldwide data automation explosion in the 1980s and 1990s, the United States Air Force faced the basic conclusion that people start wars, fight wars, and determine when and under what conditions wars end. Therefore, as the Soviets observed, training becomes essential. Review of USAF performance during the Gulf War resulted in establishing a requirement for formal training at the operational level of warfare. This requirement was articulated as the interactions of people, process, and technology; in that order of importance. Concurrent with the emphasis on operational warfighting and the revolution in information technology, the USAF had to adjust to the battlefield imperative of gaining and maintaining information dominance.

## The Holy Trinity: People, Process, and Technology

While data and data creating systems proliferate as a natural extension of the explosion in information technology, the ability of commanders to create enabling C2 architectures that provide decision quality information has not kept pace. Commanders must be able to articulate their needs in such a manner that data is filtered to support decisions. Commanders are more interested in discovering trends than a series of specific data points; looking for patterns that will characterize the battle rhythm and aid in decision making.

The USAF was also coming face to face with what the private sector discovered with personal computers in the 1980s: the productivity paradox. Postulated increases in efficiency of information workers were supposed to justify the capital expenditures in data automation equipment. But, productivity increases were marginal in most cases. Further investigation determined that simply dropping a personal computer on someone's desk was not a universal solution.<sup>2</sup> The most effective use of the new technology occurred when business processes, to include networking workers, were reexamined and reengineered

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<sup>1</sup> Edward J. Felker, "Soviet Military doctrine and Air Theory: Change through the Light of a Storm," in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, AL: Air University Press, 1997), pp 505-506.

<sup>2</sup> Explaining the Productivity Paradox, The New Economic Index, [www.neweconomyindex.org/productivity.html](http://www.neweconomyindex.org/productivity.html).

The issue in the post Gulf War analysis was how to address training for USAF personnel at the Operational Level of warfare, so they could understand existing processes as well as create new ones. The technology represents only the tools that enable the people and processes.

### ***People***

In 1994, at the direction of the Air Combat Command Deputy Commander for Operations, his staff started to identify who was involved in the area of theater command and control; who was the audience for training, and what was the size of this audience. Initial investigation revealed twenty-nine organizations calling themselves Air Operations Centers (AOC), the new name for the Tactical Air Control Center from which the Gulf War had been directed. The personnel numbered in the thousands and included all services. What was most disturbing about this population, once it was identified through a series of conferences at Headquarters ACC, was the lack of coherent formal training available to its members. In some cases limited training was available, for example Contingency Theater Automated Planning System (CTAPS) system administrator training, but graduates were not tracked in any service personnel system.

### ***Process***

The process problem actually started with vocabulary. There was no directive doctrine that established a common language for developing and executing an aerospace plan. While all agreed on a product, an Air Tasking Order (ATO), one numbered air force in the USAF might describe the process of strategy development with a totally different lexicon than another, even though the process was the same. This problem multiplied, as organizations outside the USAF with potential JFACC responsibilities, carrier battle groups or NATO CAOCs were included. The best way to attack the standardization was through a robust training program. This training program was sponsored by the USAF but coordinated with the other services and offered to coalition partners. Every effort was made to create a curriculum linked to existing joint doctrine publications referencing a common ground for a basic understanding of aerospace planning and execution processes. Joint sponsorship was integral from the beginning of the program as a response to a post Gulf War JCS J6 tasking to the USAF to address ATO interoperability issues and ensure the requirement to fly the ATO out to waiting aircraft carriers was not repeated.

### ***Technology***

Part of the answer to the ATO interoperability problem was technology driven. But, in implementing the solution, it was important to avoid the technology trap; that some technological silver bullet would solve all problems. Without trained personnel who have an understanding of the necessary processes, the technology is irrelevant. Other problems associated with technology related to the inability of operators to articulate what tools they need with sufficient depth, breadth, and vision so as to provide the developers of the technology with adequate guidance. As a result, tools in the pipeline were either late to need or woefully behind the relentless pressure of Moore's Law. Finally, a legacy of the Cold War culture of secrecy and independent development focused on the specter of global thermonuclear warfare was a myriad of

applications and systems with little or no relationship; whether human interface or data base structure.

## Effects Based Operations

War colleges teach two principal forms of warfare – attrition and annihilation. The Gulf War demonstrated another – control, through the application of parallel war. The strategies of annihilation and attrition rely on sequential, individual target destruction as the ultimate method of success and measure of progress – generally measured in terms of forces applied or input. Using effects-based operations, the determinant of success is effective control of systems that the enemy relies upon to exert influence – output.<sup>3</sup>

Whether we subscribe to General Deptula’s paradigm, the RAND strategies-to-task, or both we must agree that we are applying air and space power to affect some change, some end. In a classic sense the military objective continues to be the support of civilian goals in the attempt to get the other fellow to do what we want him to do whether or not he wants to or even realizes he is doing it. Some structure must exist for the rational explanation of the expenditure of blood and treasure in order to sustain operations within the constraints imposed by a democratic society; we need only turn to Vietnam and Somalia for examples of failure in this area. With this broader context of force in mind, the ability to deliver food becomes as imperative as the pinpoint accuracy of a bomb or the interruption in the flow of electrons.

In his Concept of Operations for Effects-based Operations, Dr. Maris McCrab relates the traditional Targets-based approach to the Objectives-based approach, strategies-to-task, to Effects-based approach. He asserts that these approaches form a hierarchy that takes us from the desired effects to specific objectives to specific targets.<sup>4</sup>

A key component of effects-based Operations is the ability to perform combat assessment; the theater level assessment of effectiveness. The more familiar battle damage assessment (BDA) is a component of combat assessment. Combat assessment provides feedback into the effects-based/strategies-to-task methodology and relates what is occurring within the battlespace to the intentions of the civilian leadership. The ability to relate missions to desired outcomes at the tactical, operational, and strategic levels provides on-going understanding and focus. Inferred in the assessment is the ability to command and control Intelligence, Surveillance, and Reconnaissance (ISR) assets to gather timely data on targets, systems, and systems of systems within the battlespace.

There is a second issue inherent in the integration of ISR systems and the information technology explosion. This issue has been termed Predictive Battlespace Awareness. In his paper, Distributed Collaborative Environments for Predictive Battlespace Awareness, Mr. William K. McQuay of the Air Force Research Laboratory examines the use of collaborative decision support tools to provide a network of support creating an environment where planners

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<sup>3</sup> David S. Deptula, *Effects-Based Operations: Changes in the Nature of Warfare* (Arlington, VA: Aerospace Education Foundation, 2001), p. 18.

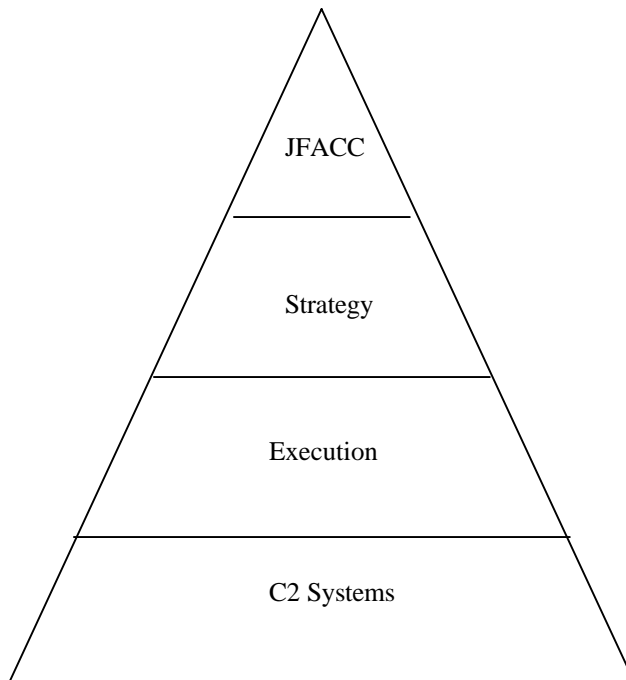
<sup>4</sup> Dr. Maris “Buster” McCrabb, *Concept of Operations for Effects-based Operations- Draft Ver. 2.0*, p. 7.

can rapidly develop alternative courses of action and evaluate them within the time limits imposed by the combat battle rhythm<sup>5</sup>.

Air Combat Command defines this process in a draft Concept of Operations:

...a continuous cycle that integrates Target Systems Analysis, Intel Preparation of the Battlespace, ISR Strategy and Planning, and ISR Employment into a coherent framework to maximize the capabilities of ISR assets in all environments and across the spectrum of separate components provides commanders the capability to quickly shift ISR assets to target those actions predictive analysis allows us to anticipate.<sup>6</sup>

Not to be confused with gazing into a crystal ball, PBA attempts to provide commanders with options and assessments based on research and updated continuously to reflect current operations. The commander never loses sight of his or her overall objectives and how well they are being achieved.



**Figure 1**

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<sup>5</sup> William K. McQuay, *Distributed Collaborative Environments for Predictive Battlespace Awareness*, Air Force Research Laboratory, Wright-Patterson AFB, Ohio, pp 1-2.

<sup>6</sup> Major Juan Berrios, HQ ACC/INXX, *Combat Air Forces Concept of Operations for Predictive Battlespace Awareness*, Draft 1 November 2001, p. 2.

## **Training**

Within the EBO construct, the Air Force Command and Control Training and Innovation Group (AFC2TIG) has been involved in an eight year odyssey searching for and implementing an effective training program. Gen. Ryan's designation of the Air Operations Center as a weapon system aided immeasurably in focusing the training discussion along the lines of a rough analogy with the levels of training required for a generic F-16 pilot.

Consider the implications of figure one. The Joint Force Air Component Commander (JFACC), sometimes expanded to a coalition role, is the focal point. The JFACC is a person and a decision maker directing the flow of the air and space war in support of the Joint Force Commander (JFC). In order to translate the JFC's direction, the JFACC relies on some key team members to formulate his concept of operations at the theater level. We can call this key group his strategy team. With strategy formulated, planning and execution staffs take over to implement the JFACC's guidance with specific missions aligned with platforms and weapons. Throughout all the associated processes runs a common theme of assessment. Without effective ISR there can be no assessment at any level, this is PBA. Finally, a C2 network of systems facilitates the direction of the campaign since a commander without control is merely part of a mob.

The USAF Command and Control Warrior School has created a family of residence courses that address the various levels presented in Figure 1 and linked them to the JFACC Course owned by Air University. Training has grown to include an Operational Command Training Program that includes both senior mentors selected by the CSAF and observer/trainers who work directly with the AOC leadership. OCTP members guide the philosophical direction of all members of the JFACC team. This building block approach leads to the BLUE FLAG exercise program of the 505 Exercise Control Squadron.

### ***Integration of Kinetic and Non-kinetic Solutions***

With acceptance of the general construct laid out in the preceding paragraphs Kinetic and Non-kinetic weapons now become tools of choice based on risk assessment and effectiveness and not a tradeoff based on black magic. In their book, Unrestricted Warfare, Qiao Liang and Wang Xiangsui, of the Peoples Liberation Army, point out the benefits of just such a methodology. It is particularly useful when facing an opponent that dominates in one or more areas of combat. A niche player can identify goals and objectives and put innovative solutions together. Thus, a target list expands from bridges and marshalling yards to financial markets and media manipulation. With a consistent framework, military leaders can now propose solutions where non-kinetic options are merely presented as another form of tool.

The USAF has adopted this approach in modifications of the BLUE FLAG exercise program and affiliated training courses at the Air Force Command and Control Training and Innovation Group (AFC2TIG). Use of kinetic and non-kinetic tools in an exercise and training environment forces the command and control students to reorient from more conventional thinking: if its on the target list, blow it up. All levels of command and staff are exposed to new options, but options that are still presented within the construct of achieving desired outcomes at the appropriate levels of warfare.



**Methodology** The levels of warfare are interrelated and missions with strategic effects can be proposed at any level of warfare. This was a difficult concept for some of the national agencies involved in non-kinetic solutions. But, by exposing various agencies to the battle rhythm during a BLUE FLAG exercise, the kinetic and non-kinetic integration became apparent and helped deconflict any number of issues identified at the national strategy level of warfare. Keeping in mind that the JFACC may propose options over which he has no direct control until the chain of command concurs with his assessment.

By way of example consider a bridge deep in the combat area running north/south over a wide and deep river. Normally bridges make great targets, they are easy to find and involve straightforward engineering principles. Targeteers can match weapons against a bridge without much difficulty. Our particular bridge is a choke point on a main line of communication for the enemy and the JFACC wants to destroy it in order to isolate portions of the enemy's forces south of the river, effectively cut them off from resupply. The Joint Force Commander has stated the desire to isolate the enemy south of the river and destroy its combat power. Our target is directly related to a desired effect. However, the bridge may be part of more than one system and this is the case here. The bridge is also part of the enemy's command and control system by virtue of the cables strung under the bridge. These cables connect a higher headquarters to a field headquarters. The field headquarters is on the south side of the river and is being electronically exploited for critical information.

With this knowledge the process teams must evaluate the bridge as a target or a series of desired mean points of impact (DMPI), each of which may create a specific effect if destroyed. Now the discussion turns to alternate ways of achieving the effect the JFC wants without curtailing his access to the electronic information provided by the field headquarters. This process may be termed Intelligence Gain Loss Assessment and is in use in some portions of the intelligence community. In short we examine the tradeoffs involved with various weapon options within the context of the enemy's systems, networks, and capabilities. As we gain sophistication in this practice we will include Gray Forces as well. Gray Forces are nominally neutral players in the conflict that may provide goods or services affecting the outcomes in the battlespace. Gray Forces enters the lexicon with Blue Forces as friendly and Red Forces as enemy.

The planning staff examines the enemy's engineering capability and determines that a large crater at the southern approach to the bridge will render it useless to the enemy without destroying the cables. With our own forces' combat engineers in place, this approach has the added benefit of keeping the main bridge structure intact so it might be exploited as part of a counter offensive that crosses the river. This is but one example of the interrelationship of kinetic and non-kinetic targeting.

By posing problems in this sort of framework during a BLUE FLAG participants are forced into a new paradigm of target evaluation that builds on the fundamentals of effects based targeting and strategy to task methodology. The next step of course is the ability to command and control ISR assets to ensure effective assessment of the combat mission regarding the bridge

and the desired outcome tied to PBA. Constant assessment at the theater level reveals whether or not the overall effects are being achieved in support of the JFC's campaign plan.

## **Conclusion**

While we wrestle with the implications of the explosion in information technology it is important to remember, very little of what we have reviewed in this paper is philosophically new. On the eve of the American entry into the Second World War, President Roosevelt requested the Navy and War Departments prepare an analysis of what it would take to defeat Nazi Germany and the Empire of Japan. Air War Plans Division-1 (AWPD-1), "Munitions Requirements of the Army Air Force," was the result. This document was created in less than two weeks, but it represented a logical assessment of the enemies as a system of systems; each system having weak points or centers of gravity, the destruction of which would contribute to ultimate defeat of the enemies<sup>7</sup>. The integration of kinetic and non-kinetic solutions merely takes the logic to a higher level, one enabled by information technology and a degree of accuracy only dreamed of by our World War II brethren.

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<sup>7</sup> Robert Frank Futrell, *Ideas, Concepts and Doctrine: Basic Thinking in the United States Air Force, 1907-1960*, Air University Press, Maxwell AFB, AL, 1989, pp. 108-110.