

WHAT IS THE ROLE OF SURVIVABILITY OPERATIONS
IN THE CURRENT FORCE?

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

WHAT IS THE ROLE OF SURVIVABILITY OPERATIONS IN THE CURRENT FORCE? by MAJ Jason L. Smallfield, 109 pages.

The contemporary operational environment (COE) has necessitated many changes in the way that American forces prepare for and conduct war. The problem, however, is that most of these changes do not adequately address the role that survivability operations should play across the full spectrum of conflict at the tactical level of warfare. Survivability Operations (SO) are all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy to include cover, concealment, camouflage, and deception (C³D). Thus, the central research question is: what is the role of survivability operations in the current force? The Training and Doctrine Command's DOTMLP framework was used to answer this question. Doctrine, organization, training, materiel, leadership and education, and personnel all require small or large modifications in order to emphasize or increase the role that SO play across the full spectrum of conflict at the tactical level. Doctrine is incomplete and fragmented. Organizations for SO are either non-existent or too austere. Training does not adequately address or prepare for SO. Materiel is varied but more variety and quantities are required. Leadership and education in formal schooling teaches SO as an embedded subject rather than a stand alone one. Finally, the Military Occupational Specialty (MOS) system does a poor job of delineating responsibility for SO.

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LIST OF ABBREVIATIONS

ACE	Armored Combat Earthmover
AIT	Advanced Individual Instruction
ANCOC	Advanced Non-Commissioned Officer Course
BCTP	Battle Command Training Program
BNCO	Basic Non-Commissioned Officer Course
BOS	Battlefield Operating System
BSFV	Bradley Stinger Fighting Vehicle
CCC	Captain's Career Course
CCD	Concealment, Camouflage, Deception
C ³ D	Cover, Concealment, Camouflage, Deception
CMTC	Combat Maneuver Training Center
CTC	Combat Training Center
CV	Command Vehicle
DOTMLP	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel
ENFORCE	Engineer Force Conference
FM	Field Manual
FSV	Fire Support Vehicle
HEMTT	Heavy Expanded Mobility Tactical Truck
HMMWV	High Mobility Multi-Wheeled Vehicle
ICV	Infantry Carrier Vehicle
IR	Infrared

JP	Joint Publication
JRTC	Joint Readiness Training Center
LMTV	Light Mobility Tactical Vehicle
MC	Motor Carrier
METT-TC	Mission, Enemy, Terrain, Troops, Time, Civil
MEV	Medical Evacuation Vehicle
MI	Military Intelligence
MOUT	Military Operations in Urban Terrain
MOS	Military Occupational Specialty
MTOE	Modified Table of Organization and Equipment
NBC	Nuclear, Biological, Chemical
NIR	Near Infrared
NTC	National Training Center
OBC	Officer Basic Course
PIR	Parachute Infantry Regiment
PLDC	Primary Leadership Development Course
POI	Program of Instruction
RV	Reconnaissance Vehicle
RSTA	Reconnaissance, Surveillance, and Target Acquisition
SBCT	Stryker Brigade Combat Team
SEE	Small Emplacement Excavator
TACSOP	Tactical Standard Operating Procedures
TRADOC	Training and Doctrine Command

TTP	Tactics, Techniques, and Procedures
US	United States
UV	Ultraviolet

CHAPTER 1

INTRODUCTION

Let the attacker attack. Let them learn that bullets kill men and that earth stops bullets.¹

Winston Churchill

Overview

Survivability operations have proven their value throughout history. Veteran soldiers on both sides of the American Civil War learned the value of temporary field entrenchments by the winter of 1863-64. According to one Army of the Potomac division commander, “It became a recognized fact amongst the men themselves that when the enemy had occupied a position six or eight hours ahead of us, it was useless to attempt to take it.”² World War I showed survivability operations taken to an extreme with the use of trench warfare and the introduction of such terms as “bombproof,” “sap,” and “traverse.”³ The 502nd Parachute Infantry Regiment (PIR) of the 101st Airborne Division in World War II at the city of Bastogne was able to hold off numerous German armored assaults over a period of eight days partly due to their skill in the conduct of survivability operations.⁴ The 23rd Infantry Regiment was able to break a ring of three enemy divisions attacking in massed waves against the UN perimeter during the Battle of Chipyeong-Ni during the Korean War.⁵ Even Allied forces during the Persian Gulf War paid particular attention to survivability operations prior to the start of the ground offensive. These facts in and of themselves, however, do not guarantee that the worth of survivability operations will continue to be high in future battles.

The Legacy Forces, light and heavy, have different characteristics but the type, extent, and priority of survivability operations that they must conduct are essentially the

same. Light forces are strategically mobile, but lack lethality, protection, and tactical mobility. Light forces are particularly vulnerable to nuclear, biological, or chemical (NBC) attack, attack by heavy forces, attack by indirect fire, and air attack. When the need arises, light forces must therefore conduct extensive survivability operations throughout the entire brigade combat team. Heavy forces, meanwhile, are lethal, better protected, and tactically mobile, but lack strategic mobility. Heavy forces, however, also conduct survivability operations throughout the entire brigade combat team when matched against a similar enemy.

The Stryker Brigade Combat Team's (SBCT's) mission is to "fight and win small-scale contingency operations in complex and urban terrain against low-end to mid-range threats that employ conventional and asymmetric capabilities."⁶ The SBCT is the Army's near term attempt to fill the gap between the Legacy light and heavy forces. The characteristics of this force include: mobility at all levels of war, superior situational awareness, full-spectrum capability, reach back, and holistic survivability and force protection. Survivability operations for the SBCT, therefore, must necessarily be different from the Legacy Force.

Problem Description

Several problems have plagued survivability operations in the past. Recent trends at the four Combat Training Centers (CTCs) show that the US Army has significant problems conducting adequate survivability operations at the brigade level and below. These problems traverse many echelons of command and all of the battlefield operating systems (BOS). This deficiency severely impacts the maneuver brigade's ability to protect itself and thus to maintain its personnel, weapons, and supplies. Most of these

problems are in the areas of doctrine, organizations, training, materiel, leadership, and education, and personnel.

This thesis will conduct a past and present analysis using the Training and Doctrine Command (TRADOC) Doctrine, Organizations, Training, Materiel, Leadership and Education, and Personnel (DOTMLP) model as a research framework. This analysis will include all field manuals pertaining to a brigade combat team for the legacy force and the SBCT. It will review the light, airborne, air assault, and mechanized divisional structures along with the SBCT structure in regards to their applicability to survivability operations. It will also analyze past legacy brigade-level deployment survivability operations from 1994 to 2003 and CTC rotational trends from 1998 to 2003. The CTC trends will include all four CTCs to include the National Training Center (NTC), the Joint Readiness Training Center (JRTC), the Combined Maneuver Training Center (CMTC), and the Battle Command Training Program (BCTP). Next, it will analyze current SBCT survivability operations based upon CTC rotations and exercise information. It will review materiel available within the Army logistical system and assess the formal education conducted within certain TRADOC schools. Finally, it will analyze the Army's Military Occupational System (MOS) in regards to its applicability to survivability operations.

This researcher decided to pursue the research question as a result of watching numerous rotational brigades at the JRTC struggle through and fail at survivability operations. Most brigade leaders defined survivability operations as solely an engineer problem and thus abdicated their command responsibilities to ensure that these critical operations were conducted and conducted to standard. Also, most brigade leaders

defined survivability operations as strictly blade team usage (cover) and thus ignored the potential advantages due to more emphasis upon camouflage, concealment, and deception. This resulted in survivability operations being stressed only during defensive operations and not across the full spectrum of conflict.

An investigation of the complex dynamics of DOTMLP on the legacy brigade combat team of the past and the SBCT of the present should lead to educated suppositions regarding changes and improvements to how survivability operations are conducted at the brigade level. The analysis and conclusions resulting from this investigation will bring new insight to the ongoing professional discussion regarding the current SBCT and the subsequent Objective Force. Past analysis of survivability operations reveals a piecemeal approach that is inadequate. This thesis will produce a holistic, systematic approach to the problem and thus contribute to the professional discussion now ongoing concerning the successful deployment and employment of both the Legacy Force and the SBCT.

Primary Question

The primary question to answer for this thesis is: What is the role of survivability operations in the current force?

Relation of Thesis to Problem

The current role of survivability operations is central to the ongoing professional discussion concerning the SBCT. Some professionals argue that the attainment of these characteristics will mean survivability operations are not needed while others vehemently disagree. The lack of consensus on this issue argues for a comprehensive examination of the problem.

The survivability operations question is practical, because it will have impacts at every echelon from brigade to individual soldier level. The execution or non-execution of survivability operations at the brigade level may determine the success or failure of that force.

The DOTMLP framework for solving this problem is appropriate since it is the force development model used by TRADOC. Force development is the process of determining Army requirements and translating them into programs and structure, within allocated resources, to accomplish Army missions and functions. DOTMLP is a proven methodology that has been in use by the Army for an extended period of time.

Secondary Questions

An analysis of past and present survivability operations combined with educated suppositions regarding future survivability operations will derive the answer to the primary question. In other words, a connection of the past and present dots may lead to an estimation of the location of the future dot. The questions that will provide these dots include:

1. What is the role of survivability operations in the SBCT?
2. What is the role of survivability operations in the Legacy Force?

Tertiary Questions

The answer to the secondary questions will require use of DOTMLP to provide the necessary resolution. DOTMLP will also provide the holistic approach to the survivability operations question that has been lacking in the past. The tertiary questions necessary to provide this include:

1. What is the state of doctrine concerning survivability operations in the Legacy Force and the SBCT?

2. What is the state of organizations concerning survivability operations in the Legacy Force and the SBCT?

3. What is the state of training concerning survivability operations in the Legacy Force and the SBCT?

3. What is the state of materiel concerning survivability operations in the Legacy Force and the SBCT?

4. What is the state of leadership and education concerning survivability operations in the Legacy Force and the SBCT?

5. What is the state of personnel concerning survivability operations in the Legacy Force and the SBCT?

Assumptions

This thesis is based upon two assumptions. These assumptions include:

1. The baseline organizational design of the Legacy Force (heavy and light) is as of 2002.

2. The baseline organizational design of the SBCT is as of 2002.

Definitions

Definitions of survivability operations and DOTMLP key terms are integral to this research study especially since there is currently confusion of these terms within Army doctrine as currently written. There are various sources within Army doctrine for these terms that only strengthens the argument for a more holistic approach within Army doctrine for the conduct of survivability operations.

Doctrine is the Army's authoritative policy, procedures, and tenets on how its forces should conduct operations. Doctrine development is the process that develops and documents doctrine, tactics, techniques, and procedures for military operations in publications such as field manuals.

Leadership and Education is the process that produces programs for the training and the professional and personal development of competent and committed leaders for the Army.

Materiel includes all items (including ships, tanks, self-propelled weapons, aircraft, and others with related spares, repair parts, and support equipment, but excluding real property, installations, and utilities) necessary to equip, operate, maintain, and support military activities without distinction as to its application for administrative or combat purposes. Materiel development is the process that conceives, develops, and executes solutions to materiel requirements.

Organization is the Army's table of organization and equipment (TOE) and tables of distribution and authorization (TDA). Organizational development is the process that translates organizational requirements into organizational models and force structure.

Personnel refers to the Army's Military Occupational Specialty (MOS) structure. Personnel development is the process or processes that concern the determination, addition, deletion, or modification of the Army occupational specialties.

Procedures are the standard and detailed courses of action that describe how to perform a task.

Stryker Brigade Combat Team (SBCT) is the US Army's first ever medium weight brigade unit.

Survivability Operations are all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy to include cover, camouflage, concealment, and deception (C3D). Cover is all measures taken to protect against direct fire weapons, indirect fire weapons, and Nuclear, Biological, and Chemical (NBC) attack. Concealment is all measures taken to protect against all forms of observation. Camouflage is all measures taken to appear to be part of the natural surroundings. Deception is a ruse or trick taken to cause the enemy to believe what is not true.

Tactics are the art and science of employing available means to win battles and engagements.

Techniques are the methods used by troops and/or commanders to perform assigned missions and functions, specifically, the method of employing equipment and personnel.

Training includes all aspects of the Army enlisted, officer, and civilian institutional, mission, and unit training. Training development is the process that produces programs, methods, publications, and devices to support individual and unit training.

Limitations and Delimitation

This thesis will explore past and present survivability operations at the brigade level in order to determine what DOTMLP changes are required for future success. It will include analysis of the Legacy Force, both heavy and light, and of the SBCT. It will not address individual systems survivability or vehicular survivability but rather will analyze survivability operations from a holistic combined arms and collective level. It will not analyze survivability operations above the brigade level for either the Legacy

Force or above the SBCT. It will identify DOTMLP strengths and weaknesses from past and present survivability operations in order to analyze proposed DOTMLP changes for future survivability operations.

Summary

Clearly, history has proven survivability operations critical in the past. If the recent CTC trends are accurate, however, the US Army has a problem conducting survivability operations at the brigade level and it may or may not have a problem in the SBCT. The causes of this trend may be in any one area of DOTMLP or in a combination of all areas. This thesis will attempt to determine the root cause or causes of this trend and develop recommended solutions to DOTMLP for the future. It will do this by conducting a holistic, systematic analysis of the survivability operations problem. This first step in this analysis is to conduct a literature review.

¹Robert Debs Heinl Jr., *Dictionary of Military and Naval Quotations* (Annapolis, MD: United States Naval Institute, 1966), 83.

²Combat Studies Institute, *The Evolution of Modern Warfare* (Fort Leavenworth, KS: CSI, July 2002), 373.

³The West Point Military History Series, *The Great War* (Wayne, NJ: Avery Publishing Group Inc. 1986), 214-218.

⁴Center of Military History, *Bastogne The First Eight Days* (Washington, D.C.: United States Army, 1996).

⁵The West Point Military History Series, *The Arab-Israeli Wars, The Chinese Civil War, and the Korean War* (Wayne, NJ: Avery Publishing Group Inc. 1986), 105.

⁶The United States Army, *FM 7-32 Stryker Brigade Combat Team* (Washington, D.C. 2002), 1-1.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter is a literature review of existing official and unofficial DOTMLP material at the brigade level and below concerning the issue of survivability operations. Official material is published by the Department of the Army or by the Department of Defense whereas unofficial material is not. The review is based upon the twelve tertiary thesis questions. These questions can be summarized by the question, What is the state of DOTMLP concerning survivability operations in the Legacy Force and the SBCT?

Doctrine

There were 114 joint publications (JPs) for the Legacy Force and the SBCT as of 17 September 2002 with 96 approved and 18 under development. Only seven of these publications, however, are directly or indirectly related to survivability operations. This includes: JP 3-0, *Joint Operations*; JP 3-06, *Urban Operations*; JP 3-10, *Joint Doctrine for Rear Area Operations*; JP 3-10.1, *Joint TTPs for Base Defense*; JP 3-33, *Joint Force Capabilities*; JP 3-34, *Engineer Doctrine for Joint Operations*; and JP 3-58, *Joint Doctrine for Military Deception*. Significant terms that are used at the joint level include force protection, force protection operations, protection, survivability, and survivability operations; but only survivability is defined with any specificity and continuity.

There were 476 Army Field Manuals (FMs) as of 17 October 2002. Forty-eight of these FMs are directly or indirectly related to brigade level operations and below or survivability operations. Key among these include: FM 3-0, *Operations*; FM 5-103, *Survivability*; FM 20-3, *Camouflage, Concealment, and Decoys*; FM 5-34, *Engineer*

Field Data; and FM 7-8, *Infantry Platoon*--the FMs dealing with key brigade sub-organizations, such as mortar platoon, howitzer battery, infantry battalion, and tank platoon, and the FMs dealing with individual or crew-served weapon systems (FM 3-23.25, *LAW*; FM 3-23.24, *Dragon*; FM 23-14, *M249*; FM 23-27, *MK-19*; FM 23-31, *M203*; FM 23-34, *TOW*; FM 23-65, *M2*; and FM 44-18, *Stinger*). Although there are numerous FMs mentioned above, the breadth and depth of information concerning survivability operations contained within these FMs varies greatly. Some, such as FM 5-103, *Survivability*, and FM 20-3, *Camouflage, Concealment, and Decoys*, were written to deal specifically with survivability operations. Others, such as FM 3-21.71, *Mechanized Infantry Platoon and Squad*, and FM 23-65, *M2*, touch on survivability operations issues, but only tangentially. Finally, ones, such as FM 11-43, *Signal Leader's Guide*, and FM 44-18, *Stinger*, do not address any type of survivability operations at all.

For the SBCT, there are currently twenty-one FMs and twenty-five MTPs in final draft form for the SBCT from the company through the brigade level. This includes fifteen concerning the infantry branch, eight for armor, four for engineer, five for chemical, six for CASCOM, three for field artillery, two for signal, and three for intelligence. Most of the manuals have an estimated final doctrine (published manual) date of December 2003. Key among these FMs is FM 3-34.221 *Engineer Operations: Stryker Brigade Combat Team*.

Organizations

The organizational structure of the Legacy Force is varied due to the number and types of legacy units to include light, airborne, air assault, mechanized, armor, and separate brigades. Enough similarities exist, however, that analysis of only four types is

necessary in order to determine organizational trends among all of them. The four types include light, airborne, air assault, and mechanized.

The organizational structure of the SBCT is currently limited to that of the First Brigade, 25th Infantry Division at Fort Lewis, Washington. The Modified Table of Organization and Equipment (MTOE) for this brigade currently shows the following.

Table 1. SBCT Modified Table of Organization and Equipment

TYPE UNIT	NUMBER	VEHICLES	PERSONNEL
Brigade Spt Battalion	1	20 / 37	390
Infantry Battalion	3	264 / 102	2250
RSTA Squadron	1	93 / 25	499
Anti-tank Company	1	15 / 17	70
HIMARS Company	1	6 / 17	81
Engineer Company	1	22 / 36	128
MI Company	1	0 / 25	70
Signal Company	1	5 / 29	88
HHC	1	2 / 37	120 ¹

Training

There are thirty-two Center of Army Lessons Learned (CALL) Combat Training Center (CTC) Trends publications dating from 1995 to the present dealing with various aspects of Legacy Force training. Fourteen of these are from NTC, thirteen from JRTC, three from CMTC, and two from BCTP. All of the CTC Trends publications contain trends relating to survivability operations. The trends cover all of the battlefield operating systems (BOS) and a fair number of the branches. Almost of these trends, however, are in the improve category rather than in the sustain category. In addition, there are thirteen survivability operations related articles within CALL *Newsletters* and

News From the Front. These articles address a number of different areas within survivability operations to include tactics, techniques, and procedures (TTPs); observations; and useful equipment. Finally, CALL has published *Initial Impressions Reports for Haiti* in 1994, *Migrant Camp Operations* in 1995, *Bosnia-Herzegovina* in 1996, and *Afghanistan* in 2001-2 that provide useful insights into force protection and survivability operations issues.

Each battalion level unit within the United States Army uses its own Tactical Standard Operating Procedure (TACSOP) to guide and streamline its operations in the field. To solicit and review each of these TACSOPs for unit SOPs on survivability operations would be an enormous endeavor. There are, however, ten engineer brigades (divisional, group, and corps) and thirty-six engineer battalions (mechanized, light, combat heavy, and corps) that can serve as a sampling to determine unit SOPs in the field regarding survivability operations. The engineer units cover a range of combat, combat support, and combat service support focused areas.

The Training and Doctrine Command (TRADOC) produces a Program of Instruction (POI) for every developmental school to include Basic Training, Advanced Individual Training (AIT), Primary Leadership Development Course (PLDC), Basic Noncommissioned Officer's Course (BNCOC), Advanced Noncommissioned Officers Course (ANCOC), Officer Basic Course (OBC), and the Captain's Career Course (CCC). These POIs touch on various aspects of survivability operations, but as a general rule the instruction is limited to a small percentage of the total available hours of instruction.

The SBCT training program incorporates the doctrine of FM 25-100, *Training The Force*, but also includes transformation unique training. The overall SBCT training

strategy is to elicit behaviors of the organization and operational theory into practice. Two training models were developed from the overall training strategy. The models include developmental and sustainment. The initial sustainment training model includes leader, individual, collective, battle staff, and functional areas. Documentation regarding SBCT training is readily available both from the SBCT itself and on the Internet through various sources. Due to the relative newness of the SBCT, however, information regarding SBCT training may need to be supplemented with interviews in order to obtain a better understanding of SBCT training regarding survivability operations. The SBCT has not deployed for any real-world missions yet, but it has deployed to the NTC on training missions. Observations regarding these deployments are readily available for analysis.

Materiel

The materiel of the Legacy Force is numerous and varied. Most of the published literature concerning materiel within the Legacy Force is contained within the various MTOEs of the units, in FM 20-3, Appendix E, and in various specialty books such as *Jane's Military Vehicles and Logistics*.

The materiel of the SBCT is relatively few and similar in comparison to the Legacy Force. Numerous systems, such as high-mobility multi-wheeled vehicles (HMMWV), Heavy Expanded Mobility Tactical Trucks (HEMTTs), and Light Mobility Tactical Vehicle (LMTV) are common with Legacy Force materiel. Supporting systems that are used for survivability operations are also common to both the SBCT and the Legacy Force. Some of these supporting systems include but are not limited to the lightweight camouflage screen system (LCSS), smoke pots, DEUCE, and Class IV

overhead cover material. There are also ten variations of the Stryker vehicle that are used within the SBCT.

Leadership and Education

FM 22-100, *Army Leadership*, is the Army's capstone document regarding leadership doctrine. The purpose for this FM is to provide a single-source reference for all Army leaders regarding leadership doctrine, leadership theory, and leadership resources. Legacy Force leadership development, however, is very decentralized and difficult to research. Each battalion within the Legacy Force develops and implements its own leadership development program that may or may not align with the information contained within FM 22-100. Some battalions do not even have a leadership development program. Very little information exists on unit leadership development programs, so a survey will be required in order to determine the quantity, quality, and type of programs available at the unit level that deal with survivability operations.

Leadership development within the SBCT is much easier to research for two reasons. First, there currently is only one fielded SBCT with a second brigade in the process of formation. Second, the leadership development plan for the SBCT is posted on the Internet. The SBCT has a very structured leadership development program. The program has identified end states, rationale, and means. The program is also focused at all levels of leaders from the brigade to the team leader level. Survivability operations training, however, within the SBCT leadership development program is limited.

Personnel

There are currently 212 military occupational specialties (MOSs) in the United States Army. These MOSs are divided into twelve major categories including

administration, combat specialties, construction, electronic-electrical equipment repair, engineering-science-technical, health care, human resource development, machine operator, media-public affairs, protective services, transportation -supply services, and vehicle-machinery mechanic. These MOSs are outlined and described on the Internet at www.goarmy.com. None of the 212 MOSs deal specifically or solely with survivability operations. Survivability operations, as far as the Army MOS system is concerned, is an embedded function that is integral to the job duty description of every Army soldier. There currently are no plans to change, delete, or add any specific MOS for incorporation into the SBCT structure.

Conclusion

There is a wealth of material available to analyze survivability operations within the Legacy Force and the SBCT. This information is available from a variety of sources and media. As plentiful as this information is, however, there are still gaps in the extant knowledge available. Some of these gaps include unit TACSOPs, leadership development programs, and some unit training information. I have identified these gaps in the discussion above and have developed solutions in order to fill them.

CHAPTER 3
RESEARCH DESIGN

Introduction

The purpose of this chapter is to introduce the research methodology that will be used in order to answer the thesis question. The subjects to be evaluated include the previously mentioned DOTMLP categories of doctrine, organizations, training, materiel, leadership and education, and personnel. Doctrine is subdivided into two areas including JPs and Army FMs. Organization is subdivided into five areas including light, air assault, airborne, mechanized, and SBCT. Training is subdivided into three areas including real-world operations, unit-level training, and unit TACSOPs. The subject of materiel is not subdivided. Leadership and education is subdivided into five areas including advanced individual training (AIT), basic noncommissioned officer's course (BNCOC), advanced noncommissioned officer's course (ANCOC), officer's basic course (OBC), and the captain's career course (CCC) across six different branches. The subject of personnel is subdivided into four areas including branch, officer, warrant officer, and enlisted.

Doctrine

Doctrinal publications to include the seven applicable joint publications, the fifty Army FMs applicable to the legacy force at the brigade level, and the thirteen Army FMs applicable to the SBCT will be evaluated using the four criteria of cover, concealment, camouflage, and deception. For the purposes of this evaluation the following definitions of the criteria will apply:

Cover: Any natural or artificial protection from enemy direct and indirect fires.

Concealment: The protection from all means of observation or surveillance to include but not limited to visual, near infrared, infrared, ultraviolet, radar, moving target indicators, imaging, acoustic, radio, counter mortar, and counter battery.

Camouflage: The use of natural or artificial materials on personnel, objects, and tactical positions to confuse, mislead, or evade the enemy.

Deception: Those measures designed to mislead the enemy by manipulation, distortion or falsification of evidence, inducing him to react in a manner prejudicial to his interests.

The publications will be evaluated in order to determine the extent to which they address the issue of survivability operations. A numbered rating system will be used for these publications to rate how well the publication addresses the criteria. The number ratings are defined as follows:

7 = A full explanation of the criteria is present along with a sketch.

6 = A full explanation of the criteria is present.

5 = A partial explanation of the criteria is present but key elements are missing.

4 = A paragraph explanation of the criteria is present and key elements are missing.

3 = A two to three sentence explanation of the criteria is present.

2 = One sentence is present where the criteria is mentioned.

1 = No mention of the criteria is present at all.

Adding the four criteria scores for the publication will produce an overall assessment for the individual publication. Publications with an overall score of fifteen or higher are color coded green, scores of 9-14 are color coded black, and scores of eight or

below are color coded red for visual purposes only. The same evaluation and scoring methodology will be used for both Legacy Force and SBCT doctrine. See table 3 Joint Publications, table 4 Legacy Field Manuals, and table 5 SBCT Field Manuals for further explanation.

Organizations

Organizations will be analyzed at the division level in the case of the legacy force and at the brigade level in the case of the SBCT as to their sub-organizations ability or mission to provide the four criteria of cover, concealment, camouflage, and deception. The reasoning for this is due to the fact that a legacy force brigade combat team's structure will be determined and resourced by its parent division. The divisional organization, therefore, must be analyzed. The divisional units that will be analyzed include the 10th Mountain Division, the 101st Airborne Division (Air Assault), the 82nd Airborne Division, and the 1st Infantry Division. This will address the basic organizations of light, air assault, airborne, and mechanized. The SBCT, meanwhile, is currently designed as a separate brigade organization and will therefore be analyzed at the brigade level. See figures 1, 2, 3, 4, and 5, respectively, for more information.

For the purposes of this analysis the following definitions of the criteria will apply:

Cover: The ability or mission of a unit or organization to provide protection from enemy direct and indirect fires.

Concealment: The ability or mission of a unit or organization to provide protection from all means of observation or surveillance to include but not limited to

visual, near infrared, infrared, ultraviolet, radar, moving target indicators, imaging, acoustic, radio, counter mortar, and counter battery.

Camouflage: The ability or mission of a unit or organization to provide materials or advice to confuse, mislead, or evade the enemy.

Deception: The ability or mission of a unit or organization to provide measures designed to mislead the enemy by manipulation, distortion or falsification of evidence, inducing him to react in a manner prejudicial to his interests.

Training

Real world deployments for the U.S. Army over the past fourteen years have included deployments to Panama, Haiti, Bosnia-Herzegovina, Kosovo, and Afghanistan. These military actions will be analyzed using Center for Army Lessons Learned (CALL) and open source material. The same methodology, criteria, and definitions that were used for doctrine will be used in this area.

Unit level training will be analyzed using the four CTC trends published since 1995. This includes the Joint Readiness Training Center (JRTC), the National Training Center (NTC), the Combat Maneuver Training Center (CMTC), and the Battle Command Training Program (BCTP). The same four criteria of cover, concealment, camouflage, and deception will be used with the same definitions as were used in the doctrine category. CALL publications will be reviewed with sustain and improve comments tracked in tabular form. The will produce the number of sustain and improve trends by branch over the past eight years. Specific recurring trends will be addressed individually in Chapter Four as a result of this analysis. See tables 6, 7, 8, and 9 for more information.

Unit Tactical Standard Operating Procedures (TACSOPs) will be analyzed by reviewing engineer unit TACSOPs from throughout the active force structure. The criteria to evaluate unit TACSOPs are based upon information found in Appendix B of FM 20-3, *Camouflage, Concealment, and Decoys*; and in FM 5-103, *Survivability*. The criteria include C3D fundamentals, C3D discipline rules, memory aids, guidelines, C3D postures, and procedures. The criteria are defined as follows:

C³D Fundamentals: The TACSOP provides a review of C³D fundamentals.

C³D Discipline Rules: The TACSOP addresses discipline rules such as light and noise discipline, minimum activity, litter control, correct uniform, cover, and concealment.

Memory Aid: The TACSOP includes memory aids for supervisors.

Guidelines: The TACSOP provides guidelines to provide uniformity among all subunits in relation to C³D covering such areas as unit, individual, fighting position, tactical vehicles, assembly areas, command posts, supply points, and water points.

C³D postures: Different postures, analogous to MOPP, are outlined in the TACSOP.

Procedures: Procedures are outlined for such missions as blackout, quartering party, unit movement, and the deployment area.

Mission Posture: Guidance is given for offensive, defensive, stability, and support operations.

The same evaluation and assessment methodology used for doctrine will be used for the unit TACSOPs. See Table 10 Unit TACSOPs for more information.

Materiel

The materiel available to the U.S. Army divisions and to the SBCT will be evaluated. A list of these materiel is available from the Army Materiel Command (AMC); Logistics Support Activity, Redstone Arsenal, Alabama; and from the Defense Logistics Service Center, Battle Creek, Michigan. The criteria to evaluate materiel as it relates to survivability operations include cover, concealment, camouflage, and deception. The materiel will be categorized as to their ability to be useful in the criteria areas. Trends such as quantity, quality, and applicability will be able to be deduced from this. See table 11 Materiel for more information.

Leadership and Education

TRADOC schools conduct institutional (individual) training. The main schools of concern here include AIT, BNCOC, ANCOG, OBC, and the CCC. The criteria used to assess this subject include instruction in the C3D areas of cover, concealment, camouflage, and deception. The focus of each area, however, will change based upon the school considered whereas the definition of the criteria will not. For example, the criteria of cover for evaluation purposes will be focused at the individual level for AIT whereas it will be focused at the collective level for OBC and the CCC. The same assessment methodology and definitions used for doctrine will be used in this area. See tables 12 and 13 for more information.

Personnel

The personnel category is divided into the areas of branch, officer military occupational specialty (MOS), warrant officer MOS, and enlisted MOS. Each area will be analyzed by the four criteria of cover, concealment, camouflage, and deception. The

purpose of the analysis will be to determine which branches and MOSs are responsible for each criteria. The results will be recorded in tabular form with a numeral “1” to indicate which branches and MOSs specifically identify each criteria. The source information will come from Department of the Army (DA) Pamphlet 611-12, *Military Occupational Classification and Structure*. Only those MOSs that are present within a legacy force brigade combat team (BCT) or the SBCT will be reviewed. See tables 14, 15, 16, and 17 for more information.

CHAPTER 4

ANALYSIS

Introduction

The purpose of this chapter is to describe the outcomes of the research conducted on survivability operations using the DOTMLP framework.

Doctrine

Joint doctrine does a reasonable job of describing the four aspects of survivability operations in various manuals. None of the publications, however, adequately describe all four aspects in the same publication. This information is shown in table 2. Joint Publications (JP) 3-10.1, 3-11, and 3-34 are the best in describing cover while JPs 3-0, 3-10, and 3-58 are the best in describing deception. None of the JPs, however, adequately describe either concealment or camouflage.

JP 3-34, *Engineer Doctrine for Joint Operations*, begins a trend seen in other joint publications and Army field manuals when it uses the terms of force protection and survivability interchangeably. Specifically, the publication states:

Combat engineering enables the JFC to freely maneuver the joint force (mobility), attack the enemy's ability to maneuver (counter mobility), and support force protection (survivability).¹ Combat engineering enhances operational movement, maneuver, and force protection by facilitating mobility, counter mobility, and survivability operations.²

JP 3-34 concisely defines survivability but does not define force protection, which contributes to the terminology ambiguity found within the Army field manuals. JP 3-34 does, however, discuss force protection in some detail. The standard operation plan annex designates Annex C, Appendix 15 as the force protection appendix. Also, the

publication states “the combatant commander may require the joint force engineer to provide a list of the forces available to support the protection plan.”³ The publication defines survivability as a:

Concept which includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. Survivability tactics include building a good defense; employing frequent movement; using concealment, deception, and camouflage; and constructing fighting and protective positions for both individuals and equipment.⁴

Finally, JP 3-34 contributes to a common misconception when it states “engineers provide support for cover, concealment, camouflage, and deception efforts beyond the supported unit’s capabilities to counter enemy intelligence operations and to protect the force from the effects of enemy fires.”⁵ This quotation may imply that engineers provide deception expertise. This issue will be discussed further when Army field manuals are discussed.

Army doctrine at the brigade level and below does not adequately address all of the aspects of survivability operations. Army doctrine for the Legacy Force is shown in Table 3. Most significantly, no one manual exists that adequately addresses all four aspects of survivability operations. Those manuals that address an aspect of survivability operations generally address only cover if an aspect is addressed at all. Concealment and camouflage, when addressed, are addressed inadequately and rarely. Army manuals, with the exceptions of FMs 20-3, 44-18, and 71-1, universally ignore the aspect of deception. Manuals that have not been updated since the 1980s and early 1990s seemed to do a better job of addressing concealment, camouflage and sometimes deception. FMs 7-91, 7-90, and 44-18 are the best examples of this.

More problematic than being inadequate, however, is the fact that current doctrine is contradictory. For example, FM 5-103 states:

The concept of survivability on the AirLand battlefield includes all aspects of protecting personnel, weapons, and supplies while simultaneously deceiving the enemy. The lethal battlefield requires commanders to know all survivability tactics available including building a good defense; employing frequent movement, using concealment, deception, and camouflage; and constructing fighting and protective positions for both individuals and equipment.⁶

FM 7-30, meanwhile, states “survivability operations consist primarily of preparing fighting and protective positions. Survivability operations also include NBC defenses.”⁷ Reading this FM alone, therefore, would give the average soldier the impression that survivability operations consist mainly of cover and NBC protection while giving no guidance as to concealment, camouflage, or deception. A similar problem exists within FM 7-10 when it states “survivability includes those activities and procedures that protect the company from the effects of NBC weapons.”⁸ FM 7-10, however, does not define what survivability is in the first place. FM 3-90 states “survivability operations protect friendly forces from the effects of enemy weapon systems.”⁹ FM 100-5 states “survivability operations protect friendly forces from the effects of enemy weapon systems and from natural occurrences.”¹⁰ Finally, FM 7-91 defines cover as “protection from the fire of enemy weapons and from enemy observation.”¹¹ These are but a few examples of where the current doctrine is contradictory or incomplete in regards to survivability operations.

The trend for the main weapon systems at the brigade level and below generally follows the same trend as for Army manuals stated above. Crew served weapons manuals are the only manuals to properly address the aspect of cover with the exception

of FM 23-67, *M60 Machine Gun*, which did not address it at all. FMs 23-34, 23-65, and 3-23.24 did address portions of concealment and camouflage although inadequately at best. The individual weapons systems focused purely on the mechanics and operation of the weapon and did not address any aspect of survivability operations at all. This included FMs 23-14, 23-31, 23-9, and 3-23.25.

The non-branch specific manuals, to include FMs 20-3, 3-0, 3-06.11, and 3-90, generally are excellent in addressing the four aspects of survivability operations. FM 3-0 is the exception in that it does not address any aspect at all. The other three FMs are well balanced as far as survivability operations are concerned and easy to understand.

The infantry manuals did the best job of the various branches in addressing the four aspects of survivability operations. The manuals addressed cover the best and sometimes addressed concealment. Camouflage and deception were rarely addressed at all. The best two manuals were FM 7-90 and 7-91 due to their balanced and detailed approach to survivability operations. FM 7-91 is noteworthy for its balanced discussions of cover, concealment, and camouflage. The manual, however, wrongly defines cover as “protection from the fire of enemy weapons and from enemy observation.”¹²

FM 7-90, *Tactical Employment of Mortars*, was the best manual within any branch. The manual could serve as the model manual as far as survivability operations are concerned, because of its ability to serve as a stand alone manual without extensive research into other manuals such as FM 5-103. Each of the techniques covered is unique to the weapon system yet vital to the weapon system’s survival on the battlefield. The manual includes excellent discussions of enemy threats including ground and air, survivability techniques such as the use of defilade and reverse-slope positions, position

placement in MOUT, dismounted position staged construction, and high survivability mortar position construction. It also includes other survivability techniques to include shoot and hide positions, camouflage, frequent displacement, and the use of a roving gun.

The engineer manuals did the second best job of any branch in addressing the four aspects of survivability operations. The manuals, however, focused primarily on cover to the exclusion of concealment, camouflage, and deception. The best manuals were FMs 5-103 and 5-34, which included definitions, explanations, and sketches.

The Armor branch manuals were third best, overall. Noteworthy among the armor manuals was extensive discussion concerning the use of smoke contained within FM 71-1, *Tank Company and Mechanized Infantry Team*, Appendix G. The appendix discusses several aspects concerning the use of smoke to include deception, screening, sources of smoke, tactical considerations in smoke operations, and countermeasures against enemy smoke.

The Field Artillery and Aviation branch manuals discuss various aspects of survivability operations but not adequately or extensively. Finally, the Signal, ADA, Military Police, CSS, and Medical branch manuals focus almost exclusively upon their branch specific issues without addressing any aspect of survivability operations more than in passing.

An examination of US Army doctrine in regard to survivability operations would be incomplete, however, without contrasting this doctrine to that of other nations. Soviet military doctrine, for example, learned and practiced the art of deception at all levels of warfare during World War II. Deception at the tactical level was conducted by corps and below and had the goal of hiding activities associated with battle preparation.¹³

Deception was achieved by maintaining radio silence; concealing command and control and troop regroupings; disseminating false information to the enemy; camouflaging the assembly areas of supporting units; and creating dummy troop concentrations, command posts, and defensive installations.¹⁴ In fact, the Soviet term *maskirovka* in its full sense encompasses camouflage, concealment, cover, misinformation, and operations security, as well as deception.¹⁵ Some aspects of *maskirovka* may be worth further study and incorporation into U.S. Army doctrine.

The field manuals specific to the SBCT followed the same general trends as those found for the legacy force branch manuals. The SBCT Field Manual information is shown in Table 5. The trends include terminology confliction and inadequate treatment of all four aspects of survivability operations.

Organizations

Divisional organizations were evaluated as to their suborganizations directly or indirectly related to survivability organizations. These suborganizations included engineer, chemical, field artillery, and mortar units. Engineer units were classified as “cover” organizations while the field artillery and mortar units were classified as “concealment” organizations. Chemical units were classified as both cover and concealment units because their decontamination capability serves a cover purpose while their smoke capability serves a concealment purpose. Camouflage was determined to be an individual unit responsibility with no one organization solely or primarily responsible for its conduct at the tactical level. Finally, all units were determined to be capable of contributing to deception operations and thus no one unit is solely or primarily

responsible for it. The divisions were also evaluated as to their capabilities and limitations impacting upon their ability to conduct survivability operations.

Overall the engineer units within the divisions and the SBCT are austere in their ability to provide cover. Units that provide concealment are almost identical within all of the units with the exception of the absence of a chemical unit within either the light division or the SBCT. For this reason, an examination of the concealment capability within an organization must be based partly upon the characteristics of the tubes that make up the field artillery and mortar organizations. These characteristics are as follows:

Table 2. Field Artillery and mortar tube concealment capabilities

TYPE WEAPON	TYPE ROUND	TIME TO BUILD (MIN)	AVERAGE BURN TIME (MIN)
60 MM	WP	0.5	1
81 MM	WP	0.5	1
105 MM	WP	0.5	1 TO 1.5
105 MM	HC	1 TO 1.5	3
120 MM	WP	0.5	1
155 MM	WP	0.5	1 TO 1.5
155 MM	HC	1 TO 1.5	4
155 MM	M825	0.5	5 TO 10

The table above clearly shows the marked advantage the 155 millimeter (mm) howitzers can provide for concealment both in terms of build time and average burn time especially when the M825 round is used. The best to worst rounds for concealment in terms of average burn time are M825, HC, and WP. The white phosphorous round,

meanwhile, provides basically the same capability no matter what size the delivery weapon.

The organizational structure for a light division is shown in figure 1. The light division is designed to disperse widely throughout a large area and conduct synchronized, but decentralized, operations primarily at night or during periods of limited visibility.¹⁶ Massing of light division forces occurs only when the risk is low and the payoff is high.¹⁷ The division conducts operations exploiting the advantages of restricted terrain and limited visibility.¹⁸ The light division has many capabilities and limitations in regard to survivability operations. Key capabilities include strategically deployability. Key limitations include susceptibility to NBC attack and enemy artillery attacks and tactical mobility.

Assets useful for cover within the engineer battalion of the light division include 18 Small Emplacement Excavators (SEEs) and six DEUCES. This means the division would require 0.64 SEE days and 5.36 DEUCE days, not counting travel time, to provide cover for its 54 x 105 mm howitzers, 8 x 155mm howitzers, 36 x Avengers, 18 x Stinger teams, 36 x HMMWV TOWs, 36 x 81 mm mortars, 54 x 60 mm mortars, 162 x JAVELINs, 51 x MK19s, and 27 x 0.50 cal machine guns.¹⁹

The light division does not have any type of organic chemical unit. The division, therefore, has no organic decontamination capability and no smoke capability other than smoke pots, howitzer, or mortar smoke. The number of howitzer and mortar tubes for concealment purposes within a light division were shown in the preceding paragraph. The concealment capability for these tubes is dependent upon the number and type of rounds fired.

The organizational structure for an air assault division is shown in figure 2. The essence of modern-day air assault tactics is rapid tempo of operations over extended ranges by air assault task forces.²⁰ The air assault division is best employed as a complete division in high-tempo, offensive operations, capitalizing on vertical envelopments and vertical turning movements.²¹ Key capabilities for the division include versatility and flexibility, terrain and obstacle independence, and speed of execution. Key limitations include limited organic ground mobility, vulnerability to NBC and enemy artillery attacks, and the requirement to defeat or avoid enemy ADA.

Assets useful for cover within an air assault engineer battalion include 27 SEEs and 12 JD450 bulldozers. This means the division would require 0.94 SEE days and 6.62 dozers days to provide cover for its 54 x 105 mm howitzers, 8 x 155mm howitzers, 48 Avengers, 45 Stinger teams, 180 x HMMWV TOWs, 36 x 81 mm mortars, 54 x 60 mm mortars, 162 Dragons, 254 x MK19s, and 203 x 0.50 cal machine guns.²²

The chemical company of the division contains eighteen M56 smoke systems and eighteen M17A3 LDS systems.²³ This gives the company the capability to provide 9 operational decon sites or three thorough decon sites and to produce three (1 kilometer by 5 kilometer) smoke hazes. The numbers of howitzer and mortar tubes within the division were given above. The amount of smoke the division is able to provide from these assets, like the light division, is dependent upon the number and type of rounds fired.

The organizational structure for an airborne division is shown in Figure 3. The airborne division conducts airborne assaults in the enemy's rear to secure terrain or to interdict routes of resupply or enemy withdrawal.²⁴ Key capabilities and limitations are the same as the air assault division.

For the purpose of cover, an airborne engineer battalion consists of 24 SEE's and six D5B bulldozers. This means the division would require 0.94 SEE days and 13.03 dozers days to provide cover for its 54 x 105 mm howitzers, 48 Avengers, 36 Stinger teams, 180 x HMMWV TOWs, 36 x 81 mm mortars, 54 x 60 mm mortars, 162 Dragons, 254 x MK19s, and 203 x 0.50 cal machine guns.²⁵

For the purpose of concealment, an airborne chemical company consists of nine officers, one warrant officer, and 114 enlisted soldiers. Major systems within the company include eighteen M157 smoke generator systems and eighteen M17 light decontamination systems (HMMWV).²⁶ This gives the company the capability to operate nine operational decontamination sites or three thorough decontamination sites. The company can also produce three smoke hazes approximately one by five kilometers in size. The chemical company's assets and capabilities are therefore the same as for the air assault division. The number of howitzer and mortar tubes are also the same as for the air assault division.

The organizational structure for a mechanized division is shown in Figure 4. The primary mission of the heavy division is to deploy on short notice and destroy, capture, or repel enemy forces using maneuver and shock effect. Key capabilities include the ability to accomplish rapid movement, conduct sustained combat operations, and conduct sustained operations in a NBC environment.²⁷ Key limitations include restricted mobility in urban areas, jungle and dense forest, steep and rugged terrain, and significant water obstacles.

Assets useful for cover within the engineer brigade of the heavy division include 18 SEEs and 63 ACEs. This means the division would require 1.76 ACE days to provide

cover for its 210 M2 Bradley Fighting Vehicles, 24 BSFVs, 24 Avengers, 40 Stingers, 210 M1 Abrams tanks, 54 x 155mm howitzers, and 60 x 120 mm mortars.²⁸ This assumes hull defilade positions for the vehicles. The amount of SEE days required depends upon the number and type of positions dug by the SEEs.

The chemical company of a heavy division consists of twelve decontamination squads divided into four platoons. The company also has a smoke platoon with seven smoke generators.²⁹ This gives the heavy division a greater decontamination capability but a lesser concealment capability than that of the other divisions. The number of howitzers and mortars within a heavy division were given in the paragraph above. The capability of the howitzers, however, is considerably greater than that of the light, air assault, and airborne divisions due to the greater number of 155 mm howitzers available.

The organizational structure for the SBCT is shown in figure 5. The mission of the SBCT is to fight and win small scale contingency operations in complex and urban terrain against a force that employs conventional and asymmetric capabilities.³⁰ Key capabilities include strategic and tactical mobility, dismounted close combat, and early entry divisional force capability. Key limitations include high intensity conflict versus armored forces.

The engineer company within the SBCT is equipped with six SEEs and six DEUCES.³¹ This organizational cover capability can not be readily compared to the legacy division cover capability due to the different war fighting methods which the SBCT is intended to use. The two most distinctive qualities of the SBCT are its mobility and dismounted close combat, so its higher mobility is intended to compensate for its reduced cover capability. Some of the TTPs that the SBCT might use, therefore, are

similar to some of the lessons learned derived from operations in Haiti and Bosnia. If the capabilities were compared in the same manner as the legacy divisions, however, the brigade would require 0.82 SEE days and 11.55 DEUCE days to provide cover for its 12 M-198 155mm howitzers, 109 Infantry Carrier Vehicles (ICVs), 30 Mortar Carriers (MC), nine Mobile Gun Systems (MGS), 24 Command Vehicles (CV), 12 x 81 mm mortars, 18 x 60 mm mortars, 48 Recon Vehicles (RV), 16 Medical Evacuation Vehicles (MEV), 12 Fire Support Vehicles (FSV), and 117 Javelins.

The SBCT, like the light division, does not organically possess a chemical unit. It therefore has no decontamination capability nor does it possess a concealment capability other than what its field artillery and mortars can provide. The field artillery consists of 12 M198 towed 155mm howitzers. The brigade also contains 30 x 120 mm, 12 x 81 mm, and 18 x 60 mm mortars. Like the divisional organizations, the concealment capability provided by these tubes depends upon the number and type of rounds available.

The RSTA Squadron could possibly be considered a survivability asset when viewed through the spectrum of survivability operations and future war fighting TTPs. The SBCT is designed to see and understand first through robust reconnaissance, surveillance, and target acquisition combined with linkages to other intelligence, surveillance, and reconnaissance assets. This is supposed to give the SBCT the capability to give battle at a time and place of its choosing therefore reducing the need for robust cover capability.

Training

Operation Enduring Freedom best highlights the contemporary operational environment (COE) and provides several survivability operations related observations.

Key to understanding the COE is the use of asymmetric, adaptive approaches. The enemy in Afghanistan sought to avoid U.S. strength while exploiting perceived U.S. weaknesses. Cover could only be provided by terrain masking because of the lack of heavy vegetation or manmade objects in the valleys and mountainous terrain.³²

Camouflage and concealment observations from Afghanistan included: wear gloves for camouflage, camouflage and dispersion were a necessity for all forces, optics needed to be shaded in order to reduce their visual signature, equipment must be moved as the sun moved to reduce reflections, and the camouflage of positions was essential.³³ Forces in Afghanistan also determined that there was a need for fly away packaging for force protection gear.³⁴

The Combined Arms Assessment Team (CAAT) addressing Operation Enduring Freedom in Afghanistan in 2002 provides few details in the area of survivability operations. It does, however, include a chapter on operational force protection that addresses some survivability operations issues. Terminology confusion is evident in this book when it defines operational force protection as including “actions taken to counter the enemy’s forces by making friendly forces, systems, and operational facilities difficult to locate, strike, and destroy.”³⁵

Operation Joint Endeavor in Bosnia in 1995 provided four key observations applicable to survivability operations in general and to the SBCT in particular. First of all, terminology intermingling was a problem. The definition of force protection operations for the operation included “all actions, direct and indirect, to preserve the combat power of the force.”³⁶ Second, one after action report identified two approaches to reducing casualties: the “survivability” approach was to build fortified base camps

while the “mobility” approach was to remain highly mobile and rely on that increased mobility to reduce casualties by denying a hostile faction the opportunity to observe, plan and attack.³⁷ Leaders in Bosnia learned that, in conventional operations, remaining highly mobile relative to an adversary provided a degree of dominance leading to an increased level of force protection.³⁸ Because leaders in Bosnia chose a combination of the two approaches, the overriding survivability theme throughout Operation Joint Endeavor was that requirements were extremely class IV intensive.³⁹ Third, leaders learned that optempo affected force protection. Finally, they determined that force protection measures had significant deterrent value. The need for force protection operations to encompass any action required greater awareness at all levels regarding the factors which may impact upon those operations.⁴⁰ Leaders also determined that all forms of media should be used to maintain the force protection issue awareness.⁴¹

Operation Uphold Democracy in Haiti in late 1994 and early 1995 started out as a planned combat operation but quickly turned into stability operation. Key survivability operations observations from this time period include the need for personal awareness, vehicle survivability, and TTPs to counter the sniper threat.⁴² The single most proactive anti-terrorism measure was found to be individual awareness for things out of place.⁴³ Vehicles were layered with sandbags in order to protect personnel from landmines.⁴⁴ Finally, TTPs to counter a sniper threat included: a response technique for soldiers to use against snipers; specific weapon systems or soldiers designated to scan for snipers; and adequate barriers and shields constructed around checkpoints and OPs.⁴⁵

The primary missions of the infantry in Haiti could be broken into two categories: tactical missions and security operations.⁴⁶ Light cavalry was assessed to have superior

mobility over mounted terrain than other ground units due to their higher concentration of vehicles.⁴⁷ This is closely related to the Bosnia observation that mobility conferred a degree of protection on US troops. One problem encountered by soldiers was that they could not sit in the cargo bed of a High Mobility Multi Wheeled Vehicle (HMMWV) and face out.⁴⁸ Also, most HMMWVs were not equipped to mount a weapon system.⁴⁹ Leaders had to consider soldier load when developing the force protection measures due to the high temperatures encountered in Haiti.⁵⁰ Force protection had to be continually improved because of the time requirement necessary to construct proper positions.⁵¹ Units used off the shelf security equipment to conduct access control operations.⁵² Finally, there was minimal engineer involvement in the initial planning process which adversely impacted upon force protection planning and initial execution.⁵³

Operations in Somalia in 1993 provided similar lessons as those observed in Haiti with the exception of a significantly increased mine threat. Vehicular survival was still key and personal awareness was still the single most proactive antiterrorism measure.⁵⁴ The mine threat in Somalia was extensive and severely impacted upon initial Allied movements with extensive booby trap activity noted in some areas.⁵⁵

Several survivability operations observations were evident during the first Persian Gulf War. First of all, it is important to note that deception has played a major role in every modern desert war.⁵⁶ The first Persian Gulf War was no exception. The XVIII Airborne Corps conducted extensive deception operations both during Operation Desert Shield and Operation Desert Storm. Key lessons from the activities included: corps and division deception cells must be consolidated and tactical level deception can make best use of operational assets.⁵⁷ Additionally, a relatively small element consisting of a signal

company, four PSYOP sonic teams, a combat heavy engineer platoon, a smoke/decontamination platoon, and an infantry platoon produced outstanding results for the corps.⁵⁸ The First Cavalry Division also planned and participated in a major deception operation in order to deceive Saddam Hussein into believing that Coalition Forces would attack up the Wadi Al Batin into Kuwait.⁵⁹

Camouflage and concealment observations during the first Persian Gulf War included: strong shadows are readily observed from the air, dig in equipment and use overhead cover or camouflage nets to reduce shadows, move vehicles and equipment as the sun moves, shade optics to prevent reflection, light and noise at night may be seen or heard from miles away so light and noise discipline are essential, move at night to conceal sand and dust trails, and use terrain such as wadis to conceal movement.⁶⁰ Cover observations included: cover can only be provided by terrain masking due to the lack of heavy vegetation or manmade objects, survivability positions are normally more important than antitank ditches, and survivability positions must be stressed especially when fighting outnumbered.⁶¹

Several survivability operations related lessons learned were gleaned during Operation Just Cause in Panama in December 1989. Most of these were related to the use and type of equipment or to METT-TC considerations. For example, the use of sandbags improved the survivability of thin-skinned and armored vehicles in MOUT.⁶² The Kevlar helmet, meanwhile, stopped bullets that would have penetrated the old steel helmet and body armor was effective at stopping grenade fragments and ricochets.⁶³ METT-TC analysis was essential to the balancing of conflicting needs. For example, the use of body armor, the destruction of street lights, and road block positioning should all

be based upon METT-TC in order to balance force protection, mission, and soldier load issues.⁶⁴ Finally, the use of GLINT tape for marking procedures was effective to reduce fratricide.⁶⁵

The analysis for the Combat Training Centers (CTC) is summarized in Tables 6, 7, 8, and 9 for JRTC, NTC, CMTC, and BCTP respectively. Two significant trends are immediately obvious from these tables. First, it is interesting to note there was only one positive or negative comment concerning deception among the four CTCs. This indicates either that deception is not performed at the CTCs, or that the Observer / Controllers (OC) at the CTCs do not comment upon deception. Either way, this indicates a lack of emphasis on deception at the tactical level within the United States Army. The second is that the number of cover comments far outweighs the number of concealment, camouflage, and deception comments combined. This possibly indicates the United States Army predilection for cover at the expense of other options in order to increase the survivability of our organizations. This is especially troublesome since cover is usually associated with defensive operations, and the United States Army is an offensively focused organization.

The JRTC comments regarding the four aspects of survivability operations are overwhelmingly weighted towards cover and the majority of cover observations fall into the “improve” category. The improve comments themselves are fairly well spread among the branches which tends to indicate that all branches need improvement in this area. Relatively few comments are made regarding concealment and camouflage for either sustain or improve. This is interesting considering the JRTC’s focus upon the full spectrum of military operations with its three-phased rotational cycle.

The JRTC trends also indicate a terminology conflict between the terms of force protection and survivability operations. The majority of combat branch comments tend to use the term survivability operations whereas the combat support and combat service support branches tend to use the term force protection. This is despite the fact that the two terms are being used to describe similar situations within the JRTC environment.

The NTC displays similar trends to JRTC with the exception that the ratio of cover “improves” to cover “sustains” is far greater at NTC. Many more comments in the area of Nuclear, Biological, and Chemical (NBC) were noted, however, due to the NTC’s increased emphasis upon high intensity operations and NBC attacks in conjunction with this. The NBC comments were included under the aspect of cover. Almost all of these comments were improves rather than sustains which indicates severe unpreparedness in this area.

There were far fewer CALL Newsletters in regards to CMTC and BCTP but similar trends are evident at these training centers even with the limited data available. These trends include the majority of trends falling under the cover aspect of survivability operations and the majority of the cover trends were improves rather than sustains.

The unit TACSOP summary is shown in Table 10. None of the reviewed TACSOPs provided any sort of review of the cover, concealment, and deception (CCD) fundamentals and only one provided any guidance for unit CCD discipline in the field. All of the TACSOPs provided some sort of inspection checklist. The most common checklists included Pre-Combat Checks / Pre-Combat Inspection (PCC/PCI), and pack lists. Other checklists found in the TACSOPs included N-Hour, OPSEC, liaison officer, reconnaissance, and change in task organization checklists. None of the TACSOPs

included a chart of the enemy's possible sensors with possible countermeasures. The 2nd Engineer Brigade, however, is the only reviewed unit that has a defined enemy. All other units are expected to be able to deploy throughout the world against a variety of enemies and enemy capabilities.

Guidelines on CCD discipline are normally limited to a discussion and sketch of various vehicle fighting and protective positions. There is no information regarding tactics, techniques, and procedures (TTPs) regarding CCD for specific areas or operations such as supply points, water points, individuals, or command posts. CCD postures, if addressed, are limited to delineation of a "REDCON" status. The use of REDCON status, however, is limited to mechanized forces. Non-mechanized forces do not include a REDCON status in their TACSOPs. The most detailed REDCON SOP is contained within the 1st Engineer Battalion's TACSOP. Procedures outlined in the TACSOPs are limited to quartering party and unit movements. No TACSOPs outlined blackout procedures and few outlined procedures for use within a deployment area. Finally, most of the TACSOPs included offensive and defensive planning considerations, but none addressed C³D issues for offensive, defensive, stability, and support operations. The 65th Engineer Battalion, however, included an annex discussing stability and support operations issues.

FM 7-20, *The Infantry Battalion*, Appendix A discusses a unit TACSOP. The discussion includes a list of annexes that can be included in a battalion OPORD although not all are required. The list includes Annex C, Operations, Appendix 6 entitled "Cover and Deception."⁶⁶

Materiel

Materiel within the U.S. Army inventory is plentiful and varied, but it is difficult to obtain a single source copy of what materiel is available. A partial list of materiel available is shown in table 11. The materiel can be divided into multiple, dual, and single use materiel. For example, camouflage screens and LCSS support sets are useful for multiple purposes to include concealment, camouflage, and deception. Materiel such as diesel fuel, smoke generators, and smoke pots are useful for the dual purposes of concealment and deception. Other materiel, however, are only useful for one purpose. The various types of decoys are excellent for deception purposes but have limited to no value for cover, concealment, or camouflage purposes. The various types of paint, meanwhile, are excellent for camouflage but are not useful for cover, concealment, or deception.

Leadership and Education

School commandants are responsible for developing schooling and assignment policies, determine branch specific task and knowledge requirements, standards of proficiency, and for company grade officer' formal training. "The school commandant, in his role as branch proponent, is an important participant in the leader development process and the MQS system."⁶⁷

Eleven different branches within the US Army were questioned as to if and how they teach survivability operations within their various courses to include AIT, BNCOC, ANCOC, OBC, and CCC. The branches questioned included Engineer, Infantry, Armor, Field Artillery, Aviation, Air Defense Artillery, Military Police, Signal, Chemical, Transportation, and Quartermaster.

Most of the branches responded that survivability operations are taught at the various courses, but they are embedded into the subjects of offensive or defensive operations. Not all aspects of survivability operations are addressed, however, with camouflage and cover receiving the most attention and concealment and deception receiving the least attention. The responses from the Air Defense Artillery School and the Armor School were fairly representative of the responses received from the other schools in terms of if and how survivability operations are taught. This information is contained in tables 12 and 13 respectively.

Personnel

Department of the Army Pamphlet 611-21, *Military Occupational Classification and Structure*, identifies 25 different branches within the United States Army. This researcher evaluated sixteen of the branches for this study. Only four of the branches, however, specifically identified at least one of the four aspects of survivability operations. This information is shown in table 14. The branches include the Infantry, Armor, Military Intelligence, and Chemical branches. The Infantry branch “directs communications, location and construction of infantry positions and ground obstacles, and camouflaging of positions and equipment.”⁶⁸ The Armor branch also “directs communications, location and construction of positions, and camouflaging of positions and equipment.”⁶⁹ The Chemical branch “advises commander and staff on chemical and nuclear employment, defensive actions involving chemical, biological, and radiological warfare, and plans for use of and defense against smoke and flame employment.”⁷⁰ Finally, the Military Intelligence branch “performs clandestine human intelligence operations and manages signals intelligence operations including jamming and

participating in performing deception operations.”⁷¹ It is interesting to note that the Engineer branch is not responsible for any aspect of survivability operations to include cover in its branch description.

There are only two officer MOSs that specifically identify at least one of the four aspects of survivability operations. These two MOSs are 21B Combat Engineer and 74B Chemical Operations and Training. This information is shown in Table 15. The 21B MOS provides “survivability support.”⁷² The 74B MOS, meanwhile, “recommends plans for use of, and defense against employment of incendiary materiel and smoke/obscurants” along with recommending “chemical and biological defensive . . . and operational activities.”⁷³ No warrant officer MOS specifically identifies any aspect of survivability operations. This information is shown in Table 16. Finally, there are 212 enlisted MOSs. This researcher evaluated thirty-two of these MOSs and identified 17 MOSs that included at least one, and in most cases two, of the aspects of survivability operations. This information is shown in Table 17. The most common phrase among the MOSs was “constructs and camouflages position” which addresses both cover and camouflage.

The Chemical branch is the only branch whose branch description is vertically nested with both an officer MOS down to an enlisted MOS. This means the branch is responsible for the aspects of cover and concealment. This responsibility is translated down to an officer MOS (74B) and subsequently down to an enlisted MOS (54B). The Infantry and Armor branches, meanwhile, are responsible for cover and camouflage. This responsibility is translated down to their respective enlisted MOSs but bypasses their officer MOSs. Finally, the Military Intelligence (MI) branch is responsible for deception

but no officer, warrant officer, or enlisted MOSs within the MI branch are specifically responsible for this task. These linkages are essential to understanding who is responsible for what under the Army's MOS and branch system.

There currently is no individual MOS designed specifically for all aspects of survivability operations. One doctrinal manual, however, provides a view into what MOS should have primary responsibility for all aspects of survivability operations. FM 7-20, *The Infantry Battalion*, states "engineers provide staff advice on camouflage, cover, and concealment."⁷⁴ The manual also goes on to state that "the engineers' role includes advising and aiding the battalion in camouflage and deception measures to include concealment, dummy positions, and decoy construction."⁷⁵ As was shown previously, however, this does not agree with DA Pamphlet 611-21.

STP 21-1-SMCT, *Soldier's Manual of Common Tasks*, includes numerous tasks that are considered common to all soldiers. Some of these tasks include perform individual camouflage, construct individual fighting position, and 21 different tasks to protect against NBC attack. STP 21-I-MQS, meanwhile, includes similar tasks that are precommissioning requirements. These tasks include camouflage self, individual equipment, and position; practice noise, light, and litter discipline; seven NBC defense training tasks; and one mobility and survivability task (the NBC Warning and Reporting System). Finally, STP 21-II-MQS requires all lieutenants to be able to perform 19 NBC tasks and all captains to be able to perform two additional NBC tasks.

Conclusion

Numerous weaknesses are evident across the DOTMLP in regard to survivability operations. Some of the weaknesses can be corrected quickly and inexpensively while

other weaknesses can not be corrected unless significant amounts of time and money are dedicated to their improvement. All of the weaknesses, however, can and should be corrected in order to improve the overall war fighting capability of the United States forces.

¹U.S. Department of Defense, Joint Chiefs of Staff, Joint Publication 3-34, *Engineer Doctrine for Joint Operations* (Washington, D.C.: Government Printing Office, July 2000), v.

² *Ibid.*, vii.

³ *Ibid.*, III-1.

⁴ *Ibid.*, V-4.

⁵ *Ibid.*, IV-3.

⁶ U.S. Department of the Army, FM 5-103, *Survivability* (Washington, D.C.: Government Printing Office, June 1985), 1-1.

⁷ U.S. Department of the Army, FM 7-30, *The Infantry Brigade* (Washington, D.C.: Government Printing Office, October 1995), 2-14.

⁸ U.S. Department of the Army, FM 7-10, *Infantry Company* (Washington, D.C.: Government Printing Office, December 1990), 1-6.

⁹ U.S. Department of the Army, FM 3-90, *Tactics* (Washington, D.C.: Government Printing Office, July 2001), 2-5.

¹⁰ U.S. Department of the Army, FM 100-5, *Operations* (Washington, D.C.: Government Printing Office, 1993), 1-2.

¹¹ U.S. Department of the Army, FM 7-91, *Anti-Armor Platoons, Companies, Battalions* (Washington, D.C.: Government Printing Office, September, 1987), 2-4.

¹² *Ibid.*, 2-4.

¹³ Richard N. Armstrong, *Soviet Operational Deception: The Red Cloak* (Fort Leavenworth, Kansas: Combat Studies Institute, December, 1988), 1.

¹⁴ Ibid., 2.

¹⁵ Ibid., 3.

¹⁶ U.S. Department of the Army, FM 71-100-2, *Infantry Division Operations Tactics, Techniques and Procedures* (Washington, D.C.: Government Printing Office, 31 August 1993), 1-1.

¹⁷ Ibid., 1-1.

¹⁸ U.S. Department of the Army, FM 71-100 Division Operations. (Washington, D.C.: Government Printing Office, 16 June 1990), 1-5.

¹⁹ United States Army Force Management Support Agency (USAFMSA), TOE 77000A100, *Light Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, October 2001).

²⁰ U.S. Department of the Army, FM 71-100-2, *Infantry Division Operations Tactics, Techniques and Procedures* (Washington, D.C.: Government Printing Office, 31 August 1993), 1-1.

²¹ Ibid., 1-3.

²² United States Army Force Management Support Agency (USAFMSA), TOE 77000A100, *Light Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, October 2001).

²³ United States Army Force Management Support Agency (USAFMSA), TOE 77000A100, *Light Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, October 2001).

²⁴ U.S. Department of the Army, FM 71-100-2, *Infantry Division Operations Tactics, Techniques and Procedures* (Washington, D.C.: Government Printing Office, 31 August 1993): 1-4.

²⁵ United States Army Force Management Support Agency (USAFMSA), TOE 77000A100, *Light Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, October 2001).

²⁶ United States Army Force Management Support Agency (USAFMSA), TOE 77000A100, *Light Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, October 2001).

²⁷ United States Army Force Management Support Agency (USAFMSA), TOE 87000A200, *Mech Infantry Division*, (Fort Leavenworth, Kansas: USAFMSA, March 2002).

²⁸ Ibid.

²⁹ Ibid.

³⁰ U.S. Department of the Army, Headquarters. "IBCT Organizational Concept" <https://ibct.army.mil/briefings.xml> (12 December 2001), Slide 2.

³¹ Anthony O Wright, "Concept and Organization of the IBCT Engineer Company," *Engineer*. (May 2001), 6-9.

³² U.S. Department of the Army, Center for Army Lessons Learned Handbook 02-8, *Operation Enduring Freedom Tactics, Techniques, and Procedures* (Fort Leavenworth, Kansas: CALL June 2002), 8.

³³ Ibid., 9,31.

³⁴ Ibid., 59.

³⁵ U.S. Department of the Army, Center for Army Lessons Learned *Combined Arms Assessment Team Operation Enduring Freedom* (Fort Leavenworth, Kansas: CALL September 2002), 149.

³⁶ U.S. Department of the Army, Center for Army Lessons Learned *Bosnia "Heads-Up" Information Disk Volume 1* (Fort Leavenworth, Kansas: CALL September 1996), 59.

³⁷ U.S. Department of the Army, Center for Army Lessons Learned. *Operation Joint Endeavor Initial Impressions II* (Fort Leavenworth, KS: CALL September 1996), 45.

³⁸ U.S. Department of the Army, Center for Army Lessons Learned *Bosnia "Heads-Up" Information Disk Volume 1* (Fort Leavenworth, Kansas: CALL September 1996), 35.

³⁹ Ibid., 28.

⁴⁰ Ibid., 60.

⁴¹ Ibid., 60.

⁴² U.S. Department of the Army, Center for Army Lessons Learned Newsletter 94-3, *Haiti* (Fort Leavenworth, Kansas: CALL, 1994), III-9,11,14.

⁴³ *Ibid.*, III-11.

⁴⁴ *Ibid.*, III-10.

⁴⁵ *Ibid.*, III-14.

⁴⁶ U.S. Department of the Army, Center for Army Lessons Learned, *Operation Uphold Democracy Initial Impressions* (Fort Leavenworth, Kansas: CALL December 1994), 113.

⁴⁷ U.S. Department of the Army, Center for Army Lessons Learned, *Operation Uphold Democracy Initial Impressions Volume III* (Fort Leavenworth, Kansas: CALL July 1995), 111.

⁴⁸ U.S. Department of the Army, Center for Army Lessons Learned, *Operation Uphold Democracy Initial Impressions* (Fort Leavenworth, Kansas: CALL December 1994), 114.

⁴⁹ U.S. Department of the Army, Center for Army Lessons Learned, *Operation Uphold Democracy Initial Impressions* (Fort Leavenworth, Kansas: CALL December 1994), 134.

⁵⁰ *Ibid.*, 126.

⁵¹ *Ibid.*, 127.

⁵² *Ibid.*, 131.

⁵³ *Ibid.*, 185.

⁵⁴ U.S. Department of the Army, Center for Army Lessons Learned Newsletter 93-1, *Somalia* (Fort Leavenworth, Kansas: CALL January 1993), 19,21.

⁵⁵ *Ibid.*, Appendix B.

⁵⁶ U.S. Department of the Army, Center for Army Lessons Learned Newsletter 90-8, *Winning in the Desert II* (Fort Leavenworth, Kansas: CALL September 1990), 5.

⁵⁷ Gary P. Melton, "XVIII Airborne Corps Desert Deception," *Military Intelligence* (Oct-Dec 1991), 45.

⁵⁸ *Ibid.*, 44.

⁵⁹ Patrecia S. Hollis, “1st Cav in Desert Storm Deception, Firepower, and Movement,” *Field Artillery* (June 1991), 31.

⁶⁰ U.S. Department of the Army, Center for Army Lessons Learned Newsletter 90-7, *Winning in the Desert* (Fort Leavenworth, Kansas: CALL August 1990), 22.

⁶¹ *Ibid.*, 23.

⁶² U.S. Department of the Army, Center for Army Lessons Learned Bulletin 90-9, *Operation Just Cause Lessons Learned Volume III* (Fort Leavenworth, Kansas: CALL October 1990), III-15.

⁶³ *Ibid.*, III-11.

⁶⁴ U.S. Department of the Army, Center for Army Lessons Learned Bulletin 90-9, *Operation Just Cause Lessons Learned Volume I and II* (Fort Leavenworth, Kansas: CALL October 1990), I-19, II-14, II-18.

⁶⁵ *Ibid.*, II-9.

⁶⁶ U.S. Department of the Army, FM 7-20, *Infantry Battalion* (Washington, D.C.: Government Printing Office, December 2000), A-16.

⁶⁷ U.S. Department of the Army, STP 21-II-MQS *Military Qualification Standards II Manual of Common Tasks For Lieutenants and Captains* (Washington, D.C.: Government Printing Office, January 1991), A1.

⁶⁸ U.S. Department of the Army, Army Pamphlet 611-21, *Military Occupational Classification and Structure* (Washington, D.C: Government Printing Office, March 1999), 10.

⁶⁹ *Ibid.*, 10.

⁷⁰ *Ibid.*, 33.

⁷¹ *Ibid.*, 14.

⁷² *Ibid.*, 12.

⁷³ *Ibid.*, 33.

⁷⁴ U.S. Department of the Army, FM 7-20, *Infantry Battalion* (Washington, D.C.: Government Printing Office, December 2000), 7-21.

⁷⁵ Ibid., 7-21.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this chapter is to make recommendations for changes to the DOTMLP based upon the analysis outcomes derived in chapter 4.

Doctrine

The survivability operations related terminology must be standardized within both the joint publications and the Army field manuals. This can best be achieved by using the term “survivability operations” to refer to all aspects of cover, concealment, camouflage, and deception (C³D) that apply at the tactical level of war. Further it should be limited to the combat zone of operations in the offense and/or the defense as far as the spectrum of war is concerned. “Force protection” or “protection” should be used to refer to operations at the strategic and operational levels of war across the full spectrum of conflict and to the tactical level of war for stability and support operations.

Joint Publication 3-34 *Engineer* should be updated to reflect all aspects of survivability operations to include cover, concealment, camouflage, and deception. This will help to standardize terminology within the military engineer community and to help define what each of the services can provide in these areas. Joint Publication 3-58 *Joint Deception*, however, should remain as the capstone manual for deception operations.

FM 5-103 *Survivability* must be updated and selectively combined with FM 20-3 *Camouflage, Concealment, and Decoys* in order to produce a single source document that addresses all aspects of survivability operations. This new manual should be referred to as FM 5-103 *Survivability Operations*. Significant changes have occurred in the world

environment, in Army doctrine, and in joint doctrine since FM 5-103 was last updated in June 1985. The Army's operational doctrine, FM 3-0 *Operations*, has undergone not just one but three revisions since the Cold War ended over twelve years ago and joint doctrine did not even exist. Over ninety-six joint manuals have been published in the intervening years with eighteen more under development. This has resulted in a survivability field manual that is severely out of step with the current needs of the Army. The contemporary operational environment (COE) and threat have changed to the point of being unrecognizable in the current version of FM 5-103. In addition, the full range of Army operations conducted today is not addressed in the manual. Defense is the only aspect addressed in the range of conflict with no consideration or guidance given to the offense in regard to survivability operations. This is all despite the fact that protection is one of the five elements of combat power. As stated earlier, those activities related to survivability operations conducted during stability and support operations at the tactical level should be referred to as "force protection" or "protection operations." Finally, FM 5-103 as currently written focuses only upon fighting and protective positions (cover) and does not address any of the aspects of concealment, camouflage, or deception.

Each weapons related field manual should, at a minimum, completely address the cover and camouflage related issues involved with that weapon system. This includes phased fighting position construction diagrams similar to that found for the M16/M4 rifle in FM 7-8, *The Infantry Rifle Platoon and Squad*. It also includes the minimum overhead cover requirements and construction methods. Finally, it includes concealment and deception related issues peculiar to that weapon system. This will provide readily

available guidance focused upon the weapon system rather than just the general guidance provided in FM 5-103.

Branch field manuals should address each aspect of survivability operations peculiar to that branch for both offensive and defensive operations and also for various terrain encountered by the U. S. Army over the past 15 years to include at a minimum desert, jungle, woodland, mountain, and MOUT.

The SBCT field manuals should also be rewritten to emphasize survivability operations during both offensive and defensive operations. The terminology ambiguity should also be fixed by implementation of the recommendations made above.

Organizations

No new organizations at the tactical level are needed to fulfill camouflage or deception requirements. Each organization is currently responsible for its own camouflage requirements and this should remain unchanged. Organizations dedicated solely to fulfill deception requirements are not required since these organizations can be formed by ad hoc organizations already available within the Army inventory. This concept is best illustrated by the activities of the XVIII Airborne Corps on 13 February 1991 when various organizations including a signal company, four PSYOP teams, a combat heavy engineer platoon, a smoke/decontamination platoon, and an infantry platoon consisting of approximately 300 personnel successfully executed the corps deception plan that supported the operational course of action.¹

Cover organizations are too austere within the non-mechanized divisions and should be enhanced with more digging capability. This recommendation, at first brush, runs counter to the strategic direction framed for the Army in its Objective Force white

paper but the recommendation is sound. The white paper envisions a force that will be able to develop situations out of contact, maneuver to a position of advantage, and then engage the enemy from beyond his weapons range.² The force will also be able to destroy the enemy with precision fires and maneuver and tactically assault the enemy capability at a time and place of our choosing.³ These capabilities were displayed in Operation Iraqi Freedom, but the limitations are also on display. The COE and asymmetric threat evident both in Iraq and in Afghanistan argue for a more robust cover organization capable of quickly providing cover to the exposed combat support and combat service support organizations that are quickly becoming the preferred targets of our enemies.

Concealment organizations within all the organizations are too austere and should be enhanced with more concealment capability. This will have the dual effect of both providing more concealment capability to the organizations while also providing the capability to resource a useful deception organization if needed. This has been proven at the NTC by the use of smoke for a deception breach point.

Finally, the Army should develop a projectile with similar capabilities of the 155mm M825 round, but capable of being delivered from a 120 mm mortar or a 105mm howitzer. This would greatly enhance the concealment capability deliverable by a division or even by a brigade in terms of smoke produced based on the average burn time for the projectiles' fillers.

Training

Lessons learned collection for Army operations over the past 15 years through CALL are adequate. More emphasis must be placed upon collecting tactical level

survivability operations lessons learned. The current method of collection merely results in a litany of “dos and don’ts” rather than in a comprehensive analysis of what actions were taken and the success or failure of those actions.

The American Army conducts operational level deception very well. Examples of this include Operation Bodyguard in support of Operation Overlord prior to the invasion of Europe and Operation Pastel Two for the invasion of Japan during World War II. The deception operation associated with Operation Desert Shield and Desert Storm in 1991 is also a good example. Tactical level deception, however, is either not conducted or not recorded as well. For this reason, increased emphasis must be placed upon the use of deception at the tactical level within the United States Army. Combining FMs 5-103 and 20-3 will assist in placing emphasis on the use of deception at the tactical level but this will only partly address the problem. The four CTCs must coach the use of deception at the brigade and division levels and also report the “sustain” and “improve” trends associated with these activities. If the CTC trends over the past six years are to serve as any sort of a guide, then this is currently not being done.

There also is a need for increased emphasis upon concealment and camouflage at both the CTCs and during real world operations. Most concealment and camouflage comments are “improve” rather than “sustain” comments. This emphasis will assist the offensive orientation of the US Armed Forces by allowing for their use across the entire spectrum of conflict rather than just in the defense.

The emphasis upon cover at the CTCs is adequate but more reporting is required regarding the success or failure of survivability operations while in the offense. The current trends from the CTCs show an emphasis upon NBC operations and the use of

cover while in the defense only. Numerous activities can and should be undertaken while in the offense in order to protect personnel, weapons, and equipment.

Unit TACSOPs should be updated in order to address the various criteria used in this study. This includes the guidelines for TACSOPs found in Appendix B of FM 20-3.

These guidelines include:

- A review of C³D fundamentals
- Rules of unit C³D discipline
- Memory aids for supervisors to include an inspection checklist and a chart of an enemy's sensor systems with possible countermeasures
- Guidelines on C³D discipline to provide uniformity among all subunits
- The different C³D postures
- Procedures for blackout, quartering party, unit movement, and the deployment area
- Appropriate C³D postures in OPORDs for different missions

Two things became evident from conducting research for the TACSOP portion of this study. First, Army units should replace the current system of vehicle bumper numbers and replace it with a coded system like that used in Korea. A great deal of information can be gleaned about a unit by merely watching the 24 hour news channels and easily identifying a particular unit merely by its vehicle bumper number. Second, units should review their websites in order to ensure critical information is not transmitted via their website. A favorite tactic of the Opposing Forces (OPFOR) at JRTC is to review a unit's website prior to a rotation in order to learn everything possible about that unit. This information becomes critical in developing courses of action against the

unit. This researcher also used the Internet to conduct research and was amazed at the breadth and depth of information that was available that probably should not have been.

Materiel

The recommended consolidated FM 5-103 *Survivability Operations* should include a consolidated list of C³D materiel available with an appendix each for cover, concealment, camouflage, and deception related materiel. There currently is no readily available single source for this information. The publication of a consolidated list in FM 5-103 would give leaders a quick reference of what materiel is available along with providing possible ideas of what can be fabricated in the field in order to meet tactical exigencies. The list shown in Table 10 is heavily focused upon concealment and camouflage materiel with only a few deception materiel and little cover materiel listed.

Finally, off-the-shelf materiel should be published and made available to fulfill short-term requirements. There are numerous examples of materiel located within the civilian sector that could be used to fulfill military C³D requirements. Some examples include the numerous amount of materiel shown at meetings or conferences such as the Engineer Force Conference (ENFORCE).

Leadership and Education

Survivability operations should be taught as a stand-alone subject rather than as an embedded subject in all TRADOC schools to include BNCOC, ANCOC, OBC, and CCC. The focus of the class should obviously be on aspects peculiar to that particular branch or MOS. This is especially true of the BNCOC and ANCOC course since most

enlisted MOS descriptions list cover and camouflage as being part of the duty description for each MOS.

There needs to be increased emphasis of survivability operations and survivability operations TTPs at all levels of TRADOC instruction. Enlisted MOSs should be taught via both classroom and practical exercises while officer MOS instruction should focus upon classroom instruction combined with historical examples.

Personnel

The Engineer branch description should be modified to include some of the aspects of survivability operations. The aspect of cover should be included at a minimum, but all aspects should be considered of inclusion due to the unique nature of the Engineer branch spanning the combat, combat service, and combat service support functions.

The Military Intelligence branch should include concealment along with deception in its branch description. The branch is already responsible for being the “enemy” expert and as such is responsible for being knowledgeable on all enemy observation capabilities. It is not a great leap to make the branch responsible for educating the rest of the US forces on all assets that the enemy employs to detect and identify US soldiers, equipment, and supporting installations. These assets can include visual, near infrared (NIR), infrared (IR), ultraviolet (UV), acoustic, and multispectral / hyperspectral.⁴

The combat branches normally “drive the train” as far as survivability operations are concerned. For this reason, combat branch descriptions should include deception within their branch descriptions. This would emphasize the role that deception can play

in successful operations and provide guidance for branch commandants as to what to include in their respective branch courses. In addition to this, the combat branches should all include cover and camouflage in their descriptions. This means that the field artillery, aviation, and special forces branches should add cover and camouflage to their branch descriptions.

All officer, warrant officer, and enlisted MOS descriptions must vertically nest with their respective branch descriptions and horizontally nest with each other as necessary in order to fix survivability operations responsibilities. This is currently not the case and has resulted in a smattering of descriptions that bear no correlation to each other as far as survivability operations are concerned. This means that, for example, the infantry branch description would nest with its officer MOS descriptions, which would nest with its enlisted MOS descriptions. See tables 11, 12, 13, and 14 for more information.

Finally, all enlisted MOS descriptions must include cover and camouflage within their MOS descriptions. Every soldier should be knowledgeable on how to protect his or her own person and equipment through the use of cover and camouflage. This information is taught at a basic level during basic training and advanced individual training but it is not generally taught at a higher level during BNCOC and ANCO. This can and must change in order to facilitate success of the US Army upon the modern battlefield and in light of the COE.

Conclusion

Survivability operations are vital to the success of US legacy and SBCT forces. The lack of emphasis across DOTMLP, however, on all four aspects of survivability

operations is a potential harbinger of disaster at the worst, or increased cost in terms of personnel, equipment, and weapons at the best in the future. Changes must be made across DOTMLP in order to ensure that survivability operations are integrated within DOTMLP, nested within all combat operations, and emphasized equally in both offensive and defensive operations.

The transformation of the United States Army to the Objective Force in the coming years will continue to change the role of survivability operations. Whether this role will increase or decrease and how survivability operations can and must change to support the force are worthy of continued study.

¹ Gary P. Melton, "XVIII Airborne Corps Desert Deception," *Military Intelligence* (Oct-Dec 1991), 44.

² U.S. Department of the Army, "United States Army White Paper Concepts for the Objective Force" (Washington, D.C.: Government Printing Officer, October 1999), 6.

³ *Ibid.*, 6.

⁴ U.S. Department of the Army, FM 20-3, *Camouflage, Concealment, and Decoys* (Washington, D.C.: Government Printing Office, 20 October 1995), 2-2.

Table 3. Joint Publications

Name	Joint Pub	Cover	Concealment	Camouflage	Deception	Overall
Joint Operations	3-0	2	2	2	7	13
Urban Operations	3-06	3	1	1	4	9
Rear Area Operations	3-10	3	2	2	6	13
Base Defense	3-10.1	5	4	4	4	17
NBC Environments	3-11	7	1	1	1	10
Joint Force Capabilities	3-33	1	1	1	1	4
Engineer Doctrine	3-34	6	3	3	2	14
Joint Deception	3-58	1	1	1	7	10

Rating Criteria

7 = Full Explanation with Sketch

6 = Full Explanation

5 = Partial Explanation

4 = Paragraph Explanation

3 = 2-3 Sentence Explanation

2 = 1 Sentence Mentioned

1 = No Mention At All

Table 4. Legacy Force Field Manuals

	FM	Cover	Concealment	Camouflage	Deception	Overall
Weapons	23-14 M249 Light MG	1	1	1	1	4
	23-27 MK19 40mm MG	4	1	1	1	7
	23-31 M203 40mm Grenade	1	1	1	1	4
	23-34 TOW Weapon System	7	4	4	1	16
	23-65 Browning MG M2 .50	7	4	4	1	16
	23-67 M60 MG 7.62mm	1	1	1	1	4
	23-9 M16A1 Rifle Marksman	1	1	1	1	4
	3-23.24 Dragon Med AT	7	4	1	1	13
	3-23.25 LAW Lt AntiArmor	1	1	1	1	4
44-18 Stinger	1	1	4	4	10	
Non Branch	20-3 Camo, Conceal, Decoy	1	7	7	7	22
	3-0 Operations	1	1	1	1	4
	3-06.11 Comb Arms Urban	7	6	7	1	21
	3-90 Tactics	6	6	6	6	24
Aviation	1-112 Attack Helicopter Ops	4	3	1	1	9
	1-113 Utility Cargo Helo Ops	3	4	3	1	11
Signal	11-43 Signal Leader Handbk	2	2	2	1	7
ADA	3-01.11 ADA Reference	1	1	1	1	4
	44-18-1 Stinger Operations	1	1	1	1	4
	44-43 Bradley Stinger Veh	1	1	1	1	4
	44-44 Avenger	1	1	1	1	4
Field Artillery	3-09.21 FA Battalion TTP	1	1	1	1	4
	3-09.31 FS CDR	1	1	1	1	1
	3-09.70 TTP for M109 Howit	1	4	2	1	8
Military Police	3-19.1 MP Operations	1	1	1	1	4
	3-19.4 MP Platoon Leader	3	1	1	1	6
	3-7 NBC	1	1	1	1	4
Armor	3-20.15 Tank Platoon	5	4	3	2	14
	3-90.3 Mounted Bde Cbt Tm	2	2	1	1	6
	71-1 Tank Company	3	2	2	3	10
	71-2 Tank BN Tst Force	1	1	1	1	4
CSS	4-93.50 Forward Spt BN	1	1	1	1	4
Engineer	5-10 Engineer Platoon Ldr	5	2	3	1	11
	5-103 Survivability	7	4	7	1	19
	5-34 Engineer Field Data	7	3	5	1	16
	5-71-2 Armor TF Engineer	2	2	2	1	7
	5-71-3 BEngr Cbt Ops (AR)	2	1	1	1	5
	5-7-30 Light BDE Engr	2	2	1	1	6
Infantry	3-21.71 Mech Inf Plt/Sqd	7	2	2	1	12
	7-10 Infantry Company	2	1	1	1	5
	7-20 Infantry Battalion	2	1	1	2	6
	7-30 Infantry Brigade	2	2	2	1	7
	7-7J Mech Infantry Bradley	7	2	2	1	12
	7-8 Infantry Rifle Plt/Sqd	7	2	2	1	12

Table 4. Legacy Force Field Manuals Continued

	FM	Cover	Concealment	Camouflage	Deception	Overall
	7-90 Tactical Emplo Mortars	7	5	4	4	20
	23-90 Mortars	3	3	1	1	8
	7-91 AntiArmor Plt/Co/Bn	6	5	4	1	16
Medical	8-10-5 Brigade Surgeon	1	1	1	1	4
	4-02.4 Medical Plt Leader	1	2	2	1	6
	4-02.6 Medical Company	1	1	1	1	4

Rating Criteria

7 = Full Explanation with Sketch

6 = Full Explanation

5 = Partial Explanation

4 = Paragraph Explanation

3 = 2-3 Sentence Explanation

2 = 1 Sentence Mentioned

1 = No Mention At All

Table 5: Stryker Brigade Combat Team Field Manuals

NAME	FM	Cover	Concealment	Camouflage	Deception	Overall
TTP Fires	BST 3-09.41	5	5	4	4	18
RSTA SQD	3-20.96	4	3	3	3	13
Recon PLT	3-20.98	3	3	2	2	10
MGS PLT	3-20.151	4	2	3	1	10
Recon Trp	3-20.971	3	3	2	2	10
INF PLT/SQD	3-21.9	4	2	2	1	9
SBCT INF CO	3-21.11	3	2	1	1	7
SBCT INF BN	3-21.21	3	2	2	1	8
SBCT INF BDE	3-21.31	3	2	2	1	8
SBCT Recon PLT	3.21.94	3	2	3	1	9
C4 Operations	6-02.2	2	1	1	1	5
SBCT Intel Ops	2-19.402	2	1	2	1	6
ENGR OPS	3-34.221	5	3	3	3	14

Table 6: Joint Readiness Training Center Survivability Operations Related Training Trends

CTC	Cover		Concealment		Camouflage		Deception	
	Sustain	Improve	Sustain	Improve	Sustain	Improve	Sustain	Improve
Engineer	7	2						
Infantry	1	9			1	1		
Armor								
Aviation	1	6						
ADA		3		1				
Field Arty	2	11						
MP	1	3		2		2		
Signal		5						
Chem	6	12	2	1				
CSS		9						
MI		1						
JRTC	18	61	2	4	1	3	0	0

Sources:

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends Joint Readiness Training Center* NO. 02-5, 4th Quarter 2000 and 1st Quarter 2001. Fort Leavenworth, KS: CALL, April 2002.

- _____. NO. 01-13, Fort Leavenworth, KS: CALL, June 2001.
- _____. NO. 01-6, Fort Leavenworth, KS: CALL, March 2001.
- _____. NO. 01-2, Fort Leavenworth, KS: CALL, January 2001.
- _____. NO. 00-2, Fort Leavenworth, KS: CALL, February 2000.
- _____. NO. 99-7, Fort Leavenworth, KS: CALL, July 1999.
- _____. NO. 98-20, Fort Leavenworth, KS: CALL, September 1998.
- _____. NO. 98-7, Fort Leavenworth, KS: CALL, April 1998.
- _____. NO. 97-19, Fort Leavenworth, KS: CALL, November 1997.
- _____. NO. 97-6, Fort Leavenworth, KS: CALL, February 1997.
- _____. NO. 96-9, Fort Leavenworth, KS: CALL, October 1996.

Table 7. National Training Center Survivability Operations Related Training Trends

CTC	Cover		Concealment		Camouflage		Deception	
	Sustain	Improve	Sustain	Improve	Sustain	Improve	Sustain	Improve
Engineer		7						
Infantry		7						
Armor					1			
Aviation		4						
ADA	1	4						
Field Arty		4						
MP								
Signal		1						
Chem	3	49		6				
CSS		23						
MI		2						
NTC	4	101	0	6	1	0	0	0

Sources:

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends National Training Center* NO. 02-7, 1st and 2nd Quarter 2000. Fort Leavenworth, KS: CALL, June 2002.

- _____. NO. 01-12, Fort Leavenworth, KS: CALL, June 2001.
- _____. NO. 01-11, Fort Leavenworth, KS: CALL, May 2001.
- _____. NO. 01-8, Fort Leavenworth, KS: CALL, March 2001.
- _____. NO. 99-10, Fort Leavenworth, KS: CALL, August 1999.
- _____. NO. 99-1, Fort Leavenworth, KS: CALL, January 1999.
- _____. NO. 98-14, Fort Leavenworth, KS: CALL, July 1998.
- _____. NO. 98-4, Fort Leavenworth, KS: CALL, February 1998.
- _____. NO. 97-17, Fort Leavenworth, KS: CALL, September 1997.
- _____. NO. 97-16, Fort Leavenworth, KS: CALL, August 1997.
- _____. NO. 97-9, Fort Leavenworth, KS: CALL, February 1997.
- _____. NO. 97-3, Fort Leavenworth, KS: CALL, January 1997.

Table 8. Combat Maneuver Training Center Survivability Operations Related Training Trends

CTC	Cover		Concealment		Camouflage		Deception	
	Sustain	Improve	Sustain	Improve	Sustain	Improve	Sustain	Improve
Engineer								
Infantry	1	1						
Armor								
Aviation								
ADA		1		1		1		
Field Arty								
MP								
Signal								
Chem								
CSS	1	3				1		
MI								
CMTTC	2	5	0	1	0	2	0	0

Sources:

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends Combat Maneuver Training Center*, 1st and 2nd Quarters FY95. Fort Leavenworth, KS: CALL, 1998.

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends Combat Maneuver Training Center*, 4th Quarter FY95 and 1st Quarter FY96. Fort Leavenworth, KS: CALL, 1998.

U.S. Department of the Army, Center for Army Lessons Learned. Newsletter 98-9. Fort Leavenworth, KS: CALL, 1998.

Table 9. Battle Command Training Program Survivability Operations Related Training Trends

CTC	Cover		Concealment		Camouflage		Deception	
	Sustain	Improve	Sustain	Improve	Sustain	Improve	Sustain	Improve
Engineer		2						
Infantry								1
Armor								
Aviation								
ADA								
Field Arty								
MP								
Signal								
Chem		1		1				
CSS								
MI								
BCTP	0	3	0	1	0	0	0	1

Sources:

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends Battle Command Training Program Perceptions FY95*. Fort Leavenworth, KS: CALL, 1996.

U.S. Department of the Army, Center for Army Lessons Learned. *CTC Trends Battle Command Training Program Perceptions II FY95*. Fort Leavenworth, KS: CALL, 1996

Table 10. Engineer Unit Tactical Standard Operating Procedures

UNIT	DIV	CCD FUNDAMENTALS	CCD DISCIPLINE	MEMORY AIDS	GUIDE LINES	CCD POSTURES	PROCEDURES	POSTURES MISSIONS
2 EN BDE	2 ID	No	No	5/7	5/8	Redcon	2/4	2/4
20 EN BDE	XVIII ABC	No	No	3/7	0/8	0	2/4	2/4
1 EN BN	1 ID	No	No	2/7	1/8	Redcon	3/4	2/4
2 EN BN	2 ID	No	No	5/7	5/8	Redcon	2/4	2/4
44 EN BN	2 ID	No	No	5/7	5/8	Redcon	2/4	2/4
65 EN BN	25 ID	No	No	1/7	5/8	0	0/4	0/4
82 EN BN	1 ID	No	No	3/7	2/8	Redcon	2/4	0/4
299 EN BN	4 ID	No	Yes	3/7	3/8	Redcon	3/4	2/4
326 EN BN	101 ID	No	No	1/7	0/8	0	0/4	0/4

Source:

U.S. Department of the Army, 1st Engineer Battalion. *1st Engineer Battalion TACSOP*. Germany, 2002.

_____, 2nd Engineer Brigade. *2nd Engineer Brigade TACSOP*. Camp Howze, Korea, 2002.

_____, 2nd Engineer Battalion. *2nd Engineer Battalion TACSOP*. Camp Castle, Korea, 2002.

_____, 20th Engineer Brigade. *20th Engineer Brigade TACSOP*. Fort Bragg, North Carolina, 2002.

_____, 44th Engineer Battalion. *44th Engineer Battalion TACSOP*. Camp Howze, Korea, 2002.

_____, 65th Engineer Battalion. *65th Engineer Battalion TACSOP*. Schofield Barracks, Hawaii, 2002.

_____, 82nd Engineer Battalion, *82nd Engineer Battalion TACSOP*. Warner Barracks, Bamberg, Germany, 2002.

_____, 299th Engineer Battalion, *299th Engineer Battalion TACSOP*. Fort Hood, Texas, 2002.

_____, 326th Engineer Battalion, *326th Engineer Battalion TACSOP*. Fort Campbell, Kentucky, 2002.

Table 11. Survivability Operations Related Materiel

ITEM	NSN	COVER	CONCEAL	CAMOU	DECEP
Camo enamel, black	8010-00-111-8356			X	
Camo enamel, black	8010-00-111-8005			X	
Camo enamel, sand	8010-00-111-8336			X	
Camo enamel, sand	8010-00-111-7988			X	
Camo screen, ultralite, asphalt/concrete	1080-01-338-4468		X	X	X
Camo screen, ultralite, green/tan	1080-01-338-4471		X	X	X
Camo screen, ultralite, snow/partial snow	1080-01-338-4469		X	X	X
Camo support set, ultralite (A Frame)	1080-01-338-4472			X	
Connector plug, w/o gen -test	5935-01-050-6586				
Connector, receptacle, electrical CCK-77/E	1370-01-171-1336				
Control, remote smoke gen, MXK-856/E32	1080-01-338-7051		X		
Decoy target, bailey bridge	1080-00-650-1098				X
Decoy target, how, 105-mm	1080-00-570-6519				X
Decoy units, inflating, radar, AN/SLQ-49	5865-01-266-3840				X
Decoy, aircraft, ground (F-16)	1080-01-301-8273				X
Decoy, close combat, M1A1 tank	1080-01-242-7251				X
Decoy, close combat, M60A3 tank	1080-01-242-7250				X
Decoy, runway (FOS)	1080-01-338-5201				X
Diesel fuel, DF-1	9140-00-286-5288		X		
Diesel fuel, DF-2	9140-00-286-5296		X		
Diesel fuel, DF-2	9140-00-286-5297		X		
Drum, S&S, 55 gallon	8110-00-292-9783				
Drum, S&S, 55 gallon	8110-00-597-2353				
Explosive, airburst projectile launch atk	1055-01-175-4002				X
Federal standard colors 595-B	7690-01-162-2210			X	
Gen set, smoke, mech, M157	1040-01-206-0147				
Gen, signal radio freq	6625-00-937-4029				
Gen, smoke, mech, A/E32U-13	1040-01-338-8839		X		
Gen, smoke, mech, M3A	1040-00-587-3618		X		
Gen, smoke, mech, M3A4	1040-01-143-9506		X		
Indiv camo cover, 3 color woodland	8415-01-280-3098			X	X
Indiv camo cover, 6 color desert	8415-01-280-5234			X	X
Indiv camo cover, snow	8415-01-282-3160			X	X
Launcher rckt, 1 bay launcher, LMU-23E	1055-01-131-7857		X		
Launcher rckt, 4 bay launcher, OMU-23E	1055-01-144-0864		X		
LCSS support set, desert	1080-00-623-7295		X	X	X
LCSS support set, snow	1080-00-556-4954		X	X	X
LCSS support set, woodland	1080-00-108-1173		X	X	X
LCSS, desert, radar-scattering	1080-00-103-1211		X	X	X
LCSS, desert, radar-transparent	1080-00-103-1217		X	X	X
LCSS, snow, radar-scattering	1080-00-103-1233		X	X	X
LCSS, woodland, radar-scattering	1080-00-103-1246		X	X	X
Lead acid btry, 24V, BB-297U	6140-00-059-3528		X		
Mounting kit, smoke gen, M284	1040-01-249-0272		X		X

Table 11. Survivability Operations Related Materiel Continued

ITEM	NSN	COVER	CONCEAL	CAMOU	DECEP
Net, multipurpose, olive-green mesh	8465-00-889-3771		X	X	X
Paint, temp, tan	8010-01-326-8079			X	
Paint, temp, white	8010-01-129-5444			X	
Pump inflating, manual, smoky flak	4320-00-822-9036		X		
Reflector, radar, Coast Guard buoy marker	2050-01-225-2779		X		X
Simulator, atomic explosion, M142	1370-00-474-0270			X	
Simulator, projectile airburst, PJU-7A/E	1370-01-279-9505				
Smoke pot, 30lb, HC, M5	1365-00-598-5207		X		X
Smoke pot, floating, HC	1365-00-939-6599		X		X
Smoke pot, floating, HC, M4A2	1365-00-598-5220		X		X
Smoke SAM rocket, GTR-18A	1340-01-130-6282		X		X
Support poles, camo net, ultralite	1080-01-338-4470		X	X	
Tool, special purpose, smoky flak	5120-01-176-2188				
Trailer, ground handling, MHU-141/M	1740-01-031-5868		X		
Valve adapter assy, smoky flak	1055-01-216-4803		X		
Valve, pneumatic tank, smoky flak	4820-00-427-5047-		X		
Wrench, bung	5120-00-045-5055				
Picket, Long	5660-00-270-1587	X			
4"x4"x8' Lumber	5510-00-272-7753	X			
4"x4"x6' Lumber	5510-00-555-9117	X			
Plywood 3/4"x4'x4'	5530-01-408-2249	X			
Plywood 3/4"x4'x6'		X			
Plastic (4.5'x50yd, 2200 psi)	8135-00-050-7698	X			
Sandbag	8105-00-142-9345	X			X
Smoke Grenades	G930		X		X

X = Applicable to this aspect of survivability operations

Blank = Not applicable to this aspect of survivability operations

Source:

U.S. Department of the Army, Headquarters. FM 5-103 *Survivability*. Washington, D.C. 10 June 1985.

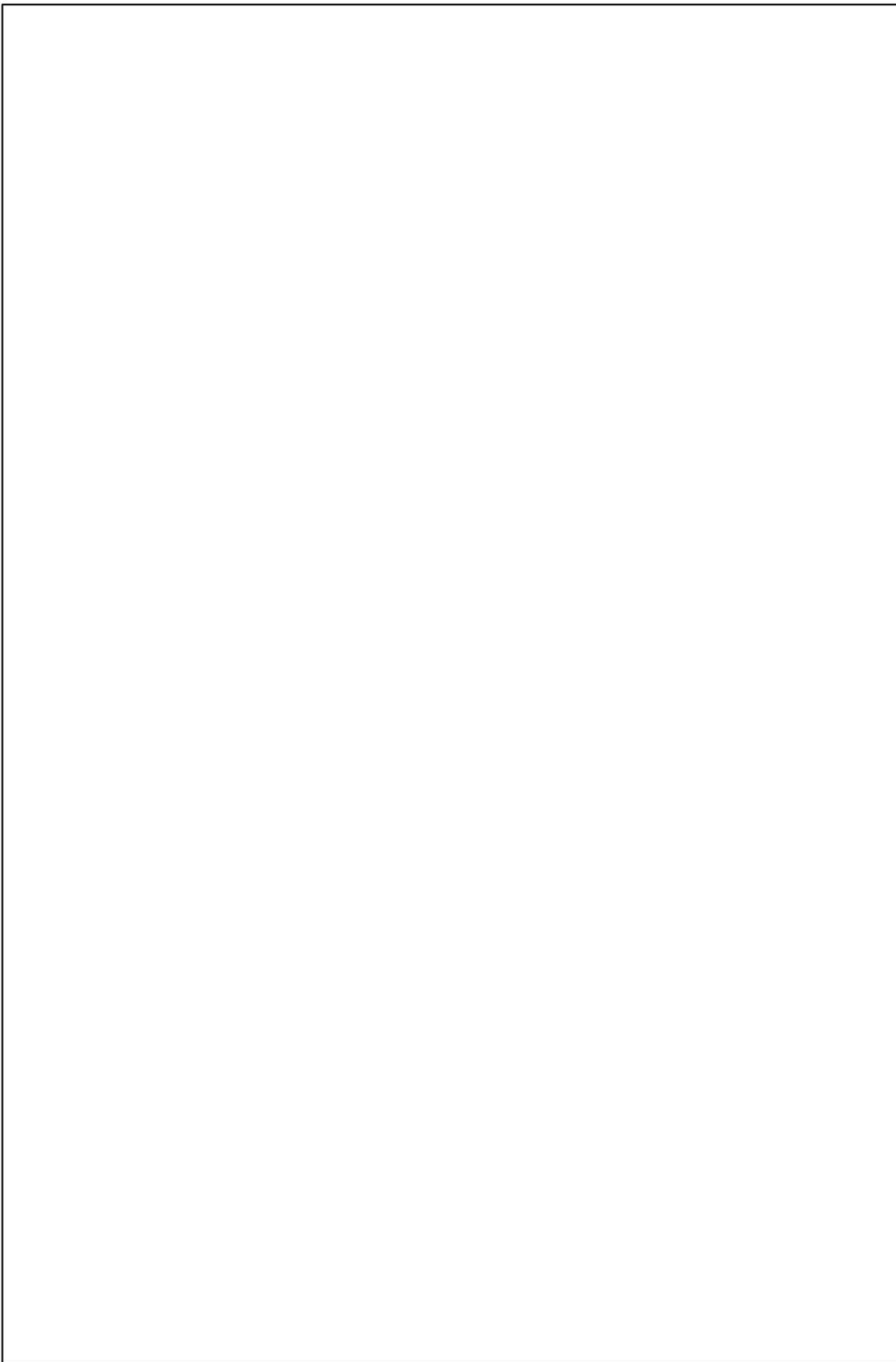


Table 13: Armor Schools

	19K10 OSUT	19D10 OSUT	19K BNCOC	19D BNCOC	19K ANCOC	19D ANCOC	Armor OBC	Armor CCC	Armor PCC
Course length	16 weeks 0 days	16 weeks	6 weeks 3 days	6 weeks 3 days	11 weeks 2 days	11 weeks 2 days	17 weeks	12 weeks 0 days	2 weeks
Taught	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	No
Embedded in Another Subject	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	Ycs	
Subject	TactMvmt Individual TactTNG Locate Mines	LP/OP Camou Equip Individ Camou	UXO Smoke FightPsn TactMvmt	TactMvmt ReconOps Infil/Exfil ScreenMsn	Convoy CP Ops BattlePsn PltDef TactMvmt	HastyObs Plt BP ObsRestrict TactMvmt PassageLine	FightPsn SurvStd PL Respon	TF Offense TF Defense FTX	
All Aspects	No	No	No	No	No	No	No	Passive Defense	
Length of Instruction	10.5	8 hrs	8 hrs	19 hrs	30 hrs	19 hrs	3 hrs	12 hrs 10 Days	

Source: Rick Armstrong. Armor Training Development Division Chief. Interview by author, 6 February 2003, Fort Leavenworth, E-mail. USACGSC, Fort Leavenworth.

Table 14: Branch Descriptions

Branch	Cover	Concealment	Camouflage	Deception
Infantry	X		X	0
Armor	X		X	0
Field Artillery				0
ADA				
Aviation				0
SF				0
Engineer	0			0
Signal				
MP				
MI		0		X
Civil Affairs				
AG				
Chemical	X	X		
Transportation				
Ordnance				
Quartermaster				

X = Specifically mentioned in branch description

0 = Should be mentioned in branch description

Blank = No mention in branch description

Source:

U.S. Department of the Army, Headquarters, Department of the Army Pamphlet 611-21
Military Occupational Specialty and Structure, Washington, D.C. 21 March 1999.

Table 15. Officer Military Occupational Specialty Definitions

MOS	NAME	Cover	Concealment	Camouflage	Deception
11A	Infantry	0		0	0
12A	Armor, General	0		0	0
12B	Armor	0		0	0
12C	Cavalry	0		0	0
13A	FA, General				0
14A	ADA, General				
14B	SHORAD				
14D	Hawk Missile				
15	Aviation, General				0
21B	Combat Engineer	X			0
25A	Signal, General				
31A	Military Police				
35D	All Source Intel				0
35E	CounterIntel				0
38A	CA, General				
74B	ChemOps&Tng	X	X		
74C	ChemMunMatMgt				
88A	Trans, General				
91B	MaintMgmt				
92A	Quartermst, Gen				
FA35	MI				0

X = Specifically mentioned in MOS description

0 = Should be mentioned in MOS description

Blank = No mention in MOS description

Source:

U.S. Department of the Army, Headquarters, Department of the Army Pamphlet 611-21
Military Occupational Specialty and Structure, Washington, D.C. 21 March 1999.

Table 16: Warrant Officer Military Occupational Specialty Definitions

MOS	NAME	Cover	Concealment	Camouflage	Deception
131A	TGT ACQ RDR TECH				
140A	C2 Sys Integrator				
140B	SHORAD Sys Tech				
140D	HAWK Sys Tech				
140E	Patriot Sys Tech				
152B	OH58A Pilot				
152D	OH58D Pilot				
152F	AH64 Attack Pilot				
153D	UH60 Pilot				
210A	Util Op& Maint Tech				
256A	Sig Sys Maint Tech				
350B	All Source Intel Tech				
880A	Marine Deck Officer				
910A	Armt Rep Tech				

X = Specifically mentioned in MOS description

Blank = No mention in MOS description

Source:

U.S. Department of the Army, Headquarters, Department of the Army Pamphlet 611-21
Military Occupational Specialty and Structure, Washington, D.C. 21 March 1999.

Table 17: Enlisted Military Occupational Specialty Definitions

MOS	NAME	Cover	Concealment	Camouflage	Deception
11B	Infantryman	X		0	
11C	Indirect Fire Inf	X		X	
11H	Hvy AA Wpn Inf	X		X	
11M	Fight Veh Inf	X	X	X	
12B	Combat Engineer	X		0	
12C	Bridge Crewmember	X		0	
13B	Cannon Crewmember	X		X	
13C	TAFSC Specialist	X		X	
13D	FATDS Specialist	0		0	
13E	Cannon FD Specialist	X		X	
13F	Fire Support SPC	X		X	
13R	RA Firefinder Rdr Op	X		0	
14M	MANPADS Crewmember	0		0	
14R	Bradley Linebacker Crew	0		0	
14S	Avenger Crewmember	0		0	
18B	SF Weapons SGT	X		0	
18C	SF Engr SGT	X		0	
18D	SF Medical SGT	0		0	
18E	SF Commo SGT	0		0	
18F	SF Intell SGT	0		0	
19D	Cavalry Scout	X	X	X	
19K	M1 Armor Crewman	0		X	
51H	Construction Engr Sprvisor	0		0	
54B	Chem Ops SPC	X	X	0	
62E	Hvy Construction Equip	X		0	
71D	Legal Specialist	0		0	
82C	Field Artillery Surveyer	0		0	
88M	Motor Transport Op	0		0	
91B	Medical Specialist	0		0	
95B	Military Police	0		0	
96B	Intelligence Analyst	0		0	
96D	Imagery Analyst	0		0	

X = Specifically mentioned in MOS description

0 = Should be mentioned in MOS description

Blank = No mention in MOS description

Source:

U.S. Department of the Army, Headquarters, Department of the Army Pamphlet 611-21
Military Occupational Specialty and Structure, Washington, D.C. 21 March 1999.

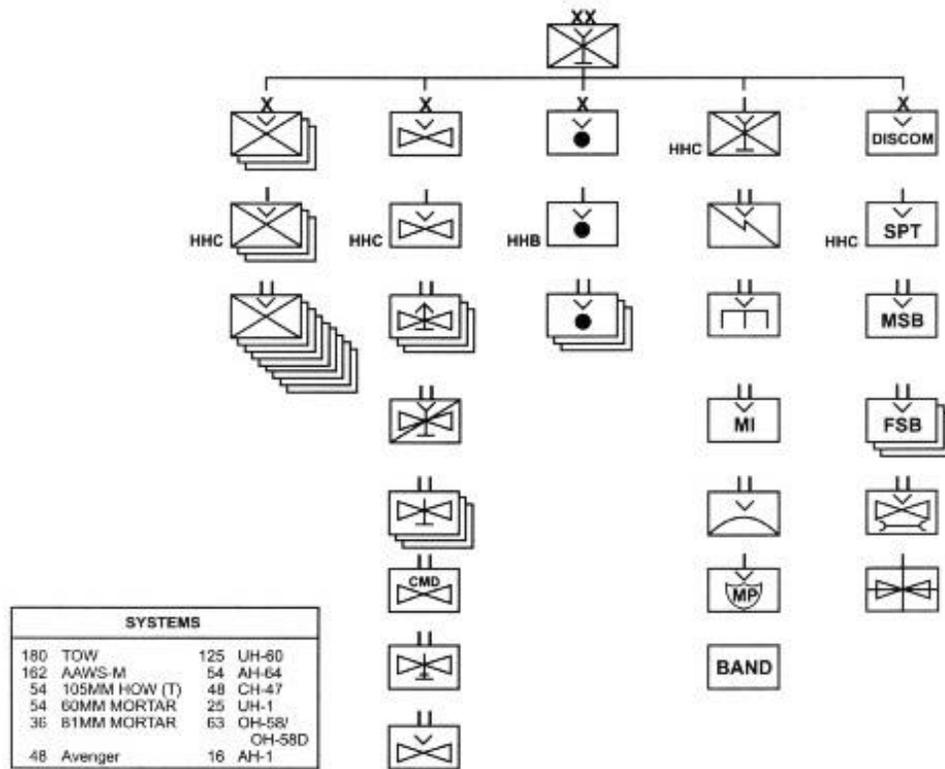


Figure 2: Air Assault Division Organizational Chart

Source: U.S. Department of the Army, Headquarters, FM 71-100 *Division Operation*, Washington, D.C. 28 August 1996.

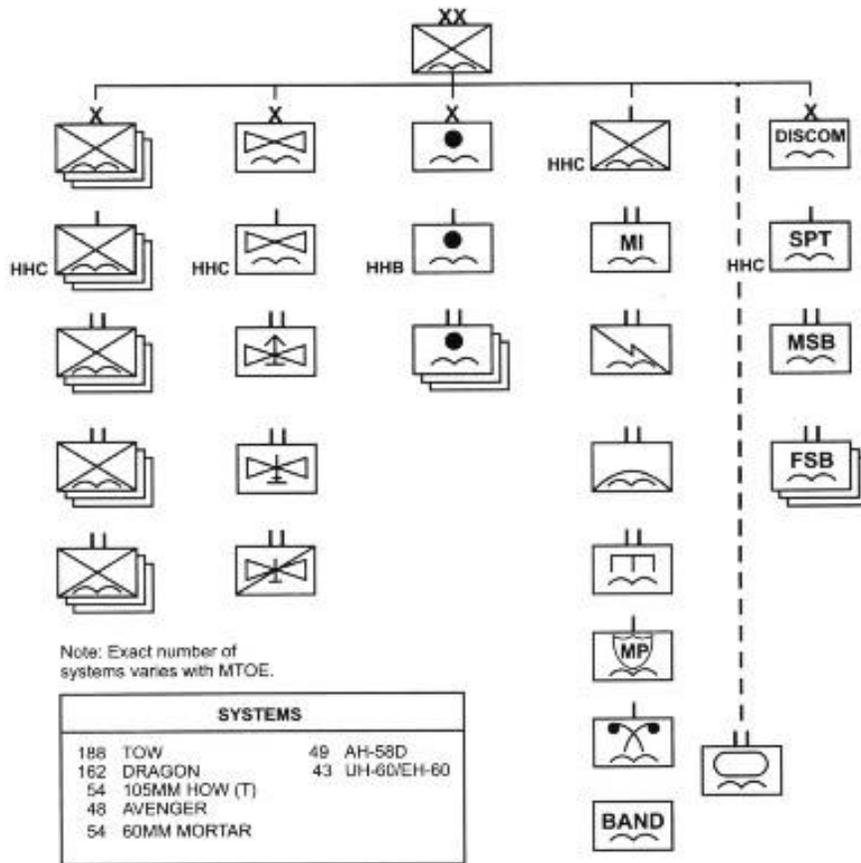


Figure 3: Airborne Division Organizational Chart

Source: U.S. Department of the Army, Headquarters, FM 71-100 *Division Operation*, Washington, D.C. 28 August 1996.

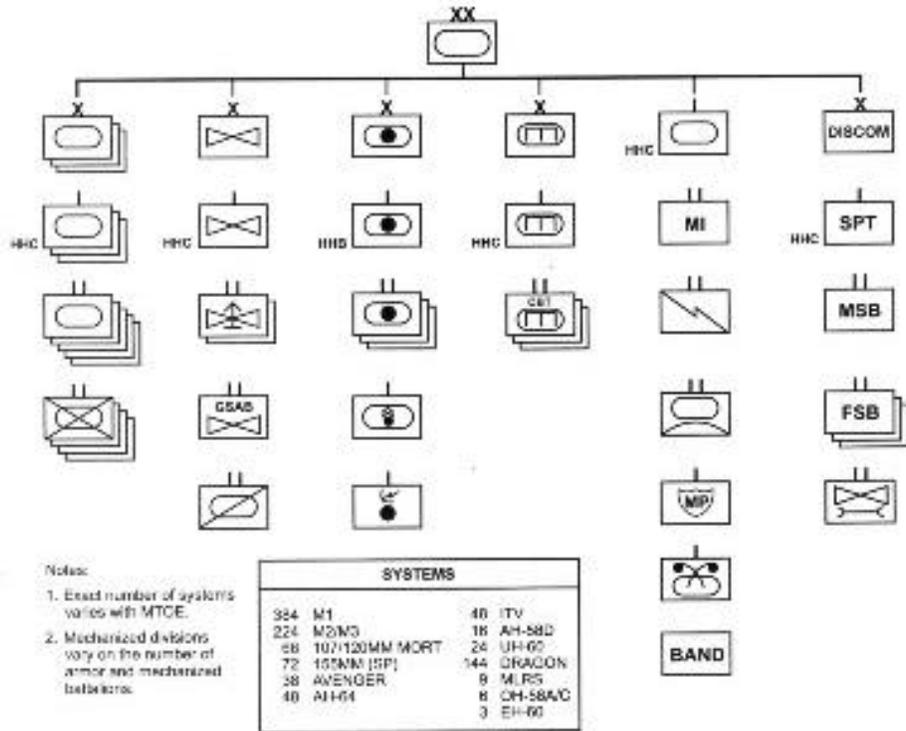


Figure 4: Mechanized Division Organizational Chart

Source: U.S. Department of the Army, Headquarters, FM 71-100 *Division Operation*, Washington, D.C. 28 August 1996.

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