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This research analyzes Distributed Operations (DO) and its dependency on joint air fire support when out of range of other indirect fire assets in the 2015 timeframe. The (DO) concept for the USMC leverages the strengths of maneuver warfare through integrated networked dispersion. The emerging U.S. technologies and training will enable DO forces to counter the asymmetric adversary. The adaptability and lethality for the squad to battalion sized units will add flexibility to Combatant Commanders. Operational planners and commanders must understand the strengths and limitations of DO forces for proper employment and risk mitigation.

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NAVAL WAR COLLEGE
Newport, RI

What Does Distributed Operations Mean for Joint Air Fire Support?

By

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Major USMC

A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract

This research analyzes Distributed Operations (DO) and its dependency on joint air fire support when out of range of other indirect fire assets in the 2015 timeframe. The (DO) concept for the USMC leverages the strengths of maneuver warfare through integrated networked dispersion. The emerging U.S. technologies and training will enable DO forces to counter the asymmetric adversary. The adaptability and lethality for the squad to battalion sized units will add flexibility to Combatant Commanders. Operational planners and commanders must understand the strengths and limitations of DO forces for proper employment and risk mitigation.

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INTRODUCTION

From the emergence of the Joint Operating Concepts, services have developed concepts that will focus the acquisition, shaping, and use of future forces. The driving force on many of these concepts is the fluid, non-linear battlefield, against an adaptive low-technology enemy that is unwilling to fight the United States conventionally or symmetrically. The United States Marine Corps (USMC) has developed operational ground maneuver capabilities under the main tenet of Expeditionary Maneuver Warfare.[1] The USMC foresees the tactical and operational concept of Distributed Operations (DO) as a natural extension and refinement of these concepts and defines it as:

> an approach that is applicable at both the operational and tactical levels of war, by which a commander alternately disperses and concentrates networked forces to define and shape the battlespace.[2]

Distributed operations forces will provide the Joint Task Force Commander (CJTF) a flexible, networked, and efficient fighting force to face the challenges of 21st Century warfare. This dispersed fighting force structure is reliant upon networked squad to battalion sized units for lethality, mission accomplishment, and survival. Dispersion enables the CJTF to achieve objectives with a reduction in risk to lives, cost, and time. Consequently, DO forces may be spread over a large battlefield and operate beyond the range of organic fire support normally utilized for conventional forces.

Thesis

This paper will analyze distributed operations and show that distributed forces,

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[1] "Maneuver warfare is a warfighting philosophy that seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions which create a turbulent and rapidly deteriorating situation with which the enemy cannot cope." *Marine Corps Doctrinal Publication 1*, 73.
[2] "Distributed Operations 2006 Capabilities and Enhancements Report," Marine Corps Warfighting Laboratory, 19 Jan 2005, 10.

especially those without organic fire support, require integration of joint air fires and battle management that is netted, clearly defined, useable, and relevant for DO to work.

It is critical for the joint forces of today and tomorrow to understand not only the new paradigm for the USMC, but what impact DO will have on all services. Distributed operations forces will have both strengths and weaknesses in their networked dispersal. Being dispersed is critical to the success of DO. Dispersion, however, can be a detriment when enemy forces mass against a DO unit that is weak at the wrong place and time. A detailed understanding of this limitation underscores the requirement for more than just Air Tasking Order assignments of Joint Close Air Support missions. It requires intimate knowledge of the threat environment and joint procedures or DO forces without joint fire support are at risk and the mission could be jeopardized.

The scope of this paper will highlight joint fixed-wing air fire support enabling technology and training, operational planning, battlespace control, and terminal control considerations for distributed operations. The focus on DO to date has been with infantry unit manning, equipment, and training. This paper will focus on precision joint air fire support in the 2015 timeframe against a low-tech, highly adaptive adversary, 200 miles from a friendly support base. Contemporary analysis consists of Special Operations Forces (SOF) employment during Operation ENDURING FREEDOM (OEF) from October 2001 through March 2002 utilizing airpower almost exclusively as joint fire support.

DISTRIBUTED OPERATIONS BACKGROUND

Distributed operations are a way the USMC and other joint forces may be fighting both conventional and Range of Military Operations (ROMO) in the future. The four

critical issues for this are: the enabling technology and training, operational planning, battlespace control, and terminal control considerations of joint air fires. The Distributed Operations concept is not something completely new. Special Operations Forces and conventional units have operated with small numbers in environments populated with a high density of adversaries. Often, multiple units worked together with decentralized command and control, linked by a primitive communications system to coordinate attacks and cause confusion on multiple fronts for the enemy. Distributed operations will take this to a new level by using technology and training to link conventional squad through battalion sized forces to fight a common enemy through dispersion.

ANALYSIS

The combined air and ground team is greater than the sum of its parts. The application and benefit of having DO forces dispersed to take offensive action against the enemy will ensure efficient application of airborne firepower. Today, with the use of the Global Positioning System for aircraft and weapons, and LASER guided munitions, the surprising limitation of airpower is often times having suitable targets to strike. Integrating the fires through a network enables ground forces to detect, locate and identify targets, provide adherence to the rules of engagement (ROE), and provide collateral damage estimates (CDE) real-time. This use of aviation to complement the ground schemes of employment and maneuver will reduce the decision time and enhance situational awareness in an environment that harbors a deceptive enemy force, thus greatly enhancing the capabilities of the CJTF. Camouflage, concealment, jungle canopy, urban environments, use of dummy targets, and weather, will always hinder the self-detect and killing capability of airborne platforms. Furthermore, current operations with

GWOT (Global War on Terror), ROMO, and insurgencies, illustrates that identifying the elusive, dispersed, adaptive enemy is very difficult on the ground and often many times harder from the air.

Distributed operations air fire support can be done today. All is not lost on waiting for the complete integration and interoperability of a common command and control (C2) architecture and systems. The USMC and SOF, can conduct limited DO on clearly defined battlefields like the deep valleys of Afghanistan. Regarding the defeat of Taliban forces, Milan Vego states, "the key to success was the availability of Special Forces on the ground to identify and designate targets for the aircraft."[3] Additionally, experienced Forward Air Controller(Airborne) (FAC(A)) crews, flying two-seat USMC F/A-18D's, have successfully conducted battlefield management of multiple ground nodes in support of joint fires in environments very similar to DO concepts. These crews are the epitome of the Marine Air Ground Task Force (MAGTF). They have the focused training, exposure, experience, and situational awareness to be successful in this often very dynamic environment. The Weapons and Sensors Officer (WSO) is vital to this mission. He can devote full attention to the ground forces, supporting air forces, and provide situational awareness to all warfighters on his net. This unique capability and inherent situational awareness provides a snapshot for what evolving technology can provide to all airborne platforms. The DO utilization of air fire support is more of training and awareness than platform specifics. The example of the two-seat F/A-18D accomplishing this will be irrelevant when the Joint Strike Fighter (JSF) replaces this platform and complementing USMC WSO military occupational specialty. The training

[3] Milan Vego, "What can we learn from Enduring Freedom?," *United States Naval Institute. Proceedings* (Annapolis: Jul 2002), 29.

and focus of DO fire support will merge into the service provided by the JSF, United States Air Force (USAF) Bombers, Unmanned Aerial Vehicles (UAV) platforms, and their integrated interoperable systems.

There are existing systems that have greatly enhanced the friendly battle picture for commanders down to the lowest level capable of monitoring them. Conceptually, the future DO forces will have the technology down at the squad level to be able to monitor both friendly and enemy positions. These systems will be vital to enhance DO employment. The Force XXI Battle Command, Brigade and Below System, better known as the Blue-Force Tracker (BFT), is considered to be the best system yet fielded. It consists of vehicle mounted displays and a transponder/receiver; it sends and receives positional data to all friendly forces on the battlefield.[4] The USMC DO units are experimenting with the netted satellite communications radio (SATCOM) named the Expeditionary Tactical Communications System (ETCS).[5] This is an experimental system that provides input to the Position Location Information network which is similar to the BFT. Satellite connectivity does away with Frequency Modulation line-of-sight problems noted in urban terrain or mountainous regions such as Afghanistan. Additionally, airborne systems such as the USAF Fighter Data Link, integrates the Enhanced Position Locating Reporting System with LINK-16 to F-15E cockpits to share and display targeting data and locations of Tactical Air Control Party (TACP) teams or other friendly forces. This function minimizes fratricide and increases battlefield situational awareness for aircrew and has been very successful in the GWOT.

[4] Daniel Goure, "Standardize Blue-Force Tracking," www.DefenseNews.com, 8 Nov, 2004, 1.
[5] "Distributed Operations 2006 Capabilities and Enhancements Report," Marine Corps Warfighting Laboratory, 19 Jan 2005.

Having a digital link from the DO forces to aircraft is vital for efficiency, accuracy, and fratricide reduction on all battlefields. Laptop systems, such as the Target Location, Designation, and Handoff System, are currently fielded. These provide secure digital links, 9-line close air support (CAS) briefs, and precise targeting coordinate handoffs to USMC AV-8B and USMC/USN F/A-18C/D aircraft.[6] These transformational systems enhance the situational awareness of the Joint Terminal Air Controller (JTAC) and aircrew resulting in reduced errors, quicker response, less verbal communications, and more lethality. However, to be truly net-centric and joint/interoperable, a single system is required for all services, ground forces, aircraft, and coalition partners.

The U.S. services strive for interoperability and integration of weapons systems, command and control systems, doctrine, and battlespace management. This goal is lofty as there were over sixty joint command and control systems on the battlefields of Iraq during Operation IRAQI FREEDOM.[7] This common goal drives all emerging technology to be usable and useful to all players on a network and will provide the link for a common architecture of digital CAS, video downlinks, and communications, through a common data link. As noted earlier, separate pieces of these functions are working today, however, there is yet to be a common architecture that is interoperable across all joint air platforms currently fielded---it is needed. Common architecture, Intelligence Surveillance and Reconnaissance (ISR), and communications, would have prevented the costly events on 4 March, 2002 during Operation ANACONDA. Poor ISR and miscommunications, among other things, led to the tragic downing of three MH-47s and the loss of U.S. lives during a botched insertion and rescue of Sea, Air, or Land and

[6] The 9-Line CAS brief is the U.S. standard briefing format for providing necessary information to aircrew to put ordnance on target through external control.
[7] Goure,1.

Ranger forces.[8] With the reduction of inventory of the legacy platforms, and introduction of new platforms such as the JSF, this common architecture will be more readily feasible.

The littoral nature of the USMC forces is now able to influence the battlespace beyond normal fire support weapons. Operational Maneuver From the Sea (OMFTS) is the concept that will provide the fusion of naval and maneuver warfare across all warfare functions to quickly defeat an enemy.[9] OMFTS has led to the mobility development with the tilt-rotor MV-22 and Expeditionary Fighting Vehicle that will enable forces to attack over the horizon, or significant distances across the shore. USMC forces traditionally have depended on Naval Gun Fire (NGF), artillery, helicopters, and fixed-wing MAGTF or joint strike aircraft, for fire support. This vital support will rest solely on joint fixed-wing air fire support when out of the maximum weapons effectiveness range of the others.

Technology and training will provide the separate fighting nodes of the DO network a common reference for positional and situational awareness of both the friendly and developing enemy forces. As stated earlier, with experienced crews who have literally grown up in their careers working with ground forces, DO can be effectively performed at the basic level now. However, this is not feasible across the board for the joint and coalition air forces of the world due to systems interoperability, intensive workload to gain situational awareness, and lack of training with ground forces. General Michael W. Hagee, the 33rd Commandant of the Marine Corps, describes Distributed Operations as an "operating approach that requires new ways to educate and train our

[8] Anthony H. Cordesman, *The Lessons of Afghanistan: War fighting, Intelligence, and Force Transformation* (Washington D.C.: The CSIS Press, 2002), 64-65.
[9] *USMC Concepts + Programs 2005*, 9-10.

Marines and that guides us in the use of emerging technologies."[10] The "new ways to educate and train" will have to be applied to all elements supporting DO forces.

This paper is focused on air delivered fires for several reasons. Operations consisting of deeply inserted and widely spaced forces are most likely more difficult to support and must be addressed. Air power must be responsive to the individual infantry units or the risks may be too high for the CJTF to embark or proceed with the mission or task. Non-organic fire support assets such as Tomahawk cruise missiles, Army Tactical Missile System (ATACMS), NGF, long range-artillery, are often not the best response for many fire support situations. These weapons systems each have unique capabilities for fixed and mobile targets. However, Positive Identification (PID), collateral damage considerations, precision requirements, fleeting targets, urban and other terrain may prevent their use. Airpower provides a man in the loop who understands commander's intent. Aircrew are important by providing the critical cross-check of the selected targets to proportionality, adherence to ROE, and acknowledgement of CDE. Adversaries know the impact of collateral damage and continue to exploit the U.S. vulnerability to world opinion. Anthony Cordesman makes the following observation to this:

> Distributed terrorist networks and state-sponsored asymmetric forces can be expected to make steadily more use of civilians as shield and civilian areas as hiding places.[11]

Distributed operations forces will be in the best position to identify these strategic vulnerabilities and mitigate risks to the civilian populace. Advances in low-yield precision weapons will add further credibility and utility to joint air power. Air delivered fires offer the most flexibility to find targets, prevent unnecessary collateral damage, and readily strike moving and mobile targets.

[10] General Michael W. Hagee, "A Concept for Distributed Operations," 25 April, 2005.
[11] Cordesman, 35.

In making the following recommendations, the author of the paper makes the following assumptions: DO squad to battalion sized units are networked, utilize decentralized C2, are 200 miles away from the Expeditionary Strike Group (ESG), and entirely dependent on joint air fire support. Air Supremacy has been established. Due to the battlespace terrain, collateral damage restrictions, positive identification requirements, and restrictive rules of engagement, Tomahawk cruise missiles and the ATACMS can not be used. The elusive nature of the low-tech enemy and fleeting opportunities to attack him require responsive fires that have a man in the loop for direct control. Fixed-wing fire support available consists of the Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) and Carrier Air Wing (CVW) JSFs, land based bombers, and UAV's.

RECOMMENDATIONS

Making DO work for the assumptions presented requires recommendations addressing technology and training, operational planning, battlespace control, and terminal control considerations. Much work has been done with the Marine Corps Combat Development Command and Marine Corps Warfighting Laboratory (MCWL) on DO with regards to training, equipping, and manning fire-team, squad, and platoon-sized elements for experimentation and evaluation. The authors of DO emphasize training is more important than technology. This author believes the emphasis on either will fluctuate as the enabling technology for airborne platforms will possibly reduce some of the training required to gain and maintain situational awareness in an environment that they are not observing from the same perspective. Even though the United States had

successes in OEF, history shows that the United States does not "have a solution to the problems of dispersed warfare against an enemy that is fluid and unwilling to fight."[12]

The technological strides made by the services are well noted, however, merging them to be truly joint still presents some challenges. The DO forces that will be soon fielded as part of the MCWL experimentation will utilize the ETCS radios. This SATCOM network has limitations with most aircraft today. The legacy strike-fighter platforms do not have this capability---the current bombers, UAVs, and emerging JSF do. This future connectivity will be important for over-the-horizon communications, imagery sharing, targeting, and battlespace control. The Joint Oversight Council's decision to develop a common BFT for the Army and USMC is a step in the right direction to achieve joint interdependence for the service support of concepts such as DO.[13]

The product and feasible template of supportability for DO will have positive impacts in other joint cutting edge parallel programs. The plan for the networked dispersed forces is similar to the functional aspects of the Army's Interim Brigade Combat Teams. These teams utilize the Stryker Interim Armored Vehicles and are now commonly know as Stryker Brigade Combat Teams.[14] Although more robustly armed, the requirement to support the Stryker Brigades is similar to that of the USMC DO forces---one that would most likely require non-organic joint fires for additional fire support. The Army is heavily dependent on USAF air delivered fires to move forward with the lighter, quicker, maneuverable---yet more lightly defended force. The crux of this will come to light as the Army realizes C2 and decentralized control as the critical

[12] Ibid, 27.
[13] Goure, 2.
[14] http://www.army.mil/features/stryker/default.htm, 27 Jan 2006.

factor to validate the potential of the control of joint air fires that will be critical to the nodes of the Stryker Brigades.

The Navy is intricately weaved into the supportability of DO. The DO forces will initially be fielded from the existing MEU (SOC). These are continuously forward deployed now as part of the ESG. Navy and USMC integration is critical to OMFTS and DO. Additionally, the lack of organic fire support will be easily supplemented by strike aircraft organic to the deployed CVW embarked on the Carriers.

It is not surprising that ground commanders and forces gain situational awareness by continual presence on the battlefield. It is the same for joint air fire support. Continual presence by supporting aircraft and platforms provides a steady flow of information to maintain high situational awareness of the operating environment. This presence is not aircraft specific and can be accomplished by nearly every platform. For example, during OEF, from the start of offensive operations until 23 December, 2001 the ten B-52 and eight B-1B bombers employed sixty-five percent of bomb tonnage, and fifty percent of guided munitions.[15] These strategic bombers were primarily striking tactical targets. Presence is the key to reduce response times, mitigate enemy risk to friendly ground troops, prevent fratricide, and increase the situational awareness to all warfighters involved. During critical periods when more platforms are required to deliver weapons, the on-station platform can act as a funnel to leverage the firepower that the additional aircraft and weapons bring to the fight. This is essentially the contemporary FAC(A) mission that acts as an airborne extension of the TACP team for CAS. This USMC application is often misinterpreted as Strike Coordination and Reconnaissance (SCAR).

[15] Cordesman, 5.

Every aircraft is capable of SCAR, technology and training will enable platforms to have the connectivity and situational awareness to perform some level of the FAC(A) mission.

Continual presence is a problem that will plague operational planners in support of DO. Currently this is being done in Iraq by land based strike-fighter aircraft that are in the air twenty-four hours a day, everyday. This is a capability that can be accomplished in limited areas by a single squadron of twelve aircraft if there is not much of a requirement for surge operations. This gets increasingly difficult when support is from the sea or a significant distance away. The flying window is typically only twelve hours on an aircraft carrier or amphibious ship. DO forces that require airborne fire support will either require a combination of bombers, seaborne based, expeditionary, or UAVs. Airborne tanker assets will most certainly be a requirement. Planners must consider that presence via time on station or quick response is more critical than sortie generation rates. This challenge to the operational planners can be a limiting factor for DO employment due to geographic and space-time factors. In high-risk missions, where the DO forces may stay in the field for extended periods of greater than two-weeks, this may be unsupportable for limited joint air fire support. The CJTF and his staff must not only understand the capabilities of the deeply inserted DO forces, but they must also know of the limitations and risks without organic fire support.

Distributed operations will require decentralized command and control with “man in the loop” decision making to be efficient and effective, minimize casualties, minimize collateral damage, and stay within the bounds of ROE. Aviators and ground forces routinely apply experience, knowledge of weapons systems, the Cable News Network

factor, CDE, and adherence to ROE to make the correct targeting decisions. BGen Robert E. Schmidle, a proponent of DO, sums this up very well:

> Decentralized operations, facilitated by commander's intent, enable decision-making at the lowest level. This exploits our human capital and agility and accelerates our operational speed and tempo of operations. [16]

Centralized control provides situational awareness to the chain of command but is not the most efficient on the battlefield. The movement for centralized control in networked warfare occurs as operational commanders now have the ability to real-time monitor and tactically influence battles. Milan Vego warns of this:

> The conflicts in Kosovo and Afghanistan reinforced the trend toward further centralization of command and control in U.S. military. Rather than reinforce decentralized command, advances in information technologies have led in the opposite direction.[17]

This will have some strategic political ramifications when the clear tactical picture is missed and non-combatants are mistakenly killed by the use of operational fires. During a four month period in Afghanistan, fourteen collateral damage incidents resulted in a minimum of 150 deaths to civilians and eight Americans.[18] The Small Wars Manual from 1940 highlighted this challenge to commanders:

> It must be understood, however, that the air observer in small wars operations must be given a great latitude in estimating a situation on the ground than he would be given in a comparable position in major operations. Often the rapidly moving situation will not permit of delay in the transmission of information to headquarters, but requires immediate positive action on the part of the air patrol commander.[19]

Defined battlespace control measures will facilitate the DO forces. Initial use of airpower during OEF was very tenuous for aircrew and controllers as the airspace lacked coordination points and an effective C2 architecture. Diligent flight discipline and

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[16] Robert E. Schmidle, "Distributed Operations: From the Sea," *Marine Corps Gazette*, July 2004, 38.
[17] Milan Vego, 30.
[18] Cordesman, 39-40.
[19] *Small Wars Manual*, Ch 9-17, 10.

common sense, prevented mid-air collisions and bombing fratricides. The technology should be incorporated by 2015 to ensure a common battlefield picture of both friendly and known enemy forces. Development with integrated and interoperable command and control for all joint fires systems such as the Joint Battle Management Command and Control will help in the allocation of Joint air power to respond to the DO forces.[20] Kill box control measures are part of the architecture of this system and are the solution to geometrically support DO. These coordinate-based boxes will be simple to display and control through both voice and web-based computer networks. Future technology will allow any interested player to see who, what, why, where, and how the queried forces fit into the overall Joint Operating Area. This ability to readily monitor the situation benefits all forces. The ISR capabilities that aircraft have can provide real-time data-linked SA to the DO forces. This is important for developing situations, mobile targets, and having joint air provide more input than just finding and killing targets. Killbox battlespace control offers the most freedom, flexibility, and safety for DO forces.

The requirement for additional JTACs is a contentious issue for the USAF, USMC, and Army. However as "the battles of 2015 are expected to be dominated by precision fires," [21] we need more JTACs to ensure this happens. The downsizing of large forces, increased dispersion of maneuver forces, and increased dependence on joint air fires, has amplified the need. Historically this role was filled by a team led by a winged aviator who was an officer. This has changed within USAF due to the numbers required to support the Army. With DO requiring a JTAC for every squad, this requirement would

[20] United States Joint Forces Command, *Joint Fires Initiative Block 2 (JFI-2) Concept Primer* (Suffolk VA: 2004), 2.
[21] Michael O'Hanlon, *Technological Change and the Future of Warfare* (Washington, D.C.:Brookings Institutions Press, 2000), 120.

be untenable as too many cockpits would be empty. After Operation ANACONDA, Major General Franklin L. Hagenbeck, commander of the 10th Mountain Division stated:

> There are not enough GFACs or ETACs in their inventory to support every ground maneuver element . . . this war became platoon fights separated by distances in very rugged terrain with too few ETACs to go around.[22]

Current USMC doctrine prohibits JTACs to be below the rank of corporal. With DO units having the capability to require air support for squad-sized units, this requirement needs to go away. Focused training can bridge the rank gap. The more experienced Tactical Air Controllers (TAC)[23] can conduct coordination at the platoon level, much like Air Officers coordinate at the conventional battalion level. Current USMC throughput is 168 TACs per year at its two TACP schools.[24] They train only 24 JTACs per year, but now have the requirement to train 159 with DO and other initiatives.[25] This shortfall is similar to the USAF shortfall in meeting the Army's requirements. The TACs will need the official training at the schools, however, the looming problem is how to get the additional air support required for training and currency sustainment.

The solution for some of the training and sustainment will be the design and incorporation of simulators. The positive Type I visual controls taught at the schools do not properly simulate real world CAS aircraft deliveries of precision ordnance, therefore, simulation may actually benefit the JTACs.[26] Range restrictions, safety precautions, and operational risk management by commanders, prohibit realistic real world tactical

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[22] Robert H. McElroy, "Afghanistan: Fire Support for Operation ANACONDA," *Field Artillery*, Sep-Oct 2002, 9.
[23] TAC is the same as a Forward Air Controller(FAC). Normally a winged aviator and an officer. JTACs generally have no prior aviation experience.
[24] EWTGLANT/EWTGPAC, Expeditionary Warfare Training Group Atlantic and Pacific.
[25] TACP Training Development Conference (Sep 05).
[26] Type I control is the most restrictive, requiring the TAC to see the target and aircraft before clearance to employ ordnance is given.

training with air power. The merging of legacy aircraft to the JSF will make simulation beneficial to both the aircrew and the TACs as they can readily incorporate new systems, and add frictions such as weather and threats to enhance training. Finally, simulation will enable incorporation of UAVs, bombers, and other joint air assets, that otherwise may be unavailable for training.

COUNTER ARGUMENT

The salient positives of the DO model of warfare are not entirely risk free. The course of action for using conventional DO forces deep in enemy territory must carefully consider all options to include: annihilation of force, rescue, interruption of air support, network failure, sustainment, denial of air superiority, and mission success. Annihilation of part or the complete force makes deep insertion a medium to high risk mission. Faulty intelligence and lack of mass could jeopardize the force---especially if a massed enemy engages too close rendering joint air support ineffective. Rescue of engaged forces historically results in more losses. Incidents such as "Black Hawk Down" and the MH-47s, covered earlier, provide painful memories to U.S. commanders and often empower the enemy.[27] Interruption of air support due to a myriad of factors would leave the DO forces with only their direct fire weapons and mortars. This may not be enough firepower to defend in prolonged engagements. The DO forces in 2015 will be heavily dependent on the network to provide ISR, communications, C2, etc. If this broadband network is attacked or fails, the efficiency and lethality of the forces will be reduced. Traditional line of sight communications may not be sufficient to control the battle due to terrain, distances, and other factors. Air superiority is assumed for the United States in nearly all planning scenarios---this is a very dangerous assumption.

[27] Mark Bowden, Black Hawk Down: A Story of Modern War (New York: Penguin Books, 2000).

Proliferation of improved strategic and mobile surface- to-air missiles, massing of aircraft, and anti-aircraft artillery, may deny this on future battlefields. The fight against the Taliban and Al Qaeda has not resulted in the desired end-state for the United States to date. These two forces suffered extensive losses but the top leadership, to include Osama bin Laden, dispersed and fled to initial sanctuaries in the border regions of Pakistan. One could hypothesize it may have been better to fight the dispersed Taliban and Al Qaeda forces with a larger conventional force to seal the seams and gaps and prevent their escape.

CONCLUSION

Distributed operations forces in 2015 will utilize their dispersion, superior mobility, enhanced situational awareness, and control of joint air fires to defeat the enemy. The paths to success are the training and technology, operational planning, battlespace control measures, and terminal control solutions. Distributed operations can be accomplished today, but not to its fullest potential or with many joint forces or systems. The potential lack of joint fire support offers the highest risk to the DO forces. Much has been written and tested for indirect fire support integration. Due to CDE, ROE, fleeting targets, and political restraints, this paper focused on deep insertion of DO forces relying solely on joint air fire support. There are many challenges to make this relevant by 2015, but with a common objective to provide the CJTF this capability, the end-state should be achieved. Distributed operations are a reality that will gain momentum and have application to other services for 21st Century warfare.

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