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AIR COMMAND AND STAFF COLLEGE

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SPACE SUPPORT TO MILITARY OPERATIONS OTHER
THAN WAR—A NECESSITY FOR SUCCESS

AN HTML TOOL

by

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Preface

This research project was undertaken, with guidance and direction from the National Reconnaissance Office Operational Support Office, to create a hypertext markup language (HTML) tool to show the necessity of information from space in the execution of Military Operations Other Than War (MOOTW). The tool is intended to be used as a stand-alone, computer-based, educational aide for military operators. The tool should provide a consolidated background from a variety of joint and service publications on doctrine and various articles on MOOTW and space.

We would like to acknowledge the support and guidance provided by our Faculty Research Advisor Lt Col Jeffery Garner. His comments and feedback to us during the development of this HTML product were key in making this project a success. Also, we would like to acknowledge the superb direction and insights of Mr. Frank Strickland and the NRO/OSO team. And lastly, we would like to acknowledge the help and ideas from Mr. Doug Kirkpatrick, Mr. Al Sexton, Mr. Brent Marley, Major Mike Lakos, and Major Tom Doyne.

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Abstract

In the military's planning and execution of our National Security and National Military Strategy, space support, mainly as a force enhancement, has become a critical link in the chain that ensures the national security of the United States. The National Security Strategy (NSS) and National Military Strategy (NMS) require that we be engaged all over the world. This policy of global engagement and deterrence has led to many Military Operations Other Than War (MOOTW) throughout the world. Today's military commanders rely heavily on timely and precise information for success in such operations. Space support has become the primary source of this information and is a necessity both in peacetime and during crisis situations. The purpose of this HTML based tool is to investigate how space support, as a force enhancement, critically plays in the success of MOOTW. This is basically accomplished in the tool through a discussion of the types of MOOTW, key space doctrine for ground operations, specific space force enhancement systems and how they support MOOTW, and an example of how space has been key to the successful MOOTW in Bosnia. Joint Publications, service doctrine, recent articles, and the Internet were used to gather the information for this tool.

The tool is broken into eight sections: (1) Introduction, (2) Spectrum of Conflict, (3) MOOTW, (4) Space Doctrine, (5) Space Support, (6) Operational Examples, (7) Conclusions, and (8) Sources and Contacts.

In the first section, we give a short **Introduction** with some background on our nation's posture for global engagement and how that has led to an increased need for MOOTW. Given this propensity for MOOTW, we next present the **Spectrum of Conflict** to summarize the environment which the military must operate and where MOOTW fall within that spectrum. After the section on the Spectrum of Conflict, we concisely summarize the different types of **MOOTW** based on information derived from Joint Publications. The purpose of this section is to outline the breadth of operations included in MOOTW and to begin to build a picture of why space is important to the success of such diverse operations that can take place anywhere in the world. The next question we answer is how space fits in with MOOTW. We start off with a summary of key **Space Doctrine** for ground operations highlighting how space provides a force enhancement capability for those operations leading to successful MOOTW. The following section, **Space Support**, provides a basic description for each space force enhancement mission described in Air Force Doctrine Document (AFDD) 2-2, Space Operations (Navigation and Positioning; Communications; Weather and Terrain; and Reconnaissance, Intelligence, Surveillance, and Target Acquisition) and how each mission relates to MOOTW. Then we next use an **Operations Example** in Bosnia to demonstrate the importance of space to achieving successful MOOTW. The major thrust of this section is to provide a real-world example of how space is making a difference to the success of MOOTW. The last couple of sections wrap up the tool via some **Conclusions** to include recommendations for future research, a list of the **Sources** for the project, and some **Contacts** for further information.

The general findings of this project are that MOOTW are taking the military to many places in the world that have little or no supporting infrastructure. This lack of infrastructure makes space support all the more critical to these operations due to its provided weather, remote sensing, navigation, positioning, and communications. In support of operations in Bosnia, for example, space played a key role in achieving an assortment of successful MOOTW. These operations included humanitarian assistance, peace operations, and strikes and raids. In Bosnia, a space communications network provided a significant command and control capability with reach-back to Germany and the U.S. Also, space communications made telemedicine possible in theater. Weather, remote sensing, and the Global Positioning System (GPS) made the humanitarian airdrops very accurate and seemingly easy. Location and marking of minefields and boundaries of separation were done successfully through the use of GPS. Additionally, GPS was optimally used to achieve the best success in hitting targets during NATO air strikes. Lastly, remote sensing provided 3-D maps that were key in resolving disputes over territory, which, in turn, were critical to the respective parties reaching agreement in the Dayton Accords.

Chapter 1

Background

The occupation of the high ground can thus mean genuine domination. Its reality is undeniable.

> — Carl Von Clausewitz
> *On War*

The National Security Strategy (NSS) and National Military Strategy (NMS) require that we be engaged all over the world. A *National Security Strategy for a New Century* states that "American Leadership and engagement in the world are vital for our security, and the world is a safer place as a result."[1] Given this strategy of engagement, the military must be prepared to support global operations that involve any or all of the instruments of national power. Thus threats, such as regional or state-centered, transnational like illegal drugs and arms trafficking, and weapons of mass destruction, must be mitigated or eliminated by the instruments of national power. The bottom line of this strategy is to ensure that stability around the world is maintained in order to allow for the growth of free markets and democracies. In turn, Americans abroad will be safe, the security of the nation will be improved, and the conditions for global, and more importantly, American economic growth and prosperity will be nurtured. The military instrument of power is playing an increasingly prominent role in this strategy of engagement. The National Military Strategy of the United States of America (1997) states that "US Armed Forces help shape the international environment through their

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inherent deterrent qualities and through peacetime military engagement" and that "US

forces must be able to respond to crises from a posture of global engagement."[2] The

policy of global engagement and deterrence has led to many Military Operations Other

Than War (MOOTW) for all the military services.

JP 3-07, *Joint Doctrine for Military Operations Other Than War*, defines MOOTW

as the following:

> MOOTW encompasses the use of military capabilities across the range of
> military operations short of war. These military actions can be applied to
> complement any combination of the other instruments of national power
> and occur before, during, and after war.[3]

In the planning and execution of our National Security Strategy and National

Military Strategy, space support, mainly as a force enhancement, has become a critical

link in the chain that ensures the national security of the United States. Space assets are

at the leading edge of the sword that defends the nation both in peacetime and during

crisis situations. In FM 100-18, *Space Support to Army Operations*, the Army clearly

links the importance of space to MOOTW:

> The importance of MOOTW is increasing. Army forces conduct these
> types of operations as part of the NMS to prevent or preempt situations
> that, although less threatening, could eventually affect US access to
> critical regions of the world, our credibility among our allies, or the
> confidence of other nations in our abilities and resolve. In the future,
> development of campaign and operations plans may be based entirely on
> MOOTW requirements. ***During MOOTW***, ***space systems provide***
> ***essential information to support security assistance, nation building,***
> ***disaster relief, and humanitarian assistance. Satellites also provide the***
> ***means for assessing disasters, predicting crop growth, and analyzing a***
> ***nation's infrastructure (for example, lines of communication, sources of***
> ***energy and power, and trafficability situations)*** . . . They [space
> capabilities] support US interests, both at home and abroad, and often are
> an integral part of the overall MOOTW campaign plan.[4]

AFDD 2-2 powerfully states this yet another way:

Space forces play a significant part in our ability to characterize threats and identify an adversary's strengths, weaknesses, and vulnerabilities for our national leaders to use in diplomatic, political, and economic efforts. Data and information derived from space forces are often critical decision-making elements that can provide global situational awareness and diplomatic advantage and can permit the United States to respond effectively to evolving crises. Military operations other than war (MOOTW) can be applied to complement any combination of the other instruments of national power. *Space forces directly support military and civil leaders performing all sixteen representative types of MOOTW described in joint doctrine*.[5]

How Space Support Fits with MOOTW

Know the enemy, know yourself; your victory will never be endangered. Know the ground, know the weather; your victory will then be total.

Sun Tzu

Today's military commanders rely heavily on information dominance for successful outcomes across the spectrum of conflict. MOOTW, "which focus on deterring war and promoting peace" to protect our interests around the world, are becoming common place for the U.S. military.[6] Since the late 1980s, the U.S. Armed Forces have supported and conducted the full spectrum of MOOTW in now familiar places such as Somalia (EASTERN EXIT, PROVIDE RELIEF and RESTORE HOPE) Bosnia-Herzegovina (PROVIDE PROMISE, SKY WATCH, DENY FLIGHT, DELIBERATE FORCE), Haiti (RESTORE DEMOCRACY) and Iraq (PROVIDE COMFORT, NOTHERN WATCH, SOUTHERN WATCH, DESERT THUNDER, and DESERT FOX). According to Martin van Creveld, "conventional war may be at its last gasp," with low-intensity conflict becoming the predominant form of war.[7] Our former Chairman of the Joint Chiefs of Staff, General John Shalikashvili, stated in Joint Pub 3-07 that "while we have historically focused on warfighting, our military profession is increasingly changing its

focus to a complex array of military operations—other than war."[8] Our success in

MOOTW is tied to having the best possible and most timely information. This is due to

the sensitive political nature of these operations and the fact that even small-scale tactical

operations can easily affect strategic objectives. Joint Pub 3-07 says "commanders

should remain aware of changes not only in the operational situation, but of changes in

political objectives that may warrant a change in military operations."[9] The importance

of information at all levels of command, both civilian and military, has become the key to

gaining the strategic, operational, and tactical advantage.

Given the critical importance of information and the nature of the conflicts we face

in the future, we must look to our nation's space capabilities to give our joint forces the

critical information they need for success. General Thomas S. Moorman, Jr., Vice

Commander, United States Air Force Space Command in 1994, stated that "in recent

years, every conflict that we have been involved in has used **space** to a certain extent."[10]

Communications, weather, navigation, and remote sensing are but a few of the space

mission areas that have become extremely important to commanders performing

MOOTW. According to General Moorman, the military used communications, weather,

and remote sensing satellites for the 1983 Grenada invasion and used space for mission

planning during the 1981 raid on Libya and Operation JUST CAUSE in Panama in

1989.[11] Operation DESERT STORM, the most impressive example, proved to be the

first war in which space was clearly seen as a key contributor to the outcome. Then

Secretary of Defense William J. Perry said that during DESERT STORM "space systems

helped confer a decisive advantage upon the United States and friendly forces in terms of

combat timing, operational tempo, synchronization, maneuver, and the integrated

application of firepower."[12]   A variety of space platforms contributed to the overwhelming success in the 1991 desert war.   "Weather satellites, multi-spectral imagery satellites, navigation satellites, early warning satellites, communications satellites . . . all played a part in ensuring the success of the coalition."[13]   Space communications, remote sensing, weather and navigation also played critical roles in securing the peace accords that ended the brutal fighting in Bosnia. We chose to use space support to the Bosnia operations as the case study example for the HTML tool because it clearly demonstrates how space contributed to the success of MOOTW. In Bosnia, many of the MOOTW, ranging from humanitarian assistance, peace operations and strikes and raids, were successfully conducted. This makes the Bosnia operations a perfect case study.

According to FM 100-18, *Space Support to Army Operations*, emphasizes that space systems are the **force multipliers** needed to successfully support missions across the full range of military operations.[14]   On the lower end of this range of operations are MOOTW.   "While the Army's focus remains on missions of the warfighter, it will assume greater responsibilities for MOOTW, such as noncombatant evacuations, nation building, security assistance, peacekeeping, disaster relief, countering drugs, and search and rescue missions."[15] More importantly, FM 100-18 strongly states that "commanders at all levels must understand space capabilities and fully integrate them into Army operations."[16] We strongly believe that this statement applies to all the services and that space is an integral part of MOOTW.

HTML Tool Need

Given today's prevalent nature of MOOTW and the necessity of space support in conducting MOOTW, we decided to create an HTML-based multimedia educational tool to provide military operators, particularly those involved in ground operations, with a clear picture of the importance of space to successful MOOTW. The end purpose is to enable all users of the tool to have a better understanding of MOOTW and how space is essential to successful MOOTW. The tool provides this understanding through descriptions of the types of MOOTW, the types of force enhancement space provides in terms of MOOTW, and some real world examples of space's importance in MOOTW.

Notes

[1] National Security Strategy of the United States, *A National Security Strategy for a New Century*, The White House, 1997, 2.

[2] National Military Strategy of the United States of America*, Shape, Respond, Prepare Now: A Military Strategy for a New Era*, Chairman of The Joint Chiefs of Staff, 1997,12, 14.

[3] Joint Publication 3-07, *Joint Doctrine for Military Operations Other Than War*, 16 June 1995, GL-3.

[4] FM 100-18, *Space Support to Army Operations*, Headquarters, Department of the Army, Washington, D.C., 20 July 1995, 4-5.

[5] Air Force Doctrine Document 2-2, *Space Operations*, Headquarters Air Force Doctrine Center, Maxwell AFB, Alabama, 23 Aug 1998, 21-22.

[6] Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War*, 16 Jun 1995, I-1.

[7] van Crevald, Martin. *The Transformation of War*, The Free Press, New York, N.Y., 1991, 205.

[8] Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War*, 16 Jun 1995, n.p..

[9] Ibid., I-2

[10] Moorman, Thomas S., Lt Gen., *The Future of the United States Air Force Space Operations, The National Security Dimension, Vital Speeches of the Day* 60,, Issue 11, 15 Mar 1994, 325.

[11] Ibid.

[12] *Annual Report to the President and the Congress*, Washington D.C.: U.S. Government Printing Office, February 1995, 233.

[13] Joint Pub 3-14 (FIRST DRAFT V1.0), *Joint Doctrine; Tactics, Techniques, and Procedures (TTP) for Space Operations*, Apr 98, III-10.

[14] FM 100-18, *Space Support to Army Operations*, Headquarters, Department of the Army, Washington, D.C., 20 July 1995, 6.

[15] Ibid., 3.

[16] Ibid., 6.

Chapter 2

Project Description

We investigated a few options in the realm of multimedia presentation to create this computer-based tool. We were fortunate enough to visit the National Reconnaissance Office, whose Operational Support Office provided some guidance and demonstrations of various computer-based training generation software. We entertained using Microsoft Power Point to create the tool, but found it somewhat limited in the amount of information we could present on a single page. We also examined Adobe Acrobat, but felt that the generated document would not be easily readable from a computer terminal. Additionally, we looked at some very high-end tool generation software, but found it too expensive, as well as being extremely complex to master in a short time. We decided to build the tool with HTML because the product would be readable and could easily include multimedia. Additionally, the product would be portable because no special software would be required to run the tool, due to the fact that web browsers are common on most computers.

Tool Description

The tool is broken into eight sections:

(1) Introduction, (2) Spectrum of Conflict, (3) MOOTW, (4) Space Doctrine, (5) Space Support, (6) Operational Examples, (7) Conclusions, and (8) Sources and Contacts.

First, we provide a short **Introduction** to provide some background on our nation's posture for global engagement and that policy's relationship to an increased need for MOOTW. The basic thrust of this section is to briefly outline why MOOTW are becoming more common and why space is important to MOOTW. Next we discuss the **Spectrum of Conflict** in order to summarize the spectrum of operations in which the military must operate and where MOOTW fall within that spectrum. Following the section on the Spectrum of Conflict, we present a concise summary of **MOOTW** operations based on information contained in Joint Publications. The purpose of this section is to outline the breadth of operations included in MOOTW and to begin to build a picture of why space is important to the success of such diverse operations that can take place anywhere in the world. Next, we present a summary of key **Space Doctrine** for ground operations highlighting how space provides a force enhancement capability for those operations. The intent is to tie this doctrine to achieving success in MOOTW. The next section, **Space Support**, makes this tie by taking each space force enhancement mission (Navigation and Positioning, Communications, Weather and Terrain, and Reconnaissance, Intelligence, Surveillance, and Target Acquisition) and relating those missions to MOOTW. In short, the overarching goal of the Space Support section is to highlight key specific capabilities that space contributes, thereby enabling the conduct of successful MOOTW. The sixth section, **Operations Examples**, uses recent operations in Bosnia to provide real world examples of the importance of space in MOOTW. The goal here is to provide a real-world example of how space is making a difference in the success of MOOTW. We chose the Bosnia operation as an example because of the variety of space support required to conduct successful MOOTW. The last couple of

sections wrap up the tool via some **Conclusions** to include recommendations for future research, a list of the **Sources** for the project, and some **Contacts** for further information.

Tool Installation

We designed the tool to run on the Air Command and Staff College student laptop computers. These contain a Pentium CPU, 2MB video DRAM, and 4MB of EDO DRAM. They use the Windows 95 operating system. The tool should run on any Pentium or Pentium II class machines.

The file directory structure for the tool is shown in Figure 1 below.

Figure 1. File Directory Structure

The directory named SPOOTW contains all the necessary subdirectories and files to run the tool. Table 1 provides a description of each subdirectory. To install the tool, one must simply copy the SPOOTW directory along with all its subdirectories onto the

intended computer's hard drive, preferably under the C: drive. To start the tool, use a browser to open the file *index.htm*, located in the directory named DISCLMR.

Table 1. Directory Descriptions

Directory Name	*Description*
DISCLMR	Disclaimer statement and entry into the tool files
NAVIGATE	Tool navigation files
INTRO	Introduction and background files
SPECTRM	Spectrum of Conflict files
MOOTW	MOOTW files
DOCTRINE	Space doctrine files
COMSPRT	Space communication support files
GPSSPRT	Navigation and positioning support files
RECSPRT	Reconnaissance, intelligence, surveillance and target acquisition support files
WTHRSPRT	Weather and terrain support files
EXAMPLES	MOOTW space support example files
CONCLN	Conclusion files
BIBCNTS	Bibliography and contacts files

NAVIGATION WITHIN THE TOOL

The tool uses frames to create two windows on your screen. However, it should look like a single screen when opened up. Use your mouse to click on a selection on the button bar across the top of the page to enter the different sections of the tool (see Figure 2). You can think of it as your basic table of contents. Once you select a button from the button bar, a new page will appear in the frame below. The button bar will always remain at the top of your screen to allow you to jump from section to section. You will need to scroll down the page in order to read pages larger than one screen. At the bottom of each text page, you will see some more buttons for local navigation within that page. You will have choices that will allow you to go back one page, to go forward to the next page, or to return to the top of the page. Also, within a particular section, you can select

from a text menu—a mini-table of contents—at the left side of the page to jump around that section. The menu item highlighted in yellow is the current subsection you are in. Also, some pages will allow you to move to a particular point on the page simply by selecting the highlighted text. Lastly, you can exit the tool by closing the web browser you are using.
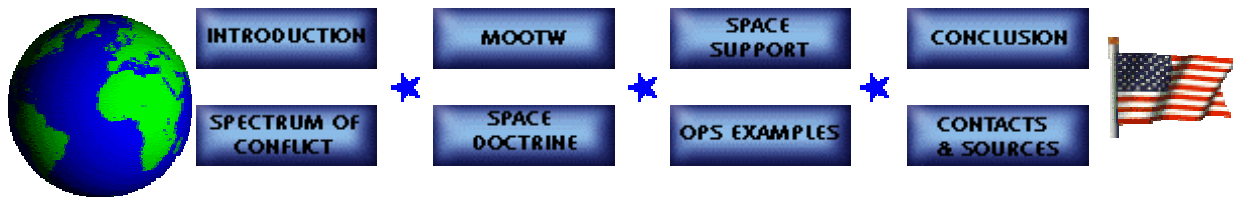

Figure 2. Main Navigation Menu

Other Features

Internet site links are provided to get further information on a particular topic in certain sections. **You must however be logged onto an Internet Service Provider to access these links**.

Recommendations for Use

When using the tool for the first time, we recommend that you page through it sequentially. However, feel free to navigate around as you see fit. The tool is targeted for the general military audience.

Chapter 3

Future Research

General Areas

This project only touched upon the areas of space doctrine and MOOTW missions. With both of these areas continuing to gain more attention in today's uncertain environment, they will need updating and refinement in the future. Also, the tool only highlights the benefits of space force enhancement information. An update to the tool to incorporate limitations would be very beneficial. Lastly, a more in-depth section on space organizations and what they provide could be incorporated into the tool to make it more comprehensive. For instance, a description of United States Space Command, the National Reconnaissance Office (NRO), and the National Aeronautics and Space Administration (NASA) would be appropriate.

Specific Areas

Other specifics that would greatly enhance the tool would have been included this year given greater work time and resources. One area that was omitted from the space support section was missile warning. We felt this section could be extensive, given the existing programs to develop theater and national ballistic missile defense systems. Therefore, we recommend adding a section on this subject matter in the future. However,

the most useful additions to this tool in the future will come form the development of additional MOOTW case studies describing how space proved key in the successful conduct of those operations. Specific areas may be targeted, such as space support to humanitarian assistance or noncombatant evacuation operations.

Chapter 4

Conclusion

Space Power is not synonymous with information age military prowess, but it is the prime provider for and the cutting edge of that prowess.

— C. S. Gray
"The Influence of Space Power upon History," *Comparative Strategy*

Space capabilities are particularly important where the operational area lacks the infrastructure to support Army operations. These capabilities apply across the entire spectrum of military operations, to include military operations other than war (MOOTW), and to all echelons of command.

FM 100-18

The general findings of this project are that MOOTW are taking the military to many places throughout the world with little or no infrastructure. In some cases, the only means to get the required support in terms of weather, maps, navigation, positioning, communications, and reconnaissance is from space-based assets. In Bosnia, an unprecedented space communications network provided a significant command and control capability with reach-back to Germany that significantly improved the commanders' ability to coordinate and synchronize operations. At the tactical level, space satellite communications allowed forces to overcome the infrastructure limitations in the area allowing coordinated freedom movement in the area of operations. Space communications also made telemedicine possible in Bosnia, enabling greater operational efficiency by allowing timely in-theater medical treatment in lieu of medevac. Weather,

remote sensing, and GPS made the humanitarian airdrops both accurate and seemingly easy. Additionally, the location and marking of mine fields and defining boundaries of separation between belligerents were successfully accomplished through position information gained from the use of GPS. GPS also was optimally used to achieve the greatest success in hitting targets during NATO air strikes by taking advantage of the satellite constellation accuracy predictions. Lastly, remote sensing and imagery provided 3-D terrain visualizations that were key in resolving territorial disputes and ultimately facilitated an agreement resulting in the Dayton Accords.

It is obvious from this research that space support, as a force enhancement, is an important part of MOOTW. It is up to each individual participating in these operations to understand how space application enhances joint force effectiveness. With today's ops tempo, the ability to arrive in theater quickly, assess the situation, complete the mission, and redeploy, depends on how well we understand and use space-derived information for force enhancement. Space support to Military Operations Other Than War is, and will be, a necessity for future success.

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