30 June 2003

CHANGE 2 to

TRADOC Pamphlet 525-3-90 O&O

The United States Army

Objective Force

Operational and Organizational Plan

Maneuver Unit of Action

[FINAL]

Prepared by

Unit of Action Maneuver Battle Lab

Fort Knox, KY 40121

DISTRIBUTION: Statement D: Distribution authorized to the Department of Defense and DoD contractors only. Relevant information may be released to foreign entities when appropriate export authorization documentation (TAA, DEA, and ITAR Exemption) accompanies the request for release and this documentation has been verified by the U.S. Government. This document contains information on systems in development or concept stage. Other requests will be referred to the Commander, U.S. Army Armor Center, ATTN: ATZK-UA, Fort Knox, KY. 40121-5000 This determination was made on 14 February 2003.

TABLE OF CONTENTS

EXSUM v

CHAPTER 1 INTRODUCTION

1.1 Introduction 1-1
1.2 Joint Transformation 1-2
1.3 The Maneuver Unit of Action 1-3
1.4 The Role of the Units of Employment 1-5
1.5 Deployability 1-6
1.6 Assumptions 1-6

CHAPTER 2 OPERATIONAL ENVIRONMENT

2.1 Introduction 2-1
2.2 Underlying Operational Environment 2-1
2.3 Terrain, Weather and Enemy 2-2
2.4 Implications for the Unit of Action 2-5

CHAPTER 3 ORGANIZATIONAL DESIGN

3.1 Introduction 3-1
3.2 Increment 1 Objective Design 3-2
3.2.1 Unit of Action 3-2
3.2.2 Unit of Action Headquarters 3-3
3.2.3 Brigade Intelligence and Communications Company 3-7
3.2.4 Combined Arms Battalion 3-10
3.2.5 Infantry Company 3-15
3.2.6 Mounted Combat System Company 3-19
3.2.7 Reconnaissance Troop 3-21
3.2.8 NLOS Mortar Battery 3-23
3.2.9 Aviation Squadron 3-25
3.2.10 Non-Line of Sight Battalion 3-32
3.2.11 Non-Line of Sight Battalion Headquarters 3-34
3.2.12 Non-Line of Sight Battery 3-38
3.2.13 Forward Support Battalion 3-40
3.2.14 Forward Support Battalion Medical Company 3-44
3.2.15 Forward Support Battalion Sustainment Company 3-48
3.2.16 Unmanned Aerial Vehicles 3-52
3.2.17 Unmanned Ground Vehicles 3-55
3.3 Increment 1 Threshold Design 3-58
3.3.1 Unit of Action 3-60

3.3.2	Unit of Action Headquarters	3-61
3.3.3	Brigade Intelligence and Communications Company	3-64
3.3.4	Combined Arms Battalion	3-66
3.3.5	Infantry Company	3-69
3.3.6	Mounted Combat System Company	3-72
3.3.7	Reconnaissance Troop	3-73
3.3.8	NLOS Mortar Battery	3-75
3.3.9	Aviation Squadron	3-76
3.3.10	Non-Line of Sight Battalion	3-81
3.3.11	Forward Support Battalion	3-85
CHAPTER 4 OPERATIONAL CONCEPTS		
4.1	Introduction	4-1
4.2	Quality of Firsts	4-4
4.2.1	See First	4-5
4.2.2	Understand First	4-5
4.2.3	Act First	4-6
4.2.4	Finish Decisively	4-6
4.3	Battlespace	4-8
4.3.1	Area of Operations	4-8
4.3.2	Area of Influence	4-9
4.3.3	Area of Interest	4-10
4.3.4	Graphical Control Measures	4-10
4.4	How to Fight Framework	4-11
4.4.1	Entry Operations	4-11
4.4.2	Actions Before Forces are Joined	4-12
4.4.3	Actions During Contact	4-14
4.4.4	Tactical Assault	4-15
4.4.5	Transitions	4-16
4.5	Deployability	4-18
4.5.1	Introduction	4-18
4.5.2	Essential and Full Combat Configurations	4-18
4.5.3	Deployment Characteristics	4-19
4.5.4	Intra-theater Operational Maneuver	4-19
4.6	Tactical Concepts	4-20
4.6.1	UJTL Task Linkages	4-20
4.6.2	Battle Command	4-21
4.6.3	Intelligence, Surveillance and Reconnaissance	4-32

4.6.4 Maneuver 4-37
4.6.5 Fires 4-56
4.6.6 Maneuver Support 4-63
4.6.7 Maneuver Sustainment 4-72

CHAPTER 5 DOCTRINE, TRAINING AND LEADER DEVELOPMENT IMPLICATIONS

5.1 Introduction 5-1
5.2 Doctrine 5-2
5.3 Training 5-4
5.3.1 Embedded Training 5-5
5.3.2 Networkable, Reconfigurable, Full Task Trainers 5-7
5.3.3 Performance Oriented Training 5-9
5.3.4 Brigade and Battalion Leader and Staff Training 5-9
5.3.5 Training Implications 5-11
5.4 Training Support Packages 5-12
5.5 Leader Development 5-14
5.6 Soldiers 5-16
5.7 Facilities 5-17

CHAPTER 6 STATEMENT OF REQUIRED CAPABILITIES (SoRC) FOR FUTURE COMBAT SYSTEMS

6.1 Statement of Required Capabilities 6-1
6.2 Responsiveness 6-1
6.3 Deployability 6-2
6.4 Agility and Versatility 6-3
6.5 Maneuverability 6-4
6.6 Soldier 6-6
6.7 C4 and Leader Architecture 6-7
6.8 Information 6-10
6.9 Intelligence, Surveillance, and Reconnaissance 6-12
6.10 Lethality 6-14
6.11 Survivability 6-17
6.12 Sustainability 6-19
6.13 Training 6-21

Annex A Acronyms and Definitions

A.1 Acronyms A-1
A.2 Terms and Definitions A-14

Annex B UE Considerations

B.1 Joint Framework Missions B-1

130 B.2 UE Employment B-3
131 B.3 UE Enablers to the UA B-5
132 B.4 Multi-functional UAs B-6
133 **Annex C Unit of Action Missions**
134 C.1 Introduction C-1
135 C.2 Army METL C-1
136 C.3 Full Spectrum Operations C-1
137 C.4 Tactical Constructs C-2
138 C.5 UA Missions C-2
139 **Annex D Brigade Staff Functions**
140 D.1 UA Staff Design D-1
141 D.2 Command Integration Cell D-2
142 D.3 Information Superiority Cell D-3
143 D.4 Fire and Effects Cell D-4
144 D.5 Maneuver and Support Cell D-5
145 D.6 Build and Sustain Combat Power Cell D-6
146 D.7 Religious Support Team D-7
147 D.8 Staff Process D-8
148 D.9 Human Resource Support D-9
149 **Annex E Land Warrior**
150 E.1 Land Warrior and the UA E-1
151 E.2 Components of the Land Warrior System E-1
152 E.3 Land Warrior Battlefield Role E-3
153 **Annex F Unit of Action Vignettes**
154 F.1 Characteristics of Terrain Sets F-1
155 F.2 Vignette 1: Entry Operations F-3
156 F.3 Vignette 2: Combined Arms Operations in Major Urban Areas F-9
157 F.4 Vignette 3: Mounted Exploitation and Pursuit F-19
158 F.5 Vignette 4: Rapid Advance to Enemy Center of Gravity F-28
159 F.6 Vignette 5: Air Assault Enabled in Mountainous Terrain F-32
160 F.7 Vignette 6: Dismounted operations to Conduct Raid on
161 Decisive Point in Jungle F-37
162 **Annex G Joint, Interagency, and Multi-National Interoperability**
163 G.1 Overview G-1
164 G.2 Army Interoperability G-1
165 G.3 Joint Interoperability G-1

G.4 Interagency Interoperability G-2
G.5 Multinational Interoperability G-2
G.6 Information Exchange Requirements G-2

Annex H Battle Command Network

H.1 Purpose H-1
H.2 Network-centric Warfare Enabling Understanding-centric Operations and Situational Awareness H-1
H.3 Network Capabilities H-2
H.4 Battle Command Network Concept H-3
H.5 Objective Force Characteristics H-10
H.6 Sensor Fusion H-13
H.7 Cognitive User Interface H-19
H.8 Multimodal, Self-adaptive, user Interface H-20
H.9 Collaborative Planning and Execution H-20
H.10 Participatory, Collaborative Rehearsal H-20

ATZK-UAC ACTO: COL Roy C. Waggoner, 4-7359, 30 June 2003

EXSUM SUBJECT: TRADOC PAM 525-3-90, Operational and Organizational Plan for the Maneuver Unit of Action.

1. The purpose of this EXSUM is to outline the updates and improvements made to the 25 November 2002 with Change 2 to TRADOC Pam 525-3-90 dated 30 May 2003. **This update is not a new O&O; it is Change 2 to the O&O dated 25 November 2002.** These changes to the O&O expand and clarify critical concepts and further describe the organizational structure of units within the UA; they include:

- removing references to the BFA's and cross-referencing UJTL Tactical task sets
- senior Army leadership decisions
- Analysis of Alternatives (AoA) work
- experiments and analysis by TRADOC centers/schools
- continued refinement of integrated concepts
- S&T advancements
- Lessons learned from current operations
- decreased overall length by 50 pages through elimination of redundancies

2. After the O&O was last published on 22 November 2002, the body of work matured significantly with the 14 April 2003 JROC approval of the Operational Requirements Document (ORD), Senior Wargames, Senior Advisory Group Meetings, continued technical studies, and simulations. As the body of work continued to mature, it became clear that we would need to "catch up" the O&O with an update.

3. We expect the CG, TRADOC to approve release of Change 2 to the FCS Unit of Action O&O. This has been a collaborative process throughout TRADOC and vetted at the COL level, with BG level review. All TRADOC schools and centers have supported this endeavor, though there are some unresolved issues with SA/SU at CAC. TRADOC DCSDEV (BG Rowe and COL Bourgoine) have read the O&O, contributed comments and approved the latest changes; MG Mixon and COL Bourgoine pre-briefed the TRADOC CG. A summary of the major updates and modifications to each chapter and annex found in Change 2 to TRADOC PAM 525-3-90 are:

a. Chapter 1. Introduction. COL Zielinski (TRADOC DCSDCS) is the primary author.

- incorporated APR 03 DoD Transformation Planning Guidance
- restructured FCS paragraph IAW JROC-approved ORD
- incorporated JAN-MAY 03 work by UE Integrated Concept Team to include redesignating UE1 and UE2 as UE_x and UE_y
- added C-17 and C-5 profile aircraft as considerations for UA deployability
- modified UE assumptions for accuracy and made them more generic; added JTF to account for potential command relationships

b. Chapter 2. Operational Environment. Mr. Joe Green and Mr. Maxie McFarland (TRADOC DCSINT) are the primary authors.

- updated OE based upon release of the 23 January 2003 DIA approved System Threat Assessment Report (STAR)

c. Chapter 3. Organizational Design. LTC Mullins (COTD, UAMBL) is the primary author of this chapter. Modifications to the organizational design were approved by CG, TRADOC on 12 March 2003.

- included incremental design with both required and resourced numbers
- reflects spiral development plan for Increment 1 (threshold) and Increment 1 (objective)
- deleted redundant concepts already found in Chapter 4
- added a discussion on Increment 1 (threshold) in-lieu-of systems (yet to be developed)
- deleted sectional descriptions titled "Developmental Capabilities"

- changed Reconnaissance Detachment to Reconnaissance Troop
- modified previous Forward Support Battalion structure IAW TRADOC CG guidance
- changed Unmanned Aerial Systems (UAS) to Unmanned Aerial Vehicles (UAV)
- changed Aviation Detachment to Aviation Squadron IAW TRADOC CG guidance
- deleted reference to distinct Class IVa and IVb UAVs IAW TRADOC DCSDEV recommendation

d. Chapter 4. Operational Concept. COL Waggoner and LTC Jacobs (COTD, UAMBL), COL Bourgoine, (TRADOC FCS Directorate) and BG Rowe (TRADOC DCSDEV) are the primary authors.

- reduced overall length by editing and removing redundant sections
- reformatted the maneuver section to address forms of maneuver and types of offensive operations IAW CSA guidance
- moved technical details of sensor fusion and situational awareness to Annex H (Battle Command) leaving the broader concepts in Chapter 4
- updated several concepts based on decisions by the CSA and JROC in the JROC ORD staffing process
- added two concepts: employment of unattended ground sensors and CBRN, which were missing from 25 Nov version of O&O
- updated concepts based on results of AOA and other work accomplished in the last 6 months
- deleted the tactical enabling concepts and small unit examples at the end of Chapter 4; the additional detail now in Chapter 4 makes these sections redundant
- refined the air-ground teaming section to reflect the work accomplished in the Fort Rucker Comanche Manned-Unmanned Teaming White Paper
- added key definitions via insert boxes to make the chapter easier to read without cross-referencing Annex A
- cross-referenced the concepts to the tactical level of the UJNTL IAW TRADOC CG guidance; removed references to Battlefield Functional Areas
- refined battle command portions to ensure compatibility with the battle command O&O produced by CAC
- refined the ISR section to explain all three components vice just intelligence

e. Chapter 5. Doctrine, Training, and Leader Development. Mr Jim Berg (COTD, UAMBL) and Mr. Bobo Brisco (TRADOC DCSOPS-T) are the primary authors.

- replaced Embedded Training and the TSP paragraphs with concept briefed to the CSA at the STRAP RRC
- consolidated training implications with Part Task Trainer and Desk-top Trainer requirements under the Networked Reconfigurable Full Task Trainers consistent with current ORD
- revised Training Support System (TSS) to explain its operational capabilities in greater detail

f. Chapter 6. Statement of Required Capabilities for Future Combat Systems. BG Rowe (TRADOC DCSDEV) and COL Waggoner (COTD, UAMBL) are the primary authors.

- updated to reflect changes to the 14 April 2003 JROC approved ORD
- corrected formatting issues

g. Annex A. Acronyms and Definitions. MAJ Barnhill (COTD, UAMBL) is the primary author.

- expanded to include key definitions in complementary O&Os
- added source documentation
- cross-referenced with the ORD

h. Annex B. Objective Force Unit of Employment Concept. COL Zielinski (TRADOC DCSOPS-DOC) and Mr Clint Ancker (CAC/UEMBL) are the primary authors.

- reflected evolving UE conceptual work found in TRADOC PAM 525-3-92 (Objective Force UE O&O Concept) expanded of the role of the UE
- introduced the concept of multifunctional UAs
- identified UA Enablers from the UE or higher headquarters

i. Annex C. UA Missions. Mr Jim Berg (COTD, UAMBL) is the primary author.

- minor revisions to the Introduction, METL and Full Spectrum paragraphs
- moved the UA core mission tasks to Annex C from Chapter 3
- incorporated Tactical Constructs to align with UJTL
- incorporated definition of critical tasks IAW TRADOC Reg 350-70

j. Annex D Brigade Staff Functions. Mr Mark Farrar (COTD, UAMBL) is the primary author.

- updated to reflect lessons learned in staff organization and duties based upon observations of the C4ISR Experiment/CEP
- updated the diagrams to reflect Unit Reference Sheet (URS) level of detail

k. Annex E. FCS Soldier Mr. Jim Stone (Fort Benning DCD) and COL Holden (TSM Soldier) are the primary authors.

- deleted “Operational Characteristics Specific to various Terrain Sets”; redundant now that the vignettes in Annex F are complete
- new Annex is FCS Soldier
- incorporated Land Warrior, Air Warrior and Mounted Warrior IAW VCSA guidance

l. Annex F. Unit of Action Vignettes. MAJ Penfield (COTD, UAMBL) and Mr Jim Stone (Fort Benning DCD) are the primary authors.

- completed all six vignettes: Entry Operations; Urban Operations; Pursuit and Exploitation; Advance to Center of Gravity; Air Assault to Restricted Terrain; Jungle Operations
- reduced overall length by 30 pages with editing and removal of redundant paragraphs
- changed Jungle Vignette from a battalion size raid on a WMD site to a C2 Facility IAW feedback from TRADOC DCSDEV
- reformatted Jungle and Air Assault vignettes to conform to standard vignette format

n. Annex G. Interoperability. LTC Jacobs (COTD, UAMBL) is the primary author.

- updated to match JROC approved ORD requirements
- cross-walked Chapter 4.1.1.8 of the ORD requirements

o. Annex H. . Battle Command. COL Morris (UAMBL COTD), COL Rovegno (G2, UAMBL) and Steve Riddle (SIGCEN DCD) are the primary authors.

- moved technical details from Chapter 4 to Annex H
- changed C4 to Battle Command
- synchronized with DoD Transformation Network-Centric Warfare Concept

CHAPTER 1 INTRODUCTION

1.1 Introduction

1.1	Introduction
1.2	Joint Transformation
1.3	Maneuver UA
1.4	Role of the UE
1.5	Deployability
1.6	Assumptions

This chapter provides the rationale for Joint and Army transformation and for the brigade sized Maneuver Unit of Action (UA). It also lists the key assumptions established in developing this Operational and Organizational Plan and discusses in broad terms the operational considerations used in shaping its design. The concepts and capabilities described in this Operational and Organizational Plan are intended for the decade between 2010 and 2020.

1.1.1 Strategic Guidance

The National Military Strategy and the Defense Planning Guidance are the foundations for establishing the requirements for our military forces. US Armed Forces must be able to accomplish the national military objectives, defined in the National Military Strategy as "Promote Peace and Stability and Defeat Adversaries"iv and, in pursuit of those objectives, to "…shape the international environment and respond to the full spectrum of crises, while we prepare now for an uncertain future." Additionally, the nation's military strategy, military objectives, and defense policy goals drive six critical transformation goals for our forces:

- Protecting critical bases of operation.
- Protecting and sustaining US forces.
- Denying enemies sanctuary.
- Assuring information systems.
- Enhancing capability and sustainability of space-based systems.
- Leveraging information technology.

As stated in the National Military Strategy, US Forces help shape the international environment primarily through their inherent deterrent qualities and through peacetime military engagement. The US military will be called upon to respond to crises across the full range of conflict from homeland security to humanitarian assistance, to fighting and winning major combat operations (MCO), to conducting concurrent smaller-scale contingencies (SSC). Additionally, the U.S. must maintain the military superiority essential to global leadership. To be credible in the future, US forces must transform across the full range of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) to develop a new level of responsiveness and relevance, while remaining engaged worldwide, always ready to fight and win.

Transformation is "a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organizations that exploit our nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic position, which helps underpin peace and stability in the world."

DoD Transformation Planning Guidance, April 2003

1.2 Joint Transformation

1.2.1 Joint Vision

As the United States military enters a new century, the Joint Force is superbly trained and comprised of dedicated men and women who are ready to deliver victory whenever, wherever, and however the Nation calls them to act. Military power, applied in concert with the other instruments of national power, will remain indispensable to both the achievement of and protection of enduring national interests. We will continue to modernize the current US Armed Forces while transforming their capabilities to maintain our preeminence in conducting joint warfare and crisis resolution in the 21st century. The purpose of the U.S. Armed Forces remains to protect and advance US national interests and, if necessary, to defeat threats to those interests, now and in the future. With this in mind, the overall focus of military transformation is the transition to a capabilities-based Joint Force able to leverage all of the capabilities provided by the Services. The future Joint Force will achieve full spectrum dominance through the complementary capabilities of joint forces and interagency partners. The future Joint Force may operate unilaterally or with multi-national partners to defeat any adversary or control any situation across the full range of military operations.

In the 21st century, the Nation will continue to face a wide range of challenges requiring a military that can both win wars and through deterrence, contribute to peace. The global interests and responsibilities of the US will endure, and there is no indication that threats to those interests or to friends and allies of the US will diminish. Therefore, the Joint Force will develop adaptive capabilities focused primarily on joint warfighting applicable across the entire range of military operations. The objective for the continuous transformation of the U.S. Armed Forces is to dramatically increase strategic and operational responsiveness, speed, reach and effectiveness, making these forces increasingly precise and lethal, tailorable, agile, survivable and more easily sustainable. To meet these objectives, we must develop and integrate innovative joint concepts and capabilities that will change the characteristics and conduct of joint warfare and crisis resolution. We will further develop today's capabilities for command and control, maneuver, strike, logistics and protection into the joint concepts of:

Joint Operations.

- Major Combat Operation.
- Stability Operations.
- Homeland Security.
- Strategic Deterrence.
- Battlespace Awareness.
- Command and Control.
- Force Application.
- Protection.
- Focused Logistics.

1.2.2 The Army Vision

The Army Vision[i] describes how the Army proposes fighting in the future Operational Environment (OE) as part of the nation's aforementioned joint military forces. To maintain the Army's supremacy in any future OE, we must become a more strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable force, effective in all situations from MCO to homeland security. The seven characteristics of the

The Operational Environment is the composite of all the conditions, circumstances, and influences which affect the employment of military forces and bear on the decisions of the unit commander.

[JP 1-02]

Army Vision are the foundation for the development and evolution of the Army's organizations and their operational concepts, required capabilities, and missions.[ii] Our forces must have the ability to generate overmatching combat power by leveraging the synergy of maneuver, firepower, protection, and leadership, all empowered by dominant situational awareness (SA) resident in a robust network. This combination of capabilities increases both lethality and force survivability exponentially.[iii] At the same time, Army forces must contribute directly to joint force capabilities per the concepts listed in paragraph 1.2.1.

1.2.3 The Army's Purpose

The Army's core purpose remains decisive operations. At its most fundamental level, war is a brutal contest of wills. Winning decisively means compelling our enemies to submit to our will. Potential opponents must be convinced we are able to break them physically and psychologically and that we are willing to bear the cost of doing so. For some opponents now, and others in the future, mere punishment from afar will not suffice. For these adversaries, the only way to guarantee victory is with ground forces that control and occupy their territories and destroy them in their sanctuaries.[iv]

The Army operates as part of a joint and often multi-national force and generally constitutes the preponderance of the land component of that force. The Army's ability to dominate the tactical level of war is essential for Joint Force success. The Army's Objective Force (OF) concept employs a functional framework in which Units of Employment (UE) perform tasks assigned to service headquarters above brigade level. The UA is the tactical warfighting echelon of the OF and comprises echelons at brigade and below to fight tactical engagements and win battles. The UA is designed to win on the offensive, across the full spectrum of conflict, against any expected adversary as part of a UE or Joint Task Force (JTF). In a low end SSC, one or more UAs can operate directly under a JTF. A UA can serve as an Army Forces (ARFOR) component headquarters for the JTF in this low end SSC framework.

1.3 The Maneuver Unit of Action

Today, we have a superb fighting force, the best Army in the world. It will remain dominant in the future. It is ready to perform the full spectrum of missions directed by national leadership. But, the Army will gradually lose its decisive edge against modernizing, adaptive competitors who are designing forces and systems to overmatch our current capabilities. None of our current organizations have the complete array of responsiveness, deployability, mobility, agility, lethality, survivability, and sustainability necessary to be dominant across the full spectrum of operations in the full range of future conflict. We must develop new organizational and operational concepts optimized for offensive combat operations over the next several decades. We must seek leap-ahead enhancements in operational effectiveness not available in current force alternatives.

> **The objective of Force Projection is to conduct decisive operations so rapidly that the enemy is defeated before he can effectively confront US forces.**
>
> **FM 3-0**

An increasingly demanding OE (see Chapter 2), coupled with America's future strategic, operational, and tactical military art, clearly defines the necessity to build a ground force designed for rapid deployment and operations across the full spectrum of war. The Army OF will incorporate active and reserve components as part of a joint and coalition team that is decisive in any operation against any threat, in any environment. This team will be a "force projection" Army that is strategically and operationally responsive; an Army that can deploy a Future Combat Systems (FCS) equipped UA in 96 hours, a division (equivalent) in 120 hours and five divisions (equivalents)v in 30 days, using a mix of air, sea, and land movement and pre-positioned equipment. The FCS equipped UA represents a capability critical to the OF and the accomplishment of the goals of the Joint Vision, Army Vision and the applicable policy documents. Although the deployability qualities of the OF are significant, it is the OF's operational maneuver capability to conduct decisive operations that is the most relevant to the Joint Force.

To accomplish the full spectrum of operations this nation calls upon its Army to perform peacetime military engagement (SSCs and MCOs). The Army today draws from nine types of ground combat formations.

These are Special Operations Forces (SOF) groups and the Ranger regiments; airborne and light infantry; the Stryker brigades; heavy forces constituted by mechanized infantry, armor and armored cavalry; and air assault formations (in order of strategic responsiveness). These nine types of formations are available to respond to the entire range of threats and all conditions and variables in which these forces will be employed – from complex (jungle, dense forests and mountainous) to urban to open, rolling terrain (flat desert and vegetated plains) in all weather conditions (see Annex F, paragraph F.1 for more detailed description of the terrain). Light forces are very responsive and strategically agile, but once employed lack combat power and lethality, survivability, tactical mobility, and sustainability especially in open, rolling terrain. Further, light forces lack the ability to generate a knowledge base to develop the situation, shape and isolate the battlefield. Heavy forces lack strategic responsiveness outside designated major theaters that have Army Preposition Stocks, and require very large logistical footprints to sustain combat operations. Moreover, their effectiveness is diminished in complex and close terrain. The UA eliminates the limitation of our current forces and will accomplish their mission sets except for Special Forces, Ranger, Airborne, and Air Assault forces. The Army's UA will be part of a joint team that is decisive in any operation, against any level threat, in any environment. This team must be strategically and operationally responsive, rapidly deployable, capable of changing patterns of operations faster than the enemy can respond, and able to adjust to enemy changes of operations faster than he can exploit them. Future Combat Systems (FCS) will enable the UA, in a large part, to execute these mission sets.

FCS are comprised of a family of advanced, networked air and ground-based maneuver, maneuver support, and sustainment systems that will include manned and unmanned platforms. FCS are networked via a C4ISR architecture including networked communications, network operations, sensors, Battle Command system, training, and both manned and unmanned Reconnaissance and Surveillance (R&S) capabilities that will enable levels of SA and synchronized operations heretofore unachievable. FCS will operate as a Family of Systems (FoS) that will network existing systems, systems already under development, and new systems to be developed to meet the needs of the UA. The network will enable improved Intelligence, Surveillance, and Reconnaissance (ISR), enhanced analytical tools, Joint exchange of blue and red force tracking down to the tactical level, battle command, real time sensor-shooter linkages, and increased synergy between echelons and within small units. It will also enable the UA to connect to UE and Joint, Interagency, and Multinational (JIM) capabilities, making these capabilities available to the small units of the UA as well as with adjacent, non-contiguous units. FCS enable the networked UA to develop the situation in and out of contact, set conditions, maneuver to positions of advantage, and to close with and destroy the enemy through standoff attack and combat assault per Chapter 4 of this O&O Plan.

The UA balances the capabilities for strategic responsiveness and battlespace dominance. The UA also balances deployability and sustainability with its responsiveness, lethality, survivability, agility and versatility. Although optimized for offensive operations, the UA can execute stability and support operations. It employs its revolutionary C4ISR architecture to expand or contract its span of control and integrate UE or JTF supporting capabilities to accomplish missions. The hallmark of UA operations will be the significant abilities to develop situations out of contact, engage the enemy in unexpected ways, maneuver to positions of advantage with speed and agility, engage enemy forces beyond the range of their weapons, destroy enemy forces with enhanced fires, and assault at times and places of our choosing. Although not necessarily sequential, it is the combination of fires (precision and volume) with maneuver that makes the enemy's problem so difficult. The cumulative effect of simultaneous, multi-dimensional operations will be to destroy, dislocate and disintegrate an adversary and transition to the next engagement.

The UA is designed to ensure a campaign quality. Although it has the responsiveness and deployability to achieve the 96-hour deployment goal it is designed with the durability, endurance, and stamina to fight battles and engagements for the duration of a campaign, focused on decisive points and centers of gravity. It is designed with the durability, endurance, and stamina to fight battles and engagements for the duration of a campaign, focused on decisive points and centers of gravity. It can perform tactical and operational maneuver by land, air, and sea. Given its inherent tactical mobility, it can land at points removed from its objectives, out of range of enemy defenses, then move by land to complete its mission. This capability applies not only to entry operations, but also to theater operations throughout the campaign.

It is the intent of Congress to provide an Army that is capable, in conjunction with the other armed forces, of - (1) preserving the peace and security, and providing for the defense, of the United States, the Territories, Commonwealths, and possessions, and any areas occupied by the United States; (2) supporting the national policies; (3) implementing the national objectives; and (4) overcoming any nations responsible for aggressive acts that imperil the peace and security of the United States. In general, the Army, within the Department of the Army, includes land combat and service forces and such aviation and water transport as may be organic therein. It shall be organized, trained, and equipped primarily for prompt and sustained combat incident to operations on land. It is responsible for the preparation of land forces necessary for the effective prosecution of war except as otherwise assigned and, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components of the Army to meet the needs of war.

Section 3062, Title 10, USC

The UA will master the transitions in warfare that sap operational momentum and threaten initiative retention. Situational awareness delivers the advantage required to close with and destroy the adaptive and asymmetric adversaries of the future and allows the commander to set the requisite conditions for mission success. Most importantly, the UA is based on capable, lethal small units. At every echelon, the UA forces dominate their combat environments during entry operations, movement to the fight, decisive operations, and transition. Commanders, who are expert in using terrain and knowing the enemy, and who also have the instincts to “feel” the battle, will lead this force. The UA is not a fixed organization. It has the capability to command and control up to six Combined Arms (CA) Battalions. It is also able to employ a range of supporting capabilities, from a UE or JTF, to perform a variety of missions: i.e., reinforcing fires, engineers, military police, air and missile defense, psychological operations, and civil affairs. The UA can be tailored with additional capabilities for specific missions and between missions in the campaign. Its C4ISR architecture enables the UA to increase its span of control. The Forward Support Battalion can likewise be tailored with additional sustainment capabilities when required to support UA augmentation.

1.4 The Role of Units of Employment

UEs are tailorable, higher-level echelons that integrate and synchronize Army, Joint and Multinational forces for full spectrum operations at higher tactical and operational levels of war. They link ground and joint forces and orchestrate ground operations that decide joint campaigns. They will be organized, designed, and equipped to fulfill C2 functions as the ARFOR Component, Joint Force Land Component Command (JFLCC), or the JTF. UE are the basis of combined arms, air-ground task forces.

A higher tactical (UE_X) or operational-focused (UE_Y) echelon that for the UA: facilitates deployment; develops the situation and gains information superiority and retains it throughout the operations; shapes and isolates the battlespace; shields; directs entry and decisive operations; synchronizes operations and combat power; facilitates transitions to maintain tempo in multiple battles; sustains forces by synchronizing operations and provides enablers. Acts as the ARFOR or JTF.

UEs resource and execute combat operations, designate objectives, coordinate with Joint, interagency, multinational (JIM), non-governmental agencies, employ long range fires, aviation, and sustainment all the while enabling C4ISR and tactical direction to UA. The UE structures organic, higher level Army, joint, and coalition effects to set conditions to enter battle on our terms, seize the initiative before contact, and employ our strengths against enemy weaknesses. UEs focus on battles, major operations, and decisive land campaigns in support of joint operational and strategic objectives. UEs participate (by mission-tailoring forces to subordinate elements, employing capabilities to perform applicable functions, and allocating capabilities to enable lower formations) in all phases of joint operations from initial entry to conflict termination in any form of conflict and operating environment, in all weather and terrain conditions. The UA normally fights under the command and control of a UE responsible for higher tactical Command and

Control (C2). The UE fights battles; the UA orchestrates multiple engagements to win battles. The UE employs the UA to achieve tactical decisions. The UA integrates organic and supporting ISR, fires, and maneuver to close with and destroy the enemy. The UE must execute these core missions to enable UA success:

- Facilitate deployment, in total or part, anywhere in the world with little notice.
- Develop the situation before forces are joined and gain information superiority.
- Shape and isolate the battlespace.
- Protect the force.
- Direct entry and decisive operations to destroy, disintegrate, and dislocate the enemy.
- Provide sufficient aircraft to support battalion-sized air assault operations.
- Synchronize operations and combat power.
- Facilitate transitions to maintain tempo in multiple battles.
- Sustain forces.
- Provide enablers to UAs. (See Annex B.3 for more details).

1.5 Deployability

The UA will be deployable on C-130, C-17 and C-5 profile aircraft to effect key capabilities of responsiveness, deployability, agility, and versatility. The UE will seek to introduce UA and their sub-elements at multiple points of entry other than fixed, predictable and potentially vulnerable Aerial Ports of Debarkation (APOD) and Seaports of Debarkation (SPOD). This capability is required to ensure unpredictability in how forces arrive in theater while mitigating against the growing trend in anti-access investments by potential threats. Austere points of entry, not reliant on large runways, port facilities, and other infrastructures, are more readily available in most theaters.

By sizing systems to use the C-130, the combatant commander increases his options available for entering forces into theater; by combining available C-130 and C-17 airframes to maximize force flow, using multiple entry points to bring in combat configured units. This improves not only the entry capability, but also the continued flow of forces later in the campaign for decisive operations. A C-130 profile provides maximum flexibility in pursuing future advanced airlift options that range from vertical lift to super short takeoff and landing concepts. Vehicles and systems that are sized to fit the C-130 will also make the UA compatible with the Theater Support Vessel, allowing the UA to move combat capable units on these vessels to land at less predictable locations in theater. UAs will also fit more easily on current and future strategic sealift (RORO, as well as shallow draft high-speed concepts). The UA must be capable of operational maneuver directed by the JTF commander through multi-modal maneuver of FCS equipped units. During entry or decisive operations, the UA can be transported by a wide range of air, land or sea systems to seize opportunities and attack enemy centers of gravity or decisive points.

1-6 Assumptions

The Maneuver Unit of Action O&O development is based on the following key assumptions:

- Acquisition community will be able to deliver required technologies IAW OF threshold and evolutionary acquisition strategies, resources will be available.
- Developing UA doctrine will complement developing UE and Joint doctrine.
- Sufficient strategic air and sealift, and intra-theater air/land/sea lift will be available to transport the UA to theater IAW the goal of deployment within 96 hours of liftoff .
- Regional combatant commander, Joint Force Commander, and Army force commander establishes the conditions required for UA deployment and employment.
- UA will be C-130 deployable to support key capabilities described in the OF Operational Concept that will improve UA characteristics of responsiveness, deployability, agility, and versatility.

- Virtually all UA missions will be conducted within a joint, multi-national, and interagency framework.

Key JTF/UE assumptions are:

- Provides fidelity of information for the UA to conduct entry operations, actions before forces are joined and transition operations
- Provides fidelity of information for the UA while forces are in contact and during tactical assault.
- Battlefield preparation prior to forces being joined is successful:
  - In achieving favorable correlation of forces and means for UA to move to advantage and enter contact at advantage.
  - During UA entry, approach to contact and transitions.
  - Once the UA is committed, the divisional UE immediately shapes the battlefield for follow-on fights.
- Protects UAs and isolates the battlespace to enable the UA to conduct combat operations to close with and destroy the enemy:
  - Through access to increased lethality at extended ranges against complex threats.
  - With acquisition means, communication links and a dynamic, proactive, sensor-to-shooter construct.
- Provides Intelligence, Surveillance and Reconnaissance assets to allow the UA to operate in non-contiguous areas for extended periods of time and function widely separated from sister units.
- Employs acquisition and long-range destructive fires against the most dangerous and high payoff target sets, as determined by the UA.
- Provides enablers such as ISR, fires, aviation, air and missile defense, engineers, and military police, either through reachback from the UA or through mission tailoring.
- Sustains operational momentum through multiple battles by cycling forces in and out of contact, managing a split-based distribution system, and pulsing logistics.
- Provides aviation lift capabilities to UAs as required in order to:
  - Allow greater freedom of maneuver.
  - Account for the fact that the UA is not tethered to tenuous ground lines of communication.
  - Assist in the support one UA for up to three days over extended lines of communication.
  - Augment UA with lift capabilities as mission requirements dictate.
- Provides gap crossing and other assured mobility capabilities when required.

---

[i] Dated 13 NOV 2001 http://www.army.mil/2010/

[ii] Mission Area Analysis, TRADOC Analysis Center, May 2002

[iii] U.S. Army White Paper, Objective Force Concept

[iv] US Army White Paper, Objective Force Concept

[v] With Objective Force echelonment study ongoing, it would be premature to assume that “divisions”, as we know them, will form part of our future force. Therefore it may be best to discuss deployment metrics in terms of generic UEs, division “equivalents” if you will (definitions of this differ by context – but in this case means a UE that is mission tailored to the approximate type units of a current heavy division with a requisite decrease in weight/cube), until a decision on echelonment is reached.

CHAPTER 2 OPERATIONAL ENVIRONMENT

2.1 Introduction

This chapter outlines the range of future operational environments in which the Maneuver Unit of Action must dominate. These critical variables - recognized as present in all of these environments will shape the nature of future combat operations at UA level.

2.1 Introduction
2.2 Underlying OE Variables
2.3 Terrain, Weather and Enemy
2.4 Implication for the UA

"Variables" in the Future Operational Environment at Unit of Action

Critical Variable	Defining Characteristic
Physical Environment	Complex & urban
Nature of the State	Failed state/fractured institutions
Sociological Demographics	Internal society fractured
Regional/Global Relationships	International & regional
Military Capabilities	Modernized industrial age forces
Technology	Discrete high tech & hybridization
Information	Media/Info Attack/IO
External Organizations	NGO/IO/Crime
National Will	NOT a threat center of gravity
Time	Critical for all sides
Economics	Supports sustained operations

The future battle space –

- High likelihood of close combat in urban and complex terrain
- Humanitarian issues present across the full spectrum of conflict
- Governmental, Private, International, and Criminal Organizations increased presence and influence
- Ubiquitous presence of media
- Increased Global and Regional interest in local matters
- Advanced Technology available…

…and a changing Military Dynamic

Figure 2-1 Variables of the Future OE

Unlike the design of previous organizations, optimized for mass, momentum, and attrition warfare against a single well defined opponent, the UA must fight and win across a wide range of conflict situations against various opponents with differing capabilities, from high to low ends of the operational spectrum, from MCO to Peacetime Military Engagement (PME), and under a more expansive framework employing all elements of national power. Thorough analysis of the variables suggest that difficult terrain, adverse weather, and adaptive enemies, within a social, physical and economic context of failed states, fractured societies, rampant crime with international linkages, and religious and ethnic tension will likely characterize the UA's OE.

2.2 Underlying OE Variables: Social, Economic and Physical Context for Full Spectrum Operations

The nature of the political, economic, and social conditions in the wide range of environments where Army forces will be employed drive a requirement for units to possess the capability to deal with the dilemmas these variables create. The future UA must be absolutely dominant in complex situations where sophisticated political and informational skills are required at the small unit leadership level. Adversaries will continue to leverage the environment to achieve maximum advantage. To dominate these enemies, the

UA must be trained, led, and equipped to operate in complex situations impacted by multiple variables, demanding more sophisticated capabilities and tactical skills.

The UA will often operate in locales and under conditions determined by friction in the environmental variables. For example, the world's population is expected to increase by fifty percent in the next 40 years; over 95 percent of that growth will occur in the developing world. Projections include a "youth bulge" in Africa, the Middle East, and the Asian Pacific region. By 2020, most of the world's population will be concentrated in Asia; most of that will be in cities. Fractured governmental structures will often be the norm where the UA is committed. Governments in many places will have lost solid control over borders, allowing free flow of weapons, drugs, and other contraband across State frontiers. Criminal and terrorist elements, with transnational interests and links, will take advantage of the decay in State control and even attempt to accelerate it. These criminal and terrorist elements will act in ways that threaten both local and international security, and will be targets of the UA. Police, constabulary, and other elements of State control will have been under-resourced, corrupted, and/or dissolved. The Rule of Law, as we know it, will be absent.

The "so what" for the UA of these difficult social and economic dynamics is that it will find itself committed to support of, or performance of, stability and security functions that would otherwise have fallen to local governmental agencies, when US interests so dictate. The UA may also have to control the population, or restore humanitarian infrastructure, while engaged in combat. The UA must be prepared for operations in areas where society is in tremendous disarray. For example, by 2020, there will be over 20 million migrants. Migrants will comprise upwards of 15 percent of the population, in more than fifty countries. This phenomenon is likely to continue in the future. Most of these unfortunate migrant individuals will be either internally displaced or have refugee status in neighboring countries. Refugee camps and shanty towns continue to be breeding grounds for discontent, with many having lived out their lives in venues intended only for temporary habitation. Religious differences and disagreements of centuries, often underpinned in histories of genocide - real or perceived - will fester in these environments, and be sources of conflict and instability within the UA's OE.

Operations in these difficult conditions will challenge leaders and soldiers alike in a variety of ways not encompassed by the uncluttered battlespace for which battalions and brigades, and their leaders, have historically been designed and prepared. Disease will be a common feature of future operational settings at UA level. Epidemic diseases will spread among populations in areas under conflict. Bioengineering offers some hope for the future, but not in time to impact on problems in this area. Toxic industrial chemicals will be a routine hazard. Soldiers and leaders must operate successfully in these circumstances; force protection and mission will be in constant tension for all elements of the UA. Complex variables resident in future OE will challenge the US Army at the strategic, operational, and tactical levels. These factors will mandate entirely new solutions for operational and tactical employment of the UA.

2.3 Terrain, Weather and Enemy

2.3.1 Terrain

Future threats will prefer to fight the US in those terrain sets and under conditions where US capabilities to apply precision effects from distance are degraded. Opponents will move to areas where their capabilities are optimized and ours are degraded, and where they have the home court advantage. At the same time, we must account for open and rolling terrain as a framework for strike operations, both for the UA, and for the opponent. Future OEs will therefore feature a range of difficult terrain - covering the gamut from open rolling (flat desert and vegetated plains) to complex (jungle, dense forest and mountainous) to urban. The UA will encounter and must master these multiple terrain dimensions. Mountains, in both arid and wet environments, often with steep slopes and elevations, will challenge the UA Soldier as well as accompanying aviation and ISR support. Open and rolling ground will frequently be cut by compartments, and with micro-relief, can and will be used to advantage by adaptive opponents. Fractured infrastructure in complex terrain with rivers and streams, e.g., destroyed bridges will drive need for a gap crossing capability accompanying the UA.

Urban terrain will challenge the UA. Complex urban environments, ranging from modern skyscraper jungles, to huge shantytowns are an increasingly predominant feature of the OE. Clutter - electronic and physical - rubble, and other obstructions common in complex populated environments will challenge

communications and ISR. Wires, overhead cables, towers, and other obstructions (e.g., civil use of the frequency spectrum), will challenge the UA's aerial ISR suite. Subways, sewers and tunnels will be prominent in threat urban operational patterns, and must be dominated by the UA or else they will be sources of strength for the adaptive opponent of the future. Precision engagements driven by technical ISR will be extremely difficult under these circumstances. Austere, often deteriorating, infrastructures such as ports, airfields, road networks, and buildings, as well as communications infrastructure will not be "first world" standard in most venues. The UA must be effective at operating and controlling the variables in these environments. Future opponents will understand and leverage the existing infrastructure to his advantage – targeting fixed facilities and areas where we are likely to operate.

Complex terrain sets will challenge the UA in a 3-D fashion – elevated, surface and subsurface. This 3-D aspect will be present in all terrain sets – urban, open, jungle and mountain. Caves, for example, will be used for cover and concealment, and will be leveraged for deception and to frustrate targeting. Jungles, tunnel complexes, and similar complex terrain will be leveraged by adaptive opponents to offset UA advantages and create conditions for close combat. Terrain enables observant learning enemies, masters of their own environment, to offset advantages of a superior force. Future opponents will be masters of their own environment. Threat will use highly restricted and urban terrain to hide and shield themselves from precision fires, limit LOS, and leverage constraints of weapon trajectories and munitions effects. These enemies will hide and shelter themselves in caves, jungle and other complex terrain, creating the conditions of opportunity. They will use terrain and weather to mask movement and positioning, while engaging with precision fire and slowing the UA's tempo. At the same time, advances in technology – often spread via the open market – will enable future opponents to take advantage of micro-relief where it exists in open ground – in deserts, temperate, and frigid climes – to maximum advantage.

2.3.2 Weather

Adaptive opponents will also use weather as a force multiplier. Adverse weather degrades the UA's ability to conduct reconnaissance and see first. Future enemies will leverage adverse weather, whenever possible, to reposition forces, to conduct attacks, and to re-supply. As in other aspects of the OE, future opponents will leverage knowledge of local and regional weather to achieve the greatest possible effect on the UA. A range of challenging weather and climatic conditions will characterize those environments where the UA and joint forces will operate. Temperatures will range from frigid cold to enervating heat in desert and jungle. Temperature extremes - both hot and cold - will challenge UA soldier endurance as well as high-tech system performance. The future opponent will be thoroughly acclimated to his own weather conditions, and will understand how to use it to maximum advantage.

Sensors and communications systems will be especially susceptible to extremes of weather, challenged by rime icing, and other weather phenomena. Many areas of conflict will require operations at high altitudes and temperatures requiring Army aviation assets and UAVs to be optimized for the 'high hot' capabilities (4000 feet above sea level and 95° F) with adequate vertical rate of climb characteristics. Predictive and real-time precision weather information delivered to multiple dispersed locations on the battlefield will be important, and must be immediately available - on demand - to the UA.

2.3.3 Enemy

2.3.3.1 Strategic and Operational Pattern. The UA must be capable of decisive action against an adaptive learning opponent greatly empowered by a thorough mastery of his battlespace, environment, and technology, as well as an understanding of US military capability. Future threats are informed by US patterns of operation and tactical methods. Over the last two decades, the US has been viewed as predictable, casualty adverse, unwilling to engage in close combat, and reliant on precision technology - applied from a distance - for victory. Our projected future force will likely strengthen that perception. Opponents will see our society and its soldiers as soft, unwilling, and unable to deal with harsh battlefield realities. At the strategic level, the future enemy will focus on attacking US National Will using all elements available – diplomatic, informational, military, and economic - to preclude U.S. military engagement in the region.

Operationally the threat will seek to deny US access to the region itself - to ports and airfields, in particular, along with maritime zones. The future adversary will use all means possible to prevent U.S. forces from establishing a foothold in the region. He will attempt to destroy US flagship systems to

reduce confidence of allies and coalition partners - forcing the US to concentrate on protecting these systems, thereby degrading their effectiveness. These likely enemy strategic and operational patterns mandate the need for rapid entry through unimproved or expedient ports, austere forward airfields, and across all domains – air, ground, maritime, space, and information. Future threats will seek to separate forces by disrupting the flow of organizations and supplies. At the same time, soldiers and leaders in the UA must be prepared for the physical and moral effect of strikes at the U.S. homeland, and at facilities along the strategic lines of communication.

2.3.3.2 Tactical Method. Faced with the realities of UA capability overmatch, the threat seeks to conduct tactical actions that will have operational or strategic effect. The threat has the "home court" advantage in that he understands his battlespace. He has access to commercially produced data, information, and knowledge that he can use for intelligence; has studied his enemy; and receives continuous updates from a globally distributed information system. The future threat will focus effort on attacking UA C4ISR through multiple means. He will seek to cloud SA through Information Operations including computer network attack and defense, electronic, electronic warfare (EW), psychological operations, deception, and destructive command and control attacks. The enemy will work to use these advantages to deny the situational awareness crucial to UA success.[v]

During entry operations the enemy will focus his efforts on actions to limit our access by "metering the flow" of US forces. The enemy will attempt to limit force size and capability to create an opportunity to isolate and defeat early entry forces through Special Purpose Forces (SPF) and long range fires to attack points of entry and ports of transfer. The enemy will work to keep US forces out of areas and facilities key to his operations, and will attempt to force the UA to areas which present lucrative targets for deep and close fires. The opposition will disperse to avoid precision strikes from air and missile capabilities. He will operate in complex terrain – often urban areas - until he can set conditions for decisive attack. Future threats will seek battle in complex and urban terrain as a way of offsetting UA advantages, especially in long-range precision fires. Future opponents will employ camouflage, cover, concealment, dispersion, and deception to reinforce defenses, create opportunity for attack, conceal positions, and intent to frustrate UA information gathering activities. Enemy forces will mask their own high value target sets by terrain or urban structures, and deliberately mix with local populations to avoid identification and to facilitate close-in attacks and ambushes. Potential target sets will be fleeting; movement will be executed as small mounted elements or in dismounted fashion over a sequence of short distances. Movements will be masked amongst non-combatants to further complicate our targeting abilities. Finally, the enemy will employ hugging tactics to present danger-close fires and the risk of civilian casualty problems.

The enemy's offensive tactical actions will be opportunistic. These tactics will be built around strikes involving rapid closure, swarming, massing forces and effects quickly to destroy the opponent, and then dispersing with equal speed. Surprise will be the centerpiece of these tactical designs. The enemy will focus effort on vulnerable and key C4ISR systems and associated linkages. This future opponent will routinely attack in elements from team to even brigade, when and where the opportunity presents - key will be the right combination of terrain, adverse weather, and our own tactical and operational predictability in setting conditions for these actions. Combat will likely be continuous. UA forces will face enemy units operating in non-linear fashion that will attack from the front, rear, flanks, above, and from below. Threat forces will attempt to draw the UA into close combat situations and attack with a combination of older, but still lethal, technology and state-of-the-art high tech weapons. Threats will use precision munitions, purchased on the open market, or will often employ locally developed expedients, or adaptations, to destroy UA systems. By attacking our systems and degrading their capabilities, they will attempt to create opportunities to mass and attack, and then disperse quickly. In selected instances, threat forces opposing the UA will have the ability to employ weapons of mass destruction / effects. The enemy will seek to create conditions that provide him overmatch in every way - technical, physical, and moral.

2.3.3.3 Threat Technology Trends. The pace of technological change is growing exponentially. In 2020, the threat will likely be able to gain some niche parity or selected overmatch when engaged with UA forces. Potential threats have an advantage because their respective military and/or paramilitary forces are optimized for their regional environment. They will seek niche and off the shelf technologies as well as advanced weapons systems enabling them to selectively improve their capabilities, and oppose ours, often in asymmetric ways. [vi]

Threats will possess advanced communications and signature reduction technologies to better coordinate their activities and frustrate UA target acquisition efforts. They will use technology-enhanced weapons, such as cruise missiles, Unmanned Combat Attack Vehicles (UCAV) and improved tactical ballistic missiles in an anti-access strategy. Asymmetric air and missile threats with increased precision and improved tactical ballistic missiles will enhance an anti-access strategy. UA forces in combat will face threats with increased precision and ranges, advanced warheads of larger or smaller, more lethal caliber, active and passive protection systems, improved signature management capabilities, directed energy weapons, and night vision capabilities. These capabilities, and more, are readily available on the world's arms markets. UA enemies, in at least some areas, will enjoy technological parity or overmatch.

2.4 Implications for the Unit of Action

Weather and terrain will be extreme, and vary widely in character - the UA must therefore be dominant across all varieties of ground and climate. The spread of urban environments and mix of civilians, paramilitaries, insurgents, and others in close physical proximity and often in cooperation with formed military forces will challenge all aspects of operations at the UA level. Opposition will be dispersed, camouflaged, and difficult to locate. ISR must therefore be multi-disciplined, and capable, close, and distant, in order to understand enemy composition, disposition, and intent to the fidelity required. It must also be able to discriminate and see through deception. To defeat these adaptive adversaries operating with unparalleled lethality and mobility in close terrain, UA sensor - shooter links must be informed and near instantaneous. The UA will employ a construct of focused Intelligence Preparation of the Battlefield (IPB), Indications and Warnings, Targeting, BDA, Situational Development, and Force Protection (FP) actuated by ISR integration to develop and maintain SA and cut through battlefield clutter.

- Adaptive adversaries will seek to modify their operations to create false battlefield presentations and reduce signatures through deliberate and expedient means to frustrate IPB, deceive and show the UA exactly what it expects to see.
- Threat will intentionally complicate indications and warnings – the process of detecting and assessing threats that fundamentally alter the commander's selected course of action. Adversaries will position decoys and deception minefields in locations where the UA expects to see them, while emplacing real ones where they are not anticipated, making indications and warnings – complicated and difficult.
- Force protection at UA level will be made difficult by complex terrain, where opponents can close undetected with UA forces, often employing low-signature weapons. This, combined with myriad commercially available deception measures, deliberately raises the level of ambiguity with the goal of slowing the pace of UA maneuver, thereby making it still more vulnerable.
- Enemies will seek to complicate UA targeting by "hugging" (closing distances to neutralize standoff precision fires) UA forces or through shielding of forces in cities, among civilian populations, or within landmarks and social or religious structures.
- Presence of niche high-technology systems in enemy hands will also make discerning signatures of high payoff systems more difficult, further confounding the UA's targeting efforts. Differentiating valid and invalid targets will consume time, impact ISR capabilities through deception and, dispersion.
- Battle effects will be difficult to determine due not only to dispersion and signature reduction efforts, but there will be compounded masking of the true effects of strikes through the same deception and denial techniques employed against targeting.

UAs will routinely operate across a dispersed variable highly lethal environment; to survive and win, they must therefore "see first" - enabled by organic/embedded, SOF, UE, Joint, and National ISR before and during entry and decisive operations. The UA, augmented by UE Air and Missile Defense (AMD) must ensure the enemy sees last by destroying enemy unmanned aerial vehicles beyond standoff and conducting an aggressive counter-Reconnaissance, Surveillance, Target Acquisition (RSTA) effort. At the same time, the FCS reliance on advanced sensors, sensor fusion/processing and rapid information

movement will provide primary focus for threat forces working counters across a range of missions and operational environments.

The sum of our future adversaries' efforts will be to seek defeat of the UA by confounding its ability to achieve and maintain unparalleled situation development – superior knowledge of the enemy in relation to friendly forces and intentions, and through it, dominant situational awareness. The net effect will be to drive the increased speed and unparalleled decisiveness the UA Commander must possess to act within his opponent's decision cycle and win. Future Operational Environments will place mid grade and junior leaders in complex situations with international informational and political importance, where their tactical actions have operational and strategic impact. These leaders must effectively recognize and solve challenging problems in these difficult circumstances. The unparalleled visibility and reach provided by both sensors and shooters available on the worldwide arms markets means that UA subunits must be capable of providing overwatch in mutual support of moving formations, and performing immediate action at ranges Beyond Line of Sight (See Annex A for detailed description of Beyond Line of Sight). The UA can also expect to be engaged by opponents similarly equipped and trained, on their own ground.

The variety of difficult terrain sets in the future OE, along with adverse weather and the lethal nature of adaptive learning opponents, often equipped with state of the art equipment, operating with home ground advantage, means that the UA must seek lethality and survivability overmatch through a combination of:

- Using terrain to advantage for cover.
- Enhanced concealment.
- Mobility.
- Superior dash speed.
- Ability to displace while maintaining mutual support in overwatch.
- Advanced networked C4ISR.
- Firing first with assured lethality and assured kill.
- Effective suppressive and obscuration fires when closing with and assaulting the enemy.
- Leaders who are competent and capable to do the right thing at the right time, and do it effectively.

---

[v] Some of the source material for the 'tactical threat' include

Department of the Army DCSINT. Threat Panel White Paper. Washington: GPO, 1999. U.S.

National Ground Intelligence Center Technology Watch Program. NGIC, Jan 01 – May 02.

Senate Select Committee on Intelligence. Global Threats and Challenges to the United States and Its Interests Abroad. Washington: GPO, 1999.

TRADOC DCSINT, TRADOC PAM 525-2-60, The Operational Environment and Threat: A View of the World to 2020 and Beyond

U.S. Marine Cops Intelligence Activity. Marine Corps Midrange Threat Estimate 1997-2007. Quantico: GPO, 1997.

[vi] Sources for the tactical 'threat technology trends' include:

FCS System Threat Assessment Report (STAR), dated 24 January 2003.

National Ground Intelligence Center. A Preliminary Assessment of the Asymmetric Threat (2010 and 2020) to U.S. Army Systems. NGIC-1572-0506-02, May 02.

Chapter 3 ORGANIZATIONAL DESIGN

This chapter describes the organizational design used in the development of the Maneuver Unit of Action (UA). There are two designs reflected in this chapter. First and most importantly is the Increment 1 Objective design. This design is the "goal" design of the Increment 1 UA and is an organization that the Army will be capable of achieving toward the end of Increment 1 (between 2017 and 2020). It is the design that best supports the operational concept. The second design is the Increment 1 Threshold design for the 1st Unit of Action that reflects affordability, technology, and fielding constraints in the 2010 to 2012 timeframe. The Increment 1 Threshold design identifies both the required systems quantities and shows affordability constrained systems for fielding in the first UA.

In addition to personnel, vehicular, and technological changes to the Organizational Design, the differences between this Chapter 3 (updated May 2003) and the previous Chapter 3 (25 Nov 2002, Change 1) include:

- Deletion of concepts discussed in Chapter 4.
- Discussion of systems fielded in lieu of future systems (yet to be developed).
- Abbreviated systems titles (i.e. FCS Mounted Combat System Company to Mounted Combat System Company).
- Deletion of sectional descriptions titled "Developmental Capabilities".
- Changed Reconnaissance Detachment to Reconnaissance Troop.
- Modified previous Forward Support Battalion structure to account for additional personnel to support the ILO fleet.
- Changed Aviation Detachment to Aviation Squadron.

3.1 Introduction

3.1 Introduction

3.2 Increment 1 Objective Design

3.3 Increment 1 Threshold Design

The UA design is a modular organization that is tailorable based on METT-TC and capable of receiving UE augmentation. Commanders have the ability to task organize on the move and can operate successfully in open rolling, urban, and complex terrain. For example, the UA can rapidly integrate an engineer battalion from the UE, equipped with the same common operational picture, allowing the UA to fully integrate the battalion and collaboratively plan before the engineer unit arrives at the link up point. The UA can accept command and support relationships from additional combined arms battalions, maneuver support capabilities, and maneuver sustainment capabilities. This modular design facilitates greater flexibility for the commander and minimizes its deployment footprint. The UA builds lethal overmatch through a new combat power formula. In the past, combat units derived combat power from Maneuver, Firepower, Protection and Leadership as the formula for Combat Power based on this formula: CP=M+F+P+L. However, in the UA, situational awareness derived from real-time, accurate, fused Information raises combat power exponentially: CP=((M+F+P)(L))Information.

The UA is a combined arms force built to be interdependent with joint forces. A key construct of this design is the ability to develop sensor to shooter linkages across service lines. The UA is designed with an operational architecture that allows it to access joint assets across the joint tactical constructs of the Universal Joint Task List. The effect of this on the design is an organization built to leverage the best capabilities of other services vice building redundant like-capabilities into the UA.

Also built into the organization is the ability to employ lethality from external sources. Structurally and through the network, sensor-shooter relationships begin at the Soldier level and exist throughout the formation, providing the UA the ability to accurately direct effects internally or from supporting UE forces and joint assets. This ability to cooperatively engage targets with tactical, operational, and strategic level assets will be accomplished in seconds rather than minutes. Another key construct of the operational effectiveness of the UA, is that it achieves lethality and survivability overmatch by leveraging powerful

multipliers. The UA fosters the ability of soldiers and leaders to achieve lethality and survivability overmatch. It presupposes platform superiority and emphasizes teaming of teams to achieve combat power synergy. The Soldier is the centerpiece of the Objective force. Land Warrior supports every soldier within the UA with greater access to information and better situational awareness. See Annex E for a detailed discussion of this Family of Systems.

3.2 Increment 1 Objective DESIGN

3.2.1 Unit of Action

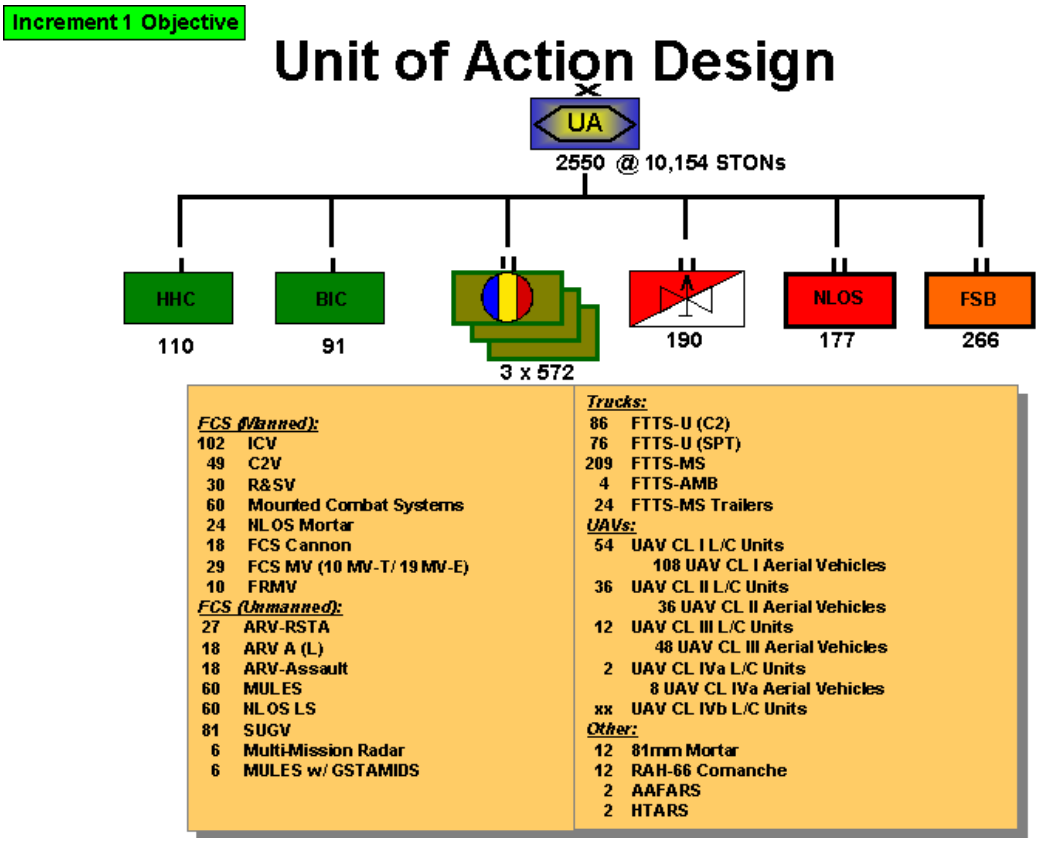


Figure 3-1. UA Brigade Rollup

UA Mission. The UA rapidly deploys anywhere in the world in 96 hours as a fully integrated combined arms force to conduct combat operations as part of either a Unit of Employment (UE) or a Joint Task Force. The UA conducts the full spectrum of military operations including deterrence, homeland security, stability operations, support operations, SSC to restore peace and stability, global war on terrorism, and is optimized for the offense in MCO. It is organizationally designed to conduct these operations in all types of terrain and in any weather condition.

3.2.2 UA Headquarters (HQ)

This UA organization consists of the following major units and sub-unit designs, and includes associated missions and supporting tasks:

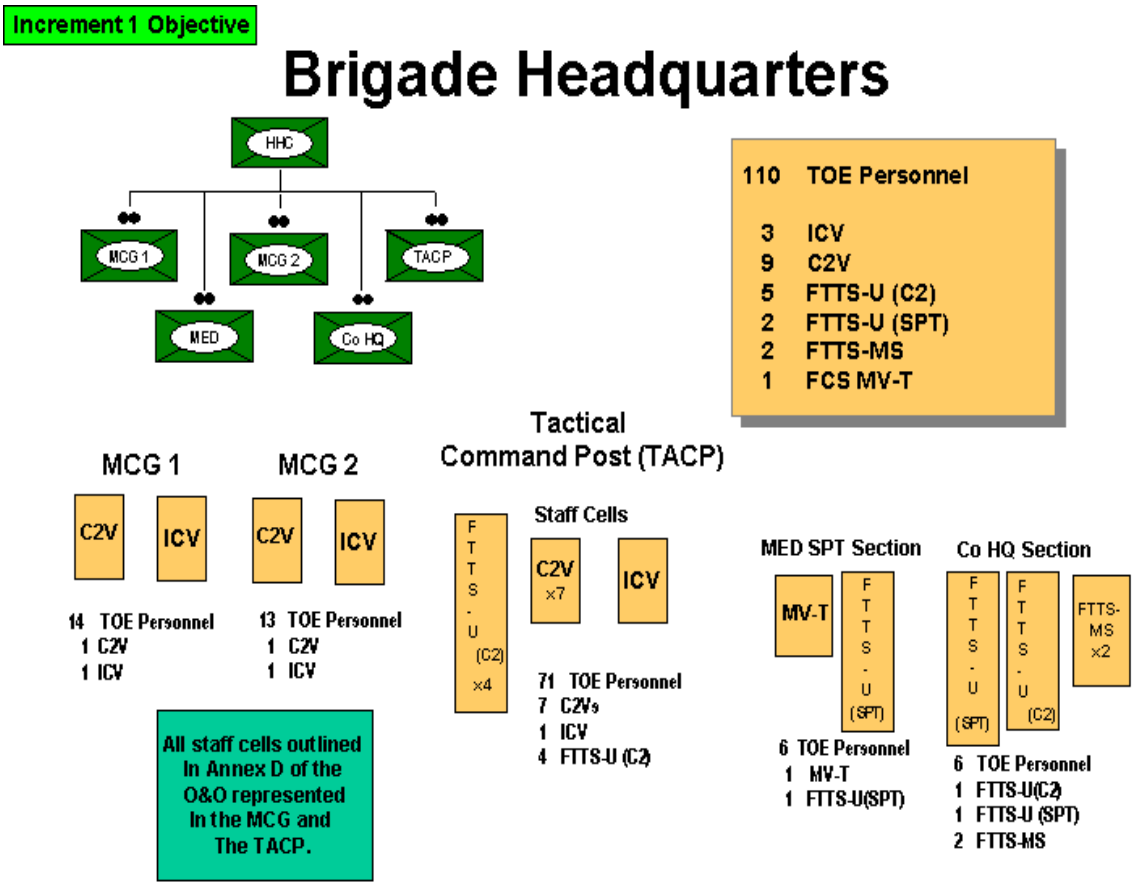


Figure 3-2 UA Brigade Headquarters

Increment 1 Objective

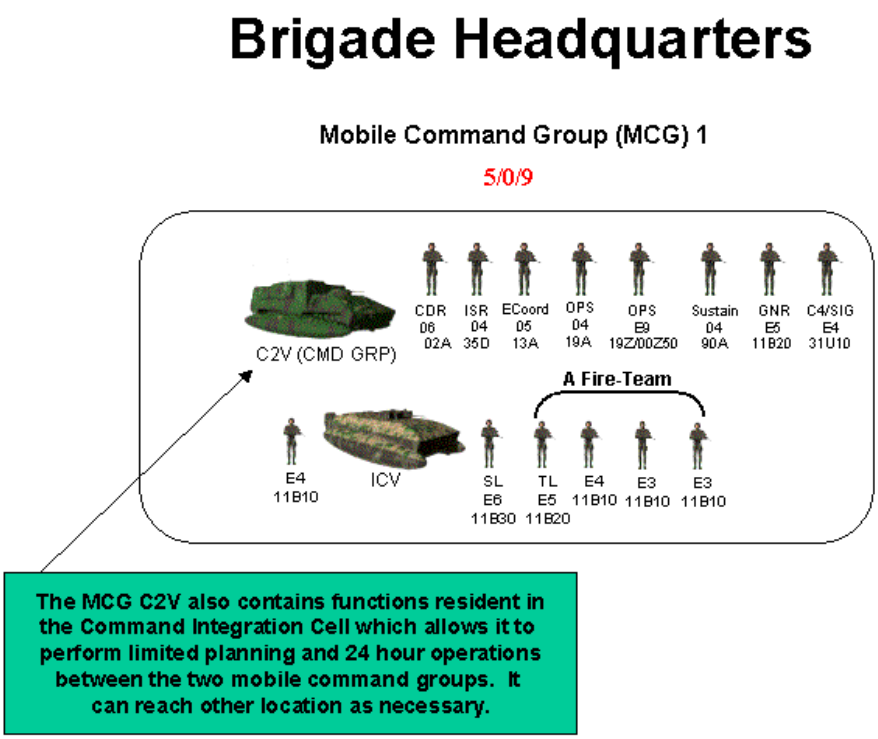


Figure 3-3 UA Brigade Headquarters MCG 1

Increment 1 Objective

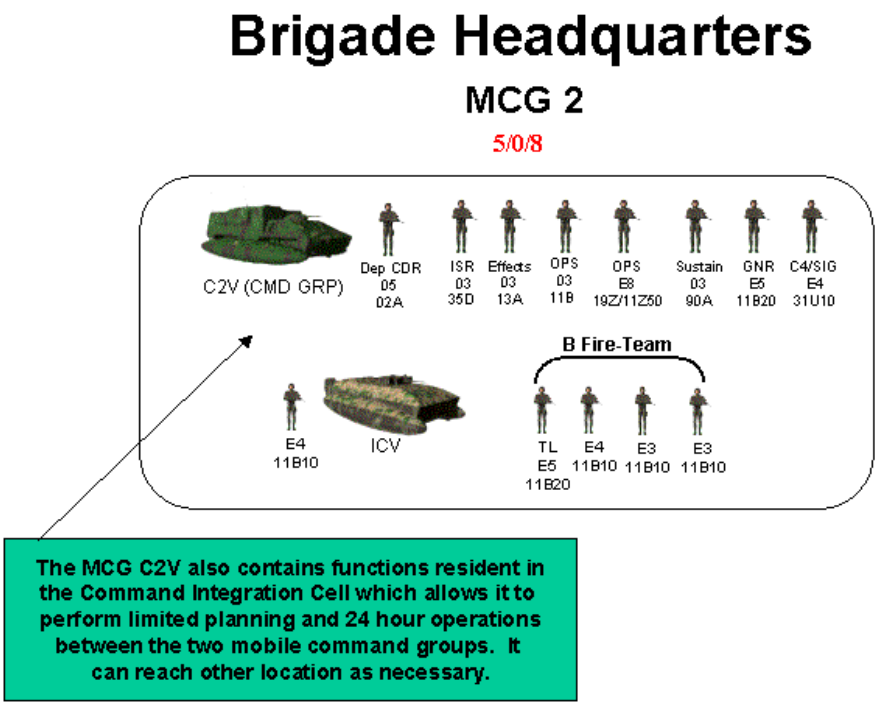


Figure 3-4 UA Brigade Headquarters MCG 2

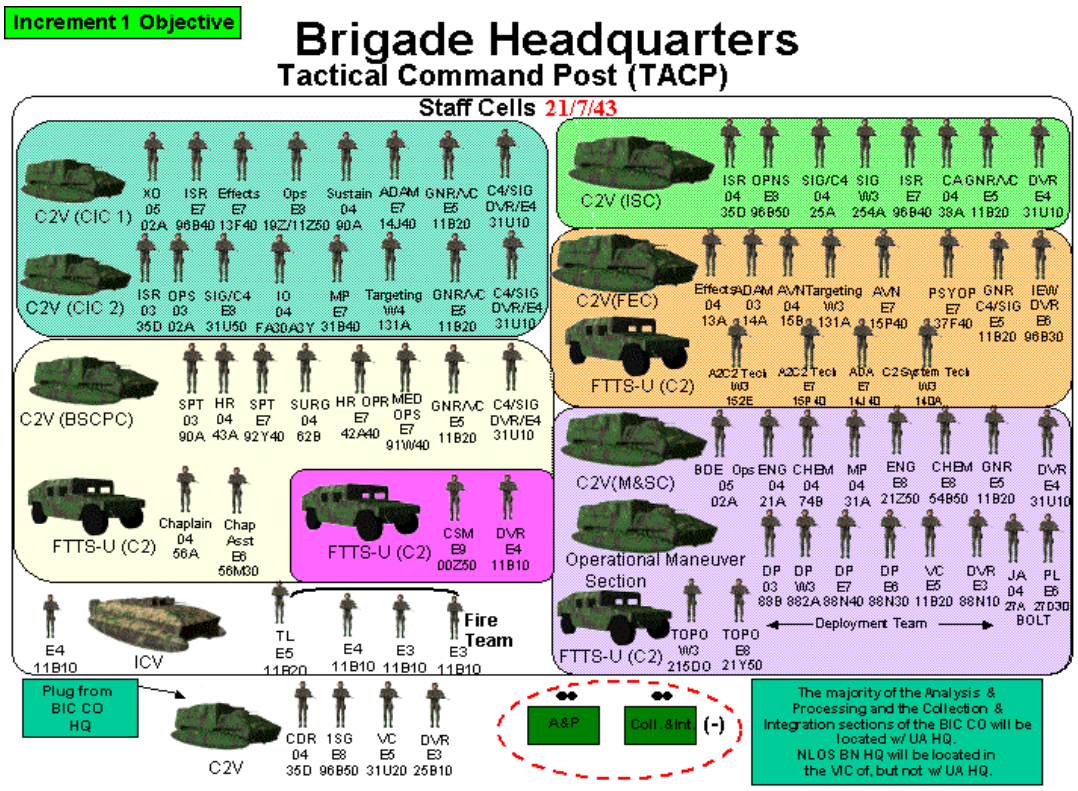


Figure 3-5. UA Brigade HQ TACP

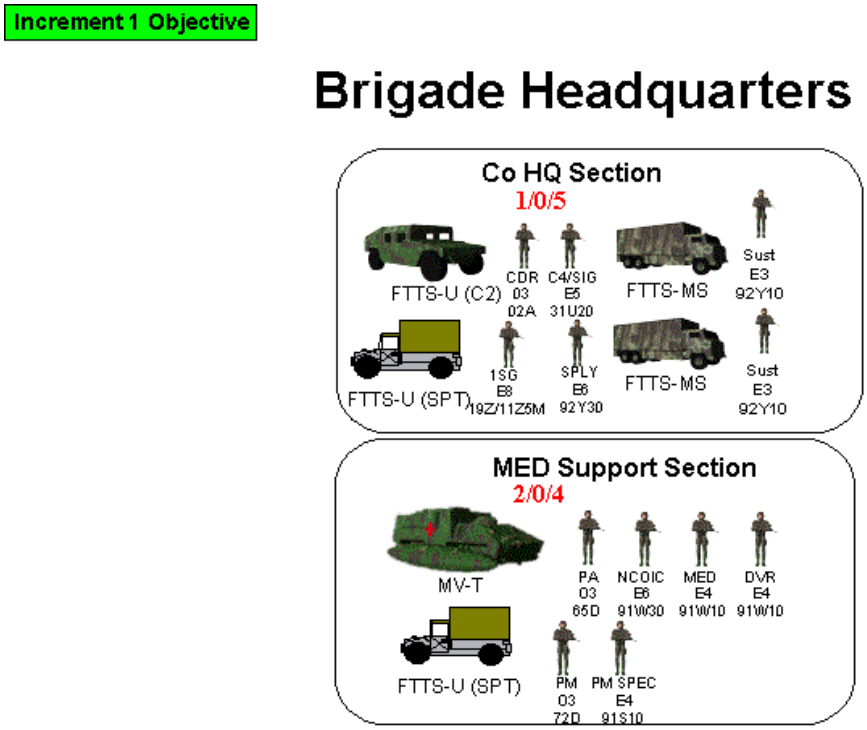


Figure 3-6. UA Brigade HQ HHC & MED Support

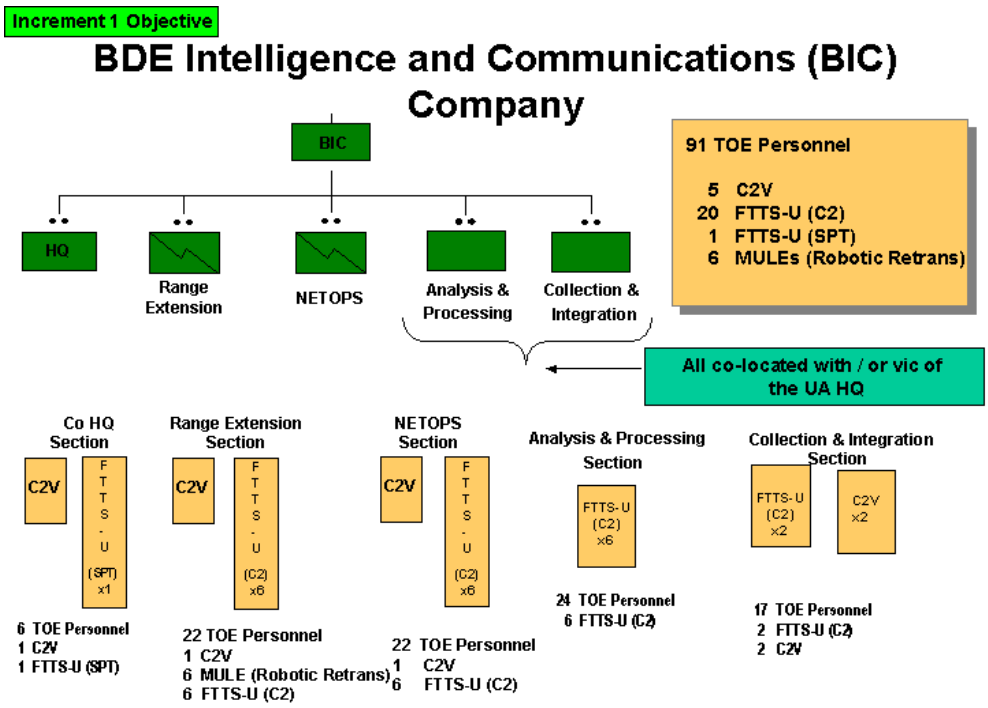
Mission. The UA HQ provides C2, information management and communications to enable the UA command group to plan and execute missions. It also provides administrative and logistical support to the headquarters section.

UA Brigade Headquarters Tasks:

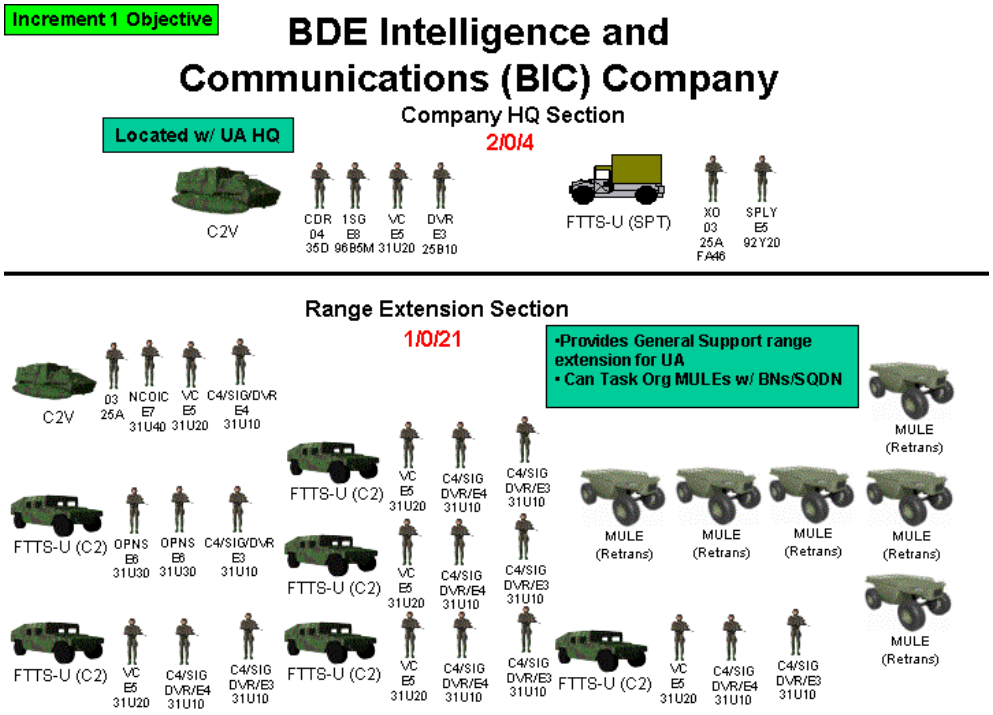
- Execute command and control to exercise authority and direction.
- Develop plans and orders for operations.
- Identify centers of gravity through evaluating information and decision-making while systematically examining all aspects of the operation.
- Synchronize C2; communications; ISR; maneuver, fires and effects, protection, and sustainment.
- Orchestrate development of the situation with organic and external ISR – Army and Joint - to satisfy the combat information requirements of each echelon in the UA.
- Prepare the battlespace and protect the force with organic and external fires and effects – Army and JIM.
- Direct purpose-based tactical maneuver.
- Orchestrate tactical control of assigned airspace and allocate available air defense assets.
- Enable maximum effects from manned and unmanned airspace users and fires and effects while precluding fratricide in a jointly acceptable way
- Plan, synchronize, and integrate augmentation from UE as needed based on METT-TC.
- Orchestrate sustainment support to provide arms, munitions, transportation, re-supply, human resource, financial management, religious, legal, and health services.

Design considerations: The brigade headquarters and headquarters company has the capability of employing two separate Mobile Command Groups (MCG) and a Tactical Command Post (TACP). An MCG consists of a commander or deputy commander and a command group staff cell along with a security team. This staff cell contains the functions resident in the command integration cell in the TACP. The two Mobile Command Groups have a 24-hour a day capability between them. The TACP consists of a Command Integration Cell (CIC) that integrates and prioritizes the actions of the Information Superiority Cell (ISC), Fire and Effects Cell (FEC), Build and Sustain Combat Power Cell (BSCPC), and Maneuver and Support Cell (M&SC), which contains the Operational Maneuver Section. The UA XO resides in the CIC and is overall responsible for the TACP operation. The TACP can operate continuously 24-hours a day. There is no rear CP. All command elements are 100% mobile and optimized to command and control tactical engagements while synchronizing ISR, fires and effects, force protection, maneuver and logistics. The headquarters company also contains limited sustainment and medical treatment capability.

980 **3.2.3 Brigade Intelligence and Communications (BIC) Company**



981
982 **Figure 3-7. BIC Company**
983



984
985 **Figure 3-8 BIC Company - Range Extension**

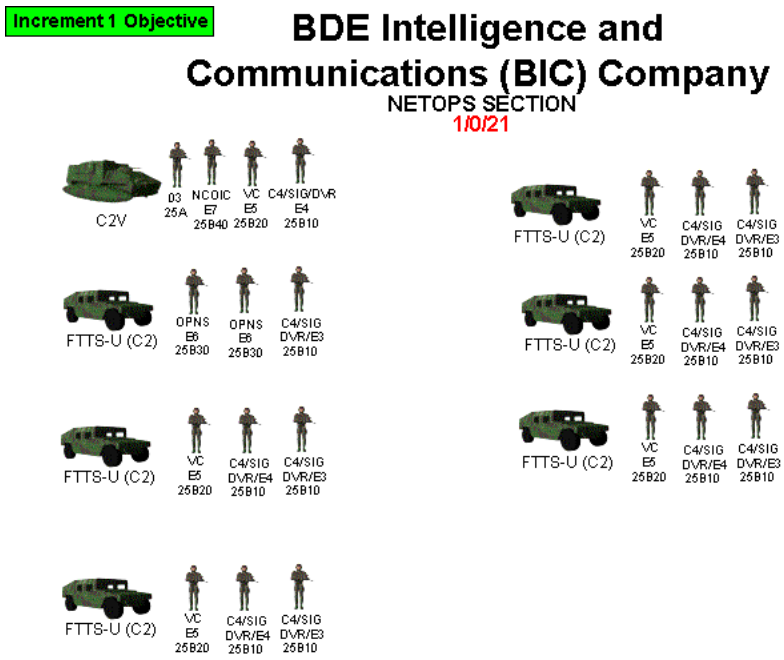


Figure 3-9 BIC Company – NETOPS

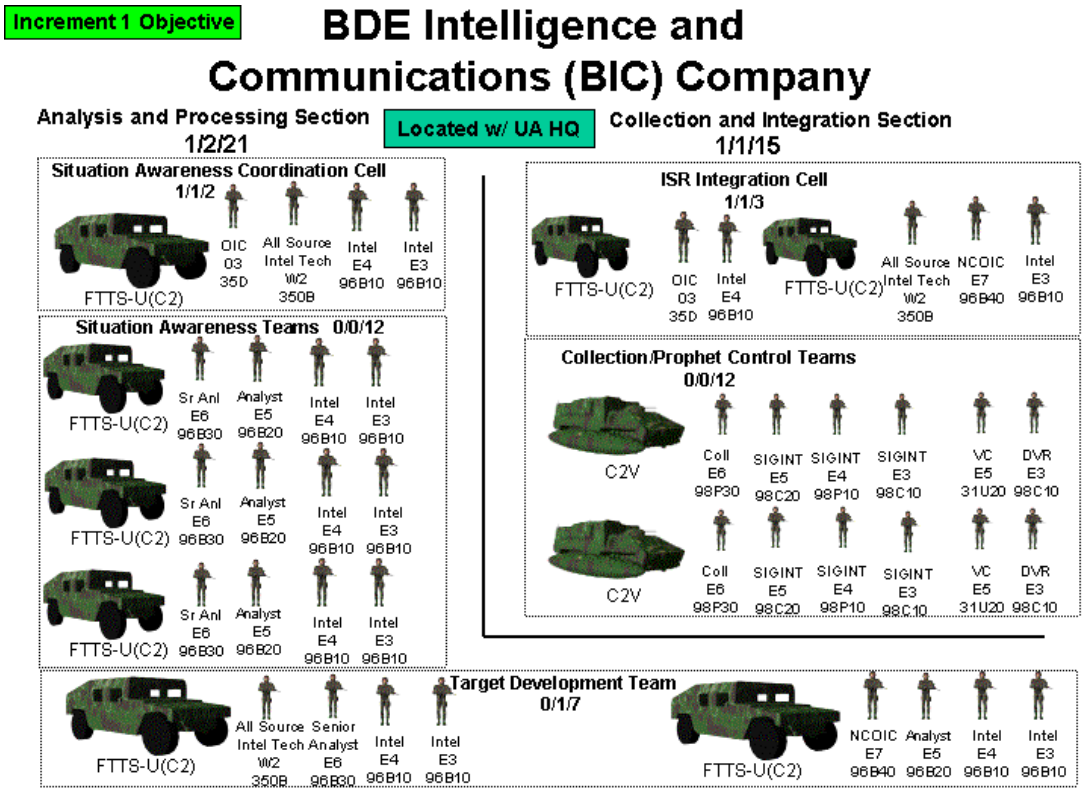


Figure 3-10 BIC Company -A&P, Collection & Integration

BIC Company Mission. The BIC Company plans, coordinates, and executes communications and intelligence related functions. The BIC Company enables proactive decisions by the commander by providing timely, relevant, and accurate early warning and predicative intelligence based on information from organic sensors and external sources. The BIC plans, coordinates, and directs signal assets to support the UA in achieving seamless communication architectures, an assured information management construct, and a reliable network gateway to external resources.

BIC Company Tasks:

- Manage the entire communications frequency spectrum and systems architecture to include internal, external and allied or Joint communications and transmissions beyond UA immediate/direct influence.
- Establish communications (digital, voice and visual) with required communications and control facilities and organizations.
- Provide communications network management, control and enforce circuit discipline on all forms of communications within the UA.
- Establish and manage the flow and display of information critical for command and control of the UA force and organic elements and associated units.
- Conduct situational development, target development, battle damage assessment, indications and warnings, Intelligence Preparation of the Battlefield and Intelligence Support to Force Protection.
- Prepare the Intelligence Running Estimate.
- Support the UA staff in planning, monitoring and assessing organic and supporting ISR operations and information operations.
- Provide the integration and synchronization of organic and attached MI assets as part of an integrated ISR and produce timely, relevant, accurate and predictive intelligence.
- Support Electronic Warfare operations.
- Use reach to access information and intelligence from UE and Knowledge Centers that permits access up to the Top Secret/SCI Level.
- Develop profiles, filters and alarms based on commander's guidance and PIRs
- Integrate and task ISR assets augmented from UE.

Design Considerations: The BIC Company is designed to provide actionable information and intelligence to the UA. It executes a critical role in assessing and maintaining the knowledge that enables the brigade commander's understanding of the threat and the operational environment. It establishes, maintains and controls both the communication and knowledge grid structure under a single commander. It integrates information requirements in support of knowledge-based actions. The BIC provides the assured communications management of both UA communication network and operates the information conduit for shared “situational awareness”, enabling precision maneuver and effects. The BIC executes the integration and synchronization of sensors, builds C2 to dynamically task and re-task the IS architecture and maintains technical and tactical competency to effectively and efficiently maneuver the network. This enables battle command by providing the commander knowledge through focused analysis and by identifying and filling gaps in collection coverage. It adds value to information from the brigade's organic ISR assets as well as leveraging external information and intelligence sources. It is optimized to provide full spectrum intelligence support with a small communications and intelligence related forward presence while making extensive use of reach operations to the unit of employment, theater, Home Station Operations Center (HSOC), and national level knowledge centers.

3.2.4 Combined Arms Battalion (CA Battalion)

Increment 1 Objective

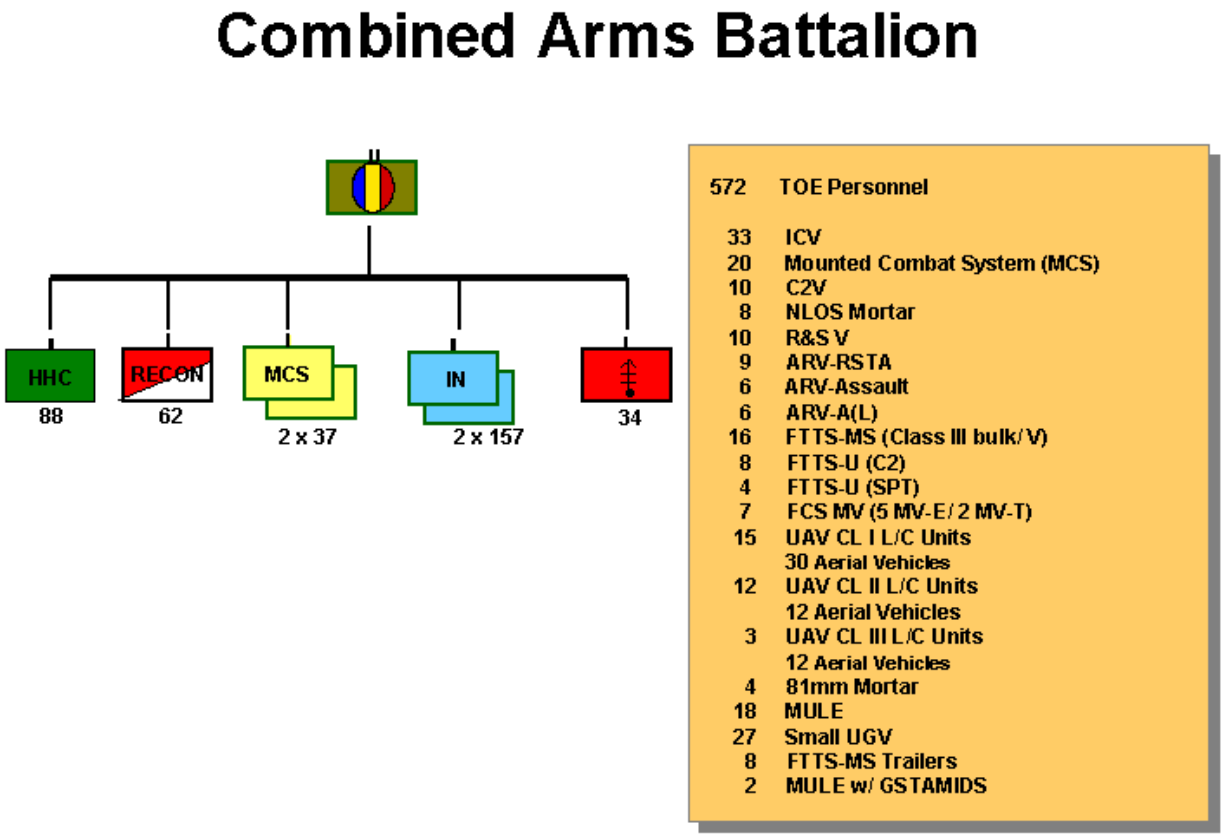


Figure 3-11 CA Battalion Rollup

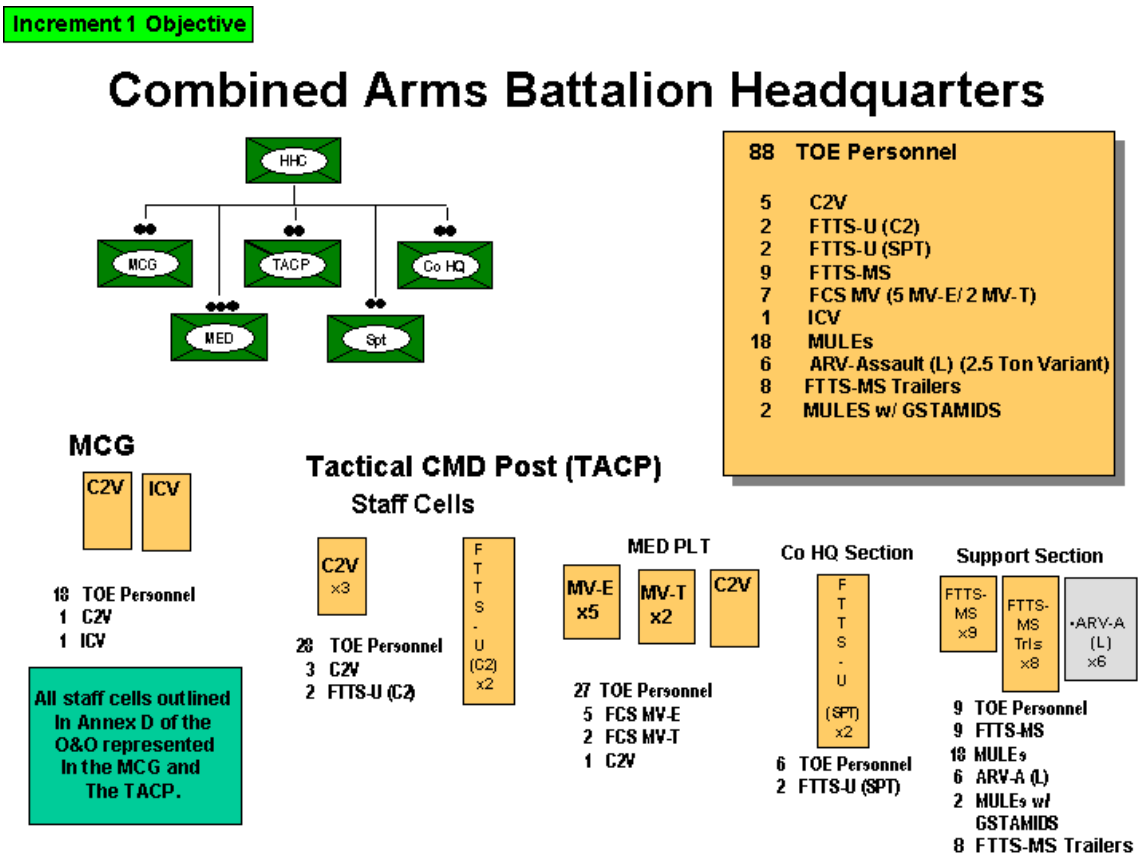


Figure 3-12 CA Battalion HQ

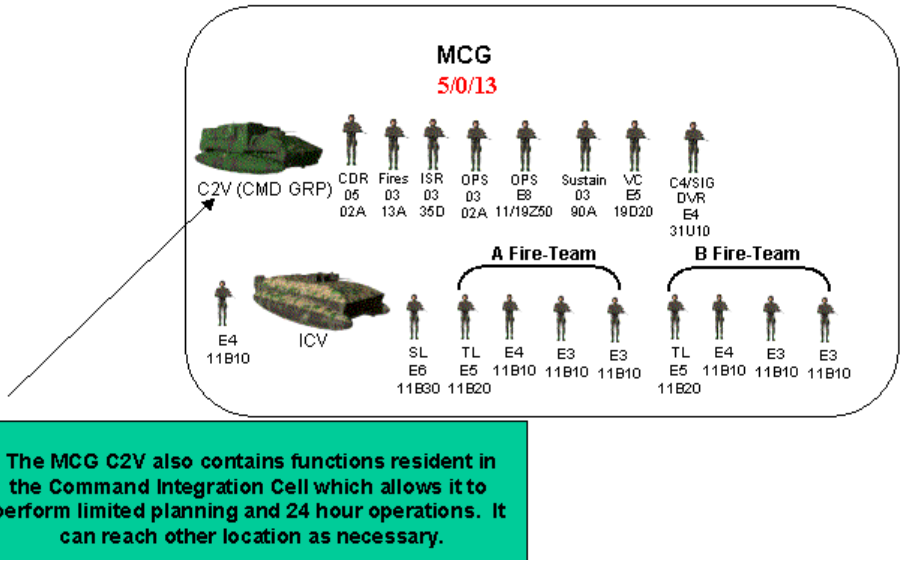
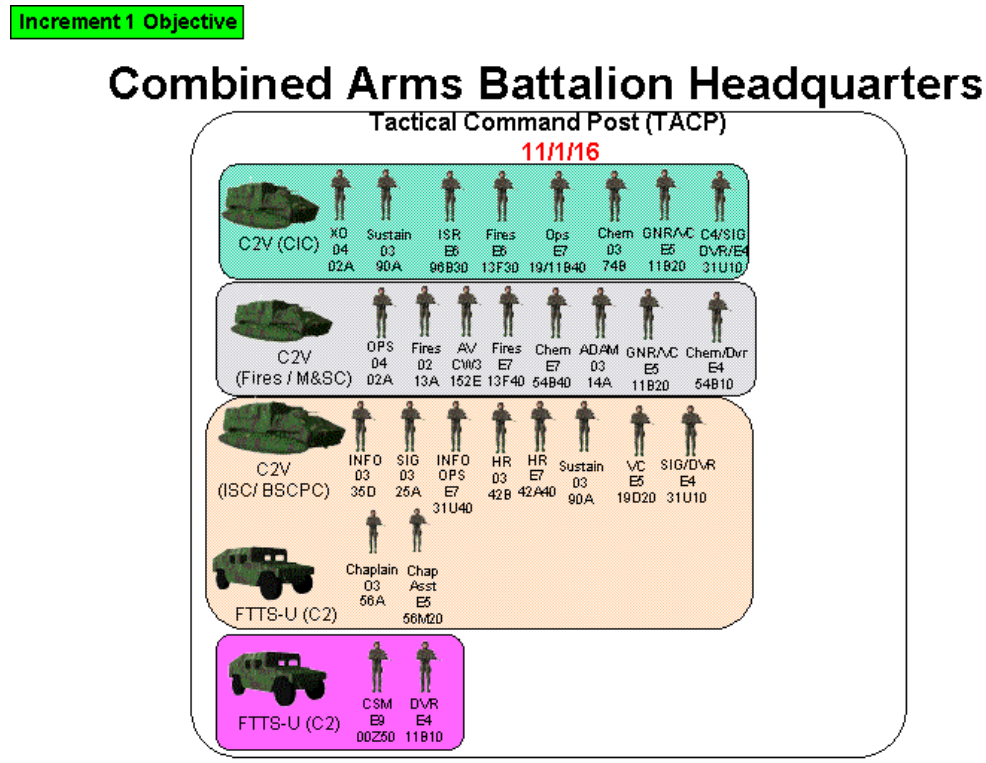
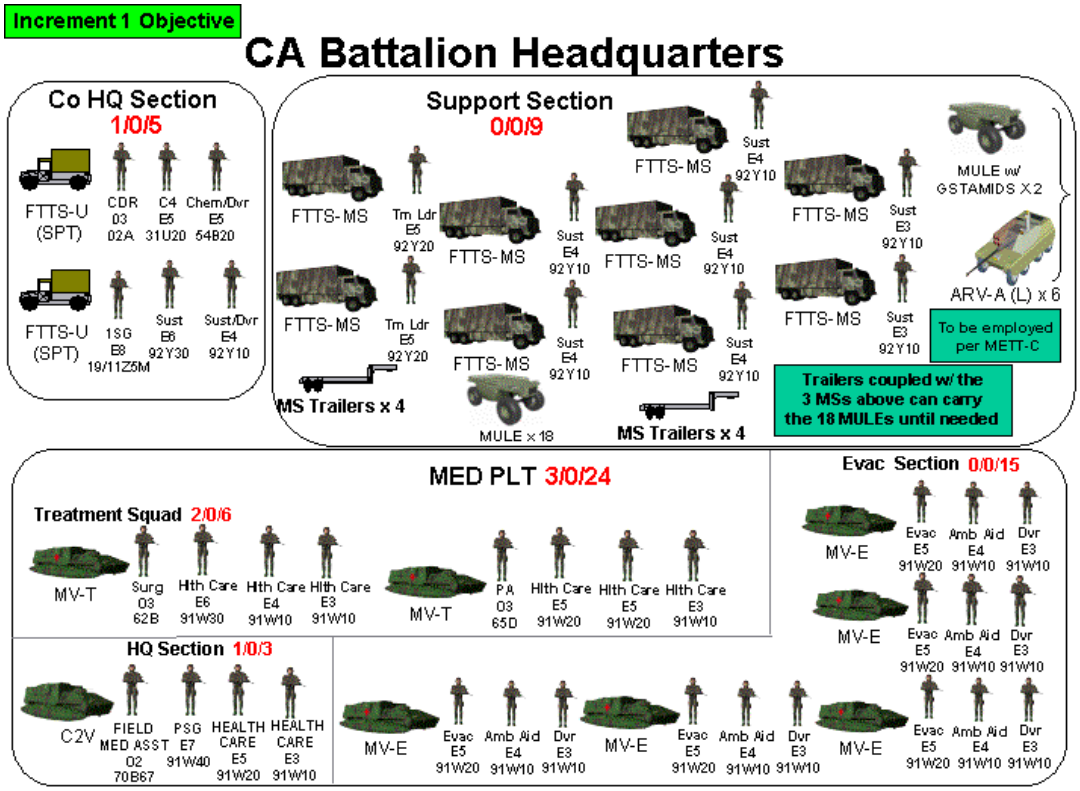


Figure 3-13 CA Battalion HQ - The MCG



1042
1043 **Figure 3-14 CA Battalion HQ - TACP**



1044
1045 **Figure 3-15 CA Battalion HQ - CO HQ, MED Support, Support Section**

CA Battalion Mission. The CA Battalion closes with the enemy by means of combined arms fire and maneuver and tactical assault to destroy the enemy, repel his assaults, or to seize terrain. The CA Battalion will be able to operate for three days at medium to high operational intensity and up to seven days in a low operational environment before it must be re-supplied.

CA Battalion Tasks:

- Execute movement out of contact; fire and maneuver in contact and during tactical assaults to destroy the enemy.
- Perform battle command on the move.
- Employ maneuver to complement destructive fires and effects – Army and Joint - at tactical standoff. During fire and maneuver and tactical assaults, employ organic and close support fires and effects to enable maneuver.
- Air assault dismounted elements with manned – unmanned mission equipment packages dismounted from platforms (lift assets will be provided by the UE).
- Transition rapidly between engagements.
- Conduct offensive, defensive, stability and support operations against any threat in all terrain and weather.
- Conduct reconnaissance and surveillance operations (zone, area, route).
- Conduct security operations (counter-reconnaissance, screen and guard).
- Breach or neutralize obstacles in-stride and from standoff when required with UE engineer assets; accomplish gap and obstacle crossing with augmentation.
- Employ countermobility and survivability assets during defensive operations.
- Receive early warning and perform self-defense Combined Arms for Air Defense fires and effects within LOS/BLOS/NLOS-LS weapons ranges.
- Conduct integrated sustainment operations during offensive, defensive, stability and support operations.

Design considerations: The CA Battalion is optimized for offensive operations with companies attacking on multiple routes. It develops the situation through all phases of the operation using organic and external manned and unmanned sensors. The battalion is able to quickly team organic and augmenting units for mutual support and cooperative engagement. It establishes and maintains a dynamic relationship between sensor-shooter and teaming to achieve assured overmatch. This overmatch mandates soldiers have a high level of competency in use of terrain and teaming to achieve superior lethality and survivability.

The CA Battalion headquarters company has the capability of employing one Mobile Command Group and a Tactical Command Post. A MCG consists of a commander and a command group staff cell along with a security team. This staff cell contains the functions resident in the command integration cell in the TACP. Coupled with the TACP, the MCG can conduct 24-hour a day operations. The TACP consists of a Command Integration Cell that integrates and prioritizes the actions of the Information Superiority Cell, Build and Sustain Combat Power Cell, and Maneuver and Support Cell. The CA Battalion XO resides in the CIC and is overall responsible for the TACP operation. The TACP can operate continuously 24-hours a day. There is no rear CP. All command elements are 100% mobile and optimized to command and control tactical engagements while synchronizing ISR, fires and effects, force protection, maneuver, and logistics.

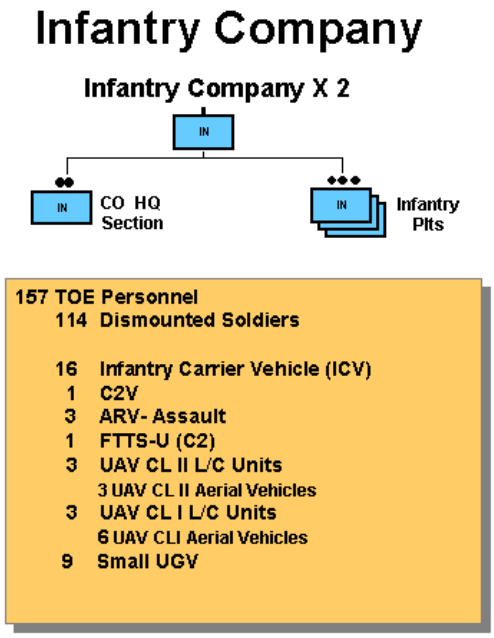
The medical platoon is organic to the CA Battalion headquarters and consists of a HQ section, a treatment squad, and an evacuation section. The headquarters is mounted in a FCS Command and Control Vehicle (C2V) and consists of a platoon leader, platoon sergeant, and two enlisted medics. Its purpose is to command and control the platoon, conduct Force Health Protection planning in conjunction with the battalion staff, and advise the commander on maintaining the health of the battalion. The treatment squad will form the base of the Battalion Aid Station (BAS) and will be comprised of two FCS Medical Vehicles (MV) Treatment (FCS MV-T) variants, with a crew of one physician, one PA, and six medical enlisted

soldiers. This gives the commander the flexibility to temporarily split the aid station into two treatment teams, or consolidate the aid station, whichever best supports his scheme of maneuver. The evacuation section has five FCS MV-Evacuation (FCS MV-E), each with a crew of three combat/emergency care medics. These vehicles and crews will provide initial treatment and stabilization and if possible, will return patients to duty. They will evacuate any casualties that cannot return to duty back to the BAS. From the BAS, disease non-battle injuries (DNBI) or wounded soldiers are either RTD or evacuated to the Forward Support Battalion (FSB) medical company for additional resuscitative care. One dismounted (trauma specialist) medic is assigned to each infantry platoon headquarters and when the platoon takes casualties quickly relieves combat lifesavers from their enhanced first aid mission and provides emergency medical treatment, as required.

The support section of the CA Battalion Headquarters consists of nine Future Tactical Truck Systems – Maneuver sustainment (FTTS-MS) with trailers, 18 Multifunction Utility/Logistics Equipment Vehicles (MULE), and six Armed Robotic Vehicles – Assault (L). The MULEs are to carry equipment and ammunition when the soldiers are dismounted. The FTTS-MS will transport the MULEs until operationally required but will also carry a portion of the CA Battalions' three days of requirements.

1108 **3.2.5 Infantry Company**

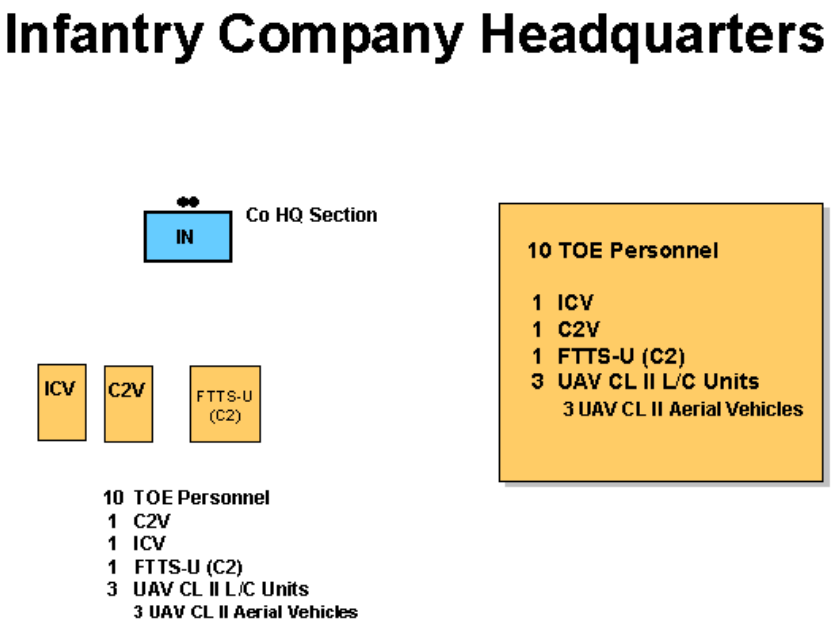
Increment 1 Objective



1109

1110 **Figure 3-16 Infantry Company**

Increment 1 Objective



1111

1112 **Figure 3-17 Infantry Company HQ**

Increment 1 Objective

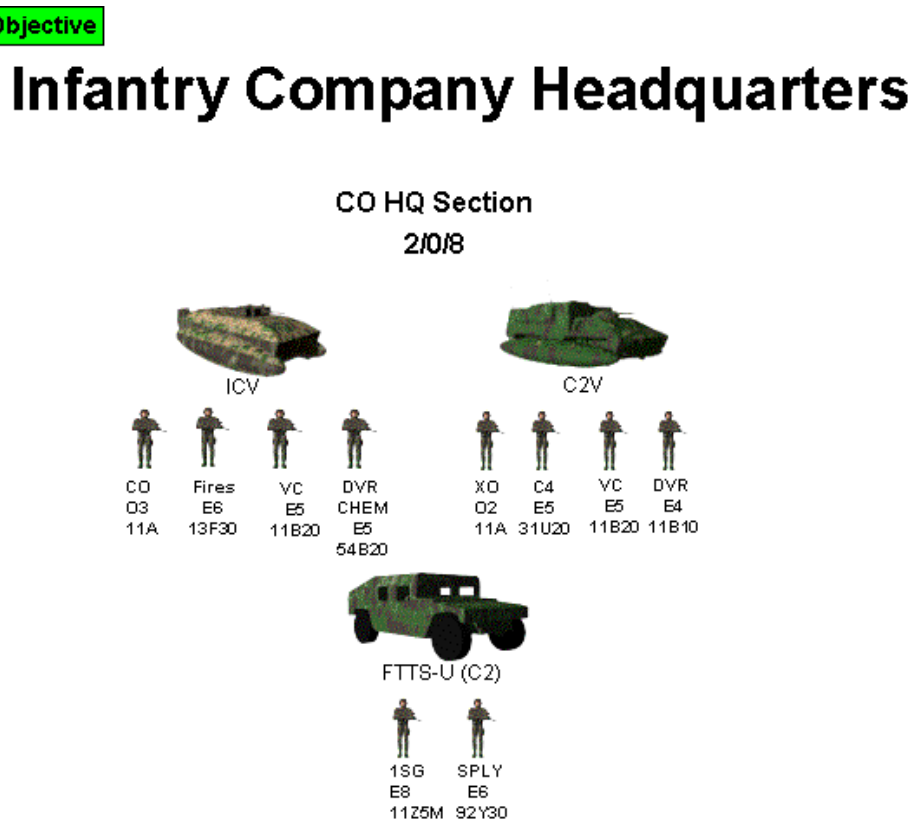


Figure 3-18 Infantry Company HQ

Increment 1 Objective

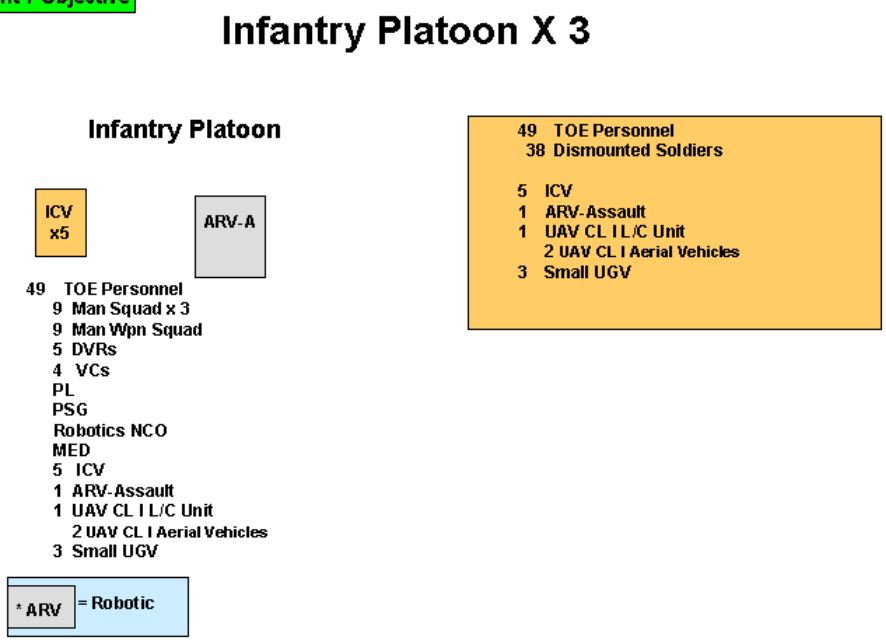


Figure 3-19 Infantry Platoon

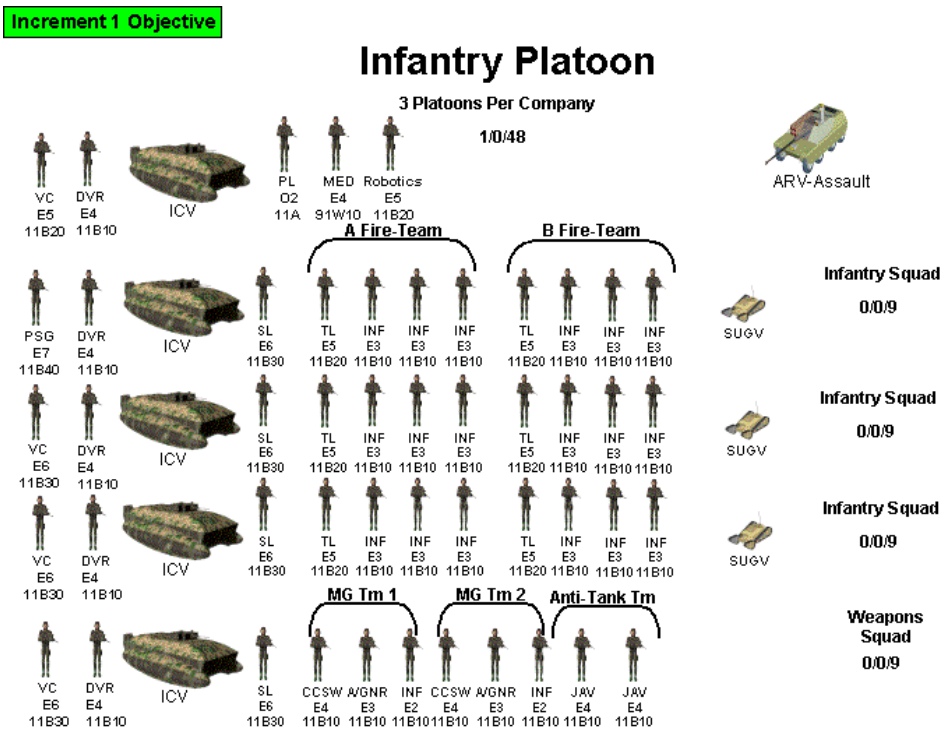


Figure 3-20. Infantry Platoon

Infantry Company Mission. The Infantry Company closes with the enemy by means of fire, maneuver, and tactical assault to destroy, fix, or repel the enemy's assaults by fire, close combat, and counter-attack.

Infantry Company Tasks:

- Execute movement before contact; fire and maneuver in contact and during tactical assault to close with and destroy the enemy.
- Provide mutual support in overwatch and control cooperative engagements.
- Conduct offensive, defensive, stability and support operations in all terrain and weather.
- Conduct reconnaissance and surveillance operations in contact (zone, area, route).
- Conduct security operations (counter-reconnaissance).
- Conduct limited air-assault operations.

Design considerations: The Infantry Company is organized with a Company HQ and three rifle platoons. The Company HQ contains a Commander, Executive Officer, First Sergeant, vehicle commanders and drivers, and the following non-commissioned specialists;

- Fires and Effects NCO.
- C4 NCO.
- NBC NCO.
- Supply NCO.

The company HQ is equipped with one ICV, one C2V and one FTTS-U. The commander and executive officer each employ their vehicles to provide company command and control from disparate locations. Either is capable of independently commanding the company. The First Sergeant and Supply Sergeant share the FTTS-U. Company level unmanned systems consist of three UAV Class II systems. Additionally,

the company commander may task organize his UAV assets to any of his subordinate elements and pass their control through the battle command network.

The rifle platoon is organized with a Platoon HQ, three nine man rifle squads, and one nine man weapons squad. The Platoon HQ consists of a Platoon Leader, Platoon Sergeant, Medic, Robotics NCO (E5, 11B), a vehicle commander and driver. The platoon leader rides in an ICV and dismounts with his squads during dismounted operations. The Platoon Sergeant rides in the 1st squad ICV and during dismounted operations remains with the vehicles to control vehicle fires and effects and maneuver.

The Robotics NCO is intended to assist the platoon leader in employing his unmanned systems. He is the platoon leader's robotics subject matter expert and assists the platoon leader in platoon level R&S tasks. Additionally, he coordinates and executes platoon level unmanned systems training. The platoon's vehicles include an ICV for the platoon HQ and an ICV for each of the four squads. The platoon HQ also possesses one UAV class I system and an Armed Robotic Vehicle-Assault (ARV-A). The platoon leader will employ his UAV in support of his R&S plan and may pass its control to any subordinate element through the Battle Command network. The ARV-A provides the platoon direct fire and BLOS capabilities the platoon leader employs in support of his maneuver. An additional unmanned platform the platoon may employ on demand is the Armed Robotic Vehicle Assault-Light (ARV-A (L)). This asset normally resides in the CA Battalion Support Platoon and is intended to replace the platoon's ARV-A during air assault operations when the platoon's heavier, non-air assault capable assets are not available. The ARV-A (L) provides the platoon leader LOS and BLOS capability.

The rifle squad is organized with a squad leader and two fire teams. Each fire team contains a team leader, grenadier, automatic rifleman, and rifleman. Each squad is transported in its own ICV. Each ICV has a vehicle commander and a driver distinct from the rifle squad. The 1st squad's ICV commander is the platoon sergeant. Vehicle commanders are the crew chiefs that perform the Preventive Maintenance Checks (PMC) and at least 80% of the total Field Maintenance tasks/requirements.

Each rifle squad possesses a Small Unmanned Ground Vehicle (SUGV) that serves as an unmanned sensor platform the squad leader uses to gather information without directly exposing his soldiers to hostile action. There is no assigned robot operator in the squad. The squad leader will delegate SUGV operation to either one of his squad members or to his ICV vehicle commander. An additional unmanned platform the squad may employ on demand is MULE. This asset normally resides in the CA Battalion support platoon and during extended dismounted operations provides the squad logistic carrying support normally provided by their ICV. The weapons squad is organized with a squad leader, two machine gun teams and one anti-tank team. Each machine gun team contains a gunner, assistant gunner, and ammunition bearer. The anti-tank team contains two javelin gunners. The squad is transported in an ICV with its vehicle commander and driver.

The Infantry Company will operate mounted when possible to gain the tactical mobility and protection inherent in the FCS vehicles. When the situation dictates the company will dismount and fight with its organic vehicles providing supporting fires and effects. The company can also fight entirely without its vehicles in restrictive terrain and during air assaults. The Infantry Company achieves lethal overmatch through Battle Command network enabled sensor-shooter relationships with NLOS and BLOS assets and aviation. Through the use of manned and unmanned systems, the soldiers will identify the enemy and apply LOS, BLOS, and NLOS effects through the sensor to shooter links. The company attacks the enemy from stand-off distances to destroy or seriously degrade him before executing the close assault. Unmanned systems perform in a synergistic manner as additional maneuver elements that move in front of the soldiers, overwatch each other, detect mines and other obstacles, and destroy the enemy from standoff.

3.2.6 Mounted Combat System Company

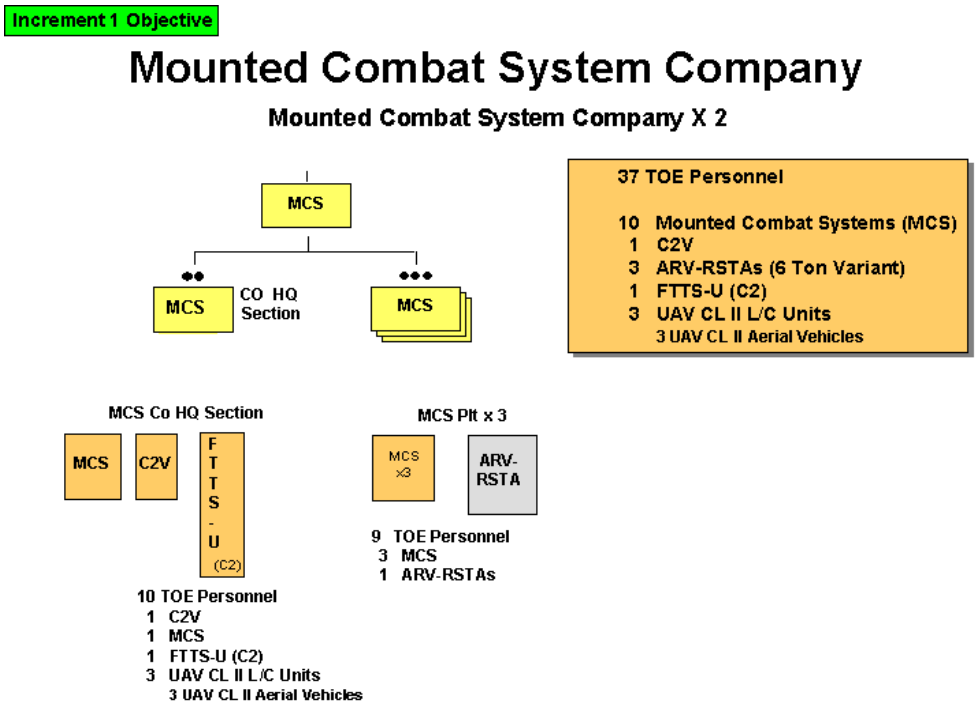


Figure 3-21 MCS Company

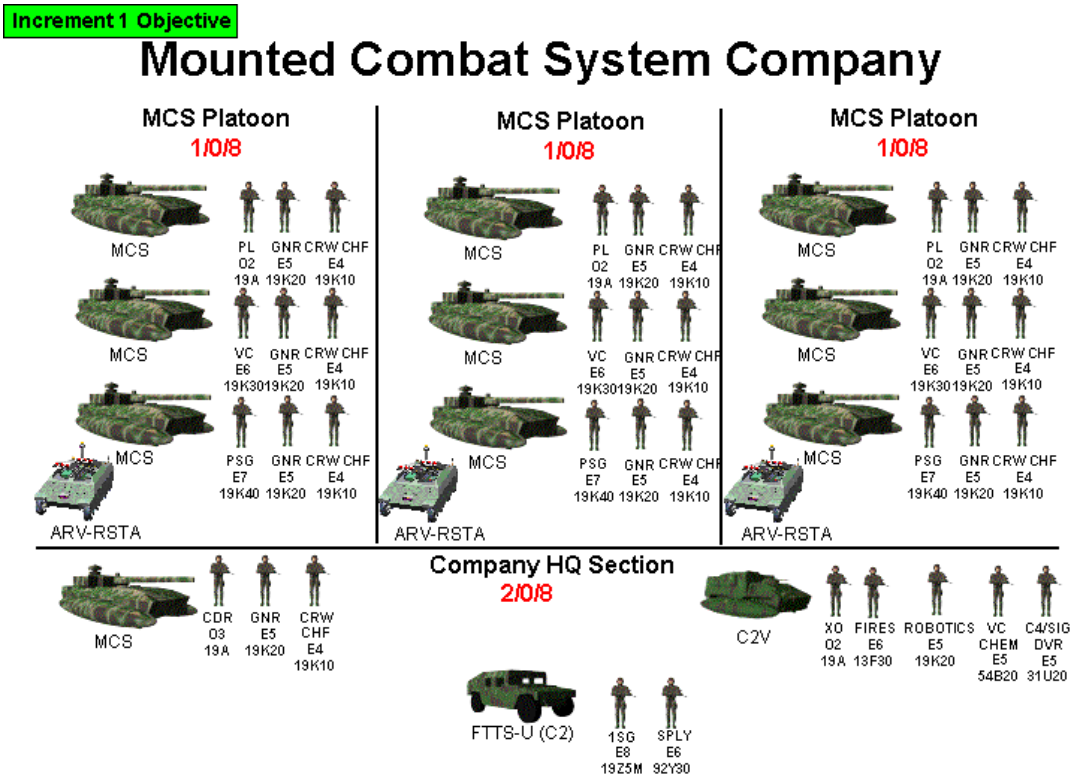


Figure 3-22 MCS Company

MCS Company mission. To close with and destroy enemy forces, using fire and maneuver and tactical assault. Optimized for extended LOS and BLOS fires and employs chemical energy (CE) and kinetic energy (KE) munitions to engage at standoff as well as provide rapid gun fires required for actions on contact or during tactical assaults. Attacks or defends under hostile fire and during limited visibility conditions. This unit is optimized for high-speed mobile operations and has required lethality to kill main battle tanks (MBT) with enhanced reactive armor and active protective systems. Each MCS is operated with a 3-man crew with the ability to transport a fourth soldier.

MCS Company Tasks:

- Execute fire and maneuver before contact, in contact, and during tactical assault to close with and destroy the enemy.
- Provide mutual support in overwatch and cooperative engagements.
- Conduct offensive, defensive, stability and support operations in all terrain and weather.
- Conduct reconnaissance and surveillance operations (zone, area, route).
- Conduct security operations (counter-reconnaissance).
- Fire munitions that will accurately destroy low and slow moving enemy aircraft and UAVs.

Design considerations: Further analysis will determine endstate mixes. Each MCS platoon has three MCS weapon platforms. The company can tailor its platoons to support infantry companies or can be employed to mass in support of mobile battalion operations. Each company has three Class II UAVs and three ARV-RSTAs. The UAVs and ARVs provide the company with reconnaissance capability in MOUT and other battlespace. Unmanned systems move ahead of manned platforms, providing overwatch, mine and obstacle detection. The third crewmember is the crew chief that performs Preventive Maintenance Checks (PMC) and at least 80% of the total Field Maintenance task and requirements.

It achieves lethal overmatch through teaming relationships with sister units, sensor–shooter relationships with fires and aviation. The MCS Platoon applies knowledge of friendly, enemy, and terrain/weather to contribute to overmatch. Its leadership must have a high level of leader competencies in use of terrain, combined arms teaming, and achieving lethal overmatch.

3.2.7 Reconnaissance Troop

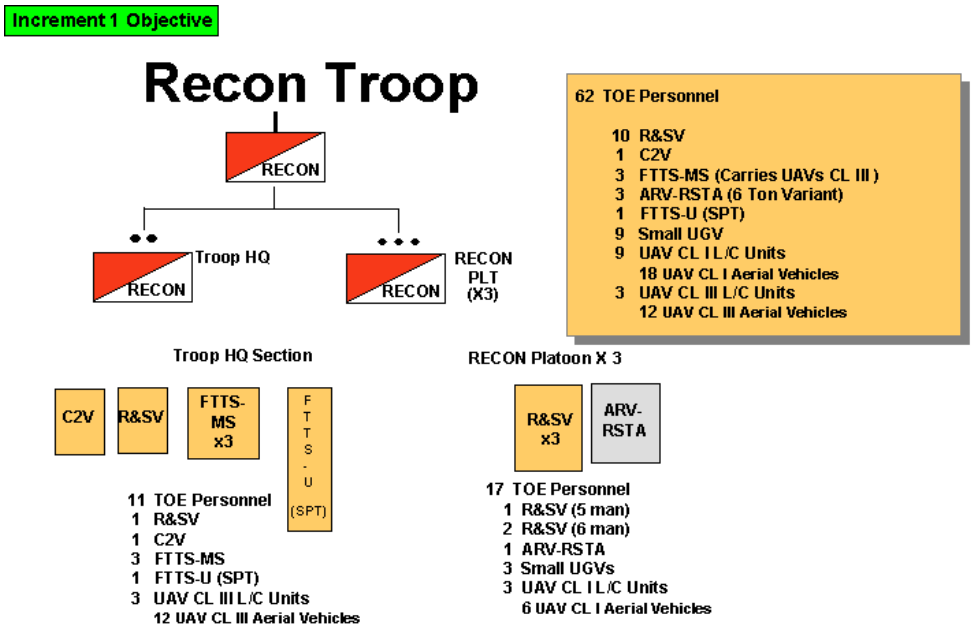


Figure 3-23 Recon Troop

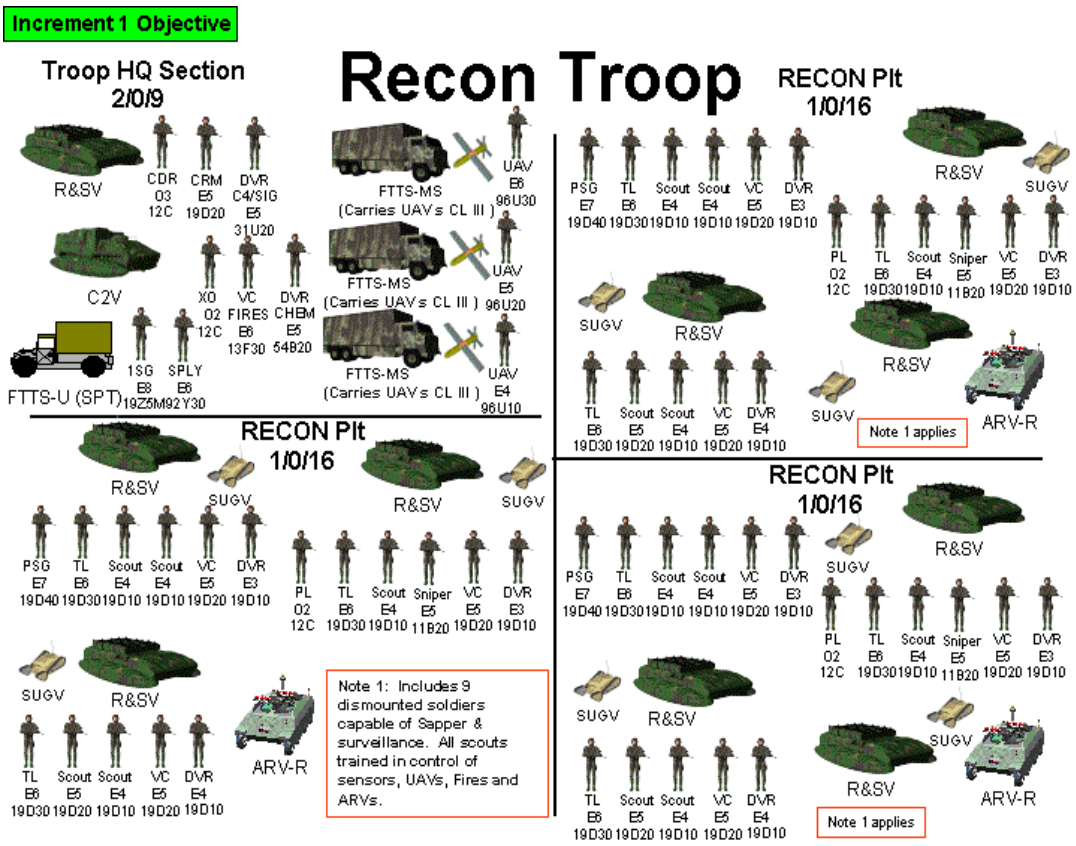


Figure 3-24 Recon Troop HQ and Platoons

Reconnaissance Troop Mission. Gain information superiority over the enemy through active reconnaissance and surveillance operations. Gain and maintain contact with enemy forces, develop the situation and enable the situational awareness of the supported commander. Provide security through reconnaissance and surveillance.

Reconnaissance Troop Tasks:

- Conduct reconnaissance and surveillance (mounted and dismounted) operations to develop battlefield mobility and emplace observation.
- Perform R&S on a minimum of three routes or nine NAIs (using manned and unmanned sensor capabilities).
- Conduct the traditional “sapper” tasks, conducts limited breaching operations, locate mine fields, categorize enemy bridges and fortified structures.
- Provide sensor data from its organic sensors, both manned and unmanned, to produce combat information into the COP.
- perform target acquisition tasks and calls for effects as part of normal operations.
- Find and bypass obstacles (using organic personnel trained in sapper skills – sapper element - possess demolition expertise). Perform gap crossing with augmentation from divisional UE.
- Employ snipers for lethal precision fires in restricted/urban terrain.

Design considerations: The Troop teams with Infantry and MCS companies and receives mobility support augmentation to achieve increased tempo for tactical movement. It establishes sensor to shooter relationships with fires systems to apply precision fires to destroy high payoff and most dangerous target sets (planned or opportunity). It teams with manned and unmanned aviation to accomplish the mission and requires a high order of leader competence at skillful use of terrain and R&S techniques operating in advance of the CA Battalion. Each Troop has three Class III UAVs and three ARV-RSTAs. The UAVs and ARVs provide the troop with reconnaissance capability to support the CAB mission.

3.2.8 NLOS Mortar Battery

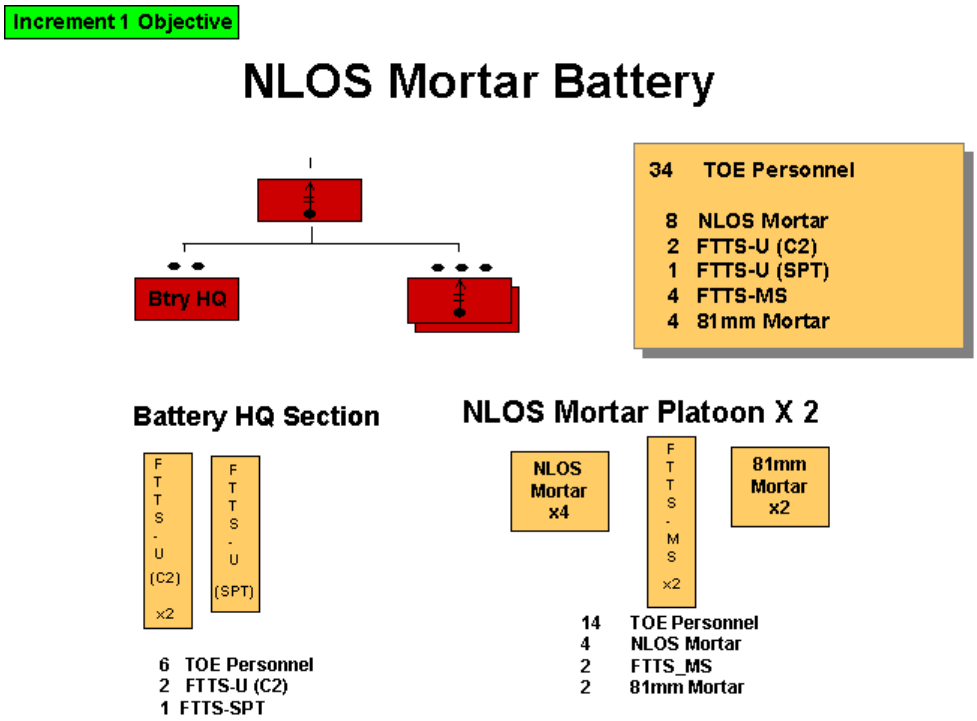


Figure 3-25 NLOS Mortar Battery

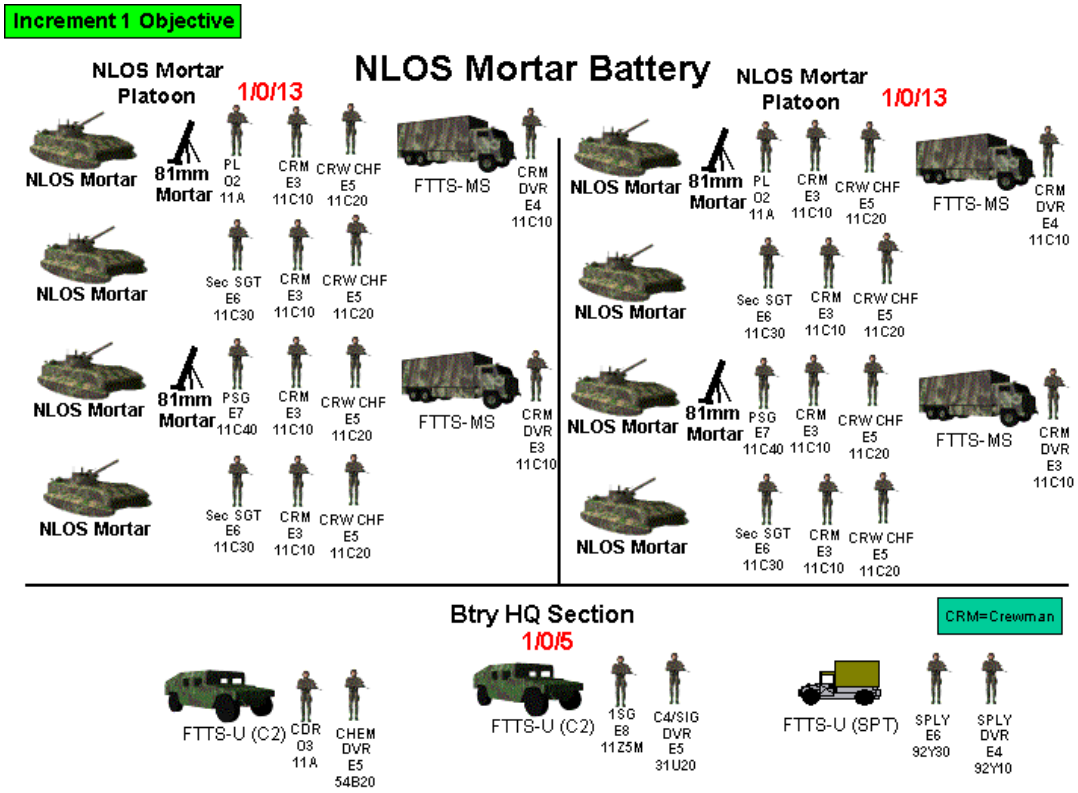


Figure 3-26 Mortar Battery

NLOS Mortar Battery Mission. The mortar battery provides fires in close support of tactical maneuver that include destructive fires, protective fires and special purpose fires.

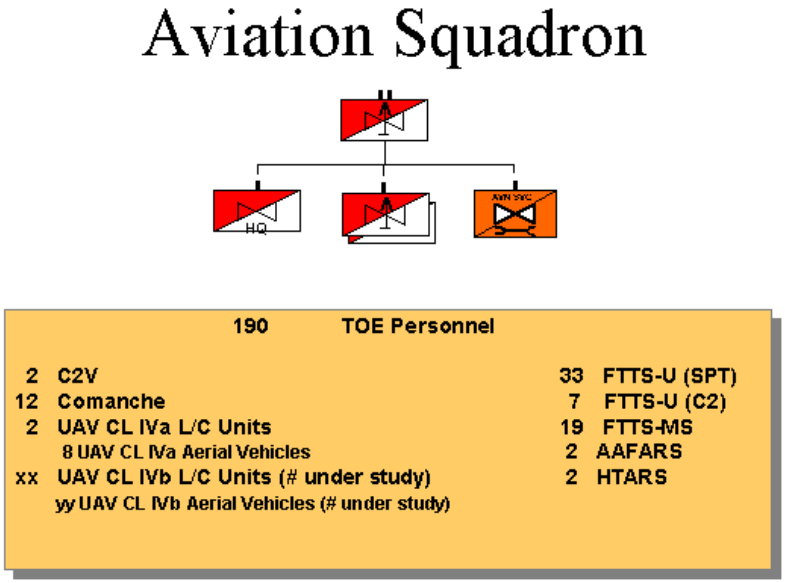
Mortar Battery Tasks:

- Employ precision fires to destroy high payoff and most dangerous targets.
- Provide area suppression in support of companies and platoons.
- Employ protective indirect fires (lethal and non-lethal) to suppress and to provide obscuration from enemy forces in order to enable maneuver forces to close with and destroy the enemy by empowering the formation with freedom of maneuver during contact while minimizing casualties.
- Provide danger close and final protective fires.
- Link the availability of networked fires – Army and Joint.
- Support cooperative engagements.

Design considerations: The mortar battery consists of two platoons of four NLOS mortars and two 81mm mortars (organic to the platoon in an “arms room” concept). It provides precision-guided mortar lethality out to a range of 12-15 km. It operates normally as either two platoons or four sections to establish teaming relationships with recon troop elements and maneuver companies. The battery is highly flexible and agile in establishing sensor-shooter linkages. The organization provides highly responsive, reliable, timely, accurate and sustained rates of fire and rates of kill with 24/7 availability in all weather and terrain conditions at extended range (12-15 km). It provides precision-guided fires to destroy, protective fires to suppress and obscure enemy, and illumination fires all in close support of maneuver units of the battalion. The platoon provides responsiveness with fires on-demand to engage complex and simultaneous target sets and can tailor for agility in tactical operations to execute pre-planned or opportunity engagements and scale effects to the nature of the target sets and Rules of Engagement. The battery can employ its 81mm mortars on air assault missions and in complex terrain impassible to the FCS Platforms.

1273 **3.2.9 Aviation Squadron**

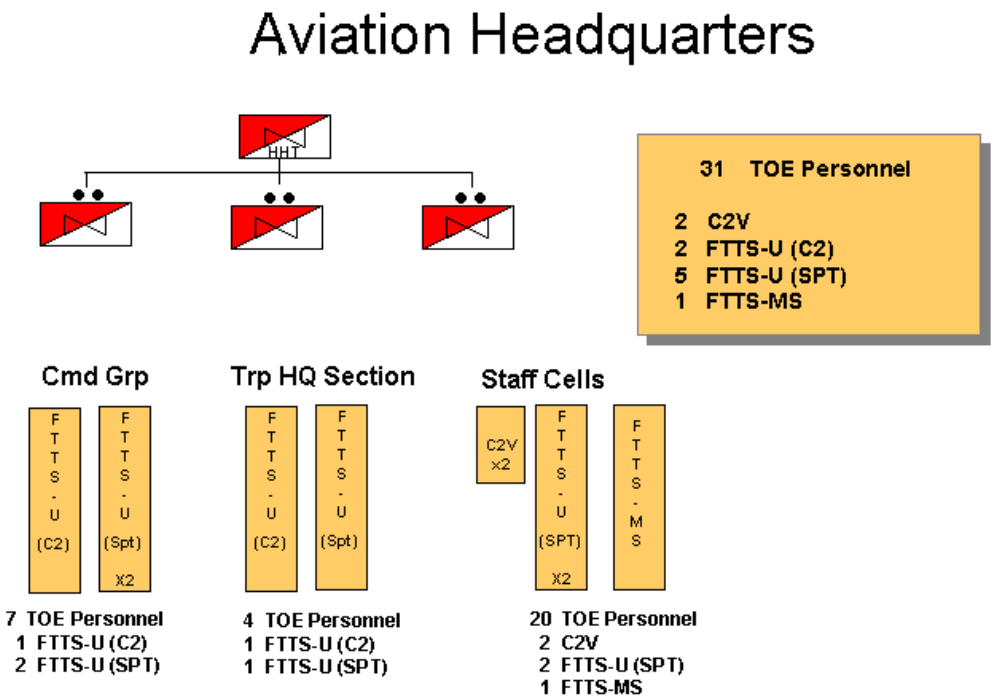
Increment 1 Objective



1274

1275 **Figure 3-27 Aviation Squadron**

Increment 1 Objective



1276

1277 **Figure 3-28 Aviation HQ**

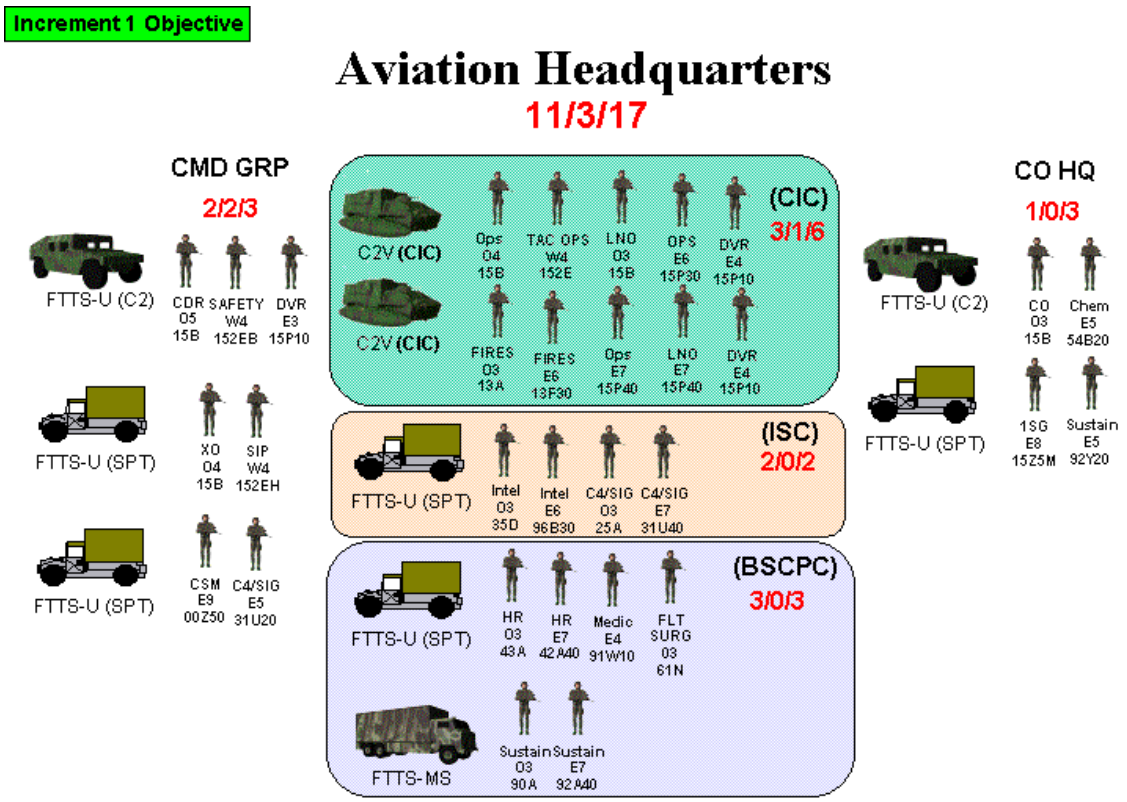


Figure 3-29 Aviation HQ

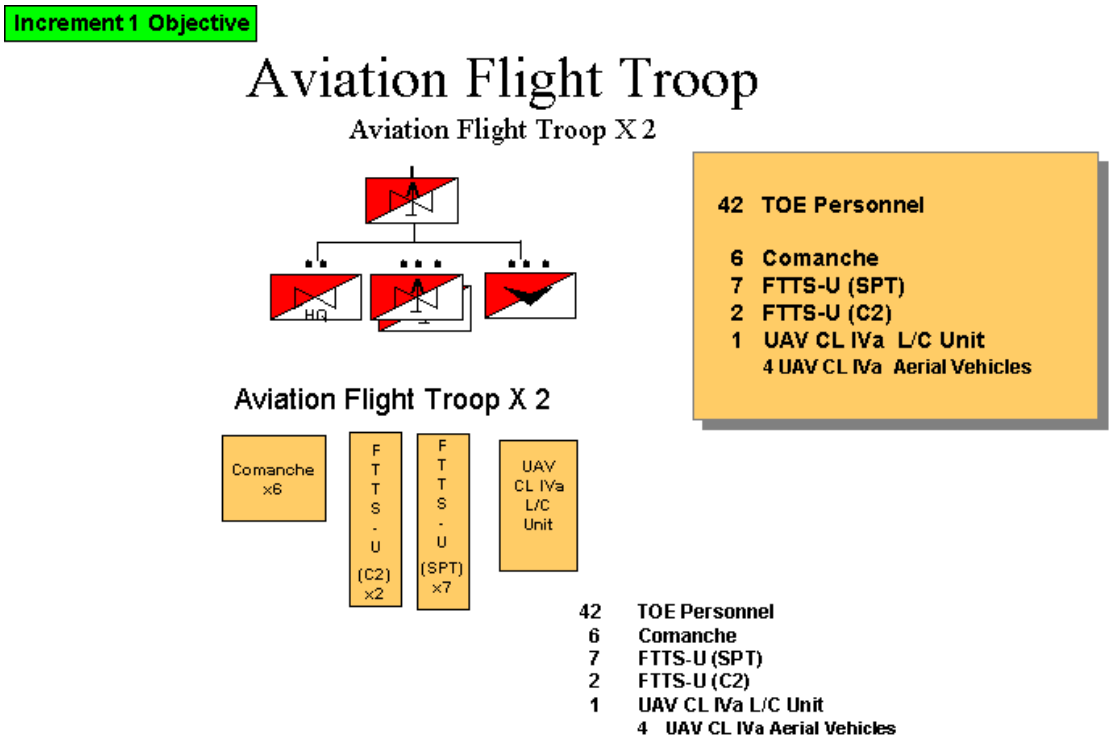


Figure 3-30 Aviation Flight Troop

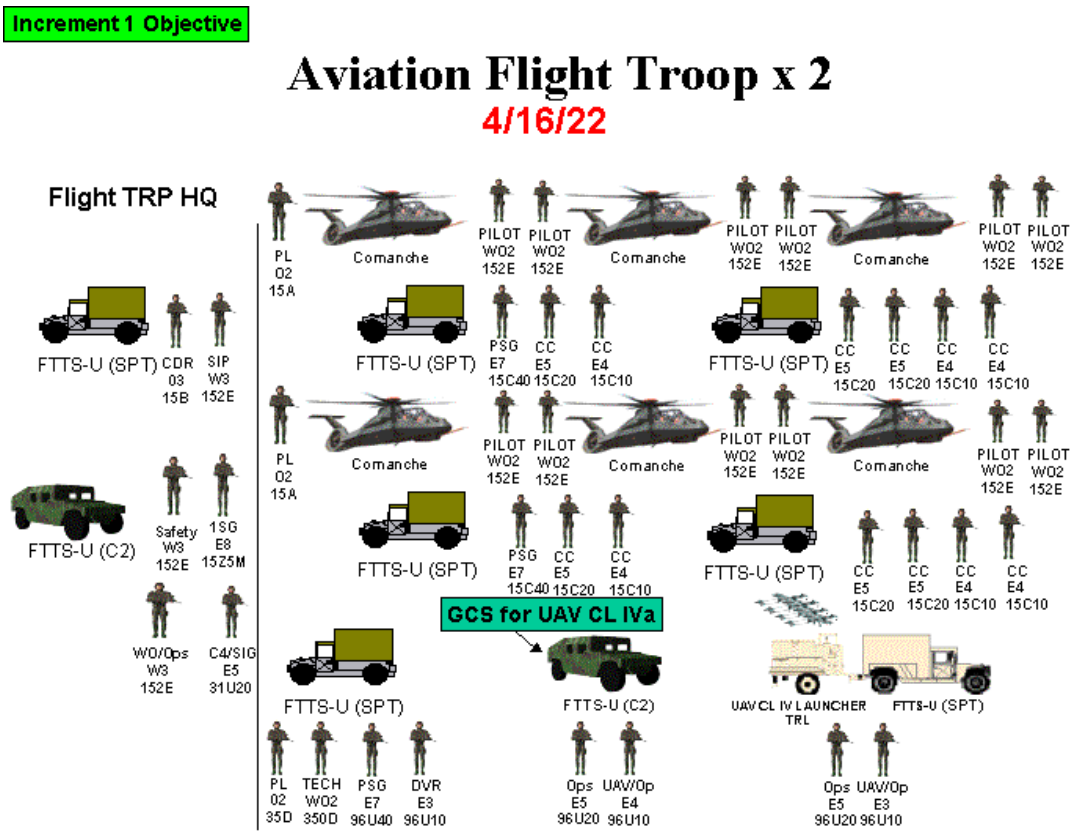


Figure 3-31 Aviation Flight Troop

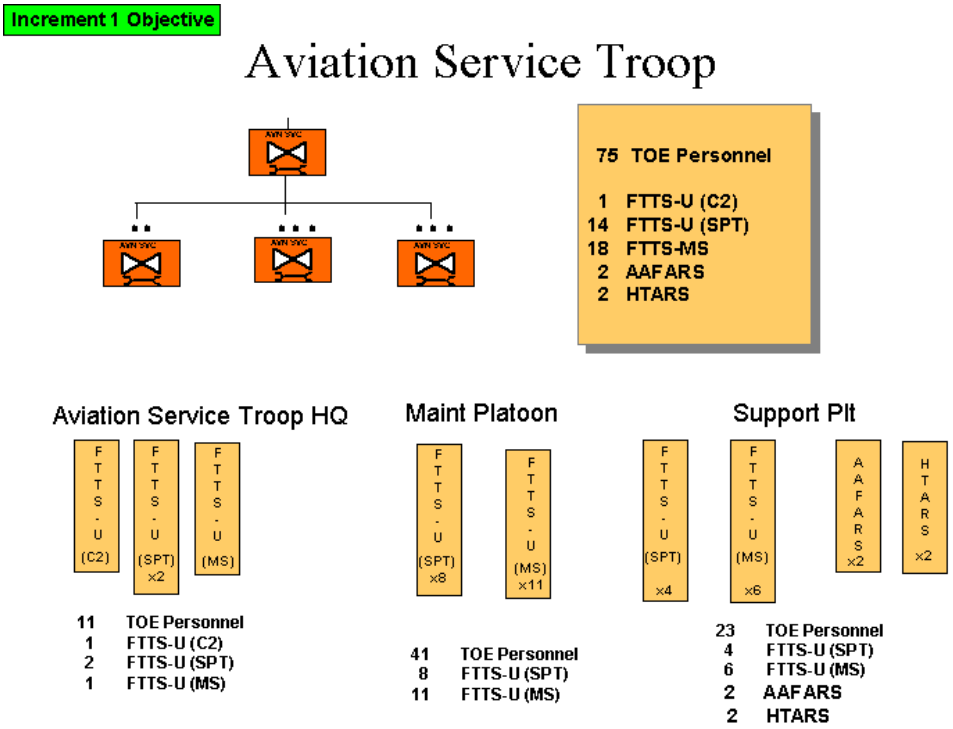


Figure 3-32 Aviation Service Troop

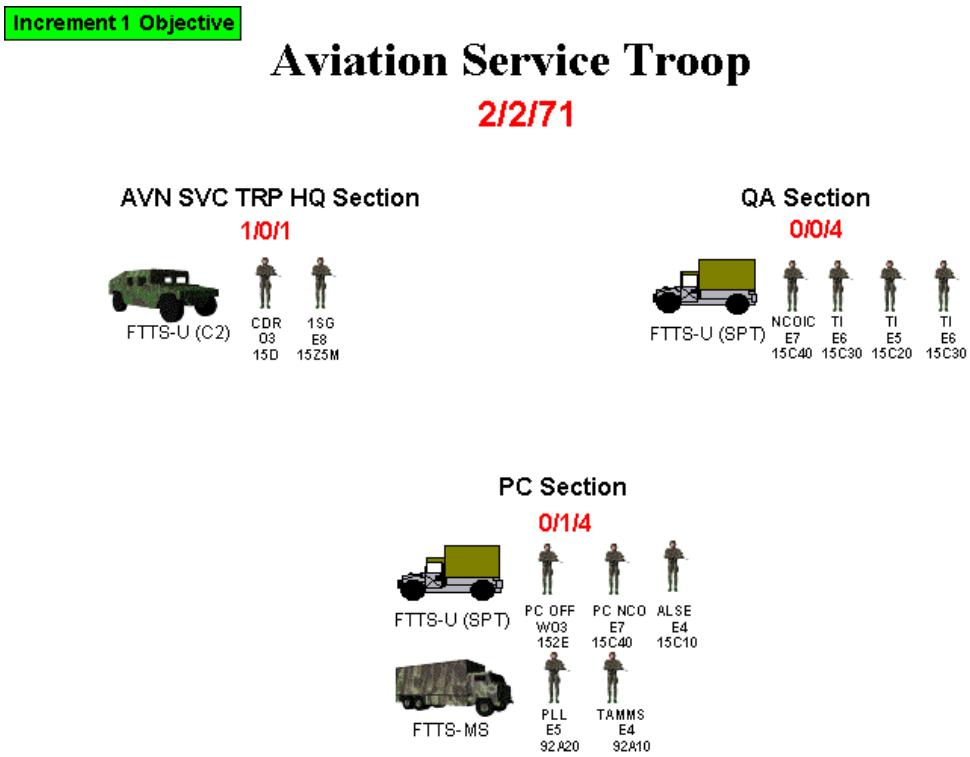


Figure 3-33 Aviation Service Troop

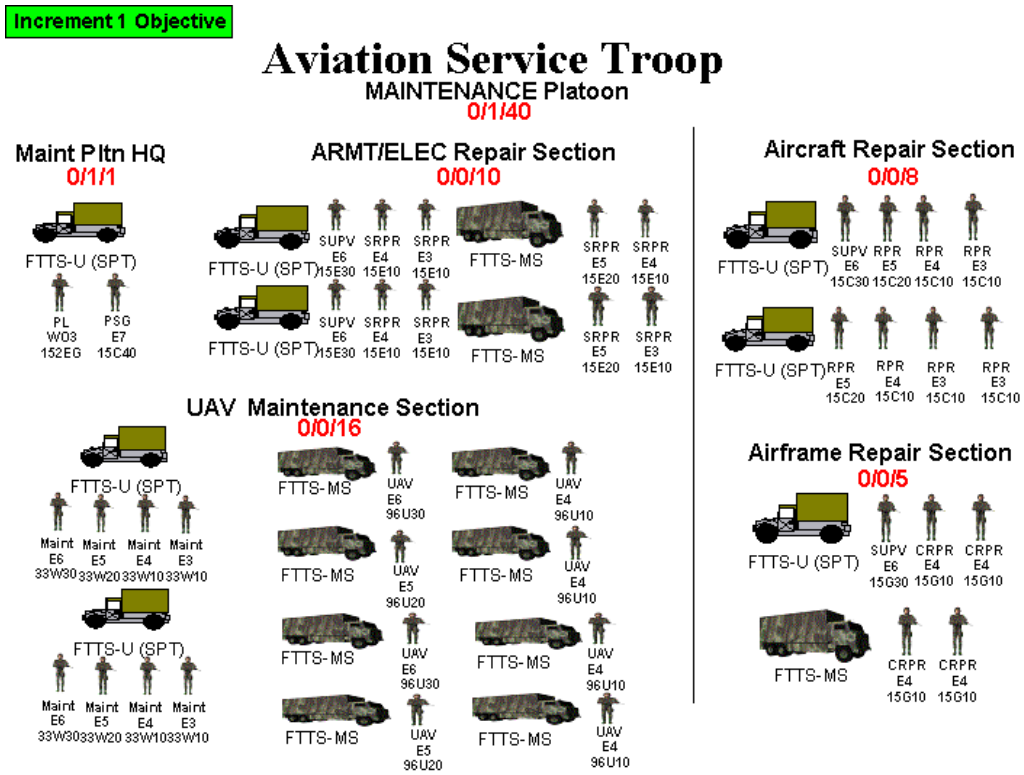


Figure 3-34 Aviation Service Troop

Figure 3-35 Aviation Service Troop

UA Aviation Squadron Mission: Reconnoiter in order to find/fix threat, to build and share the Common Operational Picture tailored to the air-ground team task/purpose, and to focus combat power at the decisive point at the right time. Conduct security operations to provide reaction time, maneuver space, and protection to air-ground maneuver. Conduct decisive, integrated air-ground operations to close with and destroy the enemy through fire and maneuver or tactical assault. Conduct decisive, integrated air-ground operations to close with and destroy the enemy through fire and maneuver or tactical assault.

Task:

- Reconnaissance:
  - Conducted as part of integrated air-ground manned / unmanned team to avoid meeting engagement.
  - Task/purpose-based NAI–per mission order to develop situation out of contact, sort out HPT, enable freedom of maneuver, avoid meeting engagement, and enhance force protection.
- Orchestrate recon effort by employing off-board/on-board R & S assets and Man-in-loop eyes on to 'see first--understand first' (C2 R&S effort and cue and be cued).
  - Apply principles of reconnaissance – gain and maintain contact.
  - Conduct actions on contact to fix, destroy, or disengage as required.
- Security:
  - Orchestrate sensors to develop the situation
  - Maneuver to position of advantage increasing agility and mobility of force
  - Develop and share COP with all members of the air-ground team

- Apply principles of reconnaissance – gain and maintain contact
- Conduct actions on contact to fix, isolate, provide reinforcing fires, or destroy threat forces
- Synchronize fires, maneuver, and tactical assault as required
- Maintain communications with all members of the air – ground team

- Close Combat with Ground Forces:
  - Key is close support of ground forces conducting fire and maneuver and tactical assault
  - Complementary fires and maneuver taking advantage of terrain, stand off, and ground forces for protection
  - Reinforcing fires
  - Continue development of dynamic situation
  - Extend the tactical reach of maneuver forces, particularly in urban and other complex terrain
  - Present the enemy with multiple/simultaneous dilemmas from which he cannot escape
  - Establish and control the OPTEMPO of the fight
  - Synchronize all available RSTA, fires (Joint/Army), and maneuver on the enemy force.
  - Provide extended acquisition range and lethality to the Force after contact is made.
  - Ground forces OPCON to Aviation (and vice versa) as situation dictates
  - Air Battle Captain – command and control (air ground coordination, A2C2 (to include UAV), Fire support coordination measures and Battle handover / link-up.

Design considerations: Further analysis will determine end state mixes. The unit is crewed by 1.5 crews per Reconnaissance Attack Helicopter (RAH). Each flight troop consists of six RAH per troop teamed with UAVs in order to have the ability for day and night cycle. The Squadron has a service troop designed to provide necessary Aviation Unit-level Maintenance, Battlefield Damage Assessment and Repair, for Comanches and UAVs, as well as necessary maneuver sustainment to operate autonomously throughout the UA brigade battlespace. The service platoon of the troop has the capability for 4-point Forward Arming and Refueling Point operations either simultaneously or in two groups. It has capability to transport one day's fuel supply and a basic load of ammunition with organic assets, and relies on the Forward Support Battalion for additional supplies and sustainment replenishment. Each of the two FARPs can provide maintenance, armament support, rearming and refueling necessary to support continuous operations. The Squadron has two UAV CL IV Launcher/Control units and an organic UAV Maintenance Section that utilizes pooled resources to provide recovery and appropriate levels of maintenance support for all of the Unit of Action's UAVs. The UAV Maintenance Section will provide limited maintenance, evacuation, and exchange of Aerial Vehicles for all classes of UAV.

This Squadron provides a robust reconnaissance capability with manned and unmanned aviation (man-in-the-loop) in support of the brigade mission. Key to success of UA operations is the ability to build and maintain a credible knowledge base to know more about what's going on and dominating the battlespace before, during and after tactical operations in terms of ISR with a strengthened ability for providing it to small units. This is particularly important given the dynamic action, reaction, and counter action that occurs once forces are joined. R&S in this brigade has the mission, task, and purpose of enabling freedom of action, speed, mobility, and mutual support of its combat and supporting elements. It is designed to empower lethal units with agility, responsiveness, and an ability to operate with greater competence, confidence, and purpose. The difference is the embedded competency and capability to begin developing situational awareness from the outset.

This is accomplished by the brigade level manned and unmanned air and ground reconnaissance, the recon troops of the combat battalions, BLOS elements in overwatch linked to NAI /TAI, and troops in contact. These capabilities are layered with a strengthened linkage to sub elements to ensure coherency of

mission and purpose. The squadron's organic R&S capabilities are integrated and synchronized with the ISR plan. This includes integration and fusion of data collected in the Distributed Integrated Database (DIDb) and displayed on the COP. Purpose of this unit is to provide the brigade an organic ability to perform R&S at extended ranges in time and space leveraging air and ground, manned and unmanned competencies and capabilities. The squadron is highly capable of dominating the battlespace in terms of ISR and directing fires and effects either in mobile strike roles to destroy high payoff targets or in close support of ground maneuver. Teaming relationships are established rapidly with combined arms units as needed per METT-TC. The purpose of teaming is to be highly responsive across a dispersed brigade area of operation to accomplish mission, task, and purpose.

3.2.10 NLOS Battalion

Increment 1 Objective

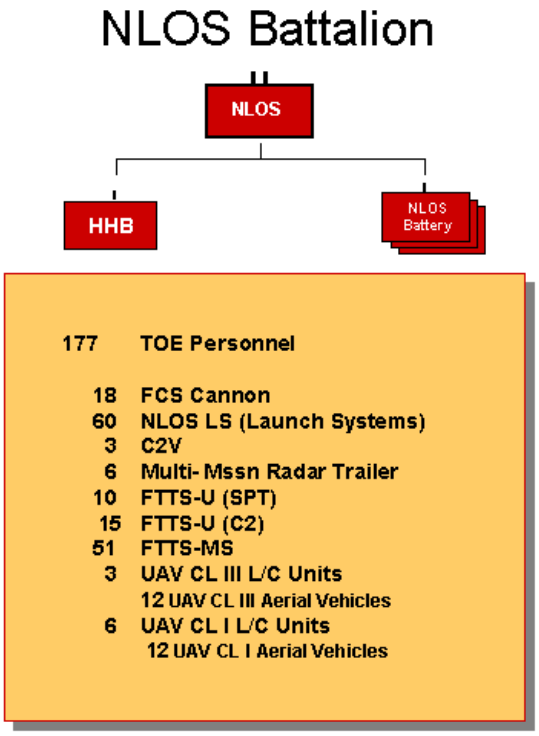


Figure 3-36 NLOS Battalion

NLOS Battalion Mission. The NLOS Battalion provides destructive, suppressive, protective, and special purpose fires and effects to enable the UA to conduct decisive operations. The battalion is organized and equipped to acquire targets and deliver fires and effects at extended ranges in all terrains and environments to deny enemy forces sanctuary, provide precision point and area effects from dispersed locations, and rapidly shift striking power across the area of operations. As a secondary role, the NLOS Battalion is capable of extended range counter-air engagements against low, slow portions of the rotary wing and UAV threat in accordance with JIADS rules and procedures.

NLOS Battalion Tasks:

- Locate:
  - Acquire targets with organic radars and Class III UAVs.
  - Leverage target acquisition capabilities of external systems.
- Strike:
  - Deliver precision point and area destructive, protective/suppressive and special purpose fires and effects fully integrated with maneuver.
  - Mass fires and effects from dispersed delivery means over extended distances.
  - Shape current and future battles by providing fires and effects out of contact to: destroy, isolate, shield or fix enemy forces; protect friendly forces by suppression or obscuration of the enemy and deny his mobility; counter enemy strike capabilities; and provide protection to maneuver formations.
  - Provide close supporting fires and effects (lethal and non-lethal) in support of friendly forces enabling freedom of action while denying options to the enemy .
- Assess:

- Provide limited BDA.

Design considerations: The NLOS Battalion consists of a headquarters and three firing batteries. The Headquarters has a CIC, an NLOS Launch System (LS) platoon, and a sensor platoon with three UAV CL III L/C units and six Multi-Mission Radars (MMR). Each firing battery has six FCS cannons, 12 FTTS–Maneuver Sustainment (MS) trucks and 12 NLOS LS container launch units (C/LU) organized into two platoons. The battalion is capable of all terrain/weather maneuvers. It is dynamically tailorable to support sensor-to-shooter teaming relationships with all relevant UA, UE and Joint sensors. Its firing units and target acquisition assets are organized to fight as a fully integrated team with UA maneuver forces and routinely interact directly with troops in contact, mobile strike aviation platforms, and unmanned sensors.

NLOS LS and FCS cannon platforms provide unprecedented responsiveness and lethality to the UA commander. These systems provide reliable, accurate, timely, and continuous fires and effects, enabling the battalion to achieve intended effects at extended ranges. NLOS LS and FCS cannon systems will routinely maneuver within 2-4 km of CA Battalion elements enabling mutual support and massed effects from dispersed locations. The NLOS Battalion's design ensures the capability to rapidly shift striking power across the battlefield. The NLOS Battalion is a highly versatile organization capable of dynamic tactical tailoring to support maneuver in rapidly changing situations. It is optimized to provide flexible and responsive fires and effects to simultaneously engage multiple target sets on-demand. The battalion is equally adept at attacking both pre-planned, high payoff, and most dangerous targets of opportunity, applying scaleable effects to account for the challenges of complex environments and ROE.

The NLOS Battalion is capable of fighting with smaller teams comprised of multiple weapons types to rapidly deliver fires and effects. This provides greater munitions effects to destroy, disintegrate, or dislocate enemy forces. This offers improved agility to shift fires and effects and missions quickly.

3.2.11 NLOS Battalion Headquarters

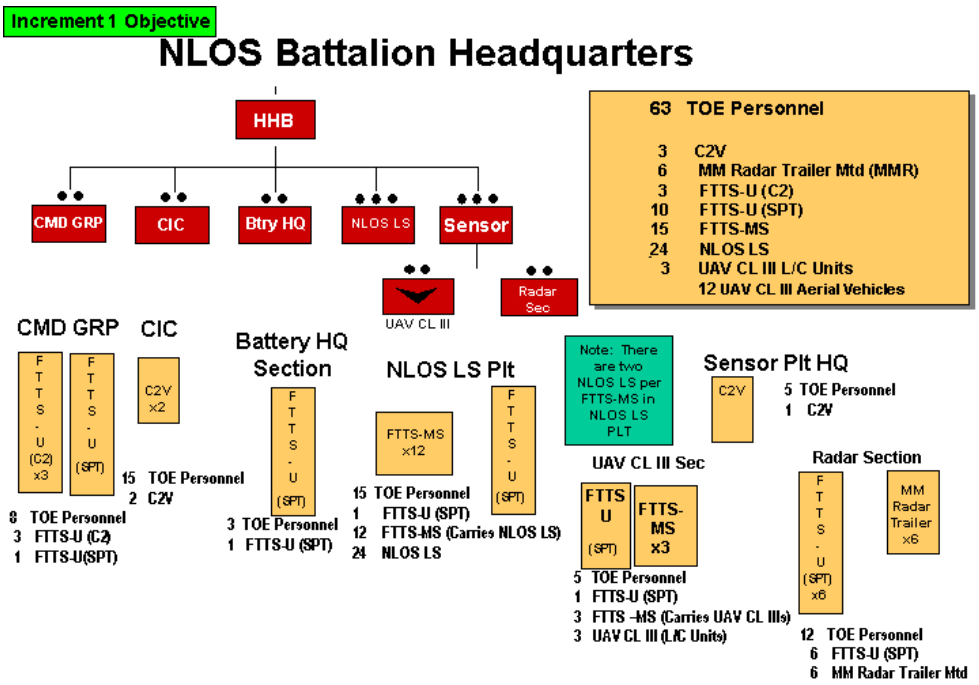


Figure 3-37 NLOS Battalion Headquarters

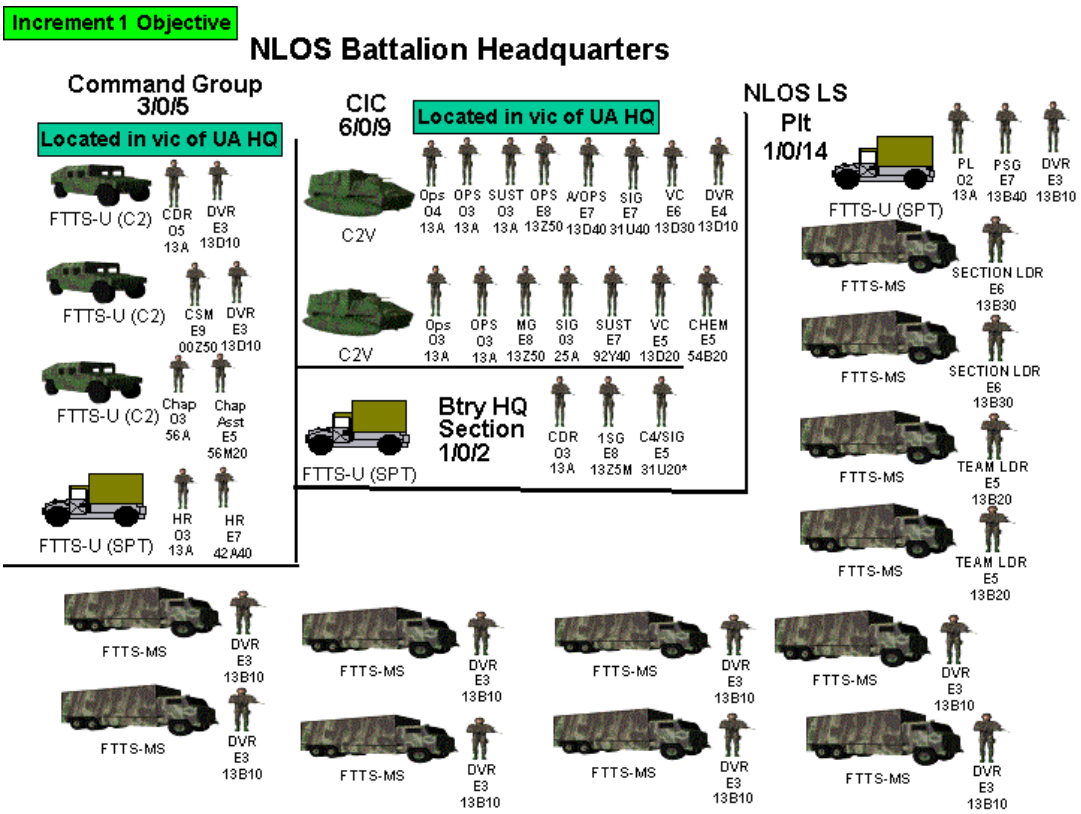


Figure 3-38 NLOS Battalion Headquarters

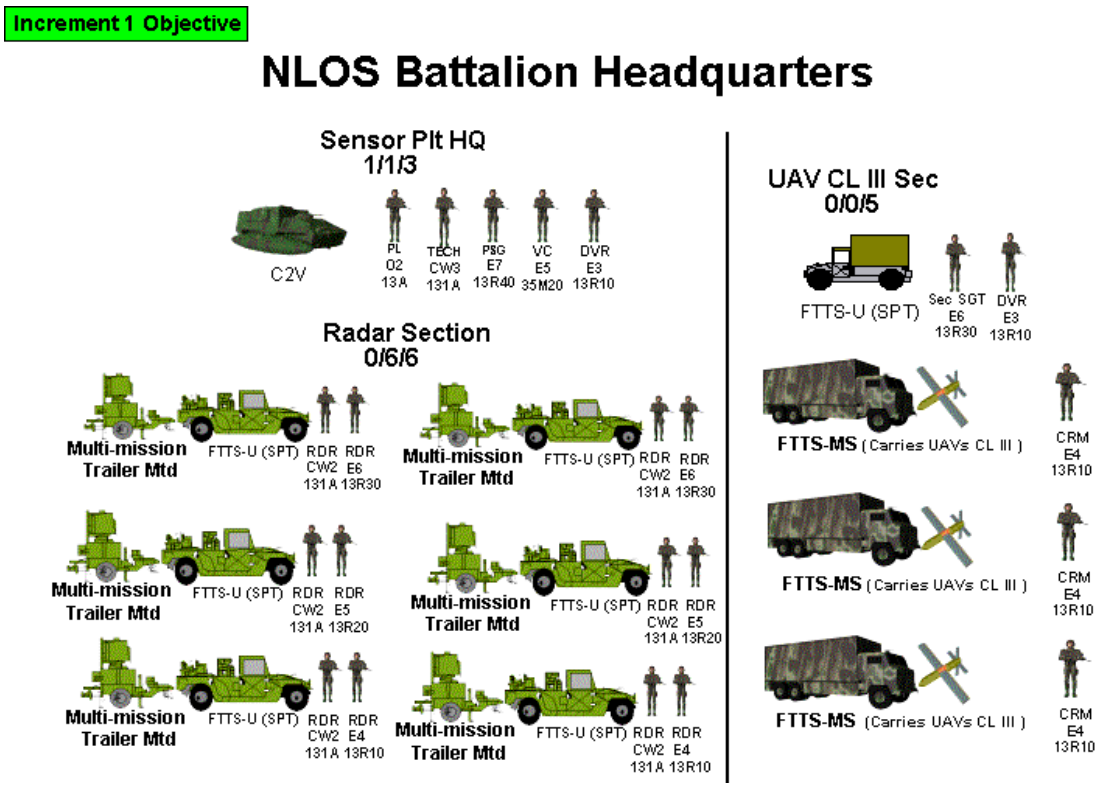


Figure 3-39 NLOS Battalion Headquarters

NLOS Battalion Headquarters Mission. The NLOS Battalion headquarters provides C2, information management, and communications to enable the NLOS Battalion Commander to plan and execute fires and effects in support of the UA. It also plans, and requests administrative and logistical support for the battalion.

NLOS Battalion Headquarters Tasks:

- Command and control subordinate assets and exercise authority and direction.
- Coordinates deployment, tactical employment, and terrain management for NLOS Battalion assets.
- Organizes subordinate units for combat.
- Develops plans and conduct operations.
- Ensures meteorological data is received and processed at the platform level to meet the requirements for accurate predicted fire.
- Synchronizes the C2, ISR, maneuver, fires and effects, protection, and sustainment.
- Orchestrates sustainment replenishment operations to arm, fuel, fix, move, supply, man, and provide financial, religious, legal and health services.

NLOS LS Platoon. The NLOS-LS Platoon provides fully networked targeting and precision engagement for the attack of armored, lightly armored, and other targets. This includes targeting and engagement of aircraft in day, night, obscured, and adverse weather conditions. The platoon is organized and equipped to provide responsive long-range precision missile attack in support of UA level High Payoff Targets (HPT) and most dangerous targets of opportunity.

NLOS LS Platoon Tasks:

- Shapes and isolate the battlespace by destroying enemy forces out of contact.

- Provides precision destructive and protective fires and effects while avoiding noncombatant casualties and minimizing collateral damage.
- Provides close supporting fires and effects for friendly forces joined in contact enabling freedom of action while denying options to the enemy.
- Operates within the networked fires and effects application of the Battle Command system.
- Provides a counter-air capability to accurately destroy low and slow moving enemy aircraft and enemy UAVs through the use of on board munitions.

Design considerations: Consists of 24 NLOS LS C/LUs transported on 12 vehicles (FTTS-MS). The platoon provides the UA commander a precision loitering and attack capability to engage brigade level HPTs.

Sensor Platoon: The sensor platoon provides the brigade with acquisition of threat mortar, artillery, rocket systems, and short-range air defense (SHORAD) weapons to provide target intelligence and information to allow friendly forces to take force protection measures and enable counterfire mission processing. It consists of a radar section and UAV section.

Radar Section: The Multi-Mission Radar (MMR) section provides the capability to detect, track, identify, report, and communicate the position and velocity vector of aerial targets. It also detects, classifies, determines, reports, and communicates the firing location and impact point of mortars, artillery rockets, and missiles. The MMR section performs counterstrike target acquisition, air defense surveillance, and air defense fire control.

Radar Section Tasks:

- Detect, locate, classify, report, and communicate the firing locations and impact points of enemy mortars, artillery, rockets, and missiles to generate fire missions, update the COP, and help cue UE Maneuver AMD fires and effects against incoming rounds.
- Detect, track, identify, report, and communicate the position and velocity vector of aerial targets, alert Maneuver AMD systems, and update the COP.
- Identify airspace users and exchange information to assist in the management of A2C2 operations.
- Confirm the actual burst location of friendly fires and effects.
- Operate within the Networked Fires and effects application of the Battle Command system.

Design Considerations: The section consists of six radars capable of counter fire target acquisition, air defense fire control, airspace management and air defense surveillance. Three MMRs will routinely be required to perform the Critical Threat Analysis (CTA) mission. Three additional radars provide coverage of critical CA Battalion operational areas, but not full coverage of the entire UA area of operations. UE radars fill these gaps in coverage and provide overlapping CTA coverage across the UA.

UAV (CL III) Section. The UAV CL III section provides target acquisition, target designation, meteorological, reconnaissance, and surveillance and BDA capabilities to the NLOS Battalion. This section includes one FTTS-U (SPT), three FTTS-MS carrying UAV CL III, and three UAV CL III Launcher/Control Units.

UAV (CL III) Section Tasks:

- Acquire and locate enemy strike assets to facilitate counter precision strike.
- Provide target area meteorological data to support the requirement for accurate fires and effects.
- Acquire and transmit targetable data to support the attack of HPTs and most dangerous targets of opportunity.
- Provide target designation.
- Conduct route observation.

- Provide surveillance.
- Provide BDA.

Design Considerations: The UAV CL III Section provides a proactive targeting capability to enable UA counterstrike operations. The section responsively executes the UA commander's targeting and attack priorities through sensor to shooter teaming arrangements between UAV CL IIIs and NLOS delivery systems. Once a target is engaged, the UAV CL IIIs provide real-time BDA to the network. Based on the BDA, the network may initiate re-attack or end the mission when the desired effects are achieved. In addition, the section provides target area meteorological data required for NLOS systems to accurately attack targets.

3.2.12 NLOS Battery

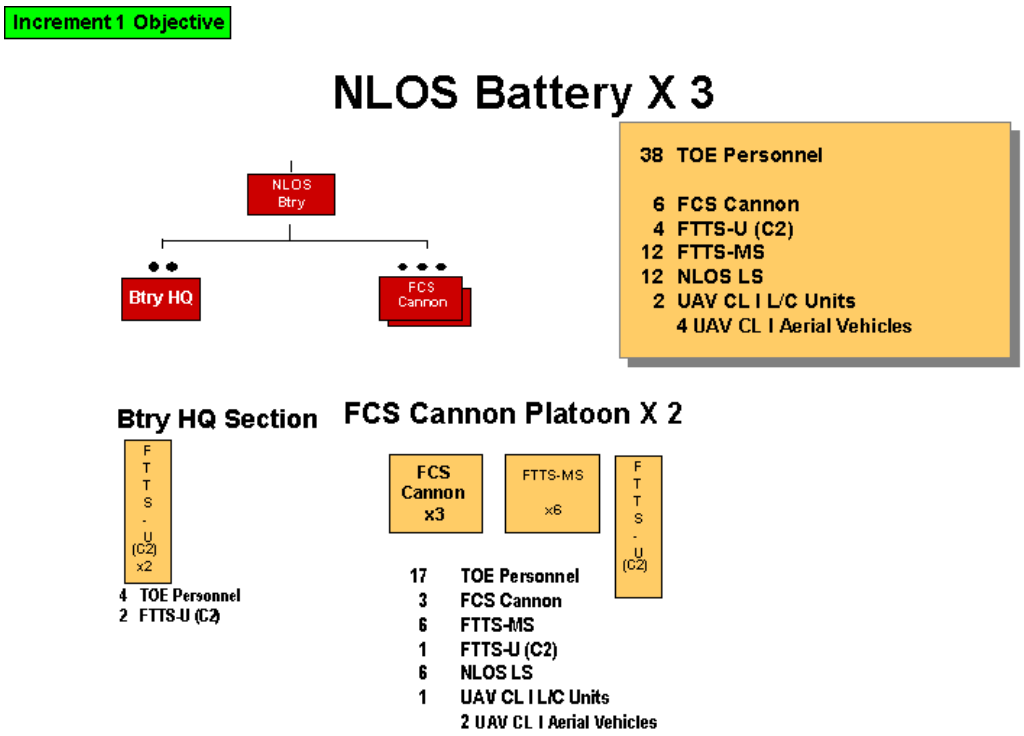


Figure 3-40 NLOS Battery

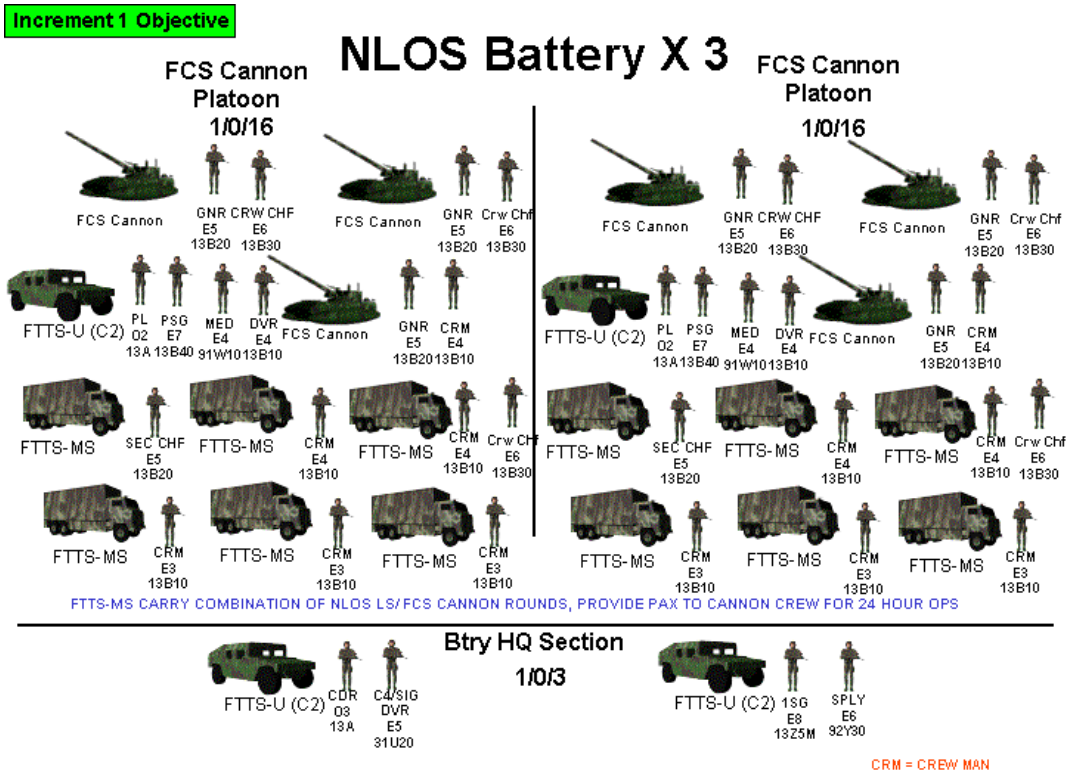


Figure 3-41 NLOS Battery

NLOS Battery Mission: Provide responsive, destructive, protective, suppressive, and special purpose fires and effects in support of UA maneuver forces. Provide an agile mix of fires and effects able to rapidly shift between missions.

NLOS Battery Tasks:

- Deliver precision point and area long-range tactical fires and effects in support of maneuver.
- Provide lethal and non-lethal fires and effects in close support of friendly forces to destroy, isolate, shield, or fix enemy forces; protect friendly forces by suppressing or obscuring enemy forces; deny the enemy mobility; counter enemy indirect fires and effects; and provide protection to maneuver formations.
- Perform raids and other special missions to ensure maneuver forces are provided adequate fires and effects.
- Operate within the Networked Fires and effects application of the Battle Command system.
- Fire munitions that will accurately destroy low and slow moving enemy aircraft and UAVs.

Design Considerations: Each NLOS battery has six FCS cannons, 12 NLOS LS C/LUs and 12 FTTS-MS organized into two platoons. Each platoon has one Class I UAV in order to provide a reconnaissance and security/early warning capability for the platoon. The batteries are designed to provide responsive fires and effects down to the lowest tactical level. The mix of NLOS LS and FCS cannons provide precision, point, and area fires and effects through the networked fires and effects process. The battery is capable of operating in dispersed three-gun platoons or two gun pairs. Battery assets will be routinely positioned within CA Battalion area of operations typically within 2-4 km from maneuver companies in order to provide responsive fires throughout the battlespace as well as benefit from maneuver's protection for NLOS-LS sustainment.

3.2.13 Forward Support Battalion

Increment 1 Objective

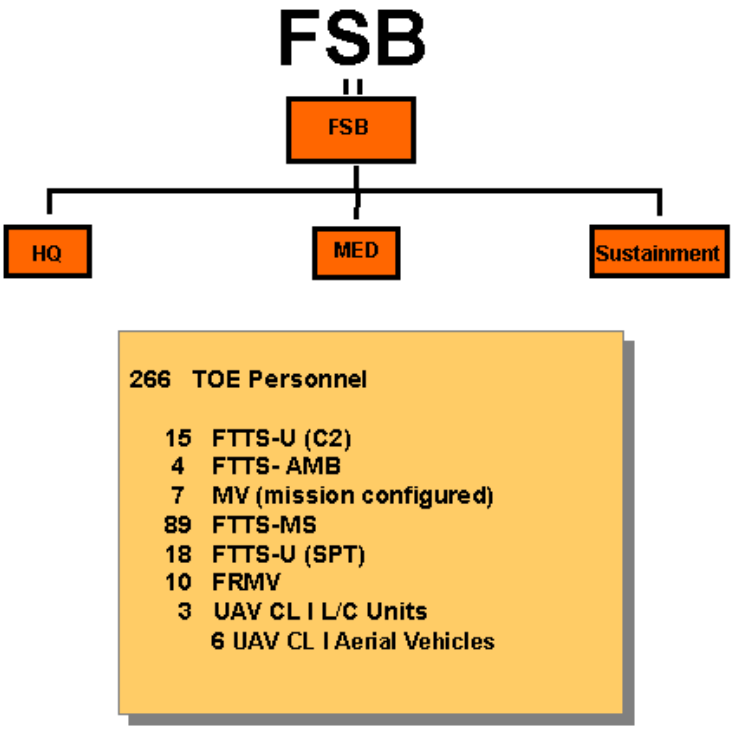


Figure 3-42 Forward Support Battalion

FSB Mission: The FSB distributes supply classes I, II, III, IV, V, VIII, and IX. It performs field maintenance and recovery, and provides health service support (HSS) for force health protection (FHP) to the UA. It carries the sustainment stocks that exceed the organic carrying capability of the UA's maneuver and maneuver support three days of requirements for high intensity operations or seven days of requirements for low intensity operations. It plans and coordinates for the UA sustainment requirements. The FSB executes replenishment operations in concert with the operational plan and the UE.

FSB Tasks:

- Develops, maintains, individual and shared group higher level situational awareness from the DIDb for display on the COP, other information sources, and the environment.
- Monitors and updates the COP.
- Plans, synchronizes, manages, and executes maneuver sustainment operations at UA level within the maneuver commander's battle rhythm.
- Within the UA, plans, establishes, maintains, and synchronizes distribution management operations; Links back with UE for coordination of requirements and synchronization of flow.
- Determines and anticipates maneuver sustainment requirements.
- Provide level II medical support plus emergency resuscitative surgery.

1542 • Plan, coordinate, and provide emergency medical treatment and Advanced Trauma Management
1543 for wounded, and disease non-battle injury patients and sick call services.

1544 • Provides mass casualty management to include: triage, treatment, and evacuation.

1545 • Executes sustainment replenishment operations.

1546 • Conducts field maintenance and recovery operations.

1547 • Conducts retrograde operations.

1548 • Integrate mission tailored CSS augmentation as required.

1549 Design Considerations: The FSB consists of the headquarters and three companies; the Headquarters and
1550 Headquarters Company (HHC), the Sustainment Company, and the Medical Company. The FSB is 100
1551 percent mobile. It is optimized for Class IIIB and V in three days of medium to high OPTEMPO; and for
1552 Class I, Dry Cargo, and Water for seven days of low OPTEMPO. It carries one set of chemical protective
1553 gear for each solder in the UA (one set is carried by every soldier in the UA).

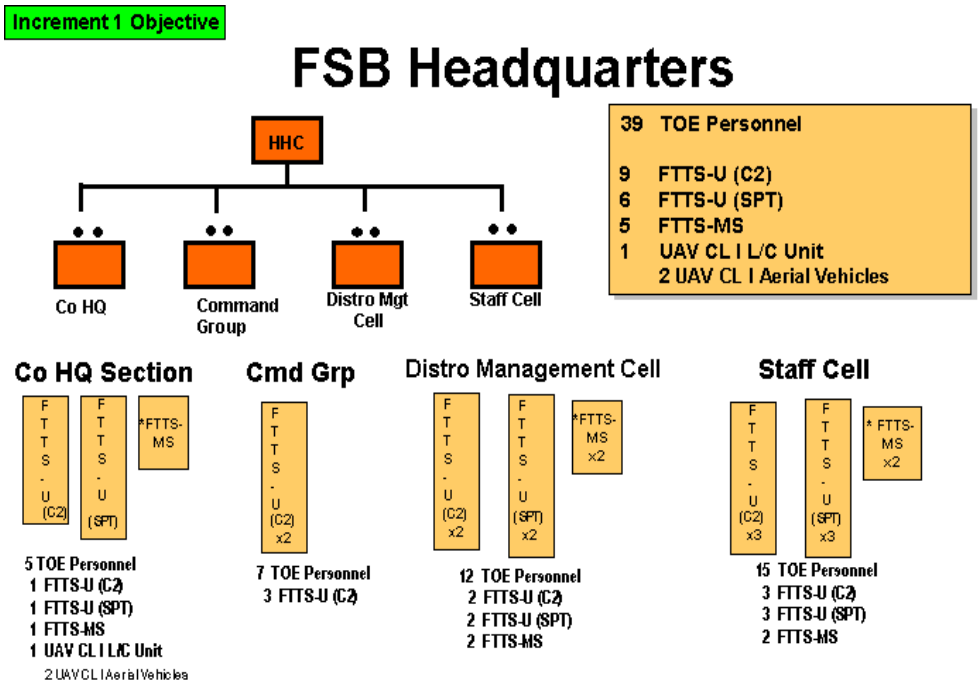


Figure 3-43 Forward Support Battalion HQs

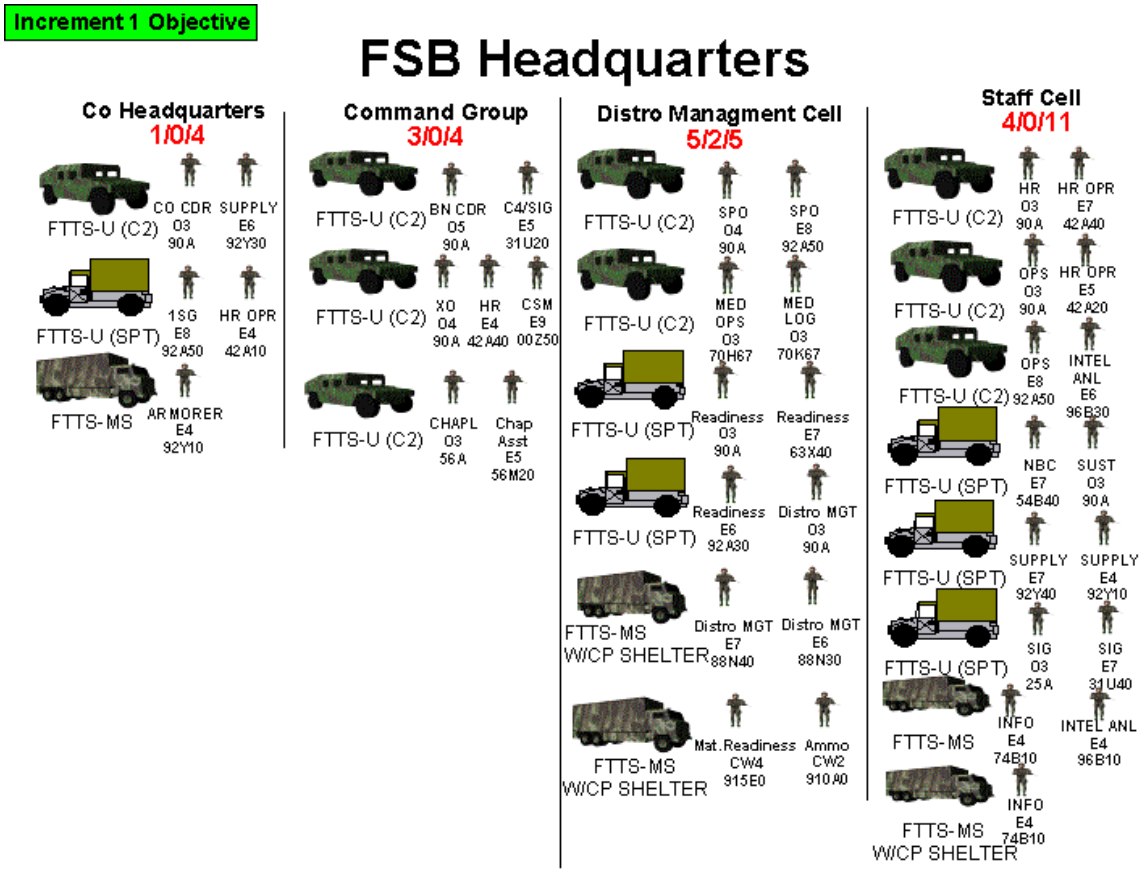


Figure 3-44 Forward Support Battalion HQs

The FSB Headquarters provides the command and control to the FSB's maneuver sustainment operations in accordance with the UA Commander's intent and operational plan. It includes a Headquarters Company, a Command Group, a Distribution Management Cell (DMC), and a multi-functional Staff Cell.

The Headquarters Company provides administrative and logistics support to the headquarters and all personnel assigned or attached to the HHC. The Command Group is responsible for providing planning guidance to the staff, ensuring integration of sustainment operations into the maneuver commander's battle rhythm, supervises the activities of subordinate units, and advises the UA commander on sustainment issues. The DMC maintains visibility of the distribution pipeline from the strategic level to the UA level in order to synchronize pulsed sustainment operations with the brigade commander's battle rhythm. It operates within a networked common logistics operational environment to maintain situational awareness. It plans, coordinates, and synchronizes both current and future sustainment operations. The DMC coordinates for any sustainment support not available in the UA.

The DMC also contains one medical operations officer and one medical logistics officer. Their mission is to assist the FSB commander in the building capabilities to meet medical requirements identified by the brigade surgeon. In addition to planning the use of FSB assets, they identify and coordinate with elements outside of the UA in order to support those requirements that are beyond the capability of the FSB to support. The medical operations officer focuses on all medical functional areas, while the medical logistics officer focuses on Class VIII resupply and medical equipment repair. The FSB Staff Cell contains the functions that provide administration and logistics to FSB troops.

The Human Resource Section provides limited human resource support, including strength accounting, casualty operations, replacement operations, and essential personnel services to FSB troops; advises the FSB Commander on personnel issues and coordinates with the UA for manning. The Intelligence, Operations, and Training Section advises the FSB Commander on intelligence; maintains situational awareness of FSB assets; monitors readiness status; provides and oversees training in the FSB; provides limited advice on nuclear, biological, and chemical matters; coordinates staff actions with the brigade staff. The Logistics Section provides limited planning, coordination, and execution of logistics requirements internal to the FSB and the Communications Section coordinates area communications with the BIC Company.

3.2.14 FSB Medical Company

Increment 1 Threshold

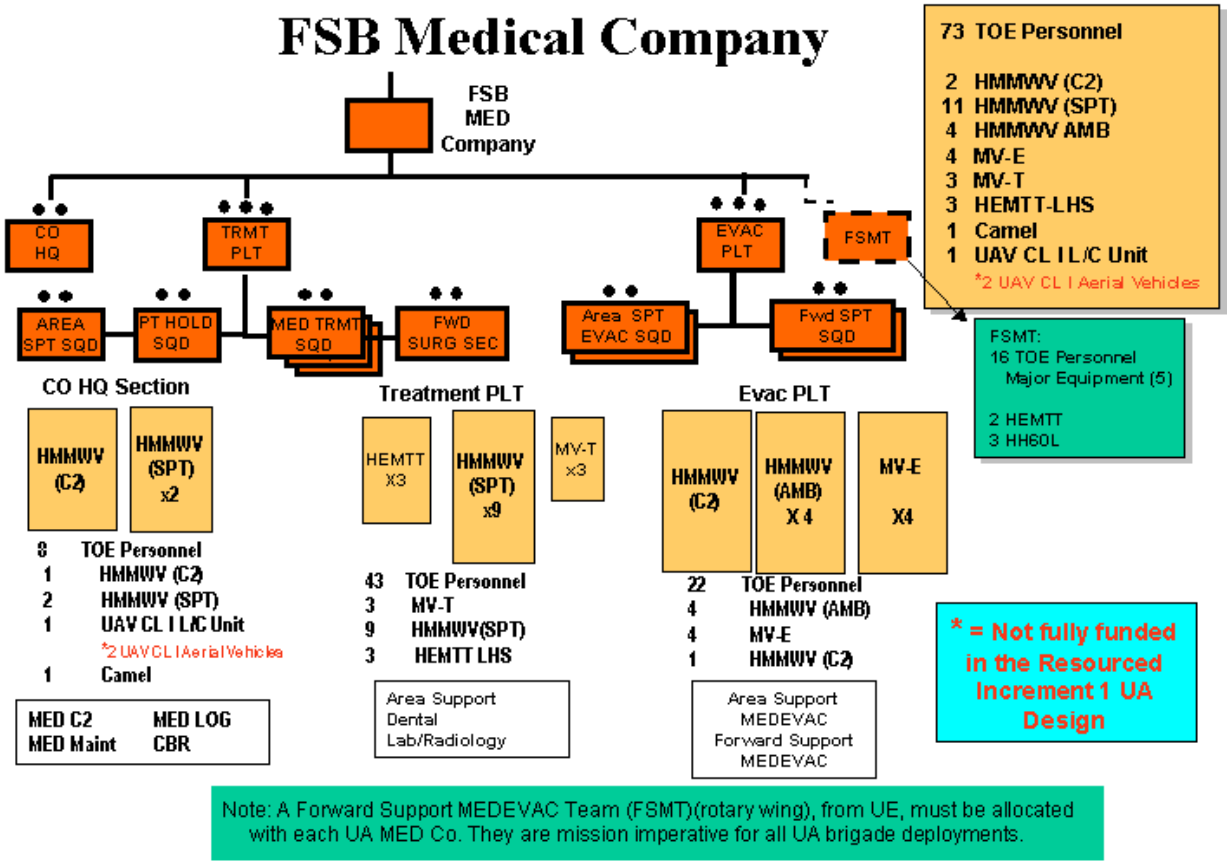


Figure 3-45 FSB - Medical Company

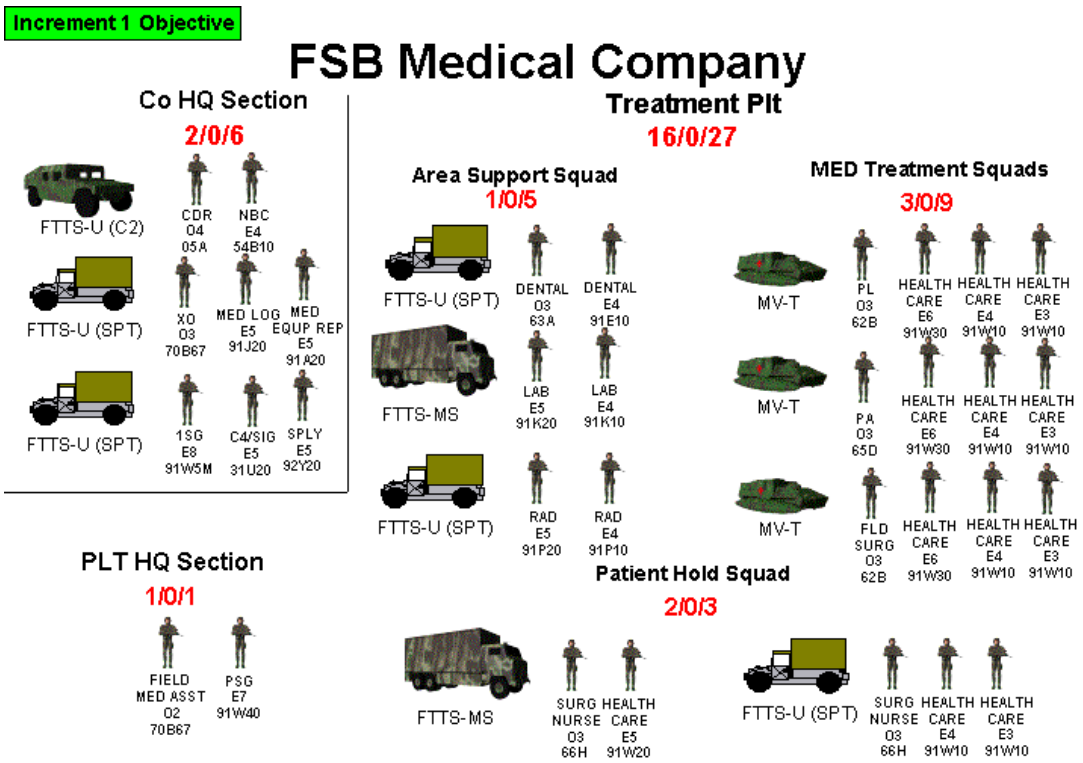


Figure 3-46 FSB - Medical Company

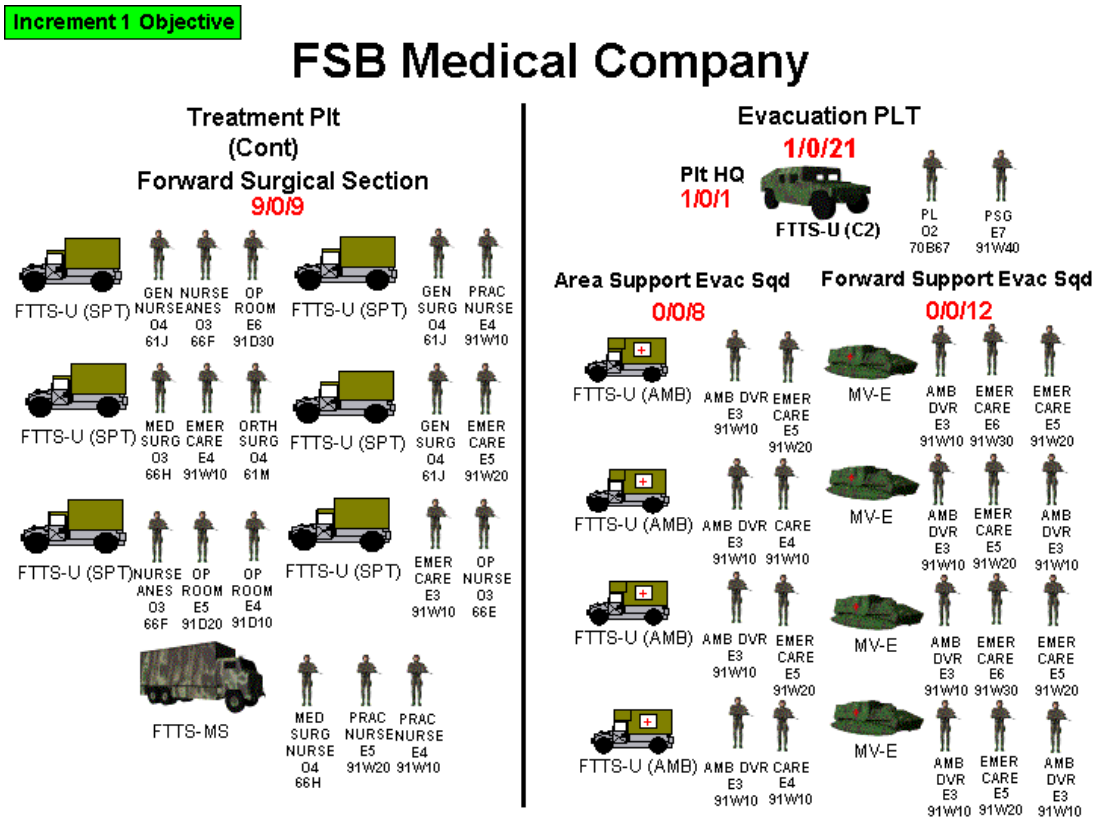


Figure 3-47 FSB - Medical Company

Medical Company Mission. The dispersion of troops and distances of operations dictate that the UA push life-saving "damage control" surgery as far-forward as tactically permitted. An Echelon II medical company, with expanded functions including far-forward emergency resuscitative surgical capabilities, will be located in the secured UA FSB's area of operations. This emphasis will aid in maintaining maximal combat effectiveness of the soldier system. The presence of far-forward resuscitative surgery at the brigade-level provides an organic emergency (urgent) surgical capability without which death or loss of eyesight, limb, or body function is inevitable. The casualty's best chance of survival comes when advanced trauma life support is received within one-hour, and far-forward "damage control" surgery is received within four-hours.

The Level II medical company is assigned to the FSB and provides the following capabilities:

- Emergency medical treatment and advanced trauma medicine (ATM) for wounded and DNBI patients.
- Emergency resuscitative surgery.
- Sick call services.
- Ground ambulance evacuation from supported units.
- Operational dental treatment that includes emergency and essential dental care.
- CL VIII resupply and medical equipment maintenance support.
- Medical laboratory and radiology services.
- Outpatient consultation services for patients referred from level I medical treatment facilities (MTF).
- Patient holding for up to 20 patients (that may RTD within 72 hours).
- Reinforcement/reconstitution of maneuver battalion medical platoons.
- Mass casualty triage and management.
- Limited patient decontamination.

Design Considerations. The FSB medical company is comprised of a headquarters, a treatment platoon, and an evacuation platoon. The company headquarters consists of the commander, 1SG, XO, company supply, medical logistics, biomedical maintenance, communications, and NBC personnel. The treatment platoon consists of: a headquarters element; an area support squad that provides dental, lab, and x-ray support; a patient holding squad, that provides the holding capability for 20 patients for up to 72-hours; a medical treatment squad, consisting of three treatment teams, that provides area support, including sick call services; and a forward surgical section. Each treatment team consists of one physician or PA and three health care specialists that operate from an MV-T, which enables them to support from the FSB, or push forward to reinforce or reconstitute a BAS. At least one of the treatment teams will always stay with the FSB to form the treatment base for the company, leaving the other two available to provide support forward or to reinforce or reconstitute a BAS.

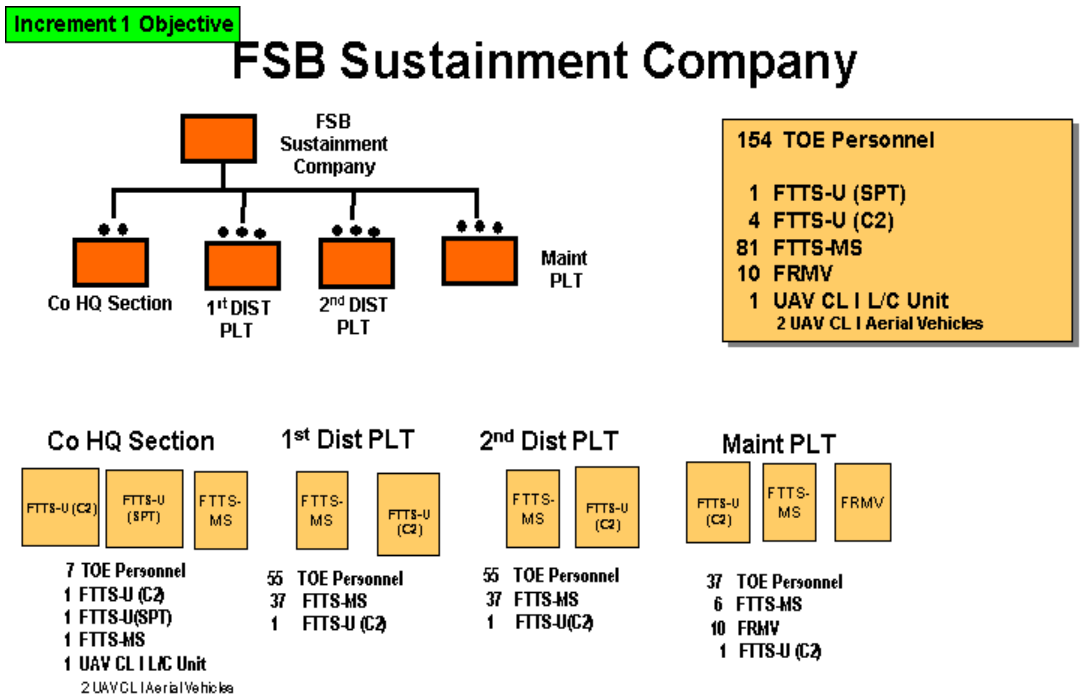
The treatment platoon's forward surgical section provides a rapidly deployable far-forward emergency resuscitative surgical capability, enabling casualties to survive during longer evacuation periods. It provides emergency medical treatment, resuscitation, stabilization, ATM, and surgical support forward within the secured UA Brigade's OA. The UA has the need to project surgical capability forward due to increases in the operational distances of the extended battlefield. At forward locations the section must be augmented with a Level I MTF. The surgical section is capable of continuous operations for up to 72 hours. Continuing operations is contingent on personnel fatigue and available supplies. The platoon provides urgent, initial surgery to patients whose conditions are such that, without the surgery, their ability to survive evacuation to the next level of care would be compromised. The section's personnel and equipment (less vehicles) are capable of deploying in one C-130 aircraft for initial entry missions, and subsequent movement by helicopter sling-load operations is also possible. The section consists of 18 personnel, which includes four surgeons and eight nurses, and is 100% mobile in organic FTTS-U (SPT) and FTTS-MS.

The evacuation platoon is comprised of a headquarters, two area support evacuation squads, and two forward support evacuation squads. Each area support evacuation squad is made up of two MV-Es, each

with a crew of three ambulance driver/emergency care medics. Their mission is to move forward to BASs and casualty collection points to evacuate casualties back to the medical company. Each Forward Support Evacuation Squad is made up of two MV-Es, each with a crew of three ambulance driver/emergency care medics. The MV-Es in the forward support evacuation squad will be the primary source of replacement for those platforms lost or damaged within the UA's operational area.

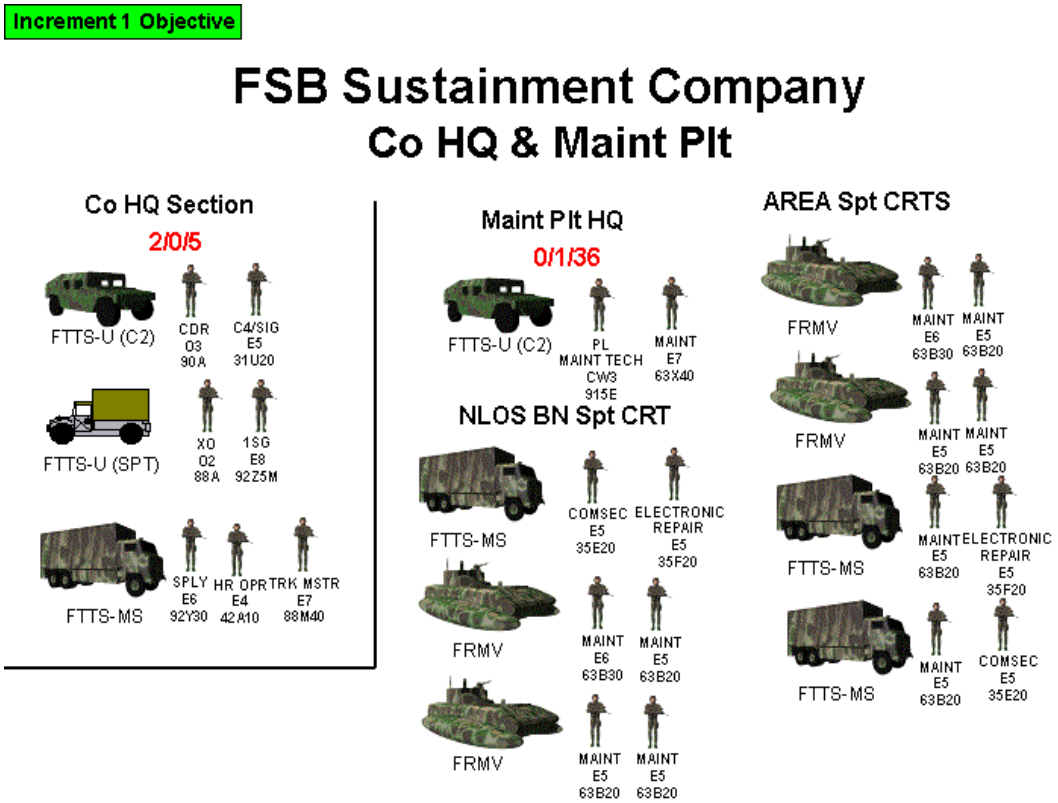
The use of air ambulance is the primary and preferred means of medical evacuation on the battlefield. Its use, however, is METT-TC driven and can be affected by weather, availability of resources, chemical, biological, and radiological conditions, and air superiority issues. A forward support MEDEVAC team (FSMT), forward deployed from the UE air ambulance company, will provide aeromedical evacuation within the UA's AO. Operational distances and dispersion in the UA will lead to an increased reliance on "enroute care" by medical personnel to keep the casualty alive during longer evacuation periods. Medical platforms will have the ability to provide "enroute care" through such enablers as on-board oxygen/oxygen generation systems, physiologic monitoring, telecommunications, and other life support equipment.

1653 **3.2.15 FSB Sustainment Company**



1654

1655 **Figure 3-48 FSB - Sustainment Company**



1656

1657 **Figure 3-49 FSB - Sustainment Company**

Figure 3-50 FSB - Sustainment Company

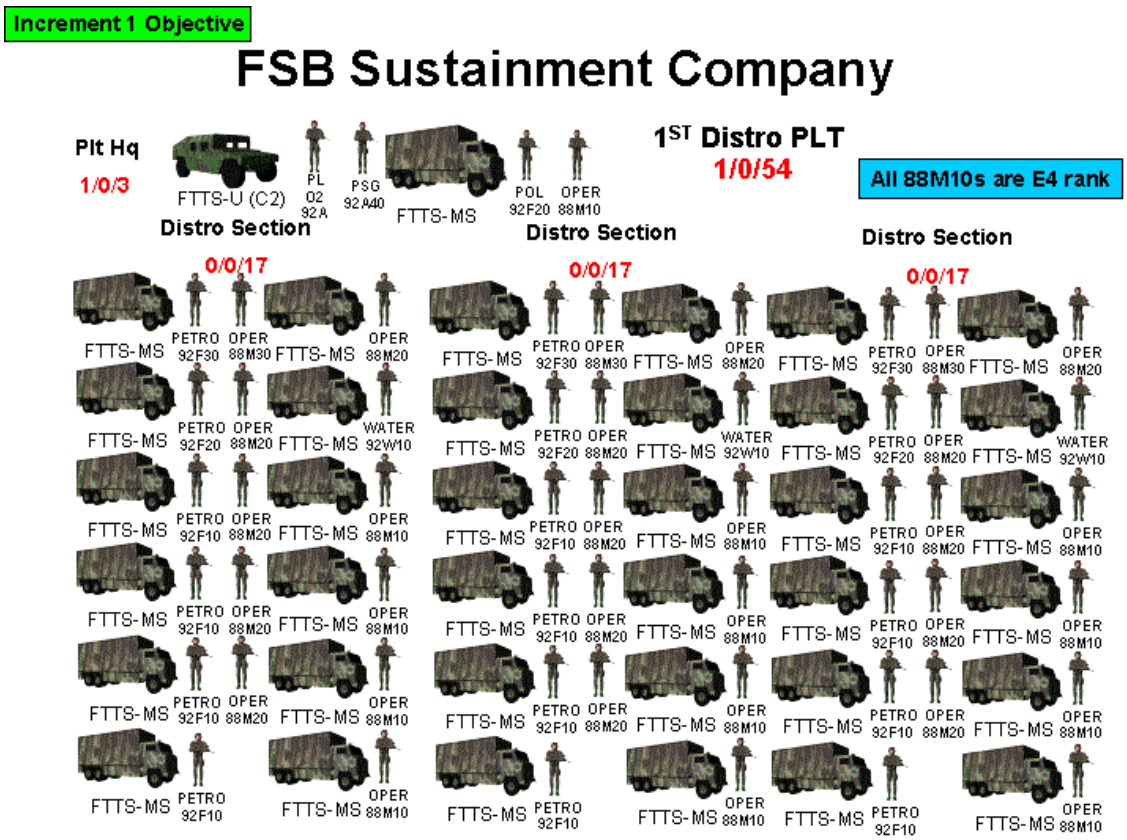


Figure 3-51 FSB - Sustainment Company

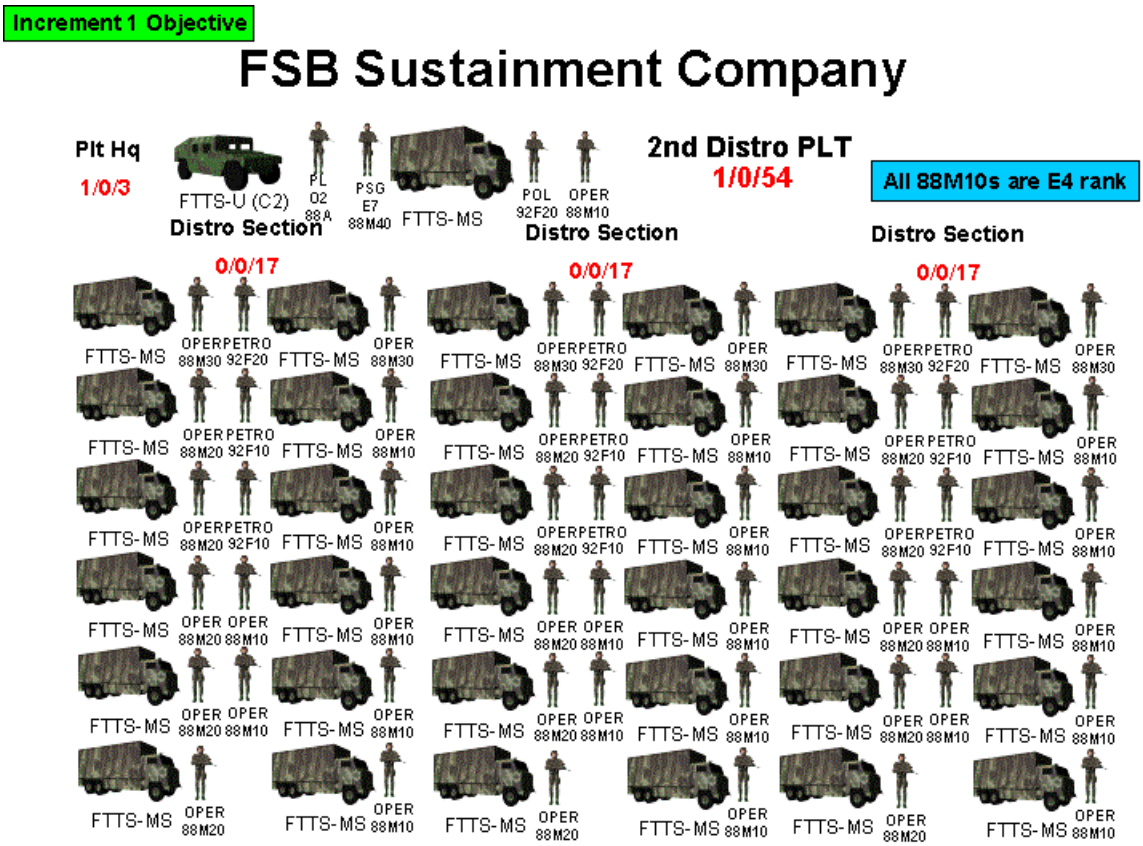


Figure 3-52 FSB - Sustainment Company

The Sustainment Company consists of a headquarters section, two distribution platoons, and a maintenance and recovery platoon. The company:

- Distributes supply classes I, II, III, IV, V, VIII, IX, and water, and conducts field maintenance and recovery.
- Holds and distributes the sustainment stocks that exceed the organic carrying capability of the UA's three days of requirements for high intensity operations or seven days of requirements for low intensity operations.
- Executes sustainment replenishment operations.
- Conducts field maintenance and recovery operations.
- Conducts retrograde operations.

The Distribution Platoons each consists of a platoon headquarters and three distribution sections with 12 FTTS-MS (Future Tactical Truck System- Maneuver Sustainment). The distribution platoon carries the balance of the brigade's three days of high OPTEMPO requirements or seven days of medium to low OPTEMPO requirements that are not transportable by FCS platforms and maneuver unit trucks. The distribution platoon executes Sustainment Replenishment Operations in support of the UA. When required, the distribution platoon accepts augmentation of UE maneuver sustainment elements to conduct sustainment replenishment.

The Maintenance Platoon consists of a Platoon Headquarters and six Combat Repair Teams (CRTs): one team supporting each CA Battalion, one team supporting the NLOS Battalion, and two smaller teams providing area support to the UA HQ, the BIC Company, and Aviation Ground Assets. This forward maintenance support structure is possible only through implementation of the Army two-level maintenance system, increased system maintainability and reliability, an integrated common operational picture, plug and

play component design and programmed logistics enablers that include Integrated Electronic Technical Manuals and embedded diagnostics and prognostics. These CRTs will perform field maintenance requirements beyond the capability of the crew chief/operator. They will also accomplish BDAR, limited recovery operations, and all field maintenance tasks where lift, welding, cutting, heating, or other capabilities not organic to the crew are necessary to complete the repairs. The CRTs are enabled with a dedicated FCS Recovery and Maintenance Vehicle (FRMV), which includes lift, welding, metal-cutting, and heating capabilities. The immediate maintenance support focus within the deployed UA will be those limited maintenance functions required to keep systems in the fight until completion of the current operation or such time as the battle rhythm allows for more in-depth maintenance.

As a general rule, a majority of the CRTs, while under the command and control of the FSB, will be allocated to maneuver units and operate forward in that unit's area for the specific purpose of executing field maintenance tasks/requirements and recovery operations in support of that unit. There will be times, however, when mission dictates that particular maintenance emphasis be placed on one unit over another based on METT-TC and the commanders' intent. In such cases, it may be necessary to mix, combine or shift assets from one CRT to another to support maintenance requirements. The preferred solution is to provide assistance or surge maintenance capability from within the assets of the FSB. However, in accordance with METT-TC and the limited FSB resources, that may not be the most efficient or effective way to support the force. There may be a requirement to temporarily task organize a CRT with augmentation from the UE or other FSBs to perform maintenance at a Sustainment Replenishment Site as part of the pulsed sustainment concept.

3.2.16 UAVs

The commander's requirements to develop and maintain situational awareness throughout the UA requires a robust suite of RSTA and communications relay assets. The UAV is integral to meeting these requirements and is organic to the UA and its subordinate organizations. To optimize RSTA and communications relay functions within the UA, UAV capabilities will be echeloned in a tiered, mutually supportive and hierarchical framework from platoon through UA Brigade. This tiered, integrated approach will:

- Enhance commander's ability to see first, understand first, and act first.
- Integrate sensor information into the COP.
- Tailor system sizes at each echelon.
- Scale logistic requirements at each echelon based on transport, maintenance, and recovery capabilities.

When teamed with other manned/unmanned ground systems and with manned air systems, i.e. the Comanche, the UA commander can extend the area of influence and significantly enhance situational awareness, lethality, survivability, and agility. This teaming will additionally aid in collision avoidance and associated technologies will result in automatic reporting of routes, speed, and altitude to the DIDb to assist trajectory clearance and A2C2. Echeloning of capabilities and system commonality (architecture, fuel, and configurable mission packages) will help to minimize the UAVs logistic footprint and enhance sustainability. Where four classes or sets of capabilities are listed, it is entirely possible that a single platform could be used to satisfy more than 1 set of capabilities as long as no capability is sacrificed.

The UAV Classes I through IV are dissected as follows. The Launcher/ Control Unit (L/C Unit) and its respective Aerial Vehicles (AV) represent an entire UAV system. The Launcher/Control Unit includes the launching platform and its ground control station, (GCS), if applicable. The Launcher/Control Units for each class of UAV each have a distinct number of associated aerial vehicles. Thus far, only the UAV CL IVb does not have a specified numbers of Launcher/Control Units nor a specified number of aerial vehicles per Launcher/Control Unit. All other classes of UAVs have specified numbers of Launcher/Control Units and aerial vehicles. The number of Launcher/Control Units and aerial vehicles for the UAV CL IVb is still under study.

The material solution for the various classes of UAVs may yield different Launcher/Controller to Aerial Vehicle ratios. That being said, from a concept perspective the classes of UAVs have specified numbers of Launcher/Control Units and aerial vehicles which are described in the system description paragraphs below. The contributions of unmanned systems teamed with manned platforms across the full range of multi-dimensional military operations and environments will enhance the UA. Networked unmanned systems will give the commander a valuable tool to gather information and will augment as well as supplement other intelligence assets while reducing soldiers' risk factors in combat. A variety of unmanned system applications will be used as a combat multiplier for mission performance, increase force protection and survivability, while reducing logistical support and support manning requirements.

3.2.16.1 UAV Core Capabilities. All classes of UAVs have the following core capabilities and characteristics:

- Day and night, to look onto terrain and sense and report the presence of a human, sense and report the presence of wheeled and tracked vehicles.
- Report platform location and heading to the user.
- Report target location to the user.
- Conduct communications relay.
- Possess embedded autonomous flight and navigation capability and incorporate autonomous safe flight protocols.
- Be durable against environmental effects (rain, dust, etc).

- Reusable.
- Use a common, open architecture to allow control by FCS platforms via the Battle Command system.
- Possess an anti-tamper capability
- Utilize power sources that are compatible with the fuel/power cells that are readily available within the UA.
- Detect and report to its operator that the platform is being acquired or targeted upon the location and direction of the threat system.

3.2.16.2 UAVs by Class. The UAV CL I is most appropriately employed at the squad through company echelon. The system is organic to dismounted infantry, and recon platoons within the CA Battalion. The UAV CL I also resides in NLOS Batteries and in FSB companies for the purpose of perimeter security. The UA has 54 UAV CL I L/C Units. It has two aerial vehicles per L/C Unit.

UAV Class I characteristics include:

- Small in size (man-packable) and allows the soldier to “see over the next hill” day and night, onto open, rolling, complex, and urban terrain (i.e. provide target information for LOS/BLOS systems).
- Does not require an airfield for launch and recovery.
- Limited target location reporting ability to enable engagement by area fire munitions.
- Primary purpose is to enhance SA, performing reconnaissance, limited surveillance, and limited (short endurance time) communications relay for the unit.

NOTE: The UAV CL I platform is not necessarily a fixed-wing design.

The UAV CL II is most appropriately employed at the platoon through company echelon and is organic to the UA Infantry and MCS companies. The UA has 36 UAV CL II L/C Units. It has one aerial vehicle for every L/C Unit.

UAV CL II characteristics include:

- Mounted on organic platforms with an aerial vehicle that can hover over terrain, in the urban canyons of a city or perch on buildings or terrain to allow persistent staring capability and prolonged loiter times.
- Light enough so it allows no more than two soldiers to remount one launch vehicle to another FCS ground platform without material handling equipment.
- Provides LOS enhanced dedicated imagery.
- Performs target acquisition and designation.
- Does not require an airfield.
- Conducts RSTA operations under canopy, in open, rolling, complex and urban terrain; performs reconnaissance and security/early warning capability for the UA Infantry and MCS Companies, providing reconnaissance and surveillance support to routes, NAIs, TAIs, avenues of approach, and other areas of interest; remotely overwatches and reports changes in key terrain, avenues of approach and danger areas in MOUT and urban terrain.

NOTE: The UAV CL II platform is not necessarily a fixed-wing design.

The UAV CL III is most appropriately employed at the battalion echelon. System is organic to the NLOS Battalion and the reconnaissance troops within UA CA Battalions. The UA has 12 UAV CL III L/C Units. It has four aerial vehicles per L/C Unit.

UAV Class III characteristics include:

- Mounted on its’ own platform.

- Detects mines.
- Detects CBRN.
- Performs meteorological survey.
- Performs target acquisition and designation.
- Does not require an airfield.
- Conducts RSTA operations with emphasis on targeting; the battalion UAV CL III will perform tactical level RSTA and Command, Control, Communications & Intelligence (C3I) and target attack throughout the full spectrum of Army operations including offensive, defensive, stability, and support operations; it must have the range and duration to support the acquisition of targets to be attacked by NLOS systems and provide reconnaissance within the UA area of influence

NOTE: This is the largest class of UAV that does not require an airfield and launches its Aerial Vehicles from a trailer-mounted platform.

The UAV CL IV is most appropriately employed at the brigade echelon. The system is organic to the Aviation Squadron. The UAV CL IVa will conduct manned/unmanned teaming, paired with the Comanche helicopter. The CL IVa has two L/C Units with four aerial vehicles per L/C Unit. The UAV CL IVb will provide the UA its necessary communications relay and persistent staring functions throughout its domain. Both the number of UAV CL IVb L/C Units and Aerial Vehicles are still under study.

UAV CL IV characteristics include:

- Capable of persistent staring.
- Provides robust, long endurance communications relay across the depth of the 75 km combat radius and for CA Battalions executing aerial envelopment to operational depth.
- Performs recon during aerial envelopments to operational depth or during operational moves from point of entry to the area of operations (400 km).
- Performs wide area search to cue other sensors.
- Performs emitter mapping.
- Detects CBRN.
- Assists other manned systems in performing reconnaissance and close combat with ground force missions throughout the full spectrum of Army operations including offensive, defensive, stability, and support operations; functions independently in support of multiple users or teamed with Comanches to conduct the UA RSTA mission; provides the brigade an organic ability to perform R&S at extended range (75 km radius).
- Requires an unimproved airfield for recovery.
- Sufficient numbers of these platforms to cover its combat radius and observe NAIs in its area of interest.

System Class (Total Systems in the UA)	Operational Radius	On Station Time	Operating Altitude AGL (MSL*)	Allocation
UAV (CL I) (54 Systems)	8 km (T) 16 km (O)	50 min (T) 90 min (O)	500 ft. AGL (10,500 ft MSL)	1 x IN Plt (18) 3 x Recon Plt (27) 1 x Cannon Plt (6) 1 x FSB Co (3)
UAV (CL II) (36 Systems)	16 km (T) 30 km (O)	2 hours (T) 5 hours (O)	1000 ft AGL (11,000 ft MSL)	3 x IN Co (18) 3 x MCS Co (18)
UAV (CL III) (12 Systems)	40 km (O)	6 hours (T) 10 hours (O)	2000 ft AGL (12,000 ft MSL)	3 x Recon Trp (9) 3 x NLOS Bn (3)
UAV (CL IVa) (2 systems) UAV (Class IVb)	75 km (O) 400 km** (O) **Limited duration	18 –24 Hours	Minimum of 6,500 ft AGL (16,500 ft MSL)	2 x AVN SDN (2)

* MSL Altitude assumes a baseline MSL altitude of 10000 ft

Figure 3-53 UAV Characteristic Chart

3.2.17 Unmanned Ground Vehicles (UGVs). The UA is equipped with an array of UGVs to perform routine and dangerous missions. The "robots" reduce risks to soldiers and frees soldiers from routine tasks like guarding a perimeter to allow those soldiers to do other tasks or sleep. The UA has a combination of high end and low-tech robots. This combination is important. High-end robots give you increased capabilities and precision. Low-end robots are expendable in high-risk tasks. They can be outfitted with mission equipment packages carried on-board the ICV, such as RSTA. The bottom line is when UA infantry platoons dismount they have the same capability as they had from its ICV.

The ARV has two common chassis with three Mission Payloads: ARV-A, ARV-A (L), and ARV RSTA. The ARV-A and ARV RSTA will be different mission payloads mounted on the same chassis. The ARV-A (L) will be on a lighter chassis than the other ARVs and tailored to support infantry companies conducting air assault operations. The ARV-A (L) will have a similar payload as the ARV-A as weight restrictions allow. The ARV will be self-employed (not towed or trailer deployed). The ARV is used to rapidly shape the battlespace and provide force protection that enhances operational and tactical flexibility. The UA will conduct extended reconnaissance of various terrains including the urban battlespace to gain and sustain information dominance. The ARV will be used to investigate features including structures, field fortifications, bunkers, and facilities.

The ARV RSTA consists of a chassis platform with payloads that provide video capability, digital communications/audio relay modules (plug in/out), and advanced sensors/mission modules. The RSTA platform and its payloads will generally be controlled by an operator in another vehicle, or by a dismounted operator. It weighs approximately six tons and will be capable of keeping up with the MCS or ICV platforms over rough terrain. It will also have a self-defense capability. The ARV RSTA variants will support the following tasks:

- Remotely provide reconnaissance capability in MOUT and other battlespace; remotely deploy sensors, direct fire weapons and special munitions into buildings, bunkers, and other urban features.
- Remotely locate or by-pass threat obstacles in buildings, bunkers, tunnels, and other urban features.
- Act as a communications relay.
- Remotely assess and report BDA.
- Capable of keeping up with the MCS or ICV platforms over rough terrain.

The ARV-A and the ARV-A (L) variants consist of an Operator Control interface, a Chassis Platform, video capability, digital communications/audio relay modules (plug in/out), and advanced sensors/mission modules. These systems will be unmanned and highly mobile for mounted and dismounted forces. The Assault variant will be equipped with an offensive machine gun or KE cannon and BLOS missiles. The ARV-A and ARV-A (L) will provide LOS/BLOS support for the dismounted infantry operations when the MCS is not available. The UA is required to conduct battalion sized air assault operations; therefore, the Light variant, or the ARV-A (L), must be air transportable by UH-60. Further, the ARV-A (L) can be delivered by airborne delivery when environmental conditions do not permit it to be sling loaded with the air assault force. Assault variants will support the following tasks:

- Support the infantry in the assault with direct fire and AT weapons; occupy key terrain and provide over-watching fires and effects.
- Remotely provide reconnaissance capability in MOUT and other battlespace.
- Remotely deploy sensors, direct fire weapons and special munitions into buildings, bunkers, and other urban features.
- Remotely locate or by-pass threat obstacles in buildings, bunkers, tunnels, and other urban features; remotely assess BDA.
- Act as a communications relay.
- Provide LOS fire to kill dismounted infantry and suppress fortified positions; BLOS fires to destroy vehicles up to T-72 (protected with Explosive Reactive Armor 4 (ERA4) and Armor Protection System (APS)) and fortified positions.
- Employ non-lethal munitions.

The MULE provides transport of equipment and/or supplies in support of dismounted maneuver. This is a multi-functional platform, capable of following Maneuver systems or being directed to move to positions not along the line of movement. It will be picked up and distributed to the dismounted unit on an “as needed” basis from the support platoon at the CA Battalion. The anticipated requirement to support dismounted operations away from the ICV is two per platoon. The MULE's mission is to provide logistic support and lighten the load of the dismounted force as well as perform within the BICC network range extension missions through out the UA. The MULE will help provide superior tactical mobility in a wide assortment of terrain and weather variables to the dismounted force without compromising tactical unit integrity. The MULE must be capable of semi-autonomous operations allowing it to follow dismounted forces by distance or time. It must be capable of following dismounted forces across rolling and open terrain (Threshold), constricted, complex terrain (Objective) at a distance of up to 2 km (Threshold), 10 km (Objective) while fully autonomous (with tactical behaviors).

Small (manportable) Unmanned Ground Vehicle (SUGV). To rapidly shape the battlespace and for force protection that enhances operational and tactical flexibility, U.S. Forces will conduct extended reconnaissance of MOUT and subterranean battlespace to gain and sustain information domination and assess land domination (above and below ground) by the force commander. Critical features include structures, field fortifications, tunnels, sewers, subways, bunkers, facilities, and other structures in support of strikes, raids, early and forced entry operations, peacekeeping, and other Stability Operations and Support Operations. The SUGV is a man-packable robot system, weighing less than 30 lbs, consisting of a

robotic Operator Control Unit, a robotic chassis platform with video capability and digital communications/audio relay modules (plug in/out).

These small systems can be disassembled and efficiently packed for storage and transport for rapid deployment or man-pack dismounted operations. These proposed systems will be highly mobile for dismounted forces and will be capable of being re-configured for other missions by adding or removing sensors, modules, mission payloads, and/or subsystems. This SUGV can be mission tailored with special munitions and deploy ground sensors, thus eliminating the need for infantry to remain in cleared buildings to secure them. It can conduct ISR in all spectrums, through buildings or even subterranean. What is important here is that the SUGV is an integral part of the fighting team. It is not a separate platform added for the mission. The power of robotics is they reduce the enemy's ability to create tactical surprise. The SUGV will support the following tasks:

- Remotely provide reconnaissance in MOUT and subterranean battlespace.
- Remotely deploy sensors, dynamic payloads and special munitions into buildings, bunkers, tunnels, sewers, and other urban features.
- Remotely detect and neutralize booby-traps, landmines, and explosive threats to forces in buildings, bunkers, tunnels, sewers, and other urban features.
- Remotely locate or by-pass threat obstacles in buildings, bunkers, tunnels, sewers, and other urban features.
- Remotely detect subterranean avenues of approach to prepare obstacle plans.
- Remotely assess bomb damage and subterranean structural integrity of facilities and buildings.
- Act as a communications relay.
- Provide an integrated family of sensors to acquires, process, and transmit data to supplement the capabilities of manned/unattended sensors.
- Accept/host an integrated family of modular "plug-and-play" tailored mission ISR sensor suite which improves abilities to acquired, process, and transmit ISR data beyond the organic on-board capabilities of the host unmanned ground vehicle.
- Possess an anti-tamper capability that is scalable from lethal to non-lethal means.
- Possess a self-destruct mechanism that can be initiated from a distant control agent.

Variant	Echelon
ARV-RSTA	**1 x MCS Platoon** **3 x Recon Troop**
ARV-A	**1 x Infantry Platoon**
ARV-A (L)	**6 x CA Battalion HQ**
MULE	**6 x BIC Company** **18 x CA Battalion HQ-task org as required**
SUGV	**3 x Infantry Platoon** **9 x Recon Troop**

3.3 Increment 1 Threshold Design

This section describes the organizational design used in the development of the Unit of Action (UA) Threshold Increment 1. The first UA was defined by the Operational Requirements Document (ORD), Change 3 (JROC approved on 14 April 2003) and reflected in the Army FCS Unit of Action (UA) Systems Book version 2.0. These documents reflect the decisions made at Fort Belvoir in March 2003 and approved by the Chief of Staff, Army on 29 March and the Secretary of the Army on 1 April 2003.

Increment 1 systems to be fielded between 2010 and 2012 include (13+1):

- Mounted Combat System.
- Infantry Carrier Vehicle.
- Non Line of Sight Mortar.
- FCS Cannon.
- Command and Control Vehicle
- Reconnaissance and Surveillance Vehicle.
- Medical Vehicle (Treatment and Evacuation).
- Multifunctional Utility/Logistics and Equipment Vehicle (MULE) & Armed Robotic Vehicle-Assault (Light) (ARV-A (L) is a MULE derivative).
- Non Line of Sight Launch System.
- UAV Class I.
- UAV Class III/IV (fulfilled in the interim by a single aircraft solution).
- Unattended Ground Sensors.
- Small Unmanned Ground Vehicle.
- Battle Command network.

The systems that will function in lieu of (ILO) include the following equipment:

- HEMTT Wrecker will be fielded ILO the FCS Recovery and Maintenance Vehicle (FRMV).
- Current trucks will be used ILO the Future Tactical Truck System.

Systems that will be spiraled forward during Increment 1 include the UAV Class II, ARV-A and ARV-RSTA variants, Loiter Attack Munition (LAM RDTE is funded, but not procurement), and Intelligent Munition System (IMS). Additional systems required by the approved ORD that require a spiral development plan include: UAV Class III, UAV Class IV, and FRMV. As technology matures, the improved capabilities will be fielded into new UAs and retrofitted to existing UAs.

Some important differences between the organizational designs include:

- Threshold design has a significantly increased personnel and force structure footprint.
- Threshold design does not have the Future Tactical Truck System.
- Threshold design does not have the FRMV.
- Threshold design vehicle commander requirement for many ILOs is not a requirement in Objective.
- Threshold design has a greater number of unmanned system operators, given the limitations on autonomous operations.
- Threshold design has automated level-2 fusion.
- Threshold design resourced quantities only has four ICVs per Infantry platoon.

- Threshold Resourced design has fewer UAVs.
- Threshold Resourced design does not have ARV-RSTA and ARV-A variants which are the only UGVs that can keep up with FCS platforms.

Threshold design includes a meteorological data section to the NLOS Battalion headquarters. The MET section provides timely and accurate meteorological data to correct for nonstandard atmospheric conditions ensuring all weather first round target accuracy for LOS, BLOS, and NLOS systems. The MET section obtains and processes critical target area MET data required for accurate engagement of targets at extended ranges by conventional, precision guided, discriminating and loitering munitions. This data populates LOS, NLOS, and BLOS weapon system databases through the Battle Command system facilitating munitions selection and optimal aim point calculations. Further, the section provides vital upper air weather data in support of Aviation and UAV operations and extends battle area meteorological coverage out to 500 km from its location.

The Increment 1 Threshold design is described in terms of both the quantities and systems REQUIRED in the design and the quantities and systems RESOURCED in the FCS program. The differences between required and resourced are summarized in the following table:

Increment 1 Threshold Unit of Action Platform List

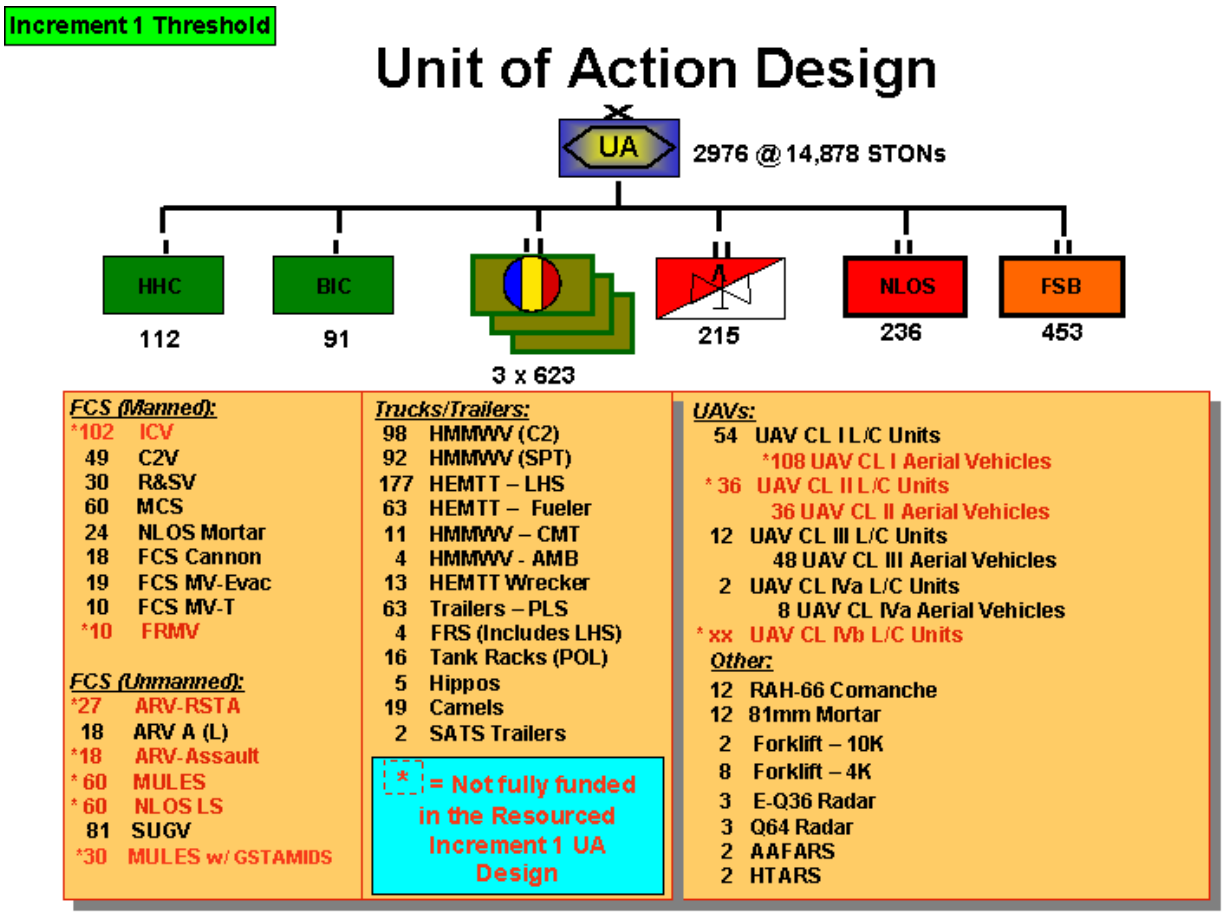
Area	Increment 1 Threshold (FOC-2012)	Required QTY	Resourced QTY	(IOC- 2010)	QTY
LOS/BLOS	MCS	60	60	MCS	20
	ICV	102	84	ICV	26
	ARV-A	18	--	--	--
	ARV-A(L)	18	27	ARV-A(L)	5
NLOS	NLOS Mortar(non-turreted)	24	24	NLOS Mortar (non-turreted)	8
	NLOS LS	60	24	NLOS LS	8
	FCS Cannon	18	18	NLOS Cannon	6
C4ISR	C2V	49	49	C2V	24
	RAH-66 Comanche	12	12	RAH-66 Comanche	12
	R&SV	30	30	R&SV	10
	ARV-RSTA	27	--	--	--
	EQ-36 Radar (CM/CB)	3	3	EQ-36 Radar (CM/CB)	3
	AN/MPQ-64 Radar (Sentinel-E)	3	3	AN/MPQ-64 Radar (Sentinel-E)	3
	UAV (CL I) Launcher/Aircraft	54 / 108	54 / 54	UAV (CL I) Aircraft	15
	UAV (CL II) Launcher/Aircraft	36 / 36	14 / 56*	UAV (CL II / III / IV-a) Aircraft	17*
	UAV (CL III) Launcher/Aircraft	12 / 48			
	UAV (CL IV-a) Launcher/Aircraft	2 / 8			
	UAV(CL IV-b)	TBD	--	--	--
	SUGV	81	81	SUGV	18
	UGS	TBD (> 157)	157	UGS	50
Soldier	LW III**	2976	2976	LW II+	TBD
	Equipment MULE	60	54	Equipment MULE	12
	Mine Detect Carrier	30	24	Mine Det. Carrier	10
Support	MV-T/MV-E	10/19	10/19	MV (T/E)	9
	FRMV	10	--	HEMTT Fleet Wrecker	6
	HEMTT Fleet Wrecker	13	13		
	HEMTT	240	250	HEMTT	184
	HMMWV	205	241 ***	HMMWV	216

*One aircraft fills requirements for UAV Classes II, III & IVa ** Every soldier will not have full LW III ensemble *** This number includes 2 HMMWV for the missing ICVs

Figure 3-54 Increment 1 Threshold UA Platform List

In the following design items in RED print are not fully resourced. Items pictured inside a RED box are not funded.

2004 **3.3.1 Increment 1 Threshold**



2005

2006 **Figure 3-55 Unit of Action Design**

3.3.2 Brigade Headquarters

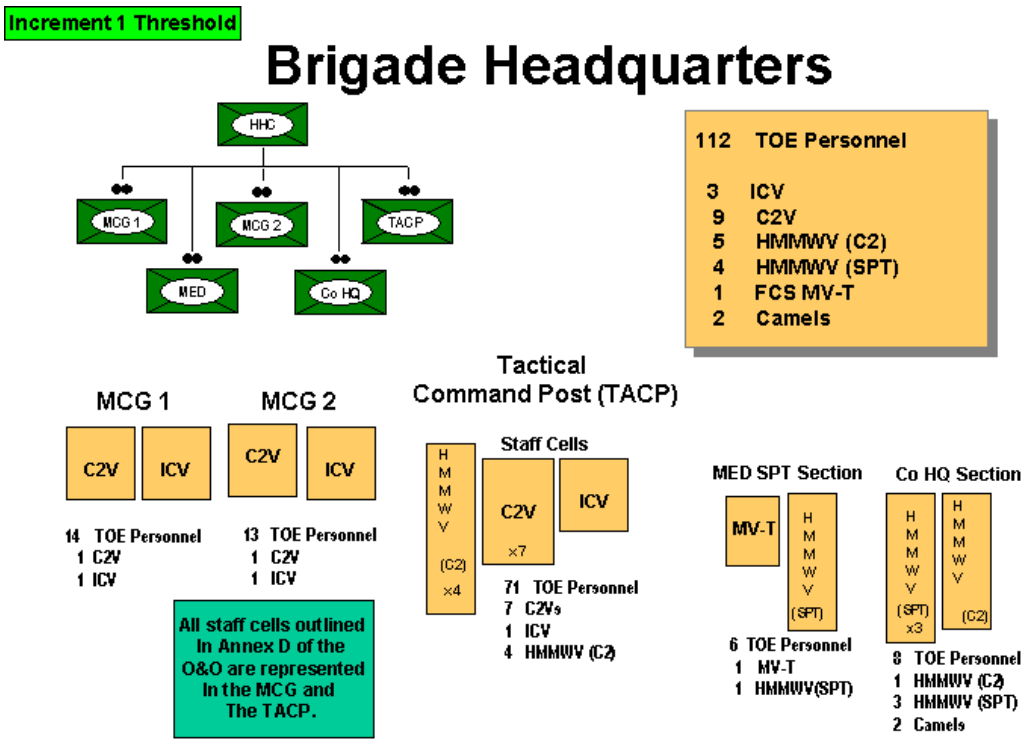


Figure 3-56 UA Brigade Headquarters

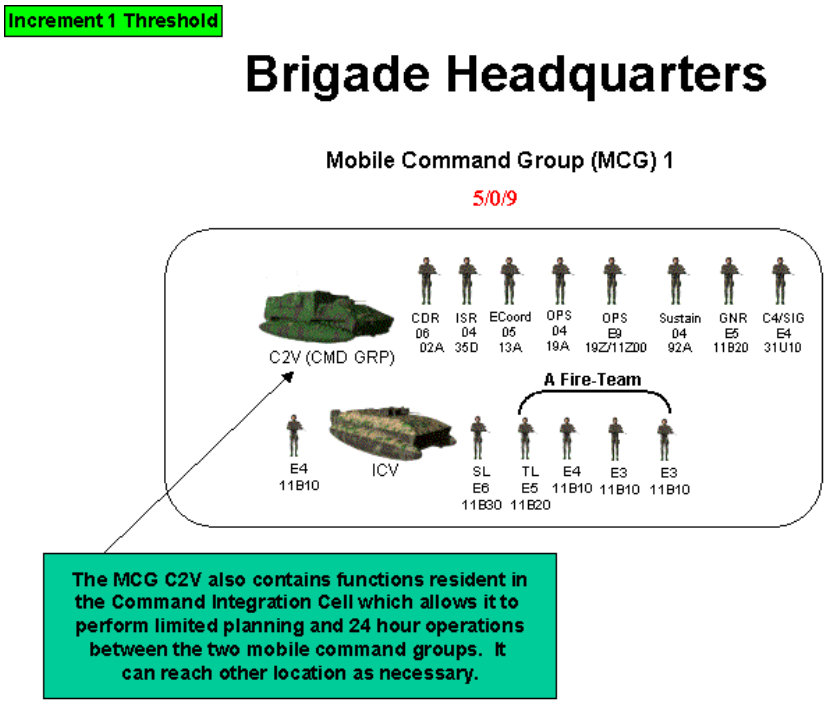


Figure 3-57 Mobile Command Group 1

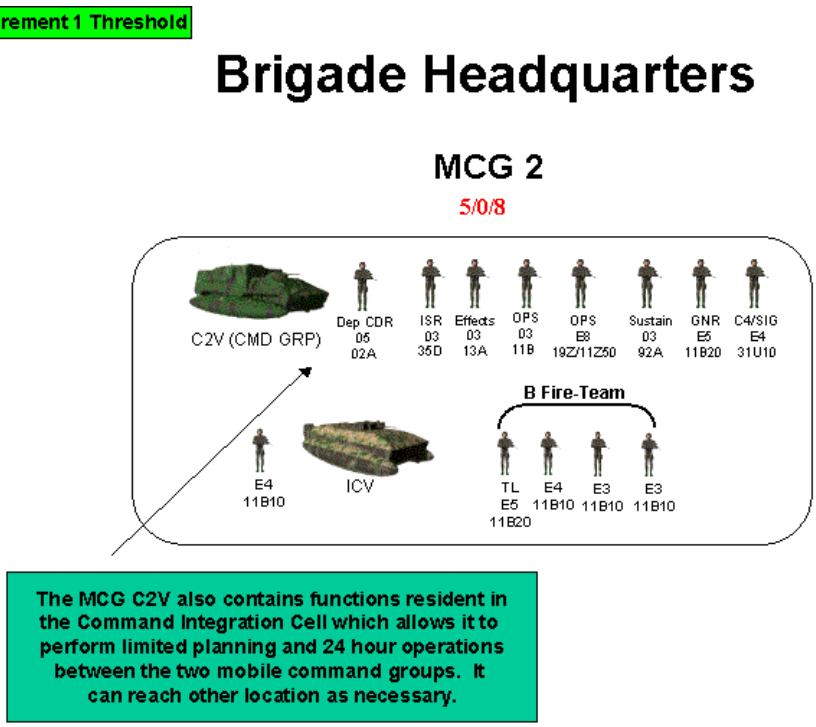


Figure 3-58 Mobile Command Group (MCG) 2

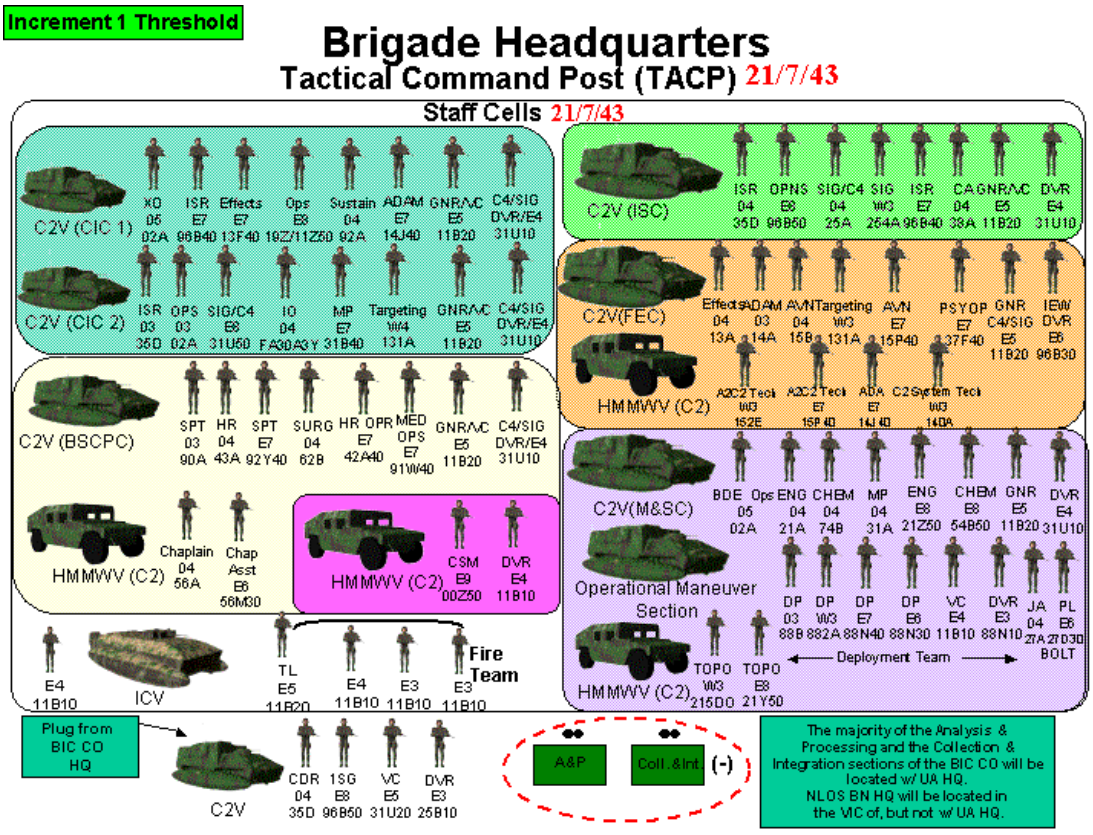


Figure 3-59 UA Headquarters Tactical Command Post (TACP)

Increment 1 Threshold

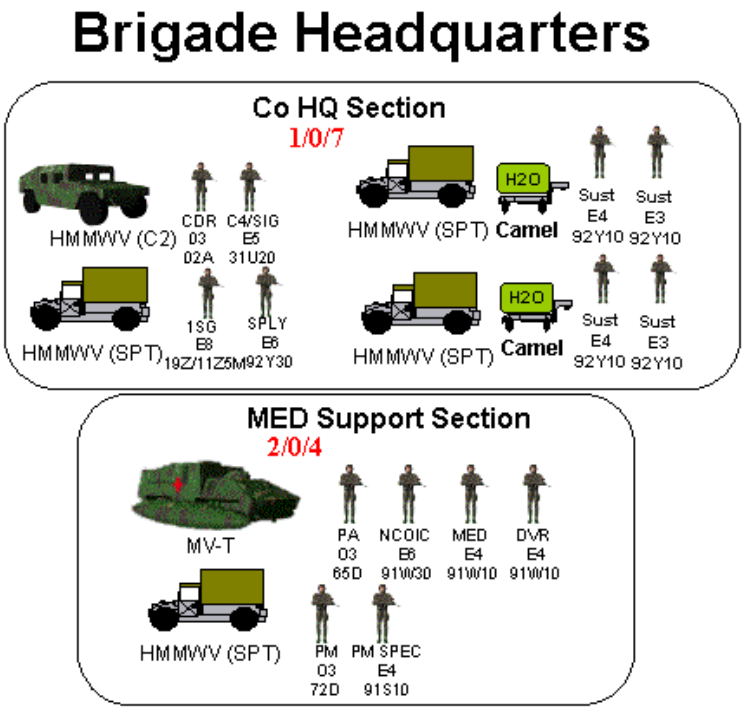


Figure 3-60 UA Headquarters CO HQ / MED Section

3.3.3 Brigade Intelligence and Communications (BIC) Company

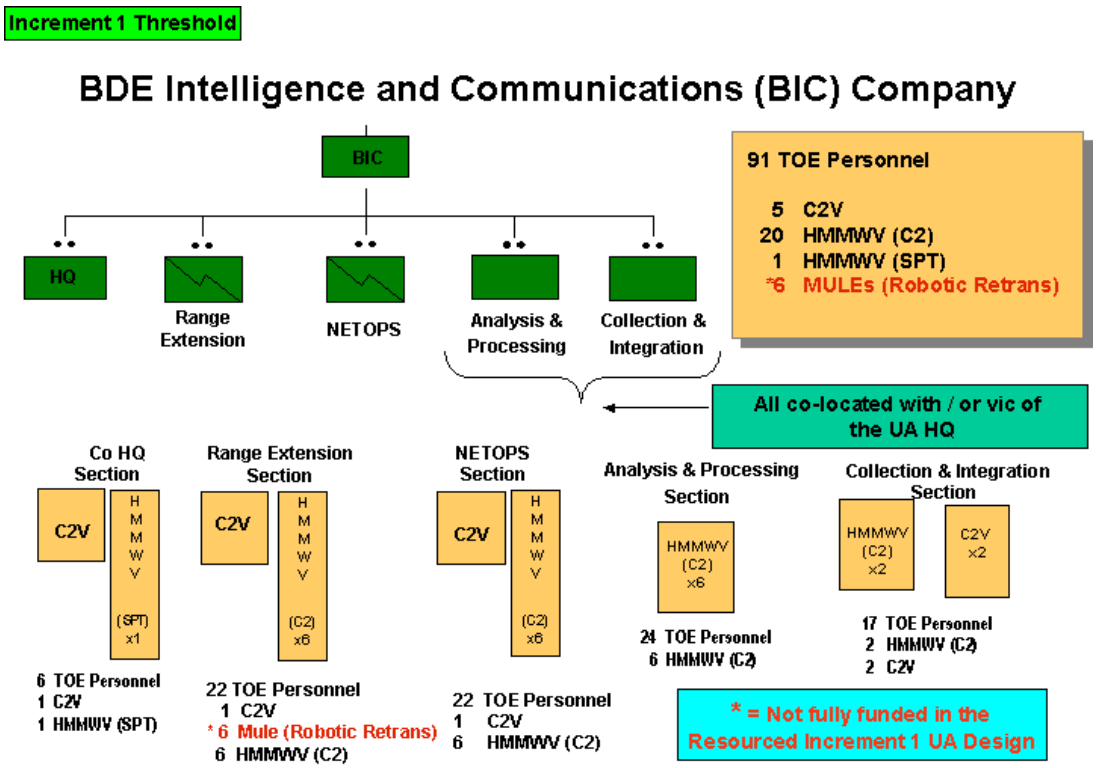


Figure 3-61 BIC Company

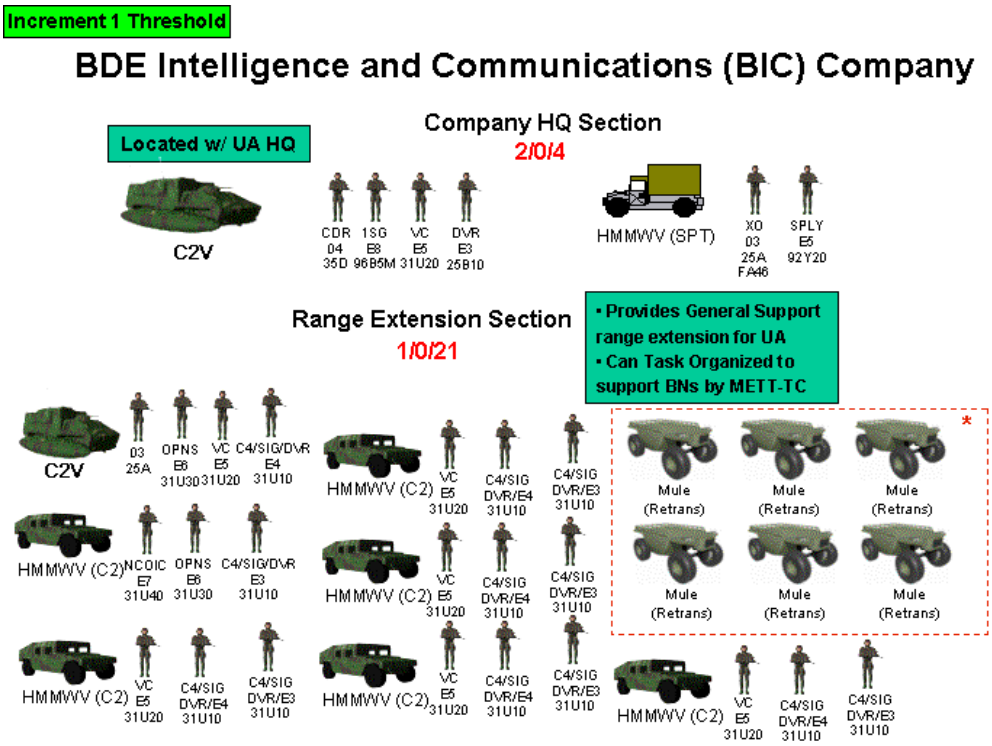
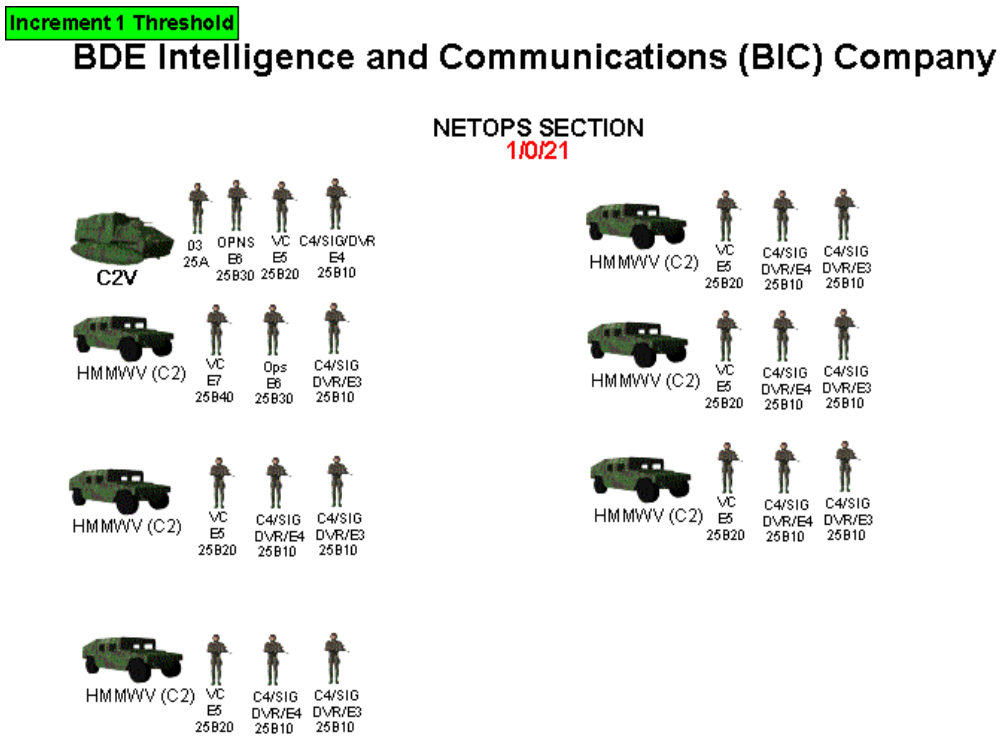
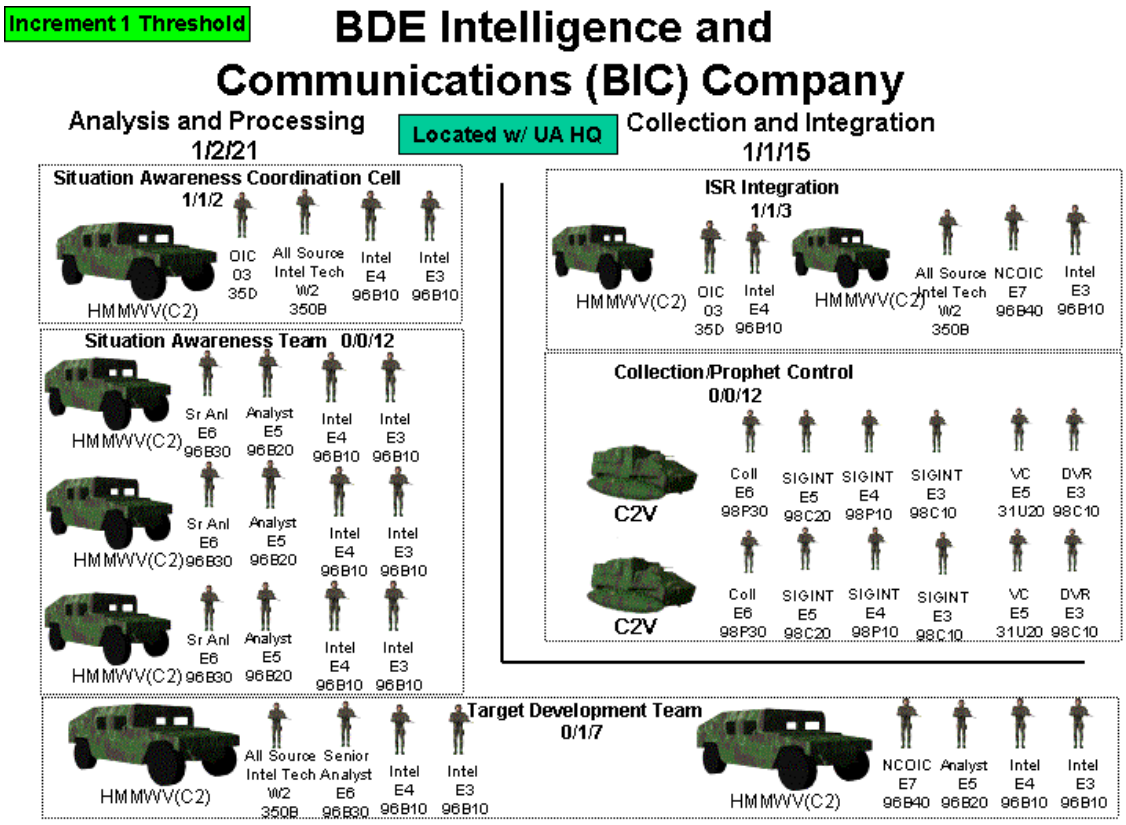


Figure 3-62 BIC Company



2025
2026 **Figure 3-63 BIC Company**



2027
2028 **Figure 3-64 BIC Company**

3.3.4 Combined Arms (CA) Battalion

Increment 1 Threshold

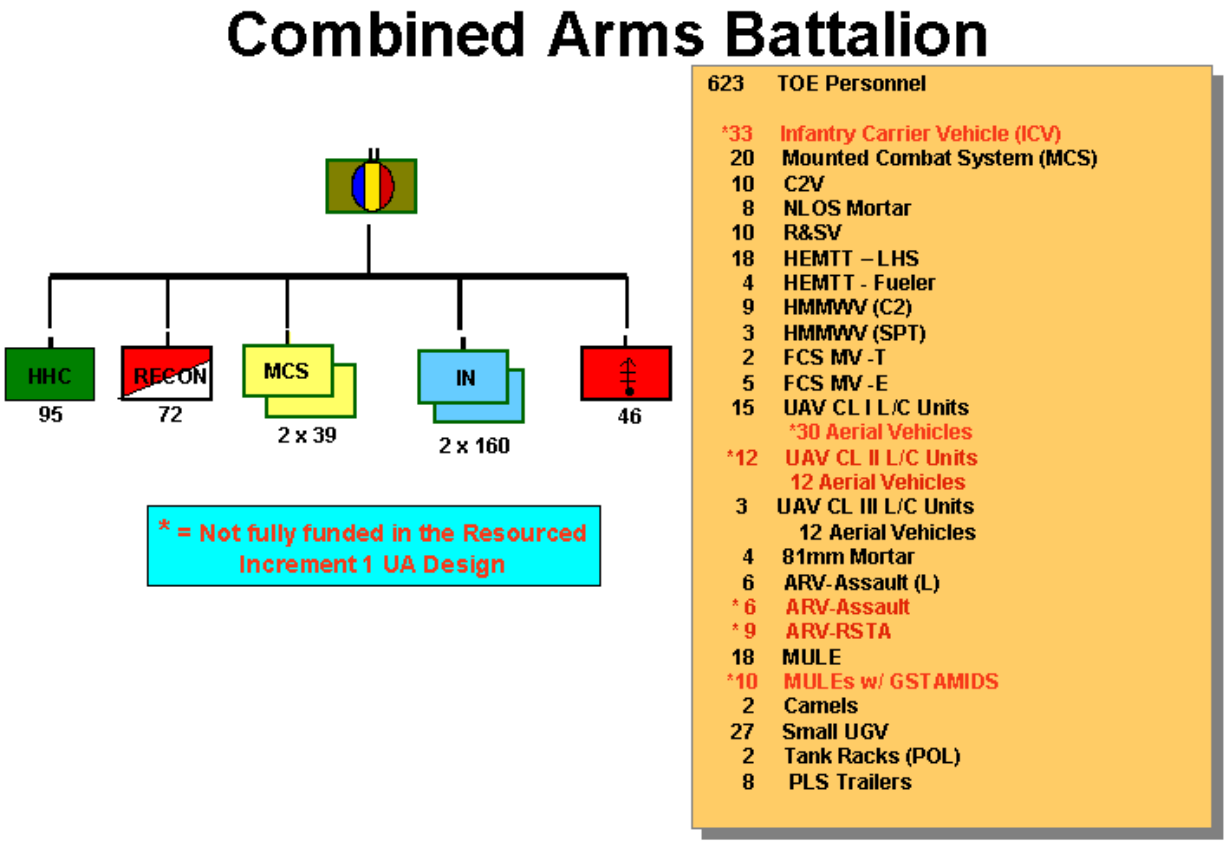


Figure 3-65 Combined Arms Battalion

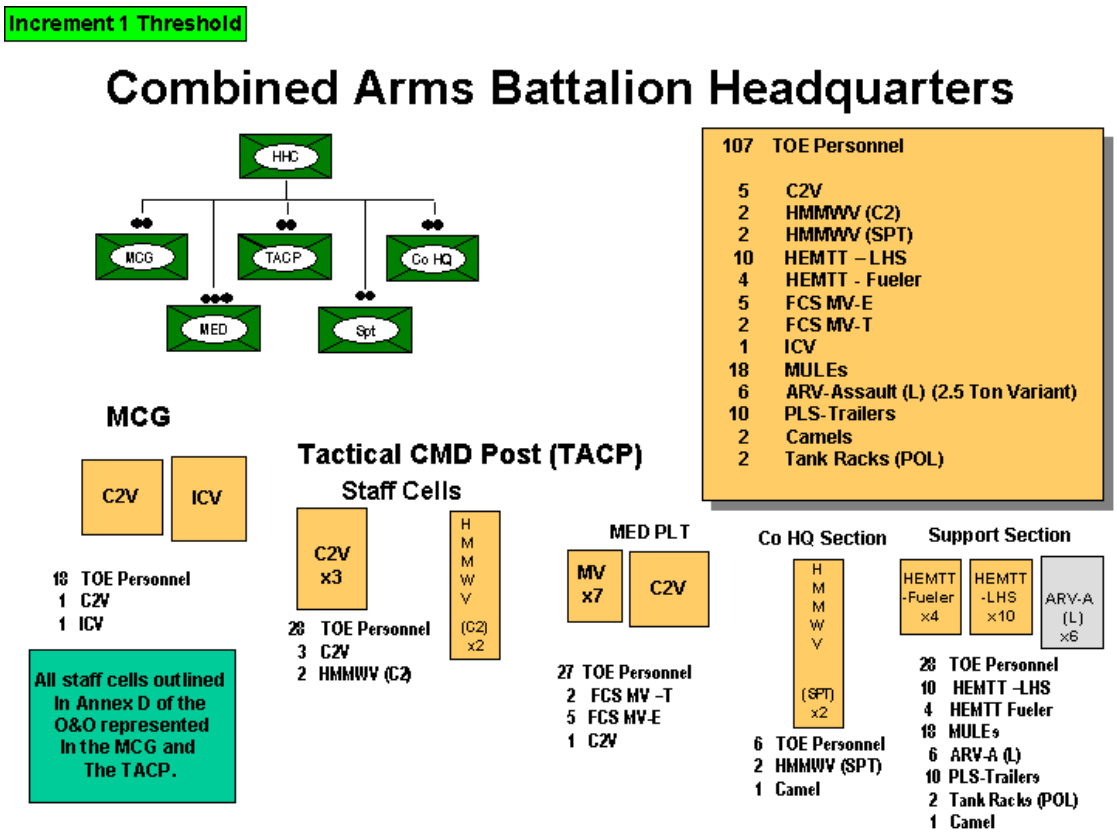


Figure 3-66 Combined Arms Battalion Headquarters

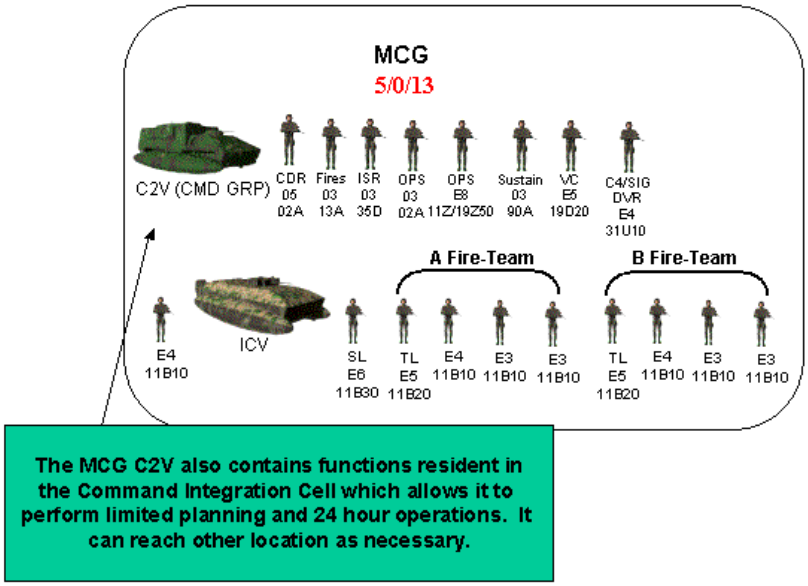


Figure 3-67 Combined Arms Battalion Headquarters

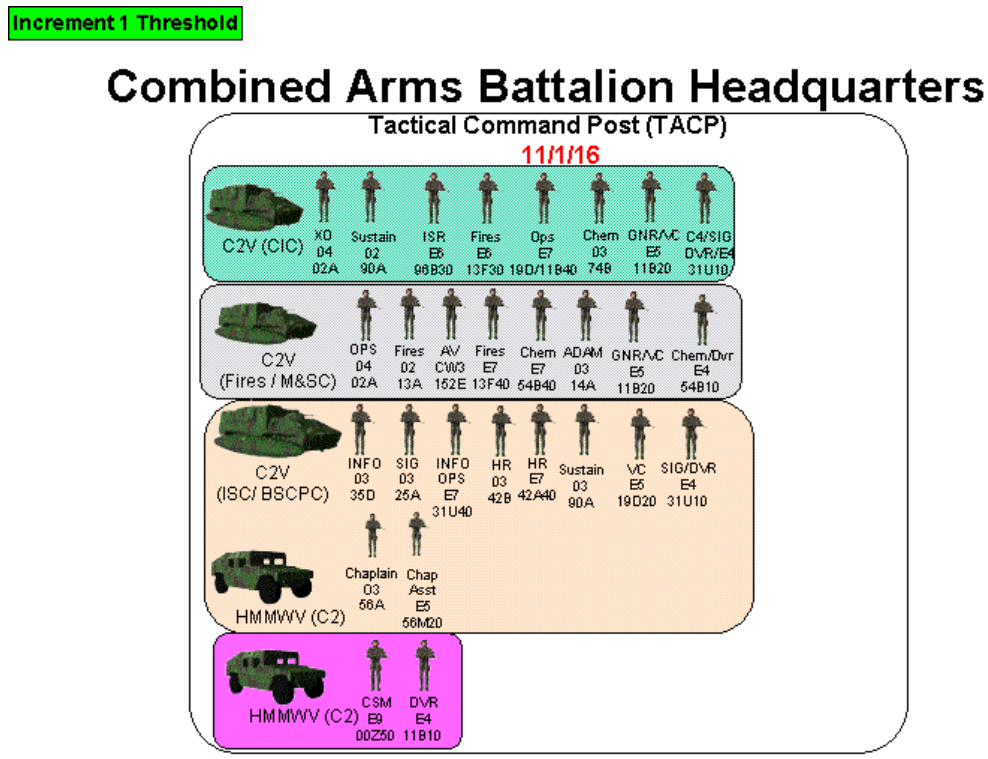


Figure 3-68 Combined Arms Battalion Headquarters

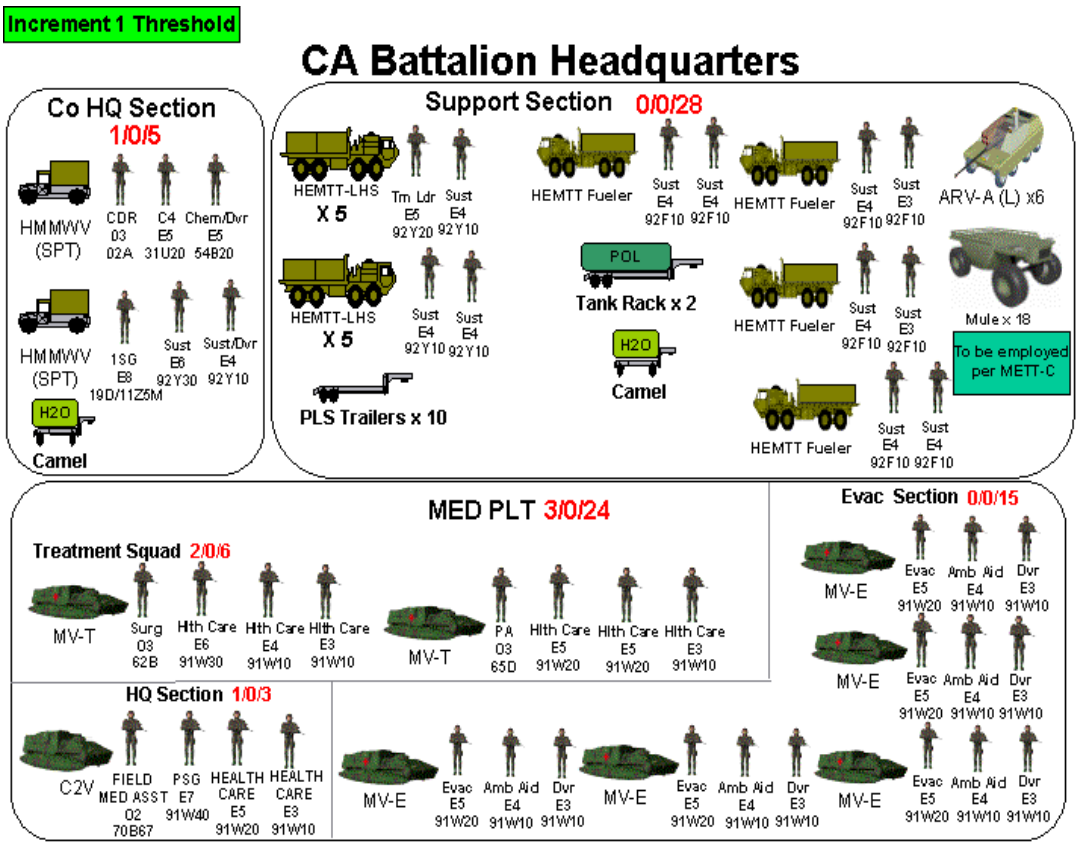
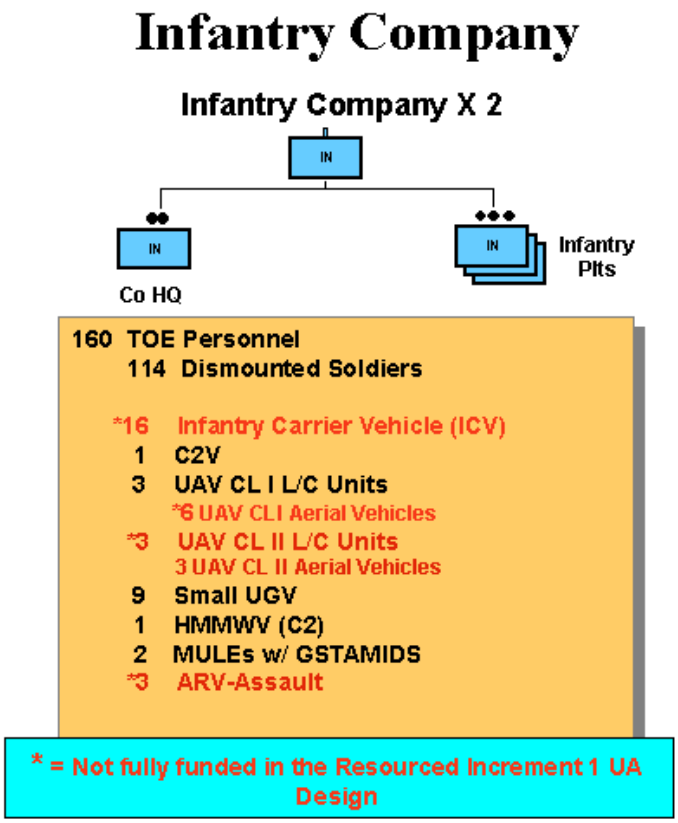


Figure 3-69 Combined Arms Battalion Headquarters

2040 **3.3.5 Infantry Company**

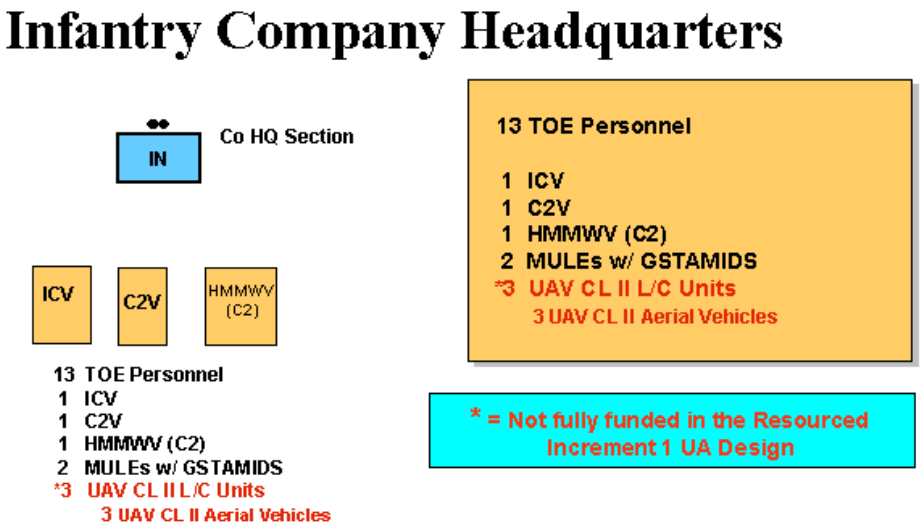
Increment 1 Threshold



2041

2042 **Figure 3-70 Infantry Company**

Increment 1 Threshold



2043

2044 **Figure 3-71 Infantry Company Headquarters**

Increment 1 Threshold

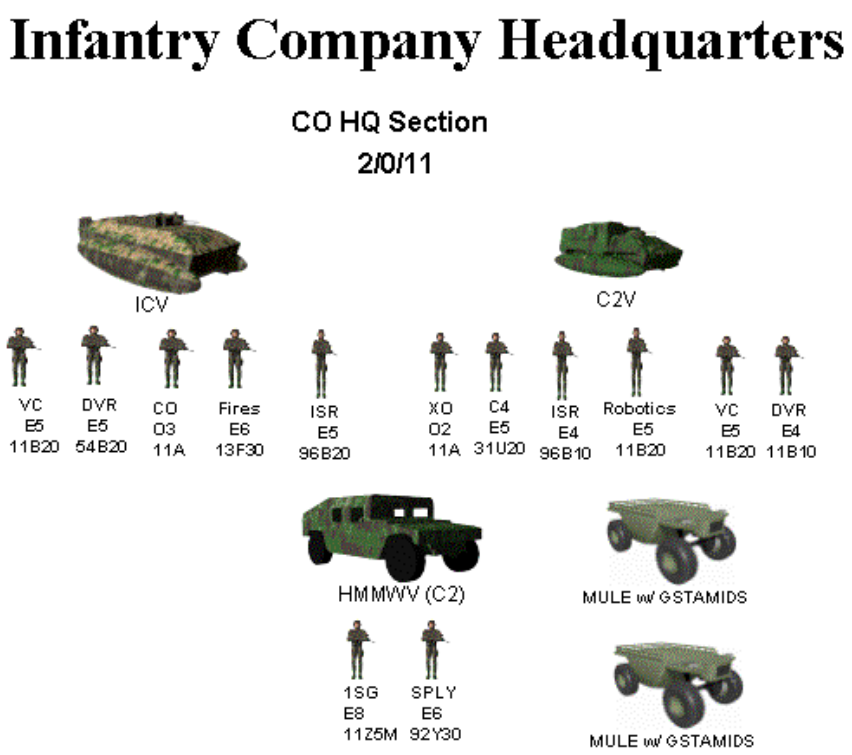


Figure 3-72 Infantry Company Headquarters

Increment 1 Threshold

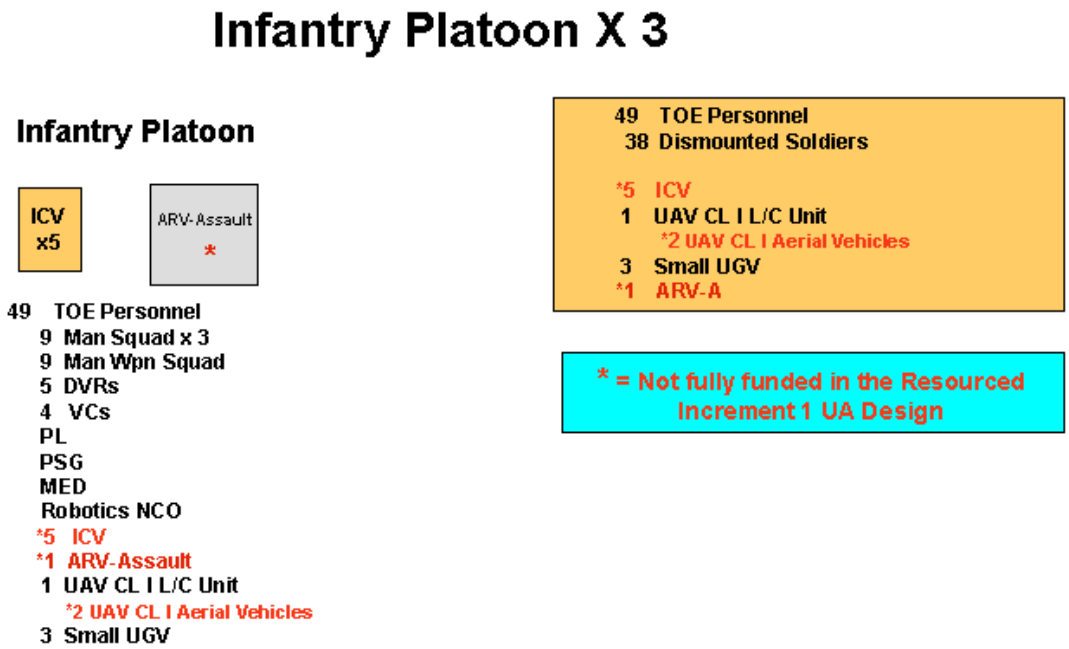


Figure 3-73 Infantry Platoon

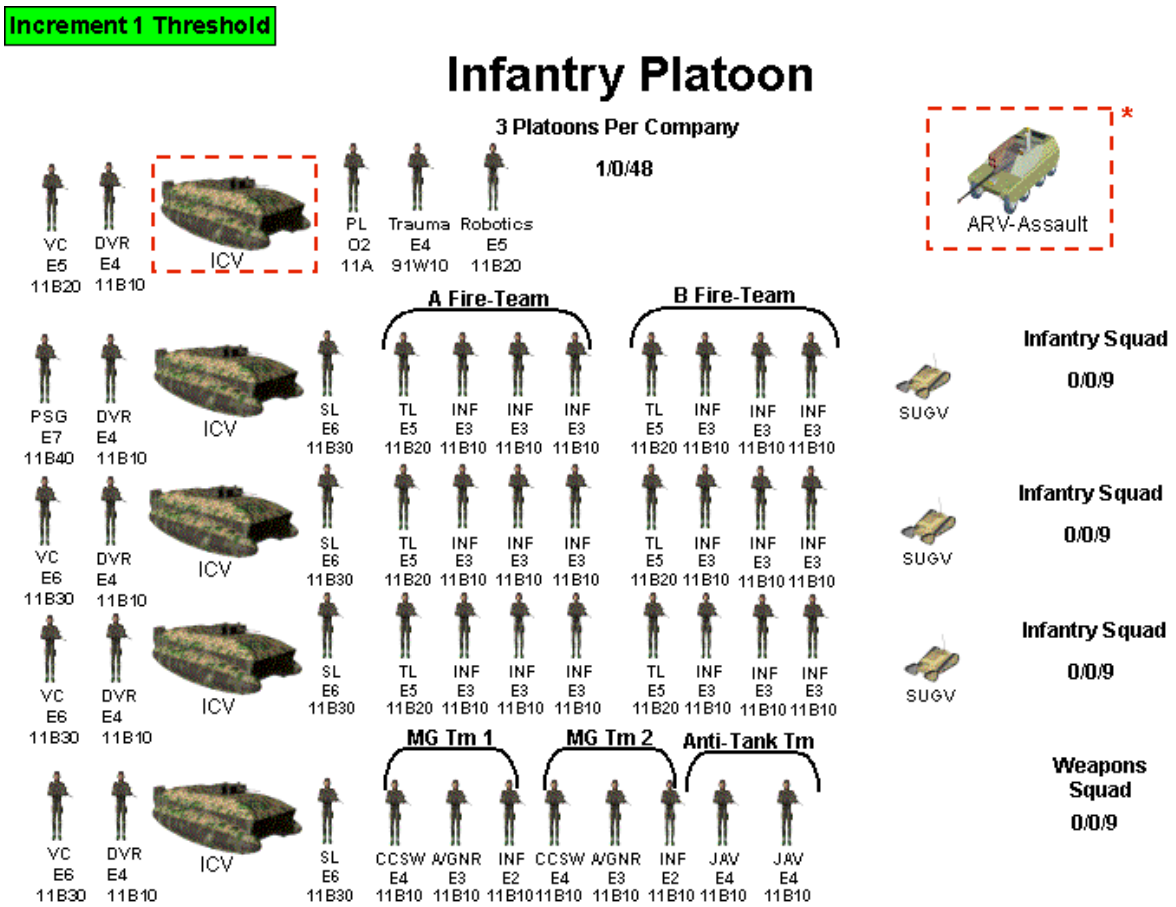


Figure 3-74 Infantry Platoon

3.3.6 Mounted Combat System (MCS) Company

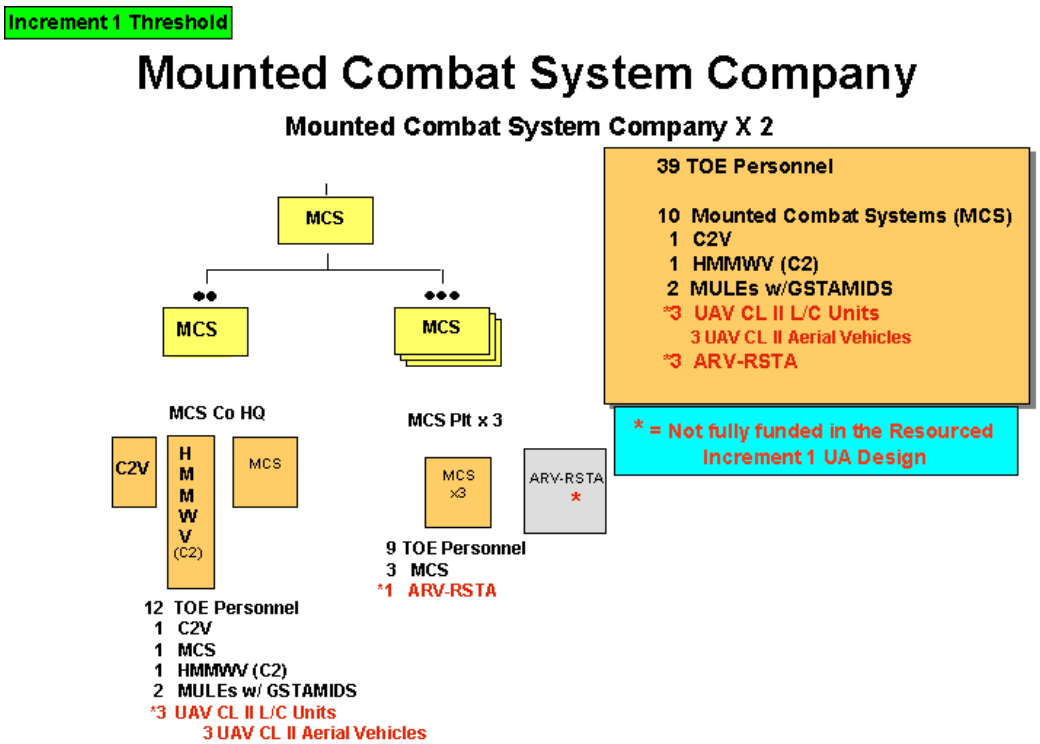


Figure 3-75. MCS Company

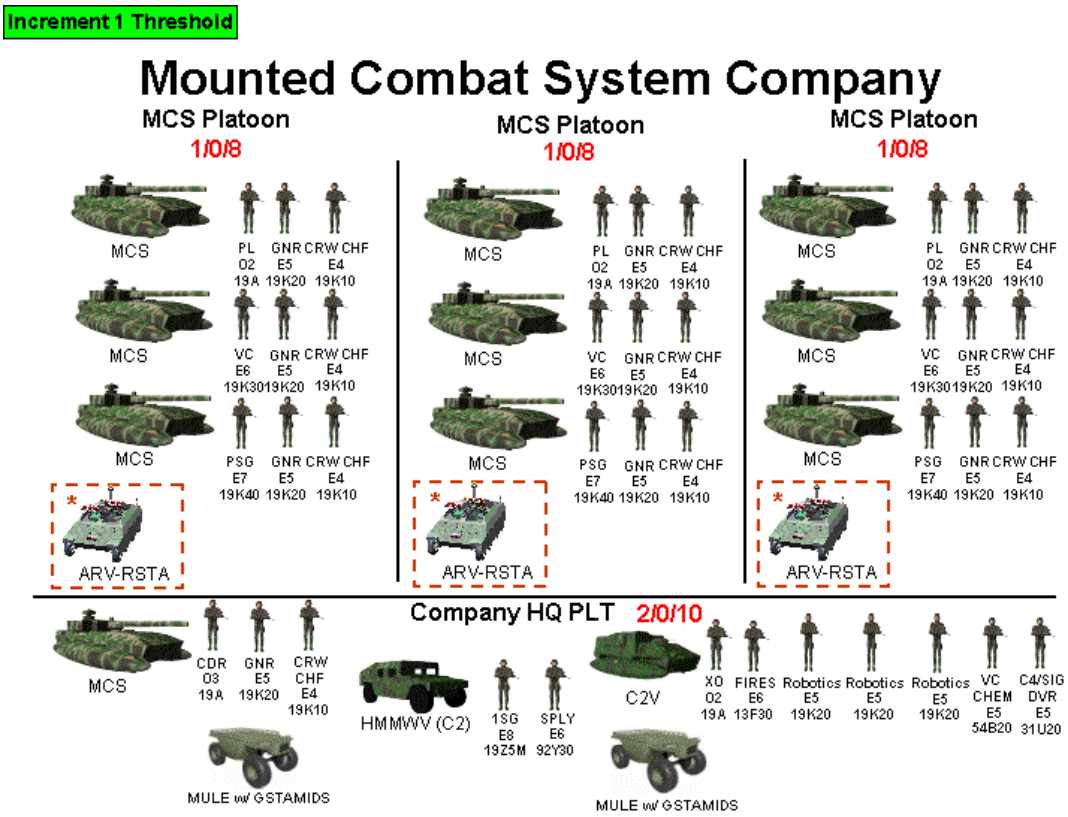


Figure 3-76. MCS Company

3.3.7 Reconnaissance Troop

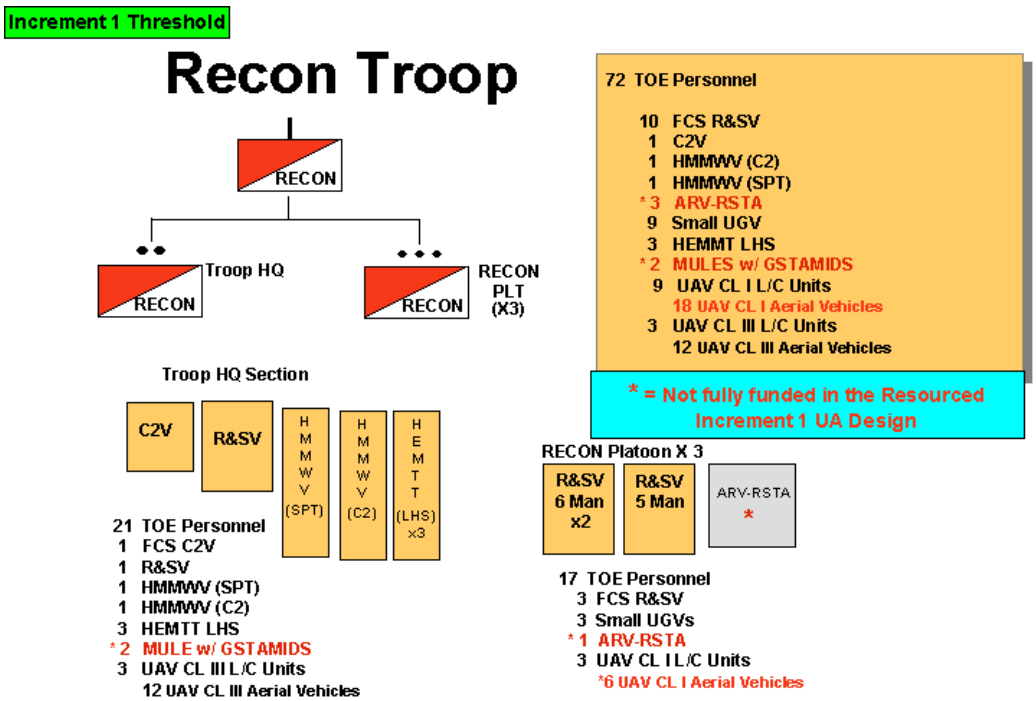


Figure 3-77 Reconnaissance Troop

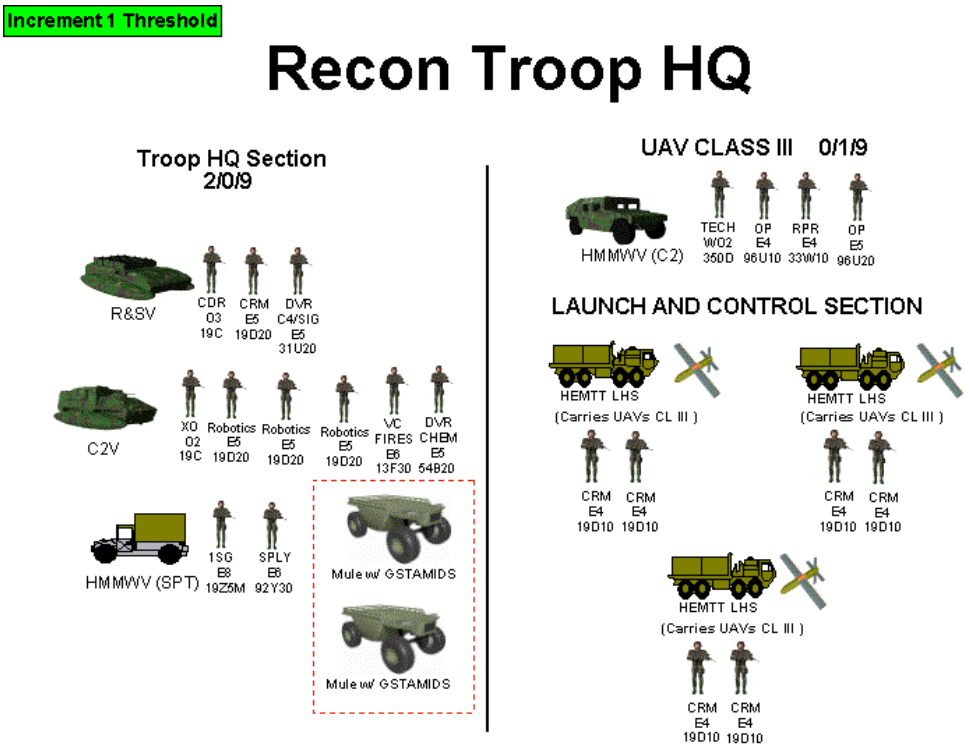


Figure 3-78 Reconnaissance Troop

Increment 1 Threshold

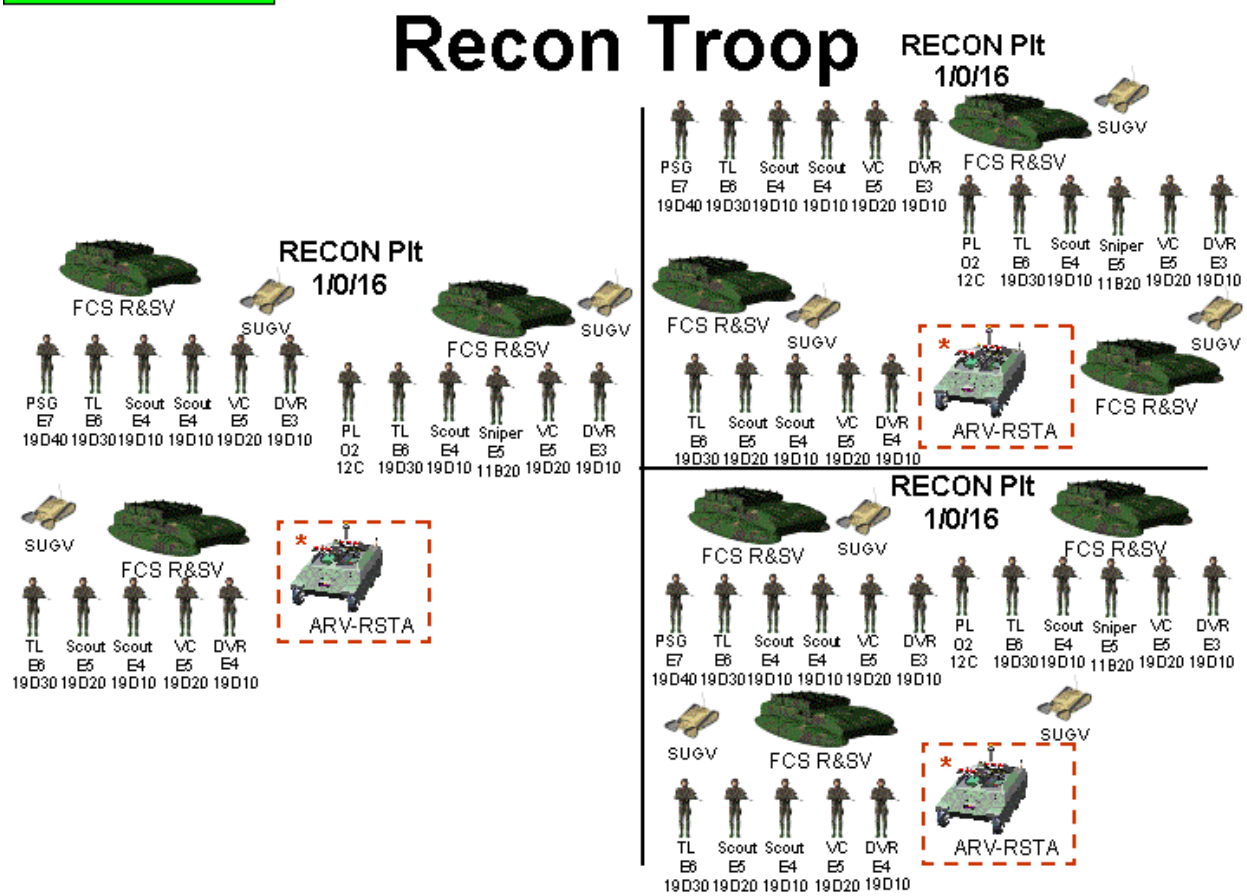


Figure 79 Recon Platoon

3.3.8 NLOS Mortar Battery

Increment 1 Threshold

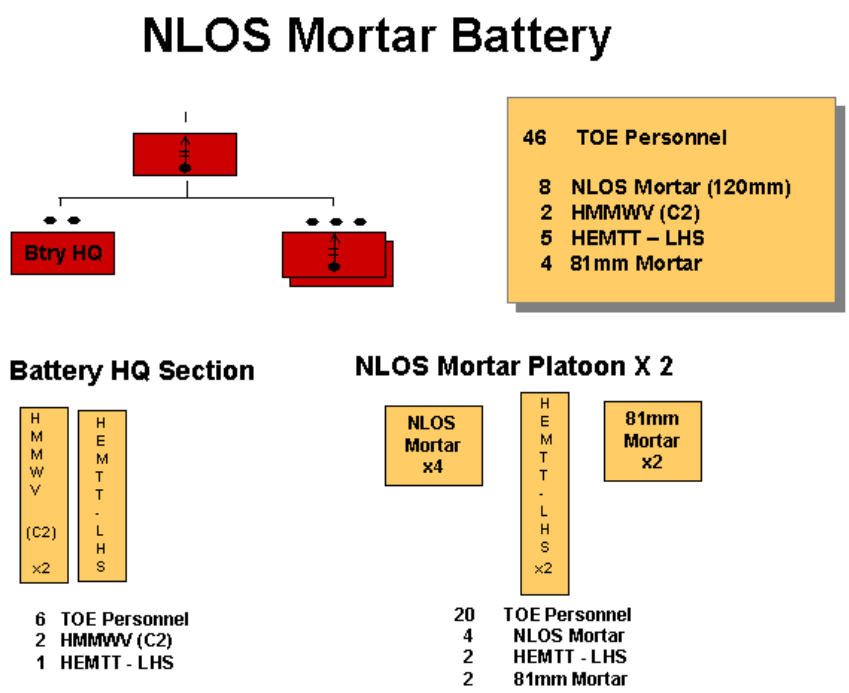


Figure 3-80 NLOS Mortar Battery

Increment 1 Threshold

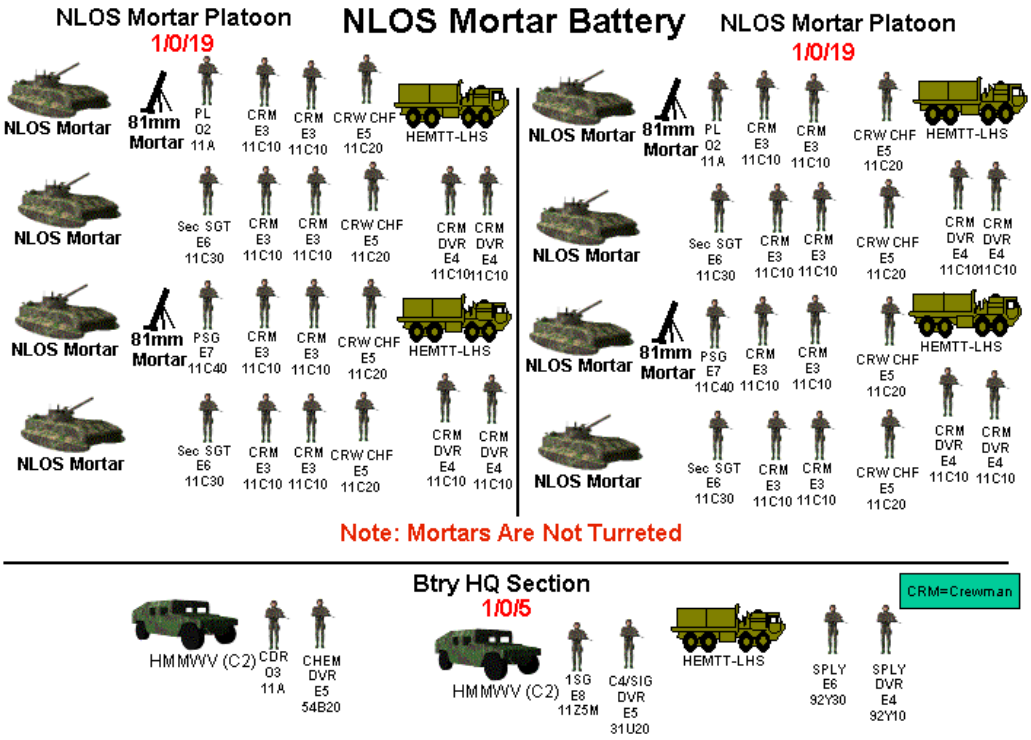


Figure 3-81 NLOS Mortar Battery

3.3.9 Aviation Squadron

Increment 1 Threshold

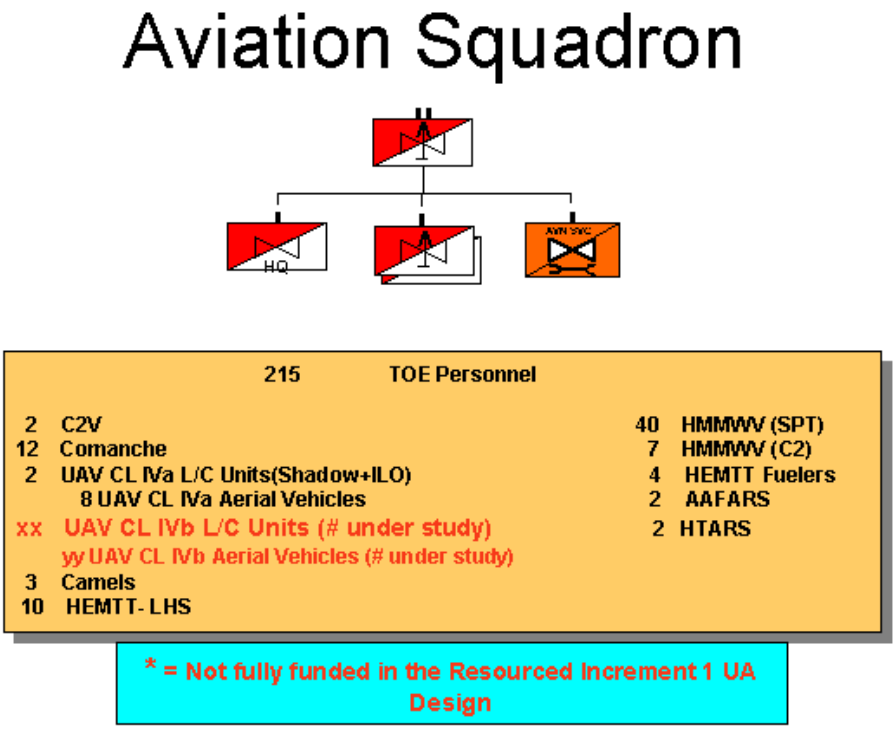
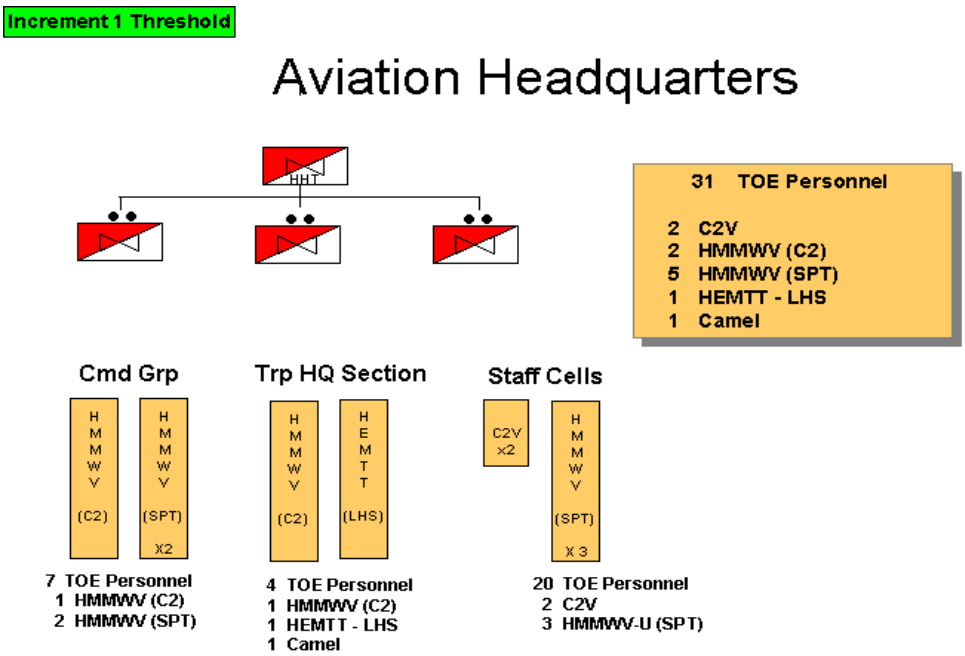
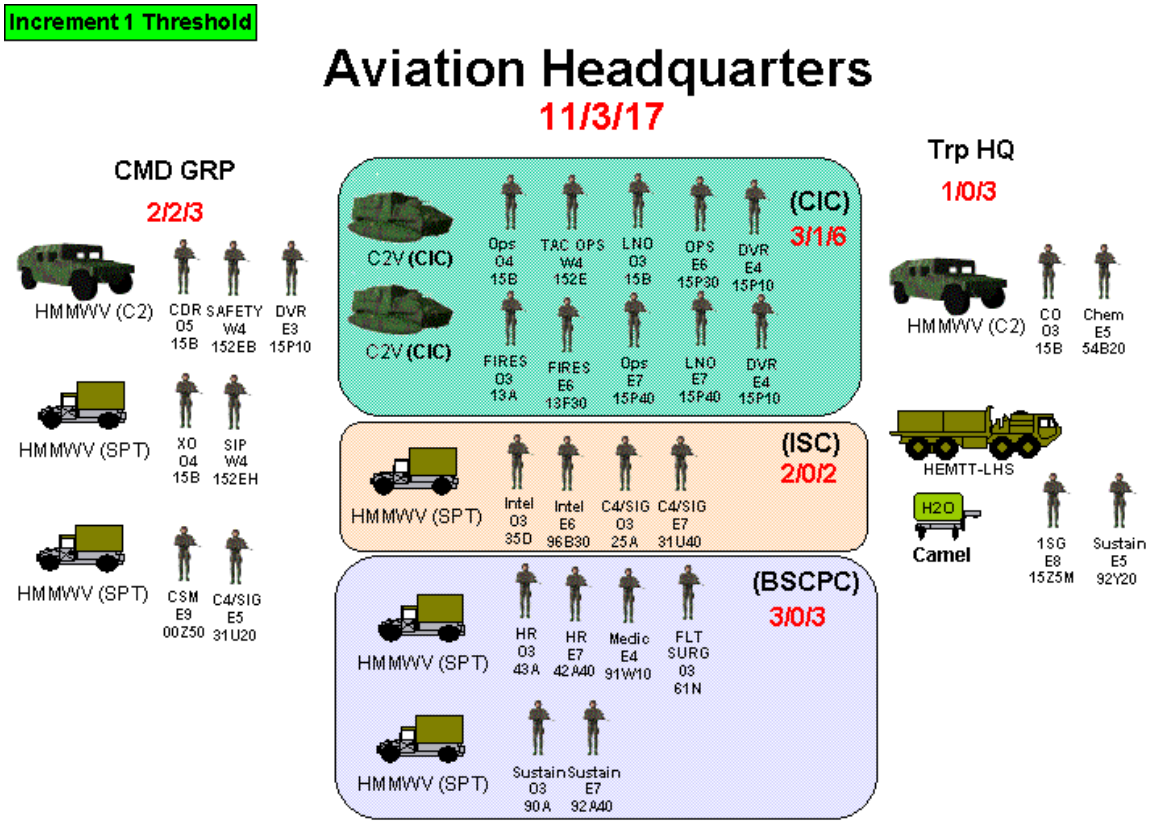


Figure 3-82 Aviation Squadron



2071
2072 **Figure 3-83 Aviation Squadron Headquarters**



2073
2074 **Figure 3-84 Aviation Squadron Headquarters**

Increment 1 Threshold

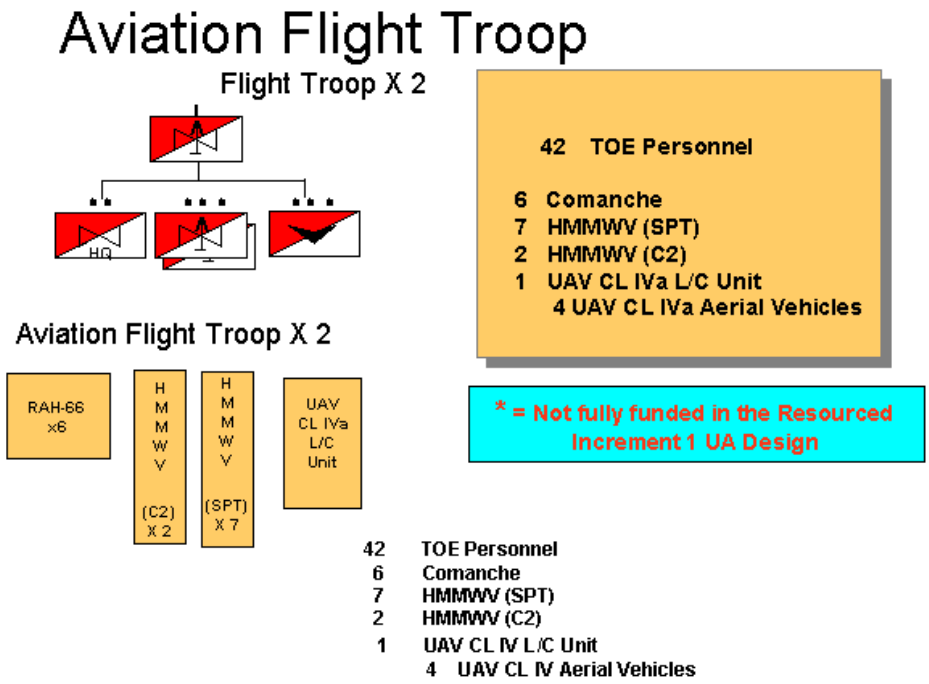


Figure 3-85 Aviation Flight Troop

Increment 1 Threshold

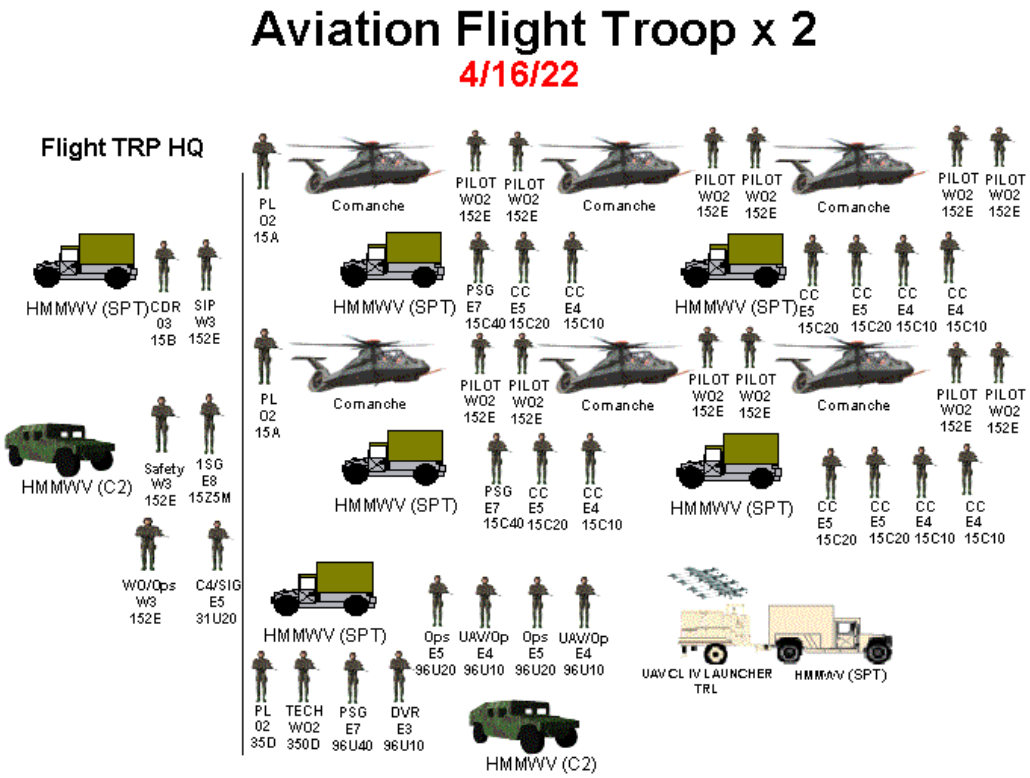


Figure 3-86 Aviation Flight Troop

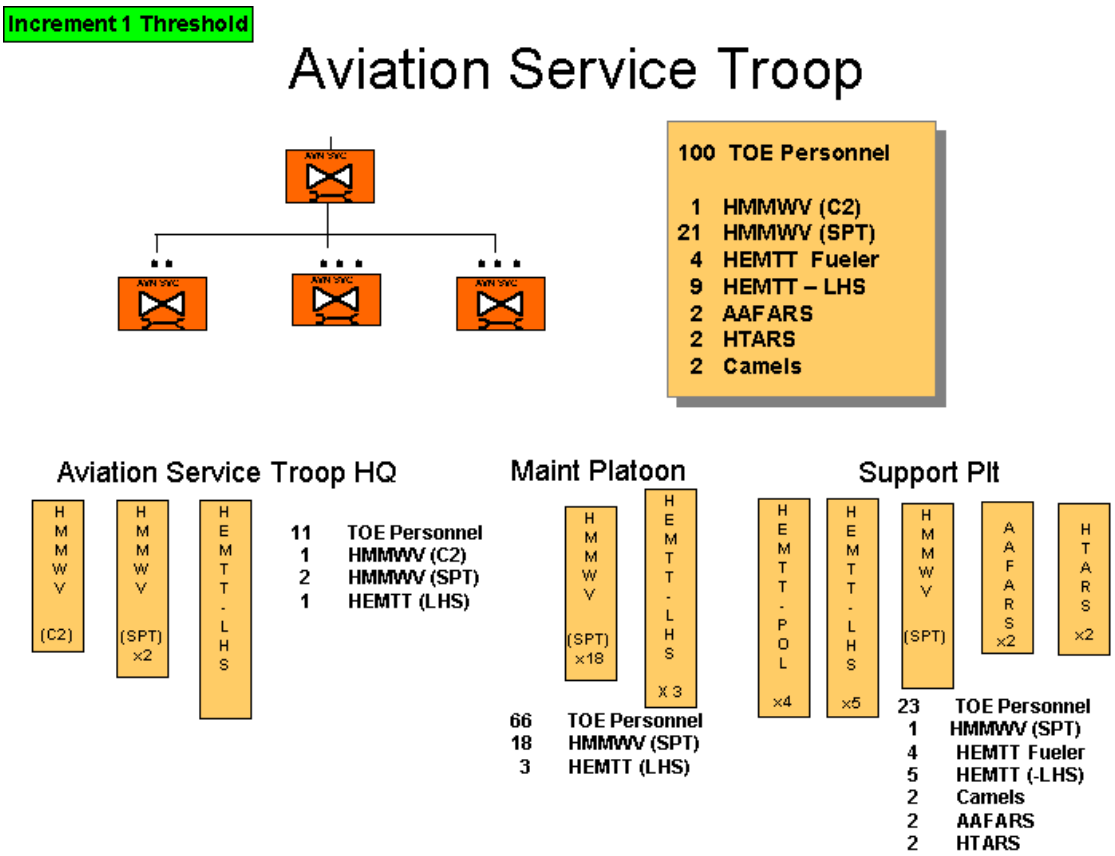


Figure 3-87 Aviation Service Troop

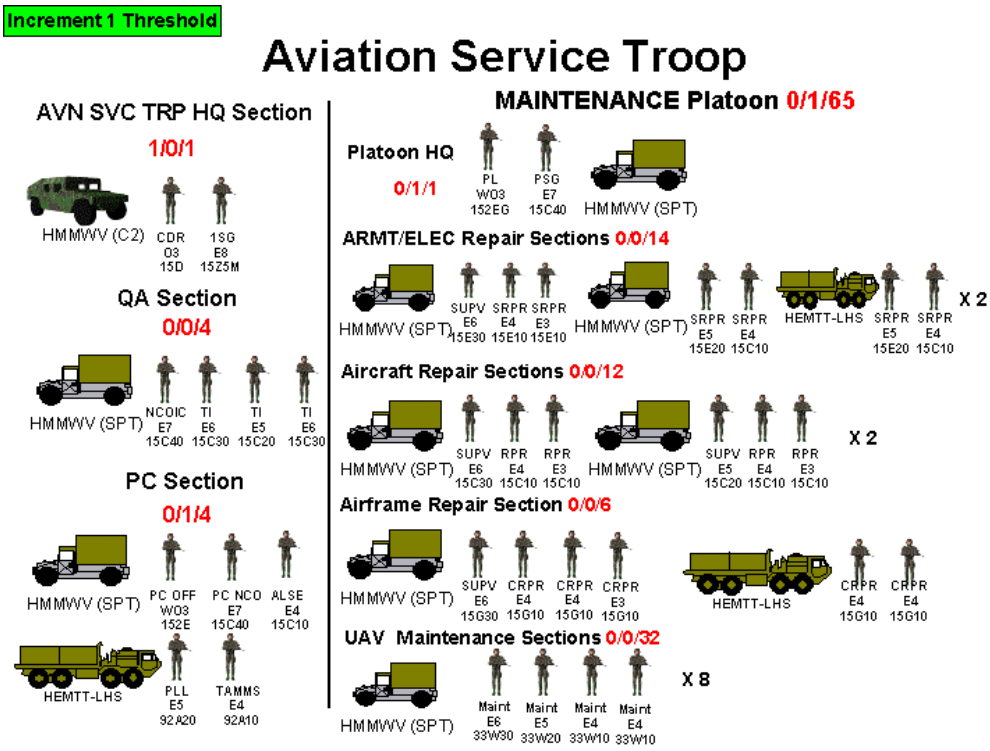


Figure 3-88 Aviation Service Troop

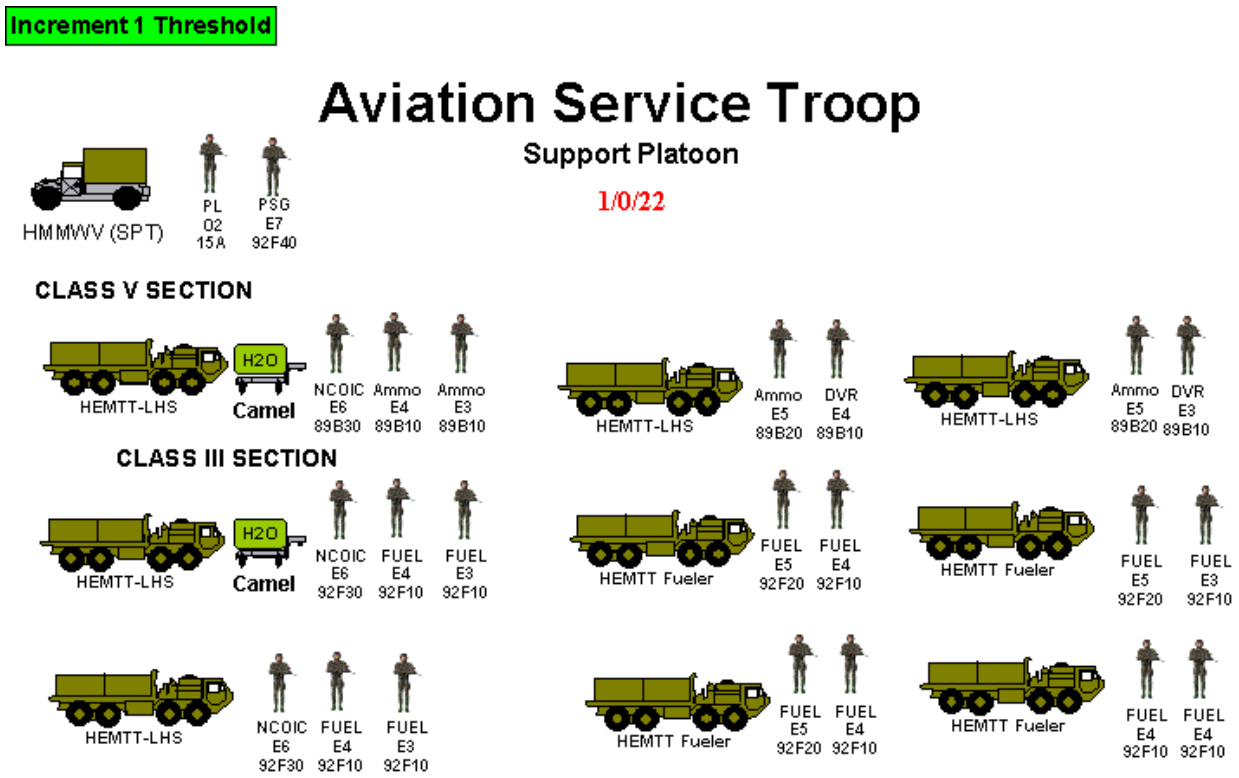
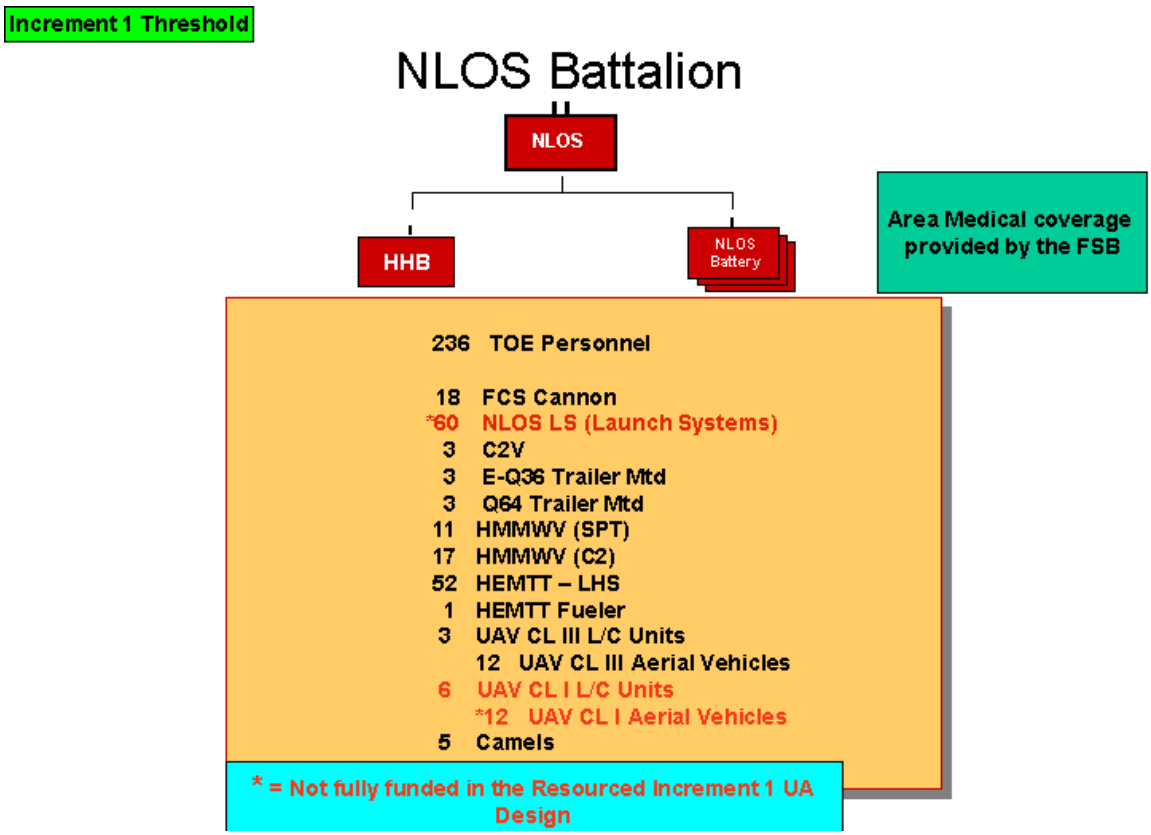


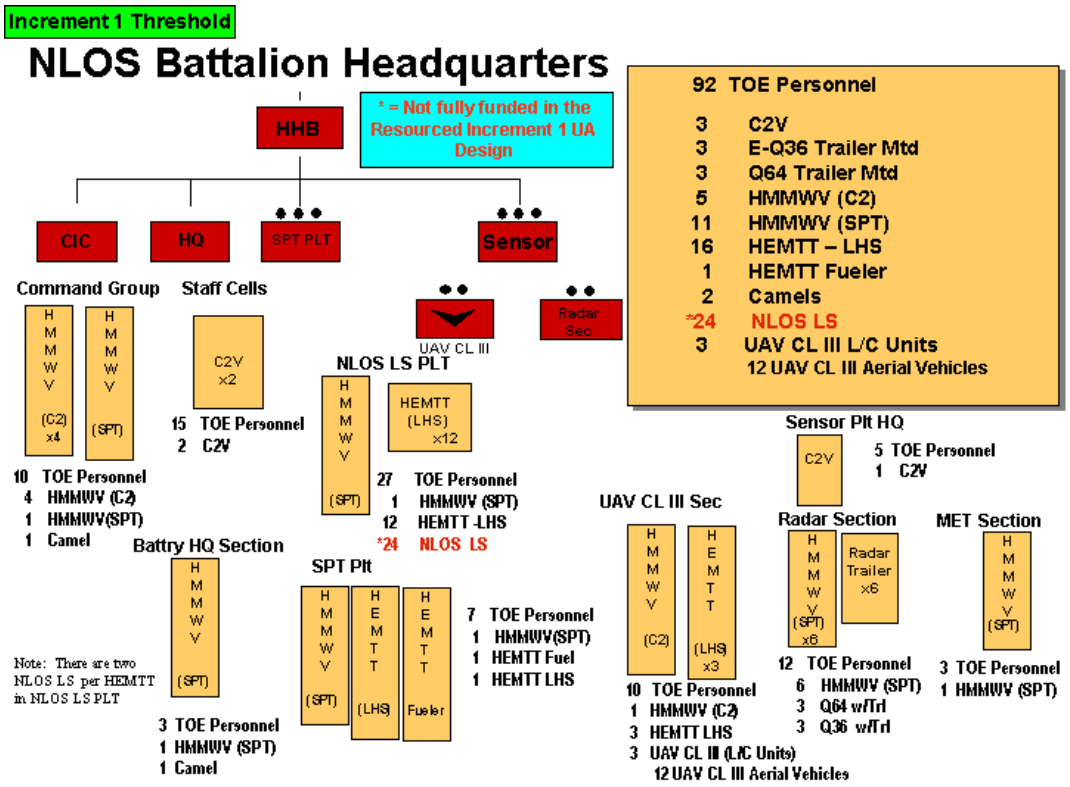
Figure 3-89 Aviation Service Troop

2085 **3.3.10 Non-Line of Sight (NLOS) Battalion**

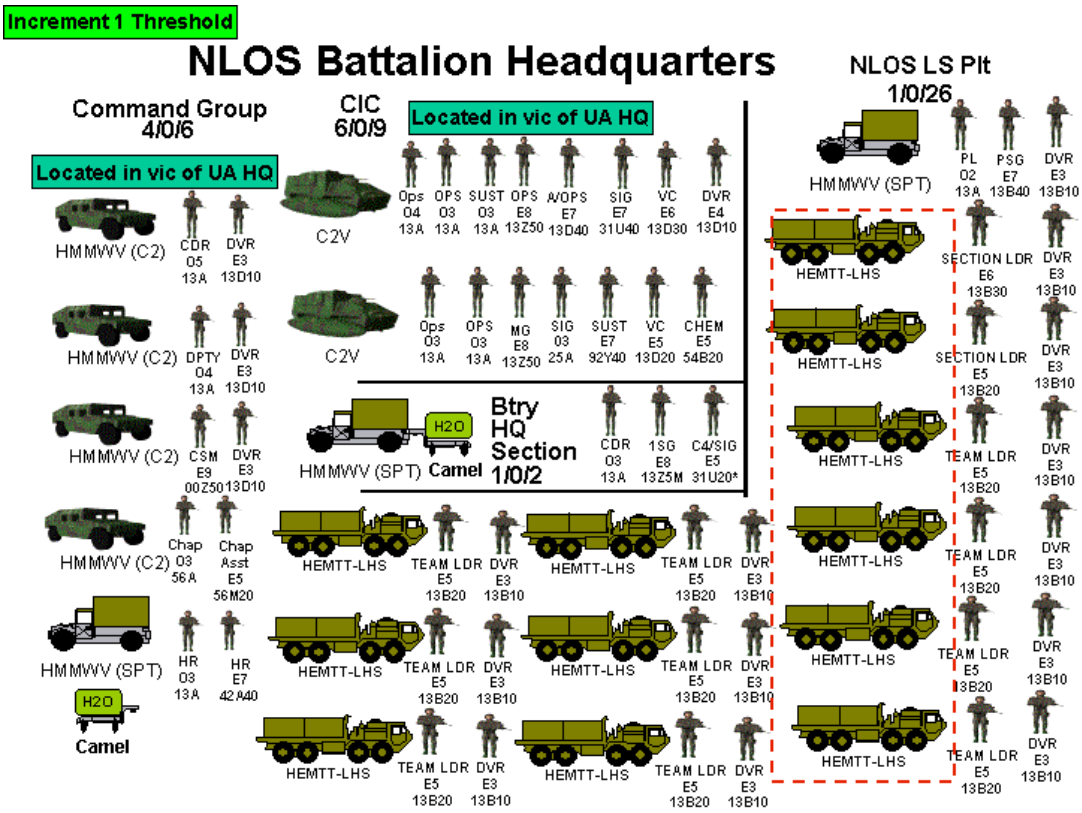


2086

2087 **Figure 3-90 NLOS Battalion**



2088
2089 **Figure 3-91 NLOS Battalion Headquarters**



2090
2091 **Figure 3-92 NLOS Battalion Headquarters**

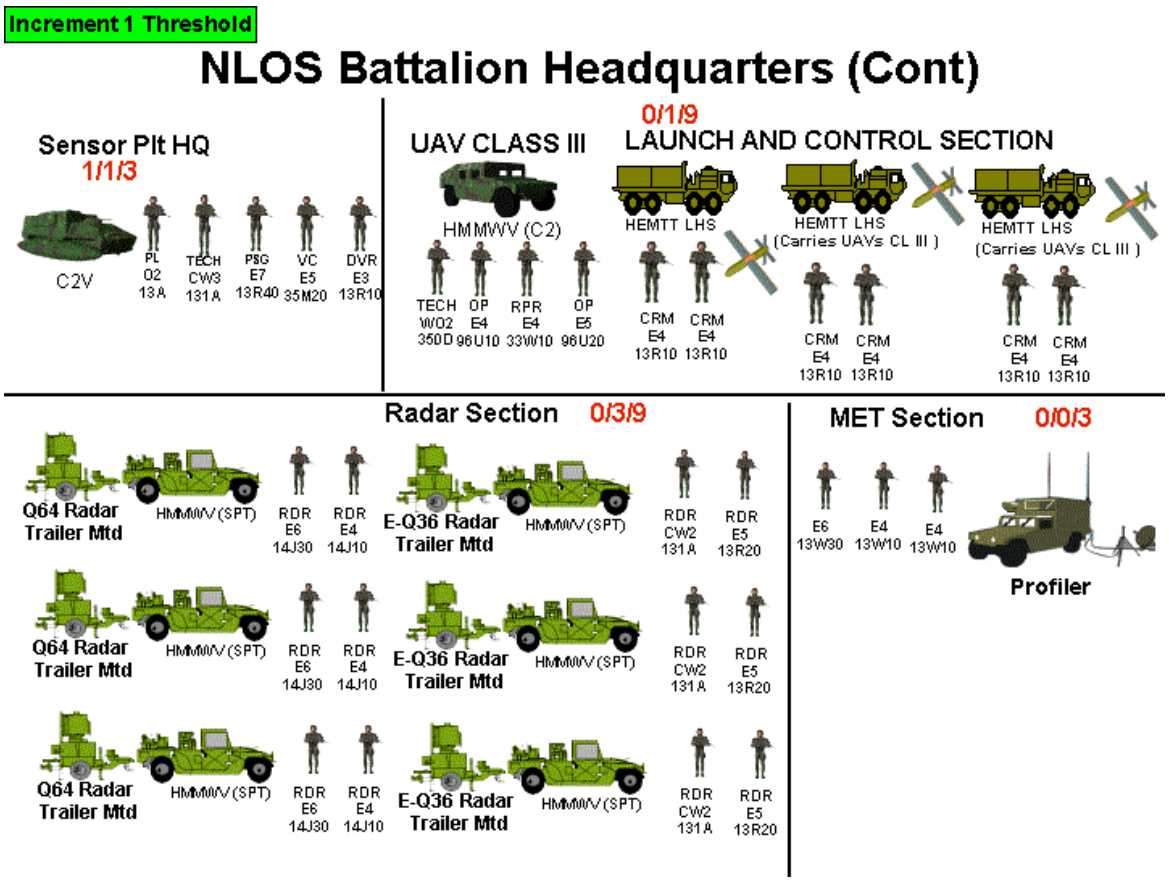


Figure 3-93 NLOS Battalion Headquarters

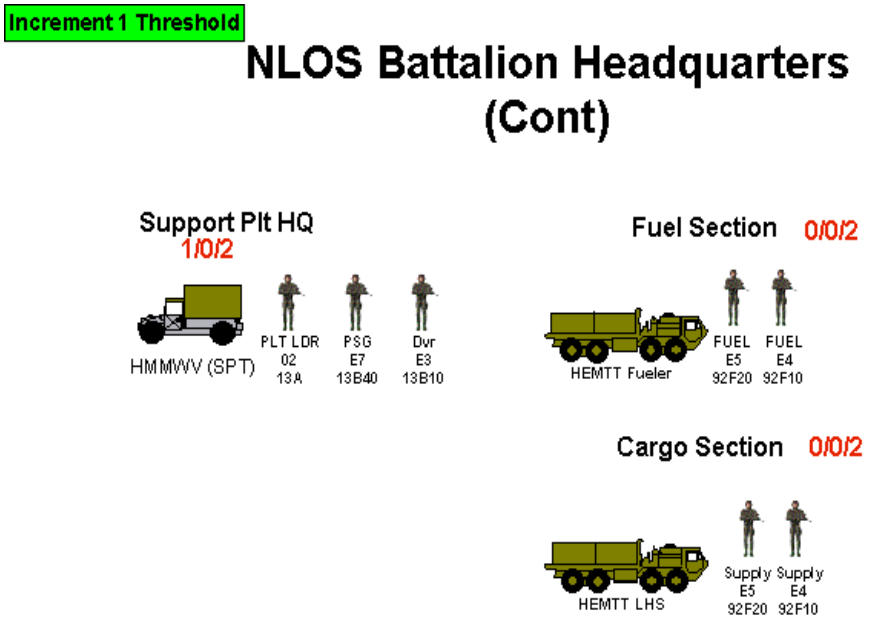
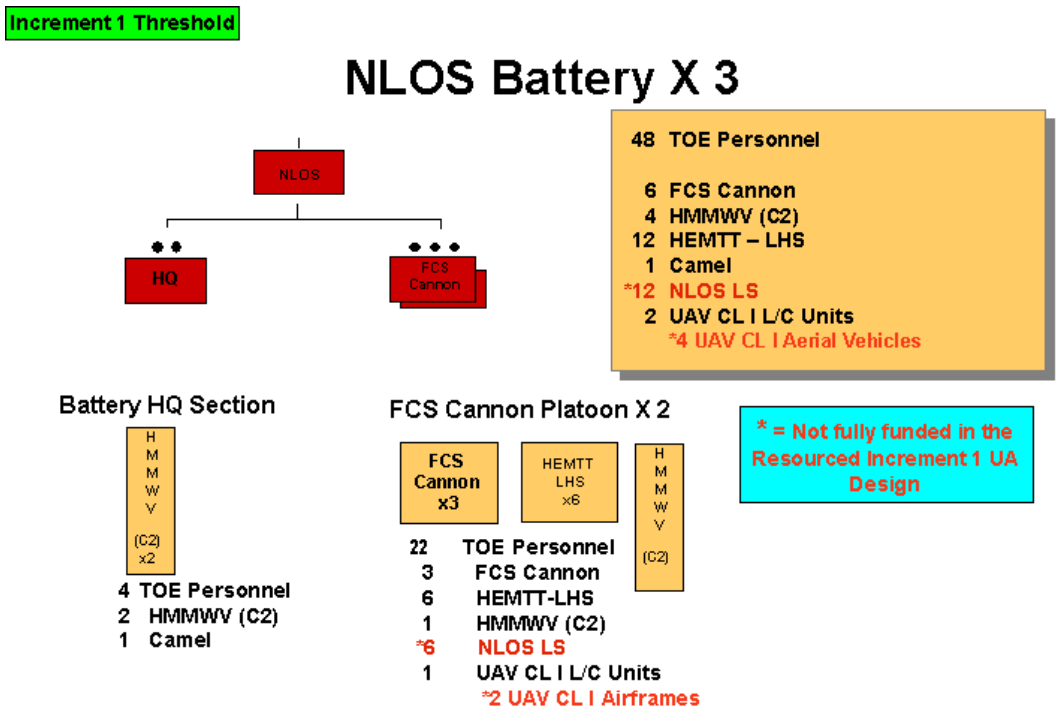
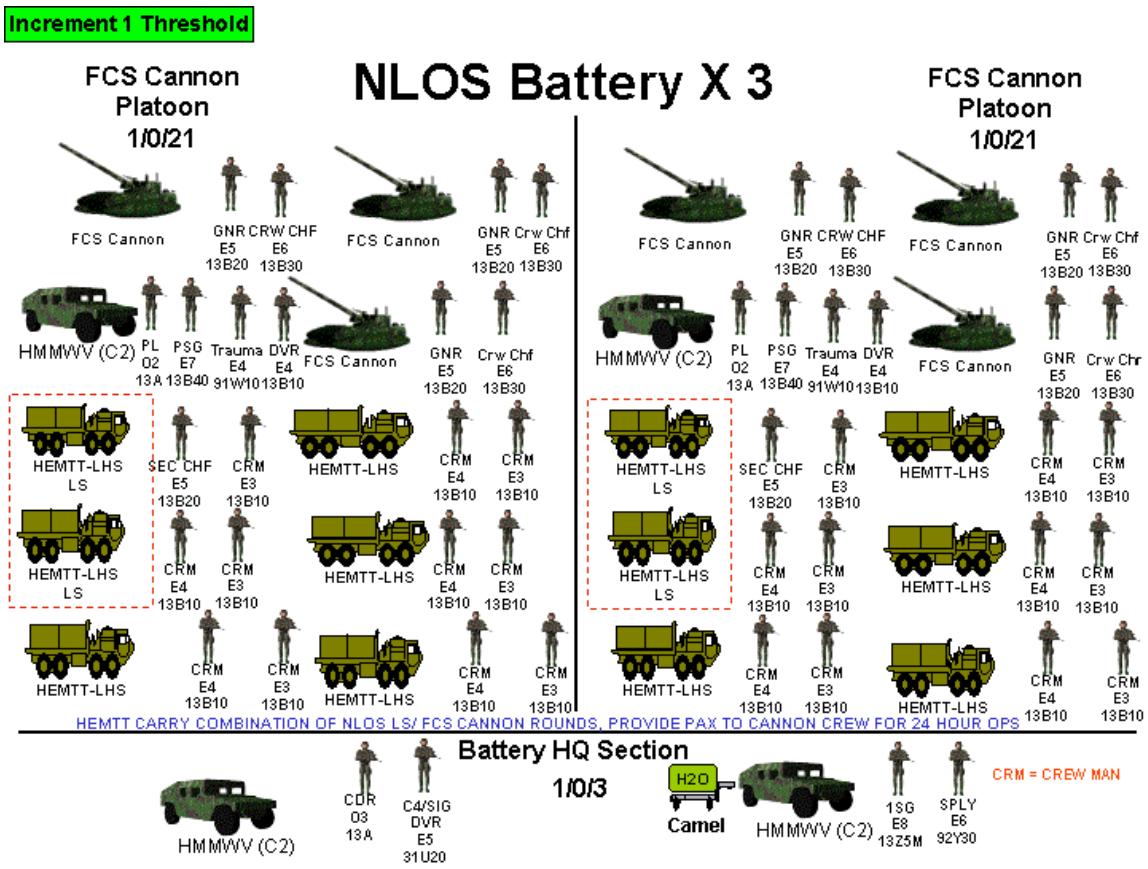


Figure 3-94 NLOS Battalion Headquarters



2096
2097 **Figure 3-95 NLOS Battery**



2098
2099 **Figure 3-96 NLOS Battery**

3.3.11 Forward Support Battalion (FSB)

Increment 1 Threshold

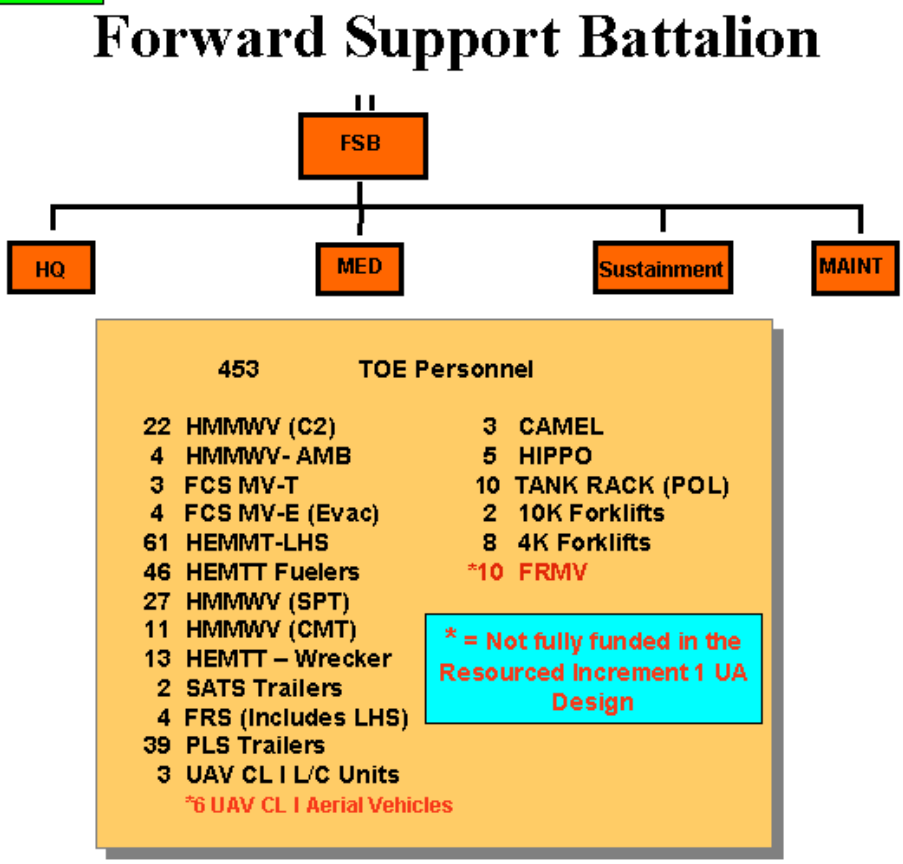


Figure 3-97 Forward Support Battalion Organization

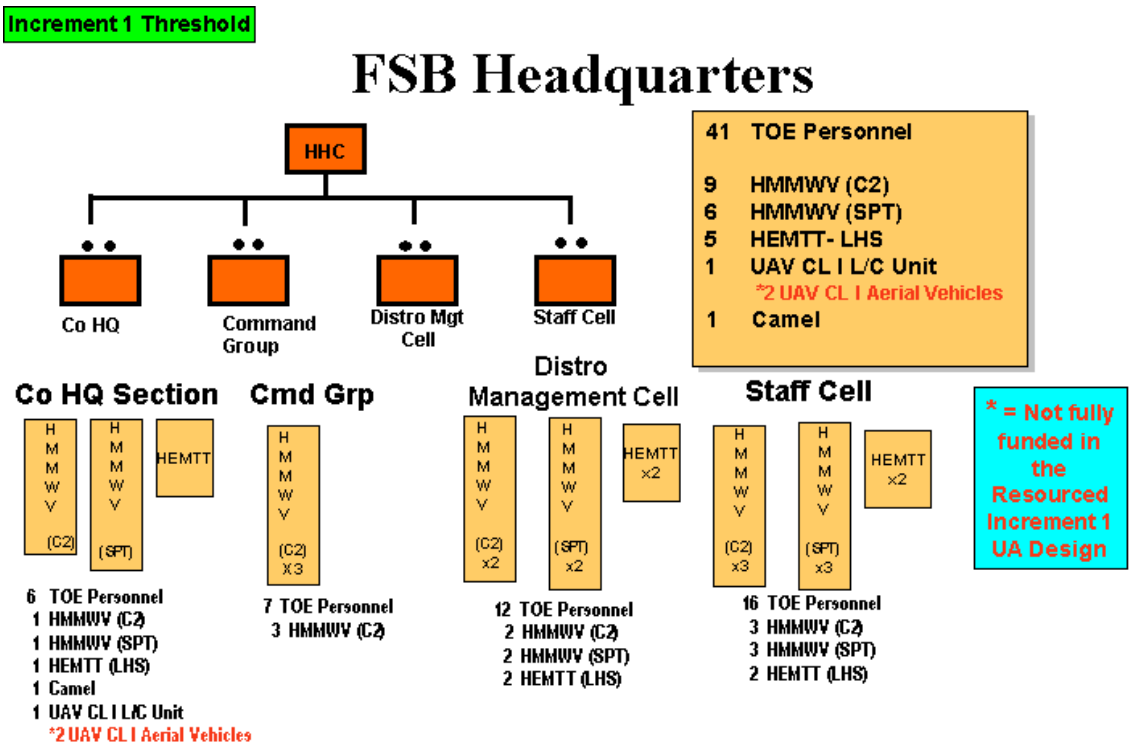


Figure 3-98 FSB Headquarters

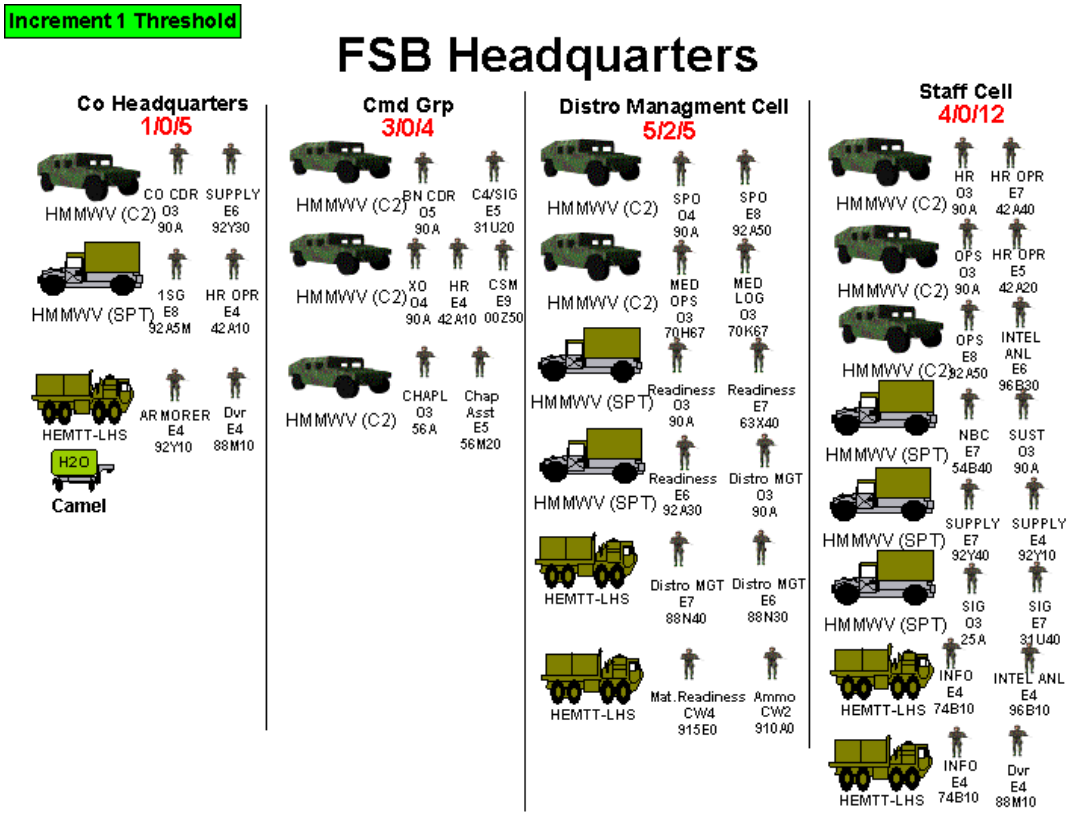
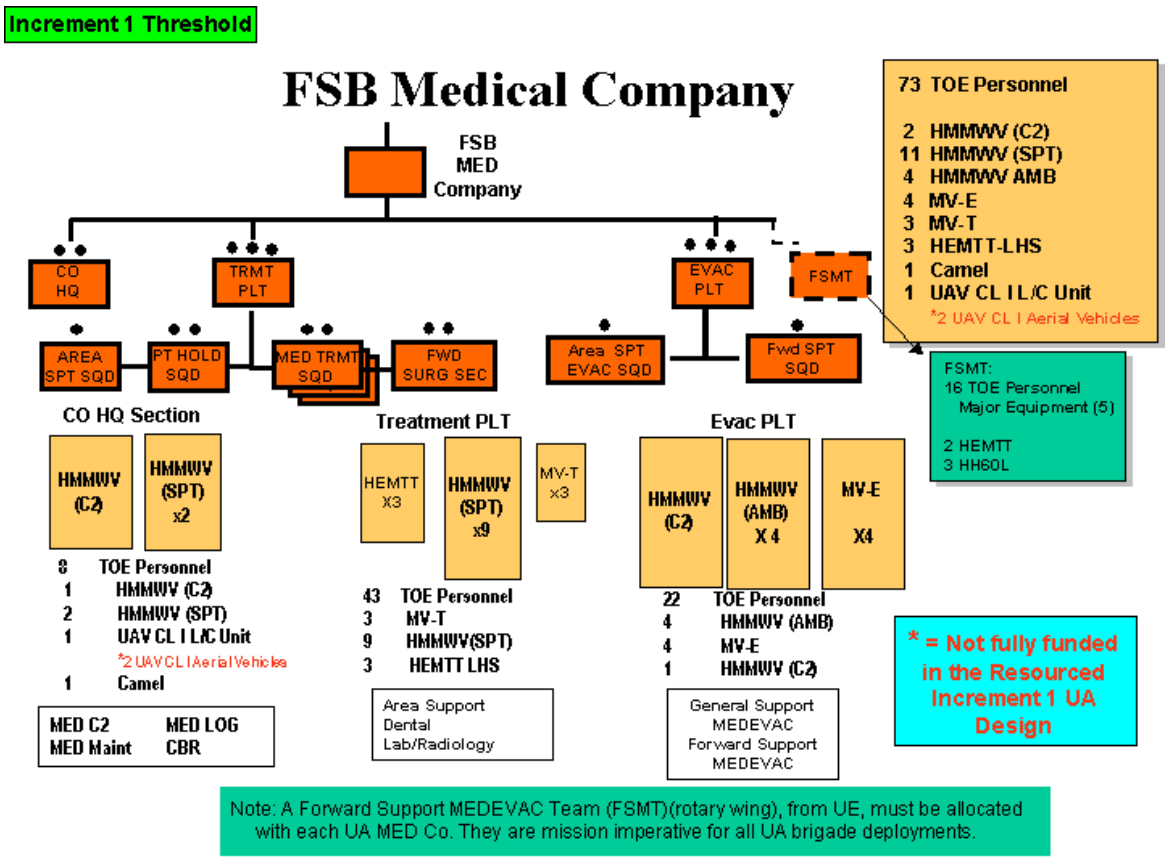
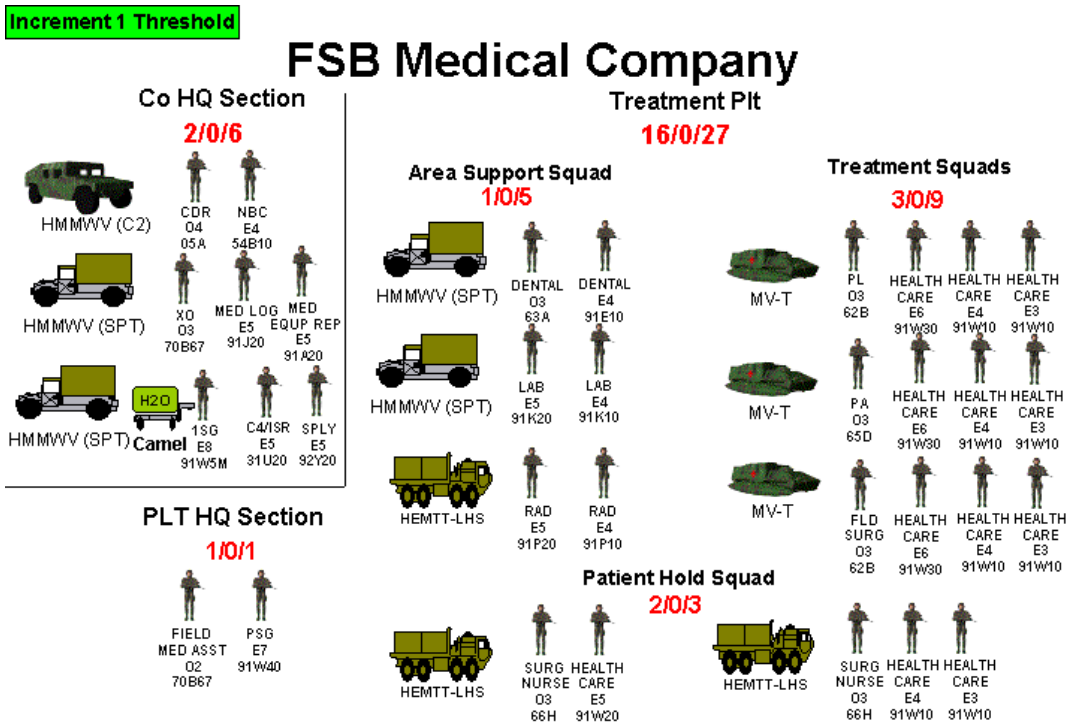


Figure 3-99 FSB Headquarters



2108
2109 **Figure 3-100 FSB Medical Company**



2110
2111 **Figure 3-101 FSB Medical Company**

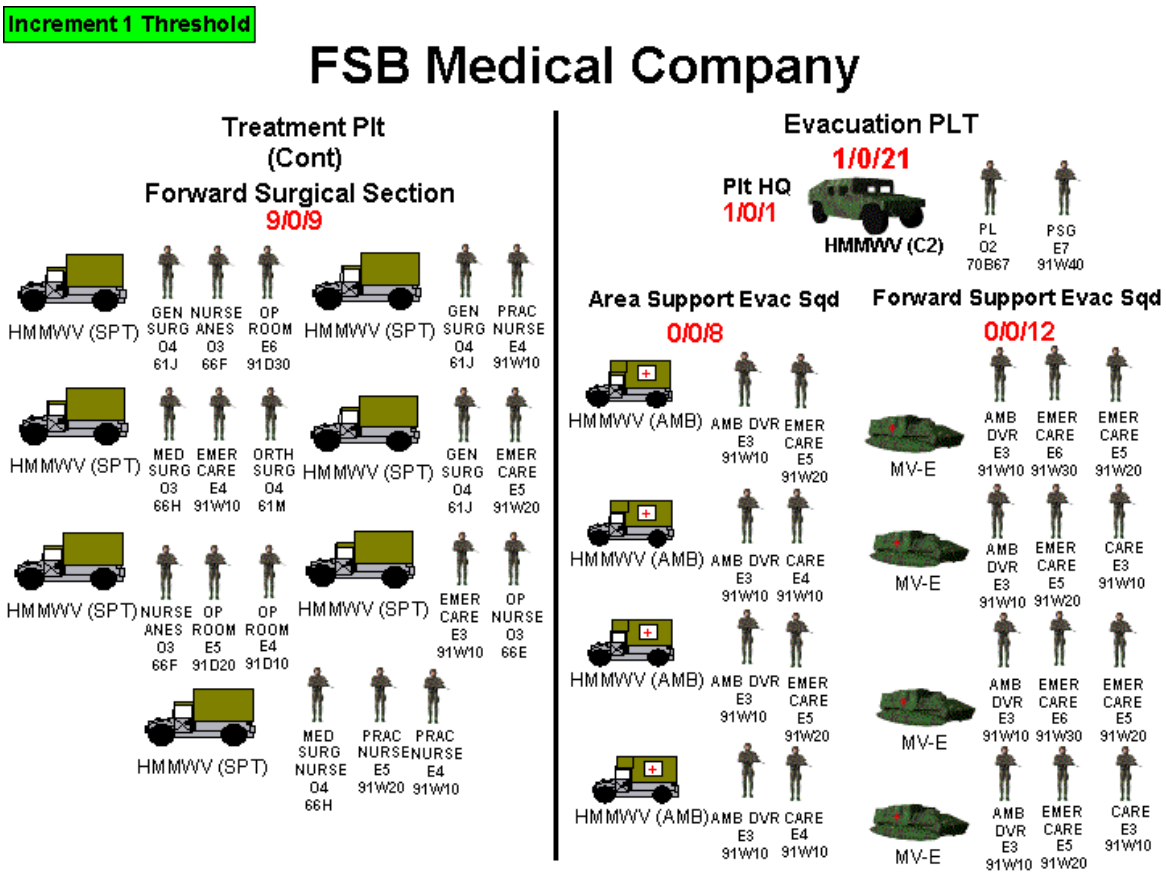


Figure 3-102 FSB Medical Company

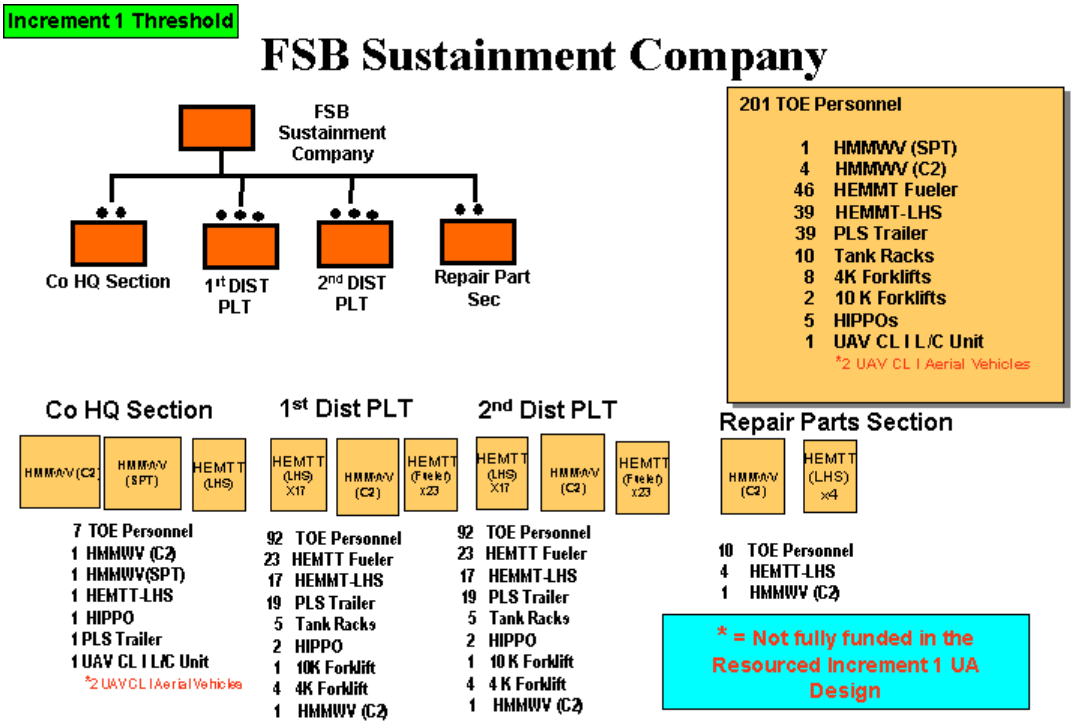


Figure 3-103 FSB Sustainment Company

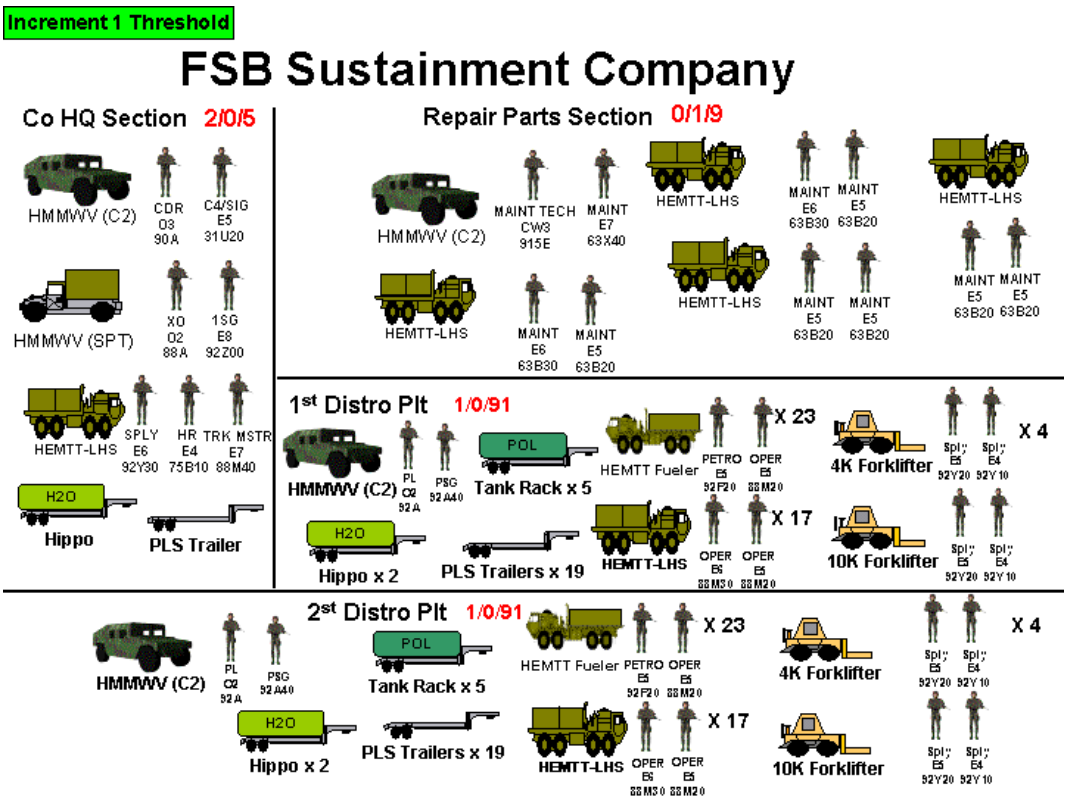


Figure 3-104 FSB Sustainment Company

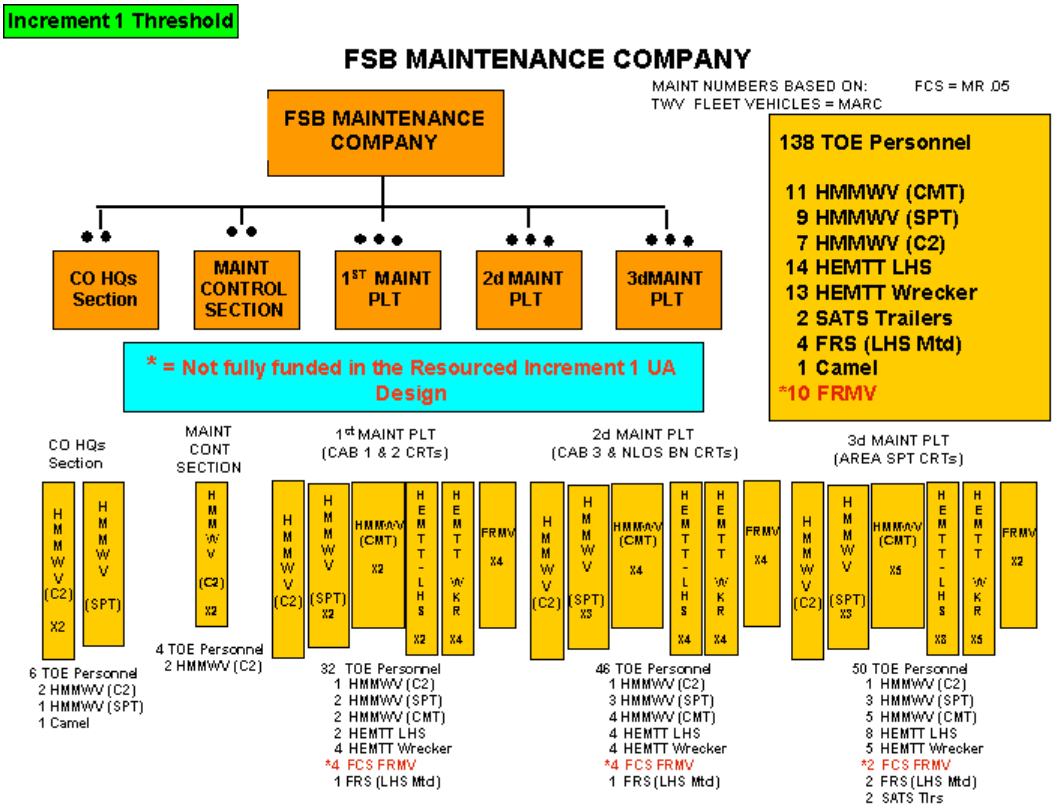


Figure 3-105 FSB Maintenance Company

Increment 1 Threshold

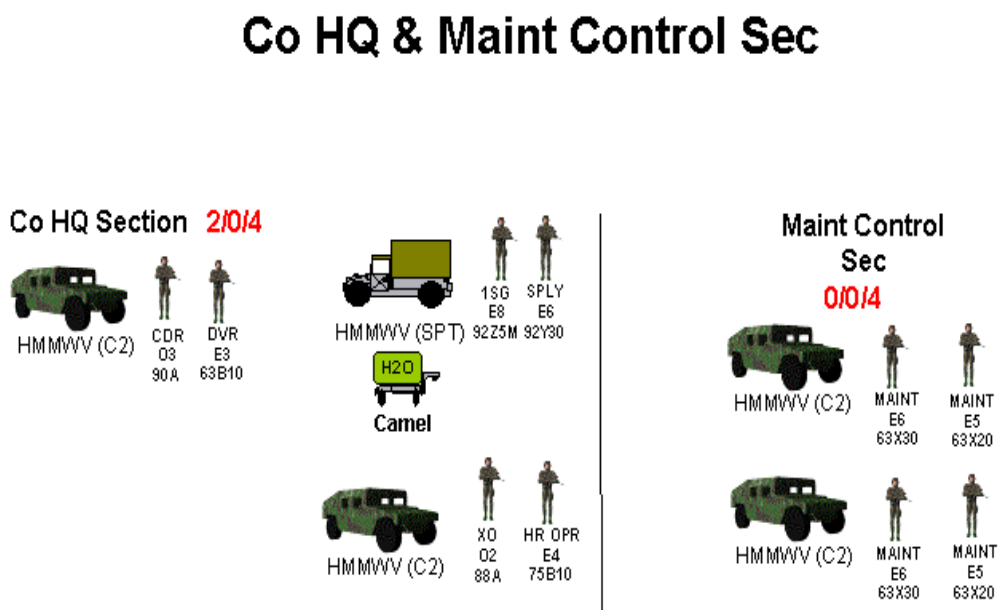


Figure 3-106 FSB Maintenance Company

Increment 1 Threshold

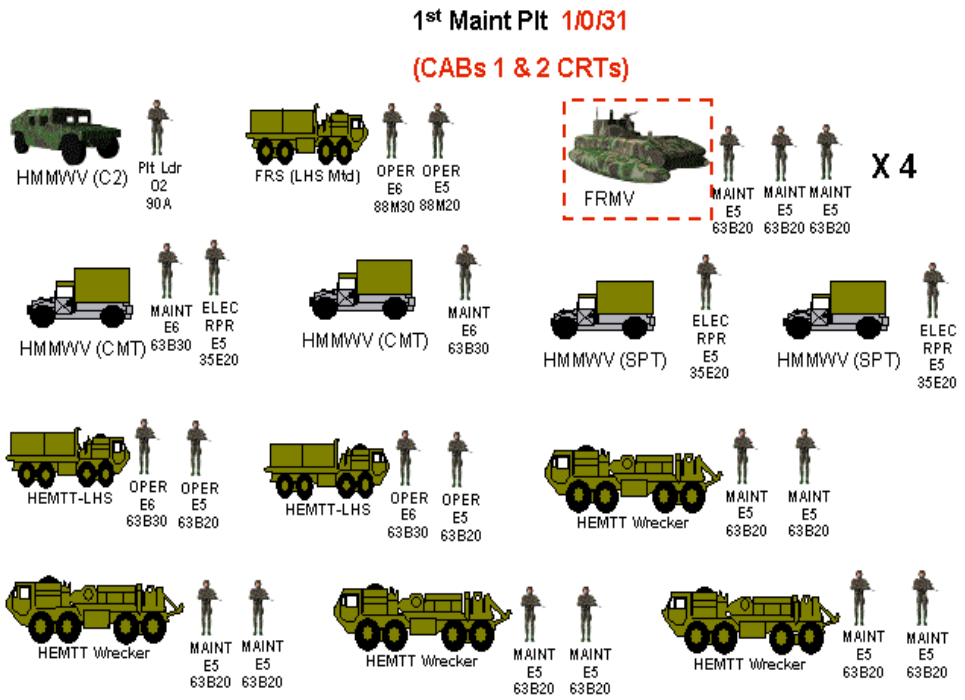


Figure 3-107 FSB Maintenance Company

Increment 1 Threshold

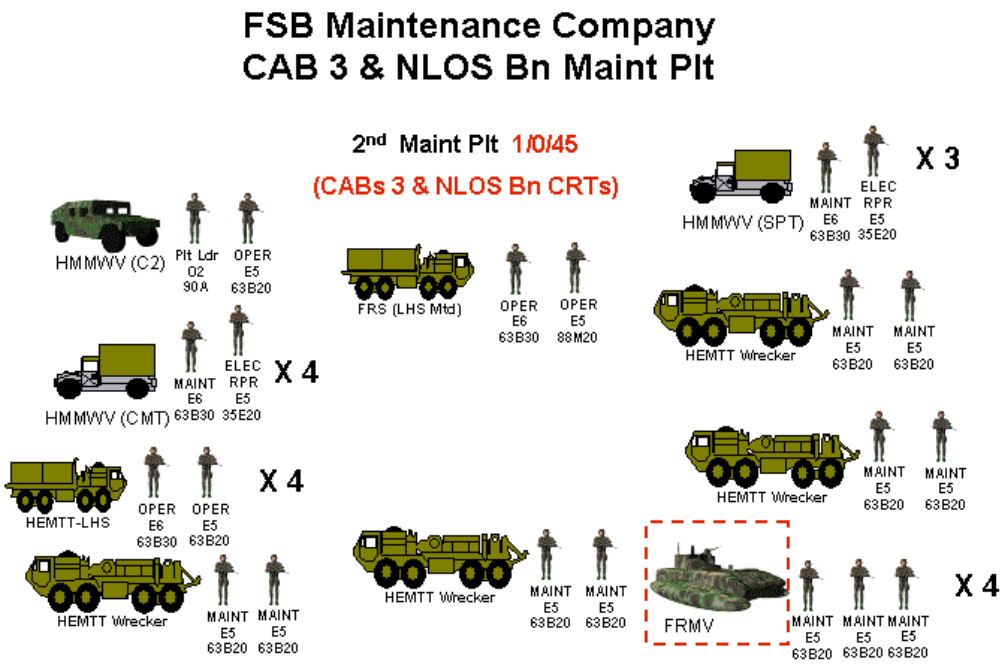


Figure 3-108 FSB Maintenance Company

Increment 1 Threshold

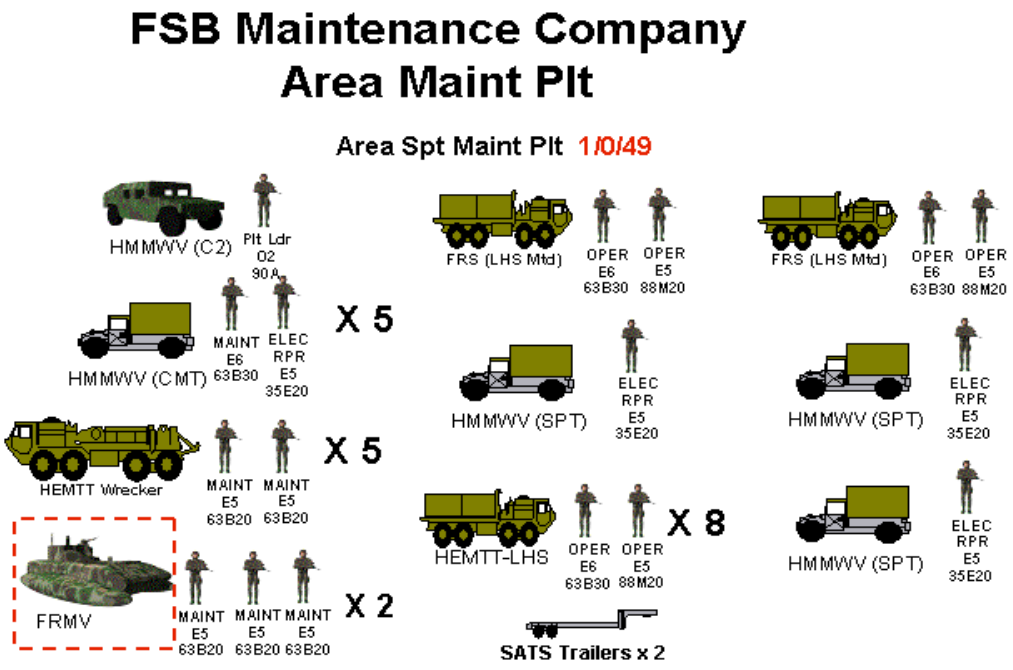


Figure 3-109 FSB Maintenance Company

CHAPTER 4 OPERATIONAL CONCEPT (HOW THE UNIT OF ACTION FIGHTS)

4.1 Introduction

4.1	Introduction
4.2	Quality of Firsts
4.3	Battlespace
4.4	How to Fight Framework
4.5	Deployability
4.6	Tactical Concepts
4.6.1	UJTL Crosswalk
4.6.2	Battle Command Concept
4.6.3	ISR Concept
4.6.4	Maneuver Concept
4.6.5	Fires Concept
4.6.6	Maneuver Support Concept
4.6.7	Maneuver Sustainment Concept

The Maneuver Unit of Action is not just a unique Brigade Combat Team, built around a Family of Systems (FoS), but a new concept for fighting those systems. It is optimized to develop the situation out of contact, throwing the enemy off balance by destroying his high payoff systems before forces are joined, and maneuver to a position of advantage. The UA sets the conditions and isolates enemy formations to enable it to close with and destroy the enemy at a time and place of its choosing. During contact, the UA continues to develop the situation integrating ISR, fires, and maneuver. The UA finishes engagements decisively with precision assaulting fires supporting mounted or dismounted assault.

Developing, fielding, and employing Units of Action will require interdependence among systems within the FCS UA, UE, and joint forces. Interdependence implies that FCS units must rely on external means-provided by other objective force and joint force capabilities-to accomplish their missions. Connectivity is an essential enabler of interdependence. The needed connectivity can be provided only with a complex set of interfaces, doctrines, operating concepts, processes, training, communications, etc.-that enable a true network environment within and beyond the UA. Such an environment will support the Joint Vision 2020 goal of achieving decision superiority based on shared situational awareness across all Joint force elements. Both effectiveness and survivability will depend on this connectivity. At the same time, this dependency can be used to drive joint standards and procedures to meet the demands of the dynamic nature of the ground combat. The speed and agility expected of FCS units will demand even more attention to this issue.

The UA is a network enabled force. It is equipped with a vast sensor array that permits leaders and commanders to achieve dramatic improvements in situational awareness. This significantly improved ability to collect and process information by employing organic sensors, as well as rapid access to information from UE and higher, will ensure commanders posses the timely, accurate intelligence necessary to achieve decision superiority. This decision superiority will permit the UA to maneuver forces and destroy enemy systems throughout its area of influence.

O&O CONCEPTUAL FRAMEWORK

ENTRY OPERATIONS

ACTIONS BEFORE FORCES ARE JOINED

- **Develops Situation Out of Contact**
- **Decides When and Where to Fight**
- **Sets the Conditions**
- **Maneuvers to Positions of Advantage**

ACTIONS DURING CONTACT

- **Initiates Decisive Combat at Chosen Time and Place**
- **Continues to Develop the Situation in Contact**
- **Continues to Integrate RSTA, Maneuver, Fires and the Network**

TACTICAL ASSUALT

- **Notion of Close Combat has Expanded**
- **Still Required to Close with and Destroy the Enemy through Assault**

TRANSITIONS TO THE NEXT ENGAGEMENT

Figure 4-1 Conceptual Framework

The UA employs irregular battlefield geometry to present the enemy with multiple dilemmas through the depth of his formations causing his defeat through disintegration or isolation of his formations, dislocation from key terrain and critical engagements, or outright destruction. The UA conducts force-oriented operations that depend on freedom of action, gaining or exercising the initiative and weakening enemy capabilities or units before accepting close combat. The UA conducts specific terrain-oriented operations to gain key terrain that allows the overlapping sensor coverage that is essential to isolating enemy formations.

In the offense, the UA has the inherent capability to gain positional advantage by ground and vertical maneuver to tactical or operational depth. This enables turning movements and both ground and aerial envelopments during ground maneuver. The UA has a much greater ability to move off the main route executing envelopments. The UA also has the ability, down to the company level, to conduct vertical maneuver to tactical depth accompanied by organic manned and unmanned platforms. UA infantry units conducting vertical maneuver arrive at the landing zone linked to the COP and networked fires with enhanced knowledge, survivability, and lethality.

The Common Operational Picture is a single fused picture containing timely information tailored by echelon. It includes information on terrain, weather, civilian, enemy, and friendly employment and helps the user draw implications collaboratively from this data.

In the defense, the UA is designed to alter the battlefield framework of close and deep fights. The UA has the mobility, sensor coverage, and precision fires to fight an area defense and begin destruction of an attacking enemy much further from its positions. The UA has an organic unmanned counter-reconnaissance capability with its unmanned ground and air systems and unattended ground sensors, again all linked to a COP. At battalion level, every CA Battalion has an organic Reconnaissance Troop. The embedded BLOS capability in every maneuver platoon coupled with a mortar battery with precision fire capabilities in every CA Battalion increase the lethality of UA subordinate units. This increases the ability of

CA Battalions to dominate their Area of Influence in the defense, without reliance on assets from higher headquarters.

This chapter describes the operational concepts for the new way of fighting. The underlying concept is the Quality of Firsts, around which UA tactics are formed. Next, is a discussion of how the UA fights described within a conceptual framework of actions before forces are joined, actions during contact, tactical assault, and transitions. This section is followed by the enabling tactical concepts that underpin the way the UA fights within the tactical constructs in the Universal Joint Task List (UJTL). For further clarification and continued combat development work, there are a series of six UA based vignettes in ANNEX F (Vignettes). The six vignettes illustrate the tactical concepts and crosswalk to required capabilities in the context of UA missions. ANNEX F also contains a detailed description of operational characteristics relating to the various terrain sets. The UA will fight a much more fluid battle moving dispersed on a non-contiguous battlefield. Leaders in the UA will be making decisions on the battlefield while physically separated from their parent unit. Chapter 5 addresses implications of these concepts in doctrine, training, and leader development.

4.2 Quality of Firsts

4.2	**Quality of Firsts**
4.2.1	**See First**
4.2.2	**Understand First**
4.2.3	**Act First**
4.2.4	**Finish Decisively**

Historically, uncertainty about enemy and friendly conditions on the battlefield often dictated cautious movements to contact. Forces lost both time and resources developing the situation while in contact, followed by the initiation of decisive action at a time and place which was not necessarily that of the commander's choosing. UA capabilities permit future commanders to develop the situation before making contact, maneuver to positions of advantage and, when ready, initiate decisive action by destroying enemy systems beyond the range of their weapons to set the conditions for decisive assault. The concept of the UA is more than providing advanced C4ISR to an organization.

To be effective across the full spectrum of operations against an adaptive, learning enemy in any terrain condition, the UA achieves greater empowerment in small unit tactical operations through improvements in:

- Developing the situation before forces are joined using organic R&S assets and UE/Joint space based sensors, coupled with analysis, to achieve the fidelity required to see, understand, and act first.
- Small units developing the situation in the terrain compartment they are in and adjacent terrain compartments to see first and prevent surprise.
- Leaders making decisions with the same level of understanding whether mounted, dismounted or En-route to the JOA.
- Knowing and using terrain and weather effects to a degree that significantly lessens the enemy's "home court" advantage.
- Achieving precision acquisition and assured lethality with a very high probability of hit and an equally high probability of kill both at tactical standoff and in close combat to defeat target sets in the FCS STAR.
- Joint interoperability from the ground up, from Joint communications to establishing sensor to shooter linkages across service lines.
- Establishing and maintaining assured mobility, creating a significant mobility differential relative to the adversary.
- Conducting organic, robust, all weather, reconnaissance and surveillance with wide area persistent staring capability.
- Achieving 3-D mutual support between units over watching each other while on the move, negating the need for close physical proximity to execute bounding overwatch or tactical maneuver.
- Planning collaboratively and rehearsing virtually while on the move to an objective even when on parallel axes.
- Transitioning from the current engagements directly into the next mission.
- Applying precision fire control and fire distribution at small unit level.
- Utilizing stand-off detection and neutralization of mines, booby traps, and CBRN threats.
- Integrating air-ground operations through a common operational picture that allows ground and air units to "see each other", controlling fires with much greater precision.
- Unprecedented reliability and availability of combat systems.
- Achieving reduced logistics footprint and personnel efficiencies through decreased demand for maintenance and supply.

- Conducting embedded individual and collective training capability that seamlessly links live, virtual, and constructive environments without external training devices.
- Employing greater precision and situational awareness, allowing assaulting fires on the move and change to 'danger close' parameters.

The UA has the wherewithal to develop the situation before, during, and after contact, affording leaders and soldiers' unprecedented situational dominance with revolutionary competencies and capabilities. The UA operates within a new tactical paradigm based upon the Quality of Firsts: the ability to See First, Understand First, Act First, and Finish Decisively.

4.2.1 See First

To **See First**, leaders see the battlespace in several ways. They see the parts, detecting, identifying, and tracking enemy forces while maintaining awareness of friendly and neutral elements. Leaders see indicators of emerging enemy patterns and intentions when UA sensors and analysis are applied through an R&S plan to collect critical information requirements. Additionally, UA leaders 'see' the environment, including the terrain, weather, and population implications affecting operations. The UA will use its organic ISR capabilities and its ability to access and fuse information from UE, Joint and National assets to see first with a much higher degree of fidelity than today.

Seeing First is not simply a technologically superior set of sensors. By applying UA sensor capabilities to a well thought out reconnaissance and surveillance plan, the UA will see directly or through indicators see enemy patterns and enemy high payoff targets. Commanders and leaders will understand the enemy's intent sufficiently to correctly project both his future actions and what we need to do to defeat those actions. High fidelity terrain knowledge is probably the most significant part of "Seeing First" that reduces the enemy's home court advantage. The UA has an inherent ability to see the environment. 3-D terrain data tools will allow small unit leaders to confirm cover and concealment from known enemy positions or conduct line of sight analysis prior to movement. By using 3-D digitized terrain leaders will quickly identify decisive terrain and a covered route to that terrain.

According to the Defense Intelligence Agency, given our national and joint assets, the UA will arrive in theater with somewhere between 50 percent fidelity of enemy locations in open rolling terrain to as low as 10 percent in a major urban area. Clearly, the percentage of seeing first will be different by type of terrain, but the embedded ISR assets at every echelon of the UA will quickly increase our knowledge of the enemy allowing us to develop the situation before contact. In open, rolling terrain, the embedded ISR assets will allow the UA to develop the situation on the move dispersed on parallel axes. In complex or urban terrain, this may require UA and combined arms battalion commanders to completely isolate an area and execute a deliberate reconnaissance prior to initiating contact. This tactical patience out of contact allows the UA to truly See First before decisive commitment and significantly reduces the potential for the enemy to gain tactical surprise. We will never completely eliminate tactical surprise at the squad and platoon level, but by seeing first, leaders will be aware of likely ambush locations and be able to position overwatch while moving through those areas.

The UA will be able to See First, even when the network is degraded. Each echelon of the UA is designed with organic sensors and shooters. By empowering small units to see first within their area of influence using organic assets, those small units can still operate on intent when the brigade network is degraded. The UA also must force the enemy to see last. This means executing an effective counter-reconnaissance effort. Counter-reconnaissance includes combining UA, UE, and JIM counter air capability to defeat enemy air and UAV threats. It also includes defeating his ground reconnaissance and Special Purpose Forces to cause the enemy to see last allowing the UA to stay inside the enemy's decision cycle. The UA is designed with organic UAVs at every echelon, and ground robotic vehicles organic to small units to provide 24/7 persistent surveillance and counter reconnaissance.

4.2.2 Understand First

To **Understand First**, leaders must understand the enemy's patterns. By filtering and fusing incoming information and data, we will see enemy patterns and options emerging. On-board fusion is a combination of automated and human analysis done as low as company level and some automated fusion down to platoon level. The information turns into intelligence, screened for source accuracy, duplication,

and timeliness. Leaders at all echelons will see emerging patterns in terms of tactical indicators gained from ISR, then assess what that information means, and make sound tactical decisions. The UA's ISR results are matched with data bases from the national, JTF and UE levels, and this processed data is available to commanders and leaders throughout the UA. To avoid information overload, the information on any COP can be scaled by echelon of command. This information availability creates an environment where not just the UA commander but small unit leaders will recognize tactical opportunities on the battlefield. UA leaders will anticipate likely enemy actions, and reactions to see the resulting tactical opportunities to allow acting first. By recognizing and acting on these tactical opportunities, small units can use initiative to take actions that potentially yield operational or even strategic results against enemy centers of gravity, decisive points, and vulnerabilities.

Understanding' prior to contact is more than applying long range fires to achieve tactical decision. Adaptive enemies have found ways to survive the massive application of firepower. The UA is able to empower 'understanding' before, during, and after tactical engagements to apply fires, fully integrated with maneuver, to achieve a tactical decision. Understanding first allows leaders to focus on profitable fights: to decide and act when and where it affords the best tactical advantage. Beyond understanding first, leaders simultaneously force the enemy to understand last. This is achieved by using techniques such as counter-reconnaissance, deception, pattern avoidance, and irregular battlefield geometry.

4.2.3 Act First

Seeing and understanding—a continuous process — enables the UA to **Act First**. Through mastery of movement techniques, mutual support, fire and maneuver, control and distribution of fires, integrating combat power, assault, and transition, small unit leaders execute with speed, agility, and initiative. The UA organization is built around excellence in small unit operations, armed with information dominance, and we create conditions that allow leaders down to squad level to act on intent as never before.

In the past, we taught leaders to accumulate an overwhelming correlation of force prior to acting. In the UA, leaders can attack at an overall force correlation as low as 1:1 because of its ability to isolate and destroy enemy forces piecemeal. They will achieve this through an overwhelming dominance of situational awareness allowing the UA to shape the battlespace to set the desired conditions for close assault. Through enhanced mobility the UA can also Act First to seize fleeting tactical opportunities like seams in the enemy defenses or destruction of an enemy HPT.

4.2.4 Finish Decisively

Finally, the UA **can Finish Decisively** by controlling the tempo of operations and denying the enemy freedom of action. The UA can maneuver, employ fires, and transition formations seamlessly while in contact. By understanding enemy patterns, identifying his deviations, and projecting his intentions, the UA can use precision maneuver to occupy or control positions of advantage at the tactical level. At the theater level, the joint force commander can employ UAs to achieve positions of advantage through envelopment to operational depth. This can render certain enemy forces positionally irrelevant so they can never affect the battle while closing with and destroying other enemy forces. The effect of using positions of advantage to isolate and destroy enemy forces piecemeal is to cause their operational defeat through their tactical disintegration, dislocation from key terrain and critical engagements, or outright destruction.

The requirement to close with the enemy will not change. The UA is capable of much more effectively setting the conditions to close with and destroy enemy forces. Prior to assaulting, the UA deliberately sets the conditions across the area of influence by:

- Completely isolating the objective so enemy positions cannot mutually support or reinforce each other.
- Destroying enemy rocket, artillery, air and missiles with attack and active defense, and destroy other combat systems which can support the objective or affect our seizing of a foothold.
- Achieving overlapping sensor coverage of the objective through precise battlefield positioning.
- Employing suppressive, obscuration, and lethal fires to allow its infantry to seize a foothold.

- Employing non-lethal area effects to incapacitate or displace enemy mixed with non-combatants.
- Closing with the enemy using precision maneuver and advanced tactical mobility to avoid being trapped in enemy kill zones near the objective.
- Supporting dismounted infantry assaults by mounted systems at standoff ranges ready with established sensor-to-shooter linkages.
- Providing infantry soldiers in the UA with full situational awareness, significantly greater lethality and precision fire control.

Finishing decisively also requires the capability to rapidly exploit success. The UA follows through the assault without tactical pause to complete the enemy's destruction by exploitation and pursuit.

4.3 Battlespace

4.3	**Battlespace**
4.3.1	**Area of Operations**
4.3.2	**Area of Influence**
4.3.3	**Area of Interest**
4.3.4	**Graphical Control Measures**

Battlespace is the environment, factors, and conditions commanders must understand to successfully apply combat power, protect the force, or to complete the mission. Battlespace includes the air, land, sea, space, enemy and friendly forces, facilities, weather, terrain, the electromagnetic spectrum, and the information environment within the operational areas and areas of interest. Battlespace is conceptual; higher commanders do not assign it. Commanders determine their battlespace based on their concept of operations. Battlespace is not synonymous with Area of Operations (AO). Because battlespace is conceptual, Army forces conduct operations only within that portion of it delineated by their AO. Battlespace has an associated area of influence and area of interest.

The UA can dominate a significantly larger AO than current forces. Because the UA will have both sensors and shooters organic to every level, it can isolate enemy forces within larger geographic areas. The UA can destroy enemy HPTs with precision fires over a much larger area of influence. Dominating an area means being able to isolate enemy forces from mutual support, reinforcements or resupply. In addition to isolation of enemy forces, the UA dominates an area by posing dilemmas to the enemy commander throughout the depth of his battlespace. Isolation of enemy forces does not imply bypassing large enemy formations and leaving those forces on the UA's lines of advance. Rather, it is the ability to use positional advantage and precision standoff engagement to completely fix those enemy formations so they can't move or fight without being destroyed. Our doctrine today includes maintaining contact with bypassed forces for turnover to follow-on forces. The greater sensor and weapons coverage of UA units will necessitate fewer forces tied to overwatch of these isolated enemy forces.

4.3.1 Area of Operations

An Area of Operations is an operational area defined by the joint force commander for land and naval forces. Areas of operation do not typically encompass the entire operational area of the joint force commander, but should be large enough for component commanders to accomplish their missions and protect their forces. For Army forces, it's a geographical area, including the airspace above, usually defined by lateral, forward, and rear boundaries assigned to a commander, by a higher commander, in which he has responsibility and the authority to conduct military operations.

AOs should be large enough for component commanders to employ their organic, assigned, and supporting systems to the limits of their capabilities. The extent of subordinate units' ability to control areas normally guides higher commanders in assigning subordinate AOs. Thus an AO assigned to a unit should never exceed its feasible area of influence. Commanders will typically subdivide some or all of their AO by assigning AOs to their subordinate units. The subordinate unit AOs may be contiguous or noncontiguous. Contiguous AOs are separated by a boundary. When the AOs are noncontiguous, the higher headquarters is responsible for the areas between noncontiguous AOs.

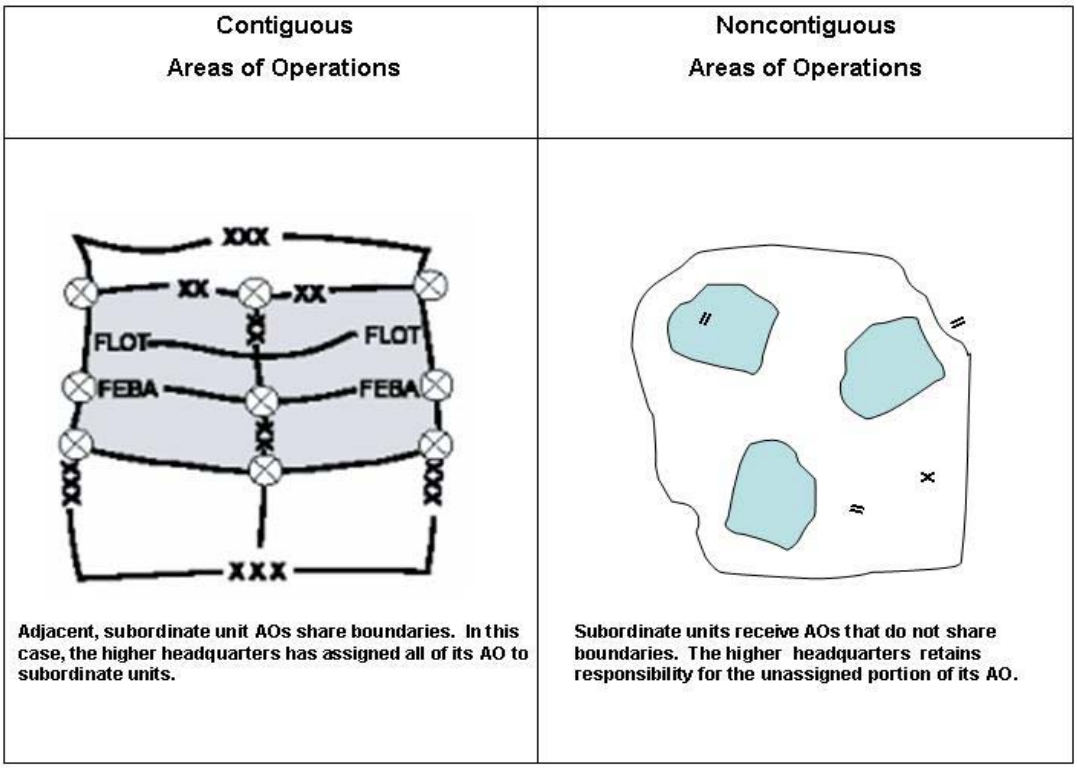


Figure 4-2 Areas of Operations

4.3.2 Area of Influence

An Area of Influence (AI) is a geographical area wherein a commander (or leader) is directly capable of influencing operations by maneuver or fire support systems normally under his command or control. It includes both organic and supporting combat power or effects within an element's battlespace, to include Army, Joint, multinational, or interagency assets. An area of influence surrounds and includes the associated area of operations; the area of operations will always be less than or equal to the area of influence. When assigned, it must be large enough for UA commanders to employ organic, assigned, and supporting systems to the limits of their capabilities.

The AO of the UA will often be significantly larger than that of a brigade today. Based on the organic sensors and fire systems at each level of the UA, a general guide on the area of influence for each unit would be no greater than the radii shown in the table below. It could be significantly less in complex or urban terrain, or through degradation of sensor systems due to the effects of weather.

Element	Area Influence
Platoon	8 km radius
Company	16 km radius
Battalion	30 km radius
Brigade	75 km radius

Figure 4-3 Unit of Action Area of Influence

4.3.3 Area of Interest

An Area of Interest (AoI) is an area of concern to the commander, including the area of influence, adjacent areas, and areas extending into enemy territory to the objectives of current or planned operations. It is a geographical area from which information and intelligence are required to execute successful tactical operations and to plan for future operations. It includes any threat forces or characteristics of the battlefield environment that will significantly influence accomplishment of the command's mission within its battlespace. The area of interest of a unit will generally correspond to the area of influence of the headquarters one level up. For example, a company commander will have an area of interest about the size of his battalion's area of influence.

4.3.4 Graphical Control Measures

In the UA, the use of graphical control measures to direct and control operations will be different. Some graphical control measures like boundaries will remain, but may be used differently. For instance, the definition of a boundary today includes a provision that a unit may fire direct fires across a boundary at a positively identified enemy. Indirect fires must be cleared through the unit in whose AO the fires will fall. In a non-contiguous battlespace today, the unit which owns the "gray" areas is the common higher headquarters. Thus, to fire into a "gray" a unit must clear those fires with its higher headquarters to ensure there are no friendly units (communications relay teams, SOF etc.) in that area. In the UA, the COP wil provide visibility of those type of units so the definition of a boundary may include the authorization to fire NLOS or BLOS (a direct fire solution) into an area outside a unit's AO.

Other graphical control measures like restrictive movement graphics (direction of attack) will be replaced with more flexible small unit areas of operations, defined by boundaries. These less restrictive measures allow small units to take advantage of the UA's ability to find and use the route with the best cover. We use restrictive control measures today, generally so we can deconflict maneuver and fires. The common situational awareness on the COP will provide the UA with less restrictive ways to deconflict fires and maneuver.

4.4 How to Fight Framework

4.4	How to Fight Framework
4.4.1	Entry Operations
4.4.2	Actions Before Forces are Joined
4.4.3	Actions During Contact
4.4.4	Tactical Assault
4.4.5	Transitions

The Army's mission is and will remain to fight and win our Nation's wars through decisive combat. Ultimately, those decisive operations require tactical success in close combat: the capability to seize and control key terrain, and the ability to close with and destroy enemy forces.

The UA concept is not just advanced technology, but a different way to fight. The UA executes decisive combat operations by denying the enemy freedom of action and destroying him through simultaneous, rapid and violent actions. Future engagements will be characterized by new tactical principles based upon developing the situation out of contact and the balanced combination of standoff capabilities, skillful maneuver, and tactical assault to achieve simultaneous decisions at multiple locations. The UA directs the continuous synchronization of powerful small tactical units moving along multiple, non-contiguous axes of advance. The following sections describe how the UA fights using the conceptual framework of entry operations, actions before forces are joined, actions during contact, the tactical assault, and transitions.

4.4.1 Entry Operations

Upon alert of a potential deployment, the UA Commander has access to immediate SA through his Home Station Operations Center (HSOC), linked to the gaining or Joint Headquarters. This provides him the ability to:

- Collaborate with other commanders.
- Ability to virtually access key members of the staff.
- Begin receiving information directly from the JOA.

Army installations are strategic platforms for global operations. Installation HSOC facilities will enable distributed information sharing among the sustaining base and deployed forces during all phases of an operation. Before deployment, these fixed facilities can collect and process large volumes of data, such as terrain mapping and common databases, that must be pre-loaded down to platform level prior to deployment.

The Increment 1 (Objective) UA is designed to be capable of deploying a credible force within 96 hours anywhere in the world and begin operations upon arrival. It is optimized for intra-theater maneuver by road, rail, air or sea. The UA exploits all military and commercial strategic lift to arrive in theater ready to fight, fully synchronized with other elements of the joint force. Future Advanced Airlift and high speed shallow draft sealift capabilities will reduce reliance on improved airfields and seaports and permit multiple entry points at austere locations. With the proliferation of airfields throughout the world of at least 5000 feet, the options for entry and the corresponding difficulty of defending them all significantly increase the JTF or UE Commander's ability to find an operational "opening" within the theater. Along with mission tailored UE maneuver AMD augmentation, this helps counter the growing trend in anti-access investments by potential threats. This concept is designed to give the Joint Force Commander a broad range of employment options.

The FCS Family of Systems is designed to rapidly load onto fast air and sealift. Completely loaded, the Increment 1 Objective UA weighs under 11,000 short tons, compared to 23,000 short tons for a Heavy Brigade Combat Team. There is also a significant savings in cargo space required to deploy the force (116,000 cubic feet for the UA compared to 438,000 cubic feet for a current heavy brigade combat team). This greatly decreased space, cube and weight allows the combatant commander to generate immediate combat power by rapidly deploying forces that arrive in the battlespace much more quickly.

The UA deploys with greater precision relying upon accurate, complete, and timely deployment information assured through persistent space-based communications. It is also contingent upon stowing and packaging for unit discharge and inter-modal delivery platforms for accompanying sustainment and unit equipment. The UA's ability to rapidly deploy on strategic and operational lift, coupled with rapid discharge of ready-to-fight units, enables operational maneuver from strategic distance.

The FCS vehicles within the UA arrive in an Essential Combat Configuration. On arrival at the point of entry, the UA is designed to execute up to a 400 km operational maneuver by road, rail, air, or sea and fight for the remainder of 72 hours of high intensity combat at the end of that move without resupply. Sub-units are ready to fight on arrival as coherent combined arms teams with all crews, squads, and fighting or turret loads accompanying them in the same sorties. The UA deploys into the JOA with a significantly increased situational awareness, updated continuously while en-route. This is normally enabled by the prior introduction of Special Operations Forces, collection by National and theater assets, UE/JTF assets (air and missile defense, etc.), and the establishment of the JTF communications network. The UA is continuously linked to the JTF (or UE) communications network from Home Station, while en-route, and on arrival. The UA has the ability to develop and maintain situational awareness, plan, and rehearse initial operations while En-route to the theater or objective. The UA can accomplish this with enablers like the en-route mission planning and rehearsal capability embedded in FCS systems and supported by space based communications assets.

4.4.2 Actions Before Forces Are Joined

The UA develops the situation out of contact, decides when and where to fight, sets the conditions to ensure tactical success, and maneuvers to a position of advantage. It is the Actions Before Forces are Joined that transforms the UA from a force that largely uses the movements to contact as its primary type of offensive operation. The UA has the ability to:

- **Develop the situation out of contact**.
- Embedded automated and human analysis to use this information to **decide where and when to assault**.
- Organic fires **to set the conditions prior to assault**.
- Maneuver capabilities to use this greater situational awareness to **maneuver to a position of advantage**.

The resulting schemes of maneuver will look much more like those of Operation Iraqi Freedom than those of Operation Desert Storm.

FM 3-0 defines the difference today between hasty and deliberate attacks. In hasty attacks, commanders trade the advantage of thorough preparation and full synchronization for those of immediate execution. Detailed planning and preparation characterize deliberate attacks. In preparation for deliberate attacks today, commanders take the time necessary to position forces and develop sufficient intelligence. Because of the time required today to plan and prepare deliberate attacks, commanders often begin from a defensive posture. The time spent preparing a deliberate attack may allow the enemy to improve defenses, retire, or launch a spoiling attack. The commander may lose the momentum and initiative. The UA is designed and equipped to enable commanders to achieve the detailed information required for a deliberate attack with significantly less time spent gathering that information.

The UA has a significant capability to develop the situation out of contact. The UA will frequently detect and identify enemy weapons systems and formations prior to contact. The level of fidelity decreases in large urban environments or complex, restricted terrain, but the capabilities embedded in the UA will detect and analyze enough to establish patterns in enemy dispositions. As technology improves the UA's ability to see through walls and foliage, the higher degree of fidelity will improve in all terrain. To develop the situation out of contact, the UA must not only See First, but Understand First. Understanding evolves from analysis of raw data and information. Today, most analysis is done at corps and division levels. The latency involved in disseminating the results of that analysis will not enable the immediate action required to defeat an adaptive enemy. In the UA, analysis resulting in actionable, targetable intelligence will be done at UA and CA Battalion level combined with intelligence fed from above. The difference is the much more robust

ability to fuse and analyze data at lower levels. The United States Army is the most powerful conventional force on the battlefield. Potential adversaries in the COE have seen the results of trying to fight the US Army head on in a symmetrical fight, thus he will attempt to change today's correlation of forces. Fighting an adaptive, asymmetric, dispersed enemy drives the requirement for synchronization and analysis done to lower echelons of command. Each level in the UA has organic sensors and shooters. The UA deploys with an unprecedented networked ISR capability including manned and unmanned air and ground surveillance and reconnaissance assets and remotely delivered sensors. These sensors are linked to direct and indirect fire systems providing every soldier and system the ability to see sensor detections on their COP and rapidly establish sensor-to-shooter links. This capability greatly decreases the latency of the target engagement process.

Reconnaissance and Surveillance are critical to developing the situation out of contact. The UA has organic surveillance capabilities at every echelon for specific purposes.

- UA Commander uses the higher level, longer endurance UAVs in the NLOS Battalion and the Aviation Squadron to set the conditions for battalions by identifying and destroying HPTs in the UA AoI.
- CA Battalions use their UAVs and reconnaissance troops to confirm mobility corridors and routes for companies and engage the most dangerous targets along the route before contact is made.
- Companies use organic UAVs and UGVs to reduce tactical surprise by identifying enemy forces in their area of influence before those forces can affect the company.

Platoons have organic unmanned air and ground vehicles for counter reconnaissance and to confirm or deny enemy activity on their route of march. In the UA, lead elements will routinely be supported by air and ground unmanned systems with the sensors to identify enemy forces before contact, or at a minimum confirm likely ambush points on the route. Small units can then choose the time and place of engagements and initiate it. The UA establishes the collection and distribution of information before contact. As sensors detect enemy targets, human analysts and automated tools rapidly fuse this data using technological enablers to produce actionable information. It is fused with other data and analyzed using technology enablers to become actionable or targetable intelligence displayed on the COP. The quality and quantity of information in the Distributed Information Database displayed on the COP increases over time as data from other sensors or enemy contact is updated. This helps soldiers under stress and heavy workload to detect and react to critical information. It reduces the potential for critical information to be buried by neutral or negative information. This display of enemy intelligence down to soldier level is one of the most powerful ways the UA sets conditions before contact.

The UA will use greater situational awareness to choose the time and place to attack. Forms of maneuver, tactical formations, and movement techniques common to today's force will endure, but the tactics, techniques, and procedures for implementing them will change. Based on the ability to identify enemy weapon systems and to see patterns in enemy dispositions, the UA will be able to maneuver out of contact to positions of advantage. From those positions of advantage, the UA will have an unprecedented ability to fix and isolate enemy forces and choose the time and place for decisive combat. The UA's embedded ISR capabilities allow it to develop a more precise knowledge of the enemy and an understanding of the battlespace. This combination of greater situational awareness, multiple dispersed routes, and organic reconnaissance at every echelon allows the UA to maneuver to positions of advantage robbing the enemy of options. Once in positions of advantage, the UA uses overlapping sensor coverage to fully isolate enemy positions and defeat them in detail. It is this use of battlefield geometry and the UA's inherent ability to achieve positions of advantage that enable the UA to attack at times and places of our choosing.

The enduring imperatives before contact are:

- Degrade threat C4ISR through combined efforts by all echelons.
- Leverage higher headquarters intelligence preparation of the battlefield.
- Employ manned and unmanned air, ground, and space-based R&S.
- Fuse ISR information.

- Predict likely enemy COAs.
- Shape and isolate the battlespace.
- Shield or protect the force with maneuver, fires or obstacles in depth.
- Neutralize enemy long range fires.
- Tactically tailor or re-task for the next mission (if required).

To facilitate using greater shared situational awareness to understand when and where to attack, the UA is designed to allow greater horizontal and vertical collaboration. Embedded in the FCS System of Systems is an en-route mission planning and rehearsal capability. Soldiers and leaders can receive and disseminate information as well as collaboratively plan and virtually rehearse en-route regardless if they are moving by land, sea, or air, mounted or dismounted. This information includes near real time enemy information and digital maps. The same systems we use in training, transitions to the Battle Command systems leaders use in combat to collaboratively plan, rehearse and execute operations on the move from vehicles or dismounted.

To set the conditions for the tactical success of its battalions, a single UA or multiple UAs under command and control of a JTF or UE destroy enemy HPTs through organic, Joint and UE Fires. The UA uses precision maneuver to establish positions of advantage and establish a battlefield geometry that enables overlapping weapons and sensor coverage. From positions of advantage, the UA can isolate those enemy forces that it must close with and destroy. Organic sensors and weapons allow the UA to maintain contact with bypassed enemy units from standoff. Maintaining contact ensures they remain isolated, cannot reposition, resupply or withdraw. The UA's ability to See First facilitates precision maneuver. With sensors on unmanned ground and aerial vehicles, the UA detects and neutralizes obstacles and booby traps at standoff. Although a UA may not physically see every obstacle or mine, future detection capabilities will allow the UA to identify mines and minefields. When coupled with locations of the direct and indirect fire systems supporting those obstacles, we will see the patterns of the enemy defense. Leaders use the information to develop a COA, which could include avoiding the area by precision maneuver and targeting key systems overwatching the obstacles.

Maneuver to positions of advantage is more than an increased ability to move off the "main routes". Where we can not conduct ground maneuver to an exposed flank due to restrictive or high force-to-space situations, the UA has vertical envelopment capabilities when augmented by aircraft from the UE, to still gain positional advantage. The UA also has the ability to execute turning movements or aerial envelopments to operational depth, gaining operational positions of advantage, allowing the UA or UE to isolate areas of restrictive terrain and fix enemy forces in that terrain. Moving "out of contact" may mean the ability to move out of decisive contact, as when fighting through a covering force. The UA's ability to provide mutual support, overwatching on the move across terrain compartments allow the UA to quickly overcome immediate contact, thus not becoming decisively engaged En-route to positions of advantage. A significant difference between the UA and current forces is the ability to maintain the tempo of the fight through covering forces. The layered sensors contributing to the shared COP allows the UA to maintain and continue to develop the situation when in light contact, defeating that contact through networked overwatch between units in different terrain compartments.

4.4.3 Actions During Contact

The UA initiates decisive operations at times and places of its choosing, continues to develop the situation in contact, and continues to integrate RSTA, maneuver and fires. Today we use decision support tools, linked to Commander's Critical Information requirements to develop the situation in contact. The use of CCIR and decision support tools does not change. The Battle Command system enables early identification of criteria for decision points through automated decision aids. Commanders will have access to the friendly situation in real time, a running total of BDA on the enemy, an advanced knowledge of enemy dispositions, and 3-D digitalized terrain. Advanced decision and analysis support embedded in systems will quickly and precisely identify components of the CCIR and deliver associated critical information to the right persons at the right time. This enables the UA to Act First.

The enemy does not get a “vote” on when and where he fights. Despite the tremendous ISR capabilities, the UA will never completely eliminate tactical surprise. When tactical surprise occurs or the ability to maneuver out of contact is unavailable, the UA can employ more deliberate movement techniques, synchronizing ISR, fires, and maneuver to counter flank and rear shots and attack enemy forces at standoff. Using more deliberate movement techniques and the advanced capabilities of the UA to synchronize ISR and Fires, the UA can recover quickly from tactical setbacks. Assaulting fires in support of close combat are more accurate and responsive.

During contact, multiple echelons of the UA integrate ISR, firs and maneuver during contact, empowering small units to choose the right time and place for close combat. Empowered by networked situational awareness, platoons and companies can rapidly apply precise fire control and distribution of LOS, BLOS, and NLOS fires to fully integrate fires with maneuver. The UA uses precision fires and precise fire control to synchronize simultaneous fires and maneuver, vice sequential application. Every sensor and platform is designed to establish sensor-to-shooter linkages and reduce the queuing of fire support requests that slow operations. Networked fires enable detection, delivery, and assessment of targets in near real-time with every platform and soldier providing sensor input. Advanced fire control and distribution systems refine tactical and technical fire direction, facilitate the rapid clearance of fires, and allow engagement of high payoff targets first. This results in more responsive and accurate fires.

During contact, UA and CA Battalion commanders focus their efforts on high payoff targets. With the UA and CA Battalion commanders focusing on HPTs, the small unit commanders are free to engage and destroy most dangerous targets to mitigate tactical risks. By destroying HPTs, the UA and CA Battalions can alter the correlation of forces or battlefield geometry and create tactical opportunities for subordinate elements. The ability to continue to synchronize ISR, fires and maneuver is related to understanding BDA. The Battle Command system enables earlier identification of BDA with a high degree of fidelity. Developing BDA today requires manual collection, correlation, analysis, and cataloging of thousands of individual reports. The vast amount of information and manual process for developing BDA significantly increases the potential for error. The UA networked system of systems solves this problem by reporting target effects immediately after firing or queuing more specific sensors to collect the target effects. With overlapping sensor coverage, BDA will be developed and distributed faster and with more accuracy. Distributive Integrated Databases will collate more accurate reports and keep a running total by type. Technology enabled fusion reduces human workload by automatically completing many fusion processes, as well as precisely storing, analyzing, and rapidly distributing BDA.

4.4.4 Tactical Assault

The notion of close combat has expanded to beyond line of sight, but small units in the UA are specifically designed to optimize their capability to close with and destroy the enemy decisively through assault. Small units conducting assault are supported by enhanced situational awareness and assured overmatch in lethality and survivability. When the UA commander initiates tactical assault, the continual flow of timely and accurate information from his ISR assets, provides a much higher fidelity enemy picture prior to assault. ISR is more than line of sight sensing. The objective capability includes the ability to detect and view enemy elements through walls and thick foliage, in buildings, caves, or subterranean infrastructure. This allows small units to enter close combat with a more accurate IPB, updated constantly and shared throughout the force. Discrete combat information drives ISR to a higher fidelity prior to decisive commitment to support small unit operations and to synchronize assaults. An increased fidelity of combat information enables the assaulting force to:

- Attack enemy weakness.
- Discern and attack decisive points while forgoing unnecessary action.
- Bypass or reduce final protective obstacles in stride.
- See and counter enemy reactions to our assault.
- Discern and strike the most dangerous targets.
- Confirm battle damage assessments.
- Perform enhanced combat identification of friend and foe.

Lethal overmatch in LOS, NLOS, and BLOS assaulting fires occurs through advanced fire control and distribution in time and space over the objective area. Networked fires allow leaders of small units to solve the challenges of fire control and distribution by discerning most dangerous targets and directing the most appropriate fires to destroy them. Units mass effects of weapon systems by combining organic and supporting fires in overwatch and mutual support while on the move. In the current operating force, commanders husband their combat observation/laser teams (COLT), carefully positioning these limited target acquisition at key positions on the battlefield. In the UA, every soldier and platform can act as a COLT, greatly enhancing UA ability to locate and designate targets.

Organic and supporting lethal and non-lethal fires prepare the objective, isolate it from enemy reinforcement, and emplace counter mobility on counterattack routes at standoff. These fires are enabled by quality target location and precise attack methods and munitions. The US uses precision fires, but not exclusively, particularly in support of close assault. The NLOS Battalion and reinforcing UE assets retain the capacity to apply high volume supporting fires to effectively suppress, obscure, or illuminate in support of units directed to close with and destroy enemy. The effect of these protective and suppressive fires is to assure freedom of maneuver and protection in contact. Obscuration fires blind the enemy to ensure we can see and act first in the assault. During assaults, the UA has significant advantages over today's forces to:

- Fire first with very high probability of hit and kill.
- Use 3D digitized terrain data to pinpoint covered routes.
- Employ enhanced dash speed moving from cover to cover to avoid enemy fires.
- Remain dispersed while maintaining mutual support without close physical proximity.
- Apply responsive and effective lethal/non-lethal suppression and obscuration.
- Employ passive and active protective systems to defeat enemy rounds.
- Use the advantages of a networked system of sensors to identify enemy weapons firing and automatically cue on board active protective systems and weapons to defeat it.
- Detect and neutralize mines from standoff.
- Leverage inherent gap crossing capability.

4.4.5 Transitions

Transitions between the types and forms of operations are difficult and during execution may create unexpected opportunities for enemy forces. In today's force, transitions are a complex operational consideration often developed as a branch during the planning process. The UA is designed to transition between types and forms of operations quickly. The UA can transition quickly because of a number of capabilities designed into the force:

- Greater situational awareness allowing the UA to develop the situation for the next engagement while in contact with the current engagement.
- BCOTM allowing commanders and leaders to plan and rehearse the next engagement while en-route to the objective or line of departure.
- Greater ability to affect a larger AoI, allowing it to set the conditions for the next engagement prior to contact.
- Greater logistical self sufficiency reducing the requirement to pause and resupply.

"Transitions – going from offense to defense and back again, projecting power through airheads and beachheads, transitioning from peacekeeping to warfighting and back again – sap operational momentum. Mastering transitions is the key to winning decisively. Forces that can do so provide strategic flexibility to the National Command Authorities, who need as many options as possible in a crisis. The Army, with the versatility and agility of its formations, has historically provided those options and the Objective Force will continue to do so in the evolving operational environment of tomorrow."

US Army White Paper, "Concepts for the Objective Force"

The UA's Area of Interest is larger because it has a significantly greater sensor footprint and lethality envelope at every level from platoon through UA. With this much larger area in which it can identify and destroy enemy systems, the UA gains standoff. By understanding friendly and enemy dispositions and terrain, the UA can plan and affect the next battle before it is joined. Subsequent missions will often become a continuation of the current fight, planned and rehearsed on the move using Battle Command tools.

Maneuver sustainment is often the critical factor in transitions. The maneuver sustainment concept is designed to facilitate quick, seamless transitions using combat sustainment and, when necessary, mission staging. The UA is 100 percent mobile with embedded water generation and reduction in fuel consumption. It is self sufficient for 72 hours of medium to high intensity engagements or for seven days of low intensity engagements. As a result, replenishment operations executed as companies and battalions cycle out of engagements allow the UA as a whole to continue the battle.

4.5 Deployability

4.5.1 Introduction

4.5	**Deployability**
4.5.1	**Introduction**
4.5.2	**Essential and Full Combat Configurations**
4.5.3	**Deployment Characteristics**
4.5.4	**Intra-Theater Operational Maneuver**

The UA and FCS Family of Systems (FoS) must be transportable worldwide by air, sea, highway, and rail to support inter-theater strategic deployment and UA intra-theater operational maneuver. This capability provides the flexibility for entry operations (permissive and non-permissive) to counter threat anti-access strategies by using multiple austere entry points to bring in combat configured units. Within the context of theater campaigns, the UA's ability to execute operational maneuver using multiple modes gives the Joint Commander more options.

Joint Force Commanders will overcome enemy access denial efforts by introducing the UA at multiple, austere points of entry via air, ground or sea. This capability ensures unpredictability in how forces arrive in theater and along with mission tailored UE Maneuver AMD augmentation, helps counter the growing trend in anti-access investments by potential threats. Austere points of entry, those without large airport infrastructure or major port facilities, are more readily available in most theaters. They are also more difficult to target and can be used in combination with other points of entry to achieve the required throughput.

The austere port of entry approach requires "operationalized" strategic transportation to ensure UA elements arrive ready to fight. The operational concept is to "fight on arrival" without traditional support requirements. This does not mean the platforms must "fight off the ramp" as they are being unloaded, but are prepared to quickly fight once unloaded. The FCS manned systems, inclusive of the soldiers assigned, must be capable of off loading the C-130 in ECC immediately capable of self-defense and integration into the C4ISR network. FCS vehicles will be capable of upgrading to FCC, able to complete the addition of additional capabilities like enhanced mine survivability or add-on armor all within minutes of arrival.

4.5.2 Essential and Full Combat Configurations

Essential Combat Configuration and Full Combat Configuration are platform definitions. These definitions are distinct and separate from the UA concept of basic loads. FCS systems must be transported in an essential combat configuration without substantial assembly or refit process. Each vehicle must arrive with a turret or basic ammunition load, 3/4 tank of fuel, crew with personal equipment, capable of immediate self-defense, connected to the Battle Command system. Essential Combat Configuration (ECC) helps reduce the need to execute RSOI in the UA.

Full Combat Configuration (FCC) includes all ECC capabilities plus full fuel, all basic loads needed for 72 hours of high tempo operations, and requires that add-on armor kits be applied without any specialized material handling equipment, if that additional armor is needed for the mission. The UA can fight most engagements at ECC. Arriving with3/4 tank of fuel is consistent with current Air Force policy. It is a safety issue related to vapor pressure in the fuel tank at altitudes. By using onboard fuel cans, individual platforms can readily top off fuel levels on arrival. The ORD minimum survivability requirement at ECC is ballistic protection against 14.5 mm around the entire platform and 30 mm protection in the frontal 60 degree arc or crew/squad compartment. This ballistic protection is greater than anything in our current forces except the frontal armor of an M1 tank. This survivability is obtained with only ballistic protection. Active protection systems make every platform in the UA as survivable as our main battle tank today. Add-on armor kits are required only for special threats, like the ability to survive a large anti-tank mine blast.

A basic load of ammunition is expressed according to the wartime organization of the unit or formation and maintained at the prescribed level. For other than ammunition, basic loads are supplies kept by using units for use in combat. The quantity of each item of supply in a basic load is related to the number of days in combat that the unit can be sustained without resupply. For the UA, the basic load, including ammunition

will allow it to fight for 72 hours of high intensity combat operations and up to 7 days of low intensity operations like Peace Enforcement. A fighting load is the load the soldier or vehicle carries during contact with the enemy. It consists only of essential items the soldier needs to accomplish his task during the engagement.

4.5.3 Deployment Characteristics

The UA must be sized to meet the C-130 transportability requirements supporting key Objective Force characteristics of responsiveness, agility, and versatility. By sizing the FCS platforms to the C-130 crucible, it can also execute intra-theater maneuver throughout the theater of operations by using the future advanced airlift and theater support vessels. Sizing FCS platforms to the C-130 has a number of second order effects. A platform sized to a C-130 crucible will also cross most bridges in the world. This same size allows FCS vehicles to be rail-loaded throughout the world regardless of local track gauge and fit in underpasses, covered and concealed spaces such as buildings, and be off-loaded at most port facilities with existing cargo off-load capacity. The C-17 aircraft resolves many of the size and weight constraints of the C-130, and must be part of the transportability solution for the UA in both inter-theater deployability and intra-theater maneuver. The C-17 however has a number of constraints which will require the use of both aircraft for intra-theater maneuver. Despite the proliferation of 5,000 foot runways throughout the world, many airfields we might use have taxiways or turn around points which are too narrow for the C-17. In addition, USTRANSCOM reserves the bulk of the C-17 fleet for inter-theater missions, thus relatively few are available for intra-theater maneuver to Combatant Commander. For example, at the end of Operation Iraqi Freedom, the CENTCOM order of battle included 124 C-130s, but only seven C-17s.

The addition of Future Advanced Aircraft in the increment I (Objective) or Increment II time horizon will add a vertical takeoff and landing (VTOL) or super short takeoff and landing (SSTOL) capability to the UA. Either of these advanced capabilities virtual eliminates an enemy's ability to deny access as the number of potential points of entry increase beyond reasonable ability to defend them all. By sizing the FCS platform to the C-130, we assure compatibility with Future Advanced Airlift.

4.5.4 Intra-Theater Operational Maneuver

Once in theater, a wide range of air, land, or sea modes for operational maneuver can transport the UA. After moving by air up to 500 nautical miles with current aircraft or up to 1000 km using future advanced aircraft or by sea to an austere port of entry, the UA will be able to make a 400 km operational move by ground and fight for 72 hours without re-supply. The UA will leverage austere points of entry to increase the options available to the combatant commander. By sizing FCS systems and organizations against the C-130, the locations suitable for entry operations increase significantly. The UA can combine available C-130s, C-17s, and Theater Support Vessels to maximize force flow using multiple entry points to bring in combat configured units. This facilitates not only the initial entry but also the continued deployment of forces later in the campaign. The UA will be able to be delivered into austere environments and operate autonomously or semi-autonomously, allowing CA Battalions introduced at multiple points to move over operational distances.

4.6 Tactical Concepts

4.6.1 UJTL Task Linkages

4.6	Tactical Concepts
4.6.1	UJTL Task Linkages
4.6.2	Battle Command
4.6.3	ISR
4.6.4	Maneuver
4.6.5	Fires
4.6.6	Maneuver Support
4.6.7	Maneuver Sustainment

CJCSM 3500-04C, Universal Joint Task List (UJTL) serves as a common language and common reference system for joint force commanders, combat support agencies, operational planners, combat developers, and trainers to communicate mission requirements. The UJTL identifies “what” is to be performed in terms common to the Joint Staff, but does not address “how” a task is performed. Individual services are required to develop service specific task lists that describe “how” the UJTL tasks will be accomplished. The concepts in this chapter describe the “how”.

The figure below shows the correlation of the UA Tactical Concepts described in this section to the UJTL Tactical tasks. The Tactical Concepts described in this section will continue to be refined and the Army will develop an Objective Force Mission Essential Task List (METL) that supports the accomplishment of the UJTL Tactical tasks.

Tactical Concepts	UJTL Tactical Tasks
Battle Command	TA 5 Exercise C2
ISR	TA 2 Develop Intelligence
Maneuver	TA 1 Deploy/Conduct Maneuver
Fires	TA 3 Employ Firepower
Maneuver Support	TA 1 Deploy/Conduct Maneuver TA 6 Protect the Force TA 7 Operate in CBRN Environment
Maneuver Sustainment	TA 4 Perform Logistics and CSS

Figure 4-4 Correlation of UA Tactical Concepts to UJTL Tactical Tasks

4.6.2 Battle Command Concept

4.6.2	**Battle Command**
4.6.2.1	**Battle Command on the Move**
4.6.2.2	**Distributed Information Database**
4.6.2.3	**Common Operational Picture**
4.6.2.4	**Situational Awareness**
4.6.2.5	**Joint Interoperability**
4.6.2.6	**Combat Identification**
4.6.2.7	**Army Airspace Command and Control**
4.6.2.8	**Information Fusion and Pattern Analysis**
4.6.2.9	**Communications Information Systems**
4.6.2.10	**Information Assurance**
4.6.2.11	**Ten Principles of Battle Command**

Battle Command is the art and science of applying leadership and decision to achieve mission success. Battle Command applies leadership and decision making to shape and sustain decisive actions seamlessly synchronizing those elements within and between echelons from anywhere in the battlespace from alert through redeployment against a hostile, thinking opponent to achieve mission success across the full spectrum of operations. The differing information systems today were developed by a specific BOS proponent to manage various information sets to allow the commander to visualize the battle. Staffs manually compare this information to filter out CCIRs.

TRADOC Pam 525-3-0.1 O&O, The U.S. Army Objective Force Battle Command (C4ISR) Concept introduces an overarching description of the Battle Command concept at all echelons of the Objective Force. While these 10 "Big Ideas" are useful in a general sense, at the Unit of Action echelon the focus of Battle Command must be refined to reflect the C4ISR priorities and capabilities required at the tactical level. The focused description of Battle Command for the UA complements the discussion in TRADOC Pam 525-3-0.1. Battle Command is defined as the art and science of applying leadership and decision to achieve mission success. In the objective force, there is only one Battle Command system. The Battle Command system is the first to enable both the art and science of Battle Command within a single architecture. In the past, the Army has had only limited success in employing the individual information systems. In the UA, the information needed to make decisions is pushed to the lowest level at which that decision can be made. At the same time, the information is scalable to mounted and dismounted soldiers. The Battle Command system employs automated tools such as screening filters, information fusion technologies and “intelligent agents” to highlight indicators of CCIRs, bringing them to the “top of the queue”. In this way, the Battle Command system accomplishes information management and facilitates decision making.

The Battle Command system empowers tactical commanders and allows them to execute combined arms maneuver more effectively than any previous system because it will provide commanders from squad through brigade with the decision aids and analysis tools they need regardless of their location. The system is structured and resourced for both distance and duration. Just as tactical forces are task organized, the Battle Command system will constantly reconfigure, expanding and contracting to adjust capability as the situation demands. The Battle Command system allows commanders to move and communicate effectively from alert through redeployment, from whatever location required. The Battle Command system will be born “Joint”. Today, Joint interoperability often means merely being able to communicate with another service, normally at the division level and higher. The Battle Command system will enable joint interdependence and integration at the tactical level. It does so through an operational architecture that allows tactical interactions at the small unit level to include routinely opening sensor to shooter links across service lines. For instance, a Land Warrior equipped infantry soldier who encounters an operationally significant target will be able to establish a linkage via the networked fires application of the Battle Command system with Air Force or Navy aircraft, diverted from another mission to react to the acquisition of that target. This means a change not only in the joint communications architecture, but in the policies and agreements between services. In the UA training environment, leaders will routinely practice not just

calling for assets like close air support, but knowing how and where to contact all Joint capabilities and be able to employ those capabilities.

The Battle Command system allows the UA Commander to fight the close battle from the MCP and the staff to monitor from the TACP even while located miles away from the physical battle. There are significant improvements in “on the move” capability for commanders and staff. Commanders, leaders and staff will remain connected to the information they need regardless of location so that they have the same ability to understand and influence the battlespace whether onboard strategic lift craft, in ground or air combat platforms, or dismounted. The commander must be able to command from anywhere on the battlefield as if he were in a TOC. Currently, commanders and their staffs expend significant amounts of time and resources to physically prepare and write operations orders. Distributing these orders requires information technology systems with high bandwidth capability. It is a time consuming process that slows decision-making, particularly in contact. The format does not support distributed execution. The UA will significantly improve the capability to create/change and distribute orders and graphics. Distribution of orders with graphics will be instantaneous and allow commanders to write and distribute plans; to collaborate with adjacent, higher and subordinate units on that plan, and to rehearse it all on the move.

The operational concept of the UA will require a revolutionary change to the current Military Decision Making Process (MDMP) to account for the tempo of operations and better execution. The current staff structure, stovepiped by BOS and integrated by a series of meetings in the TOC, must evolve to one of more effective groupings of subject matter experts. These cells operate mounted from C2Vs or dismounted using Land Warrior systems. They can be linked wirelessly while either stationary or moving, without the requirement to stop and erect command and control structures. The UA will have collaboration tools that include as a minimum: voice, text, chat, graphics, whiteboard, and the capability to collaboratively coordinate and execute a plan with the same efficiency as if co-located. The UA uses the Battle Command system to allow commanders and staffs to collaboratively plan and execute directly. Statistically, soldiers retain 90 percent of what they participate in developing. In the UA, every soldier will literally be able to collaboratively assist in developing the plan with his higher headquarters.

4.6.2.1 Battle Command on the Move (BCOTM). The Battle Command system allows commanders in the UA to access information and decision making tools and communicate decisions much faster than today and from anywhere on the battlefield. Widely distributed operations on future battlefields will require command post-like functions with significantly increased deployability; thus a much smaller and more mobile arrangement. Operating at a very high tempo, with widely distributed, parallel land operations in a complex environment, will overwhelm any leader or system that attempts to control execution from a fixed central location like a TOC. The UA does not have a TOC as we know it today, but rather, it has embedded Battle Command capabilities in both FCS vehicles and in the Land Warrior C2 systems while dismounted. The commander will receive staff analysis in visual form regardless of his position on the battlefield. Subordinate commanders will have instant access to those same products during planning vice waiting until the end of the MDMP process for the time consuming process of production and distribution of the order.

Today the staff assists the commander with his battlefield visualization by collecting, processing, analyzing, and transforming data into knowledge. Using this knowledge, the commander applies his judgment to achieve understanding of the situation in the form of his vision. The staff then helps him communicate his battlefield visualization to his subordinates by preparing orders. In the UA, the Battle Command system will allow the commander to much more quickly distribute and facilitate understanding of his vision and intent. The pace and scope of maneuver in the UA demands the UA Battle Command system be maneuverable anyplace, anytime. In the UA, the staff resides in two mobile command groups and a Tactical Command Post (TCP). The two mobile command groups, one with the commander and one with the deputy commander are each built around a C2V and organic security element. In the Mobile Command Group (MCG) C2V are an ISR officer, Effects Officer, Operations Officer, Operations NCO and Sustainment Officer in addition to the dedicated driver and vehicle commander. The staff elements can control execution of ISR, fires, maneuver and sustainment operations. These same groups can independently plan branches or collaboratively plan operations or sequels with the tactical command post. The CA Battalions are similarly staffed with a MCG and TCP. The brigade TCP is built around a core of six C2Vs. Each C2V has six workstations all linked to the network or should the network go down, linked wirelessly or by cable to the other TCP vehicles. This configuration allows the synergy of a current operations section MCG forward on the battlefield with the commander, yet linked to the rest of the staff as if they were in a TOC.

The tactical command post structure is comprised of a Command Integration Cell, an Information Superiority Cell, Fires and Effects Cell, a Build and Sustain Combat Power Cell, and a Maneuver and Support Cell. While the Command Integration Cell has the specific task of integration, all cells interact directly and with the CIC. The staff can reach for additional help to higher headquarters, adjacent units, the HSOC or even expert help from the TRADOC schools and centers. It also has access to joint links. One of the central tenets of BCOTM is the ability to do collaborative planning from any location on the battlefield. Distributed operations and high tempo maneuver will demand rapid synchronization, swift adaptation of plans and control measures and direct exchanges between commanders across levels of command. Current C4ISR systems do not provide integrated collaborative capabilities to support vertical and horizontal planning.

Collaborative planning is a digitally supported and enhanced system working together between one or more dispersed participants sharing situational awareness, focused on a common course of action. Collaborative planning in the UA is a digital ability to exchange information and “white board” ideas between dispersed participants to develop courses of action that will be implemented immediately without waiting for a written order. As opposed to commanders sharing radio calls or Battlefield Updates over the radio net, future exchanges will enable more immediate understanding of the plan. Collaboration tools will be so prevalent that teams at every level will interact together in a verbal and visual dialogue instead of standardized and formalized message sets.

The UA’s collaborative planning tools can be used in a number of ways. For example, they can be used to develop a plan, war-game it and virtually rehearse it while en-route to the objective. In this way, squad leaders who are going to execute a platoon or company plan share and directly contribute to the collaboration. In another example, based on a HUMINT tip, a platoon is moving to intercept a weapon of mass destruction before it can displace. Each squad in its ICV can reach back to experts or data bases in the United States or elsewhere in theater to pull up pictures of the weapon of mass destruction. These decision-making tools enable Battle Command, freeing leaders and staff to predict the enemy’s next move instead of providing orders or building terrain models. These tools include:

- 3-D terrain mapping, to include complex and urban terrain.
- Terrain analysis tools that perform MCOO-like tasks rapidly and highlight optimized use of terrain, cover and concealment, line of sight evaluation for weapons employment and identification of key or decisive terrain.
- Databases on the enemy display the enemy’s common patterns and predictions of how those patterns might be applied on the terrain. Those same data bases can be updated as a result of operations to rapidly disseminate enemy tactics, techniques or procedures identified on one part of the battlefield.
- Automated war-gaming tools which “fight” enemy capabilities or courses of action against friendly courses of action to quickly eliminate COAs or parts of COAs that are unfeasible, unsuitable or unacceptable.
- Rehearsal tools that let units, even while on the move, fight a COA in simulation.
- Filtering process that allows commander’s critical information requirements or the indications of CCIR to come to the “top of the queue” and not be buried in a mountain of incoming data.
- COP that can display the weather, terrain, enemy, friendly, non-combatants, BDA, and the logistical status of friendly forces.

A critical component of the Battle Command system is the ability to conduct en-route mission planning and rehearsal. An En-route Mission Planning and Rehearsal (EMPR) capability is embedded in all UA platforms down to the soldier level. EMPR provides situational awareness, joint planning, rehearsal, and execution tools for warfighters within and between all echelons. The capability exists at Home Station, en-route to, within, and redeploying from the JOA. This is not a stand-alone system, but the same one with which we execute BCOTM. Situational awareness begins before departure from Home Station enabled by direct access to joint, multi-national and interagency organizations. An EMPR capability allows warfighters to receive situational awareness data at any point in the operation and anywhere in the battlespace regardless

of platform. This capability supports the development of plans and orders during the alert phase (at Home Station), and allows commanders and their staffs to cooperatively make modifications/updates to the plan while en-route to the area of operations or objective by land sea or air. The EMPR capability is a key component of the 'understand first' portion of the Quality of Firsts. The EMPR capability not only facilitates planning for operations once in theater but facilitates deployment and integration into the joint force. The en-route UA links directly to joint headquarters already in theater allowing the UA to integrate into the gaining headquarters' architecture during movement. In this way, commanders will begin teaming with other joint elements beginning on alert through a global network. While en-route, commanders and staffs will have immediate in-transit visibility of unit personnel and equipment through a robust HSOC linked directly to USTRANSCOM.

4.6.2.2 Distributed Information Database. With the huge information flow into the UA, the UA will use a tactical database to store fused information so it is available to leaders. Because the UA is optimized for offensive operations and operational maneuver, this database cannot reside in a fixed facility but must be resident on the platforms of the UA. The UA will be able to reach back to UE, Joint, Interagency and HSOCs for larger data bases but the tactical database that stores and organizes the incoming sensor data from UA subordinate units must be immediately available in real time on the COP for tactical action and targeting. The database, with inherent links to the Army Knowledge Network (AKN), allows commanders and staff to reach tactical boundaries, theater and intercontinental distances to access and share information.

The Distributed Information Database (DIDb) is an integrated distributed information database of all available information derived from multiple sources. It provides a synchronized shared awareness of key battlefield information. Access to the DIDb is available to all echelons of the UA. Through a constant push and pull of information, the DIDb fuses information from multiple sources and feeds this information through the COP. The DIDb enables access and distribution of information throughout the force in standardized formats. It also enables continuous input and updates of information by establishing, maintaining, fusing, and distributing, information to the COP. The FCS database/repository will be compliant with future Army-approved data models and Army database structures. The network paths used to deliver the data will be transparent to the commander. The databases are linked to the Army Knowledge Network and are part of a two way collaborative process in which lessons learned are incorporated into the database.

4.6.2.3 Common Operational Picture. The COP is a single fused picture containing timely information tailored by echelon and individual users. The COP can display information on terrain, weather, civilian, enemy, and friendly forces and helps users draw collaboratively from this data. The DIDb feeds the COP with data from R&S, troops in contact, intelligence derived from analysis, information from higher echelons, and estimates where information is incomplete. The COP facilitates collaborative planning and enables all echelons as they develop and maintain situational awareness. In the UA, commanders will visualize the battlespace and exercise command with the aid of a COP. Today, there is no single display or interface that is tailored to the commander's local and unique requirements. In the UA, data, information, and intelligence from all echelons, sensors, and sources are used to generate a COP. By applying judgment to the COP, commanders may achieve SA and make appropriate and timely Battle Command decisions. The UA and CA Battalion CICs use the COP to exercise control, which allows commanders to focus on command.

The COP displays actionable, targetable information that is updated in near real time. Staffs contribute to the commander's SA by continually updating the running estimate, which is accessed through the COP. Staffs also use the COP to exercise control, which allows commanders to focus on command. The COP provides shooters, decision makers, and analysts at each echelon with a continuously updated display of the vital information needed to conduct operations. Updates to the COP provide the commander a real time "view of the battlefield". The COP displays orders, graphics, control measures, and other data disseminated over the network. The COP provides:

- Scalable, tailored and integrated views of ground, air, naval and space operations.
- Operational displays and the ability for "play back" by phase, unit, organization, echelon, location and or time.

- Reach capabilities that leverage pushed information IAW established user profiles, automated or manually pulled information from selected sources, user network searches for existing products, seamless data exchanges, subscription to broadcast services, and utilization of collaborative tools.
- Interactive text and voice dialogue to assist in preparing queries, Situation Reports and the development of plans, orders and directives.
- Streamlined, staff-integrated mission analysis, wargaming, and COA development.
- Visual representation of the timeliness of information.
- Graphic or text “drill down” capability on COP representations that maintains current analytical expectations and pedigree of information.
- Displays that correlate and project the cumulative effects of the multiple staff estimates.
- Displays that allow users to visualize the battlespace in four dimensions (width, depth, height, and time).
- Dynamic, fully interoperable capability to electronically partition, and hand off relevant data to the appropriate inter or intra-service user and for sharing with multinational forces.

The COP enables situational awareness, decision-making, and problem solving by commanders; displays information that can answer CCIR and facilitates tactical action. Through the COP, the commander has all the tools to describe his intent, collaborate with other commanders, staffs, and to direct actions.

4.6.2.4 Situational Awareness. Situational awareness (SA) is the perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the future. Information technology systems, properly networked, simultaneously share information with virtually any warfighter, regardless of location (land, sea, air) by a high performance information grid and access to multiple information sources. In network-enabled operations, each operator and organization has access to the same information constructed from all available sources. Users make their own determination of what is important from the totality of available data. This is tailored/configured information, not the same picture for everyone. In generic terms the three levels of situational awareness are perception, comprehension and projection. Individuals and groups (sometimes called teams) can achieve situational awareness. Currently, and for the foreseeable future machines can not.

- Level 1 situational awareness (perception) is the individual's perception of information. Level 1 situational awareness is composed of disaggregate elements of information, in other words, raw input. For the UA this includes, but is not limited to seeing all aspects of the battlespace domain, encompassing everything from physical surroundings to enemy forces, non-combatants, friendly forces, terrain, and weather.
- Level 2 situational awareness (comprehension) is the earliest level at which we gain **situational understanding**. It is achieved when the individual combines, interprets, stores and retains the information. It includes integrating information received and then determining the relationship between those pieces of information and the relevance of the individual pieces to the desired end-state.
- Level 3 situational awareness (projection) is an extension of understanding. It is reached by using understanding to project possible future events and to anticipate their outcomes. Commanders project future events as an outcome of the environment in confluence with anticipated events that will impact on the desired end state.

4.6.2.5 Joint Interoperability. The UA will possess the ability to operate seamlessly in Joint and Multi-national environments. This includes the UA's ability to access Inter-agency databases and share information across services. The FCS FoS will be interoperable with a wide range of Joint, legacy and transformational communications systems and networks. The FCS-equipped UA will use WIN-T standards and protocols to enable seamless information transport, network management and information assurance. The UA will maintain compatibility to current Battle Command systems to ensure the UA teamed with current forces can conduct Joint operations. Joint Integration requires the UA to:

- Seamlessly share information that populates the DIDb and builds the COP.
- Synchronize multiple UE, Army, and JIM inputs to build a Joint Common Operational Picture in the UA's area of interest.
- Disseminate UA data to Army and JIM forces.
- Safeguard information with no compromise of sensitive/protected information during transmission to another Service.
- Filter UA data to maintain multiple security levels for UA information.
- Collaboratively plan with other services at a small unit level from anywhere in the battlespace.
- Develop and maintain situational awareness.
- Execute as part of interdependent, integrated joint fire, maneuver, and protection.

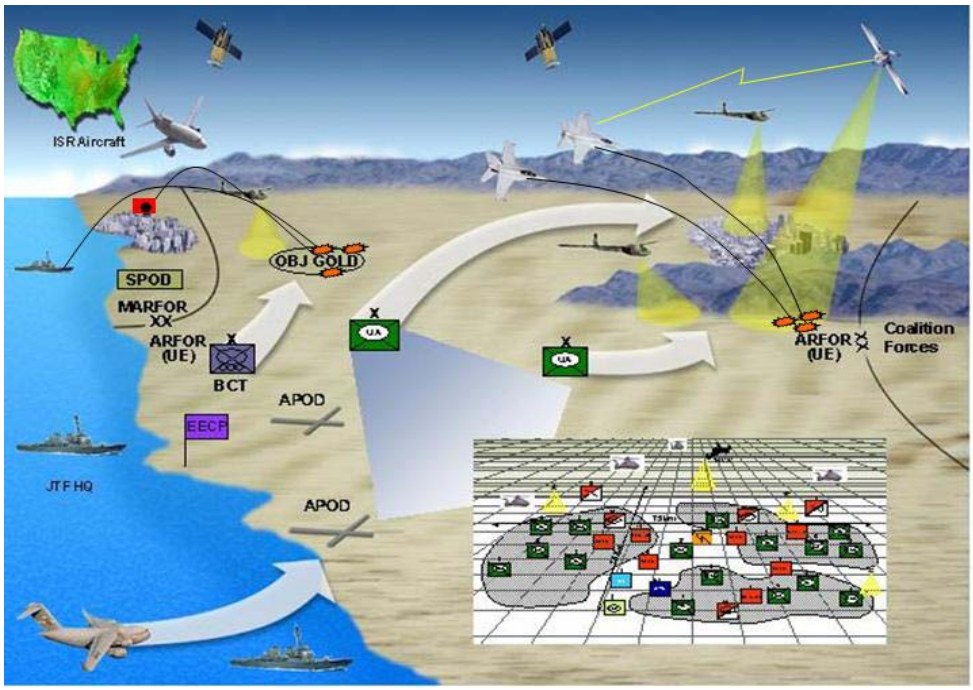


Figure 4-5 Joint Interoperability

FCS will be tactically interoperable with current and future aircraft utilized by the U.S. Army, Air Force, Navy, and Marine Corps to include SOF. This tactical interoperability will extend to friendly UAVs operating in the Joint Operational Area and be capable of air-ground combat operations with current and next generation manned and unmanned combat aircraft. For more information, see Annex G.

4.6.2.6 Combat Identification. One of the most significant contributions of the COP to situational awareness and fire control is Combat Identification (CID). CID is the positive, effective real-time identification of friendly, threat and some neutral forces. FCS systems provide CID of friendly platforms equipped with compatible CID technologies. CID applies to platform-to-platform (manned and unmanned, ground and air), platform-to-soldier, soldier-to-platform, and soldier-to-soldier under all battlefield and weather conditions. CID will accurately characterize friendly, enemy and non-combatant entities throughout the battlespace. CID systems will interface with the communications network for development and maintenance of the COP. CID systems will be compatible with the Land Warrior CID and NATO/Allied Battlefield Target Identification. In the near term, other entities will be tracked as “unknowns”, requiring positive identification as threat prior to engagement.

4.6.2.7 Army Airspace Command and Control. Army Airspace Command and Control (A2C2) increases combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control is

provided to prevent fratricide, enhance air defense operations, and permit a greater flexibility of operations. Objective A2C2 leverages the Single Integrated Air Picture (SIAP) portion of the COP. What is different in the UA is that A2C2 enables versus restricts exploitation of the third dimension.

In close coordination with the Joint Airspace Control Authority's designated UE/Joint Airspace Management C2 node, the UA orchestrates tactical airspace management. The purpose of the A2C2 portions of the C4ISR Network is to provide the common asset visibility, control, procedural coordination, synchronization, and regulation for Army and Joint manned and unmanned aerial assets, indirect fire munitions (LAM, PAM and conventional) and other airspace users. In the UA, this is not a separate, stand-alone process, but rather an integrated networked process to enhance UA operations in the JOA. In order to enable UA operations, the UA staff provides third dimensional analysis and information to the commander, and performs aerial staff estimates and battle tracking. Automated battle management processing facilitates rapid prioritization, optimization, and deconfliction during UA airspace planning and coordination.

The UA has embedded A2C2 competency, with dedicated Air Defense and Airspace Management (ADAM) expertise at the UA and CA Battalion levels. The UA is designed to operate in the most or least restrictive A2C2 environments. The UA Fires and Effects Cell include a Forward Air Traffic Control crew and an ADAM crew that can integrate directly with UE, civilian and Joint Airspace Management and Joint Integrated Air Defense Systems (JIADS) C2 facilities as required. The ADAM crew will be certified as AMD Tactical Directors in addition to their A2C2 skill sets. In addition to this dedicated A2C2 leadership structure, multifunctional leaders and staff in the UA will be tactically proficient in the coordination and de-confliction of Army and Joint airspace through the use of virtual and constructive training environments. Leaders will acquire these skill sets early in their careers and use them routinely during training events with or without live aircraft present.

During A2C2 execution, the network is aware of the procedural measures in place and tracks current and projected manned/unmanned aerial objects including aircraft, missiles and UAVs. Updates to the COP reflecting this information are rapidly transmitted throughout the network. Trajectories are cleared in a manner that is transparent to commanders. For example, changes in UAV flight patterns are updated through the DIDb and displayed on the COP. Networked fires process missions by selecting launchers with no identified conflicts in the trajectory path. Trajectory clearance algorithms will account for potential changes in flight patterns that may occur after launch of "dumb" projectiles but will not be such that they limit responsiveness of UA fires. The battlespace for manned aerial platforms are enabled by the COP and are dynamic and 3-D as opposed to today's restrictive, inflexible two-dimensional corridors prescribed for ACO time blocks. UAVs will have integral collision avoidance to avoid rotary and fixed wing manned aircraft from air service and our coalition partners as well as each other.

Airspace management and control cannot be exclusively automated. The UA retains the capability for human intervention. By exception, a leader can direct changes to UAVs and LAM or automated adjustments can be triggered as necessary via the C4ISR Network. They will also be able to activate procedural measures for manned platforms whose C4ISR systems are degraded. When not augmented by UE Maneuver AMD, the UA's A2C2 section will be linked directly into JIADS and will perform any man-in-the-loop positive control required by the rules of engagement in effect to provide joint confidence for CAS over the UA. To fully realize this enabling, responsive vision for exploiting UA airspace, some changes will need to occur to make overarching joint airspace management processes and procedures less cumbersome and more responsive to the needs of ground force commanders. The UA's C4ISR network will have these capabilities to enable A2C2:

- Discriminate and accurately identify aerial objects.
- Deconflict, synchronize, and integrate all air-ground operational requirements with fires in time, space and altitude throughout the JOA.
- Employ enhanced procedural and dynamic control measures.
- Develop, disseminate, and maintain real-time SIAP thru multi-path communications with all members of the air-ground team.
- Possess an embedded capability to support the digitized display of ATOs, ACOs, and ACMs.

- Enable commanders to effectively orchestrate air-ground operations, fires, and air defenses.
- Integrate with Army, JIM, and civilian air traffic control architectures.
- Facilitate AMD planning and coordination.
- Provide relevant airspace management information on the COP.
- Facilitate automated aviation planning and coordination of UA organic and direct support aviation.
- Reduce fratricide within the UA battlespace; air-to-air, air-to-ground, and ground-to-air
- Receive, maintain, and disseminate joint airspace control measures, AMD ROE, preplanned fires, air-ground operations and UAV usage on the COP
- Alert the COP to enemy 3-D activities from Joint or UE AMD early warning systems
- Relay air defense warnings and rules of engagement on the COP
- Integrate with UE AMD fire direction and other JIADS system C2.

4.6.2.8 Information Fusion, Pattern Analysis and Processing. Fusion is the combining or blending of data and information from single or multiple sources (sensors, logistics, etc.) into information. It involves the process of comparison, evaluation, and related activities to ensure proper correlations of data or information exist and draw out the significance of those correlations. New data, when fused with other data, can become information. Information, when fused with additional data and/or information can become combat (actionable) information and/or intelligence.

The unprecedented number of sensors in the Objective Force will generate a significant increased stream of discrete data that left unaltered will be of limited value. Current and anticipated advances in information technology, battlefield sensors (quantity and quality), and communications have combined to literally overwhelm the ability of human beings to achieve a sufficient level of understanding about the battlefield environment. This potential flood of information, combined with ever compressed decision cycle times, places a paralyzing information burden on commanders.

Fusion can help to alleviate some of this information paralysis by providing a means to merge the various sources of data into a more coherent picture for commanders. Fusion in and of itself is not the end state we seek; it is only a means to an end. Fusion systems can augment but will not replace human judgment. Fusion will take place at multiple levels. Some sensors with an on-board processing capability will fuse information independently, while others will fuse within the network. Not every sensor will be capable of collecting every observable. A static, well-camouflaged enemy may avoid detection by an electro-optical UAV, and in radio silence, COMINT collectors. A thermal collector may identify the enemy, but will introduce ambiguity as to specific identity and purpose. As a result, fusion of data, information, intelligence and knowledge will remain an integrated organizational, technological and leadership solution.

There are six levels of fusion (Levels 0 through 5). However, it is Levels 1 through 3 that add progressively greater meaning and involves more analysis; Level 4 and 5 are continuous and occur at all levels of fusion. (For a more detailed discussion on fusion, refer to Annex H of this document) The fusion levels are:

Level 0	Organize.
Level 1	Identify/Correlate (beginning of situational awareness).
Level 2	Aggregate/Resolve (situational awareness increases).
Level 3	Interpret/Determine/Predict (situational awareness achieved).
Level 4	Assess (review performance and adjust accordingly).
Level 5	Visualize (feedback and redirect activities).

FCS systems are designed to facilitate fusion of information at the lowest possible echelon of command. Fusion involves a series of processes performed to transform observed data into more detailed and refined information, knowledge and understanding. These processes involve both automation and human analysis and fusion occurs at every level. Some sensors with on-board processing capability will fuse information at

the platform level. For instance, an ELINT sensor will correlate a radar signature with its associated air defense system and report the type of ADA system to the DIDb. Other bits of information will be sent forward from the platform as raw data to be aggregated and fused at a higher echelon. To some degree, all levels of fusion occur at each echelon. Fusion at the lowest level can help alleviate information paralysis by providing a means to aggregate the various sources of incoming data into more coherent and actionable information or intelligence.

Pattern analysis is deducing the doctrine and TTP of a force by careful observation and evaluation of patterns in its activities. It is a logical output of the fusion process. Pattern analysis leads to the development of threat intentions and hence to possible COAs. Identified patterns of threat activity can be used as indicators of threat COAs. Pattern analysis is used to identify the presence of indicators or enemy activity, and based on the premise that adversaries will exhibit identifiable patterns of activity. Identification of these patterns and the sequence of events lead to the indicators or profiling of the adversary. As one indicator is observed, collection can be adjusted to focus on others. During the fusion process, information must be organized and reported to ensure these relationships can be established and identified for leaders and analysts.

In the foreseeable future, fusion will not be fully automated though automated systems will provide significant capabilities to assist human analysis. All of these conditions will require human analysis to resolve. Achieving understanding is a human capability. The UA is designed with robust analysis, processing and target development teams in the Brigade Intelligence and Communications (BIC) Company. The BIC Company is designed to be a flexible organization. It is primarily configured to have the entire Situational Awareness Section operate in support of the UA Commander. If required, it can be structured with a Situation Coordination Cell at the UA level and a Situation Awareness Team for each CA Battalion. In addition, the brigade tactical command post is augmented with ISR integration and target development teams.

The UA utilizes a full spectrum of layered sensors to collect and disseminate ISR data from organic, UE, Joint and National assets and directly display that information/intelligence on the COP. When the network is fully operational, each echelon of command will access the DIDb to maintain SA as they continue their mission. They will use the organic sensors to fill in gaps or answer questions not answered by external sources. During times when the network is degraded and the lower echelons don't have full connectivity with the updated DIDb or higher headquarters, they will rely more on their organic sensors and processors to maintain or advance their SA.

- Preprocessing at the sensor or on the platform by taking raw data and turning it into a usable form.
- Processing onboard platoon leaders' (MCS, Infantry and Recon platoons) vehicle, company commanders' vehicle (MCS and Infantry companies as well as Recon troops), and all C2Vs is where we can begin to identify entities.
- Processing by the maneuver company and/or the CA Battalion Information Superiority Cell to begin developing situational awareness.
- Processing at the UA and CA Battalion Information Superiority Cell produces the outputs intended to actually assess and quantify the target or threat capability.
- Processing at the UA Information Superiority Cell provides critical feedback that allows modification of any part of the fusion process to include algorithms.

A detailed discussion of Processing can be found in Annex H of this document.

4.6.2.9 Communications Information System. The Communication Information System (CIS) in the UA consists of the infrastructure, organization, personnel, and components that collect, process, transmit, and disseminate information. It will utilize WIN-T and JTRS as the integrating information network standard for information transport, network management, and information assurance. It enables the commander to view and understand his battlespace, communicate his intent, lead his forces, and disseminate pertinent information throughout the UA. The CIS permits continuous fusing, monitoring, and dissemination of information from a variety of sources, through an uninterrupted, self-healing, multi-layered communications

and computer network. The CIS will provide secure, reliable access to information resources throughout the Global Information Grid over extended distances and complex terrain.

The FCS FoS integrates into the multi-layered communications and computer network with unprecedented range, capacity, and dependability. The network provides secure, reliable access to information resources throughout the Global Information Grid (GIG) over extended distances and complex terrain. The UA will exploit the potential of network centric operations, advanced NETOPS (Network Management, Information Assurance, and Information Dissemination Management) and IM systems and procedures. These advanced information systems will ensure dissemination of critical information both within and external to the UA.

The network will not rely on a large fixed infrastructure but will be embedded in mobile platforms and move with the combat formations. The network is designed to facilitate BCOTM to achieve offensively oriented, high tempo operations. The communication/information system enables:

- The Battle Command system.
- Interoperability with legacy, interim, joint, interagency organizations.
- Adaptation to allies and coalition forces.
- Mission planning, rehearsal and After Action Review from the FCS platform.
- User friendly operation and software updates without removing hardware from the platform.
- Reach, the process by which military forces rapidly access information, receive support, and conduct collaboration and information sharing with other units unconstrained by geographic proximity, echelon, or command.
- Shared data converted to information that enables developing and maintaining higher levels of situational awareness.

4.6.2.10 Information Assurance. Information Assurance (IA) ensures the availability, integrity, identification, authentication, confidentiality, and non-repudiation of friendly information and systems, and forbids access to friendly information and systems by hostile forces. IA includes provisions for protection, detection and response capabilities. These capabilities include systems that ensure emission security (EMSEC), communications security (COMSEC), computer security (COMPUSEC), and information security (INFOSEC). IA also includes the detection capability needed to identify attacks, damage, or unauthorized modifications in the network. IA implies a response capability to restore normal network operation and to initiate a possible follow-on information operations response. Annex H contains further clarification of Information Assurance. For more information, refer to Annex H.

4.6.2.11 Ten Big Ideas of Battle Command. Battle Command is accomplished through the construct of ten principles of Battle Command. The principles of battle Command are:

- Commander based-purpose oriented-knowledge based-mission orders: Decentralized execution by all arms will become mandatory. Maximum initiative, within commanders' intent, will allow application of combined arms at the tempo envisioned.
- Echelonment of command is not the same as echelon of command: The appropriate mix of Networked Battle Command, maneuver, maneuver sustainment, and maneuver support is mission dependent and not tied to organizational convenience.
- Networked Battle Command resourced for sustained operations: The Networked Battle Command system must be structured and resourced for the long haul in terms of distance and duration.
- Networked Battle Command-anytime, anywhere: High tempo, fluid maneuver from strategic distance will require the commander to exert personal presence at the points of decision across vast areas.
- Teaming commanders and leaders-on demand collaboration: Distributed operations and high tempo maneuver will demand rapid synchronization, swift adaptation of plans and control

measures, flexible groupings of distributed staff elements, and direct exchanges between commanders across hierarchies.

- Fully integrated: space to mud, factory to foxhole: Joint interdependence demands that Army forces dominate maneuver, execute precision fires, efficiently support and sustain Army and Joint elements, and provide full dimensional protection.
- One networked Battle Command system: A unitary networked Battle Command system empowers tactical commanders to execute combined arms maneuver more effectively than any in history. Because the Battle Command system is interoperable with Joint systems, Army forces will be able to support and be supported by Joint elements.
- Unprecedented information network dependability: A multi-tiered network will allow commanders to reach across tactical boundaries and across theater.
- Modular, scalable, tailored Battle Command: Highly tailored and responsive Army forces will require Networked Battle Command matched and positioned precisely for Theater needs.

Dramatically smaller deployed footprint: The pace and scope of maneuver, in and outside the Theater, mandates a networked Battle Command system that is equally maneuverable.

4.6.3 Intelligence, Surveillance and Reconnaissance

Intelligence, Surveillance and Reconnaissance (ISR) is the integration of intelligence, C2, R&S and information collection and management. It includes the five steps of the intelligence process of plan, prepare, collect, process, and produce. The UA has a significantly greater ISR capability than any brigade sized element ever fielded by the US Army. ISR is designed with the enhanced capability to develop and understand the situation before and during engagements, and then disseminate that information to share situational awareness.

4.6.3 ISR

4.6.3.1 Reconnaissance and Surveillanc

4.6.3.2 Target Acquisition

4.6.3.3 Unattended Ground Sensors

4.6.3.4 DCGS-A Architecture

Current force maneuver brigades employ ISR assets in support of brigade objectives; most of the ISR assets belong to subordinate units. The collection effort is top-down driven to cover established named and target areas of interest identified during the IPB process. This construct limits the ability of lower echelons to reposition sensors to support their own missions, but is the most efficient method to cover critical areas and targets given the limited number of available sensors. In the Objective Force collection planning will evolve more balanced process. The significant increase in both number and capabilities of sensors will enable each echelon to See First in support of their mission. Layered sensors from individual soldiers to national systems will cover the entire battlespace. Each echelon maintains the responsibility to synchronize and integrate collection within their AO both to cover surveillance gaps or "white space" created by subordinate unit non-contiguous operations, and to reduce excessive redundancy in area coverage by multiple sensors. Orders to redirect subordinate sensors will be by exception rather than as a normal method of employment. With wide area, near persistent surveillance capabilities at higher echelons, the non-contiguous battlespace will receive sufficient coverage to give all echelons greater flexibility to optimize employment of their sensors.

The robust ISR in the UA, coupled with substantial improvements in access to Joint, Theater, and National ISR assets greatly enhances survivability, lethality, speed, mobility and mutual support by seeing and understanding first. The R&S assets of the UA identify terrain characteristics, enemy and natural obstacles to movement, and the disposition of enemy forces and civilian populace so commanders at every echelon can maneuver forces freely and rapidly.

> **Reconnaissance Pull allows the commander to use the products of the IPB Process in an interactive and iterative way. He obtains combat information from his reconnaissance assets to determine a preferred COA for the tactical situation presented by the factors of METT-TC.**
>
> **FM 3-90**

Reconnaissance of routes prior to unit movements is critical to survivability of the force and keeps the force free from contact so it can move to positions of advantage before decisive operations. With the advanced fire control and precision fires available to the UA, R&S operations facilitate lethality and allow units moving on parallel axes, in different terrain compartments to provide mutual support. Assured mobility is a key capability of the UA. Small units in the UA achieve assured mobility by moving with a reconnaissance-pull to parallel routes around enemy forces to positions of advantage. In reconnaissance-pull, UA Commanders use intelligence that feeds the DIDb in an interactive and iterative way. He obtains combat information from his R&S assets to develop a COA. In the UA, intelligence is developed from R&S assets and displayed in near-real time on the COP. This rapid dissemination of actionable information results allows units to collaboratively alter the plan while on the move, attacking enemy weaknesses and seams and avoiding his strengths.

The UA is designed with robust, organic R&S capabilities at every echelon of command. The UA's organic aviation squadron is organized around 12 RAH-66 Comanche aircraft organized into two Flight Troops, teamed with Class IV UAVs. In addition, the NLOS Battalion has organic Class III UAVs for the purpose of

identifying and targeting HPTs in the UA's AoI. The Reconnaissance Troop organic to each CA Battalion contains three reconnaissance platoons, each with three reconnaissance and surveillance vehicles, optimized for reconnaissance missions with an on board prophet collection system. Each recon platoon also has a Class III UAV and an organic ARV optimized for RSTA capabilities. Each reconnaissance squad in these platoons has a small unmanned ground vehicle with an array of RSTA mission payloads and a Class I UAV for close route reconnaissance and counter-reconnaissance. MCS and infantry companies have three Class II UAVs that can hover and perch. MCS and infantry platoons each have an ARV-A and the infantry platoons have Class I UAVs to enable reconnaissance-pull for the lead squad of the platoon. ISR must facilitate perception, comprehension, and projection. ISR success is measured in terms of enabling leaders to understand how to employ their capabilities to achieve the desired end state and to do so with better confidence and operational effectiveness. The UA's ISR system of systems will be aided by automation to process, fuse, and manage the distribution of actionable information. The concept of the ISR portion of the network is as complex as it is critical to provide a 'see, decide and act' advantage over future opponents.

4.6.3.1 Reconnaissance and Surveillance. Reconnaissance and surveillance (R&S) operations are those operations undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographical or geographical characteristics and the indigenous population of a particular area. Reconnaissance and surveillance are focused operations performed before, during and after other operations to provide information used in IPB. The UA is organized to exploit echelons above the UA wide area persistent staring capabilities to enable cueing of more precise organic sensors. The wide area sensors are designed to cue other, more specific sensors, allowing follow-on collecting of more detailed information by another system. Electronic, thermal, acoustic, visual and other technical assets with wide-area surveillance capabilities, often working with aerial platforms, can quickly determine areas of enemy concentration or areas where there is no enemy presence. These wide area assets cue follow-on collection by ground and air reconnaissance sensors to investigate specific areas to confirm and amplify the information developed by the technical assets. For example, access to a variety of aerial platforms from UE, Joint and National provides wide area coverage to cue organic reconnaissance assets to obtain targeting information or fill in intelligence gaps. Similarly, a ground reconnaissance asset could cue technical surveillance assets to find a radar guided air defense system. The layered R&S assets of the UA are designed to use the complementary capabilities of other assets to verify and expand information.

The R&S assets in the UA are designed to be integrated mixed in the collection plan. Employing a mix of systems is always desirable and the UA is designed to provide the robust assets to enable this mixing. Mixing uses two or more different types of assets to collect against the same PIRs. Employing a mix of systems not only increases the probability of collection, but also tends to provide more complete information. For example, a JSTARS aircraft may detect a moving enemy force. The UA ISR cell uses organic and supporting assets to determine the identity, organizational structure and indications of future plans. The UA conducts R&S with a combination of manned, unmanned ground and air assets supported by technical collection systems. Acting in concert, these assets create a synergy, using the strengths of one system to overcome the weaknesses of another. This permits the UA to optimize their R&S assets as part of an integrated "mud-to-space" ISR effort to produce synergy. The UA's Battle Command system and situational awareness teams accept data and information from the complete array of sensors and R&S assets, fuses it to produce intelligence and posts the fused intelligence on the COP to allow rapid execution. The UA is organized with air and ground reconnaissance assets at every echelon.

Ground reconnaissance units in every combined arms battalion are primarily designed to facilitate target acquisition and reconnaissance-pull for assured mobility. There are specific platforms within the UA, both manned and unmanned optimized for RSTA operations. These ground recon assets can operate in weather conditions that limit or prohibit air reconnaissance. In addition to aerial reconnaissance assets, each combat platoon has unmanned ground vehicles to provide organic reconnaissance to small units, significantly reducing the chance of tactical surprise. Aerial platforms, manned and unmanned, complement ground reconnaissance by greatly increasing the speed and depth of R&S operations that can be conducted over a given area. The air component is designed to operate easily over rugged terrain that hinders ground operations like swamps, mountains or deep snow. Aviation assets and organic UAVs can operate at considerable depth, providing the commander with additional time to develop an operation inside

the enemy's decision cycle. Technical systems in the UA conduct both surveillance and reconnaissance missions. Multi-mission radars and unattended ground sensors provide surveillance and can cue reconnaissance assets or can be cued by reconnaissance assets. UA sensors will be multi-platform, multi-functional systems with Measurements and Signatures Intelligence (MASINT), SIGINT, IMINT, Electro-Optic/Infrared, and CBRN capabilities. These families of ISR sensor systems enhance the commander's ability to "See First". Manned and unmanned ground and air vehicles, as well as unattended ground sensor systems, carry mission packages of sensors tailored to the target on which they are collecting.

4.6.3.2 Target Acquisition. One of the key responsibilities of the reconnaissance and surveillance assets of the UA is target acquisition. The goal of the target acquisition effort is to provide timely and accurate information to attack specified targets, normally HPTs and most dangerous targets. Target Acquisition systems perform the key tasks of detection, classification, recognition, identification and battle damage assessment. All platforms and soldiers can establish a direct sensor to shooter link via the networked fires application. In this manner, target acquisition in the UA is not limited to the traditional target acquisition means found in today's direct support artillery battalion. In addition to the sensor platoon of the NLOS battalion, every UAV, platform and soldier acts as a target acquisition system. The Sensor Platoon of the NLOS Battalion is organized with three Class III UAV launch systems and six multi-mission radars to provide acquisition of threat mortar, artillery, air defense and rocket systems.

There are four levels of acquisition; detection, classification, recognition and identification.

- Detection: 1. In tactical operations, the perception of an object of possible military interest but unconfirmed by recognition. 2. In surveillance, the determination and transmission by a surveillance system that an event has occurred. 3. In CBRN environments, the act of locating hazards by use of detectors or monitoring and/or survey teams. When you detect an object, you know something is there but do not know what it is. Detection in the UA will also include knowing the location of the object or target.

- Classification: The systematic arrangement in groups or categories according to established criteria. When you reach the second level of acquisition, you can place the object within a category. For instance you may detect a potential target and know it is a tracked vehicle, but nothing else.

- Recognition: The determination by any means of the individuality of persons, or of objects such as aircraft, ships, or tanks, or of phenomena such as communications-electronics patterns. In ground combat operations, the determination that an object is similar within a category of something already known; e.g., tank, truck, man, the results of bombing, or on enemy movements, concentrations, activities, and forces. Recognition is the first level of acquisition that you can target within the ROE. Recognition implies that you recognize the target within the category in which you have classified it. In other words you classify a target as a tank.

- Identification: In ground combat operations, identification is the discrimination between recognizable objects as being friendly or enemy, or the name that belongs to the object as a member of a class. This definition combines two distinct ideas – 1) Target ID, "the name that belongs to the object…" (what the target is), which provides the basis for combat ID; and 2) Combat ID, which establishes whether the target is friendly, enemy, neutral, or non-combatant. Combat ID is usually a judgment based on Target recognition or ID combined with Situational Awareness. Example: Target ID would determine a potential target as a T-72 tank; Combat ID would determine the target is an enemy or neutral T-72 tank.

4.6.3.3 Unattended Ground Sensors. Unattended Ground Sensors (UGS) are part of the layered sensor network and broader intelligence gathering architecture. UGS variants include MASINT (ISR), Urban/MOUT Advanced Sensor System (UMASS) and CBRN. UGS are small, low cost, robust sensors, capable of operating in the field for extended periods of time (30 days or more). They will consist of modular groups of sensors utilizing tailorable ground sensing technologies, such as seismic, magnetic, infra-red, acoustic, radio frequency, and CBRN detection and other advanced sensing capabilities. UGSs self-organize into a networked sensor array (sensor web) by locating the most efficient gateways for transmission of information. They are also self-healing, able to quickly bypass a neutralized gateway and locate a functional one within the sensor web. The UGS web is capable of target acquisition and tracking

through internal signature processing. Once employed, the threat target signature sets and processing algorithms within the sensors are remotely reprogrammable and updated via the network.

The sensor web parses, processes, and correlates data into standard formats for digital transmission to the DIDb. The information is accessible to any FCS UA platform or Soldier system via the COP based on user profiles and filters. Information maintained by the DIDb is also accessible to the UE and JTF DIDb via the GIG. UGS variants have an inherent Level 1 fusion capability to reduce redundancy of information transmitted to the DIDb. UGSs are a component of the layered sensor approach to leverage all sources of ISR information, from internal and external sources, to build a high fidelity COP. Each UGS sensor array is part of a coherent ISR collection plan to meet the Commander's CCIR and gain information dominance within the UA's Area of Influence. The UA employs UGS in all terrain sets to develop the situation out of contact, refine information during contact, facilitate the tactical assault or enable transition to the next engagement. The CA Battalions employ UMASS UGS primarily in urban and complex terrain to help isolate and provide unmanned security during close combat. A variety of UE and UA delivery systems (aerial, ground and NLOS systems) can emplace/deliver the UGS.

Initial UGS emplacement occurs during the UE and higher shaping effort in order to develop the situation out of contact. This allows for minimizing the UGS basic load carried at the UA level, allowing the UA to carry more lethal and/or non-lethal munitions. However, the UA must retain the organic capability to rapidly emplace a UGS sensor array in response to fluid battlefield situations and adaptive threat forces. Control of UGS emplaced by the UE during shaping operations, is transferred to the UA as it closes on the AO. The UGS gathers information and cue other point targeting sensors such as UAVs, IMS, and unmanned ground vehicles. The UA's platforms and Soldiers also have the capability to directly cue those sensors. This transition of sensor control is transparent to the UA maneuver forces. The UA employs the UGS in a variety of roles and missions to shape the battlespace, set conditions for maneuver, and perform economy of force missions. The mission sets include: remote early warning (including CBRN early warning); non-contiguous area overwatch; reconnaissance, surveillance and target acquisition perimeter security; force protection and survivability; and communications relay. Examples of how the UA may employ UGS include:

- Coverage of point and area NAIs either as a single asset or in conjunction with other manned and unmanned sensors.
- Integrated CBRN smart sensors to provide detection capability of a release from WMD production or storage facilities as part of ISR coverage of an NAI or post-strike battle damage.
- Surveillance of mounted and dismounted avenues of approach outside urban areas to facilitate condition setting for the tactical assault.
- Force protection and area observation, and ISR operations within urban and jungle areas for dismounted infantry operations.
- Ground reconnaissance efforts by maintaining sensor contact and allow soldiers to continue performing other reconnaissance tasks.
- Flank security for more static key assets such as the FSB, Aviation Assembly Areas and FARPs.
- Screen missions, deception actions and gray space coverage within the UA area of influence as an economy of force role.
- Communications relay for the sensors and a redundant means for FCS platforms.

4.6.3.4 Intelligence: Distributed Common Ground System-Army (DCGS-A) Architecture. DCGS-A is the Army's gateway for intelligence reach into Joint and National organizations and agencies. DCGS-A is the Army's ISR tasking, processing, exploitation, and dissemination system. Within the UA, the DCGS-A software resides on Battle Command system common hardware at all echelons. Additionally, at UE and above, DCGS-A is composed of unique hardware for direct links to select sensors, to perform sensor control when appropriate permissions are granted, and for robust ISR processing. The core functions of DCGS-A are:

- Collection and processing of space, airborne and ground ISR sensor systems.

- Intelligence synchronization.
- ISR planning.
- Reconnaissance and surveillance integration.
- Fusion of sensor information.
- Direction and distribution of sensor information and fusion products.

DCGS-A is responsible for providing the fused red, white, grey, and environmental information for the COP. To create the COP, the DIDb fuses information from all sensors and platforms, including the enemy situation, civilian situation, and battlespace information. DCGS-A serves as a bridge to persistent ISR sensors (service, joint, inter-agency, national, allied, coalition, & commercial) at all echelons. DCGS-A enables the BIC to provide the intelligence running estimate which, when combined with the running estimates of other staff sections, forms the commanders running estimates. Using DCGS-A, the information superiority cell coordinates with the other staff cells and translates PIR into an ISR synchronization plan. The ISR synchronization plan results in taskings and requests for available sensors at multiple Army echelons. In some cases the tasking/request will require DCGS-A to control other service, joint, or national ISR sensors. The Joint Force Commander has the option of directing use of this cross-service capability to meet his operational needs. This capability to control ISR sensors are in accordance with the JROC approved DoD DCGS CRD. ISR integration, enabled by DCGS-A, supports lethal and non lethal fires and effects by providing information and intelligence to those elements of the force engaged in the targeting process. DCGS-A supports BDA by providing near-real-time attack assessment through access to both ISR and combat systems' sensors. This feedback is in turn available on the COP. BDA results are posted to the DIDb and become available to all elements of the Combined or Joint force according to established profiles and filters.

4.6.4 Maneuver

4.6.4	**Maneuver**
4.6.4.1	**Precision Maneuver**
4.6.4.2	**Forms of Maneuver**
4.6.4.3	**Types of Offensive Operations**
4.6.4.4	**Modes of Operations**
4.6.4.5	**Lethality**
4.6.4.6	**Mounted/Dismounted Integration**
4.6.4.7	**Air-Ground Integration**
4.6.4.8	**Manned-Unmanned Teaming**

Maneuver is the other component of the UJTL task "Deploy/Conduct Maneuver. Section 4.5.2 outlined the UA's ability to deploy with a credible force within 96 hours and conduct intra-theater operational maneuver into multiple, austere landing sites. Because of its ability to conduct air, land and sea tactical and operational maneuver to operational depth, the UA can achieve operational level effects through its tactical actions. The UA is optimized for offensive operations that seek to seize, retain and exploit the initiative to decisively defeat the enemy. The UA attacks throughout the area of operations and area of influence simultaneously to throw the enemy off balance and overwhelm their capability to react. It does so by identifying those enemy objectives or forces whose destruction or disintegration will cause decisive results at the theater level and setting the conditions for decisive action against those targets. UA offensive operations attack enemy centers of gravity directly or indirectly by isolating and attacking enemy decisive points and high payoff targets. By denying the enemy freedom of action and disrupting his sources of strength the UA sets the conditions for tactical and operational success.

Decisive offensive operations are attacks that conclusively determine the outcome of major operations, battles and engagements. At the operational level, decisive operations achieve the goals of each phase of a campaign. Within a campaign plan, each phase has a major goal, the accomplishment of which substantially affects the course of the campaign. The UA wins decisive operations through close combat that physically destroys the enemy; overcomes his will to resist; or seizes or occupies and retains decisive terrain. The UA is organized to give it the ability to conduct shaping operations in support of its own or adjacent unit decisive operations. Shaping operations create the conditions for the success of the decisive operation. They include attacks in depth by maneuver or fires to secure advantages for the decisive operation or protect the force. The UA has a significantly greater ability to shape the battlespace than current forces by engaging enemy forces simultaneously through a much broader area of influence. By simultaneously attacking enemy forces throughout the Area of Influence with organic and joint fires and maneuver, the UA creates vulnerabilities for exploitation. The UA conducts shaping operations to achieve one or more of the following effects:

- Destroy enemy HPTs.
- Destroy or fix enemy forces that could interfere with the decisive operation.
- Control decisive terrain that offers a position of marked advantage or allows overlapping sensor coverage.
- Force the enemy to commit reserves prematurely or interdict uncommitted enemy forces before they can be committed.
- Maneuver to positions of advantage out of contact to unhinge enemy forces and cause the disintegration of his formation.

The UA differs from today's combat brigade in its ability to execute multiple engagements simultaneously, more effectively, and in rapid succession over an even larger area of influence. The UA develops the situation out of contact, rapidly maneuvering to positions of advantage using superior information of friendly and enemy positions. The UA attacks HPTs, tactical centers of gravity and other critical targets at decisive points to dislocate, destroy, disintegrate or isolate enemy formations. It continues to develop the situation in contact through continuous, near real time updates to the COP from organic sensor assets.

In the past, the lead battalion of a combat brigade would conduct a cautious movement to contact to develop the situation. The UA will fight differently. In the UA, input from layered sensors, fused, disseminated, and displayed on a continuously updated COP, provides near real time information to facilitate a rapid decision-making cycle. By developing the situation out of contact through organic, Army and Joint ISR assets, the UA commanders can determine how best to maneuver to positions of advantage. The UA capitalizes on the C4ISR enhanced knowledge base of its area of influence to enable this scheme of maneuver. The effectiveness of UA maneuver presents a dilemma to the enemy: either remain in position and endure lethal effects from tactical standoff, or move in an attempt to reduce the vulnerability of his position. However, the presence of a maneuver threat in a position of advantage presents another dilemma for the enemy force. By displacing, the enemy risks exposing his force to exploitation by ground maneuver and the effects of joint fires.

Position of advantage is a location within a unit's battlespace or area of influence from which it can employ lethal or nonlethal effects on an enemy force from tactical stand-off. It can also be a location where employment of a UA element provides a maneuver advantage, or steals an enemy option by virtue of position, i.e., operational maneuver via intra-theater lift.

4.6.4.1 Precision Maneuver. Enabled by information dominance, precision maneuver represents a change in the tactical maneuver paradigm. Instead of engaging the enemy in a movement to contact to develop the tactical situation, the UA is designed and equipped to develop the situation before contact. The COP, available to every platform and dismounted soldier through the Battle Command system, allows rapid, visual understanding of the terrain. 3-D digital terrain tools allow commanders and small units to understand natural obstacles, line of sight and inter-visibility lines along their avenue of approach, before they cross the LD. The robust embedded ISR assets in the UA allow a much more detailed picture of the enemy disposition and obstacles, adjusted near-real time and shared across the COP. Precision fires, both non line of sight and beyond line of sight, allow small units in the UA to selectively destroy key enemy systems and forces on the avenue of approach, creating assailable flanks or seams in the enemy defense. What all of these capabilities mean is that the UA has a much better chance of finding or creating the seam or the covered route through or around the enemy defense than current heavy forces of today.

4.6.4.2 Forms of Maneuver. The five forms of maneuver remain the same. They are envelopment, turning movement, infiltration, penetration and frontal attack. Because of its inherently greater ability to maneuver, the envelopment and turning movement are the primary forms of maneuver used by the UA. The UA improves on today's GPS and current generation of force tracking tools with precision knowledge of the terrain using shared 3-D digital terrain. The biggest advantage is the ability of the FCS platform, because it is smaller lighter and has greater cross-country mobility. The FCS family of systems will be able to cross bridges, traverse terrain, and fit between buildings that the current generation of vehicles cannot. The UA also has a greater ability to gain and maintain contact with the enemy, thus enabling the information dominance required for precision maneuver. The ability to act on this informational dominance is ensured by the tools described above, and the inherent manned-unmanned teaming; the greater ability to shape the battlefield by destroying HPTs; and the ability to provide overwatch on the move.

4.6.4.2	**Forms of Maneuver**
4.6.4.2.1	**Envelopment**
4.6.4.2.1.1	**Encirclement**
4.6.4.2.1.2	**Vertical Envelopment**
4.6.4.2.2.	**Turning Movement**
4.6.4.2.2.1	**Envelopment to Opn'l Depth**
4.6.4.2.3	**Infiltration**
4.6.4.2.4	**Penetration**
4.6.4.2.5	**Frontal Attack**

4.6.4.2.1 Envelopment. To envelop the enemy, a commander must find or create an assailable enemy flank. Sometimes the enemy exposes a flank by advancing, unaware of friendly locations. In other

conditions, a combination of air and indirect fires may create an assailable flank by fixing or isolating the enemy. The UA can also create an assailable flank by arriving from an unexpected direction. An air assault is an example of such a shaping operation. In another example, the tactical mobility of the UA allows it to go where the enemy thinks the UA cannot, thus creating an assailable flank through maneuver.

The UA is optimized to avoid the enemy front where he can concentrate fires in conjunction with mines and obstacles. For instance, the light weight of the FCS platform and its unparalleled cross country movement capability allow the UA to move through mountainous regions spanning Military Load Classification (MLC) 20 bridges where M1 tanks cannot travel. When facing a UA, the enemy must either cover a much wider area of possible avenues of approach, thinning his forces, or leave an assailable flank in terrain he thinks the UA cannot traverse. Because the UA is designed to achieve information dominance, it can maneuver much more precisely, often on parallel axes, significantly increasing the chance of finding the seam to the enemy flank or rear.

The envelopment is a form of maneuver in which an attacking force seeks to avoid the principal enemy defenses by seizing objectives to the enemy's rear to destroy the enemy in his current position. At the tactical level, envelopment focuses on seizing decisive terrain, destroying specific, key enemy forces and interdicting enemy withdrawal routes.

4.6.4.2.1.1 Encirclement. Envelopment by a UA may results in an encirclement of the enemy. Encirclement is an operation where one force loses its freedom of maneuver because the opposing force is able to isolate it by controlling all ground lines of communication. The UA is designed to be able to execute encirclements as an extension of a pursuit or envelopment. The UA applies direct pressure to the enemy, maintaining contact beyond the range of his weapons and preventing his disengagement. Meanwhile, the encircling force maneuvers by vertical or horizontal envelopment to envelop the enemy cutting off his escape routes. The encircling force seizes a position of advantage, usually on decisive terrain directing organic, joint and UE fires to complete the destruction of the enveloped enemy force. On the non-contiguous battlefield, opportunities for encirclement will often occur.

4.6.4.2.1.2 Vertical Envelopment Vertical envelopment consists of both air assaults of dismounted infantry and aerial envelopment to operational depth of mounted forces by fixed wing and future advanced airlift. Dismounted air assault is conducted to extend tactical reach, negate effects of terrain, seize key nodes, attain surprise, and dislocate or isolate enemy forces in contact or in imminent contact. Vertical envelopment to operational depth can create an envelopment of the enemy or a classic turning movement, as described later on in this chapter. The purpose of vertical envelopment at the tactical level is to create and exploit assailable flanks or rapidly exploit an opportunity presented by the enemy. Successful execution of a vertical envelopment confronts the enemy with overwhelming, multi-dimensional dilemmas throughout the depth of his force. A vertical envelopment is tactical maneuver in which air assaulted troops and/or manned aviation systems linked to Joint C4ISR and effects are able to launch unexpected attacks into the rear and flanks of an enemy. These operations in effect cut off or encircle the enemy, creating assailable flanks for exploitation by other maneuver forces.

3-D maneuvers are not significantly different in concept in the UA, but they are very different in character and scope. With the capability to employ 3-D control measures, on the COP, shared between aviation and ground units, lift assets from the UE are fully integrated into three-dimensional maneuver. The UA has capabilities to use vertical envelopment for a number of tactical advantages:

- Threaten enemy rear areas causing the enemy to divert combat elements to protect vital installations and hold key terrain.
- Overcome distances quickly, overfly barriers, and bypass enemy defenses.
- Extend the area over which the UA can exert its influence.
- Disperse reserve forces widely for force protection while maintaining their capability for effective and rapid response.
- Seize decisive terrain and remove enemy options in conjunction with a ground pursuit.

- Execute a ground attack in conjunction with an air assault by one CA Battalion against an operational center of gravity in urban or complex terrain.
- When restricted terrain is decisive but occupied by the enemy, the UA can employ vertical envelopment with Army and Joint aviation in close support, of an infantry force to the rear of the enemy to unhinge him or set conditions for a quick tactical decision.

Vertical envelopment can also be used to emplace NLOS-LS forward on the battlefield to gain a range advantage over enemy long range artillery systems allowing the UA to dominate its area of influence. Vertical maneuver may be an independent action, but is normally conducted as a complementary part of a larger operational maneuver. UE Aviation assets provide lift, aerial reconnaissance, and attack aircraft to support vertical envelopment. UE aviation assets will air assault dismounted forces, equipment and munitions of up to battalion size. In addition to lift requirements, vertical envelopment requires:

- Continued air superiority.
- NLOS coverage of the landing zone and subsequent area of operation.
- Detection and suppression of enemy air defense.
- Detection, suppression, and destruction of enemy strike assets that range the LZ.
- Shared situational awareness within the air-ground team.
- Aerial resupply until ground link up occurs.
- BCOTM of all facets of air-ground operations.
- NLOS communications connectivity.

A turning movement is a form of maneuver in which the attacking force seeks to avoid the enemy's principal defensive positions by seizing objectives to the enemy's rear and causing him to move out of his current positions or divert major forces to meet the threat.

4.6.4.2.2 Turning Movement. As turning movements typically requires a much greater depth than other forms of maneuver, the UA's inherent ability to conduct intra-theater operational maneuver by air, land or sea makes it an ideal force for a turning movement. To provide the Joint Force Commander the maximum operational flexibility, the UA will be able to conduct operational maneuver throughout a campaign. Once in theater, the UA can be transported by a wide range of air, land, or sea modes for operational maneuver. After moving 500 nautical miles by air or sea to austere ports of entry, the UA will be able to make a 400 km operational move by ground and fight for 72 hours without resupply.

A turning movement can also be conducted to expose the depth of the enemy formation to direct attack, separate echelons, prevent massing, and deny enemy reinforcement. Similarly aerial envelopment of a mounted force requires the capability to lift elements of a battalion size with FCS vehicles, munitions, and crews to unimproved areas to secure objectives to the enemy's rear and gain position of relative advantage. A major threat to his rear forces an enemy to attack or withdraw rearward, thus "turning" him out of his defensive positions. The JFC can move a CA Battalion and a NLOS Battery, or even the entire UA over 500 miles with the C130s and C17s in direct support to his theater without external TRANSCOM augmentation. The result is a brigade combat team in the enemy's rear with the lethality of a current M1A2 equipped heavy brigade.

4.6.4.2.2.1 Vertical Maneuver to Operational Depth. The UA will exploit its unique capabilities by conducting intra-theater air maneuver operations. It can leverage austere points of entry to increase the options available to the combatant commander within the theater. The UA can combine available C-130s and C-17s to maximize force flow using multiple entry points to bring in combat configured units. The UA will be able to be delivered into austere environments and operate autonomously or semi-autonomously, allowing CA Battalions introduced at multiple points to move over operational distances and join at an objective.

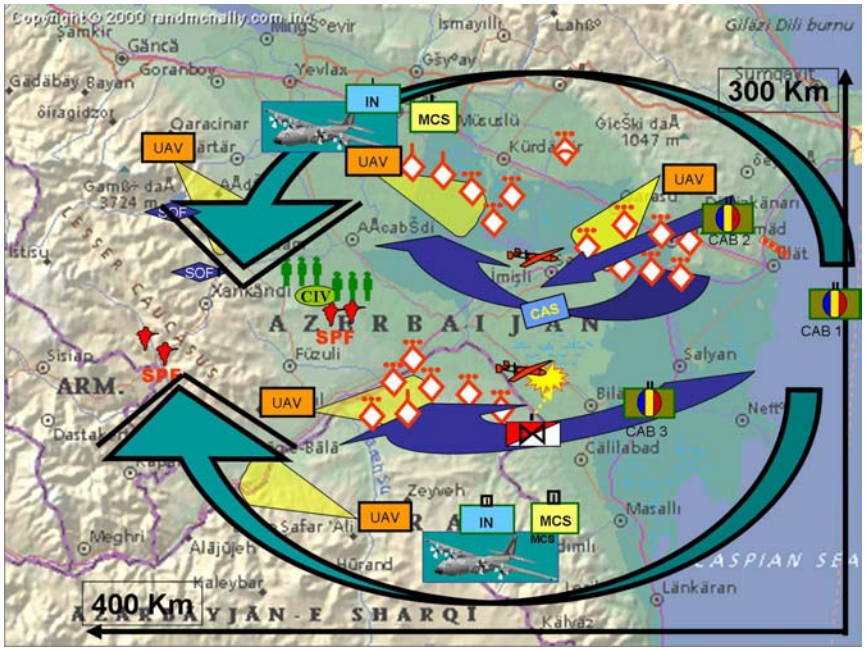


Figure 4-7 Vertical Maneuver to Operational Depth

The UA has the capability to command and control UA battalion-size operational envelopments, but will rely on the UE augmentation to command and control UA brigade-size and larger operational envelopment operations. The UA will be even more capable of vertical envelopment to operational depth with future airlift design aircraft. Future advanced aircraft can take off in as little as 2400 feet on a dirt landing strip. The future Advanced Tactical Transport using super short take off and landing technology would be able to use as little as 750 feet and potentially in a field, while the Joint Tactical Rotorcraft would have a vertical take-off and landing capability.

4.6.4.2.3 Infiltration. Today, FM 3-0 states that the need to avoid being detected and engaged may limit the size and strength of infiltrating forces. As a result, infiltration is rarely used to defeat a position by itself. Commanders use infiltration to attack lightly defended positions or stronger positions from the flank or rear, to secure key terrain in support of decisive operations, or to disrupt enemy sustaining operations. Typically, forces infiltrate in small groups and reassemble to continue their mission.

An infiltration is a form of maneuver in which the attacking force conducts an undetected movement through or into an area occupied by enemy forces to occupy a position of advantage in the enemy rear while exposing only small elements to enemy fire.

Because of the UA's ability to move on and provide mutual support on multiple parallel axes, infiltration in the UA is a decisive form of maneuver. A CA Battalion moving through an enemy area defense moves on multiple parallel axes. Because of shared situational awareness and the robust ISR capability at every echelon, the company(s) that finds the open route can redirect the remainder of the force onto that cleared route, allowing a heavy force to infiltrate to the enemy's flank or rear, with much greater lethality and survivability. Even a dismounted infiltration by UA equipped infantry arrives at the objective with ARV-A (L)'s, which can kill a T-72 main battle tank, equipped with enhanced reactive armor and active protective systems. The ability of the UA to conduct mounted and dismounted infiltrations is more than just the ability to find the open route on parallel routes. It is the ability to see and fire into the adjacent terrain compartments, and the ability to overwatch on the move within shared 3-D digital terrain. The shared situational awareness of the terrain, friendly and enemy forces that facilitate envelopment or turning movement will also facilitate an infiltration when envelopment is not possible.

4.6.4.2.4 Penetration. Because commanders use penetrations when enemy flanks are not assailable or time does not permit another form of maneuver, penetrations often risk significantly more casualties than envelopments or turning movements. Successful penetrations create assailable flanks and provide access to enemy rear areas. Swift concentration and massing of effects are particularly important at the point of penetration to make the initial breach. After initial penetration, forces will widen the penetration by enveloping the enemy units on the shoulders of the penetration, passing forces through to seize objectives in the enemy rear and defeat the penetrated forces in detail. Forces which make the initial breach must move rapidly to avoid enemy counterattacks on their own flank. The UA is designed to avoid penetrations. Because of the increased range and mobility of FCS platforms, enemy flanks are more often assailable. When the UA can envelop an enemy force by up to hundreds of kilometers, it will be easier to find that flank or seam.

A penetration is a form of maneuver in which an attacking force seeks to rupture enemy defenses on a narrow front to disrupt the defensive system.

If the UA must conduct a penetration, it is organized and equipped to do so. The robust ISR capabilities organic to the UA, both air and ground, manned and unmanned at every echelon allow the UA and its subordinate units to much more accurately understand the terrain and enemy at the point of a penetration. With a significantly greater level of SA on enemy positions and the organic precision fires available to the UA, combined arms battalions can use direct fire from beyond line of sight and/or indirect fires from NLOS to destroy enemy forces at the point of the penetration. This is not the same technique as massing artillery at the point of penetration, which often fails to dislodge or destroy a determined, dug in enemy. It is the application of direct fire at specific enemy positions from beyond the range of his weapons to destroy those enemy systems and small units which can affect the breach. The vastly superior mobility of the FCS family of systems allows small units to move cross country, while avoiding enemy engagement areas and using dash speed to move from cover to cover while closing with the enemy. One of the key dangers to a penetrating force is an enemy attack from the flank at the mouth of the breach. The superior ability of the UA and its subordinate units to see and kill enemy forces not yet joined gives it a distinct advantage in making a penetration.

4.6.4.2.5 Frontal Attack. At the tactical level, FM 3-0 states that an attacking force uses a frontal attack to rapidly overrun a weaker enemy force. In a frontal attack, the force attacks over a wide front with the most direct approach. Commanders today normally use a frontal attack when they possess overwhelming combat power and the enemy is at a clear disadvantage. Today, units executing a frontal attack mass the effects of direct and indirect fires, shifting indirect fires just before the assault. Success in a frontal attack depends directly on achieving an overwhelming advantage in combat power.

A frontal attack is a form of maneuver in which an attacking force seeks to destroy a weaker enemy force or fix a larger enemy force in place over a broad front.

The frontal attack is frequently the most costly form of maneuver, since it exposes the majority of the attackers to the concentrated fires of the defender. As the most direct form of maneuver, however, the frontal attack is useful for overwhelming light defenses, covering forces or disorganized resistance. It is often the best form of maneuver for hasty attacks and meeting engagement where speed and simplicity are essential to maintain tempo and initiative. Commanders may direct frontal attacks as a shaping effort in support of decisive operations. In the operational environment in which the UA will operate, the enemy will probably not operate in a linear defense, as fixed positions offer an opportunity for US forces to use overwhelming firepower. A frontal attack in the future will probably look much more like the 3rd Infantry Division's attack into Iraq in Operation Iraqi Freedom. This is similar to the conventional attack through a covering force whose purpose is to inflict casualties and cause the early deployment of our forces.

Although the UA has the inherent situational awareness to avoid frontal attacks, it is organized and equipped to execute a hasty attack to destroy an enemy covering force in a frontal attack across the width of the enemy front. The UA is designed specifically to use superior situational awareness to conduct an opportunistic hasty attack with the information level of a deliberate, rehearsed attack. The UA is designed to attack on multiple parallel axes across a wide front using its superior ISR capabilities to find and exploit

the seams and weaknesses in the enemy defense. By using precision BLOS capabilities to provide mutual support across terrain compartments while moving, the UA has inherent advantages in its ability to defeat a covering force or lightly defended enemy.

4.6.4.3 Types of Offensive Operations. The four types of offensive operation are the movement to contact, the attack, exploitation, and the pursuit. Today, commanders direct these offensive operations, most often sequentially and sometimes in combination. For instance, a successful attack may lead to an exploitation, which can lead to a pursuit. A deliberate attack to complete the enemy's destruction can follow a pursuit. Unlike the forms of maneuver, the types of offensive operations will be significantly different in the UA.

4.6.4.3 Offensive Operations

- **4.6.4.3.1 Movement to Contact**
- **4.6.4.3.2. Attack**
- **4.6.4.3.3 Exploitation**
- **4.6.4.3.4 Pursuit**

4.6.4.3.1 Movement to Contact. Today, forces conduct a movement to contact to seek to make contact with the smallest force feasible. The two techniques of Movement to Contact are search and contact. On contact, the commander has five options: attack, defend, bypass, delay or withdraw. A successful movement to contact today requires units with sufficient mobility, agility and combat power to gain enemy contact and to rapidly develop the situation. A meeting engagement is one of the two techniques of movement to contact today. A meeting engagement normally occurs by chance in small unit operations, typically when two moving units collide. They may result in brigade or larger unit operations when ISR has been ineffective. Meeting engagements can also occur when opposing forces are aware of the general presence but not the exact location of each other and both decide to attack immediately.

The movement to contact is a type of offensive operation designed to develop the situation and establish or regain contact.

The UA is optimized to turn a movement to contact into a hasty attack with fidelity on enemy and the terrain approaching that of a deliberate attack today. It is designed with an inherent ability to see both the terrain and the enemy before contact and more importantly share situational awareness across the force, down to individual dismounted soldiers. The UA has an inherent ability to also see the environment, including terrain and weather. The same embedded training capability we use in training gives every platform and dismounted soldier access to 3-D digital terrain and real time weather forecasts. 3-D terrain data tools will allow small unit leaders to confirm cover and concealment from known enemy positions or line of sight analysis on their routes prior to beginning the operation. High fidelity terrain knowledge is probably the most significant part of "Seeing First" that reduces the enemy's home court advantage. The UA's ability to see the enemy significantly reduces the potential for tactical surprise at the brigade and battalion level. Clearly, the percentage of enemy positions that the UA sees before contact will be different by type of terrain, but the embedded ISR assets at every echelon of the UA will quickly increase this visibility of the enemy allowing us to develop the situation before contact. In open, rolling terrain, the embedded ISR assets will allow the UA to develop the situation on the move from dispersed, parallel axes. In complex or urban terrain, this may require UA and combined arms battalion commanders to completely isolate an area and execute a deliberate reconnaissance of it prior to initiating contact.

A meeting engagement is a combat action that occurs when a moving force engages the enemy at <u>an unexpected time and place</u>.

The COP will allow units moving on parallel axes in different terrain compartments to provide mutual support. Reconnaissance of routes prior to unit movements is critical to survivability of the force and keeps the force free from contact so it can move to positions of advantage before decisive operations. With the advanced fire control and precision fires available to the UA, R&S operations facilitate destroying key enemy systems before the fight is joined. Small units in the UA achieve assured mobility by moving with a reconnaissance-pull on parallel routes around enemy forces to positions of advantage. In reconnaissance-pull, commanders use any intelligence that feeds the DIDb and is displayed on the COP in an interactive and iterative way. They obtain combat information from R&S assets to develop a COA; intelligence developed from R&S assets will be displayed in near-real time on the COP. This rapid dissemination of

R&S results allows units to collaboratively alter the plan while on the move, attacking enemy weaknesses and seams and avoiding his strengths.

4.6.4.3.2 Attack. Attacks incorporate coordinated movement supported by direct and indirect fires. They may be either decisive or shaping operations. In current forces, attacks may be hasty or deliberate depending on the time available for assessing the situation, planning and preparing. Commander's conduct hasty attacks when the situation calls for immediate action with available forces and minimal preparation. They conduct deliberate attacks when there is time to develop plans and coordinate preparations. Commanders direct hasty attacks to seize opportunities to destroy the enemy or seize the initiative. These opportunities are fleeting. They usually occur during movements to contact and defensive operations. In a hasty attack today the commander intentionally trades the advantages of thorough preparation and full synchronization for those of immediate execution. Additionally, the level of information on enemy dispositions is limited. In contrast to hasty attacks, deliberate attacks are highly synchronized operations characterized by detailed planning and preparation; there is also a higher degree of fidelity of enemy locations. Deliberate attacks today use simultaneous operations throughout the AO, planned fires, shaping operations and forward positioning of resources needed to sustain momentum. The great disadvantage to deliberate attacks is that time spent preparing a deliberate attack may allow the enemy to improve defenses, withdraw or launch a spoiling attack.

An attack is an offensive operation that destroys or defeats enemy forces, seizes or secures terrain or both.

The UA is equipped to execute attacks with the advantages of both the hasty and deliberate attacks. The UA destroys enemy high payoff and most dangerous threats from a distance while en-route to the objective. When the UA closes with the enemy, it is at the time and place of its choosing. What allows the UA to assault at a time and place of its choosing is its unprecedented abilities to develop the situation out of contact, isolate enemy forces by maneuvering to positions of advantage, destroy enemy high priority targets from beyond the range of his weapons systems, cause the disintegration of the enemy formations by positional advantage, and to transition to a new mission without a tactical pause. Prior to assaulting, the UA sets the conditions inside the area of influence to:

- Completely isolate the objective so enemy positions cannot mutually support or reinforce each other.
- Destroy enemy rocket, artillery, air and combat systems which can support the objective or affect our seizing a foothold.
- Achieve overlapping sensor coverage through precise battlefield positioning which allows us to see the enemy when UAVs cannot fly.
- Employ suppressive, obscuration, and lethal fires to allow our infantry to seize a foothold.
- Employ non-lethal area effects to incapacitate or displace enemy mixed with non-combatants.

4.6.4.3.3 Exploitation. Exploitation is a type of offensive operation that usually follows a successful attack and is designated to disorganize the enemy in depth. Exploitations seek to disintegrate enemy forces to the point where they have no alternative but surrender or flight. Traditionally, commanders of exploiting forces are given the greatest possible latitude to accomplish their missions. They act with aggressiveness, initiative and boldness. Local exploitations done at the tactical level take advantage of tactical opportunities, foreseen or unforeseen.

Exploitations are offensive operations that usually follow a successful attack and are designed to disorganize the enemy in depth.

Attacks that completely destroy a defender are rare. More often, the enemy attempts to disengage, withdraw and reconstitute an effective defense as soon as possible, particularly when defending their home terrain. The enemy may attempt to mass combat power against an attack by moving forces from a less active portion of the AO or committing reserves. During exploitations, UA commanders execute simultaneous attacks throughout the AO to thwart these enemy actions. Exploiting success is particularly

important after a deliberate attack in which the commander accepts risk elsewhere to concentrate combat power for the decisive operation. Failure to aggressively exploit the success of the decisive operation may allow the enemy to detect and exploit a friendly weakness and regain the initiative. Because the opportunity for exploitation is often fleeting, lead forces must be able to transition directly into exploitation without a lengthy pause for planning and resupply. If that is not possible, commanders must pass fresh forces into the lead. Forces conducting exploitation operations must have the situational awareness and aggressiveness to combat the inevitable friction caused by an exploitation requiring multiple attacks across a non-contiguous battlefield, particularly at night, in bad weather and through extended operations.

The UA is designed to be an ideal exploitation force. It has the organic situational awareness to execute the fire control required on a noncontiguous battlefield; the ability to fight 72 hour continuous operations without resupply; and the ability to plan and rehearse a transition to exploitation virtually during the current fight. The organization of the two mobile command groups, both of which are capable of planning and executing operations in conjunction with the tactical command post, enables the UA to simultaneously plan a transition and conduct a current engagement. Small units in the UA are trained and equipped to operate on multiple dispersed axes of advance, providing mutual support between terrain compartments. Leaders in the UA are trained to operate in this manner and have the situational awareness to do so while remaining synchronized in time and purpose. Leaders are much more comfortable in the ambiguity normally attendant with exploitations. The UA conducts dispersed operations during an exploitation converging for an assault and dispersing for pursuit as needed. The precision fires and acquisition capabilities of the UA are ideal for creating the conditions for exploitation. Effective stand-off fires present a dilemma to the enemy. He can either remain in position, continuing to suffer the effects of precision fires or move in an attempt to reduce the vulnerability of his position. By moving, the enemy exposes himself to exploitation by ground maneuver and the effects of Joint and land-based fires and effects.

Because the UA is specifically designed to be able to develop direct sensor to shooter links with Joint assets, it can much more easily direct Joint fires during a pursuit. Typically, exploitations are often a situation with great potential for fratricide. When friendly forces are conducting multiple attacks throughout an AO intermixed with enemy forces fleeing their position or counterattacking, the ground commander has a challenge to apply close air support. The enhanced situational awareness provided by the UA's shared COP and its ability to directly link to CAS aircraft greatly reduces the chance for fratricide in exploitation.

4.6.4.3.4 Pursuit. A pursuit is a type of offensive operation designed to catch or cut off a hostile force attempting to escape with the intent of destroying the fleeing force. Pursuits are decisive operations that follow successful attacks or exploitations. They can occur when the enemy fails to organize a defense and attempts to disengage. Once it becomes apparent that enemy resistance has broken down entirely and the enemy is fleeing, a force can transition to a pursuit from any type of offensive operation. Pursuits encompass rapid movement and decentralized control. Unlike exploitation, commanders can rarely anticipate pursuits so do not hold forces in reserve for them. For most pursuits, commanders designate a direct pressure force and an encircling force. The direct pressure force maintains pressure against the enemy to keep him from establishing a coherent defense. The encircling force conducts envelopment or a turning movement to block the enemy's escape and trap him between the two forces. The trapped enemy force is then isolated and destroyed. The encircling force must have greater mobility than the pursued enemy force. Joint assets and long range precision fires are essential for slowing enemy movements.

The UA has an ability to conduct vertical envelopments using rotary or fixed wing aircraft unprecedented in today's heavy forces and with significantly greater lethality than today's light forces. The traditional challenge to an encircling force is that a light force can be easily moved by air, but may not have the stopping power to block the escape of a retreating enemy armored force. An armored force has the stopping power, but cannot be easily or on short notice moved by air. A heavy force doing an encirclement must find a route on the flank of the retreating force and move fast enough to beat them to the next choke point. Because the FCS family of systems is sized to the C-130 aircraft, it is optimized for intra-theater operational maneuver. With an allocation of air frames from the Regional Combatant Commander, the UA can move a CA Battalion to operational depth. This aerial envelopment to operational depth allows the insertion of a blocking force on the enemy's line of retreat that has the lethality of an M1A2 equipped current battalion. It arrives with NLOS-LS systems and FCS Cannons that give it long range precision fires to slow the retreating enemy. The inherent mobility of the FCS platform and the ability to conduct air assaults with infantry platoons as lethal dismounted as in their carriers give the direct pressure force an unprecedented

capability to maintain direct, lethal pressure on a fleeing enemy. Precision fires allow destruction of enemy platforms slowing retreating enemies seeking cover.

4.6.4.4 Modes of Operation. From platoon through the UA level, elements and units must be able to conduct all five Modes of Operation. The UA and its subordinate units will be able to rapidly transition between modes of operation as the situation dictates and tactical opportunities arise. The UA will be able to interface successfully with joint headquarters and other services in the joint fight. Although the UA may operate in one mode throughout an operation, it will more likely use a combination at various stages of the engagement. Subordinate-units may conduct different modes of operation as part of the larger effort. For example, a CA Battalion may operate mounted supported by dismounted, but one of its subordinate companies may conduct dismounted operations supported by mounted in an area with more restrictive terrain. Simultaneously, an air-ground task force may air assault to seize key terrain in support of mounted operations.

4.6.4.4	**Modes of Operations**
4.6.4.4.1	**Mounted Enabled by Dismounted**
4.6.4.4.2	**Dismounted Enabled by Mounted**
4.6.4.4.3	**Dismounted**
4.6.4.4.4	**Mounted**
4.6.4.4.5	**Air Assault**

4.6.4.4.1 Mounted Operations Enabled By Dismounted Forces. The UA conducts mounted operations enabled by dismounted forces when the UA faces a generally unrestrictive terrain, but with natural choke points, compartmented features or small urban areas. The UA conducts mounted operations enabled by dismounted forces when faced with mix of infantry and mechanized capabilities, possibly using obstacles. The mounted elements initially provide long-range fires while dismounted elements conduct supporting infantry tasks such as clearing defiles and danger areas. UA units can also conduct air assault operations to clear enemy forces or seize key terrain enabling the advance of mounted forces.

Mounted Enabled by Dismounted

Figure 4-8 Mounted Enabled by Dismounted

4.6.4.4.2 Dismounted Operations Enabled by Mounted Forces. Dismounted operations enabled by mounted forces are required when infantry must close with and destroy enemy in well prepared positions or supported by major combat systems Dismounted forces, delivered to the most advantageous position available by air or ground platforms, assault the objective. Mounted forces provide overwatching LOS, BLOS, and NLOS fires in immediate support of assaulting infantry. Once the objective is seized, the mounted forces resupply the dismounted infantry and assist in evacuating casualties.

Dismounted Enabled by Mounted

Figure 4-9 Dismounted Enabled by Mounted

4.6.4.4.3 Dismounted Operations. Dismounted operations are required in complex or urban terrain when mounted elements of the unit cannot operate in proximity to the dismounted elements. The UA commander may infiltrate dismounted forces by ground or air assault an infantry element. The dismounted infantry soldier remains the fundamental fighting element in the UA organization. He is the UA element that closes with and destroys the enemy in close fight situations. The infantry soldier is expected to understand enemy, battlespace, and mission conditions just as the mounted elements do. The infantry soldier has the added burden of the requirement to do this while in close combat with the enemy, under a high workload. Unlike today's mechanized infantry, the UA dismounts with the same lethality and load carrying capability as if it were mounted. Currently when a Bradley platoon dismounts, they lose the 25mm cannon, load carrying capability of the M2, fire control systems and the soldier who drives the vehicle.; all that stays on the vehicle.

When the UA platoon dismounts, the ARV (L) provides weapon systems, fire control and ammunition equivalent to the ICV. The infantry platoon has access to networked fires via the application of the Battle Command system to receive effects that will kill a T-72 tank with Explosive Reactive Armor (ERA) and Armor Protective System (APS) as well as an NLOS fire capability with mortars. The platoons' MULE will carry a squads' load of mission equipment. This ensures that soldiers are not arriving at the objective exhausted by being overburdened with carrying mission essential equipment. Dismounted soldiers are linked to the C4ISR network and an array of mounted weapons systems. The platoon's organic aerial vehicles screen forward of the dismounted platoon.

Dismounted

Figure 4-10 Dismounted Operations

4.6.4.4.4 Mounted Operations. Mounted operations are usually conducted in open, rolling terrain against platform-based threats, employing direct and indirect fires from extended ranges. Mounted forces conduct rapid, powerful assaults to take advantage of superior mobility, shock and overwhelming lethality to quickly achieve objectives.

Mounted

Figure 4-11 Mounted Operations

4.6.4.4.5 Air Assault. The UA is capable of company and battalion sized air assaults utilizing UE lift assets. The UA deputy commander within the Mobile Command Group #2 can command and control the battalion air assault task force. The UA uses air assaults to quickly reposition forces, equipment, and munitions to positions of advantage, to bypass enemy strong points, and/or to quickly overcome restrictive, complex or difficult terrain. Air assaults can be used to support deception operations and move dismounted units quickly throughout the battlespace, keeping the enemy off balance. These air assaults will be highly synchronized, yet distributed operations, moving portions of the UA into positions where they can mass effects, without massing dismounted forces. The UE utility aircraft that support the air assault are equipped with the same COP as the ground element. This enables synchronization of ground and air elements of the air assault task force like never before. Reconnaissance and/or attack helicopters will support air assault operations.

Joint assets will be available to provide preparatory effects, overhead support, jamming operations, command and control linkages, and on-call effects as necessary for UA battalion level air assaults. The equipment that accompanies UA air assaults can be quickly configured for air assault operations with minimal preparation. If rigging is required to accomplish an air assault, all rigging material is organic to that piece of equipment, and preparation only takes minutes. This gives the UA commander great flexibility.

Figure 4-12 Air Assault

4.6.4.5 Lethality

- **4.6.4.5.1 Line of Sight (LOS)**
- **4.6.4.5.2 Beyond Line of Sight (BLOS)**
- **4.6.4.5.3 Non-Line of Sight (NLOS)**
- **4.6.4.5.4 Mutual Support**
- **4.6.4.5.5 Cooperative Engagement**
- **4.6.4.5.6 Point and Shoot**

4.6.4.5 Lethality. Lethality is the application of overmatching lethal effects, combining the elements of combat power at the right time and place, to allow the UA to destroy and disintegrate any opponent quickly, with shattering effect. This includes lethality overmatch against any enemy systems. Lethal, small units are central to achieving tactical decision. The UA will employ LOS, BLOS, and NLOS fires with greater precision and more devastating target effects. Dramatic improvements in precision munitions, fire control systems, and sensor-to-shooter links through the networked fires application of the Battle Command system enables employment of lethal fires with pinpoint accuracy.

The FCS-equipped UA will have the capability to destroy enemy formations at longer ranges from tactical stand-off through employment of precision BLOS and NLOS fires. It will also possess the capability to achieve lethal overmatch in the close fight with rapid fire, LOS weapon systems employing unguided kinetic energy munitions. Direct access to Army and Joint fires from external sources through the network further enhances the UA's ability to apply lethality overmatch across its entire area of influence. These same sensors provide real time battle damage assessment and allow UA units to efficiently employ their lethal effects. Technological enhancements will also enable the concept of assured kill. Assured kill is the ability to kill a target every time a weapon system achieves a target hit (Hit = PK 1.0); a target kill includes firepower, mobility, or catastrophic kills. A high PK provides the capability for maximum application of lethal effects with a minimum expenditure of ordnance.

4.6.4.5.1 Line of Sight. LOS is the traditional form of direct fire used by assaulting elements as they conduct fire and movement to close with and destroy an enemy. The target in a LOS engagement is not masked from the firing platform or soldier; the sensor and shooter are the same. The masking effects of terrain, however, limit both the range and fields of fire available in a direct fire (LOS) engagement. Direct fires (LOS) have the advantage of point and shoot immediacy against targets that can be directly seen or sensed from the combat platform. MCS direct fire weapons have the capability to destroy a T-72 tank equipped with enhanced reactive armor and active protective systems out to 4 km.

Direct fires are those fires directed at a target that is visible to the aimer or the firing unit. Direct fire includes gun, missile or rocket fire.

Beyond line of sight capabilities greatly extend the lethality envelope of UA small units, but BLOS will never eliminate the need for direct line of sight fires. Despite the network's ability to distribute information to support situational awareness, sensors will not be able to detect all threats to FCS platforms. UA elements will encounter ATGMs, RPGs and armored vehicle threats that require an immediate, direct fire (LOS) engagement. Additionally, assaulting elements will employ direct fire (LOS) as they close with and destroy the enemy.

4.6.4.5.2 Beyond Line of Sight. BLOS is an extension of traditional direct fire that extends the range to the next terrain compartment. BLOS enables standoff engagements at greater ranges and also opens up fields of fire previously denied to firing elements due to the restrictions of intervening terrain, adverse weather affecting LOS engagement or range to the target. Soldiers and crews will employ BLOS fires, extending their vision using a combination of organic three-dimensional sensors and networked fires to establish a direct sensor-to-shooter linkage. BLOS is still direct fire in that the gunner pulling the trigger sees the target directly through a sensor that has a sensor-to-shooter link to his vehicle.

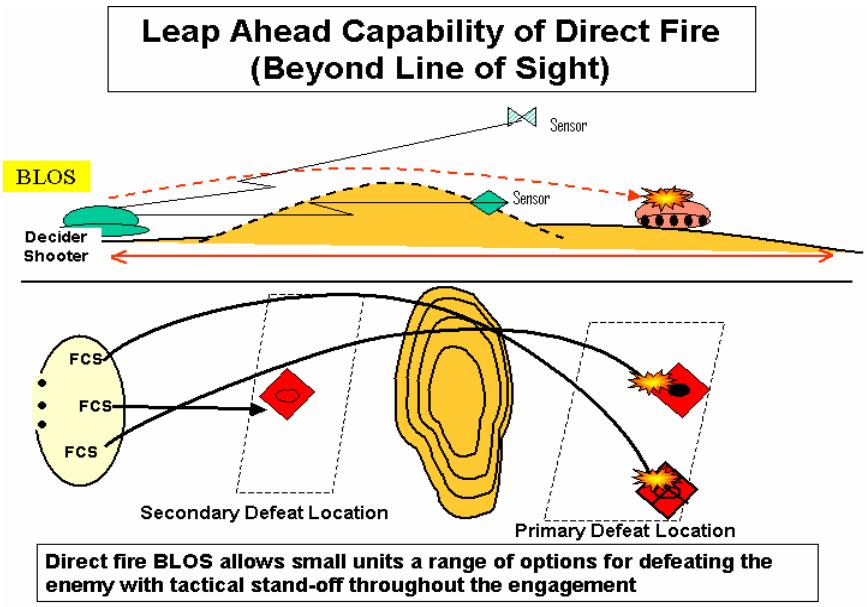


Figure 4-13 BLOS Fires

The primary defeat location shifts from engagement areas within the line of sight of the fighting teams to terrain compartments beyond their line of sight, where the enemy's LOS weapons cannot respond. The intervening terrain, once an inhibitor to an engagement, will provide protection to the BLOS system as it engages a target. This enhances survivability, as platforms remain outside the enemy's lethality envelope. BLOS fires allow the UA to establish overwatch on the move; to disperse, yet provide mutual support with precision. This is not a different way to do indirect fire, but an extension of close combat direct fire. The BLOS capability resident in every platoon, infantry or MCS, provides immediate supporting fires organic to the element in contact. There is no queue. While direct fire (line-of-sight) continues to be critical to close combat assault, BLOS fires will enable assault elements to engage from tactical standoff and continue assault fires throughout the attack.

4.6.4.5.3 Non-Line of Sight. NLOS is the current method of indirect fire support where a sensor or decider directs a firing platform to engage targets in response to a requirement for fires. The soldier or sensor identifies a target and passes a fire mission through the Battle Command system. The receiving soldier/weapon fires on the target without seeing/sensing the target based on the sensing of the requestor. The networked fires application of the Battle Command system ensures the sensor has targetable data or hands it off to another sensor as required. Networked fires also selects the best shooter/effecter (organic or external to the UA) for the target and demands BDA to ensure optimum use of limited fires assets and verify required effects on the target occurred. NLOS fires will be fully integrated and responsive to the needs of maneuver units. UA fires are designed to optimize support to small unit operations.

Indirect fires are fires delivered on a target that is not in itself used as a point of aim for the weapon or the director.

NLOS fires apply a wider range of capabilities combined with maneuver against the enemy to achieve decision. They change the focus from attacking specific weapon systems to a more precise application of a broad range of NLOS fires and non-lethal means to achieve synergistic results against key targets. Effects-based fires are less concerned about delivery systems, their locations, and associated command and support relationships. In this effects-based environment, tasks and priorities may be serviced by any fire system capable of meeting the operational or tactical needs in terms of timeliness and effects.

4.6.4.5.4 Mutual Support. Mutual support is that support which units with their inherent capabilities render to each other against an enemy because of their assigned tasks, their position relative to each other and to the enemy. It is a maneuver and fires relationship in which a sensor, weapon, or unit provides target acquisition or engagement for an adjacent weapon or unit's. Mutual support exists between two or more positions when they support one another by direct or indirect fire, thus preventing the enemy from attacking one position without being fired on from one or more adjacent positions.

Supporting range in current forces is the distance one unit may be geographically separated from a second unit, yet remain within the maximum range of the second unit's indirect fire weapons systems

That same relationship applies to units moving with relation to each other, except they can maneuver to obtain positional advantage to achieve that support. It is normally associated with fire and movement or fire and maneuver. No longer is mutual support tied to a physical, line-of-sight relationship between elements; elements requiring support need only be within weapons effect range of the element providing the support. With greater situational awareness and increases in the ranges for LOS, NLOS, and BLOS fires, UA units will be able to provide mutual support over greater ranges and with much greater precision. The expanded concept of mutual support in the UA allows units moving on parallel axes to provide three-dimensional mutual support while moving. The network will identify the closest element able to employ effects and provide the targetable data received from sensors designating the target. This can be an adjacent ground unit or a Comanche employing BLOS and NLOS fires, or Comanche integrated through air-ground teaming. This has the added benefit of optimizing fire distribution and control, since the network facilitates the employment of these effects.

4.6.4.5.5 Cooperative Engagement. Cooperative engagement is a method of engagement in which the sensor and shooter are not resident on the same platform. This may occur where the sensor and shooter are on dispersed axes or when the sensing platform's ability to engage the target is limited by field of view, enemy action, visibility, terrain, or obstacles. Cooperative engagements permit mutual support between units operating on dispersed axes or when the sensing platform's ability to engage the target is limited.

The attack can include BLOS or NLOS fires, (lethal or non-lethal effects), all facilitated by the network. Targetable data is fed into the network by organic or networked sensors, a sensor to shooter link is established, and the data is sent to the weapon system that can best employ effects for that engagement.

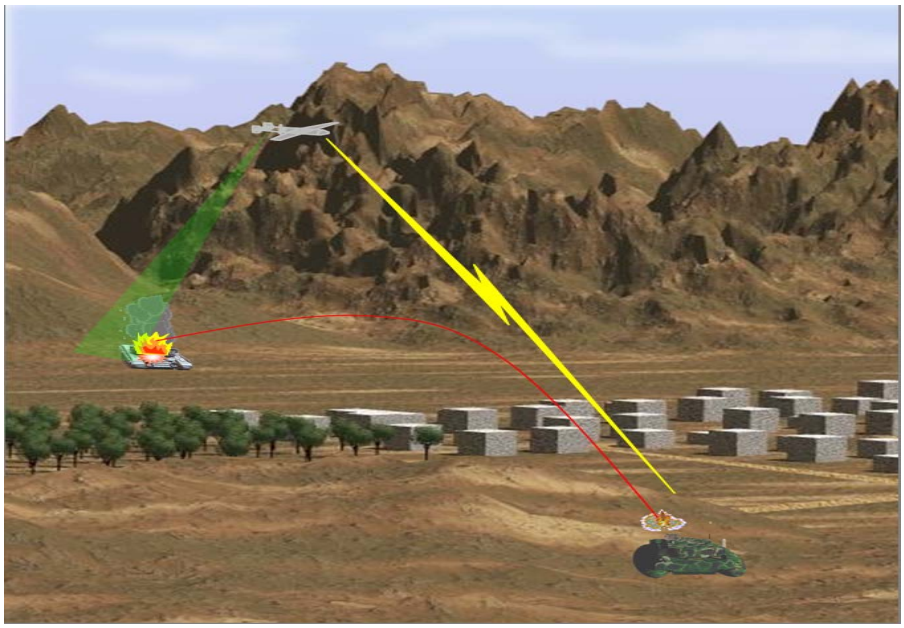


Figure 4-14 Example of Cooperative Engagement

4.6.4.5.6 Point and Shoot. Point and shoot is a subset of cooperative engagement and allows a soldier or platform to designate a target for engagement by another platform in the same echelon. Point and shoot implies the immediacy of effects and occurs within the same echelon. Inherent in this construct is a highly responsive (5 seconds or less) first round fires directed against the target once defined.

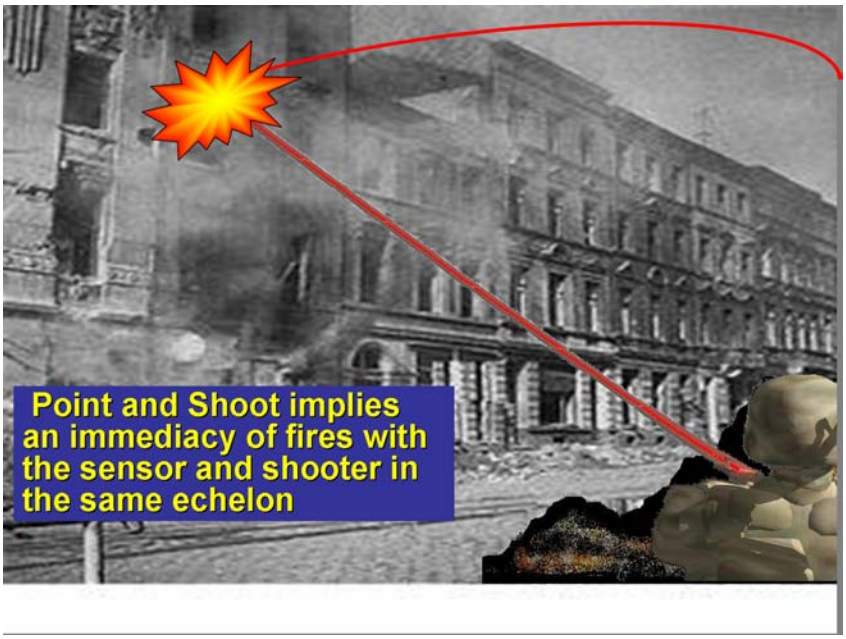


Figure 4-15 Point and Shoot

Mounted and dismounted elements possess point and shoot capability to designate targets they cannot engage with organic weapon systems. This capability is networked so that elements in the UA can move forward with pre-established sensor-to-shooter linkages. When elements of the UA must react to contact and fire for survival against a sudden threat, the “pointer” can send a message to the “shooter” to shoot here now, enabling the application of a larger, better positioned or more precise system than that carried by the “pointer”. Upon completion of the engagement, the recipient of the fires provides BDA and ends the mission. This capability permits the soldier or small unit to achieve lethal overmatch through mutual support.

4.6.4.6 Mounted-Dismounted Integration. The Unit of Action is comprised of combined arms organizations, able to operate across the five modes of operation. An essential element of the UA is its versatility to conduct these different modes of operation simultaneously within each organization. This requires an inherent capability to operate in a fully integrated mounted-dismounted environment. The shared COP will allow mounted and dismounted elements to habitually operate together in a very responsive manner regardless of the terrain set. It further enables the UA’s ability to provide three-dimensional mutual support through the application of networked fires. The Land Warrior ensemble, connected through the Battle Command system, provides the enablers to facilitate the integration of Infantry and other dismounted soldiers with the FCS system of systems. See Annex E for a complete description of Land Warrior system.

4.6.4.7 Air Ground Integration. The UA has an unprecedented ability to synchronize operations in three dimensions via an organic Aviation Squadron, staff elements focused on integration of Air-Ground maneuver at CA Battalion level and above, and unmanned aviation at each echelon above platoon. Responsiveness and extended ranges of weapon systems enable superior mutual support between decentralized, dispersed tactical units. The UA can combine ground maneuver with commitment of Comanche performing reconnaissance and close support to achieve decisive results. The Comanche operates with UAVs as manned/unmanned teams, providing integrated information on-scene and synchronizing the combat actions of the combined arms air-ground team. The Comanche and the assigned UAVs will support ground forces in contact with complementary fires and maneuver while taking advantage of terrain, mobility, and tactical standoff.

Figure 4-16 Air-Ground Teaming

The RAH-66 Comanche helicopters and their assigned UAVs in the Aviation Squadron are designed to provide habitual air-ground teaming for close support of ground forces and reconnaissance. In support of the UA, the Comanche and assigned UAVs primarily conduct two missions: armed reconnaissance and close combat. Reconnaissance requires the capability to fight for tactical information without accepting decisive engagement. Reconnaissance missions will seek to answer the CCIRs, to build the DIDb and share the COP. In the close combat role with ground forces, the Aviation Squadron will be completely integrated into the air-ground scheme of maneuver. The integration of aviation into all operations is a critical concept with the UA. Although air ground integration is not a unique concept, it is much more tightly synchronized in the UA. UA Air-Ground Integration:

- Employs organic Army aviation and UE aviation in the execution of reconnaissance security, close combat mobile strike, and vertical maneuver missions.
- Extends the UA commander's operational reach and allows the UA commander to maintain constant pressure on the enemy throughout his AO.
- Enhances currency and fidelity of the battlefield through synchronization of sensors and efforts.

4.6.4.8 Manned/Unmanned Teaming. The UA employs manned and unmanned teaming and enhances survivability and lethality by extending battlespace coverage and situational awareness. UAVs and UGVs are more than just additional items of equipment for UA soldiers. Leaders at all levels have the ability to task these systems for semi-autonomous and autonomous operation executing missions in support of the unit. They maneuver them as they would any other member of the unit.

Figure 4-17 Manned and Unmanned Teaming

The manned platforms, UAVs and UGVs provide the UA small units with 24-hour 7-day capability. Manned and unmanned teams are critical to reconnaissance, security, and target acquisition in the UA. The manned, "man-in-the-loop," portion ensures judgment is applied to situations and allows dynamic re-tasking of manned and unmanned resources during changing combat operations. The manned portion also provides curiosity and reasoning, the elements that cannot be replicated in unmanned systems. Unmanned sensors enhance the commander's ability to conduct precision maneuver along routes or axes of advance while protecting maneuvering forces from tactical surprise through surveillance of key or decisive terrain. This is especially critical in urban environments or restrictive terrain where the commander needs to know what is "around the next corner" or "over the next hill." The target acquisition/designation capability in unmanned platforms enhances the commander's ability to deliver precision LOS, BLOS, and NLOS fires and effects. Manned and unmanned teaming provides:

- Enhanced survivability, performance, and mobility.
- Ability to transport people and materiel.
- A combat multiplier for mission performance to maximize lethality of all operations.
- Reduced risk factors to soldiers by performing multiple, high-risk tasks.
- Increased force protection and survivability to expand ISR collection capabilities.

Armed robotic vehicles support mounted and dismounted operations acting as combat multipliers by providing RSTA, additional weapons platforms, and communications relays. The ARV-A provides a BLOS capability to the infantry platoon, and is employed in a support-by fire-role to provide LOS and BLOS fires and maneuver to positions of advantage as necessary. It can also be utilized, if needed, to maneuver forward of the mounted and dismounted elements in the attack or within the defense. The ARV-RSTA accompanies mounted and recon units and fills the role of an additional "scout"; its mission is to gather information.

The mission of the MULE is to provide logistic support, lighten the load of the dismounted force, and perform non-standard CASEVAC. The MULE helps provide superior tactical mobility in a wide assortment of mission sets and terrain. ARV-A (L) will provide LOS/BLOS direct fire support for the dismounted infantry conducting air assault, airborne, or other operations when the MCS, ICV, or ARV-A is not available. The SUGV is a highly mission tailorable, man-pack transportable platform. Its primary purpose within the MOUT and constricted battlespace environment is to act as a multi-mission platform to gather information that is sent directly to the operator. 'Plug and Play' equipment packages allow the operator to configure the SUGV for mission specific tasks.

4.6.5 Fires and Effects

4.6.5	**Fires and Effects**
4.6.5.1	**Fires**
4.6.5.2	**Effects**
4.6.5.3	**Non-Lethal Effects**
4.6.5.4	**Networked Fires**
4.6.5.5	**UE and Joint Fires**
4.6.5.6	**MET and Radar Support**
4.6.5.7	**Air and Missile Defense**

Joint doctrine defines fires "as the effects of lethal or nonlethal weapons." In the broadest sense, an effect is the physical, functional, or psychological outcome, event, or consequence that results from a specific action. The UA employs fires platforms and munitions in concert with other effects generating capabilities (such as information operations) to protect the force, shape the battlespace, and support decisive operations. In the UA, effects are the result of a direct application of lethal and non-lethal capabilities to achieve a desired purpose or outcome in support of the commander's intent. Integration of these capabilities within a cohesive plan of operations generates a synergy of effects that exceeds those that are possible from any individual weapon system or munitions implemented alone. For example, a maneuver force may produce the effect of dislocating an enemy by fires and/or maneuver. The enemy, once displaced, may then be attacked by NLOS and BLOS fires resulting in his physical destruction (an effect).

4.6.5.1 Fires. The UA has an organic capability to deliver fires in a networked architecture. The UA is designed to be interdependent with the UE and Joint assets. The Operational Architecture of the UA allows any UA platform or dismounted soldier to develop a direct sensor to shooter link with any UA, UE, or Joint fires platform. The UA's requirements for fires are met by a variety of delivery means. All UA echelons have organic fires units and have assured access to Army and Joint fires through the networked fires application. Maneuver platoons have BLOS systems capable of delivering responsive precision fires from tactical standoff. CA Battalions have NLOS mortars designed to deliver precision guided and other traditional munitions. The UA's organic NLOS Battalion is equipped with NLOS-LS and FCS Cannon to provide the UA Commander with a wide range of lethal and non-lethal precision and area effects at extended ranges. NLOS Batteries normally operate within a CA Battalion's area of operations in close proximity to the maneuver companies. This ensures responsive fires throughout the battlespace and allows batteries to benefit from the protective and sustainment footprint of the maneuver force.

UA fires are categorized as destructive, protective/suppressive, and special purpose. Destructive fires are employed to shape engagements with precise and/or area fires to enable tactical maneuver by striking the enemy before forces are joined. After forces are joined, destructive fires are employed in conjunction with direct fires to present the enemy with multiple lethal challenges. Protective and suppressive fires may be lethal or nonlethal in nature and are oriented to facilitate UA maneuver. Protective fires for maneuver formations include danger-close and final protective fires. Protective fires also include JTF and UE AMD fires to shield forces, critical assets, and population centers from enemy cruise missiles, ballistic missiles, and large caliber rockets. This integration of attack operations against enemy air assets with organic and UE active defense fires and passive missile defense implies enhanced targeting and responsive munitions from weapons systems. Suppressive fires also protect friendly forces. However, they are oriented on immediately attacking targets, such as enemy indirect fire assets, enemy UAV and rotary winged aircraft or air defenses that are affecting friendly forces. Suppressive fires may be employed to facilitate ground maneuver and the employment of Army or Joint aviation assets. Inaccurate or unconfirmed target locations may also dictate the employment of suppressive fires. Protective and suppressive fires are used to fix or isolate an enemy and to prevent him from emplacing accurate lethal fires on the formation.

Special purpose fires add to the full spectrum capability of the UA. These fires may include munitions that provide obscurants, incapacitants, malodorants, dazzlers, electromagnetic, directed energy, acoustic, countermobility capabilities, thermobaric effects, and munitions that blind or disable enemy acquisition and observation systems. While these fires may come from Joint and UE level, organic UA fires must deliver effects at extended ranges to deny sanctuary in the area of influence, to provide mutual support from dispersed locations, and to rapidly shift striking power across the battlefield. These organic fires will:

- Be agile to support forces in close combat and at standoff.
- Provide enhanced target location and enhanced precision.
- Provide overmatching lethality to suppress or destroy targets (point and area) more rapidly using smaller firing teams with less exposure to enemy fire, while retaining operational tempo with greater efficiency.
- Rapidly deliver scalable munitions effects to destroy, disintegrate, dislocate, or isolate enemy forces.
- Be able to shift fires and categories of fires very quickly (destructive, protective/ suppressive, and special purpose).

The UA will use fires differently than current forces. UA fires – whether delivered by Army or JIM means – are enabled by effective R&S that finds the enemy and reports accurate target locations, enabling the application of killing power. At the start of operations, the UA uses fires (to include Joint and UE through networked fires application) to enable maneuver to rapidly achieve positions of advantage. This maneuver could also include movement of fires assets to positions of advantage as required. From these positions, the UA employs destructive fires with great precision against HPTs in order to eliminate enemy combat capabilities at decisive points or centers of gravity. Before forces are joined, the extended long-range killing capability of fires fixes and destroys the enemy. During contact, fires enable maneuver by engaging targets of opportunity and most dangerous targets, while simultaneously continuing to execute fires against planned HPTs.

The NLOS battalion will tailor subordinate elements as needed for more agile support of maneuver with fires. This agility facilitates support to UA forces at the lowest tactical level. Small units engage enemy forces and systems that present themselves as most dangerous targets. The UA conducts tactical assault while leveraging all combined arms fires to achieve the destructive effects that lead to decisive outcomes. Fires in support of tactical assault often require volume area effects over time to assure freedom of maneuver, degrade enemy reaction, and protect forces in contact. Organic UA fires can provide these area fires as well as precision destructive fires. Current fires delivery systems (mortars, cannon, missiles, rockets, Army aviation, Army AMD active defense, and Joint fires) have their own individual advantages and limitations. Improvements in Joint interoperability will allow the UA to rapidly exploit the advantages of these assets, individually or in combination, with greater agility than we have today. These systems remain lethal in terms of responsiveness, accuracy, and munitions effect.

UA formations will have the ability to retain freedom of maneuver while delivering destructive effects without becoming decisively engaged. Objective Force fires support tactical maneuver by achieving greater destruction at standoff. This reduces the UA's reliance on tactical assault as the only means to achieve decision. In situations when standoff fires cannot accomplish the desired endstate, UA units will close with and destroy the enemy once the conditions for decisive action are set. Effective stand-off fires present multiple dilemmas to the enemy. He must either remain in position, continuing to suffer the effects of fires, or move in an attempt to reduce the vulnerability of his position. By moving, the enemy risks exposing his force to exploitation by ground maneuver and the effects of Joint and land based fires.

High value targets (HVT) are those assets the enemy commande requires for the successful completion of his mission.

High payoff targets (HPT) are those high value assets, which if successfully attacked, would contribute substantially to friendly operations.

Most dangerous targets (MDT) are those targets that have the most capability of destroying a platform/individual and are base on the level of command that detects them. This target is generally not planned and may be part of a HPT list.

4**.6.5.2 Effects**. Effects are the result of the direct application of lethal and non-lethal capabilities to achieve a desired purpose or outcome in support of the commander's intent. Effects are achieved by a broad range of capabilities and are not merely the result of weapons use. The synchronization of both

lethal and non-lethal effects enables the commander to conduct full spectrum operations. Effects-based fires are less concerned about delivery systems, their locations, and associated command and support relationships. In this effects-based environment, tasks and priorities may be serviced by any fire system capable of meeting the operational or tactical needs in terms of timeliness and effects.

4.6.5.3 Non-Lethal Effects. Non-lethal weapons, munitions, and other capabilities are explicitly designed (and primarily employed) to achieve non-lethal effects. Non-lethal effects include incapacitation, suppression, dispersion, or engagement of personnel, places, or things denying personnel access to, use of or movement through a particular area/point/facility. Non-lethal effects deny vehicles access to, use of or movement through a particular area/point or alter terrain/environmental conditions to favor friendly elements. Non-lethal effects influence actions of others and, separate combatants and non-combatants. Non-lethal effects include the application of offensive information operations and the ability to incapacitate, suppress, disperse or otherwise engage personnel. Non-lethal effects deny vehicles and/or personnel access to, use of, or movement through a particular area, point, or facility. The UA can also employ non-lethal effects to alter terrain/environmental conditions, to influence actions of others, and separate combatants and non-combatants.

The UA will employ all capabilities in a complementary (lethal/non-lethal) manner to enhance combined-arms battlefield effectiveness by minimizing mass physical destruction of people, materiel, infrastructure, and the environment. This will provide tactical leaders another means to influence the actions of enemy forces and civilians while minimizing collateral damage. UA delivery means will incorporate Land Warrior, LOS, BLOS, NLOS, and unmanned systems in order to accomplish the following non-lethal mission sets:

- Shape the battlespace to present the enemy with multiple and unexpected dilemmas; deny access to, through, or around a particular area/point; reduce the amount of friendly, enemy, non-combatant casualties and collateral damage.
- Create a ‘buffer zone’ around friendly forces; provide initial separation of groups that may be hostile towards one another and/or towards friendly forces; provide selected unmanned platforms with scaleable effects options; and increase force protection levels.
- Allow dismounted elements in close quarters to isolate and dislodge or incapacitate enemy forces; impair and deny the enemy abilities to observe friendly forces; facilitate the capture of persons, places, or things; and provide friendly forces a non-lethal means of influencing the actions of others.
- Force movement of individuals from sanctuary; detect/engage them; move non-combatants away from combatants; and have combatants leave urban area strong point to engage conventionally.
- Deny enemy access to advantageous terrain until friendly forces can control choke points; and deny avenues of approach.
- Support the assault by suppressing or incapacitating combatants to complement the effect of lethal systems and maneuver.
- Block reinforcements, deny avenues for reinforcements, and to suppress or incapacitate.

4.6.5.4 Networked Fires. Networked fires are a component of the Battle Command system and supporting communications architecture. It is a combination of relevant sensors, effects capabilities, Battle Command system tools, and communications capabilities available across the UA. Networked fires enable dynamic application of lethal and non-lethal destructive and suppressive effects. Networked fires are fully integrated from theater to platform, allowing the UA to rapidly establish, alter and terminate linkages between sensors and LOS, BLOS, NLOS, UE, and Joint systems to achieve a wide set of lethal and non-lethal effects. The network allows the commander to dynamically tailor his guidance and refocus sensors and effects capabilities to meet the requirements of changing situations. With all elements of the UA networked, the UA can achieve virtual teaming, mutual support, and the ability to rapidly mass effects without massing forces.

Networked fires operate as a component of the Object Force Battle Command system and supporting communications architecture to develop integrated strike solutions while applying the supported commander’s intent as the “Decider”. The requestor for fires and effects should no longer be as concerned about which platforms or units provide the effects. Networked fires fully leverages all relevant Army and

JIM sensors to locate and strike targets with a wider set of lethal and non-lethal effects exploiting the capabilities of the entire force. Automated systems or leaders using networked fires determine the weapons-target pairing to achieve the most responsive and sufficient effects on the target. While LOS and BLOS fires will not be denied by networked fires (only reported and tracked), NLOS fires will be fully integrated and coordinated. The OF will have a very large number of Army and JIM sensors collecting information for distribution, processing and use by a multitude of users. Commanders and staffs at all echelons will have access o this information. Some of the information will be of immediate use, like to strike time sensitive targets. Other information will be less time sensitive, perhaps for use in the building an enemy order of battle or forecasting tomorrow's weather. In any case, huge amounts of data will be gathered, transmitted, and received which must be processed and fused to enable it to be of value. Networked fires will accomplish these functions through automation to enable real time targeting to support responsive delivery of fires and effects.

4.6.5.4.1 Sensor to Shooter Link Clearance of both ground and airspace will be much improved using networked fires. Understanding where all friendly ground forces are at all times will allow much more rapid responses to enemy targets. With an ability to track every flying platform (manned, munitions and unmanned), networked fires will be able to open up the airspace for use by munitions, unmanned/manned air and aviation units. Simply put, networked fires will enable rather than restrict the use of airspace by all combat elements. Based on METT-TC, a dedicated sensor-to-shooter link can be established when a special situation warrants responsive fires to attack certain HPTs vital to the success of the UA or UE mission. This technique requires establishing a direct information link from a target acquisition asset to a dedicated fires platform to engage the target. When this is done, a certain number of sensors and shooters will be unavailable to the network to determine optimal solutions in other effects-target pairing decisions. Therefore, the affect on the network must be considered when establishing a dedicated sensor to shooter relationship. Nevertheless, a dedicated sensor-to-shooter link could enable an automated fires linkage from a sensor to an NLOS-LS to engage a time-sensitive HPT. The sensor could be counterfire radar, a UAV, an attack aviation platform, other RSTA system, or maneuver FCS platform. The designated sensor would then have the highest priority for calls for fire to that specific NLOS-LS through Networked Fires and supporting communications architecture. For example, consider a Comanche on a mission of search for a surface-to-surface missile reload site deep in enemy territory. The network could establish a sensor to shooter link between HIMARS launchers and the Comanche to enable immediate response to attack the target if detected or to provide SEAD in the event the Comanche encounters enemy air defense sites.

OF targeting will be very similar to the current Decide, Detect, Deliver, and Assess (D3A) methodology. Taking advantage of the Global Information Grid (GIG), targets will be developed using a highly automated process to sift through the enormous number of data points. All available sensors (including JIM assets) and targeting information will be used to locate targets for planned, on-call, or immediate attack. Automated systems or leaders using networked fires will match the appropriate munition with the target in accordance with the commander's guidance and send the fire mission to the appropriate platform(s). Effects-based targeting, enabled by the networked fires application of the OF BCS, is fully integrated with the effects of maneuver. The integration of these capabilities within a cohesive effects-based targeting plan allows the application of a wide range of effects from a variety of effects providers, generating a synergy of effects that exceeds the application of the parts in isolation. For example, consider a lethal effects package, planned in near real-time, of fires from three NLOS-LS, two FCS cannon, and one Air Force tactical strike aircraft to attack a HPT. Together, they meet the effects requirement for the target more efficiently and effectively than we can do today.

4.6.5.4.2 Fires and Effects Coordination Perhaps the most significant change from our current operational force organizational design is the separation of fires and effects coordination from the command and control of effects delivery platforms. Fires and effects coordination, enabled by Networked fires, will be a critical function in the success of Objective Force operations. Two of the central objectives for fires and effects coordination are to accelerate target processing and optimize effects distribution. Networked fires will make most real-time engagement decisions. The FEC must be able, as necessary and appropriate, to delegate control of effects to the appropriate Fires Cells. At the UA, the FEC (enabled by Networked fires) will also incorporate tactical fire direction as well as fire planning and coordination functions. Technical and limited tactical fire direction will be performed on each of the fires systems.

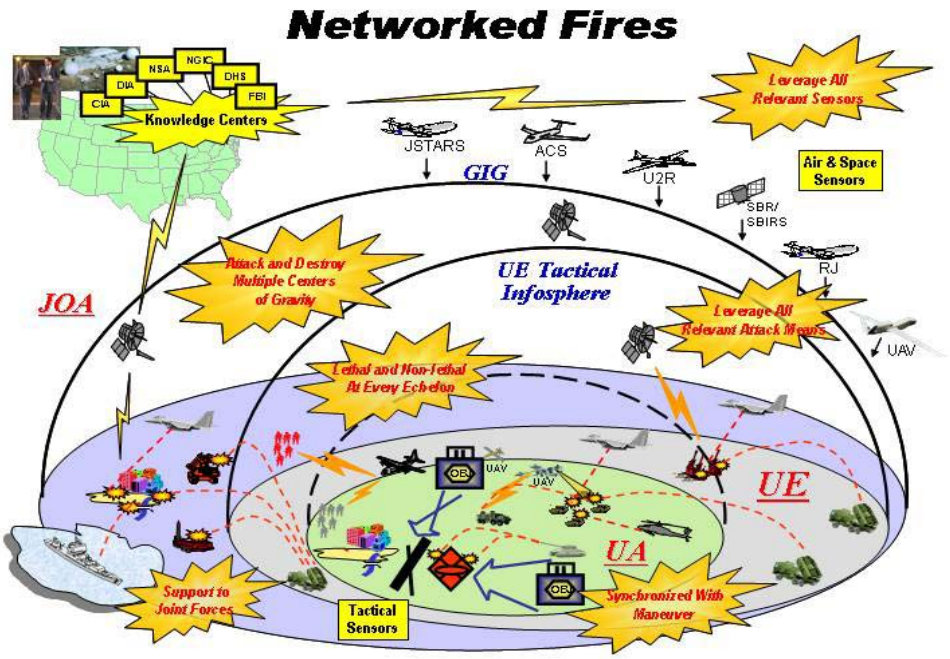


Figure 4-19 Networked Fires

The Battle Command network is capable of rapid fusion of sensor data to produce targetable information. The network routes targeting data to the appropriate fires system. Networked fires balance the need for responsive fires against producing tactical solutions with the most effective application of systems and munitions. A key aspect of this network is the facilitation of rapid clearance of fires and airspace coordination. The Battle Command network is informed of all LOS, BLOS, and NLOS engagements. This ensures that targets which are neutralized or destroyed are not re-engaged by other resources. Additional assets are directed against targets that were not suppressed or destroyed. Networked fires do not deny LOS engagements. In most cases, BLOS fires do not go through the network as the firing platform is linked directly to a sensor. Networked fires can, if required, enable BLOS cooperative engagements by facilitating the transfer of control of a sensor to a firing platform or establishing a sensor to shooter link. For example, when an ICV identifies an enemy tank, the ICV uses the Network to establish a sensor to shooter link between the ICV and MCS platform. The ICV provides target location or target designation data directly to the MCS platform. The Network ensures the air and space between the MCS and the target are cleared in near real time reducing or eliminating latency in fires.

4.6.5.5 UE and Joint Fires. The UA leverages UE and Joint fires and effects during all phases of tactical operations. The UA will rely upon UE and Joint fires to set conditions in support of its entry operations and follow-on tactical engagements. The UE orchestrates continuous shaping operations with deception, information operations, extended-range precision fires and selected air-ground maneuver operations for tactical and operational-level effects. These shaping fires and effects shield friendly forces, destroy key enemy capabilities, isolate portions of the battlefield and deny the enemy the ability to reinforce or synchronize his efforts. UE and Joint assets also provide complementary close supporting fires to engage HPTs and most dangerous targets affecting UA operations. These fires may include cannon, rocket and missile fires; close air support; and naval surface fires. Networked fires allow assured access to UE and Joint fires across all platforms to include the soldier.

4.6.5.6 Meteorological and Radar Support. The UA leverages technological leaps in meteorological (MET) and radar support to ensure the precision delivery of point and area effects and force protection. Today, MET capabilities are restricted by balloon-borne weather sensors that require large quantities of compressed gas and large support sections. The 20 km range of these systems cannot provide the low-level target area MET required for delivering BLOS and NLOS fires at extended ranges. Further, weather data is only available in two-hour increments. MET assets will provide continuously updated, on demand

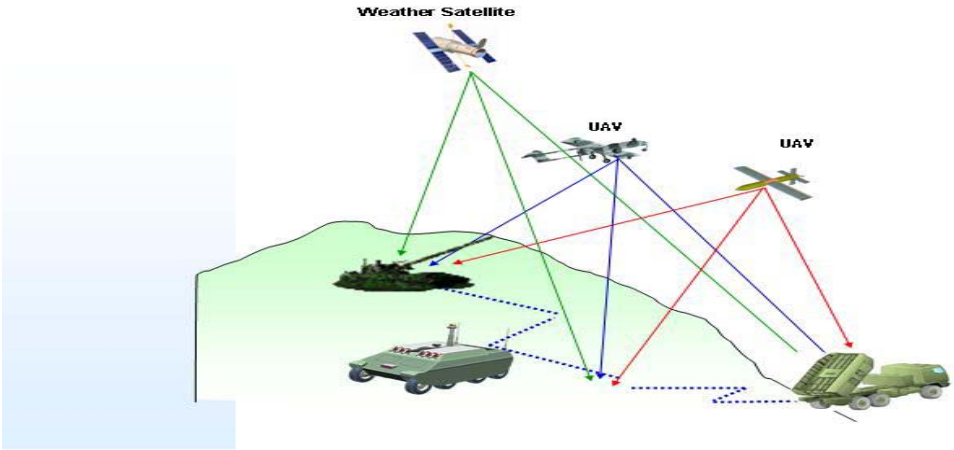


Figure 4-20 Meteorological Support in the UA

data directly to effects delivery systems and platforms across the battlespace. This Objective Force MET capability will be embedded in the Battle Command system and provide position area and low-level target area MET and aviation weather data required for precision delivery of effects while eliminating the dedicated MET personnel and support vehicles. UA MET capabilities include position area and low-level target area MET and aviation weather data over a 500 km area updated every 30 minutes. UA MET uses new technologies to eliminate current balloons and reduce dedicated support. Organic multi-mission radars (MMR) provide the UA with radar coverage. UA MMRs provide more than twice the range and accuracy for counterstrike target acquisition when compared to current Firefinder radars. In addition, MMR provides air defense surveillance and air traffic services. MMR will routinely be positioned to provide coverage of the non-contiguous CA Battalion operational areas. The extended operational area of the UA requires complementary coverage from the UE to cover the space between CA Battalions and protect the UA from enemy long-range cannons, rockets out to 100 km and missiles to 300 km.

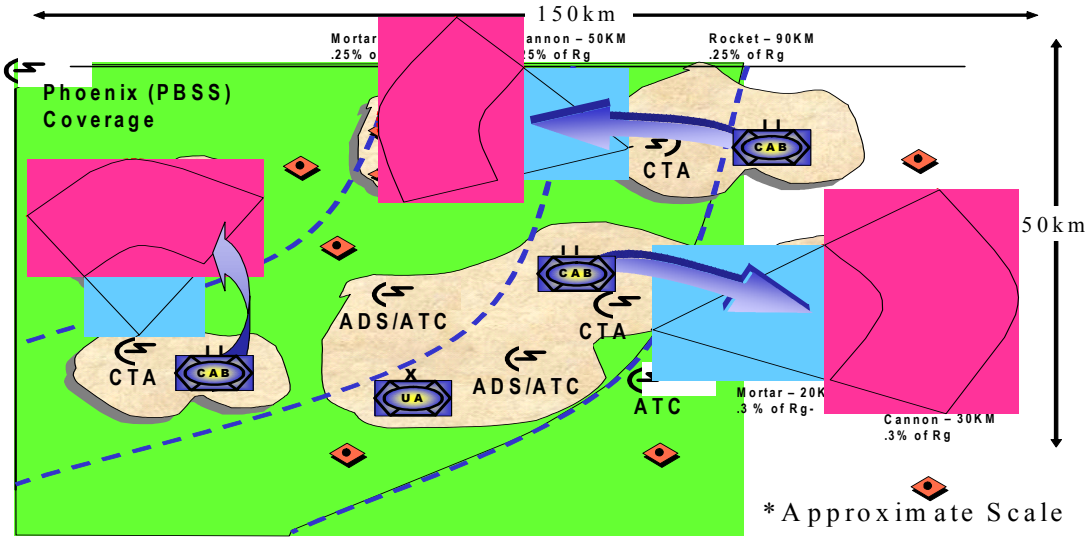


Figure 4-21 Capabilities of UA Target Acquisition

4.6.5.7 Air and Missile Defense. The aerial threat to the UA is changing and growing. The US Air Force's dominance against the fixed wing threat in the high altitude portion of the airspace has driven adversaries to seek low altitude asymmetric aerial approaches. Attack, reconnaissance, and target

designation UAV variants, large caliber rockets, theater ballistic missiles, and cruise missiles are all proliferating at an alarming rate. Rotary wing air-to-ground ordnance is also increasing in range and accuracy. To defeat this threat, the UA employs a networked, integrated, counter-air approach with focus on UAVs and rotary wing aircraft. Attack operations will attempt to destroy maximum enemy aircraft and infrastructure before they can be leveraged against UA forces. Joint counter-air and higher echelon AMD will greatly reduce the fixed wing and theater ballistic missile threat to the UA. Platform signature reduction and other enhanced survivability measures will help reduce the ability of the enemy to target UA forces. To defeat or reduce the effectiveness of the aerial threat, the UA will leverage the C4ISR network and Single Integrated Air Picture (SIAP) to cue KE and non-KE fires delivery assets. All platforms will receive early warning, take protective measures, and fire in self-defense within LOS weapons ranges. Selected multi-functional FCS platforms will be capable of employing BLOS and NLOS counter-air fires against slow moving and hovering portions of the UAV and rotary wing threat to help protect the force at large. Comanche may be employed in a counter-air role as a secondary mission.

The UA will depend on UE Maneuver AMD augmentation in METT-TC situations where the enemy employs more robust aerial threats (cruise missiles, theater ballistic missiles, incoming rockets, artillery, mortars, high end UAVs and rotary winged aircraft). UE Maneuver AMD will have significantly greater range than the current SHORAD force. UE Maneuver AMD will not only defeat high end UAVs and rotary wing beyond standoff, but will defeat the growing cruise missile threat and conduct preferential active defense engagements against incoming rockets, artillery, mortars, and in-flight surface to air missiles fired at approaching/departing intra-theater lift. This is particularly critical during vertical maneuver when defeating anti-access threats. UE Maneuver AMD and SOF special weapons crews will be capable of employing next generation MANPADS when METT-TC requires short range, dismounted air defense missions such as ambushing enemy RW arriving in LZs, conducting roof top shots in MOUT environments, or performing SOF MANPADS requirements.

The UA will have organic Battle Command capabilities necessary to provide information on the Battlespace's third dimension. This will enable the UA to develop and maintain correct individual and group situational awareness when not supported by UE AMD battle management for organic UA fires. UE Maneuver AMD Battle Command will be capable of integrating mission tailored maneuver AMD, mobile Anti-Theater Ballistic Missile (ATBM), and any NLOS fires in a JIADS compliant manner. The UA, augmented by UE as required, enables its commanders to effectively orchestrate integrated air and ground maneuver, fires, and air defenses in support of decisive operations within its AO. The key to the UA air and missile defense effort is the synergistic effects of all joint and UA/UE combined arms efforts to dominate, control, and exploit the third dimension of the battlespace.

4.6.6 Maneuver Support

4.6.6	**Maneuver Support**
4.6.6.1	**Maneuver Support Imperatives**
4.6.6.2	**Survivability**
4.6.6.3	**Operations in CBRN Environment**

Maneuver Support is a foundational operational integrating area that organizes the critical capabilities needed to enable combined arms formations at all echelons. Maneuver support shapes, leverages, and mitigates aspects of the operational environment to enable, enhance, and protect strategic, operational, and tactical freedom of action. It focuses on the totality of the environment in which military forces operate to ensure that these forces have freedom of action, while denying comparable freedom of action to the enemy. Maneuver support provides the operational framework for the commander and his staff to plan and execute integrated tasks that bring together two fundamentally interrelated components of operations: freedom of maneuver and protection.

For the UA, maneuver support enables the force to conduct protected operational maneuver by ground, air, and sea; protected force and sustainment connectivity throughout the UA's AO, including force cycling and pulsed logistics; and tactical maneuver along dispersed, noncontiguous axes to successfully close with and destroy the enemy. The capabilities inherent in maneuver support also give the UA commander the means to more rapidly transition to support operations and stability operations in some parts or all of the UA's AO. The multi-functionality of maneuver support is in providing freedom of maneuver and protection through integrated sets of capabilities, soldiers, systems, and forces. Thus the hallmark of maneuver support's contribution to the combined arms team is economy of force. This frees up combat power to be applied directly against the threat in the close fight. For the UA, maneuver support is enabled by a wide range of means. Baseline capabilities within the UA rely on embedded payloads and subsystems carried on manned and unmanned air and ground platforms. To provide for a leaner and more general-purpose force with dispersed capabilities, the UA design principle is to avoid specialized organic maneuver support platforms, soldiers, and organizations. Thus the UA depends almost exclusively on external support for focused maneuver support enablers.

Maneuver Support shapes, leverages, and mitigates aspects of the operational environment to enable, enhance, and protect strategic, operational, and tactical freedom of action.

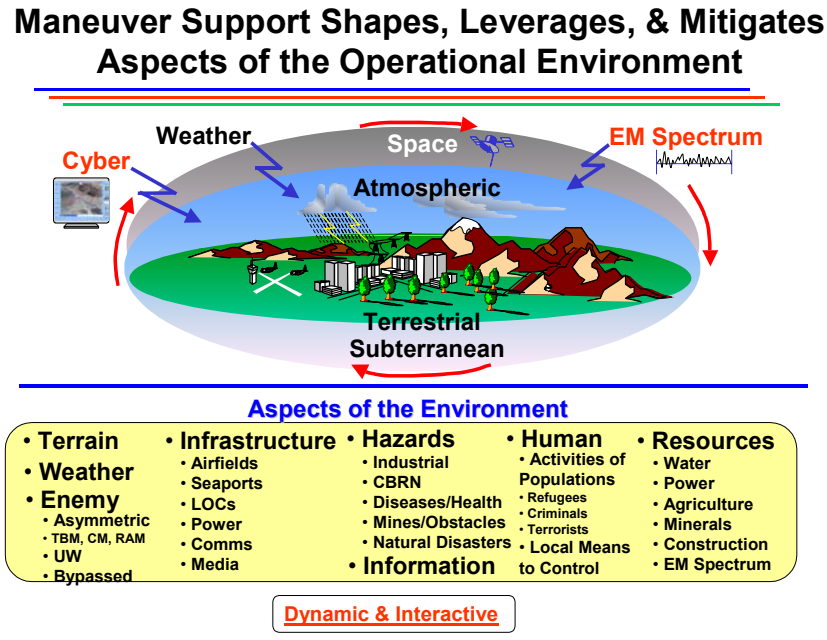


Figure 4-20 Maneuver Support Environment

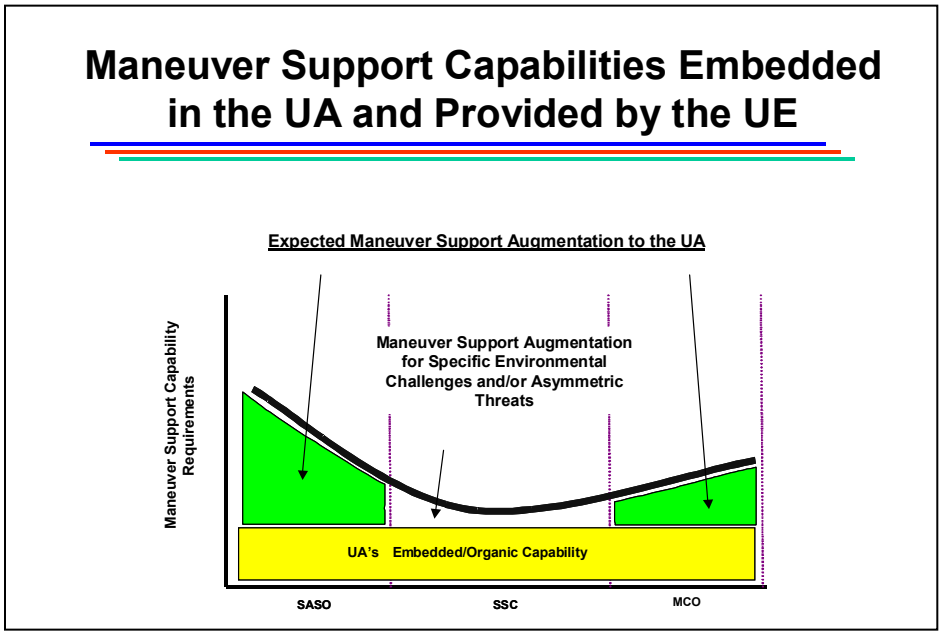


Figure 4-21 Organic and UE Augmenting Maneuver Support Capabilities

When required by a specific environment or mission, the UA will rely heavily on the UE to apply maneuver support to shape the battlespace and set conditions for UA operations, or on the UE to provide, through reach from force-pooled units, tailored capability modules as augmentation directly to the UA. Depending on demands of the operation and the requirements for maneuver support, these capability modules may be provided by any number of branch proponent organizations at different UE echelons. Maneuver support is not combat support, but an integrated set of capabilities to empower the commander. Figure 4-24 shows the wide range of proponent assets that can provide maneuver support. In addition, maneuver support capabilities may come from Joint, interagency, multinational, host nation, and contractor sources.

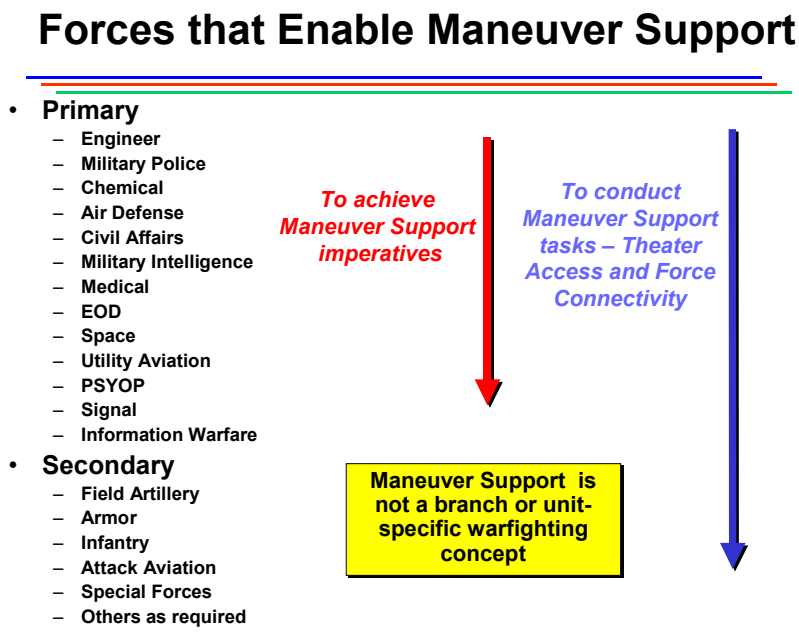


Figure 4-22 Maneuver Support Assets Come from a Wide Range of Proponents

The most critical organic enabler of maneuver support is the Maneuver and Support Staff Cell at UA Bde (as well as a limited number of staff personnel at selected Bn HQs). This staff cell plans and synchronizes maneuver support for the commander, and must be able to leverage reachback and accept staff augmentation from the UE, as necessary. The staff must be prepared to oversee assets from Current, Stryker, and Objective Forces, as well as JIM sources. In cases where a wide range of assets are provided by the UE to support a complex set of tasks, a maneuver support HQ may be assigned to directly control and integrate these assets. Tailored force packages of modular maneuver support units operating or pooled at the UE and Joint echelons will augment the UA as required based on METT-TC. This augmentation will be provided as needed, then removed when no longer required. Augmentation may take place prior to the UA's initial deployment into theater to enable it to enter theater with the full range of maneuver support capabilities it needs to complete the mission, particularly during early entry operations, when the UE is still building capability in theater. During the transition to the next mission, maneuver support enablers may be added, removed, or realigned. A prime opportunity for transition is during force cycling.

The broadest description of the maneuver support operational approach begins with the need to be predictive and proactive. The commander must understand the battlespace environment and its implications to friendly and enemy operations. This understanding allows the commander to predict enemy actions that would leverage the environment and to take proactive actions against the enemy to deny him the means to do so, or to avoid areas of highest risk. The commander also shapes the battlespace environment to best support his operations, notably freedom to maneuver and protection, and to deny the enemy the ability to maneuver. To develop and maintain this understanding, the commander applies a wide range of dedicated and collateral sensors. Where protection and security of key nodes and moving forces is most at risk, security, hazard avoidance, and hazard neutralization/obstacle crossing capabilities are applied. A particular focus of maneuver support is the asymmetric threat, including limited-capability bypassed forces that operate in the largely unoccupied "grey space" that UA forces move through. To provide the commander with the widest possible range of options to maintain operational momentum and make early decisions on force movement, the UA applies standoff detection and neutralization where possible. These are applied in layers from the highest to lowest echelons to minimize risk and the chance that "leakers" can penetrate to stop soldiers, platforms, and forces. Restoring the environment mitigates the adverse effects of military operations that produced hazards to friendly forces and noncombatants, especially where extended presence is required.

The Army's vision of the operational environment recognizes that adversaries will apply a wide array of conventional and unconventional or asymmetric means to deny friendly forces freedom of movement and access to operational areas. In some cases, the physical environment, to include the terrain, infrastructure, weather, hazards, and the presence of the local populace, will affect ground forces more than enemy actions. Maneuver support enables the UA to maneuver to objective areas; shape and isolate areas of operation and objective areas; and protect and secure critical assets. Maneuver support takes on added dimensions and significance in the UA's extended dispersed, distributed, noncontiguous, and three-dimensional battlespace. Two significant maneuver support CONOPS will be coordinated by the Maneuver and Support Staff Cell. The first will be protected strategic or operational movement and maneuver of the UA to its AO. This may be a UE-based or a UE and UA-integrated operation. The second will be protected force connectivity of assets within the UA's AO. A primary focus of the latter will be rapid and protected movement of units through the relatively unoccupied spaces in the AO (what is sometimes referred to as "gray space") while countering asymmetric threats and environmental challenges.

4.6.6.1 Maneuver Support Imperatives. Maneuver support imperatives provide the operational framework to organize, plan, and apply maneuver support functions, tasks, and capabilities. This framework supports commanders in integrating capabilities at all echelons and levels of war (national strategic, theater strategic, operational, and tactical). These imperatives have operational significance in the way they bring together functions, tasks, and capabilities, but there is inherently some overlap between the imperatives.

4.6.6.1	**Maneuver Support Imperatives**
4.6.6.1.1	**Understanding the Battlespace Environment**
4.6.6.1.2	**Enable Theater Access**
4.6.6.1.3	**Provide Assured Mobility**
4.6.6.1.4	**Deny Enemy Freedom of Action**
4.6.6.1.5	**Enable Protection and Security**
4.6.6.1.6	**Engage and Control Populations**
4.6.6.1.7	**Neutralize Hazards**

4.6.6.1.1 Understand the Battlespace Environment. This imperative supports proactive decision-making and effective actions by providing predictive analyses and tailored environmental information to the COP. Providing not just awareness of the environment, but understanding of the effects of the environment on friendly and enemy actions, to commanders is the critical requirement. Integrated and analyzed battlespace environmental information including terrain, weather, infrastructure, hazards, populations, and their interaction, enables automated decision support tools and the development of options to leverage or mitigate environmental effects on the force. The five functions of this imperative are:

- Battlespace environment data acquisition that includes real-time collection of new data as well as supplementing existing data sets with more detail.
- Battlespace environment data exploitation that includes analyses and cognitive aids that provides actionable courses of action.
- Battlespace environment data management that includes data storage, retrieval, and update capabilities.
- Battlespace environment data representation that either displays visually or in other forms compatible with user needs and learning styles to enable perception visualization, comprehension, understanding, and retention.
- Battle environment data dissemination that is timely and compatible with a network-centric environment.

Battlespace environment data acquisition, exploitation, management, representation, and dissemination is primarily done by UE and higher echelon environment/terrain visualization assets and pushed down to the UA DIDb and displayed on the COP. As a minimum, the COP will present:

- Modified combined obstacle overlay (MCOO).
- Trafficability analysis.
- Terrain databases.
- Integrated weather data and forecasts.
- Infrastructure capacities.
- Actual and potential hazardous materials.
- Local population traffic flow.

The UA expands and focuses portions of the COP using organic sensing assets, integrated and analyzed by the UA BIC Topographic Section to meet the specific needs of commanders as operations evolve. A key enabler for the UA and UE is an Objective Force geospatial information system. The COP is dynamically updated as natural and man-made alterations to the environment are made by friendly forces or enemy

forces (such as minefields, anti-tank ditches, fighting positions, and CBRN and hazardous material), detected by UA and higher echelon ISR assets, and then fused into the COP. This enables automated decision support tools and the development of maneuver COAs, branches, and sequels to leverage or mitigate environmental effects on the UA. Understanding is further developed with risk assessments and other predictive tools to allow the commander to take proactive actions.

4.6.6.1.2 Enable Theater Access. This imperative provides a proactive means to ensure the force can freely enter and operationally maneuver within the theater of operations by air, sea, and ground. Maneuver support capabilities enhance entry capabilities and infrastructure, mitigate adverse effects of the environment (terrain, weather, enemy action, infrastructure, hazards, and local population), enable theater air and ground lines of communications, and protect/facilitate multiple theater entry points. These capabilities also enable prolonged presence of Joint and Army forces in theater by providing a stable and capable support base characterized by viable infrastructure, installations, and critical services. These capabilities readily support and are a means for rapid transitions to and from support and stability operations. The UE enables theater access for the UA in support of major operations. The UA may conduct strategic movements and/or operational maneuver from strategic distances. The operational environment identifies these as prime targets of enemy actions, particularly through asymmetric means to deny friendly theater access. Enabling theater access is normally fully integrated with enabling protection and security to provide protected force movement and support. Maneuver support capabilities can be readily applied to inter-theater movement and operational maneuver from strategic distances. Some assets must be designed to optimally support early entry for the UA. The UA's Maneuver and Support Staff Cell, with its maneuver support and operational maneuver elements, is the key integrator.

The UA must have UE support and augmentation in order to enable theater access, conduct operational maneuver, and set conditions in the battlespace. Enabling theater access for the UA is done by maneuver support, ISR, maneuver, fires, AMD, and maneuver sustainment assets at all echelons in a layered, synchronized, cooperative effort that supports the commander's intent. Maneuver support packages from the UE and Joint echelons, joint and UE fires, and mission-tailored UE maneuver AMD are the primary means of enabling theater access for the UA. These capability modules, combined with the limited maneuver support capabilities embedded in the UA that can provide long-range standoff hazard detection and neutralization, such as on-route mine detection, mine neutralization, and CBRN detection, enable the UA to understand, avoid, and mitigate adverse environmental effects, conduct force protection, and repair/upgrade/develop theater entry points, infrastructure, and installations.

Data from UA and higher echelon sensors enables the commander to understand the battlefield environment and leverage or mitigate its effects on the UA as it enters and operationally maneuvers within the theater. The UE sets the conditions for UA maneuver forces to seize theater entry points so the UA can freely enter and operationally maneuver. UA maneuver forces or augmenting maneuver support forces, depending on the specific environment and threat, secure theater entry points to enable a prolonged presence of forces in theater. Depending on the purpose and support provided, the UE-based augmenting maneuver support capability modules or the UA's maneuver sustainment assets augmented by modular maneuver sustainment packages from the UE and higher echelons provide stable, capable support bases and critical support services.

4.6.6.1.3 Provide Assured Mobility. This imperative includes those actions that guarantee the force commander the ability to move and maneuver where and when he desires in all types of terrain and weather, including urban terrain, without interruption or delay, to achieve his intent. The six fundamentals of assured mobility are:

- Predict.
- Detect.
- Prevent.
- Avoid.
- Neutralize.
- Protect.

Joint and national level ISR assets provide a foundational MCOO that is updated in real time to enable the UA commander and staff to predict actions and circumstances that could affect the ability of the force to maintain momentum by air and ground movement and maneuver. Organic ISR assets are used to detect early indicators of impediments to battlefield mobility and identify possible solutions. The commander and staff act early to prevent potential impediments to maneuver from affecting the battlefield mobility of the force by monitoring and protecting cleared routes. If prevention fails and impediments are detected, then the force will avoid them using other alternatives. If these mobility impediments cannot be prevented or avoided, or the commander chooses to maneuver through them, then the force will neutralize, reduce, or overcome (e.g., breach) these impediments to battlefield mobility. Platforms within the UA are designed with inherent survivability capabilities to the crew and platform against the effects of mines, CBRN hazards, and HAZMAT prediction, detection, prevention, avoidance, and neutralization fails. Providing assured mobility is both a sequential and a continuous process that must be applied enroute to an objective, on the objective, and beyond the objective. Layered capabilities are critical to reducing the effects of mobility impediments to the lowest acceptable levels of risk to the force.

The UA also must have UE augmentation in order provide long-range standoff detection and neutralization capabilities and for tactical assured mobility in a wide range of environmental conditions, such as complex terrain with large gaps to cross. Initially, the UA staff predicts the circumstances that could affect the ability of the force to maintain momentum based on their understanding of the battlefield environment. The collection and integration of imagery and geospatial information, cultural, and enemy information collected by UA, UE, and higher echelon ISR assets, aided by automated terrain analysis and other tools, is fused into the overall COP. This enables the early detection of indicators of impediments to battlefield mobility, the identification of alternative routes, and establishment of surveillance on primary and alternate routes. Critical mobility choke points, operating areas, and airspace are identified and a shaping plan is developed before movement or enroute. This plan includes prediction of enemy actions and required sensor coverage to fill any information voids within the operating area. Through this proactive process, ISR assets such as UAVs, UGS, or IMS may be assigned the role of “staring” at critical areas by the UA to fill the voids or improve the quality of information, to include critical queues that enable developing and maintaining correct situational awareness. These ISR assets can be linked with fires or other smart munitions to form an active protective system to deny the enemy’s ability to influence or degrade mobility at these critical points.

The UA commander acts early to prevent identified potential impediments to maneuver from affecting battlefield mobility of the UA by proactively attacking those enemy systems capable of directly or indirectly impeding friendly maneuver, thus destroying route interdiction capability before it can be applied. This is accomplished through UA and UE precision fires, munitions, obstacles, and attack by aircraft. If prevention fails, he identifies alternatives to avoid detected impediments to battlefield mobility. Most mobility impediments will be mitigated though prediction, detection, and prevention. Obviously, if operationally feasible, impediments to maneuver will simply be avoided. There will be situations in which operational requirements dictate negotiation of obstacles. This will be enabled by maneuver support capability modules from the UE and Joint echelons. The Maneuver and Support Staff Cell is the commander’s critical planner and integrator for assured mobility.

4.6.6.1.4 Deny Enemy Freedom of Action. This imperative includes proactive measures to leverage the physical environment to isolate enemy forces, deny key terrain, and deny, impede, or canalize enemy movement in order to protect friendly forces and their freedom of action, and to place enemy forces in positions of disadvantage. The UA must have augmentation from the UE in order to emplace extensive tactical obstacles or to emplace obstacles at long ranges. The UA denies enemy freedom of action through the use of fires, IMS, obscuration, and deception. IMS provides a proactive means for the UA commander to shape the battlespace to support his scheme of maneuver. IMS with its integrated sensors/munitions provides overwatch of known enemy forces and potential routes that could interfere with friendly maneuver. It can engage them, isolate them in place, prevent reinforcement, and cue fires. In urban operations, IMS can be used to maintain surveillance of cleared areas and to directly attack any enemy attempts to regain access. IMS has the capability to deny terrain that would be favorable to the enemy without requiring occupation and overwatch by friendly maneuver forces, thus serving as an economy of force capability for the UA. Other means to deny enemy freedom of action include the use of large-area, multi-spectral and designer obscurations projected at long ranges or applied locally to counter enemy RSTA capabilities in all

three dimensions; a wide range of both lethal and non-lethal obstacle/fires effects; and deception tools. Fires and unmanned systems will be significant delivery platforms for these.

4.6.6.1.5 Enable Protection and Security. This imperative includes layered and integrated protection of the force through proactive attack, defensive, and standoff measures that tie together point and area protection of nodes and operating areas; this includes comprehensive intelligence coverage, early warning, cueing, and target engagement to the lowest levels. Prediction is the start point to determine risk and means to proactively deny enemy capabilities. Asymmetric threats are a major focus of this imperative. Effective protection and security operations will depend on effective interoperability of communications systems, the COP, and ISR systems to ensure real-time early warning of threats. Long-range standoff detection and early warning of such hazards as TBMs, cruise missiles, and CBRN agents will require support from the UE and higher echelons. The UA's Maneuver and Support Staff Cell integrates protection and security means with freedom of maneuver to foster desired synergy and provide economy of force. Incorporated into this imperative are the capabilities to:

- Obscure the full range of RSTA and electromagnetic threats.
- Isolate the immediate battlespace dynamically to prevent interference by noncombatants; use of lethal and non-lethal effects to alter the tactical environment; retention of control of and maintenance of LOCs in the AO.
- Use criminal investigation division (CID) information in support of current and future operations.
- Use anti-terrorism and force protection equipment and vulnerability assessment planning tools.
- Use robotic support for manpower intensive security and force protection tasks.
- Use improved camouflage, concealment, deception tools, and air and missile defense against asymmetric threats.

When required by METT-TC, mission-tailored AMD, counter-terrorism, and maneuver support augmentation enhance UA force protection and security. The UA enables force protection using the embedded capabilities of sensors on the FCS manned and unmanned platforms to facilitate force protection and security operations. The UA's ISR assets will be used for standoff detection to support real-time warning, assessment, and prediction of threats from local, populations, asymmetric forces, or unconventional forces. The UA will have reachback to CID information and vulnerability assessment planning tools. It is critical that a layered approach be applied for protection and security for the UA. In addition to embedded survivability enablers on manned and unmanned platforms, organic and augmenting means provide protection through fixed and moving node protection, movement escort and route protection, area security, and protection umbrellas over forces that are projected from long-range systems. UAVs, UGVs, UGS, and IMS are primary examples of unmanned systems that will also be used for manpower intensive security and force protection tasks, including operations in environments where human beings cannot operate.

4.6.6.1.6 Engage and Control Populations. This imperative includes control over demographically diverse populations to ensure maneuver, maneuver support, and maneuver sustainment forces are unencumbered in the conduct of their respective operations. Populations are most often classified as enemy prisoners of war, civilian internees, retained personnel, detainees, refugees, displaced persons, stateless persons, war victims, evacuees, resident (stay-put) populations, or mass transiting civilian populations, but can also include local insurgent groups, organized crime syndicates, and other governmental, law enforcement, political, informational, military, economic, religious, and social leaders (legitimate or otherwise). Supporting functions facilitate the commander's ability to conduct rapid and decisive combat operations; deter, mitigate, and defeat threats to populations which may result in conflict; reverse conditions of human suffering; and build the capacity of a foreign government to effectively care for and govern its population.

Engagement functions refer to the ability of US forces to attract and gain the attention of fragmented populations; bring them together for open dialogue, coordination and interface; and inducing their continued participation and cooperation. Control functions refer to the positive physical and/or psychological pressures exerted by US forces over a selected population that ensure the entire group complies and responds as directed.

5028 An adaptive enemy manipulates populations hostile to our intent by instigating mass civil disobedience,
5029 directing criminal activity, and masking his operations in urban/complex terrain to detract from our ability to
5030 focus our combat power effectively in decisive operations. Augmentation by UE and higher echelon
5031 maneuver support modular packages is required to enable the UA to engage and control populations while
5032 simultaneously conducting combat operations. UE maneuver support elements set conditions that
5033 unburden the UA commander by preventing uncontrolled population movement and enabling his
5034 unconstrained maneuver without fear of noncombatant interference or collateral damage. These assets act
5035 in conjunction with either foreign or host nations and other multinational and interagency actors to mitigate
5036 the effects of local insurgents on military operations and to reestablish legitimate enforcement and other
5037 public service capabilities to meet the basic requirements of the civilian populace. These capabilities also
5038 allow the UA commander to rapidly transition to stability and support operations within his AO. The
5039 commander's key planner and integrator is the Maneuver and Support Staff Cell. Based on METT-TC, the
5040 UA staff may be augmented from the UE with a Civil Military Operations Center (CMOC) to execute this
5041 process. The CMOC consists of a staff element and a mobile coordination cell. The staff element plans,
5042 executes, and transitions the activities of civil affairs units with the UA tactical plan and directs the activities
5043 of the mobile coordination cell.

5044 **4.6.6.1.7 Neutralize Hazards and Restore the Environment**. This imperative requires the reduction or
5045 elimination of the operational impact and effects of a full range of environment-based hazards through
5046 avoidance, mitigation, neutralization, and, when necessary, restoration of the environment to acceptable
5047 safety levels. An adaptive enemy may use the products of industry and enterprise against the force in
5048 unexpected ways. The enemy is likely to have access to and be willing to employ WMD, including the
5049 clever use of CBRN weapons, as well as toxic industrial chemicals/toxic industrial materials. Other hazards
5050 likely to be encountered include mines, unexploded ordnance, and stockpiles of munitions and equipment.
5051 The force may also become exposed to the hazards of pollution, poor sanitation, endemic diseases, and
5052 other environmental hazards. Damage to the soil, water, and air must be minimized in a manner consistent
5053 with the military mission. Augmentation by UE and higher echelon maneuver support capability modules
5054 will be required to provide the UA with full CBRN neutralization and area clearance capabilities and enable
5055 it to restore the environment as required. ISR assets will be used to support standoff detection, warning,
5056 and prediction of environment-based hazards, with real-time updates to the UA's DIDb and displayed on the
5057 COP. Without augmentation, avoidance is the UA's primary means of neutralizing these hazards. The UA
5058 will have reachback linkage to a CBRN and vulnerability assessment planning tools database. The UA's
5059 unmanned platforms will be used for route clearance of mines, unexploded ordnance, and stockpiles of
5060 munitions and equipment. The UA's embedded maneuver sustainment capabilities will prevent soldier
5061 exposure to the hazards of pollution, poor sanitation, endemic diseases, and other environmental hazards.

5062 **4.6.6.2 Survivability**. Survivability is the ability to combine systems, tactics, operations, and processes
5063 that afford optimum protection to deployed Army forces. The UA uses situational awareness with lethality
5064 and speed in conjunction with active and passive protection capabilities to achieve survivable forces.
5065 Survivability for the UA is more than armor protection to platforms; it is a holistic and layered approach. The
5066 survivability concept for the UA is to destroy the enemy first and not be detected, acquired, hit, or
5067 penetrated. The ability to See, Understand, and Act First is essential for the UA to kill enemy forces before
5068 they can detect and destroy UA platforms and systems. FCS ground platforms will achieve survivability
5069 overmatch during fire and maneuver, tactical movement, actions on contact against surprise encounters or
5070 local counterattacks, and tactical assaults through a combination of these measures:

5071 • Employment of LOS, BLOS, and NLOS fires in overwatch of displacing formations; using long-
5072 range acquisition to shoot with assured lethality and assured first round kill to destroy targets each
5073 time we pull a trigger.

5074 • Integration into cooperative direct counter fire systems that provide slew to cue 'avenge' kill
5075 capability to destroy enemy systems engaging or preparing to engage friendly systems.

5076 • Employment of multi-functional all-arms defense approach with organic UA assets augmented with
5077 UE AMD as required by METT-TC.

5078 The UA seeks to avoid detection and acquisition through effective signature management. To degrade
5079 enemy detection and terminal targeting, the UA employs camouflage and terrain to its advantage for cover
5080 and concealment. It supports counter-reconnaissance efforts to blind enemy ISR through the use of

obscurants, jamming, signature reduction, deception, disinformation, and pattern avoidance techniques. FCS platforms avoid being hit by using superior dash speed from cover to cover with the capability to overcome simple mobility impediments. Active protection systems are used to defeat, from standoff, in-flight missiles and tank rounds. Standoff detection sensors provide real-time warning and dissemination to protect the force against CBRN hazards, mines, booby traps, and enemy dismounted personnel. Multi-purpose robots perform manpower intensive, high-risk functions such as ISR missions in urban operations (inside buildings and the subterranean dimension) and reconnaissance/reduction of minefields, obstacles, and breaching of doors and walls in support of urban operations.

FCS platforms have ballistic protection against 14.5mm all-around, with add-on armor ensembles for 30mm, and can withstand anti-personnel and anti-tank mine effects. The UA will provide maximum protection of the individual soldier, whether that soldier is on a platform (air or ground) or operating dismounted. This holistic protective system of systems ensures soldiers are not impacted by ballistic, flame, thermal, chemical-biological, thermobaric, and electromagnetic threats. FCS systems will have sufficient hardening from directed energy weapons, such as EMP and high-powered microwave. Embedded overpressure, filtration, and decontamination on FCS manned systems will stop chemical and biological penetration threats. FCS systems will ensure protection against weather effects to include extreme temperatures. The UA must have augmentation from UE or higher echelon maneuver support assets in order to prepare survivability positions to protect the force. Finally, the UA will protect its ability to See and Understand First by maintaining information assurance and prevent unauthorized access, interception, and exploitation within the FCS network.

4.6.6.3 Operations in a CBRN Environment. Maneuver support imperatives provide the UA the means to conduct operations in a CBRN environment through embedded capabilities and augmentation from UE and Joint forces. The basic maneuver support operational approach is applied in CBRN operations through the processes of Shape-Sense-Shield-Sustain. UA personnel and leaders are trained and equipped to conduct operations in a CBRN environment. CBRN defense personnel integrated in the Maneuver and Support Staff Cells at Bde and Chemical/CBRN defense staff personnel at Bn coordinate external CBRN support and perform battle management functions. The UA identifies and locates delivery systems and hazard areas, and predict potential hazard areas that could impact UA operations. It uses dispersion, information superiority, protective posture, and mobility to reduce its vulnerability to CBRN targeting. It attacks delivery systems to prevent potential hazards.

CBRN are those actions taken to preserve the combat power and mobility of the Unit of Action during CBRN or hazardous environmental conditions. These conditions exist when UA operations could be impacted by the use of Chemical, Biological, Radiological, and Nuclear weapons or the release of hazardous materials.

The UA uses non-CBRN ISR (termed collateral sensors) such as radar to identify munitions and aircraft that are delivering CBRN, to initiate the warning and reporting system, and to cue CBRN sensors. It uses CBRN standoff detectors, UGS, UAVs, UGVs, and point detectors embedded on manned platforms to provide the layering of detection capabilities needed for a dispersed force to confirm hazards and their extent, avoid hazards, and warn personnel to assume protective posture, notably against downwind hazards whose impact can change rapidly due to changes in weather and the effects of terrain. It neutralizes hazards that cannot be avoided. The UA maintains combat effectiveness even in a hazardous environment through the use of collective protection for manned systems, allowing crews to perform their duties without assuming mission oriented protective posture (MOPP). Personnel are vaccinated, medically monitored, and have ready access personal protective equipment, decontamination supplies, and immediate treatment measures for expected hazards. If contaminated, the UA will conduct contamination reduction using organic decontamination systems, request augmentation from UE and higher echelons if needed, and rapidly return to a pre-attack state.

4.6.7 Maneuver Sustainment

4.6.7	Maneuver Sustainment
4.6.7.1	Sustainment Operations
4.6.7.2	Combat Replenishment
4.6.7.3	Sustainment Replenishment
4.6.7.4	Mission Staging Operations
4.6.7.5	Distribution Operations
4.6.7.6	Supply
4.6.7.7	Field Services
4.6.7.8	Maintenance
4.6.7.9	EOD
4.6.7.10	Transportation
4.6.7.11	Force Health Protection
4.6.7.12	Other Sustainment Operations

The UA is self sufficient for up to three days of high intensity operation or up to seven days in a low intensity operation. Self-sufficiency enhances the UA's agility, versatility, and lethality. To maintain combat power within the UA, the FSB conducts synchronized sustainment pulses to the CA Battalions and other subordinate elements as the UA commander cycles his units through sustainment operations. The UA, through its supporting UE, is capable of having its supporting sustainment base extended by leveraging Navy sea-based logistics. This will reduce the dependency on Army – only assets and will integrate Army sustainment with the Navy and Marine Corps.

The key to successful maneuver sustainment is the continuous flow of information from maneuver forces through the COP and the synchronization of sustainment operations. In the UA, sustainment is an operation directed by the maneuver force commander and coordinated by his battle staff rather than an administrative or logistic function. In this manner, sustainment becomes a positive force multiplier and fully integrated into the maneuver commander's. The DIDb information displayed on the COP enables the integration of maneuver sustainment into maneuver. Access to and information pull from the DIDb is crucial to sustainment on the battlefield. Sustainment information from each soldier and platform, and a variety of CSS automation systems (e.g. Global Combat Service Support – Army (GCSS-A)) is automatically fed to the DIDb.

This information is automatically formatted and scaled to allow each level of sustainment to access appropriate information enabling predictive sustainment of consumables or provision of maintenance support. Predictive consumption and spatial awareness provided by the DIDb enables precise management of the 'sustainment pipeline', which, in turn leads to dynamic rerouting. The COP provides the flexibility and responsiveness that enables sustainers to integrate their efforts into the maneuver commander's battle rhythm. Through demand reduction, improved reliability and maintainability, the Common Logistics Operating Environment (CLOE) (prognostics and diagnostics), and distribution-based logistics will help to reduce or eliminate the need for supply support activity requirements. CLOE along with access to the GIG will enable leaders and sustainers to operate a distribution-based logistics system to meet the warfighters requirements rather than establishing and maintaining large stockpiles in the theater of operations. Emphasis is placed on information management and visibility of the distribution pipeline through the use of Total Asset Visibility. Sustainers use the tenets of Joint Theater Distribution; visibility, capacity, and control to actively manage priorities of the force and ensure sustainment is provided when and where required.

4.6.7.1 Sustainment Operations. The UA Commander is enabled by maneuver sustainment as it fits into his battle rhythm. No longer will a commander be tied to sustainment support programmed to arrive on a regular scheduled basis. It is through the use of pulsed sustainment, the intermittent multi-modal flow of goods and services (to include personnel services) integrated into the maneuver commander's battle rhythm to sustain or rebuild combat power, that will provide the maneuver commander with operational flexibility and the ability to operate without permanent attachment to a long sustainment supply line. It will eliminate the requirement to maintain a secure LOC at all times and in all places within a non-contiguous battlespace. Coupled with the concept of cycling, which is a series of events or operations that recur regularly within combat operations to rebuild or sustain the combat power of Army organizations, the commander can maintain unrelenting pressure on the opposing force while integrating sustainment

replenishment activities into maneuver operations. It is through these two concepts that sustainment allows the maneuver commander to become less encumbered by sustainment bases and provides the inherent flexibility to carryout sustainment operations by one of three types of operations: Combat Replenishment Operations (CRO), Sustainment Replenishment Operations (SRO), and Mission Staging Operations (MSO).

4.6.7.2 Combat Replenishment Operations. Combat Replenishment Operations (CRO) are replenishment events executed by UA battalions using organic assets to conduct internal resupply. CRO occurs in-stride and within the CA battalion commander's battle rhythm. The objective is rapid internal sustainment replenishment that enables follow-on engagements within the same battle. Combat replenishment operations are brief events to rearm, refuel, provision essential supplies, and support the fix function by cross leveling of on-board spares and limited Battle Damage Assessment and Repair (BDAR). They are executed by the support sections where provided, and resupply vehicles located in the respective UA battalions. Although UA battalion commanders conduct combat replenishment operations as required, they are not planned or executed in isolation. The UA brigade headquarters and FSB maintain visibility of the requirements, capabilities, and execution.

4.6.7.3 Sustainment Replenishment Operations. When the CA Battalions can no longer logistically support combat replenishment operations or METT-TC considerations dictate, elements from the FSB and possibly UE units conduct SRO to regenerate or sustain combat power. The FSB has the capability to conduct sustainment replenishment operations independently, but requires augmentation from the UE around the 72 hour mark of high intensity operations. The purpose of sustainment replenishment is to provide a quick, in-stride, sustainment operation that fits within the battle rhythm. This is similar to a "pit-stop" operation. Sustainment replenishment can be either a deliberate or hasty operation if an opportunity exists or circumstances allow. Rearm, refuel, fix, medical support and personnel replacement activities fulfill immediate needs.

The UA commander and his battle staff coordinate with the FSB so sustainment replenishment occurs in-stride with the maneuver commander's battle rhythm. The objective is rapid sustainment replenishment that enables follow-on engagements within the same battle. More detailed regeneration will occur later at mission staging locations, which will be a secure site selected in consultation with the maneuver commander and his battle staff. The primary method of replenishment is for the supported unit and the supporting unit to maneuver to a pre-determined location away from direct combat operations. In those instances where the supported unit cannot break away, the supporting unit will go to the supported unit. In all sustainment replenishment operations, considerations will be given to all modes of delivery; surface, aerial, and sea. Extended battlefield distances may increase reliance on aerial-based replenishment operations. The most appropriate mode for the tactical situation will be selected.

4.6.7.4 Mission Staging Operations. Mission Staging Operations (MSO) is a planned deliberate operation executed by UE maneuver sustainment elements. The purpose of MSO is to provide sustainment through an intense, time sensitive operation to include all preparations for an upcoming mission. This includes, but is not limited to, reorganization, planning, troop leading, rehearsals, training, reconnaissance and surveillance, tailoring for the next mission, and information operations to ensure mission success. Initially mission staging coincides with operational-level preparations, but thereafter the tactical cycle turns more rapidly.

Mission staging are operations that are intense and time sensitive which include all preparations for an upcoming mission -- planning, troop leading, rehearsals, training, ISR, reconstitution, tailoring for the next mission, information operations, *etc.* This is a planned, deliberate operation

The maneuver commander and his battle staff, in conjunction with the supporting maneuver sustainment commander, plan the mission staging. The anticipatory planning of linked UA and supporting unit staffs ensures that little time is taken to produce fully coordinated plans. Mission staging may require external escort and security. When surface transportation is required and LOCs must be secured or convoys protected, force protection assets from the UE/UA are necessary. When units are replenished by air, battalions (or, in some cases, companies) secure aerial penetration and landing zones and prepare to rapidly receive and upload the incoming re-supply.

4.6.7.5 Distribution Operations. Distribution operations integrate personnel, transportation and supplies. The principles of distribution consisting of centralized management, optimizing infrastructure, maximizing throughput, minimizing forward stockpiling, and maintaining continuous and seamless pipeline flow remain in the Objective Force. However, the concept for distribution operations in the UA is significantly different from today's operations. The greatest difference will be the speed and precision at which these operations are executed. Centralized management enabled by access to information through the CLOE reflected on the COP must be available to logisticians so they can monitor the supply status of subordinate platforms and units, anticipate requirements, configure loads, begin movement, and coordinate delivery. Information requirements include individual soldier and platform status, location of enroute supplies, customer locations, enemy locations, routes and terrain data. Information also permits the UA to maximize throughput and minimize forward stockpiling. Configured loads built away from the UA area of operation are pulsed forward to the UA on multi-modal platforms (flat racks). All UA sustainment remains uploaded to assure 100% mobility using a combination of command and control, fighting platforms, and designated sustainment vehicles.

Unlike current operations, the maneuver commander is not responsible to maintain a continuously secure Main Supply Route (MSR). Instead, sustainment pulses move to a Supply Replenishment Site (SRS) or a Mission Staging Site (MSS). LOCs and their protection will occur at specific times and locations rather than being continuously secured. These LOCs will be identified by the appropriate maneuver commander's battle staff and secured in accordance with his operational plan. The majority of dry cargo moving from the UE to the UA is transported as configured loads on multi-modal flat racks, and liquids are transported in tank racks. When METT-TC allows, the majority of movements will utilize ground transportation. However, when distances are too great or the enemy situation prevents ground movement, aerial LOCs will be used. The UA may also employ precision aerial delivery/air drop for emergency situations. During Mission Staging Operations, both UE and FSB assets are necessary, and throughput from UE to the MSS is optimal. The two methods for the throughput of supplies from the UE to the UA are:

- UE delivers to SRO/MSO locations linking with the FSB and other element(s) of the UA. This is the preferred method of resupply from the UE to the UA.
- FSB acts as the UA's receptacle for limited supplies. The FSB receives all inbound cargo to the UA and then conducts SRS operations using its own assets. The FSB can only receive and distribute a portion of the UA's three day requirement needs.

4.6.7.6 Supply. The UA possesses the enablers that make it more self-sustaining than previously possible. Particularly, the decreased size of future rations, embedded water generation, and mandated fuel efficiencies allow the UA to operate nearly autonomously. The future combat ration reduces the size of the current ration by 52%, allowing the FCS to carry more days of crew sustainment with them. The UA optimizes support to provide critical commodity availability of combat rations, water, bulk fuel, packaged petroleum and lubricants, ammunition, and repair parts to build and sustain combat power. Dry cargo (supplies) and liquid bulk, including embedded water generation, will be carried on FCS platforms and replenished as required.

Common classes of supply (I, water, II, III (P) & (B), IV, VI, VIII (non-regulated items), and IX) will be distributed during CROs internal to the UA units, during SROs between the FSB and the supported units, and during MSOs by UE maneuver sustainment elements. Exceptions to this method of support will be class VIII (controlled items i.e., blood and narcotics). While the UA maintains a level of self-sustainability, there will be requirements that demand the UA units be replenished during the three days high OPTEMPO and seven days low OPTEMPO windows. Class V (ammunition) re-supply occurs through either cross leveling or trans-loading.

Internal resupply at the CRO will be the first and second options of ammunition resupply. The first option consists of cross-leveling between systems. The second option is trans-loading from the distribution platforms in the CA Battalion support sections, or those distribution platforms in the other UA elements. The third option of re-supply will be an SRO from the FSB or UE. The final option for resupply will be throughput or MSO from the UE. The UA Build and Sustain Combat Power Cell in coordination with the FSB Sustainment Cell, is responsible for monitoring weapons system's ammunition status, directing cross leveling activities within the UA, and coordinating with the UE for ammunition re-supply activities by UE

assets. Should the need arise; ammunition is prepared for aerial delivery directly to the user. Weapons systems crews are then responsible for conducting trans-load from the ground to the weapon system.

4.6.7.7 Field Services. With the exception of UE augmented Mortuary Affairs (MA), no other field service support will be conducted during initial entry and actions before forces are joined. The identification and collection of remains is a unit responsibility. The UE augments the FSB with a MA Team to train UA organizations in the proper handling and initial identification of remains. The UE MA Team establishes a MA collection point in the vicinity of the FSB. Evacuation of remains flows from the point of death to the MA Collection Point in the FSB. Collection and transport of remains can occur during combat replenishment, sustainment replenishment, mission staging, and medical facilities due to possible extended operational distances, precision aerial distribution will be considered as routine. The FSB Distribution Management Cell coordinates with the UE for aerial (precision drop, rotary or fixed wing) distribution to SRO and MSO sites. Laundry, Shower, and Clothing Renovation will be provided by UE elements during MSO.

4.6.7.8 Maintenance. UA maintenance operations are conducted within a two level maintenance system that features “replace forward and repair rear.” The two level systems are comprised of field and sustainment maintenance levels. A two level maintenance system will reduce maintenance echeloning, return equipment to the fight faster, reduce logistics footprint in the battlespace, and reduce repair cycle time to generate and sustain combat power. Reducing the maintenance footprint will require systems that are designed with significant increases in reliability and maintainability, allowing maximum operator/crew maintenance. Operator/crew maintenance will be further enabled by the use of modular, “plug and play” components, embedded diagnostics, and Interactive Electronic Technical Manuals (IETMs). Significant improvements in reliability and maintainability, as well as the use of embedded prognostics enabling anticipatory maintenance, will result in maximum availability of combat power during mission pulses. Field maintenance consists of on-system repair and return-to-user tasks, primarily Line Replaceable Unit (LRU)/Line Replaceable Module (LRM) replacement, and will be performed forward in the battlespace as the supported unit’s battle rhythm permits. Field level maintenance consists of operator/crew, organizational and selected direct support capabilities from the current four-level maintenance system.

Sustainment maintenance consists of off-system tasks that result in repair and return to the supply system. These tasks are focused on actions required to return components, subassemblies, and/or end items to a serviceable condition. Sustainment maintenance may take place at designated locations in the UE, or even as far back as CONUS, and will be performed by military, government civilians, and/or contractors. Only in rare cases will sustainment maintenance be conducted in the UA. As a general rule, Combat Repair Teams (CRTs) in the UA’s organic FSB are allocated to maneuver units for the specific purpose of executing field maintenance tasks/capabilities beyond the crew chief/crew level, limited BDAR, and recovery operations in support of that unit. There will be times, however, when mission dictates that particular maintenance emphasis be placed on one unit over another based on METT-TC and the UA/UE commander’s intent. In such cases, it may be necessary to mix, combine or shift assets from one CRT to another to support maintenance requirements. The preferred solution is to normally provide assistance or surge maintenance capability from within the assets of the FSB. Due to the limited FSB resources and in accordance with METT-TC, there will be instances where there may be a requirement to temporarily task organize a CRT with augmentation from the UE or other FSBs to perform maintenance at an SRO as part of the pulsed sustainment concept. While not organic to the FSB maintenance and recovery platoon, it is important to note that the crew chief is an integral, necessary, and valuable part of the success of this maintenance concept.

4.6.7.9 Explosive Ordnance Disposal (EOD). EOD teams neutralize domestic and foreign conventional, nuclear, chemical, and biological munitions and devices that present a threat to military operations and civilian facilities, materiel, and personnel. EOD support is provided to the UA from the UE.

4.6.7.10 Transportation. The UA is 100% mobile with three days of supply for high OPTEMPO operations and seven days of supply for medium to low OPTEMPO operations. The Distribution Management Cell (DMC) of the Forward Support Battalion coordinates transportation support for any requirement that exceeds the UA’s organic capability. UE maneuver sustainment and aviation elements will provide transportation assets to move personnel, enemy prisoners of war, displaced civilians, or other cargo exceeding the UA’s capability. The DMC will coordinate with the UE to ensure these assets are secured. The Operational Maneuver Section, of the Maneuver and Support Cell, provides technical expertise and

5353 coordination for all deployment, redeployment, intra-theater movement, movement control, and multi-modal
5354 transportation issues in the UA.

5355 **4.6.7.11 Force Health Protection**. The soldier is the centerpiece of the Objective Force. As technology
5356 advances, warfighting tactics, techniques, and procedures change, but human physiology does not. The
5357 time sensitive nature of treating critically injured soldiers requires a flexible and responsive medical system.
5358 In that regard, Health Service Support - Force Health Protection (FHP) will continue to play a vital role in the
5359 battlespace to protect the most important piece in future warfare - the soldier. Future adversaries will seek
5360 to exploit a perceived center of gravity for US forces – an aversion to significant numbers of casualties.
5361 Accordingly, any future conflict will be characterized by operations intended to inflict large numbers of US
5362 casualties quickly. Limited FHP during early and forced entries, dispersion on the battlefield, and the
5363 increased likelihood of operations occurring in complex and urban terrain will challenge the ability to
5364 decrease killed-in-action and died-of-wounds rates. FHP efforts must address the needs, and coordinate
5365 care, of the entire deployed force, including contractors and civilians on the battlefield. Close coordination
5366 with allies, coalition forces, and Non-Governmental Organizations will be essential to meet the
5367 overwhelming FHP requirements.

5368 The joint doctrine of FHP will be achieved through operational and institutional medical capabilities that are
5369 linked and delivered seamlessly across service and organizational boundaries and synchronized and
5370 coordinated by medical command and control. Only essential care in theater will be provided to the UA with
5371 definitive care taking place in CONUS-based/Home Station medical treatment facilities. The ability to
5372 achieve footprint reduction while maintaining the ability to provide adequate essential care in-theater is
5373 paramount in the UA. This will be accomplished though increased utilization of medical reach activities and
5374 a skip policy for casualty evacuation management. FHP activities will be sustained through responsive
5375 medical logistics support. In the UA, traditional levels of medical care will merge. Casualties within the UA
5376 will be treated and evacuated to higher echelons of medical care or returned to duty (RTD). Critical patients
5377 cannot be held far forward for 3-7 days without evacuation to higher echelon healthcare. Medical
5378 evacuation and emergency resupply of CL VIII must be on demand, and are an exception to "pulsed"
5379 logistics. However, the increased distances of operations and dispersion of troops will create significant
5380 challenges. Communications and technology enablers (tele-consultation) will facilitate reach, allowing the
5381 immediate application of intra-theater/CONUS-based clinical expertise to solve in-theater needs.

5382 Emergency medical treatment (EMT) is the first medical treatment that a sick, injured, or wounded soldier
5383 receives from a soldier who holds a medical MOS. The trauma specialist provides EMT. Any emergency or
5384 lifesaving measures required prior to EMT are self-aid/buddy-aid or enhanced first aid from the combat
5385 lifesaver (CLS). Self-aid/buddy-aid and the advanced first aid by the CLS, received at the point-of-injury,
5386 will be critical to a casualty's survival. Trauma specialist care entails the skillful application of assessment
5387 techniques, to include his ability to triage and identify those casualties requiring emergency or lifesaving
5388 measures; and continuing observation and care to ensure that the airway remains open, that bleeding has
5389 been controlled, and that shock, infection, and further injury are prevented. It involves the effective use of
5390 medical supplies not available to the non-medical soldier and arrangement for evacuation by dedicated
5391 medical ground or air evacuation resources, as appropriate. The FCS Medical Vehicle-Evacuation (MV-E)
5392 allows trauma specialists, maneuvering with combat forces, to be closer to the casualty's point-of-injury.
5393 The FCS MV-E used to transport casualties must have the same characteristics/ capabilities as the
5394 supported force. Trauma specialists are organic to UA units/elements that based upon their operational
5395 dispersion and/or increased risk of taking casualties will require embedded medical capabilities, decreasing
5396 KIA rates and increasing the combatant commander's ability to maneuver by clearing the battlespace.

5397 Echelon I healthcare including basic sick call services, EMT/trauma specialist care, advanced trauma
5398 management (ATM), advanced trauma life support (ATLS)(including transfusion with advanced blood
5399 products), and medical ground evacuation resources will be organic to the UA Brigade's maneuver
5400 elements. The ATM/ATLS, or initial resuscitation and stabilization treatment is distinguished by the
5401 application of clinical judgment and skills of the physician or physician assistant (PA) assigned to Echelon I
5402 treatment teams. The FCS Medical Vehicle – Treatment (FCS MV-T) enhances the ability to provide
5403 ATM/ATLS treatments and procedures forward, for more rapid casualty intervention and clearance of the
5404 battlespace. Treatment teams are organic to the UA HHC Medical Support Section, CA Battalion Medical
5405 Platoon, and FSB – Medical Company.

The dispersion of the troops and distances of operation dictate that the UA push life saving "damage control" surgery as far forward as tactically permitted. An Echelon II medical company, with expanded functions including forward resuscitative surgical capabilities, will be located in the UA FSB's AO. This emphasis will aid in maintaining maximal combat effectiveness of the soldier system. The presence of forward resuscitative surgery at the brigade-level provides an organic emergency (urgent) surgical capability without which death or loss of eyesight, limb, or body function is inevitable. The patient's best chance of survival comes when advanced trauma life support is received within one hour, and far forward "damage control" surgery is received within 4 hours. The FSB medical company provides the following capabilities:

- EMT and ATM for wounded and diseased non-battle injury patients.
- Emergency resuscitative surgery.
- Sick call services.
- Ground ambulance evacuation from supported units.
- Operational dental treatment that includes emergency and essential care.
- Class VIII resupply and medical equipment maintenance support.
- Medical laboratory and radiology services.
- Outpatient consultation services for patients referred from Level I medical treatment facilities.
- Patient holding for up to 20 patients (that may RTD within 72 hours).
- Reinforcement/reconstitution of maneuver battalion medical platoons.
- Mass casualty triage and management.
- Patient decontamination.

The use of air ambulance is the primary and preferred means of medical evacuation on the battlefield. Its use, however, is METT-TC driven and can be affected by weather, availability of resources, chemical, biological, and radiological conditions, and air superiority issues. A forward support MEDEVAC team (FSMT), forward deployed from the UE air ambulance company, will provide aeromedical evacuation within the UA's AO. Operational distances and dispersion in the UA will lead to an increased reliance on "enroute care" by medical personnel to keep the casualty alive during longer evacuation periods. Medical platforms will have the ability to provide "enroute care" through such enablers as on-board oxygen/oxygen generation systems, physiologic monitoring, telecommunications, and other life support equipment.

4.6.7.12 Other Sustainment Operations. A Religious Support Team (RST), consisting of a chaplain and a chaplain's assistant will provide the UA with religious support and contribute to the moral well being of the force. Human Resource support provides the personnel support in a cycle of three phases to man the force and sustain soldiers and units. Effective personnel support ensures the UA has the right number or people with the right skill sets, in the right place, and at the right time to execute combat missions. There is no organic financial management support within the UA. When financial management support is required the UE will provide a team of finance personnel to perform the functions required. Embedded in the Operational Maneuver Section is a Brigade Operational Law Team (BOLT) providing legal support to the UA Commander. For a more detailed description of their mission see Annex D.

CHAPTER 5 DOCTRINE, TRAINING, AND LEADER DEVELOPMENT IMPLICATIONS

5.1 Introduction

5.1	Introduction
5.2	Doctrine
5.3	Training
5.4	Training Support Packages
5.5	Leader Development
5.6	Soldiers
5.7	Facilities

The Army is compelled to anticipate and prepare for change now if it intends to progress and synchronize the transformation of the Objective Force. Within the Unit of Action (UA) formation, the Army emphasizes the importance of quality in the contribution of tactics to doctrine, training and leader development. Although these areas have always been considered to be important, the requirements of the UA place an even greater emphasis on the qualitative contributions they historically provide. The Army must reevaluate its past practices to produce a clear road map for accomplishing the required changes.

Due to the combined arms framework of the UA within the Joint, Interagency, and Multi-National (JIM) construct, it is essential to develop soldier and leader skills and a high level of unit cohesion. Leaders must understand how the UA formation achieves overmatch through teaming. Leaders must also understand how networked systems will leverage the power of network-centric warfare to share data that will become information to facilitate knowledge development enabling shared group situational awareness. Fundamental tactical competencies will be key to the readiness of the UA. A new level of competency in leaders enabled by networked technologies will significantly improve operational efficiency and effectiveness. Future leaders at all levels must be educated and trained to develop and maintain correct situational awareness under high workload and high stress situations to achieve the operational and strategic intent and the full spectrum of operational and tactical options available to the UA. The UA requires a new standard of competency in our soldiers, leaders, staffs, and units.

The UA is organized around fighting teams. Soldiers in the UA, working more effectively with each other and as a team, are at the core of agility during tactical operations. Leaders must be skilled in synchronization and coordination, able to dominate in the realm of tactical decision-making, and be combat proficient at the collective level. UA leaders must have a competency in the variables of terrain, enemy, and weather. Leaders must know how to leverage terrain to achieve positional advantage, achieve freedom of maneuver through the use of terrain for cover and concealment, integrate maneuver and fires, and reconcile tactical dilemmas in a manner that is unparalleled. What is different is that this UA design is based on strengthening leader ability to understand the environment, seek advantage aggressively, and attain a much greater competency in combat skills. The UA demands a competency to develop the situation and understand before, during, and after tactical operations with strengthened means of providing it to small units. In the UA, leadership is empowered by access to Intelligence, Surveillance, and Reconnaissance (ISR) distributed rapidly and effectively in terms meaningful to subordinates and responsive to changes in mission.

To see and understand first, leaders must be capable of understanding the enemy's patterns within the COP and identify deviations, the importance of terrain, centers of gravity, decisive points, and vulnerabilities. UA leaders must know and understand their own capabilities and understand the strengths and limitations of their adversary. UA leaders at all echelons must receive information, assess what it means, and know what to do about it. Unique to the UA is the UA's ability to enable shared understanding before, during, and after tactical engagements. Situational awareness (SA) allows leaders to focus on profitable fights and engage when and where it gains the best tactical advantage for starting and finishing engagements. Seeing and understanding — a continuous, unending process — enables us to act first. Small unit leaders have to be skilled at the concepts of fighting: movement techniques and control, mutual support, fire and maneuver, control and distribution of fires, integrating combat power, assault, transitions, and executing with speed, agility and initiative. To finish decisively, UA tactical

leaders must control the tempo of operations, direct combat actions to destroy the enemy's ability to fight, and achieve tactical decision.

UA training strategies must promote soldier and leader skill proficiencies, competencies of teams, and collective skill proficiencies that produce capabilities integral to combat experiences. Leaders in the Unit of Action must not only have guile, courage, and be experienced in tactical operations, they must have the wherewithal to employ units collectively to dominate the realm of tactical decision. The UA must have access, competence, and cohesion that overcome the insular domains that make up today's combined arms. Its training must drive combat proficiency at collective levels that optimize individual soldier skills, small unit skills, leader skills, synchronization, and integration skills at battalion and brigade.

This chapter provides a discussion of the doctrine, training, leader development, Soldiers, facilities, and implications for change that accompany implementation of the UA. These categories complete the analysis of the Doctrine, Organizations, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) construct within this O&O plan.

5.2 Doctrine

To provide the OF with timely insights, Tactics, Techniques, and Procedures (TTP), and doctrine, the doctrine development process will become shorter and more responsive. The rapid incorporation of new doctrine and TTPs will be enhanced through Training Support Packages (TSPs) discussed later in this chapter. Tier One Doctrine will remain our capstone/keystone doctrine but will be designed with a much longer shelf life. Tier Two doctrine will be "How-to-Fight" publications responsive to warfighter needs. Key to achieving these capabilities will be ensuring the right people are available to author the doctrine and the information technology is available to rapidly develop and distribute the doctrine. Figure 5-1 shows what the Army must do to leverage technology, to separate doctrine from TTP, and to achieve the responsiveness required to support the UA.

Leveraging new and emerging technologies, which is the first step in the new process, will separate the more enduring doctrine from the more responsive and flexible TTP. Doctrine will be more overarching, high-end, and principled — not procedural. Although the doctrine development process will be shorter and more collaborative, it will still be based on consensus. TTP will be automated and routinely updated based on lessons learned, training experiences, and trend analysis incorporated into TSPs. These steps — linking the processes, redefining doctrine, and the application of the appropriate people and technology to the development processes — will significantly decrease the development process timelines, and provide responsive support to the UA.

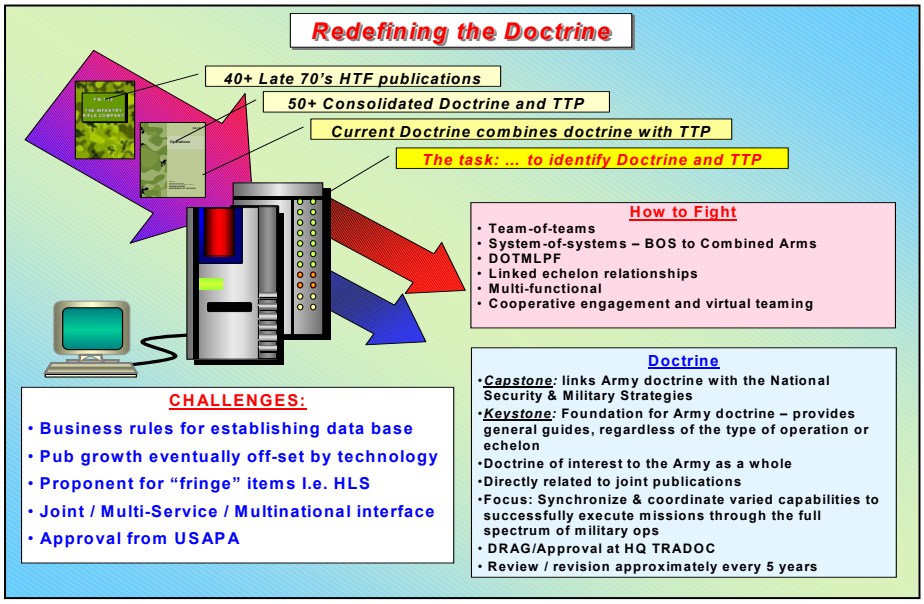


Figure 5-1 Redefining Doctrine

To support the separation of doctrine and TTP, there must be a movement toward a newer hierarchy that disciplines the development process. The new hierarchy redefines doctrine into a different series of tiers and provides for the separation of doctrine principles from TTP. Tier one doctrine will remain our capstone/keystone doctrine, which will be the "principles-level" fundamentals — the intellectual "theory, history, and practice" doctrine done by The Army War College, Command and General Staff College and the Battle Labs. These fundamental principles will not require frequent revisions.

Tier Two doctrine will be "How-to-Fight" publications, which include the more practical TTP that requires frequent changes and can be quickly revised to be responsive to warfighter needs. It will be developed by the centers, schools, and proponents. Key to producing this doctrine will be ensuring that the right people are available to author the doctrine and that the information technology is available to rapidly develop, coordinate, integrate, and access the doctrine. Observer Controllers (OCs), Small Group Instructors (SGIs) and Small Group Leaders (SGLs) will have major roles in the development of both tiers and in providing critical insights and incorporating lessons learned.

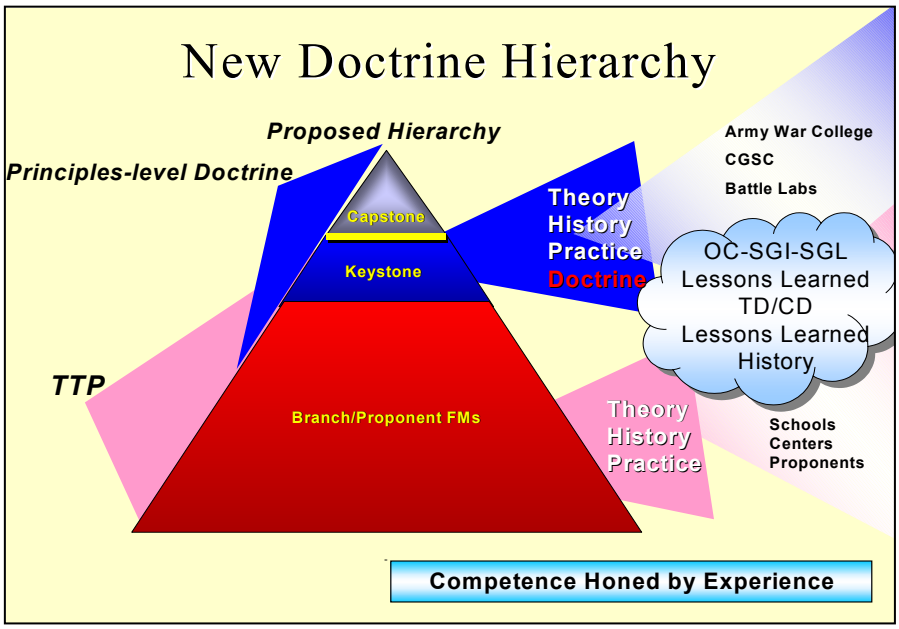


Figure 5-2 The New Doctrine Hierarchy

Understanding this change requires an overall understanding of how doctrine will be developed in the future. Training and Doctrine Command (TRADOC) HQ will support the development of the strategic-level Army vision and overarching operational-level capstone concepts. It will be responsible for Army doctrine policy, overall doctrine management, and the TRADOC Doctrine Literature Program (TDLP). It charts the course to the future, approves program directives, and coordinates the Doctrine Literature Master Plan (DLMP) with the doctrine portion of the Installation Contracts. As reflected in the current TRADOC Internal Operational & Organizational Plan, the Combined Arms Center (CAC) is the proponent for developing Army doctrine with the Battle Labs, AWC, and proponents in support. Enhanced Battle Labs will be the cornerstone in UA doctrine development, while branch proponents will continue to ensure SBCT and Current doctrine is reviewed and updated. Chartering and partnering relationships will outline supporting roles based on subject matter or level.

Ongoing studies will determine the added value and efficiencies of technology application for dissemination as well as taxonomies for reducing redundancies in the development process. Critical resourcing issues must be resolved in order to put the right people in the right places. A study effort will address the current shortages of SGIs, SGLs, and OCs in their essential role in the doctrine development process. Experienced doctrine writers will develop relevant, timely doctrine and TTP using a collaborative process supported by an architecture populated with the latest operational lessons learned. Trained and

experienced officers, Noncommissioned Officers (NCOs), and civilians will develop, review, and revise doctrine. Instructor experience and involvement of SGIs and OCs will be critical.

By more closely linking the processes, redefining the doctrine, leveraging technology, and applying the right people in the right places, doctrine will achieve the responsiveness required to support the UA. To conduct full spectrum training requires the development of a training environment that approximates the operational environment. Enabling this training environment requires a training support system that allows the OF to train as we fight. Training products, processes, services, and programs must embed training tools in operational and institutional systems, integrate training environments and link them to joint training, interlink the training domains, and link the domains and environments through the infosphere and Global Information Infosphere.

5.3 Training

The UA requires a revolutionary and dynamic training and leader development model producing leaders who are confident and experienced to lead and train organizations composed of Army, Joint, and multi-national elements. These Soldiers will be self-aware, operationally focused, and enabled by the Global Information Infrastructure to reach for information and see clearly how to adapt to any situation. They require relevant, on-demand training available anywhere, anytime, and tailored to their operational requirements. The Army's strategy transforms from current training to a training strategy that emphasizes frequent training via Embedded Training (ET) linked to the Live, Virtual, and Constructive (LVC) capabilities. The UA requires a level of competency enabled by technology that is adaptive and embedded within the UA incorporating proper leadership, cohesion and unit design. A different approach in the training strategy will attain the core performance of soldiers, leaders, staffs and units.

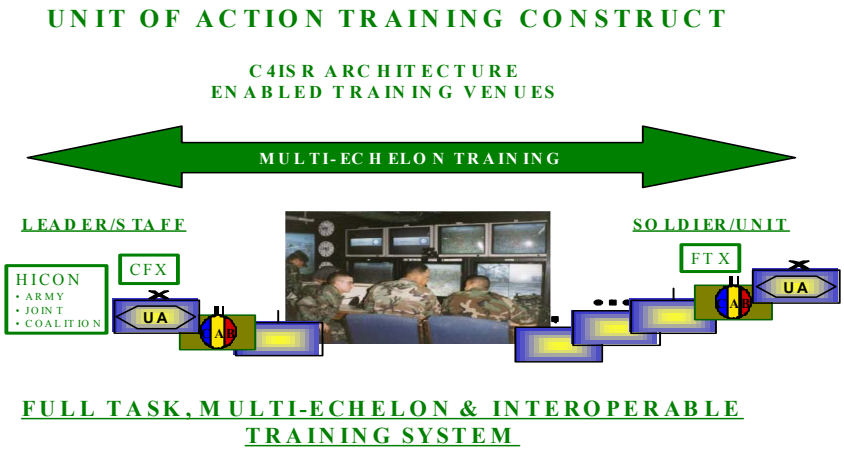


Figure 5-3 UA Training Construct

The UA training construct (Figure 5-3) supports the development of commander and leader proficiency. The training construct must support the growth of leader proficiencies in tactical and technical skill sets. Training must focus on building leader mental agility to recognize and resolve complex tactical dilemmas found in full spectrum operations with an adaptive, complex enemy in all terrain and all weather. Additionally, the training model must emphasize the growth of character and fitness for all leaders. Tactical and technical proficiency as junior leaders provides the building block to attain commander and staff proficiency at battalion and brigade levels.

5.3.1 Embedded Training

Embedded Training (ET) is defined as the user's option for Future Combat Systems (FCS) training in the institution, at the Combat Training Centers (CTCs), at home station, while deployed, and for self development. It will be developed as an integral part of the FCS manned platform systems and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures, not as a set of additional boxes and software applications. All FCS platforms, manned and unmanned, will have embedded training capability: those unmanned platforms will be able to train the operator and maintainer through the use of technology hosted on the manned FCS platform or through the basic kit which comes with the FCS unmanned platform. All FCS variants have the embedded capability to train the operation, maintenance, and employment of the FCS. FCS Embedded training is an Increment I requirement that is technically feasible but represents an integration challenge. It must be developed at the start of the program to ensure it is developed in conjunction with the other FCS System of Systems (SoS) platforms.

> "While there will be changes in the framework of the strategic environment, national military strategy, the contemporary and future operational environment, doctrine, and force structure, the most significant difference will be how we apply advanced and dynamic technology to create a full spectrum Army and a fully integrated, relevant training environment that seamlessly merges training across the institution, unit, home station, CTCs, and deployed theaters."
>
> Objective Force Doctrine, Training and Leader Development Plan

The top-level ET program plan is outlined in Figure 5-4. A detailed task analysis — individual through Unit of Action — will drive the definition of ET capabilities and the development of operator and maintainer Training Support Packages (TSPs). The results will be provided to all FCS platform suppliers as a baseline (format and content). Each supplier will be required to update the baseline with tasks — individual and collective — associated with their platform and recommend the training mode. Annex C&F of the UA O&O will drive TSP development for collective training TSPs. ET must support all essential tasks unless they are unsafe, impractical, or unaffordable. Army Training Information Architecture – Migrated (ATIA-M) Automated Systems Approach to Training (ASAT) will host the task database for the FCS program. Networkable, Reconfigurable, Full Task Trainers (NRFTTs) may be the primary support to institutional training if the fielding of FCS vehicles is limited. ET software from manned platforms will flow into the NRFTTs to ensure consistency and configuration management of training capabilities. TSPs will be developed to operate in ET and NRFTTs.

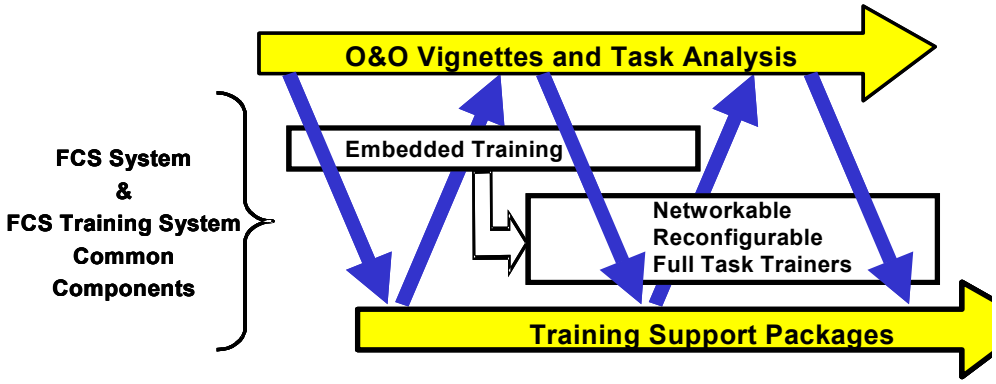


Figure 5-4 FCS Training High-level Program Plan

At the Home Station Operations Center, FCS Embedded Training will include capabilities for distributed L-V-C training and 'reach' to the Army Knowledge Enterprise (AKE). These capabilities will be enabled by the FCS C4ISR and Combat Systems architectures and resources to include computing resources, computer generated forces (CGF) and interfaces as an integral part of the FCS SoS. The ET provides a common After Action Review (AAR) interface using standardized AAR data. AAR packets will be generated and made available whether units and soldiers are at institution, home station, CTCs, or deployed. The data from an AAR will be interoperable with the Army Training Information Architecture – Migrated (ATIA-M) for archiving and unit training management purposes. Objective One SAF (OOS), an FCS training common component, will be the on-board driver for all simulation-based training. Live training will be supported by FCS interface(s) with CTC instrumentation system(s) (current and future) and an embedded Tactical Engagement Simulation System.

Every FCS manned platform will have embedded training management services and/or be able to link to these services via the C4ISR system — including the Army Unit Training Management System (UTMS) and the Army Learning Management System (LMS) — to facilitate training/learning management in any training domain. Each FCS manned platform will also have an embedded exercise/scenario development system to enable the user to build or modify collective training TSPs. Leader Development requires FCS embedded Command Field Exercise (CFX) and Command Post Exercise (CPX) capabilities that hone the proficiency of leaders to perform their individual responsibilities, how they fit into the framework of small units, and how they operate as a member of a leadership team. Leader exercises must be mission-focused at small unit level up to brigade/UA operating as part of a division, Unit of Employment (UE) or Joint Task Force (JTF).

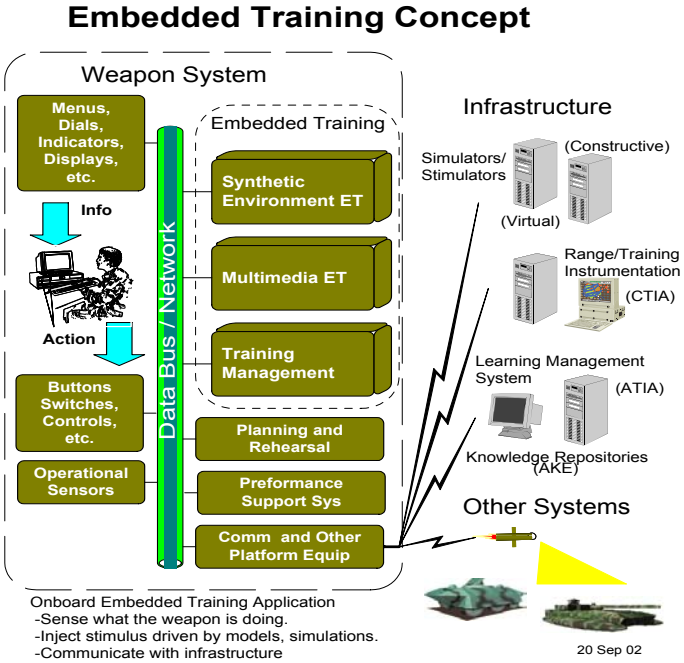


Figure 5-5 Embedded Training Concept

Embedded Training (Figure 5-5) will do the following:

Concept:

- Provide a system or family of systems synthetic training environment.
- Present training to individuals, crews/teams, units, unit leaders, and staffs.
- Enable training individual through collective task in all domains* and environments* to all audience* at any level.

Simulation/Stimulation Data:

- Simulate operational data not available from actual data sources.
- Receive operational data from actual data sources.
- Integrate simulated and actual data.
- Present data to the operator(s), maintainer(s), leader(s), and other user(s) by means of their normal operational equipment.
- Require operator(s), maintainer(s), leader(s), and other user(s) to perform their job tasks and duties in response to data presented.

Capability:

- Ability to simulate faults and errors to allow training in degraded modes of operation.
- Ability to tailor training based on user(s)' needs, performance, and choice as appropriate. This includes the capability for leaders to tailor training exercises to meet units' needs.
- Ability to control an exercise and inject data into an exercise.
- Provide training interoperability with Joint, Coalition, Allied, Non-DOD and other external agencies operating in the Global Information Grid (GIG) IAW DoD accepted standards and protocols.
- Interface with on-board communication systems to reach to remote distributed repositories.
- Interface with range instrumentation to transport data.

Interconnectivity

- Provide training interoperability with Joint, Coalition, Allied, Non-DOD and other external agencies operating in the Global Information Grid (GIG) IAW DoD accepted standards and protocols.
- Interface with on-board communication systems to reach to remote distributed repositories.
- Interface with range instrumentation to transport data.

Training Feedback:

- Assess the performance of the operator(s), maintainer(s), leader(s), and other user(s).
- Collect and record the performance of the operator(s), maintainer(s), leader(s), and other user(s).
- Provide feedback on the performance of the operator(s), maintainer(s), leader(s), and other user(s).
- Aggregate performance records (for individuals, crews, units, and unit leader) over time.

5.3.2 Networkable, Reconfigurable, Full Task Trainers (NRFTT)

The FCS Family of Systems (FoS) must include a NRFTT capability. The NRFTT will be a device used mainly at the institutions where, depending on class size and student through-put requirements in the various specialties, a training device is more cost effective than platforms and thus can be more available than platforms with embedded training system. Thus, the NRFTT and embedded training share the following qualities. The NRFTT, like the platform embedded training, must provide a virtual training capability to support individual, crew, and small unit competencies when parts of the combined arms team are not available. NRFTT will be fully operational without the need for external components to transport or install on the FCS/FoS platforms. NRFTT will be capable of supporting individual through brigade level training and be capable of simulating and stimulating tactical systems at all echelons (to include JIM). NRFTT will account for effective contribution of future systems to include sensors. To ensure training in the NRFTT is the same as embedded training on the platform, the NRFTT will operate with the same software used in the operational/embedded training system and present the same man- machine interface to the soldier.

The NRFTT, as well as embedded training, will provide feedback similar to a CTC live fire framework. Data feedback, for example, will be able to inform the user of the number of mortar missions that were effective. Did the company commander mass weapons effectively? What was the number of platoons or squads that did or did not get into the fight? Did the user perform overwatch and mutual support to standard? What was the number of rounds fired — was line of sight (LOS), beyond line of sight (BLOS), or non-line of sight (NLOS) effective? How long did it take to get effective fires on the enemy? Did the unit develop the situation to the fidelity needed?

NRFTT and FCS embedded training will provide key performance indicators for the purpose of assessing soldiers, leaders, and units at company level and below for preparation and execution of tactical engagements. NRFTT will provide indicators that answer the tough questions. Did they produce what we wanted them to? Did they acquire targets in a way that contributed to lethality overmatch? Did they facilitate tactical maneuver to advantage? Did they contribute to tactical decision? Did leaders contribute effectively? Did soldiers contribute effectively? Because the synergistic effect of fires that are LOS, BLOS, and NLOS are key to lethal overmatch, embedded architectures must be able to provide this feedback. Training architecture must account for who shot what, when and at what point. Did the user achieve fire control and distribution? Did the user provide adequate overwatch in mutual support of movement and maneuver? Were fires and maneuver fully integrated? Was NLOS able to achieve effectiveness with regards to mission, task, and purpose? Is it contributing in a way that complements maneuver? Was suppression and obscuration achieved to enable freedom of maneuver and protection of the formation? In the future, we must know and train to this higher level of performance standards.

NRFTT will provide a rehearsal capability conducted in an LVC training environment linked to other forces within the UE or JTF. What is different is a strengthened rehearsal mechanism that facilitates leader and collective competencies. The UA needs a virtual collective framework that empowers more efficient and effective rehearsals. It must be able to assemble parts collaboratively and be tiered to bring together external input. The Army can no longer accept a strategy of rockdrill sites that requires leaders to assemble at one location and treats execution as wooden, mechanical solutions. Instead, the Army seeks an embedded rockdrill capability to go through potential dilemmas and think through branches and sequels. As concepts unfold in relationship, the UA will want to establish tactical control measures and schemes, and be able to adjust as needed. These must be permeated throughout the organization simultaneously.

TRAINING SYSTEM CHARACTERISTICS

C4ISR ARCHITECTURE ENABLED TRAINING VENUES

- **Diagnostic software with performance metrics for leader, soldier, small unit, and battlestaff proficiency**
- **Mapped to 'how to fight' manuals and TSPs to gain technical and tactical competency for combat performance**
- **Draw from a variety of scenario conditions to gain full spectrum and global confidence**
- **Distributed live, virtual, and constructive participants**
- **Link home or remote stations, NSC, CTC, and schoolhouse**
- **Embedded in FCS and tactical command posts. Leverage UA C4ISR architecture for instrumentation and virtual teaming**
- **Scaled to training needs of the unit (T/P/U); have greater control of readiness destiny**
- **Fight a semi-autonomous or World Class OPFOR**
- **Combined arms collective competency for combat performance**
- **Linked to repository through the "Reach" capability..**

Figure 5-6 Training System Characteristics

5.3.3 Performance Oriented Training

Training produces readiness. We have the opportunity to achieve profound changes in the quality and rigor of performance oriented training: collective, leader, and Soldier skill sets. The instrumentation necessary to give the UA (from Soldier to brigade formation) feedback on core performance is embedded on the FCS. The FCS embedded training capability within the SoS Architecture accounts for all contributing capabilities, e.g., fires, suppression, overwatch, obscuration, terrain knowledge, deception, ISR, etc. Embedded training provides a virtual framework for the UE/UA formation to conduct planning, training, and rehearsals. Feedback must be rigorous and must account for all contributing capabilities. The training architecture embedded in the FCS must support the attainment of tactical competence for the unit and its leaders. The training strategy and supporting systems must ensure that training standards can be established, assessed, and enforced. Training exercises in the TSPs train junior leaders how to direct and maneuver platforms, systems, and soldiers as part of a unit and optimize hands on, performance oriented, experiential training to plan, prepare, and execute operations. Leadership development must provide experience in the application of tactics, techniques, and procedures in relation to the variables of time, terrain, weather, and enemy. Leaders must be competent and experienced in the discretionary employment of small units during the conduct of tactical missions. Leaders, who seek advantage unconstrained by graphical boundaries, are unshackled and empowered to take the initiative yet have a coherency of task and purpose.

The Army seeks situational training exercises that promote proactive thinking and action, not reactive mechanical action or drill proficiency. Drills must focus on getting systems into position to be lethal in a 'process' construct. Leaders must stress the tactical competence of the formation. Within these formations, Leaders are reintroducing the quality of TTPs balanced with Battle Drills. TTPs are the discretionary application of schemes to always put the unit in advantage over a foe. TTPs involve the discrete application of Soldiers, systems and external support. In this construct, situational training exercises must provide the ability to conduct live and virtual training with feedback mechanisms. Our training methodology for platoons and companies recognizes that there are many solutions. It is performance of units against tasks, conditions and standards that count. The training feedback mechanism must allow Leaders to determine in the construct of a collective training experience, if the unit demonstrates core competencies well enough to accomplish the overall task and purpose.

The UA requires a leader development CFX capability that will facilitate training from garrison. The UA Commander will have the ability to contact his affiliated Home Station Operation Center (HSOC) and arrange for training support packages and the appropriate live, virtual, and constructive training enablers to execute training scenarios and/or mission rehearsals. The HSOC will be the focal point for the synchronization of all training resources required for the execution of training tasks at all affiliated locations. This allows the commander to make bottom up inputs to identify training readiness and to execute repetitive training scaled to the needs of the soldier. Training must be multi-echelon and combine live, constructive, and virtual training. The embedded training architecture facilitates small unit proficiency as well as commander and staff proficiency. It also enables the 'school house' to provide observer controllers or to integrate institutional training into UA training — for example, a small group of combined arms students at Leavenworth, Benning, Knox, Sill, Lee, Leonard Wood, Bliss or Rucker could participate as a constructive 4th combat battalion or as a reinforcing maneuver support or maneuver sustainment unit in a UA deployed to a CTC or training at its home station.

5.3.4 Brigade and Battalion Leader and Staff Training

The objective of training UA leaders and staffs successfully is to ensure that they can See First, Understand First, Act First, and Finish Decisively. To accomplish this objective, the leaders and staff must be capable of executing Battle Command on the Move in a challenging and fluid operational environment. To properly prepare UA leaders and staff for the operational environment, the Army must ensure that the Training Environment replicates the Operational Environment (OE). The enemy will further complicate the environment because they are less clearly identified, able to rapidly transition in types of operations, and capable of fielding conventional forces. Enemy forces have a selective high-tech capability through modernization, use extensive information warfare, capable of multi-dimension warfare, and will increase

battlespace dispersion. To overcome the challenges that await the UA, the leaders and staff will be educated and trained for rapid tactical decision making: changing from a plan-centric to intent-centric operations; changing from physical rehearsals to virtual rehearsals; and changing from static command post to command and control on the move. This shift in capability will enable a battalion commander to execute a cycle of rapid decision-making, find the enemy first with the sensor network including UAVs, organize his companies while on the move, and build his plan collaboratively using Battle Command on the Move.

Leaders and staffs will be able to synchronize ISR, fires, and maneuver while on the move. This critical training requirement is at the heart of the training model desired for the UA leaders and staffs. The embedded training system architecture will ensure that the training environment replicates/equals the OE to include demanding decision making processes at the tactical level. To do this commanders and staffs will be able to train repetitively to attain the highest order of proficiency in maneuver enabled by fires and fires enabled by maneuver to execute the tactical concepts linked to the operational concept described in Chapter 4 of this O&O. This has significant implications for the C4ISR architecture and the embedded training architecture.

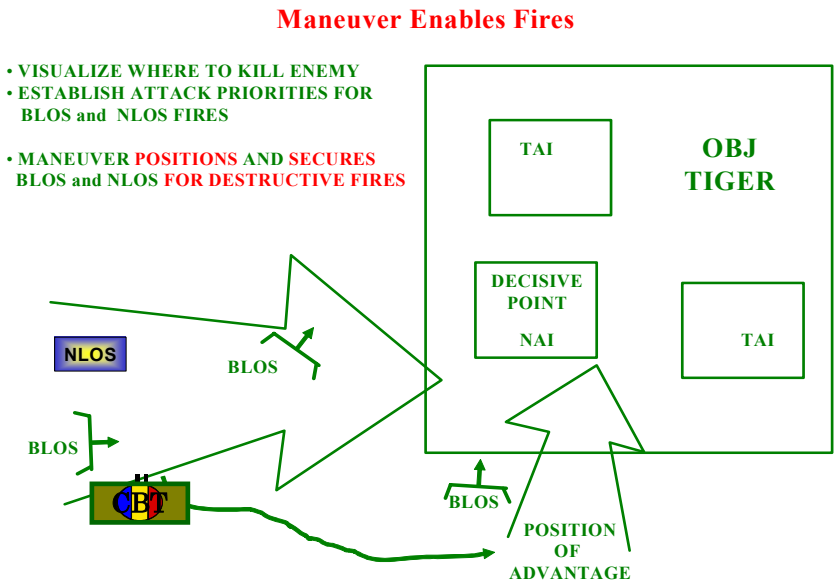


Figure 5-7 Fires and Maneuver Training Concept

When maneuver enables fires, the commander must visualize how and where he wants to destroy the enemy. Destructive fires are going to be the means to achieve enemy disintegration, dislocation, and destruction. The commander employs maneuver to shape the objective or engagement area and focuses external and internal fires from NLOS and BLOS to strike the enemy with killing blows, destructive fires. ISR is layered to develop the situation and detects and identifies high payoff targets for destruction by fires. Maneuver helps shape the killing area. It emplaces BLOS fire elements and secures NLOS positions for FCS firing units as required. Transition may occur rapidly with maneuver exploiting the success for fires and pursuing the enemy. NLOS units shift fires purpose to suppress/protective fires to suppress enemy and to provide close support. NLOS units maneuver to maintain supporting range of maneuver forces. When fires enable maneuver, the commander must again visualize how and where he wants to destroy the enemy. In this tactical concept, the commander recognizes that the enemy composition and disposition, the qualities of the objective, or other condition will require maneuver to develop the situation in contact with the enemy and close fighting by tactical assault. Fires by NLOS, BLOS, and LOS will be integral to the tactical assault. The commander will identify and position forces in positions of advantage for BLOS and NLOS fires, and potentially LOS direct fire assault positions. ISR is again layered to assist the UA to develop the situation.

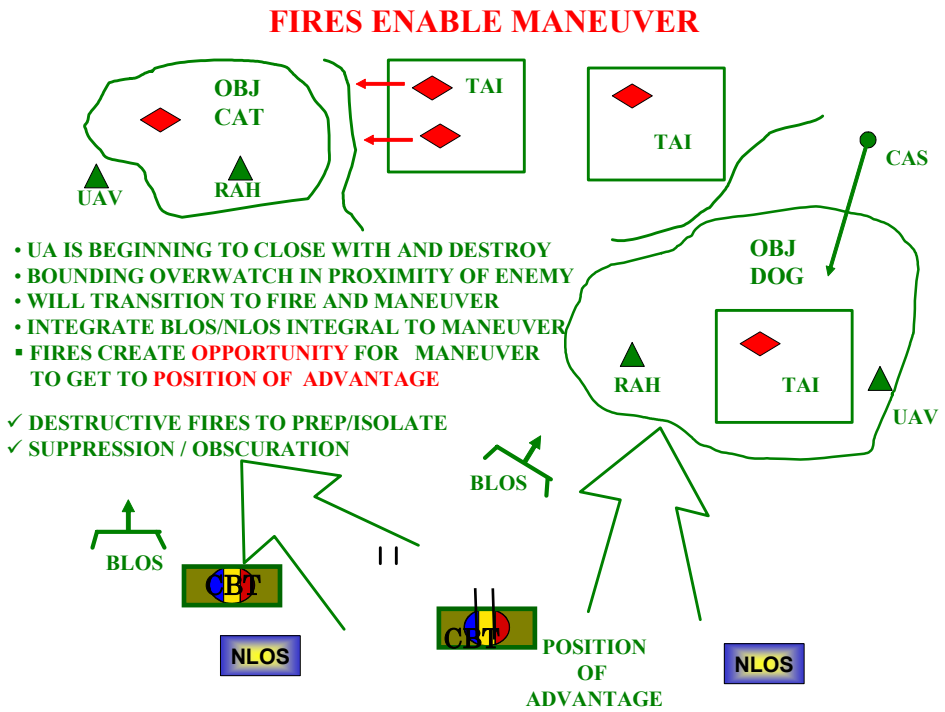


Figure 5-8 Fires Integral to Maneuver Training Construct

Comanche and teamed UAVs provide reconnaissance with the capability to direct fires against high payoff targets. In the close fight, Comanche provides close support to maneuver elements. Ground recon troops provide Reconnaissance and Surveillance for mobility and identification of enemy positions to facilitate rapid maneuver. Additionally, ISR assets verify for the commander the positioning locations for NLOS and BLOS firing units (based on terrain and disposition of enemy). As maneuver elements close with the enemy, fires units provide very precise destructive fires as well as protective fires for suppression and close support. NLOS fires capabilities provide suppression and obscuration to reduce enemy observation, to protect flanks, and to isolate the objective.

5.3.5 Training Implications

The C4ISR architecture must include embedded training from individual/crew to UA collective embedded in ground platforms and NRFTT. Training implications include:

- Connectivity and interoperability to support on-platform mission rehearsal, full reach capability, and network embedded training without additional auxiliary equipment.
- Software to support training must be ‘as capable’ as how to fight doctrine – very adaptable and updateable.
- Training model must support combinations of virtual, constructive, and live training.
- Training to order — executed by the HSOC to provide UA Commanders with support in all training areas to include terrain, weather, and threat. General support, as required, will be provided by the National Simulation Command (NSC).
- Training reach from the soldier at any location to the institutional resource center or subject matter expertise.
- Automatic training updates that link Interactive Electronic Technical Manuals (IETMs) and technical data with the training developments process.

- Interoperability and interfaces with complementary, in-lieu-of, and JIM systems and organizations.

Leading and operating in the UA during any type of operation will challenge officers, non-commissioned officers, and soldiers. In tactical situations the various echelons will operate relatively independently often, out of sight of each other. The training implications of this environment include:

- More multifunctional individual and team training.
- Sophisticated, embedded training/decision aids will be required at all levels (soldier, leader and staff).
- Soldiers, leaders and staff adept at individual tasks required to support collective training.

Officer and NCO performance, knowledge, and skills broadened to cover a wider array of tasks and increased responsibility and knowledge through MOS consolidation. Battle staff training becomes essential to synchronize the effects of joint and combined arms operations on the battlefield with habitually associated UA enablers, Stryker, and current forces. We realize the importance of a mix of live, virtual, and constructive systems to maximize the effectiveness of individual and collective training. Reach capabilities at every level to facilitate training in combat as well as at home station.

Embedding NRFTT in the FCS will eliminate the current requirement to replicate combat vehicles/stations with virtual simulators at home station in order to support individual and crew proficiency training. A requirement exists for Part Time Trainers (PTT) to support Institutional Training. PTT is required for training small groups on specific aspects of a vehicle. For example: weapon, engine, and transmission. The same device can be used by the schoolhouse to train the Soldier Portable on System Repair Tool and Maintenance Support Data troubleshooting, basic, remove, and replace tasks, as well as verification of repair. The PTT provides the student with ways of integrating cognitive and motor skills, both of which are required for many diagnostic procedures. PTT supports fault injection that is not possible in end-item vehicles. The PTT is designed with safety interlocks to reduce the chance of a student getting injured during training.

Desk Top Trainers (DTT) are valuable training aids required for both unit and institutional Battle Staff training. DTT will host Web-delivered, simulations and emulations that teach familiarization with the C4ISR systems, operational skills required by the operator and decision maker, and cognitive skills required by UA soldiers and leaders. Web-delivered simulations and emulations of the C4ISR systems allow units to take advantage of home station training facilities. Web-delivered training will facilitate assignment-oriented training and provide a soldier who is transferring into a UA the opportunity to become familiar with the UA, UA Battle Staff operations, and basic C4ISR system operation.

5.4 Training Support Packages (TSPs)

TSPs will be developed to support individual tasks through UA (collective) tasks nested within the vignettes described in the UA O&O Plan to provide common understanding and continuity from FCS soldier through UA collective task performance. TSPs and their scenarios will support FCS development and testing. They will then be left with the UA for sustainment training. TSPs will be delivered in three forms: computer-based interactive courseware for individual training, self-development training, and New Equipment Training/New Organizational Training (NET/NOT), simulation-based for crew operations, and simulation based for collective training of units, leader teams and staff groups including JIM). TSPs will be developed to operate in both ET and NRFTTs, thus providing a link between the two training Medias.

TSPs will be linked vertically and horizontally and include required training resources, including time. TSPs will be structured to ensure all performance is evaluated through After Action Reviews. TSPs will be designed IAW guidance and specifications defined by UAMBL Training Ddivision and TR 350-70. TSPs must:

- Train core tasks and missions.
- Be a composite of institutional, self-development, and operational training.
- Develop proficient soldiers, leaders, staffs, and units.

- Support and integrate JIM.
- Focus on pre-mobilization combat proficiency levels including Military Operations on Urbanized Terrain and Peacetime Military Engagements keeping, Post-mobilization training and mission rehearsals, and sustainment training while deployed.
- Maximize the training potential of all training environments: live, virtual, and constructive.
- Justify training resources.
- Developed and refined in Concept Exploration Programs (CEPs) developmental and operational testing, NETT, DTTP, and FUE.
- Supportable by the C4ISR.

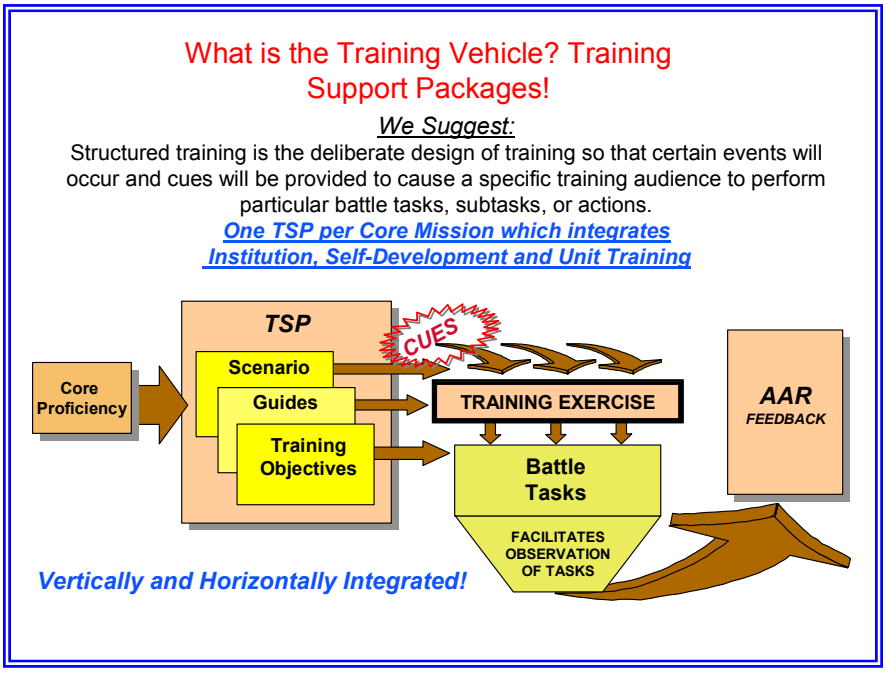


Figure 5-9 Training Support Packages

Current versions of the TSPs, matching the operational/ET software, are required on board the FCS to facilitate “opportunity” training, maintain MOSQ, cross-train crew members, duty position training, execute training drills, exercises and events independently or in concert with other FCS vehicles and elements. Where TSPs cannot be feasibly stored on the platform, TSPs must be stored in distributed information repositories supported by the Army Knowledge Enterprise and retrievable via the FCS C4ISR "reach" capabilities. FCS, as part of the Objective Force program must provide instructional institutions the capability to develop, manage and distribute training support products for the operational force. TSPs must be designated and developed for delivery by the C4ISR and in consideration of bandwidth, spectrum and frequency limitations. This will entail different information parameters than normally associated with fixed communication systems and desktop delivery.

Careful packaging of TSPs in consideration of limitations on text, graphics, color, visuals, motion, audio, interaction, force-on-force simulation, latency, digital terrain requirements, and other factors will enhance accessibility and updates. The TSPs will identify the Embedded Training capabilities required to execute the TSPs and identify stand-alone Training Aids, Devices, Simulators and Simulations (TADSS) for those tasks not supported by the FCS ET capability or required by the institution in lieu of actual FCS Platforms. The TSPs, Courseware, and TADSS will be designed for reconfigurability or reuse TSPs properly configured and developed to enable more effective training in the unit; specifically, TSPs save time, reduce overhead, focus training on identified critical tasks, address identified weaknesses in individual and

collective skills and can be easily integrated into unit training plans. In summary: "Experience is the best teacher."

5.5 Leader Development

The changing OE requires new ways for the Army to think and operate. The UA and OF units will drive revolutionary change in how the Army prepares leaders and Soldiers. The Army will design doctrine, education and training:

- Instill the mental agility and versatility required to master transitions across the full spectrum of operations.
- Develop leaders as warriors with a common baseline of values, discipline, and ability to employ emerging combat systems.
- Accommodate uncertainty; to and foster a culture of disciplined initiative, teamwork, determination, sacrifice and self-reliance.

To develop leader competencies to perform full spectrum operations, the Army requires a coherent strategy that spans education in the institution and training. The Objective Force UA needs proficient small unit leaders capable of operating in widely dispersed areas, integrated with Combined Arms Teams across the JIM spectrum. The leader of the future must be:

- Self aware, adaptive, and comfortable with ambiguity.
- Multi-functional (e.g., able to perform combined arms integration).
- Able to predict 2nd and 3rd order effects.
- Able to reconcile tactical and operational dilemmas.

These characteristics require a collaboration of experiential learning experiences with leaders and Soldiers integrated in a collective framework. Leader development will focus on universal qualities of leaders to achieve tactical competence. Education and training allows leaders to understand the applicability of Army values to warfare and the differences between strategy and tactics. The Army cannot be satisfied with 'localized' ways of doing business that must be learned anew each time leaders change duty station. However, small unit leaders also must be competent in selecting and employing tactics, techniques, and procedures that allow their small units to deal with the changing situations that will occur in tactical combat. The objective of leader development is to build tactical competence and confidence to successfully handle complex tactical dilemmas. The UA body of work has provided insights into what will constitute small unit excellence for the UA. Small unit leadership and Battle Command will require adaptive, creative, multi-functional leaders. Resident within small units will be leaders and Soldiers who are empowered to exercise uncommon initiative based upon competencies in skill sets associated with warfighting. Small units will be execution focused; their leaders, enabled by technology, will be mentally and physically ready to lead fighting teams. Leaders will be competent at decentralized execution on the basis of mission orders**,** intent, and effects-based operations. In operations where small units are dispersed on the battlefield, the value of competent leaders who operate forward with fighting teams is paramount. The requirement for leaders to operate forward at key points on the battlefield endures.

The most important design requirement of the UA is the development of leaders and Soldiers. The purpose of this effort is to transform the leaders and soldiers of the Army along with the materiel and organizational aspects of Army Transformation. In order to command and lead in a unit that has multi-functional leaders and Soldiers, our leaders must be capable of building cohesive teams, quickly processing an extraordinary amount of information, and taking decisive action. Leaders and soldiers who are multi-faceted, self-aware, and adaptive are developed through a concerted process. This process of Leader Development is accomplished through the implementation of the Objective Force Leader framework that includes Formal Assessment/Feedback and the Transformation of Professional Military

Education across the domains. The Objective Force Leader framework builds on the characteristics of the Objective Force soldier with the goal of growing Objective Force leaders. The first factor is training which is competency based vice task based (i.e., react to a CBRN threat vice don a protective mask).

The second factor in growing UA leaders is the implementation and sustainment of a Formal Assessment and Feedback process to develop Leader Competencies. Leader self and individual assessment and feedback during a career starts with accession and continues throughout unit assignments and institutional training. The process is a norm in the Special Operations Force (SOF) community, but will require a culture change for the rest of the Army. This assessment and feedback must become a normal process for our soldiers and leaders and integrated into all domains. Future battlefield environments will pressure timelines to develop leaders with the requisite skills to meet UA operational challenges. These conditions require a leader development system that can compress and accelerate development of expertise and maturity, enhance leaders' conceptual and team building skills, and develop adaptive and self-aware leaders. Assessment and feedback will improve leadership, and motivation with the endstate of the Army having adaptive leaders that are more confident and mature and can understand first, act first, and finish decisively.

The third factor in growing UA leaders in the Army is having a coherent approach to develop Army leaders across the four domains: institution, home station, CTC, and deployed. The domains are intertwined and provide feedback to the others. One example is the CTCs providing feedback to the institution for the updating of doctrine or TTPs. A second example is experiential learning and feedback between the CTCs and home station training. A third example is self-development with a career map/leader portfolio using ATIA-M. These two processes clearly lay out for the individual what they can accomplish in self-development. This system is part of life-long learning and professional development. Finally, the transformation of the Professional Military Education (PME) supports the UA by changing to the way TRADOC currently educates the Army's leaders and soldiers. Leaders will access institutions from anywhere, home-station or deployed. PME will allow experiential, competency-based training that challenges leaders and educates them on how to think, not what to think. Assignment-oriented training will become the norm. Common core competencies will be taught in a distributed mode and allow proponent institutions to focus on specialized training. The transformed PME is intertwined with the formal assessment and feedback program.

PME for UA leaders will provide TRADOC proponents who are schoolhouses without walls. Schoolhouses that take advantage of the best available learning models, including high impact, experiential resident training in live, virtual, and constructive environments. The schoolhouses will leverage the Army's information technology infrastructure in an effort to develop and sustain the readiness of its units, soldiers, and leaders. The schoolhouses will focus on inculcating these competencies in a series of new courses. This approach facilitates the development of those competencies in leaders. This ensures confident and competent leaders able to plan and execute combined arms and Joint operations. One of the principal aims of effective leadership is that it must produce 'wisdom of action' based on insight, foresight, instincts, inspiration, and innovation. This has to be done in 5-dimensional battlespace: the physical (3-D), the human dimension (4-D), and the temporal dimension (5-D). This grasp of the 5-D nature of battlespace is critical to ensure understanding of complex sets of outcomes 'in the dirt' on land, over time, and in the minds of a wide range of players.

The abilities described above are the product of making conscious investments in Soldier/leader development through advanced studies, experiential learning, in-country studies, and operational experience in which soldiers and leaders develop instincts that enable them to "see what others don't". This ability to be competent in military art and see what others do not is what gives decisive advantage on a complex battleground. It is also what makes soldiers able to assume leadership roles. It is what makes a digitized COP come to life and what is required to bring meaning to a plasma board and databases. Life-long, leader, learning applications must span the spectrum of functions in the practical forms of:

- Classroom tools.
- High-tech battle books.
- On-line products.

- Knowledge reachback services and support.
- Knowledge outreach.
- Experiential learning (virtual and actual).
- Virtual and actual coaching / mentoring / advisory support.
- Hierarchy of self-development programs that enable advanced, specialized, and emergent areas of expertise.

As an extension of leadership, commandership in the 21st Century needs to extend beyond the doctrinal Battle Command model to address the nuances of full-spectrum operations in the Operating Environment. The command and control of outcomes takes on dynamic meaning for 21st Century Battle Command when one considers the broad range of players and effects to be orchestrated, the majority of which are not a part of the military's organic formations, nor are they a part of familiar battlefield effects. The art and science of command thus takes on new meaning and implications for leader developers that must be apace with complex realities on contemporary and future battleground. Significant DOTMLPF implications for leadership include the following:

- Small unit leaders will be able to command and control over greater distances
- Leaders will rapidly transition from standoff to close assault.
- Leaders able to command on the move, in a fight, in all terrain, in all weather, when the enemy is reacting and counteracting to our small unit actions.

Small unit leaders must have the tactical acumen to decide rapidly when to remain mounted for tactical standoff and when to dismount to support mounted maneuver and for close assault. Leaders must be competent in the integration of supporting fires, Air and Missile Defense, and aviation. Small unit excellence requires leaders who anticipate well, are comfortable in decentralized actions based upon small unit initiative, and possess Army values. Battles will continue to be decided by the direct leadership in fighting teams, acting, contributing, and influencing the outcome of the engagements. The time to begin training Objective Force leaders is today. Today's lieutenants and corporals are the colonels and sergeant majors of the UA. This generation of leaders must be prepared through the military professional education system to become Objective Force leaders.

The UA requires a holistic and mutually supporting training and leader development process. Each portion of the leader development triad (institution, unit, and self-development) must have a particular role and focus. The focus of the leader development system at junior levels will be to inculcate new leaders with a common set of values and tradition and to train them in the conduct of war, and to provide them the minimum skills and knowledge necessary to make the initial transition to their first assignment. At intermediate and senior levels of leader development, the focus will shift to provide an educational environment and curriculum exposing leaders to the nature and the art of war as opposed to only the scientific conduct of war. The UA leaders must know 'how to think' versus 'what to think' at every level of command. The institution must support this requirement by creating an academic setting that produces well-rounded leaders, who are capable of synthesis, adaptive, politically astute, who have a broad understanding of human nature, as well as are capable and comfortable with the full-spectrum operations environment with Joint, Current, Stryker and coalition forces in the 21st century battlefield.

5.6 Soldiers

The Soldier remains the centerpiece of the UA. The human dimension encompasses aspects beyond the mental, physical, moral, and spiritual well being of soldiers themselves. The human dimension impacts UA readiness and extends to civilians, contractors, families, and the institutional support networks that frame the environment surrounding them. The Soldier is the most important factor in maintaining and effecting unit readiness. Soldier and unit readiness in the UA are synonymous and critical elements in the Train – Alert – Deploy culture of the Objective Force. UA soldiers will be physically and psychologically prepared for non-contiguous warfare, fighting in small units separated from their higher headquarters; they must possess the competence and confidence to close with their opponents in

open, close, and complex terrain and destroy them. Advanced technologies empower soldiers and leaders to achieve situational dominance and create a powerful construct for the use of force; the human dimension of the Soldier empowers him with the moral courage and determination to impose the will of the nation.

The OE in which the OF soldier will operate will be both complex and challenging. The battlespace will be 360 degrees, enemies will be dispersed throughout the area given its non linearity, and enemy positions will be hard to template. The battlespace will be violent, unpredictable, and multi-dimensional. Enemies will try to fight in complex and urban terrain in order to degrade UA long range targeting and precision munitions delivery capability. More noncombatants, media, and civilian agencies will populate the battlespace and complicate operations. Operations will be fluid with rapid transitions at the tactical level. These factors translate into a battlespace that offers no definable lines and offers no respite from constant, high intensity, close combat. Situations will be constantly changing with new ROE being introduced frequently. An IO campaign will be waged at very low levels to influence both soldiers and the civilians in the battlespace. The results of these activities will be extreme stress on soldiers and leaders at even the lowest unit levels and the possibility that stress, fatigue, and high cognitive workload could lead to incorrect situational awareness contributing to poor decisions. What this means for the OF soldier is that regardless of where that soldier is or what his job, eventually that soldier will engage in close combat. All actions are open to media scrutiny and may impact the local and possibly international populace. The 'How' of soldier conduct becomes paramount. The intensity of this environment, coupled with the fact that soldiers and units may have to operate for long periods separated from one another, will increase both physical and psychological stress, and demands increased individual competent judgment and decision-making down to individual soldier levels.

Potential solutions to submitting soldiers to these stresses are by exposing soldiers to replications of these stresses in extremely high-resolution training and education on a recurring basis. Moreover, soldiers and particularly leaders must understand the potential outcomes of human behaviors on the battlefield and let them contribute to the advantage of friendly forces. Successful UA operations will be grounded in the human dimension, the vital heritage of America's Army. The soldier must be capable of contributing relevantly on the first day of assignment to their first unit. This evolution renders Initial Entry Training (IET) relevant to operational Army requirements; more so than it is today. For the entire career the soldier will be supported by the training base as he transitions from assignment to assignment, moves from lower to higher rank, and from enlisted to Warrant Officer/Officer. Learning is a continuous, never-ending process enabled by a distributed training base that now more closely shares the training responsibility with the operational Army (merging of the operational and training environments). Developing and maintaining this edge in the human dimension is critical to the success of the UA: the soldier is the centerpiece.

5.7 Facilities

While the areas of doctrine, training, and leader development will constitute the preponderance of the transformation effort, each of them will have implications that affect the existing and future Army facilities. The Army will have to determine if current stationing plans support future OF units. Facilities and infrastructure of Army garrisons will require a significant investment of resources to train and deploy UA forces in accordance with the UA concept. The power projection infrastructure of our facilities must be carefully analyzed to ensure the UA can meet deployment timelines. Once deployed, units will rely upon a robust reach capability to support themselves both operationally and logistically. Facilities must support this capability through robust intra and inter communications nodes. Installations must have a robust inter and intra internet backbone to support connectivity requirements. Facilities need to be capable of supporting new equipment, sustainment, and ramp-up training. They must optimize systems integration and training, and warfighter readiness evaluations. Although commanders and staffs will be able to conduct constructive training events from their FCS platforms, facility support will be required to conduct much of the UA's training. Facilities will be required in the institutions to house the NRFTTs required for training of the FCS:

- New ranges to accommodate the capabilities of advanced weapon systems and command and control systems.
- Surrogate tactical internets.
- Installation I3 backbone that provides connectivity to motor pools, barracks, logistics, and intelligence centers, family quarters, HQs buildings, training facilities, centers, and ranges to include wireless communications capability.
- Battle Simulation Centers (BSC) like capability.
- Home Station Operations Center to the types of capabilities needed for connectivity and task management/support of the UA.
- High OPTEMPO mission Support Training Facilities/Battle Command Training Center like capability (may combine with BSC capability).
- Digital Multi-purpose Range Complex/Battlefield Area Complex capability
- Home Station Instrumentation Systems.
- Facility upgrades for motor pools, BSCs, MSTF/BCTC and other facilities that support connectivity requirements of future ET capabilities.
- Maintenance facilities, motor pools and platform storage facilities that provide inclement weather protection, climate control and physical security.
- Airstrips to support UAV training.
- Dedicated air traffic control at facilities to deconflict airspace.
- Storage facilities to maintain 72-hour basic load (all classes) in support of high OPTEMPO.
- Unique ammo storage requirements to support missions beyond the 72-hour basic load requirement such as training ammunition.
- Adequate strategic and tactical mobility support facilities including airfields, roads, rail and sea.
- Space for co-location of selected UE enablers.

The Army UA will be part of a Joint Team faced with an increasingly demanding Contemporary Operational Environment. This force must be trained to be fully capable for rapid deployment and offensive operations across the full spectrum of operations. To achieve this objective, training support capabilities must be available worldwide, around-the-clock to provide soldiers, leaders, and trainers with a flexible, mission essential task list driven menu of structured training support products, exercises, and mission rehearsal capabilities. The Army TSS is a system of systems that provides the networked, integrated, interoperable training support necessary to enable an operationally relevant training environment for warfighters. It is comprised of three components: product lines, architectures and or standards, and management, evaluation, and resource processes that enhance training effectiveness.

- Product lines consist of training information infrastructures; training aids, devices, simulators, and simulations; training products; training facilities and land; and training services. These product lines provide the capabilities that trainers and soldiers need to train in the institution, operational, and self-development domains.
- The architectures and standards provide the means to ensure integration and interoperability across product lines.
- Management, evaluation, and resource processes employ best business practices to plan, implement, and sustain the TSS.

Capabilities of the TSS extend across the institution, home station, CTC, and deployed theaters, and support current, SBCT, and objective forces. The figure below depicts an integrated, interoperable TSS.

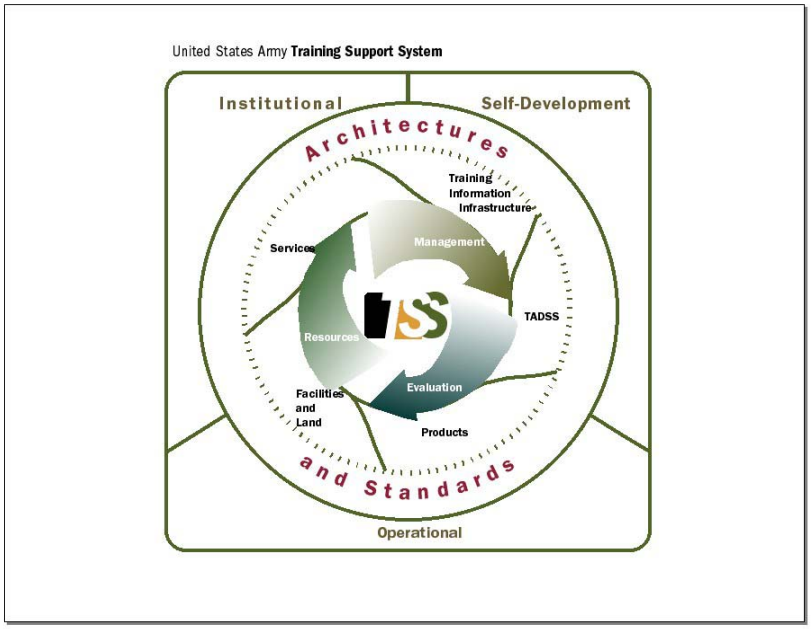


Figure 5-10 Army Training Support System

Training support capabilities must be available worldwide and around-the-clock to provide soldiers, leaders, and trainers with flexible, structured training support products, exercises, and mission rehearsal capabilities. Essential capabilities include the ability to provide synthetic environment battlefields that can be integrated with live training and the ability to use automated training management tools to operate in the OF environment. The TSS provides commanders, leaders, and soldiers with accurate, timely, relevant, and affordable training and mission rehearsal through interoperable and compatible products with the requisite connectivity. The TSS supports specific operational needs through continuous and evolutionary modernization of training as envisioned by DoD and outlined in the Strategic Plan for Transforming DoD Training, March 1, 2002.

Chapter 6 STATEMENT OF REQUIRED CAPABILITIES FOR THE UNIT OF ACTION

6.1	SoRC for FCS
6.2	Responsiveness
6.3	Deployability
6.4	Agility and Versatility
6.5	Maneuverability
6.6	Soldiers
6.7	C4 and Leadership
6.8	Information
6.9	ISR
6.10	Lethality
6.11	Survivability
6.12	Sustainability
6.13	Training

This chapter describes the required capabilities in the Maneuver Unit of Action and Future Combat Systems. The Army's developmental work over the past several years has provided a tremendous body of work. This work has developed the analytical underpinnings for required capabilities to achieve key Unit of Action concepts and the Future Combat Systems that will provide the DOTMLPF solutions to achieve the Objective Force Unit of Action. The capabilities cited herein represent the body of work to date. The Statement of Required Capabilities (SoRC) has been significantly modified since its initial release in November 2001 to reflect the results of subsequent study, analysis, and professional military judgment. The modifications still fully support the FCS ORD.

6.1 Statement of Required Capabilities

This document summarizes required capabilities to achieve UA concepts and to support the JROC approved FCS ORD dated 14 April 2003. The document is organized as follows:

- Responsiveness.
- Deployability.
- Agility & Versatility.
- Maneuverability.
- Mobility.
- C4 and Leadership.
- Soldier.
- Information: intelligence, surveillance and reconnaissance.
- Lethality.
- Survivability.
- Sustainability.
- Training.

6.2 Responsiveness

Responsiveness has qualities of time, distance, and sustained momentum. It includes the ability to capitalize on the positioning of forward-deployed forces and supplies as well as strategic lift. It demands close, continuous coordination between Army component commanders and Joint and interagency decision-making bodies. The Army must be able to respond to worldwide threats to our national interests and the interests of our Allies anywhere in the world. Responsiveness also encompasses the political will of the Nation to deploy forces in response to a crisis or threat. For American forces to be successful, adversaries must realize that American land power can prevent them from achieving their aims and also recognize the willingness of the American people to support military action.

1. Capability. Insert FCS combat unit into an austere theater through multiple unimproved entry points without relying on fixed ports and staging bases to overcome problems of enemy access denial strategies.

2. Capability. Deploy and employ the UA immediately upon arrival as a coherent, integrated combined arms formation as part of a divisional UE or JTF, by air, ground or sea in support of early entry operations.

3. Capability. Upon arrival, FCS combat units immediately employ over operational distances (up to 400 km) to designated area(s) of operation as a coherent, integrated combined arms team.

The UA must be able to conduct these critical mission tasks:

- Conduct sensor fusion and pattern analysis of combat information and intelligence.
- Conduct ISR Operations.
- Deploy within 96 hours.
- Conduct aerial envelopments to operational depth.
- Conduct a terrain-oriented attack.
- Conduct a force-oriented attack.
- Conduct area security operations.
- Conduct battalion size air assault operation.
- Conduct combined arms breach.
- Conduct urban operations.
- Employ networked fires.
- Conduct JAAT.
- Conduct defensive CBRN operations.
- Establish liaison for Current, Stryker, Joint and Coalition forces.
- Maintain the DIDb to provide a COP.
- Execute A2C2.
- Conduct BCOTM.

4. Capability. FCS combat tactical units are immediately capable of conducting distributed, simultaneous, multiple and continuous fully integrated combined arms full spectrum operations, day and night, against any threat in a wide assortment of terrain and weather conditions from open to complex and urban throughout an expanded battlespace without undergoing reception and staging. The UA can self-sustain military operations for up to three days of high intensity tactical operations upon arrival. Minimal prep time is required from alert to deploy and from deploy to employ after arrival.

5. Capability. UA must be capable of supporting operational maneuver directed by the JTF commander by combining vertical and inherent horizontal maneuver qualities of FCS units. During entry or decision operations, the JTF can ‘pick up’ the UA by a wide range of air, land or sea options and reposition it at advantage to seize opportunity and attack enemy centers of gravity or decisive points. The UA must be tailorable to be delivered into austere environments and operate autonomously or semi-autonomously.

6.3 Deployability

To be truly responsive, Army forces must be deployable and capable of quickly and rapidly concentrating combat power in an operational area. The Army goal is deploying a brigade combat team anywhere in the world in 96 hours after liftoff, a division in 120 hours, and five divisions in 30 days (a mission-tailored UE with all required maneuver and functional UAs). This will require enhanced systems and capabilities. Systems must be transportable, logistics must be focused and flexible, and a culture must reside within The Army that accepts deployment readiness as a way of life. UE pooling and

stationing constructs will consider forces likely to fight with the UA to facilitate a train, alert, and deploy mindset, minimizing integration challenges in theater. Army forces need support from the other services to achieve the required levels of deployability.

1. Capability. FCS equipped UA must be transportable by inter/intra-theater land, sea vessel and airlift anywhere in the world; be more deployable with reduced deployment tonnage; be transportable by C-130 profile aircraft with essential combat load and, when available, comparable advanced vertical lift or Theater Support Vessel (TSV). Rationale for this capability is to introduce the UA at multiple points of entry that are unpredictable to overcome enemy access denial, to be able to leverage austere points of entry to increase force flow, to increase transport options available to the combatant commander using C-130/C-17 aircraft and fast sealift, to conduct operational maneuver to positions of advantage during a campaign, and to pursue future vertical lift concepts that are follow-on to C-130.

2. Capability. Enable the deployment of a combat ready brigade combat team anywhere in the world in 96 hours after liftoff, a warfighting division on the ground in 120 hours, and five divisions in theater in 30 days.

3. Capability. Be capable of rapid inter-theater to intra-theater trans- shipment to maximize force flow and gain operational momentum to meet deployment objectives.

4. Capability. The UA must be able to integrate into an enroute mission planning and rehearsal capability embedded into FCS systems during alert, deployment and employment. FCS and Unit of Action C2 systems must utilize enroute mission planning, and support mission rehearsal, battle command, and ability to integrate into gaining C2 architectures during movement by air, land and sea.

5. Capability. Provide embedded Joint in transit visibility of systems for movement planning and tracking.

6.4 Agility and Versatility

Army forces must possess the mental and physical agility to transition among the various types of operations; just as we have demonstrated the tactical warfighting agility to task organize on the move. Agile forces will be required to transition from stability operations and support operations to warfighting and back. As the Army crafts a more rapidly deployable force structure, it must continue to grow leaders who can adapt quickly to change. The pace and complexity of operations will increase, especially as military operations in the information environment become more important.

Versatility must be emphasized in doctrine and training at all levels. Our organizations must be able to generate formations that can achieve sustained land dominance at any point and in all environments. This must be done with minimal adjustments and in minimal time. Currently our warfighting organizations can be tailored to respond to any contingency. However, the future will require even more versatile forces. Increasing versatility requires special consideration of structuring and equipping initiatives as well as training of personnel to respond to unfamiliar scenarios.

1. Capability. The UA brigade is full spectrum capable, optimized for offensive operations. FCS combat units must be optimized for closing with and destroying any threat in all terrain and weather conditions when forces are joined by: 1) bounding overwatch under contact, 2) fires at standoff and tactical movement not in contact, 3) fire and maneuver in contact, and 4) tactical assault. Closing and destroying includes any form of lethality, Army and Joint, to engage an enemy with LOS, BLOS and NLOS fires when under observation by an adversary and when in contact. FCS combat units must rapidly exploit success.

2. Capability. Enable quick transition between engagements; changes in mission task, purpose and direction to execute branches or sequels; or to conduct reconstitution or mission staging without sapping operational momentum. The UA will be able to attack from the move and execute simultaneous, multiple deliberate attacks under hasty conditions. FCS units must adapt faster than the enemy can.

3. Capability. The UA is design to be inherently modular. Based on mission needs, it can add to and take away capabilities on demand. The network must facilitate rapid force tailoring and teaming as required and enable mission retailoring during tactical operations.

4. Capability. Provide resources to ensure current and Stryker units can seamlessly join the UA and be force tailored along with other UA elements.

5. Capability. Provide inherent capability to perform Battle Command on the move. The C4ISR architecture must enable commanders to lead forward and in proximity of where they are needed to influence the outcome of battles. Empower leaders with technologies such as terrain and problem solving/decision making tools to perform their roles during tactical operations. Leaders and staffs conduct continuous 'running' estimates of the situation while on the move collaboratively and by an integrated COP that enables early understanding of threat actions/intentions. The COP provides critical combat information (enemy, terrain, and weather, non-combatant and friendly) tailored to unit mission, task and purpose. It enables visualization and dissemination of tactical schemes by mission orders with graphic overlays. Changes in leadership that occur during battle will be automatically disseminated to appropriate levels with shared COP to enable continuity of command. Units must be able to move from one tactical engagement to the next with an integrated ISR, fires and maneuver plan ready for the next battlefield architecture. Battle Command tools enable leaders to:

- Know the terrain and appreciate its tactical implications for tactical concealment, employment of weapons, mobility and seeking positions of advantage.
- Know the enemy, where his capabilities are, his composition, disposition, intent, movement, strength and limitations.
- Know friendly forces locations and capabilities.
- Control and distribute fires, and know where to establish priorities in fire plans.
- Adapt to emerging situations more quickly than an adversary. be able to adjust in real time to developing enemy actions as opposed to merely fighting a plan.
- Be in position to direct effective maneuver, and fully integrate fires with maneuver.
- Enable rapid resynchronization of forces and functions to mitigate the potential loss of combat power.

6. Capability. Provide operations groups and command posts for use by command groups and their staffs to command and control tactical operations. These C2 facilities must be 100% mobile and are optimized to:

- Rapidly develop plans.
- Synchronize combat power.
- Command and control in a dynamic and adaptive environments.
- Orchestrate the development of the situation with organic and external ISR.
- Prepare the battlespace with fires, army and joint.
- Direct tailoring; perform A2C2; protect and sustain the force.
- Synchronize maneuver: mounted and dismounted, manned and unmanned.
- Integrate army aviation in roles of reconnaissance and close support of ground operations.
- Enable architecture to strengthen supporting to supported relationships.

7. Capability. Enable setting of conditions and movement to a position of advantage to initiate combat on our terms, at a time and place, with a method of our own choosing. Be resilient and durable to withstand unexpected actions on contact.

6.5 Maneuverability

1. Capability. Enable decisive maneuver, horizontal and vertical, day and night, in all terrain and weather conditions synchronized with Army and Joint fires and ISR.

2. Capability. FCS combat units must have superior tactical mobility in a wide assortment of terrain and weather variables as a dismounted / mounted combined arms force without compromising tactical unit integrity. Operational mode summary of FCS is off-road tactical speeds of 50 kph and on road speeds of 90 kph. Rapid dash speed from cover to cover is crucial. The capability involves not only platform mobility characteristics, but also understanding how to use terrain to gain a mobility advantage, and how to deny that advantage to the enemy. FCS platforms will provide tempo for rapidly gaining initiative and momentum. Negotiate all-surfaces: on and off-road, improved or unimproved trails. They will be able to move to positions of advantage with speed and accuracy, able to ford, negotiate rubble and cross gaps. The FCS must provide protected mobility of 7-9 man rifle squad and 6-9 man weapons squads. Multi-purpose robots will perform functions such as ISR and sustainment for manpower intensive or dangerous tasks; these may also be armed. Finally, FCS platforms must retain sufficient mobility in degraded mode to continue the operation or link up for combat repair; the systems must also be like-platform and self recoverable.

3. Capability. FCS combat units must have unsurpassed mobility over operational distances (up to 400 km) to designated area(s) of operation as a coherent, integrated combined arms team.

4. Capability. Provide enhancements that enable soldiers to conduct dismounted maneuver with load bearing equipment and ensure loads do not exceed 40 pounds, enable soldier stamina through prophylaxis and enhance endurance in hot, cold, dry weather with advanced uniform ensemble.

5. Capability. Support fully integrated combined arms maneuver of combat tactical units to execute:

- Mounted operations enabled by dismounted forces.
- Dismounted operations enabled by mounted forces.
- On occasion, dismounted operations.
- On occasion, mounted operations.
- Aerial envelopment and air assault.

6. Capability. Conduct air assault operations by a dismounted unit with manned or unmanned mission equipment packages dismounted from their platforms; enables ability for overmatching combat power until linkup can be accomplished.

7. Capability. Enable tactical, dismounted operations in urban terrain enabled by mounted forces to provide overmatching combat power fully integrated with ground maneuver; retain initiative and aggressively reach tactical decision to:

- Establish tiered, multi-echelon and multi-dimensional ISR, fires and maneuver that are fully networked to assure overmatch in lethality, survivability, mobility and information in urban conditions.
- Gain and maintain correct situational awareness continuously under day and night conditions throughout the tactical operation by employing organic manned and unmanned, air and ground R&S that is fused with external ISR (SOF, coalition, Joint, strategic, and national). Must network ISR that is 'tiered' from brigade, battalion, small units ('troops in contact') and external to gain multi-dimensional synergy to see and understand first.
- Quickly prioritize and reprioritize focus at NAI/TAI on approach routes and objective areas. ISR must overwatch tactical movement, fire and maneuver, the assault and enable actions on contact against the surprise encounter. It must cover dead space and gaps that could conceal enemy ambushes, counterattacks, reinforcement, or withdrawal. ISR must be networked with direct access to the full array of LOS, BLOS and NLOS fires, Army and Joint, with sensor-to-sensor links that receive fire support in seconds. Allow visualization through walls and thick foliage, inside buildings, caves or subterranean infrastructure.
- Gain lethality overmatch through overwatching fires and mutual support against all threats in compartmented urban terrain conditions. Overwatching fires must account for dead space and

gaps, flanking and enfilade fires from keyhole positions that will be masked. Overwatching fires from LOS, BLOS, NLOS – Army and Joint, must be integral to movement, fire and maneuver, the assault and actions on contact. R&S and small tactical units must be networked to an array of 'tiered' fires from snipers, MCS LOS/BLOS, PGMM, NLOS, Joint (CAS, AC130, etc.), and Comanche in close support for on demand, very responsive, accurate and reliable fires. Due to time and space limitations of getting quick fires on floors, between floors, or in alleys; elements require 'point and shoot' capability in which the observer either marks the target by laser or transmits targetable data to firing platforms. Fires must respond to 'point and shoot' in less than 5 seconds and must be fire and forget. MCS LOS/BLOS provides immediate direct fire support of dismounted elements by defeating enemy in buildings, armor, bunkers, breaching walls to produce 30" x 50" holes, in all types of construction. BLOS must also engage enemy up to the 14th floor of a building. PGMM must provide very high trajectory precision-guided fires to overcome enemy masked by infrastructure. Snipers provide precision fires from occupied positions. Comanche, in a close support role, engages point targets with on-board precision missiles or provides suppressive fires. NLOS fires must provide precision destructive fires FCS Cannon, (LAM/PAM), as well as obscuration fires to assure freedom of maneuver.

- Conduct air assault operations into urban LZs to attack key objectives in order to set conditions for decisive operations. Must be able to dismount LOS/BLOS mission equipment packages that can be delivered by UH-60, manned or unmanned, from platforms to accompany dismounted forces. This must include the capability to airlift MULE, ARV(L), and NLOS-LS systems via UH-60 aircraft, and ARV (A) and ARV (RSTA) via CH-47. Packages are multi-purpose to provide ISR, fires and sustainment support to the dismounted force until linkup.
- Gain mobility overmatch by retaining the employing force in mounted and dismounted combination. Also, require multi-story building entry through roofs and upper floors. Dismounted forces must command and control movement through subterranean avenues. FCS must be able to negotiate natural obstacles and rubble.
- Provide urban C4ISR architecture that networks combat power through NLOS communications, as well as for subterranean movement to integrate combined arms from soldier to system, organic and external, air and ground, with strengthened relationships from supporting to supported. Land Warrior Block III empowers mounted and dismounted operations and fully integrates combat power in a dynamic, adaptive battlefield framework.

8. Capability. Provide superior capability to detect presence, identify disposition and counter all obstacles, natural and manmade, to include anti-tank and anti-personnel (AT/AP) mines above and below surface, booby traps such as side-charge and remote detonated mines. Also, need ability to conduct route reconnaissance with multi-dimensional means to detect and bypass at greatly improved speeds (at least 50 kph). Have means to perform limited clearing of routes organically. It must possess standoff means for detection and defeat of obstacles, and the ability to detect and locate other man-made obstacles. FCS architecture enables real-time dissemination of reported obstacles throughout the force, and mark or performs in-stride counters to neutralize mines at a distance. UA accepts augmentation packages from the UE for gap-crossing capabilities and to conduct in-stride or deliberate breach of disrupting and fixing obstacles.

9. Capability. UA must have organic capability to cross gaps without loss in operational momentum. UE will enable the UA to cross larger gaps. These capabilities will be task organized to the UA in tailored packages, as needed.

10. Capability. Tailor protective counter-mobility and survivability support available at transition to defensive operations using augmentation from UE.

6.6 Soldier

The combination of quality Soldiers, competent leaders, and cohesive units creates a versatile, powerful force. The Army needs competent and versatile Soldiers able to accomplish missions in a challenging and dynamic global environment. They must be able to successfully accomplish tasks while operating as part of teams. Soldiers and leaders must exercise mature judgment and initiative under

stressful circumstances and be capable of learning and adapting to meet the demands of full spectrum operations. Soldiers must also be technically and tactically proficient. They must employ and maintain increasingly sophisticated equipment. Current and future technologies require skilled Soldiers who understand their systems. Regardless of the importance of equipment or the expansion of technological capabilities, Soldiers are more important than machines. Soldiers, not equipment, accomplish missions to win wars. Leadership links soldiers' technical and tactical competence to operational success. Achieving CA effectiveness with complex systems demands adaptive and flexible soldiers.

1. Capability. Decrease task complexity and execution times to improve performance while minimizing soldier sensory, cognitive and physical demands.

2. Capability. Enhance soldier endurance and stamina to fight effectively under all operational and environmental conditions:

- Full spectrum operations.
- Full range of conflict – Major Combat Operations, Small Scale Contingencies, and Peacetime Military Engagements.
- All terrain; open/rolling, complex and urban.
- All-weather.
- CBRN.
- All modes of operation – mounted, dismounted and air assault.

3. Capability. Possess soldier mobility enhancements to reduce soldier workload through environmental ride quality and task automation. Exploit unmanned technology and manned systems to enhance continuous 24-7 operations.

6.7 C4 and Leadership Architecture

1. Capability. The UA knowledge base and C4ISR architecture must enable leadership to be agile, intuitive and adaptive to all variables of dilemmas that occur in full spectrum operations and to lead the effort to reconcile what has to be done, applying necessary emphasis on priorities. Optimize C4ISR to empower decentralized/semi-autonomous small unit actions. Enable competent and capable leaders to see the environment, take initiative, seek the advantage aggressively, and employ the combat skills and competence of the formation as a fully integrated team to fight and win simultaneous, multiple engagements.

2. Capability. The FCS-equipped UA is a networked force, horizontally and vertically integrated from strategic to tactical level. The UA comes under the command and control of a divisional UE or JTF for mission execution; for access to C4ISR, Army and Joint fires sustaining base. It is interoperable with Army current and Stryker units, Joint and interagency units and is adaptable to allies, coalitions and PVOs with automatic language translation ability that can be tailored to local dialects.

3. Capability. FCS combat units are fully compliant with operational architectures and core information exchange requirements tailored to unit task and purpose. UA has access to information from organic, external and troops in contact optimized for rapid distribution to small units for greater operational effectiveness.

4. Capability. Provide collaborative, distributed problem solving and decision aids that empower Battle Command to support commanders, as well as staffs to advise commanders during planning, preparation and execution of operations. They must enable 'running' estimates of the situation, better problem solving and decision making, and better command and control over functional areas. FCS provides aids to enable commanders and staffs to operate effectively from anywhere on the battlefield while 100% mobile by:

- Empowering decentralized execution and initiative by sub units in the UA linked to purpose.

- Maintaining individual and group situational awareness at all times in the assigned AO and surrounding AI. This includes access to a running estimate that is updated continuously, as well as an ability to collaborate with subject matter experts; subordinate, adjacent and higher commanders and staffs in real time to develop a complete appreciation of the situation.
- Filtering information so commanders and staffs can focus on pertinent items relative to mission purpose, recognize opportunity, and attend to decision making, problem solving and leadership.
- Enable visualization and dissemination of the tactical scheme of maneuver with collaborative planning (vertically and horizontally) and execution at all levels.
- Enabling understanding of terrain; how to use it to advantage for its cover and concealment, for mobility advantage, and for employment of systems and units. Understand how to deny its use by the enemy.
- Allowing understanding of own unit capabilities and how to employ given operational variables. Enable employment of units with better confidence and operational effectiveness and wargame base plans, branches and sequels against mission variables. Enable conception of solutions through accelerated collaborative planning, automated course of action analysis, rehearsal and simulations.
- Enabling recognition and exploiting of opportunities.
- Helping commanders deal with dilemmas and make reasoned and timely decisions based on superior information.
- Enabling C2 to direct decisive action through communicating orders, intent and supporting graphics collaboratively with the chain of command.
- Synchronizing ISR, fires, maneuver, survivability, leadership and sustainment.
- Battle tracking compliance with directions and status of preparation for mission execution.

5. Capability. The FCS tailorable, networked Battle Command system provides mutually supporting and enables situation awareness for dismounted and mounted forces, their leaders and Soldiers, in all terrain: open, complex and urban and in adverse weather conditions. Networked dismounted elements equipped with Land Warrior Block III capabilities and mounted force Battle Command construct must be able to integrate support from ISR, fires and maneuver to achieve overmatch in compartmented, restricted terrain.

6. Capability. Provide The UA's C4ISR network and leadership structure provide Airspace Command and Control management capability. This organic functionality helps the UA gain situational awareness that includes the Third Dimension (air) domain enabled through a single, integrated air picture (SIAP). It enables UA airspace users with an integrated, networked process to facilitate multi-dimensional operations. It will also provide positive, procedural coordination, integration, synchronization, and regulation for Army and Joint manned and unmanned aviation assets as well as indirect fire munitions (loitering, precision and conventional) within the battlespace. Required UA A2C2 capabilities include the ability to:

- Discriminate and accurately identify all aerial objects.
- Deconflict, synchronize, and integrate all air-ground operational requirements with fires in time, space and altitude throughout the joint battlespace.
- Employ enhanced procedural and dynamic control measures.
- Develop, disseminate, and maintain a real-time SIAP thru multi-path communications with all members of the air-ground team as well as possess an embedded, layered, multi-path digitization capability to support the digitized display of ATOs, ACOs, and ACMs.
- Optimize execution of Army, Joint, Multinational, and Interagency operations.

- Enable commanders to effectively orchestrate integrated air and ground maneuver, fires, and air defenses to support decisive operations within the AO.
- Integrate into and operate with formulating/existing Army, Joint, Multinational, and Interagency (in some cases Civilian) architectures to support operations.
- Possess knowledge-based battle command with embedded artificial intelligence that is interactive with all required force elements.
- Facilitate air and missile defense planning, coordination, and synchronization of UA and augmented air and missile defense assets.
- Determine recommended air and missile defense coverage for the UA.
- Provide relevant airspace management information.
- Facilitate automated aviation planning, coordination, and synchronization of UA organic as well as augmented aviation assets/capabilities.
- Identify UA airspace conflicts.
- Identify, receive and dynamically process UA operational airspace management changes.
- Preclude fratricide within the UA battlespace.
- Receive, maintain, and disseminate information on all airspace control measures, preplanned field artillery fires, airmobile operations, aviation operations, and UAV utilization.
- Coordinate and disseminate information concerning the establishment of coordinating altitudes and changes thereto throughout the JOA.
- Assess enemy Third Dimension activity (missile launch times/locations and air flight patterns).
- Relay information concerning air defense warnings (to include early warning of air and or missile attack) and rules of engagement (weapons control status and hostile criteria).
- Enhance force protection for air and ground forces.
- Integrate NLOS-LS counter air fires against low and slow moving (< 70 Knot) portions of the rotary and UAV aircraft threat.

7. Capability. Provide dynamic, uninterrupted C4 architecture that is fully functional in all conditions, LOS and NLOS, with no latency at extended range and with redundant communications through a network that is:

- Highly integrated, single, ubiquitous, distributed, and capable of greatly increased yet scaleable data rates.
- Open, multi-layered architecture with multiple paths that provide a level of redundancy for assured communications that can be quickly diagnosed and are self-healing. Allow voice and data routing around inoperative nodes without interruption of information flow and situational awareness.
- Pervasive and optimized for mobile operations, where all platforms are integrated nodes, which do not rely on stationary, attended ground nodes and permit data management independent of the communication architecture.
- Leverage opportunistic use of the spectrum and commercial derivatives.
- Self-organizing and extendable – add entities to the network in a seamless manner and is permission based to meter who enters the layer.
- Backward adaptable to current and Stryker systems.
- Comprised of improved reliable, redundant NLOS communications to optimize connectivity through automatic link establishment to support operations in restricted, urban and subterranean

environments that enables full integration of combined arms from soldier teams to system of systems, organic and external, air/ground, with strengthened relationships from supporting to supported.

8. Capability. Provide an aerial, multi-functional, non-line of sight communications relay and node capability that is pervasive throughout the UA Area of Operation. Capability accepts additional mission packages optimized for ISR such as FOPEN radar to also enable friendly force tracking through digital radio frequency tags to provide Level 1 Situational Awareness in support of developing Level 2 and Level 3 Situational Awareness to execute semi-automated clearance of fires, and combat identification to prevent fratricide.

9. Capability. FCS networks enable efficient information management to move vital information in a timely manner through the network tailored to unit mission, task and purpose. Continuously fuse, monitor and disseminate information from a variety of sources to support CCIR, responsive combat action, decision-making and analysis. Optimize automated integration and dissemination to small unit level. Enable fire control and distribution to assure lethality and survivability overmatch in full spectrum operations. Provide information to leaders in actionable form for 'running' estimates, to retransmit to subordinates, or to 'cut and paste' into mission orders. The FCS network:

- Deploys without requiring space in the airflow for dedicated communications packages. Network must be fundamentally sound without signal sites.
- Employs a variety of means to connect users with local and global networks. Must not be dependent on a single means anywhere in the network.
- Provides common, general-purpose networks that all classified/unclassified customers can use and are interoperable with Joint networks. Establishes appropriate classification at the entity.

10. Capability. Provide protected information systems and networks with low, near zero, probability of detection, interception and exploitation (LPD / LPI). This includes the ability to:

- Detect and prevent intruders and malicious software; identify points of intrusion and origin, information compromised, and information introduced into the network. The system must automatically report such events and take actions to minimize the impact of such events on the performance of the network without inhibiting the network.
- Provide embedded information assurance/protection to deny network access to unauthorized personnel or systems.
- Provide active and passive countermeasures to protect the electromagnetic spectrum against conventional and unconventional threats.
- Accomplish POSNAV without continuous emission that reveals force disposition to threat.

6.8 Information

1. Capability. Establish an adaptive learning repository with embedded capabilities to gain access to Joint Operational Net Assessments (ONA) of mission areas and to build and manage an evolving library of friendly and enemy DOTMLPF and 'how to fight' lessons learned through semi-automated capturing and archiving of data from operational humans and sensors. This provides the framework for mission-focused training.

2. Capability. Enable development of the situation out of contact rapidly to the fidelity needed to initiate combat on our terms, engage at tactical standoff, and maneuver to positions of advantage prior to contact. Provide highly precise targetable data from sensor to shooter. Enable reliable, timely battle damage assessment during engagements to quickly transition to subsequent actions and ensure efficient expenditure of limited munitions. Provide strengthened capabilities to provide it to small units. The UA develops the situation out to 75km radius. R&S is fully integrated with fires.

3. Capability. Provide ability to see, understand and act first, then finish decisively. Purpose of the ISR network is:

- Drive immediate action, often in semi-autonomous or autonomous modes
- Enable Battle Command, decision-making and problem solving before, during and after tactical operations. Information that answers CCIR must be provided from sensor direct to decider.
- Provide leaders and staffs with 'running' estimates updated in near-real time from a wide variety of information sources, from automated and human, to provide the means for situation awareness.
- Provide information for analysis. Information will be applied to establishing, maintaining and distributing a synthesized, single-fused COP that comprises baseline knowledge of the variables of terrain, weather, enemy, civilian and our own capabilities tailorable and scalable to unit task, purpose and situation. Purpose of the COP is to enable situation awareness development by soldiers, problem solving by leaders, and development of tactical concepts. It is near real time in utility and optimized for flow to small unit level. When combined with 'running' estimates, the COP enables leaders to recognize and seize opportunity. The quality of firsts is also empowered by the ability to collaborate with subject matter experts; subordinate, adjacent and higher commanders and staffs in real time to develop a complete appreciation of the situation. When combined, these capabilities must promote knowing, thinking and understanding one to three steps ahead of the enemy. They also must promote visualization of future action, concepts and endstate. Information must be actionable and targetable for precision fires and maneuver to attack at advantage.

These capabilities listed above enable the force to:

- Execute Battle Command by strengthening the ability of leaders to not only understand their environment, but how to act accordingly to aggressively seek an advantage.
- Have soldiers work together more effectively as a combined arms team rather than as individuals or stove-piped functions.
- Fully integrate ISR, fires, maneuver, survivability and leadership.
- Gain precision acquisition to strike most dangerous and high payoff target sets prior to and during contact with destructive fires.
- Properly emplace close support fires fully integrated with maneuver.
- Confirm battle damage assessments.
- Monitor and direct maneuver to include: tactical movement, fires at standoff, overwatch, mutual support, fire and maneuver, tactical assault and transitions.
- Provide the UA the ability to discern and attack decisive points while foregoing unnecessary action. Create and exploit enemy weakness.
- Detect, bypass or reduce obstacles and booby traps in stride.
- Anticipate and see enemy reactions to our assault.
- Perform superior combat identification of friend and foe.

4. Capability. Provide digital high-resolution terrain tools to empower leaders to understand terrain, weather, hazards, and infrastructure, how to use to advantage and how to deny its advantage to an enemy in order to mitigate the 'home court' advantage he would normally enjoy. These must be tailored to the needs of leaders at each echelon in the UA. Be able to receive accurate, timely up-to-date digital map information of the battlefield. Units must be able to receive and disseminate terrain and weather information immediately throughout the AO even while on the move at all times. This tool must also enable: C2 of small unit tactical action by providing 3D resolution in close, complex and urban terrain in which a high degree of resolution is needed for situational awareness and C2, virtual rehearsals, and terrain analysis.

6.9 Information: Intelligence, Surveillance and Reconnaissance

1. Capability. Employ improved ISR means to see the full range of operational variables – terrain, weather, friendly and enemy force, non-combatants and detect threat actions in all environments. This will require a family of manned and unmanned; ground, air and space; day/night R&S means that extend vision beyond line of sight to gain timely combat information through passive and aggressive ISR networked providing Level 1 and enabling Level 2 and Level 3 Situational Awareness to facilitate combat action or decisions. These capabilities are included in the UA to produce combat information from multiple sources, such as:

- External ISR.
- Teaming of manned with unmanned air vehicles to conduct R&S and develop the situation for brigade.
- Mobile ground reconnaissance to develop battlefield mobility and emplace observation in the FCS combat battalion.
- BLOS elements in overwatch.
- Troops in contact.

2. Capability. Enable situational awareness through a robust suite of Unmanned Aerial Vehicle System (UAVs) assets to conduct RSTA and communications relay. UAV capabilities will be echeloned in a tiered, mutually supportive and hierarchical framework – platoon, company, battalion and brigade. UAVs will have the following core capabilities and characteristics:

- UAV will not require airfields below brigade echelon but use similar landing zones of manned systems.
- An ability, day and night, to look onto terrain and detect and report the presence of a human, detect and report the presence of wheeled and tracked vehicles, and assist with TDA.
- Report location and heading to the operator.
- Report target location to the operator.
- Conduct communications relay.
- Possess embedded autonomous flight and navigation capability and incorporate autonomous safe flight protocols.
- Durable against environnemental effects from rain, dust, temperature etc.
- Reusable.
- Use a common, open architecture to allow control by FCS platforms via the Battle Command system.
- Possess an anti-tamper capability.
- Utilize power sources that are compatible with the fuel/power cells readily available within the UA.
- Detect and report to its operator that it is being acquired or targeted upon and the direction of the threat system.

a. UAV (CL I): UAV (CL I) systems are organic to dismounted infantry platoons, recon platoons, NLOS platoons and FSB. Capabilities and purposes unique to platoon-company echelons include UAVs:

- Small in size (man-portable) and allow the soldier to “see over the next hill” day and night, onto open, rolling, complex and urban terrain.
- Having limited target location reporting ability to enable engagement by area fire munitions.

- A primary purpose of enabling, developing and maintaining correct situational awareness; performing reconnaissance and limited surveillance; and limited (narrow band, short endurance time) communications relay for the platoon.

b. UAV (CL II): UAV (CL II) systems are organic to UA infantry companies and MCS companies. Capabilities and purposes unique to the platoon-battalion echelons include:

- Mounted on organic platforms with an aerial vehicle that can hover over terrain, in the urban canyons of a city or perch on buildings or terrain to allow persistent staring capability and prolonged loiter times.
- Actual air vehicles lightweight enough to allow the soldier to remount one launch vehicle to another launch platform by no more than two soldiers without MHE.
- Providing LOS enhanced dedicated imagery.
- Performing target acquisition and designation.
- Primary purpose to conduct RSTA operations under canopy, in open, rolling, complex and urban terrain. Performs reconnaissance and security/early warning capability for the UA Infantry and MCS Companies, providing reconnaissance and surveillance support to routes, NAIs, TAIs, avenues of approach, and other areas of interest. It remotely overwatches and reports changes in key terrain, avenues of approach and danger areas in MOUT and urban terrain.

c. UAV (CL III): UAV (CL III) systems are organic to NLOS battalion and the CA Battalion Recon Detachment. Capabilities and purposes unique to the battalion echelon include:

- Systems mounted on organic platforms.
- Mine detection.
- CBRN detection.
- Meteorological survey.
- Performing target acquisition and designation.
- Communications relay.

One of the principle functions of RSTA operations with emphasis on targeting. The battalion UAV system will perform tactical level reconnaissance, surveillance & target acquisition and Command, Control, Communications & Intelligence and target attack throughout the full spectrum of army operations including offensive, defensive, stability, and support operations. The CA Battalion UAV must have the range and duration to support the acquisition of targets to be attacked by NLOS systems and provide reconnaissance within the UA Area of Influence

d. UAV (CL IV). Capabilities and purposes unique to the brigade echelon UAV systems include:

- Persistent staring and robust, long endurance communications relay within the UA AI.
- Performing wide area search to cue other sensors.
- Performing emitter mapping.
- Target acquisition and designation.
- Performing SIGINT collection.
- Performing meteorological survey.
- CBRN detection.

Brigade UAV system will assist other manned systems in performing reconnaissance and close combat with ground force missions throughout the full spectrum of Army operations including offensive, defensive, stability, and support operations as defined by FM 3-0. The system will function independently

in support of multiple users or teamed with Comanches to conduct the UA RSTA mission. It provides the UA an organic ability to perform R&S at extended ranges (75 km radius).

3. Capability. Perform automated pattern analysis to detect, locate and identify enemy combatants and systems. Eliminate unique single point ground control, and fusion stations. Enable situational awareness development by standoff and staring (loitering capability) to gain indications of enemy composition, disposition, intent, reaction, reinforcement or withdrawal, strength and vulnerabilities, dead space or gaps, movement, and BDA before, during and after tactical operations. Perform analysis to assess:

- Moving and stationary entities that are mounted, dismounted or hidden.
- Enemy strengths, while discerning and avoiding fire sacks.
- Most dangerous enemy target sets for precision strike.
- Signatures such as signal, glint and flash.
- All terrain, to include open, complex and urban, and adverse weather conditions.
- Enemy entities that are dispersed, covered and concealed, masked and fleeting.
- Enemy use of decoys, deception and disinformation.
- Terrain and weather, and inform how to use it to advantage, how to best deny its use to the enemy, and implications of weather on tactical operations.
- Enemy use of obstacles and identify bypasses or how to properly neutralize.

4. Capability. Integrate synergistic use of ISR organic and external: SOF, national, strategic, Joint and Army manned and unmanned, air and ground, to retain freedom of maneuver, be able to operate in non-contiguous areas for extended periods of time and function widely separated, to gain and maintain contact with enemy elements and to provide high-resolution combat information on terrain and weather. Area sensors cue more discrete sensors. Employ unmanned systems for high-risk situations. Units are able to access Joint and national assets through reach via the UE (DCGS-A) or JTF. Facilitate C2 of ISR to maximize understanding of the battlefield. Identify areas that have shortcomings and re-task to fill the void.

5. Capability. Provide near-real time combat identification of friend, foe and noncombatant across the spectrum of operations through platform-to-platform (air and ground), platform- to-soldier, soldier-to-platform, and soldier-to-soldier interrogation. Seamlessly integrate joint combat identification measures.

6. Capability. Enable blinding of the enemy through use of obscurants, signature reduction, deception, and pattern avoidance techniques in order to see and understand first.

6.10 Lethality

Enhanced lethality will allow Army forces to destroy any opponent quickly, with shattering effect. Lethal Army forces can combine the elements of combat power to provide overwhelming and decisive force at the right time, at the right place, and for the right purpose.

1. Capability. Enable command and control needed to synchronize fires, maneuver and ISR in near real time to close with and destroy the enemy. We must design unit lethality relationships such that fires are integral to maneuver. The C4ISR network enables every element in the formation to generate combat power and contribute to the fight to achieve mass.

2. Capability. Provide the capability for lethal overmatch to destroy enemy formations or target sets that are dispersed and moving at longer ranges, with smaller calibers, greater precision, and more devastating target effects in all terrain and adverse weather conditions without frequent positioning through technical improvements in weaponry and munitions. Key enablers include organic line of sight, beyond line of sight, and non-line of sight fires. These fires must overmatch any enemy LOS, BLOS and NLOS capability in all conditions and environments, and are based on one shot one or more assured kills

– with one or more kill disciplines and designs that overmatch the projected enemy capability in the areas of range, P_{ACQ}, P_{HIT}, and P_{KILL} (LOS, BLOS, lethal, non-lethal and KE, CE, and DE) with scaleable effects.

3. Capability. Small tactical units provide mutual support from dispersed locations employing LOS and BLOS fires as the underpinning of tactical maneuver to:

- Overwatch tactical movement focused on NAIs/TAIs and perform immediate action at ranges beyond line of sight against opponents similarly equipped and trained.
- Combine NLOS/BLOS effects to mass from dispersed locations.
- Execute attack by fire and support by fire missions at tactical standoff at prescribed BLOS ranges.
- Enable cooperative engagement capability between squads, platoons, companies/batteries and battalions; execute Point and Shoot within all echelons. This construct involves LOS, BLOS, NLOS thermo baric, lethal and other non-lethal fires integrated with maneuver.

4. Capability. Have direct access to Army and Joint fire delivery systems from external sources to provide extended range, networked, responsive precision or volume fires on demand in support of tactical maneuver. Be able to apply CAS on demand.

5. Capability. Employ improved precision munitions with destructive effects (threshold) and broad range of effects to include suppression and protection (objective) and capabilities to loiter or be maneuvered in flight, enabling man-in-the-loop terminal control of precision effects even after launch. Enable PAM engagements out to range of 40km threshold and 60km at objective. Enable LAM engagements out to 70 km (threshold) and 100 km (objective). The intent is to employ NLOS - LS as a Class V commodity – more analysis is required to validate mobility requirements.

6. Capability. Provide LOS rapid gun firing capability from 0 to 2 km on the move. Capability is optimized for: developing the situation in contact, responding to actions on contact, executing fire and maneuver, and tactical assault. These fires will be optimized for:

- KE overmatch to kill enemy target sets, static and moving, with assured first round kill and to blow 30” x 50” holes in reinforced concrete walls.
- Lethality overmatch to kill T72 tanks equipped with enhanced reactive armor and active protective systems. These fires also suppress enemy on demand.
- Mobile protected fires in immediate direct support of infantry dismounted operations.
- Networked MCS LOS to support ‘point and shoot’ capabilities because of time and space problems in restricted compartments such as defiles and urban conditions.

7. Capability. Direct fire BLOS opens up fields of fire previously denied and enables standoff engagement from temporary halt or on the move against all enemy target sets from 2-8 km on the move, out to 2-16 km from static positions. Provide BLOS, if attainable, from one city block away. BLOS is:

- Optimized to support high speed mobile operations with required lethality to kill T72 tanks equipped with enhanced reactive armor and active protective systems.
- Able to exploit mobile or other sensors organic to an echelon to extend direct vision and weapon effects.
- Employed to provide mobile protected fires in immediate direct fire support of infantry dismounted operations. BLOS organic to infantry companies will be able to dismount their BLOS capability to support dismounted and air assault operations. Module is mounted either on a robot or smaller troop carrier.
- MCS is networked to provide ‘point and shoot’ capabilities because of time and space problems in restricted compartments in defiles or urban terrain.

- Provide precision fires to kill at 14th story or into basements.

8. Capability. Provide networked mortar/cannon NLOS capabilities by:

- Employing precision-guided fires that can destroy high payoff and most dangerous target sets. Destructive fires will be measured in terms of creating opportunity for maneuver; destroying, dislocating or disintegrating enemy capabilities.
- NLOS-LS systems must allow multitasking and transfer of tactical control of launch units and their munitions between units and services.
- NLOS-LS system must provide the ability to disenable munitions in flight prior to target attack.
- Receive and compute fire missions from all fielded and developmental target acquisition sources and C2 systems of the following levels: UE, UA, Joint, Allied and Coalition.
- Employing close support fires including protective and suppressive fires that are area, volume and duration in nature. Must also provide ultimate protection to maneuver formations through danger-close and final protective fires less than 600 m from friendly troops. Also, provide illumination. All fires in close support of maneuver will be measured in terms of assuring freedom of maneuver, fixing enemy and isolating objectives, protecting maneuver forces while closing with to destroy.

Required fire support capabilities are:

- Highly responsive to the dynamic, adaptive battlefield framework.
- Timely and agile to support forces in contact.
- Greater target location and weapon delivery accuracies.
- Sustained rates of fire and rates of kill with smaller teams and with less exposure.
- Available 24-7 in all weather and all terrain conditions at extended ranges (15) km for mortars, 40 km for cannon.
- High angle fires to support tactical operations in compartmented defiles or urban and mountainous terrain conditions, support highly mobile and dynamic situations in which maneuver employs speed to get to positions of advantage.
- Able to shift fires and mission types very quickly, and provide mutual support and combine effects to mass from dispersed locations.
- Optimized for opportunity engagements on demand.
- Scalable effects to the nature of the target set and Rules of Engagement.

9. Capability. Provide Comanche teamed with unmanned platforms that fuse external ISR to perform R&S to develop the situation, to engage and destroy most dangerous and high payoff target sets during reconnaissance missions by employing external networked fires under brigade control, and to provide close support of ground maneuver.

10. Capability. FCS sensor to shooter linkages enable lethal overmatch by engaging enemy target sets near-instantaneously in seconds using automated, semi automated or manual fire control and distribution procedures; provide automated target identification to reduce latency in providing effects. Facilitate clearance of fires and discern high payoff and most dangerous targets rapidly in depth, while static or moving, and direct the most appropriate fires to destroy them.

11. Capability. Reduce ammunition weight to enable system, as well as unit agility by employing small caliber penetrators with increased accuracy.

12. Capability. The FCS will employ Non-Lethal capabilities in a complementary (lethal/non-lethal) manner to enhance combined-arms battlefield effectiveness by minimizing mass physical destruction of people, materiel, infrastructure, and the environment. This will provide commanders and leaders at the tactical and operational levels another means to influence the actions of enemies, and

civilians/other non-combatants when minimizing collateral damage and undesired casualties are the preferred objectives. Objective Force delivery means will incorporate OFW, LOS, BLOS, NLOS and UMS in order to accomplish the following mission sets:

- Incapacitate, suppress, disperse or engage personnel, places, or things.
- Deny personnel access to, use of or movement through a particular area/point/facility.
- Deny vehicles access to, use of or movement through a particular area/point.
- Alter terrain/environmental conditions to favor friendly forces.
- Influence actions of others.
- Separate combatants and non-combatants.

The strategy for developing non-lethal scalable effects must include:

- Clearly identifiable target sets consisting of personnel, vehicles/materiel, and terrain – using multiple delivery means
- Immediate physiological/psychological effects on personnel
- Immediate or persistent physical effects on vehicles/materiel
- Effects duration that allows sufficient time for completion of on-going friendly forces shaping and/or decisive operations
- Focus on the distances to the targets and desired effects rather than stand-off distances from threat weapon systems

13. Capability. Employ self-healing minefields that can be remotely armed and disarmed that are precision delivered either by cannon or fires at UE or JIM.

14. Capability. Maximize lethality of dismounted operations, while decreasing the weight footprint of the soldier, by shifting fires functions from his back to enabling platform systems (manned and unmanned).

6.11 Survivability

Survivability is the ability to combine systems, tactics, operations, and processes that afford optimum protection to deployed Army forces. Speed and lethality are essential characteristics for achieving survivable forces. Ground and air platforms that employ the best combinations of low observability, ballistic protection, long-range acquisition and targeting, early attack, and high first-round hit-and-kill technologies will be required to ensure the desired degrees of survivability.

1. Capability. Provide maximum protection of the individual Soldier, whether that Soldier is on a platform (air or ground) or on the ground. Protect soldiers from ballistic, flame, thermal, and Chemical Biological and electromagnetic threat.

2. Capability. The Soldier and platforms will leverage integration of lighter, more effective ballistic protection (composite materials) with active and passive protection systems to enhance survivability against KE, and current and projected enemy lethal effects.

3. Capability. Ground platforms in FCS will achieve survivability overmatch during fire and maneuver, tactical movement, actions on contact against surprise encounters or local counterattacks, and tactical assaults through a combination of these measures:

- Use terrain to advantage for cover, concealment and mobility.
- Employ LOS, BLOS, and NLOS fires in overwatch of displacing formations.
- Optimize long-range acquisition for assured lethality of a first round kill (mobility, firepower or catastrophic) each time we achieve a target hit.

- Engage and destroy low, slow moving (less than 40 knots) and hovering rotary wing and UAV threats.
- Use highly responsive suppression and obscuration fires while closing with and assaulting the enemy.
- Able to employ on-board immediate multi-spectral capabilities as well as the ability to employ wide area, long duration multi-spectral obscurants.
- Use active and passive protection against KE and CE.
- Optimize signature management technologies to degrade enemy detection and terminal targeting from all spectrums by signature management and stealth capabilities. Camouflage is included in this category.
- Use superior dash speed from cover to cover.
- Ensure platforms have ballistic protection against 14.5 mm all-around, upgrade sides to 30 mm with add-on armor ensembles.
- Protect platform mobility against anti-personnel mines and protect crew against anti-tank mines.

4. Capability. FCS integrates into cooperative direct counter fire systems that provide slew to cue 'avenge' kill capability to destroy enemy systems engaging or preparing to engage friendly systems.

5. Capability. Provide improved, embedded standoff sensor/detector capability to provide real-time warning and dissemination to protect the force against CBRNE hazards. Require multiple multi-functional networked sensors to enable situation awareness development. Be capable of plugging into homeland force protection systems. UA can be augmented by special purpose CBRN capabilities from UE per METT-TC. Provide embedded overpressure, filtration, and decontamination on FCS manned systems against CBRN threats.

6. Capability. The UA must be capable of defeating low, slow portions of the UAV and rotary wing threat and, when augmented by Maneuver AMD, must be capable of defeating the full range of more dangerous air, missile, and rocket threats to UA forces and high value assets. As a baseline, all manned UA platforms must be capable of receiving early warning and cueing for self-defense Combined Arms for Air Defense fires within LOS weapons ranges. Each echelon in the chain of command will have situational awareness of their battlespace domain and the ability to perform aerial target designation. The NLOS Battalion will have longer range counter-air capabilities against low, slow portions of the RW and UAV threats. The UA leadership structure will include the ability to integrate with the Joint Integrated Air Defense System fire direction when not augmented by UE AMD. When needed based on METT-TC, the UA will be capable of rapidly integrating augmentation from UE Maneuver AMD in order to defeat high-end UAVs, RW, cruise missiles, incoming rockets and other more stressing aerial threats and to integrate with the JFACC-designated controlling authority. Together with UE AMD, the UA can achieve combat overmatch against the complete air and missile threat, and meet the third dimension key performance parameters for lethality and survivability.

7. Capability. Support counter-reconnaissance effort to blind enemy ISR through use of obscurants, jamming, signature reduction, deception, disinformation, and pattern avoidance techniques. Employ ISR to detect and find, then destroy, defeat, disrupt or neutralize enemy R&S through security operations.

8. Capability. FCS systems must have sufficient hardening protection from Directed Energy (DE) weapons, such as electro-magnetic pulse (EMP) and high-powered microwave. FCS systems must have protection from thermo baric weapons.

9. Capability. Employ multi-purpose robots to perform manpower intensive, high-risk functions such as ISR missions in urban operations (inside buildings and the subterranean dimension) and reconnaissance/reduction of minefields, obstacles, doors and walls and in support of close assault.

10. Capability. Must have standoff means to detect and neutralize mines, booby traps employing precision-guided thermo baric munitions delivered by BLOS or NLOS and other means.

11. Capability. The system will operate in and support soldiers in conditions including, but not limited to, snow, moderate ice, rain, sand, dust, salt water spray, and extreme climatic temperatures.

12. Capability. Ensure information assurance by preventing unauthorized access, interception, exploitation, and degradation of the C4ISR network.

6.12 Sustainability

Army forces must be sustainable across the spectrum of conflict. Sustainability requirements reflect the continuous, uninterrupted provision of combat service support to Army forces. Sustainability in a full spectrum Army will require a combat service support reach capability that allows commanders to reduce stockpiles in theater while relying on technology to provide sustained velocity management and real-time tracking of supplies and equipment. This includes the requisite combat support—such as, military police, military intelligence, and signal corps—and combat service support—such as, medical, transportation, maintenance, legal, religious, human resource, and finance corps—to support the force.

1. Capability. Provide capability to manage Distribution Operations for the Objective Force for pulsed operations, maintenance functions, replacement operations and transport linked to the UE sustaining base in order to build and sustain combat power in the UA.

2. Capability. Enable aggressive battlespace reduction in sustainment footprint of the Unit of Action and demand for replenishment. UAs will have fewer vehicles and leverage reach capabilities.

3. Capability. Enable the UA to organically sustain itself for three days of high tempo operations without replenishment from external sources in continuous combat in mid to high intensity conflict. Be self-sustainable for up to seven days in low-end conflict and peacetime military engagement. Figures account for organic Class I, III, V and water.

4. Capability. Enable significant sustainment effectiveness and efficiencies through:

- Innovative, multi-modal distribution concepts.
- Ultra-reliable and/or redundant components to remain operationally effective for the full three / seven-day mission period with minimal pulsed service or repair organic to the UA.
- Commonality across formations, in platforms and components, to simplify and reduce sustainment, support multi-functionality, reduce the many personnel and skills required in today's organizations, and contribute to simplification of deployment, maintenance and training.
- New power generation and high fuel efficiency with reduced dependence on petroleum products to minimize use of external power generators.
- Simplified systems maintainability to reduce maintenance and replenishment requirements. System maintainability also will allow crews to perform on-site repairs. FCS platforms will be operated by crew chiefs that perform PMC and at least 80% of the total field maintenance tasks/requirements. Complimentary systems included in the UA (such as FTTS-U and FTTS-MS) will be operated by crew chiefs that perform PMC and a majority of field maintenance tasks.
- Like and self-recoverability of platforms to enable rapid evacuation.

5. Capability. Reduce demand and minimize the maneuver sustainment burden on unit effectiveness through balanced system reliability, redundancy and repair, to include embedded diagnostics and prognostics on soldiers and platforms as well as modular component design. Responsive and on-demand sustainment is centralized at UA level. FCS lethal effects produce multiple, single round kills at the smallest caliber and with increased accuracy and effectiveness to reduce ammunition weight and cube to enable system, as well as unit agility.

6. Capability. Provide embedded potable water generation, storage and replenishment at every echelon to minimize the need for special-purpose units and demands.

7. Capability. Enable modularity by accepting rapid force tailoring for increasing force versatility, operational flexibility, and agility in the UA area of operations.

7103 **8. Capability.** Knowledge-based C4ISR architecture must enable:

7104 • Reach to local, regional, and non-deployed sources both governmental and non-governmental,
7105 Joint, coalition partners and allies.

7106 • Secure capability to passively and actively monitor, report and submit requests to facilitate
7107 anticipatory sustainment, as well as to enhance friendly force capability to build, generate, and
7108 sustain maximum combat power during military operations.

7109 **9. Capability.** Provide revolutionary means of transporting people and materiel to leverage new
7110 ground and aerial concepts for delivery, to include:

7111 • Transport using standard / non-standard, manned and unmanned, organic and external systems.

7112 • Maneuver sustainment functions that require organic mobility to ensure they will not degrade
7113 deployability, agility, and maneuverability of combat forces. Be able to perform maneuver
7114 sustainment over secured or unsecured Lines of Communication using air and ground means –
7115 organic and external from the UE and Joint Forces elements.

7116 • Enable quick cross leveling of supplies between platforms and units in contact and on the move.
7117 Leverage pre-configured packaging and platform-embedded materiel handling and lift for rapid,
7118 accurate and agile resupply that minimizes demand on soldiers.

7119 • Ensure dynamic re-routing and tracking of supply delivery as priorities dictate.

7120 **10. Capability.** Dismounted forces must be self-sustaining during continuous operations for at
7121 least 24 hours. Enable increased endurance of soldiers for the assault by load optimization and
7122 redistributing many functions from the soldier's back to systems or platforms. MULE like capability will
7123 perform a variety of sustainment/replenishment functions on a highly agile, light, but survivable platform to
7124 include:

7125 • Carrying dismounted soldier loads.

7126 • Operating in terrain requiring dismounted operations, under adverse weather conditions.

7127 • Performing non-standard CASEVAC and services like battery re-charging.

7128 • Delivering classes of supply from battalion through company to soldiers to include resupply of
7129 ammunition.

7130 • Performing combat tasks such as recon of high-risk areas.

7131 **11. Capability.** Employ unmanned systems to perform redundant and appropriate maneuver
7132 sustainment tasks in order to enhance continuous operations.

7133 **12. Capability.** FCS Medical Vehicle (FCS MV) is the medical system within both the Unit of
7134 Action and Unit of Employment. It will have a common chassis with two types of modules (Evacuation and
7135 Treatment). The time sensitive nature of treating critically injured Soldiers requires an immediately
7136 responsive force health protection system with an expedient field evacuation system. Air is the preferred
7137 method of casualty evacuation. Critical patients cannot be held far forward for 3-7 days without
7138 evacuation to higher echelon healthcare. Science and Technology are not expected to provide a method
7139 to hold critically injured patients far forward in the early Objective Force timeframe (2008-2015).
7140 Dispersion of supported elements over extended areas of operation, and changes in the OF operational
7141 environment will challenge the medical support structure. The FCS MV-Evacuation (FCS MV-E) and FCS
7142 MV-Treatment (FCS MV-T) are integral modules of the FCS that contribute to sustaining and generating
7143 combat power to the OF structure. Their specific functions are as follows:

7144 • FCS MV-E allows trauma specialists, maneuvering with combat forces, to be closer to the
7145 casualty's point-of-injury. It is used to transport casualties and must have the same characteristics/
7146 capabilities as the supported force.

7147 • FCS MV-T enhances the ability to provide Advance Trauma Medicine (ATM)/Advance Trauma
7148 Life Support (ATLS) treatments and procedures forward, for more rapid casualty intervention and

clearance of the battlespace. To maximize survivability, severely injured casualties must receive advanced Trauma Life Support within 1 hour. This is accomplished by having an FCS-MV internally configured for patient treatment.

6.13 Training

Every day, the Army trains soldiers and units while developing leaders. Effective training is the cornerstone of operational success. It is a full-time job for commanders in peacetime and continues when units deploy. Training to high standards is essential for a full spectrum force; Army forces must train to, and maintain, the highest readiness levels. Battle-focused training on combat tasks prepares soldiers, units, and leaders to deploy, fight, and win.

1. Capability. Develop UA doctrine and training architecture that compliments UE and Joint doctrine development.

2. Capability. Provide an embedded repository of 'how to fight' TTP in its training architecture that enables crosswalk from mission and training to common doctrine, TTP, individual and collective performance standards.

3. Capability. Provide multi-echelon training construct for individual soldiers and small unit collective skills to:

- Promote competencies of combat skill proficiency to gain collective tactical and technical competencies that optimize individual soldiers and small unit collective skills for company and below. at the core of this strategy is the ability to conduct an FTX that involves live, virtual and/or constructive participation to assess if the unit demonstrates core competencies to accomplish mission task and purpose.
- Vertically and horizontally integrate system of systems at home station, institutions and while deployed. Provides an embedded training architecture for CTC quality AARs that captures what happened, why and how to fix. Offers diagnostic matrices those crosswalk performance standards to MTP with graduated degrees of scenario difficulty. Enables leaders, soldiers and small units in the UA to learn how to work together more efficiently and effectively as a team and with others. Capable of representing all UA echelons and BFA and operating in a live, virtual and/or constructive distributed framework to place demands on all elements in the UA. Employs a networked, 'tiered' full task trainer embedded in FCS platforms with no reconfiguration.
- Leverage UA C4ISR architectures
- Employ diagnostic software with performance metrics for leader, soldier and small unit skill proficiency mapped to MTP 'how to fight' to gain competencies.
- Enable combined arms proficiency for leaders, soldiers, units and staffs.
- Produce scalable needs of unit based on training assessments.
- Draw from a TSP library of scenarios on demand. FTT must be able to load a variety of scenario METT-TC conditions to achieve full spectrum and global competency.
- Enable training linkage from home station to National Simulation Center, to Combat Training Centers, and to other geographic locations. Can link to a semi-autonomous or world class OPFOR and to observer controllers from combat training centers or schoolhouse small group instructors.
- Be utilized during deployment to theater.
- Ensure schoolhouse's can conduct 'over-the-shoulder' training leveraging unit field training exercises.
- Ensure access to a repository of doctrine, MTP and soldiers manuals for crosswalk to performance tasks, conditions and standards.

- Enable cognitive readiness in soldiers.

4. Capability. Provided a multi-echelon training construct for leader skills, and synchronization and integration skills at battalion and brigade that:

- Promotes competencies of combat skill proficiency to gain collective tactical and technical competencies that optimize at battalion and brigade. At the core of this strategy is the ability to conduct a CFX that involves live, virtual and/or constructive participation.
- Vertically and horizontally integrates system of systems at home station, institutions and while deployed. Provides an embedded training architecture for CTC quality AAR's that captures what happened, why and how to fix. Offers diagnostic matrices those crosswalk performance standards to MTP with graduated degrees of scenario difficulty.
- Employs a networked, 'tiered' Full Task Trainer embedded in FCS platforms with no reconfiguration. Leverages UA C4ISR architectures.
- Employs diagnostic software with performance metrics for leader and staff skill proficiency mapped to MTP 'how to fight' to gain competencies.
- Enables combined arms proficiency for leaders and staffs.
- Is scalable to needs of unit based on training assessments.
- Draws from a TSP library of scenarios or rapidly generate scenarios tailored to the specific battlespace domain on demand. FTT must be able to load a variety of scenario METT-TC conditions to achieve full spectrum and global competency.
- Enables training linkage from home station to NSC, to CTCs, and to other geographic locations. Can also link to a semi-autonomous or world class OPFOR. Can link to OCs from the HICON, CTC or schoolhouse.
- Utilized during deployment to CTC or in theater.
- Schoolhouses can conduct 'over-the-shoulder' training leveraging unit CFX.
- Accesses a repository of doctrine, MTP and soldiers manuals for crosswalk to performance tasks, conditions and standards.
- Develops, through training and experience, thinking, confident, versatile, adaptive, and seasoned leaders at the tactical level required for the digitized, rapidly deployable UA
- Develops leaders skilled in synchronization and coordination, able to dominate in the realm of decision making and be combat proficient at the collective level, have a competency in the variables of terrain, enemy, weather and own capabilities; to seek advantage aggressively; to act when and where it gains the best tactical advantage for starting and finishing engagements, employ forces with greater efficiency and effectiveness
- Hones the proficiency of leaders to perform their individual responsibilities, how they fit into framework of small units, how they operation as a member of a leadership team. provides leader exercises that are mission – focused at small unit level, hands-on performance oriented, experiential training to plan, prepare and execute operations
- Provides rapid terrain generation of the specific battlespace domain on demand

5. Capability. Be able to link training constructs for battalion and brigade with training for individual soldiers and small unit collective skills to conduct multi-echelon training that can be distributed to live, virtual and constructive participants. Can train 3-6 battalions with pooled UE type assets, institutional, Joint participants, and CTC at home or remotes stations.

6. Capability. To enable responsiveness, all aspects of FCS Full Task Trainer system of systems must be easy to learn, user friendly, preclude catastrophic mistakes, and facilitate operational competence. To achieve this end, a formal and accountable "usability engineering" process must be rigorously and systematically incorporated into the developmental process.

7. Capability. Provided virtual "rockdrill" construct for multi-echelon rehearsals by soldiers, leader, and small units and to enable synchronization and integration at battalion and brigade that:

- Promotes competencies of combat skill proficiency to gain collective tactical and technical competencies that optimize at battalion and brigade. at the core of this strategy is the ability to conduct a CFX that involves live, virtual and/or constructive participation.
- A collaborative wargame tool for developing tactical concepts, branches and sequels.
- Enables mission rehearsals that can be distributed to live, virtual and constructive participants.
- Can load scenario conditions tailored to mission, task and purpose.
- Empowers more efficient and effective rehearsals that assemble the parts collaboratively and are tiered.
- Accesses a repository of doctrine, MTP and soldiers manuals for crosswalk to performance tasks, conditions and standards.

ANNEX A ACRONYMS AND DEFINITIONS

A.1 Acronyms

A

A2C2	Army Airspace Command and Control
A/DACG	Arrival/Departure Airfield Control Group
AAF	Army Airfield
AAR	After Action Review
ABCS	Army Battle Command System
ACA	Airspace Control Authority
ACE	All-source Control Element
ACL	Allowable Cabin Load
ACM	Airspace Coordination Measure
ACO	Airspace Control Order
ACS	Aerial Common Sensor
ADA	Air Defense Artillery
ADAM	Air Defense and Airspace Management
ADM	Area Denial Munition
ADNS	Automated Digital Network System
AEF	Air Expeditionary Force
AGL	Above Ground Level
AGTF	Air Ground Task Force
AI	Area of Interest
AIT	Automatic Identification Technology
AiTR	Aided Target Recognition
AKM	Army Knowledge Management
ALO	Air Liaison Officer
AMC	Air Mobility Command
AMD	Air and Missile Defense
AMPS	Army Mission Planning System
AMT	Army Modernization Training
AO	Area of Operation
AoI	Area of Influence
AOR	Area of Responsibility
AOT	Assignment Oriented Training
APOD	Aerial Port of Debarkation
APOE	Aerial Port of Embarkation

APS	Active Protection System, Army Pre-positioned Stocks
AROC	Army Requirements Oversight Council
ARFOR	Army Forces
ARV	Armed Robotic Vehicle
ARV-A	Armed Robotic Vehicle - Assault
ARV-A (L)	Armed Robotic Vehicle - Assault (Light)
ASG	Area Support Group
ASCC	Army Service Component Command
ATC	Air Traffic Controller
ATGM	Anti Tank Guided Missile
ATIA	Army Training Information Architecture
ATLS	Advanced Trauma Life Support
ATM	Advanced Trauma Management
ATO	Air Tasking Order
ATR	Automatic Target Recognition
ATSE	Army Theater Support Element
ATT	Advanced Theater Transport
AUTL	Army Universal Task List
AVN	Aviation
B	
BAS	Battalion Aid Station, Battlefield Automated System
BC	Battle Command
BCS	Battle Command System
BCOTM	Battle Command on the Move
BDA	Battle Damage Assessment
BDAR	Battle Damage Assessment and Repair
Bde	Brigade
BFA	Battlefield Functional Area
BIC Co	Brigade Intelligence and Communications Company
BLOS	Beyond Line of Sight
Bn	Battalion
BOLT	Brigade Operational Law Team
BOS	Battlefield Operating System
BSA	Brigade Support Area
BSC	Battle Simulation Center
BSCPC	Build and Sustain Combat Power Cell
BSS	Brigade Surgeon Section

BTID	Battlefield Target Identification
BTRA	Battlefield Terrain Reasoning and Assessment
C	
C2	Command and Control
C2V	Command and Control Vehicle
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CA	Combined Arms, Civil Affairs, Combat Assessment
CAC	Combined Arms Center
CAFAD	Combined Arms for Air Defense
CAS	Close Air Support
CASEVAC	Casualty Evacuation
CBR	Chemical, Biological and Radiological
CBRN	Chemical, Biological, Radiological, Nuclear
CCAT	Critical Care Augmentation Team
CCIR	Commander's Critical Information Requirements
CCT	Combat Crew Training
CDE	Chemical Defensive Equipment
Cdr	Commander
CE	Chemical Energy, Communications Electronics, Counterespionage
CEP	Concept Exploration Program, Circular Error Probable
CFX	Command Field Exercise
CGF	Computer Generated Forces
CI	Counterintelligence, Combat Intelligence, Civilian Internee
CIC	Command Integration Cell
CID	Combat Identification
CIFFN	Combat Identification, Friend, Foe or Neutral
CIS	Communications Information Systems
CJCSI	Chairman, Joint Chiefs of Staff Instruction
CJTF	Combined Joint Task Force
C/JTLME	Coalition/Joint Theater Logistics Management Element
CLOE	Combined Logistics Operating Environment
CLS	Combat Life Saver
C/LU	Container/Launch Unit
CM	Chemical, Countermine, Cruise Missile
CMO	Civil Military Operations
CMOC	Civil Military Operations Center

CNA	Computer Network Attack
CND	Computer Network Defense
CNO	Computer Network Operations
COA	Course of Action
COE	Contemporary Operating Environment
COG	Centers of Gravity
COMINT	Communications Intelligence
COMSEC	Communications Security
CONUS	Continental United States
COP	Common Operational Picture
COTS	Commercial Off-the-Shelf
CP	Command Post
CPX	Command Post Exercise
CRAF	Civil Reserve Air Fleet
CRD	Capstone Requirements Document
CRIS	Crewman's Remote Interface System
CRO	Combat Replenishment Operations
CRS	Combat Replenishment Site
CRT	Combat Repair Team
CSAR	Combat Search and Rescue
CSS	Combat Service Support
CSSCS	Combat Service Support Control System
CTA	Critical Threat Analysis, Counterstrike Target Acquisition
CTC	Combat Training Center
CTIA	Common Training Instrumentation Architecture
CWT	Customer Wait Time

D

DBLS	Distributed-Based Logistics System
DCGS	Distributed Common Ground Surface System
DCGS-A	Distributed Common Ground Surface System-Army
DCP	Deployable Command Post
DCRI	Detection, Classification, Recognition, Identification
DE	Directed Energy
DIDb	Distributed Information Database
DII	Defense Information Infrastructure
DIMHRS	Defense Integrated Military Human Resources System
DISE	Deployable Intelligence Support Element

DISN	Defense Information Support Network
DLMP	Doctrine Literature Master Plan
DM	Dominant Maneuver
DMS	Defense Message System
DMC	Distribution Management Cell
DNBI	Disease Non-battle Injury
DS	Direct Support
DoD	Department of Defense
DOTMLPF	Doctrine, Organizations, Training, Materiel, Leadership and Education, Personnel, and Facilities
DTSS	Digital Topographic Support System

E

EA	Electronic Attack
EAADS	Enhanced Area Air Defense System
EAC	Echelons Above Corps
EAUA	Echelons Above Unit of Action
ECC	Essential Combat Configuration
EECP	Early Entry Command Post
ELINT	Electronic Intelligence
EMP	Electromagnetic Pulse
EMPR	Enroute Mission Planning and Rehearsal
EMT	Emergency Medical Treatment
EMST	Essential Maneuver Support Task
EOD	Explosive Ordnance Disposal
EO/IR	Electro Optical/Infra Red
EPLRS	Enhanced Position Location Reporting System
EPW	Enemy Prisoners of War
ERA	Explosive Reactive Armor
ESF	Expeditionary Support Force
ESO	Expeditionary Support Organization
EW	Electronic Warfare

F

FARP	Forward Arming and Refueling Point
FASCAM	Family of Scatterable Mines
FBCB2	Force XXI Battle Command Brigade and Below
FCC	Full Combat Configuration
FCS	Future Combat Systems

FDP	Full Dimension Protection
FDRP	First Destination Release Point
FEC	Fires and Effects Cell
FHP	Force Health Protection
FIOP	Family of Interoperable Pictures
FOB	Forward Operating Base
FP	Force Protection
FL	Focused Logistics
FMTV	Family of Medium Tactical Vehicles
FoS	Family of Systems
FRAGO	Fragmentary Order
FRMV	Future Recovery Maintenance Vehicle
FSB	Forward Support Battalion
FSCM	Fire Support Coordinating Measures
FSE	Fire Support Element
FSMT	Forward Support Medical Evacuation Team
FSS	Fast Sealift Ship
FTR	Future Transport Rotorcraft
FTT	Full Task Trainer
FTTS	Future Tactical Truck System
FTTS-MS	Future Tactical Truck System - Maneuver Sustainment
FTTS-U	Future Tactical Truck System - Utility
FW	Fixed Wing
FY	Fiscal Year

G

GCS	Ground Control Station
GCCS-A	Global Command and Control System Army
GCSS-A	Global Combat Service Support Army
GIG	Global Information Grid
GPS	Global Positioning System
GTN	Global Transportation Network

H

HE	High Explosive
HF	High Frequency
HHC	Headquarters and Headquarters Company
HIMARS	High Mobility Artillery Rocket System
HN	Host Nation

HPT	High Payoff Target
HPTL	High Payoff Target list
HQ	Headquarters
HR	Human Resource
HRS	Human Resources System
HSOC	Home Station Operations Center
HSS	Health Service Support
HUMINT	Human Intelligence
HVT	High Value Target
HVTL	High Value Target List

I

IA	Information Assurance
ICV	Infantry Carrier Vehicle
IDM	Information Dissemination Management
IET	Initial Entry Training
IER	Information Exchange Requirement
IETM	Interactive Electronic Technical Manuals
IGI	Imagery and Geospatial Information
IM	Information Management
IMETS	Integrated Meteorological System
IMINT	Imagery Intelligence
IMS	Intelligent Munitions System
IO	Information Operations
IPB	Intelligence Preparation of the Battlefield
IR	Information Requirement, Infrared
IS	Information Superiority
ISB	Intermediate Staging Base
ISC	Information Superiority Cell
ISR	Intelligence, Surveillance, and Reconnaissance
IT	Information Technology
ITV	In-Transit Visibility

J

JCAS	Joint Close Air Support
JFACC	Joint Force Air Component Commander
JFC	Joint Force Commander
JFLCC	Joint Forces Land Component Commander
JIADS	Joint Integrated Air Defense System

JIM	Joint, Interagency, and Multinational
JOA	Joint Operational Area
JROC	Joint Rear Operations Center
JSCP	Joint Strategic Capabilities Plan
JSTARS	Joint Surveillance Target Attack Radar System
JTF	Joint Task Force
JTRS	Joint Tactical Radio System

K

KE	Kinetic Energy
KIA	Killed in Action
KPP	Key Performance Parameter

L

LAM	Loiter Attack Munitions
LAN	Local Area Network
LD	Line of Departure
LMS	Learning Management System
LMSR	Large Medium-Speed Roll-on-Roll-off Vessel
LOC	Lines of Communication
LOS	Line of Sight
LPB	Logistics Preparation of the Battlefield
LRM	Line Replaceable Module
LRS	Long Range Surveillance
LRU	Line Replaceable Unit
LSCR	Laundry Shower and Clothing Renovation
LVC	Live, Virtual and Constructive Training
LW	Land Warrior
LZ	Landing Zone

M

MA	Mortuary Affairs
MANPADS	Man Portable Air Defense System
MASINT	Measurement and Signatures Intelligence
MCO	Major Combat Operations
MC4	Medical Communications for Combat Casualty Care
MCOO	Modified Combined Obstacle Overlay
MCS	Mounted Combat System
MCG	Mobile Command Group

MDMP	Military Decision Making Process
ME	Main Effort
MEDEVAC	Medical Evacuation
METL	Mission Essential Task List
METT-TC	Mission, Enemy, Troops, Terrain, Time, Civil Considerations
MHE	Material handling Equipment
MI	Military Intelligence
MLC	Military Load Classification
MLS	Multi-Level Security
MMR	Multi-Mission Radar
MMS	Maneuver and Mobility Support
MNS	Mission Needs Statement
MOG	Maximum on Ground
MOUT	Military Operations on Urbanized Terrain
MRC	Major Regional Crisis
MRL	Multiple Rocket Launcher
M&SC	Maneuver and Support Cell
MS	Maneuver Support
MSL	Multiple Security Levels, Mean Sea Level
MSM	Maneuver Sustainment Module
MSO	Mission Staging Operations
MSOTM	Mutual Support on the Move
MSR	Main Supply Route
MSS	Mission Staging Site
MTF	Medical Treatment Facility
MTMC	Military Traffic Management Command
MTP	Mission Training Plan
MTW	Major Theater War
MULE	Multi-function Utility/Logistics and Equipment Vehicle
MV	Medical Vehicle
MV-E	Medical Vehicle - Evacuation
MV-T	Medical Vehicle - Treatment
N	
NAI	Named Area of Interest
NCO	Noncommissioned Officer
NETOPS	Network Operations
NGO	Non-Governmental Organization

NLOS	Non-Line of Sight
NLOS-LS	Non-Line of Sight - Launch System
NRT	Near-Real Time
NRFTT	Network, Reconfigurable, Full Task Trainer
NSC	National Simulation Center
NSFS	Naval Surface Fire Support

O

O&O	Operational & Organizational
OAN	Operational Area Network
OC	Observer Controller
OE	Operational Environment
OF	Objective Force
OFW	Objective Force Warrior
OICW	Objective Individual Combat Weapon
OP	Observation Post
OPLAN	Operations Plan
OPLAW	Operational Law
OPORD	Operations Order
OPSEC	Operations Security
OSINT	Open Source Information
OPTEMPO	Operational Tempo
OMS	Operational Maneuver Section
ONA	Operational Net Assessment
ORD	Operational Requirements Document
OST	Order Ship Time

P

PA	Physician Assistant, Public Affairs
P&P	Plug and Play
PAM	Precision Attack Munition
PE	Precision Engagement
PGMM	Precision Guided Mortar Munition
PK	Probability of Kill
PIR	Priority Information Requirement
PM	Preventive Medicine
PME	Peacetime Military Engagements, Professional Military Education
PMJ	Professional Military Judgment
POD	Point of Debarkation

POE	Point of Embarkation
PSYOPS	Psychological Operations
PTT	Part Task Trainer
PVNTMED	Preventive Medicine
PVO	Private Volunteer Organizations
Q	
QoS	Quality of Service
R	
R&S	Reconnaissance & Surveillance
R&SV	Reconnaissance & Surveillance Vehicle
RAH	Reconnaissance Attack Helicopter
RF	Radio Frequency
RFI	Request for Information
RMV	Recovery Maintenance Vehicle
ROE	Rules of Engagement
ROM	Refuel-on-the-Move
RPG	Rocket Propelled Grenade
RRF	Ready Reserve Force
RSOI	Reception, Staging, Onward Movement and Integration
RST	Religious Support Team
RSTA	Reconnaissance, Surveillance, Target Acquisition
RTD	Return to Duty
RV	Recovery Vehicle
RW	Rotary Wing
S	
S&T	Science and Technology
SA	Situational Awareness
SaaS	Soldier as a System
SATCOM	Satellite Communications
SEAD	Suppression of Enemy Air Defense
SHORAD	Short Range Air Defense
SIAP	Single Integrated Air Picture
SIGINT	Signals Intelligence
SIGP	Single Integrated Ground Picture
SLAMRAAM	Surface Launched AMRAAM Missile
SOF	Special Operations Forces

SOSO	Stability Operations and Support Operations
SoS	System of Systems
SoSA	System of Systems Architecture
SoRC	Statement of Required Capabilities
SPF	Special Purpose Forces
SPO	Support Operations Officer
SPOD	Seaport of Debarkation
SPOE	Seaport of Embarkation
SRO	Sustainment Replenishment Operations
SRS	Sustainment Replenishment Site
SSA	Supply Support Activities
SSC	Smaller Scale Contingency
SSP	Synchronized Sustainment Pulse
STTW	Sense Through the Wall
SUGV	Small Unmanned Ground Vehicle
SUV	Staff Utility Vehicle
T	
TACSAT	Tactical Satellite
TACP	Tactical Command Post
TADSS	Training Aids Devices, Simulators and Simulations
TAI	Target Area of Interest
TALCE	Tanker/Airlift Control Element
TAV	Total Asset Visibility
TBM	Tactical Ballistic Missile
TCS	Tactical Communication System
TDA	Targeting Damage Assessment
TI	Tactical Internet
TLE	Target Location Error
TMIP	Theater Medical Information Program
TOC	Tactical Operations Center
TPFDD	Time-Phased Force and Deployment Data
TRADOC	Training and Doctrine Command
TRL	Technology Readiness Level
TSC	Theater Support Command
TSP	Training Support Package
TSV	Theater Support Vessel
TTP	Tactics, Techniques, and Procedures

U

UA	Unit of Action
UAV	Unmanned Aerial Vehicle
UE	Unit of Employment
UGS	Unattended Ground Sensors
UGV	Unmanned Ground Vehicle
UHF	Ultra High Frequency
UJTL	Universal Joint Task List
UMASS	Urban/MOUT Advanced Sensor System
UMS	Unmanned System
UO	Urban Operations
UTMS	Unit Training Management System

V

VISA	Voluntary Intermodal Sealift Agreement
VTC	Video Teleconference/Video Teleconferencing

W

WAN	Wide Area Network
WARNO	Warning Order
WIA	Wounded in Action
WIN-T	Warfighter Information Network-Terrestrial
WMD	Weapons of Mass Destruction
WNW	Wideband Networking Waveform
WO	Warrant Officer

X

XO	Executive Officer

Y, Z

A.2 Terms and Definitions

These definitions include Unit of Action unique terms derived from conceptual work during development of the Maneuver Operational and Organizational Plan. Those definitions not clearly referenced from any approved Joint or Army publication are sourced from this O&O.

aerial envelopment An offensive maneuver by air, in which the main attacking force passes around or over the enemy's principal defensive positions to secure objectives to the enemy's rear and gain position of relative advantage. [Derived from JP 1-02, FM 3.0, FM 71-100 and FM 71-100-3, by merging the applicable terminology from the current term to adequately define the future concept]

air and missile defense (AMD) The synergistic effect of all joint and combined arms efforts to dominate, control, and exploit the third dimension of the battlespace in order to protect the force and high value assets, enable the UA commander freedom to maneuver, and enable the force to see and act first by helping destroy the enemy’s ability to do the same and by providing enhanced situational awareness. [TRADOC Pam 525-3-90, UA O&O Plan; derived from JP 1-02, JP 3-0, JP 3-01.5]

air assault The movement of friendly assault forces (combat, combat support, and combat service support) by rotary-wing aircraft to engage and destroy enemy forces, or to seize and hold key terrain. [JP 1-02, FM 90-4]

air movement Air transport of aircraft, units, personnel, supplies, equipment, and materiel. See also airdrop; air landed; free drop; high velocity drop; low velocity drop. [JP 1-02]

allowable cabin load (ACL) The maximum payload that can be carried on a mission. ACL may be limited by the max takeoff gross weight, max landing gross weight, or by the max zero fuel weight. [AF Pam 10-1403]

application The system or problem to which a computer is applied. Reference is often made to an application as being either of the computational type (arithmetic computations predominate) or of the data processing type (data handling operations predominate). In the intelligence context, the direct extraction and tailoring of information from an existing foundation of intelligence and near real time reporting. It is focused on and meets specific, narrow requirements, normally on demand. [JP 1-02; JP 2-0]

architecture The structure of components, their relationships, and the principles and guidelines governing their design and evolution over time. [DoD Integrated Architecture Panel]

area of influence (AI) A geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control. It includes both organic and supporting combat power or effects within an element’s battlespace, to include Army, Joint, multinational, or interagency. [JP 1-02 and FM 101-5-1]

area of interest (AoI) An area of concern to the commander, including the area of influence, adjacent areas, and areas extending into enemy territory to the objectives of current or planned operations. It is a geographical area from which information and intelligence are required to execute successful tactical operations and to plan for future operations. This includes any threat forces or characteristics of the battlefield environment that will significantly influence accomplishment of the command's mission within its battlespace. [JP 1-02 and FM 101-5-1]

area of operation (AO) An operational area defined by the joint force commander for land and naval forces. Areas of operation do not typically encompass the entire operational area of the joint force commander, but should be large enough for component commanders to accomplish their missions and protect their forces. For Army forces, it’s a geographical area, including the airspace above, usually defined by lateral, forward, and rear boundaries assigned to a commander, by a higher commander, in which he has responsibility and the authority to conduct military operations. [JP1-02; FM 1-02, FM 3-0]

armed robotic vehicle (ARV) Consists of three types of vehicles; an ARV-Assault (ARV-A), ARV-RSTA and ARV-Assault (Light). The ARV-A and ARV-RSTA will consist of a common chassis and two variants of mission modules: These ARVs will be self employed (not towed or trailer deployed). ARV-A and ARV-RSTA are used to rapidly shape the battlespace and provide force protection that enhances operational and tactical flexibility. The UA will conduct extended reconnaissance of various terrains including the

urban battlespace to gain and sustain information dominance. The ARV will be used to investigate features including structures, field fortifications, bunkers, and facilities. ARVs may be used to provide mine detection and be part of the assured mobility scheme for the UA. The ARV Assault (Light) will be used for a number of security and assault support missions where a lighter weight vehicle is required (such as air assault operations). It will be capable of employment via UH-60 lift, or via truck conveyance within UA assets. [Concept derived from work developed in TRADOC Pam 525-3-90, Maneuver UA O&O Plan and AROC Approved FCS ORD dated 14 May 2003]

army airspace command and control (A2C2) Airspace control in a combat zone as a process used to increase combat effectiveness by promoting the safe efficient and flexible use of airspace. Airspace control is provided to prevent fratricide, enhance air defense operations, and permit a greater flexibility of operations. A2C2 planners must understand the principles of joint airspace control. [FM 3-52]

army knowledge management (AKM) The Army's strategy to transform itself into a network-centric, knowledge-based force. The vision of AKM is a transformed Army, with agile capabilities and adaptive processes powered by world class network-centric access to knowledge, systems, and services, interoperable with the joint environment. [AKM Strategic Plan; version 2.9.8]

army space operations Army actions, activities, and operations contributing to space missions: space combat operations, space support operations, and combat support operations. Army space operations may be conducted from Earth to space, space to space, from space to Earth, or within or between terrestrial elements of a space system. [FM 3-14 Space Support to Army Operations]

assessment Consists of four steps:

- Detection. 1. In tactical operations, the perception of an object of possible military interest but unconfirmed by recognition. 2. In surveillance, the determination and transmission by a surveillance system that an event has occurred. 3. In arms control, the first step in the process of ascertaining the occurrence of a violation of an arms control agreement. 4. In CBRN environments, the act of locating CBRN hazards by use of CBRN detectors or monitoring and/or survey teams. [JP 1-02; JP 3-11]
- Recognition. 1. The determination by any means of the individuality of persons, or of objects such as aircraft, ships, or tanks, or of phenomena such as communications-electronics patterns. 2. In ground combat operations, the determination that an object is similar within a category of something already known; e.g., tank, truck, man. [JP 1-02].
- Classification. The systematic arrangement in groups or categories according to established criteria. When you reach the second level of acquisition, you can place the object within a category. For instance you may detect a potential target and know it is a tracked vehicle, but nothing else. [JP1-02].
- Identification. 1. The process of determining the friendly or hostile character of an unknown detected contact. 2. In arms control, the process of determining which nation is responsible for the detected violations of any arms control measure. 3. In ground combat operations, discrimination between recognizable objects as being friendly or enemy, or the name that belongs to the object as a member of a class. [JP 1-02]

assured kill The ability to kill and destroy a target every time a weapon system achieves a target hit; a target kill includes firepower, mobility or catastrophic. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

assured lethality The ability to employ any combination of lethal or non-lethal effects that result in the destruction, neutralization, suppression or incapacitation of a target. The overall effect generated on the target must preclude its ability to engage or influence a UA element, FCS platform or soldier. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

assured mobility Actions that guarantee the force commander the ability to deploy, move, and maneuver where and when he desires, without interruption or delay, to achieve his intent. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

7821 asymmetric threat An adversary strength that can be used against a friendly vulnerability. An adversary
7822 may pursue an asymmetric advantage on the tactical, operational, or strategic level by identifying key
7823 vulnerabilities and devising asymmetric concepts and capabilities to strike or exploit them. To complicate
7824 matters, our adversaries may pursue a combination of asymmetries, or the UA may face a number of
7825 adversaries who, in combination, create an asymmetric threat. [TRADOC Pam 525-3-90, UA Maneuver
7826 O&O Plan; derived from JP 3-0, by using the applicable terminology from the term and modifying it to
7827 adequately define the future concept]

7828 avenge kill A lethal retaliatory response to the enemy platform that has targeted or engaged friendly
7829 forces process. This ensures destruction of the enemy that targeted our forces and discourages other
7830 enemy forces from sighting, targeting, or designating our forces. When a friendly soldier/platform is
7831 designated, the targeted platform immediately alerts supporting forces via the COP. The platform also
7832 deploys survivability means like obscuration/screening smoke and fires back at the enemy to disrupt the
7833 enemy designation and engage enemy munitions fired at him. The targeted friendly platform fires back at
7834 the enemy as do supporting weapons systems to ensure the enemy is destroyed. This has the potential
7835 to psychologically affect other enemy attacks as they realize even by designating a UA element, they are
7836 destroyed. The retaliatory fires can be executed by the targeted/engaged platform, or a supporting
7837 platform. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

7838 basic load The quantity of supplies required to be on hand within, and which can be moved by, a unit or
7839 formation. It is expressed according to the wartime organization of the unit or formation and maintained
7840 at the prescribed level. For other than ammunition, basic loads are supplies kept by using units for use in
7841 combat. The quantity of each item of supply in a basic load is related to the number of days in combat
7842 that the unit can be sustained without resupply. Consumption of basic load supplies in peacetime may be
7843 authorized, depending on the class of supply. [FM 1-02 and FM 10-27]

7844 battle command The art and science of applying leadership and decision to achieve mission success.
7845 Battle Command applies leadership and decision making to shape and sustain decisive actions
7846 seamlessly synchronizing those elements within and between echelons from anywhere in the battlespace
7847 from alert through redeployment against a hostile, thinking opponent to achieve mission success across
7848 the full spectrum of operations. [TRADOC Pam 525-3.01 Battle Command O&O]

7849 battlespace The environment, factors, and conditions that commanders must understand to successfully
7850 apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space,
7851 and the included enemy and friendly forces, facilities, weather, terrain, the electromagnetic spectrum, and
7852 the information environment within the operational areas and areas of interest. Battlespace is
7853 conceptual—a higher commander does not assign it. Commanders determine their battlespace based on
7854 their concept of operations, accomplishing the mission, and protecting the force. Commanders use their
7855 experience, professional knowledge, and understanding of the situation to visualize and change their
7856 battlespace as current operations transition to future operations. Battlespace is not synonymous with AO.
7857 However, because battlespace is conceptual, Army forces conduct operations only within that portion of it
7858 delineated by the AO. Battlespace has an associated area of influence and area of interest. [JP 1-02
7859 and FM 3-0]

7860 battlespace environment The land, subsurface, sea, air and space including the terrain, weather,
7861 infrastructure, hazards, populations and their interaction, impact on operations, and options to leverage or
7862 mitigate their effects, tailored to the commander's needs. [JP 1-02 and TRADOC Pam 525-3-90,
7863 Maneuver Unit of Action O&O]

7864 battlefield visualization The mental process which supports the commander's decision-making process
7865 and lies at the center of Battle Command. Utilizing a vision of the proposed battle allows the commander
7866 to know when, where, and if a decision should be made. It is a continuous process which commences
7867 prior to the operation and continues through achievement of the desired conclusion to the operation.
7868 Additionally, it provides the key to where and how the commander can best lead and motivate soldiers.
7869 Battlefield visualization is an essential leadership attribute of the commander and is critical to
7870 accomplishing missions. It is learned and attained through training, practice, experience, wisdom, and
7871 available battle command technologies. Other resources, both human and technological, only serve to
7872 assist the commander in formulating a vision and taking action to implement it. [TRADOC Pam 525-70,
7873 Battlefield Visualization Concept]

7874 beyond line of sight (BLOS) BLOS is an extension of traditional direct fire that extends the range to the
7875 next terrain compartment. BLOS enables standoff engagements at greater ranges and also opens up
7876 fields of fire previously denied to firing elements due to the restrictions of intervening terrain, adverse
7877 weather effecting LOS engagement or range to the target. Soldiers and crews will employ BLOS fires,
7878 extending their vision using a combination of organic three-dimensional sensors and networked fires to
7879 establish a direct sensor-to-shooter linkage. BLOS is still direct fire in that the gunner pulling the trigger
7880 sees the target directly through a sensor that has a sensor-to-shooter link to his vehicle. . [Concept
7881 derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

7882 build and sustain combat power cell (BSCPC) A cell that exists as part of TACP in UA Bde HQ and
7883 whose functions also are found at the CA Battalion to plan and coordinate operations which generate
7884 combat power. The cell continually anticipates the commander's needs to generate and maintain fighting
7885 strength, provides multiple options for the commander to execute the overall operation at a tempo that
7886 gives adversaries no respite from relentless pressure, and keeps soldiers and systems in the fight. The
7887 cell includes those staff functions traditionally represented by transportation (materiel, equipment, and
7888 personnel replacement), supply, maintenance, medical, ordnance, human resource, religious support,
7889 finance, and "contractors on the battlefield". For a full description of the functions, refer to Annex D of the
7890 O&O. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

7891 centers of gravity (COG) Those characteristics, capabilities or sources of power from which a military
7892 force derives its freedom of action, physical strength or will to fight. [JP 1-02; JP 3-0]

7893 circle error probable The radius of a circle, usually about the true center of impact of the rounds, but
7894 sometimes about the point of aim, which includes one-half or 50% of the shots, considering a very large
7895 number of rounds fired onto the target area under stable firing conditions.

7896 classification The systematic arrangement in groups or categories according to established criteria.

7897 close combat The combat operations carried out with direct fire weapons, supported by indirect fire, air
7898 delivered fires, and non-lethal engagement means. Close combat defeats or destroys enemy forces or
7899 seizes and retains ground. The range between combatants may vary from several thousand meters to
7900 hand-to-hand combat. [FM 3-0].

7901 cognitive readiness The point at which the individual can employ the brain's most efficient processing
7902 and thinking styles within available sensory modalities and compensating for physical needs and the
7903 environment to maximize cognitive processing and produce Level 3 situational awareness as well as
7904 perform in the function behavioral mode regardless of the situation. [Concept derived from work
7905 developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]. Supports the critical linkage between
7906 SA, training, and decision making required to achieve future force capabilities]

7907 collaborative planning Collaborative planning is the real-time interaction of commanders and staffs at two
7908 or more echelons facilitated by Battle Command systems that allow real time exchange of data, voice,
7909 and video so that commanders and staffs at all echelons can work together during all phases of planning
7910 and execution. These systems make sharing information much easier through a COP; distributed
7911 databases; increased speed and accuracy of dissemination of orders, plans, and guidance; and improved
7912 connectivity between echelons for the sharing of information. [Derived from FM 3-21.31 The SBCT and
7913 TRADOC Pam 525-3-90, Maneuver O&O]

7914 combat identification (CID) Positive, effective real-time identification of friendly, threat and neutral forces
7915 and non-combatants. CID must accurately characterize friendly, enemy and non-combatant entities
7916 throughout the battlespace. [TRADOC Pam 525-3-90, UA O&O Plan; derived from Combat Identification
7917 Capstone Requirements Document]

7918 combat load consists of the minimum mission-essential equipment, as determined by the mission
7919 commander. This includes only what is needed to fight and survive immediate combat operations. There
7920 are two levels of combat load: fighting loads, which are carried on dynamic operations where contact with
7921 the enemy is expected, and approach march loads, which are carried when transportation cannot be
7922 provided for equipment over and above fighting loads. [FM 3-21.11]

7923 combat replenishment operation (CRO) Combat replenishment operations are brief or "pit-stop" like
7924 events to rearm, refuel, provision essential supplies, and support the fix function by cross leveling and on-

board spares. They are executed by the support platoons/sections and re-supply vehicles located in the respective UA battalions. . [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

command and control (C2) The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. [JP 1-02]

command integration cell (CIC) A cell that exists as part of TACP in UA Bde HQ and whose functions also are found at the CA Battalion. The cell's primary focus is facilitating the commander's leadership and decision-making functions by integrating and synchronizing the efforts of the multi-functional cells. This cell will be composed of a small number of multi-functional officers and NCOs conversant with the expertise afforded by the four multi-functional nodes. For a full description of the functions, refer to Annex D of the O&O. [TRADOC Pam 525-3-90, UA O&O Plan]

command, control, communication, computers, intelligence, surveillance and reconnaissance (C4ISR) An integrated system of systems to allow the UA to develop situational awareness. The system uses doctrine, procedures, organization, personnel, equipment, facilities and communications to collect, evaluate, and interpret data. This system of systems better allows a commander to command and control his organization. [JP 1-02, as written, this is a: Current definition that does not support Objective Force concepts (overly system focused). TRADOC DCSDOC tasked to publish a revised definition 26 FEB O3. Once published it will be used as the base for a definition supporting Objective Force concepts].

common operational picture (COP) A single identical display of relevant information shared by more than one command. A common operational picture facilitates collaborative planning and assists all echelons to achieve situational awareness. [JP 1-02] (Chapter 4 provides specific examples of a COP.)

communication information systems Consists of the infrastructure, organization, personnel, and components that collect, process, store, transmit, display, and disseminate information. It allows the commander to view and understand his battlespace, communicate his intent, lead his forces, and disseminate pertinent information throughout the UA within his area of operations. [derived from WIN-T ORD]

complex terrain Any terrain characteristics or combination of characteristics that make military action, such as maneuver, difficult. Examples include, but not limited to; urban areas, mountainous terrain with slopes greater than 30%, swamps, jungles and dense forest etc. All complex terrain is "classified" as severely restricted. [Derived from FM 30-10, Military Geographic Intelligence and FM 34-130, Intelligence Preparation of the Battlefield]

computer network attack Operations designed to disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves. [JP 1-02]

computer network defense Defensive measures to protect and defend information, computers, and networks from disruption, denial, degradation, or destruction. See also computer network attack. [JP 1-02]

computer network operations Comprised of Computer Network Attack, Computer Network Defense, and Computer Network Exploit, collectively.

configured load A load of supplies built to anticipated or actual needs and intended for maximum throughput with minimal reconfiguration. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

cooperative engagement A method of engagement in which the sensor and shooter are not resident on the same platform. This occurs where the sensor and shooter are on dispersed axes, or when the sensing platform's ability to engage the target is limited by field of view, enemy action, visibility, terrain, or obstacles. Cooperative engagement will involve two different crews or units, working together to destroy a target. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

combined arms for air defense (CAFAD) The ability of FCS manned systems to accept early warning and cueing information to execute LOS self-defense engagements against low/slow portions of enemy air threat. [FM 3-01.94 Army Air Defense and Missile Defense Command Operations]

crewman's remote interface system (CRIS) The connection with or without wire for each FCS Manned System Crewman to the C4ISR system from within the vicinity of the platform in a secure mode out to an operational distance of 500 m.

cycling A series of events or operations that recur regularly within combat operations to rebuild or sustain the combat power of Army organizations. It enables the operational commander to maintain unrelenting OPTEMPO while integrating sustainment replenishment activities into maneuver operations. Cycling typically applies to battalions but may be applied to companies, brigades and divisions. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

data Information in a format suitable for storage and processing on a computer. Representation of facts, concepts, or instructions in a formalized communication, interpretation or processing by humans or by automatic means. Any representation such as characters or analog quantities to which meaning is or might be assigned. [Encarta New World Dictionary, Term and relation to battle command was presented to the Army Science Board knowledge working group. Fully Joint Interoperability and difference between Data and Information taken directly from the results of Army Fellowship research contained in the new Information Technology Model; a paradigm shift in the Information Technology development; current term from SECOMP-I was updated with applicable terminology from other references to define future concepts]

decisive point A geographic place, specific key event, or enabling system that allows commanders to gain a marked advantage over an enemy and greatly . [JP 1.02].

deployability. The movement of forces within operational areas. The positioning of forces into a formation for battle. The relocation of forces and materiel to areas. Deployment ll activities from origin or home station through destination, specifically including intra-continental United States, inter-theater, and intra-theater movement legs, staging, and holding areas. [JP 1.02, Page 153 and 154]

detection. In tactical operations, the perception of an object of possible military interest but unconfirmed by recognition. 2. In surveillance, the determination and transmission by a surveillance system that an event has occurred. 3. In arms control, the first step in the process of ascertaining the occurrence of a violation of an arms control agreement. 4. In CBRN environments, the act of locating CBRN hazards by use of CBRN detectors or monitoring and/or survey teams.. [JP 1-02, JP 3-11]

disintegrate The rapid loss of enemy formation or element cohesiveness and combat effectiveness through application of overmatching lethal effects [FM 71-100]

displaced persons Someone who has been forced to leave his or her home or country especially because of war or political oppression. The difference between refugees and displaced persons is displaced persons remain in their country or are likely to return to their homes when the crisis ends. [root definition taken from Encarta with explanation added]

disrupt A tactical task in which a commander integrates fires, terrain, and obstacles to upset an enemy's formation or tempo, interrupt his timetable or cause his forces to commit prematurely or attack in piecemeal fashion. [JP 1-02]

distribution 1. The arrangement of troops for any purpose, such as a battle, march, or maneuver. 2. A planned pattern of projectiles about a point. 3. A planned spread of fire to cover a desired frontage or depth. 4. An official delivery of anything, such as orders or supplies. 5. The operational process of synchronizing all elements of the logistic system to deliver the "right things" to the "right place" at the "right time" to support the geographic combatant commander. 6. The process of assigning military personnel to activities, units, or billets. [JP 1-02; JP 4-0]

distribution based logistics An integrated industry, DoD, Joint, and Service network of organizations, infrastructure, processes, and automated systems that enable rapid and assured provisioning of sustainment and retrograde support to forces worldwide across the full spectrum of military operations. Its fundamental distribution principles are: velocity over mass, centralized management, optimization of

8024 the distribution system, maximum throughput, and reduced customer wait time, minimum essential
8025 stocks, maintaining continuous, seamless, two-way flow of resources, and achieving time-definite
8026 delivery. While each of these principles is important, the principle of velocity over mass is the key
8027 element that enables OF maneuver sustainment operations. [Concept derived from work developed in
8028 TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

8029 distribution centric operations The transition from a supply-based sustainment system to a distribution-
8030 based system reduces the layering of logistics stocks throughout the theater and places a significantly
8031 greater emphasis on delivering sustainment at the right place and in the right quantities at the right time
8032 while using the sustainment pipeline as the system warehouse. [Concept derived from work developed in
8033 TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

8034 distribution operations The system of information exchanges, management procedures, functional
8035 designs, and reengineered operational processes which enable Army forces to properly request, receive,
8036 redirect, track, distribute, control, and retrograde materiel, services, units, and personnel within an
8037 integrated system of systems. Employs a hub and spoke distribution method to execute multi-nodal
8038 distribution operations. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

8039 distributed information database (DIDb) An integrated, distributed information database containing all
8040 available information derived from multiple sources. Access to the DIDb is available to all echelons of the
8041 force to draw upon to obtain information and develop operational plans. Though a constant push and pull
8042 of information, the DIDb fuses information from multiple sources and feeds this information through the
8043 COP to all echelons. The DIDb provides information superiority, maintains all critical information, enables
8044 access and distribution of information throughout the force, enables continuous input and updates of
8045 information, establishes, maintains, fuses, and distributes information to the COP, and allows access to
8046 near real time information. [Concept derived from work developed in TRADOC Pam 525-3-90, UA
8047 Maneuver O&O Plan and Joint Common Database, WIN-T ORD]

8048 echelonment The ordering of subordinate elements in an integrated and mutually supportive hierarchy.
8049 [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

8050 effects The result of a direct application of lethal and non-lethal capabilities to achieve a desired purpose
8051 or outcome in support of the commander's intent. Effects are achieved by a broad range of capabilities
8052 and are not merely the result of weapons use. [Concept derived from work developed in TRADOC Pam
8053 525-3-90, UA Maneuver O&O Plan]

8054 embedded training An capability in all warfighter systems that provides effective individual and collective
8055 training to users any time, anywhere using their operational equipment. Training encompasses user
8056 training on systems themselves and operational training using the system in live, virtual, and constructive
8057 collaborative environments that leverages expectation failure, increases retention, and is tailorable to
8058 warfighter individual learning and working styles to bring warfighters from exposure, through the guided
8059 learning, independence, and mastery levels through rapid perception and long-term retention. [TRADOC
8060 Pam 525-3-90, UA O&O Plan; derived from Defense Science Board Report on Training Superiority and
8061 Training Surprise, Army Training Support System CRD, modified using United States Army Test and
8062 Evaluation Command Assessment Report for the Division XXI Advanced Warfighting Experiment]

8063 enroute mission planning and rehearsal (EMPR) A battle command capability embedded in the Battle
8064 Command system providing joint planning, rehearsal, and execution tools for warfighters with and
8065 between all echelons at home station, enroute to, within, and redeploying from the Joint Operational Area
8066 (JOA). Provides warfighters the capability to develop, maintain, and share situational awareness at any
8067 point in the operation and anywhere in the battlespace regardless of platform as well as conduct
8068 collaborative planning and virtual rehearsal within and between echelons. [TRADOC Pam 525-3-90, UA
8069 O&O Plan; derived from the Secure Enroute Communications – Improved (SECOMP-I) ORD, the 17
8070 November 02 Council of Colonel's, Senior Leader's Meeting (ICT #4, with the Combined Arm's Center's
8071 "10 Big Ideas system development that focused on Enroute Mission Planning and Rehearsal]

8072 environment A general reference including the generic natural environment; e.g., weather, climate,
8073 terrain, vegetation, etc. A modified environment refers to specific induced environments; e.g., dirty
8074 battlefield environment, nuclear-chemical-biological environment, etc. The environment includes those

conditions observed by the system during operational use, standby, maintenance, transportation, and storage. [JP 1 and JP 1-02]

essential combat configuration (ECC) FCS systems must be transported in an essential combat configuration without substantial assembly or refit process. Each vehicle must arrive with a turret or basic ammunition load, 3/4 tank of fuel, crew with personal equipment, capable of immediate self-defense, connected to the Battle Command system. Essential Combat Configuration (ECC) helps reduce the need to execute RSOI in the UA. [Derived from conceptual work in TRADOC Pam 525-3-90, UA O&O Plan]

family of systems (FoS) A set or arrangement of independent systems that can be arranged or interconnected in various ways to provide different capabilities. The mix of systems can be tailored to provide desired capabilities dependent on the situation. [Derived from CJCSI 3170.01]

fighting load The load the soldier carries once contact has been made with the enemy. It consists only of essential items the soldier needs to accomplish his task during the engagement. For close combat and operations requiring stealth, any load at all is a disadvantage. Cross loading of machine-gun ammunition, mortar rounds, antitank weapons, and radio equipment causes most combat loads to exceed 48 pounds. Excessive combat loads of assaulting troops must be configured so that the excess can be redistributed or shed (leaving only the fighting load) before or upon contact with the enemy. [FM 3-21.11]

fires The effects of lethal or nonlethal weapons. In the broadest sense, an effect is the physical, functional, or psychological outcome, event, or consequence that results from a specific action. The combination of destructive, protective, suppressive, and special purpose fires that provide the UA the freedom of action while denying options to the enemy. [TRADOC Pam 525-3-90, UA O&O Plan; derived from JP 1-02]

fires and effects cell (FEC) A cell that exists as part of TACP in UA Bde HQ and whose fires functions also are found at the CA Battalion. This cell plans and coordinates the production of effects resulting from the application of lethal and non-lethal capabilities. The Fires and Effects Cell supports the commander's intent through the physical destruction, information disruption and denial, enemy system collapse and erosion of the enemy's will to fight. For a full description of the functions, refer to Annex D of the O&O. [TRADOC Pam 525-3-90, UA O&O Plan]

force protection (FP) Security programs designed to protect service members, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services, and supported by intelligence, counterintelligence, and other security programs. Results from measures taken by commanders to protect their forces and also applies to security of noncombatants in urban operations. [JP 1-02 DOD The Department of Defense Dictionary of Military and Associated Terms, JP 3-0 Doctrine for Joint Operations]

full combat configuration (FCC) Full Combat Configuration (FCC) includes all ECC capabilities plus full fuel, all basic loads needed for 72 hours of high tempo operations, and requires that add-on armor kits be applied without any specialized material handling equipment, if that additional armor is needed for the mission. The UA can fight most engagements at ECC. [Derived from conceptual work in TRADOC Pam 525-3-90, UA O&O Plan]

fusion The combining or blending of data and information from single or multiple sources (sensors, logistics, etc.) into information. Involves the process of comparison, evaluation and related activities to ensure proper correlations of data or information exist and draws out the significance of those correlations. [TRADOC Pam 525-3-90, UA O&O Plan, derived from JP 1-02, Ft Huachuca White Paper, Fusion (13 January 03 (and previous versions), and Senior Leader's Meeting (ICT #4, with the Combined Arm's Center's "10 Big Ideas"]

fusion levels Each of the six levels of fusion adds progressively greater meaning and involves more analysis. [Objective Force Fusion White paper dated 14 March 2003]

- Level 0 - organize. This is the initial processing accomplished at or near the sensor that organizes the collected data into a usable form for the system or person who will receive it.

- Level 1 - identify/correlate. This level takes new inputs and normalizes its data; correlate it into an existing entity database, and updates that database. Level 1 Fusion tells you what is out there and can result in actionable information.
- Level 2 - aggregate/resolve This level aggregates the individual entities or elements, analyzes those aggregations, and resolves conflicts. This level captures or derives events or actions from the information and interprets them in context with other information. Level 2 Fusion tells you how they are working together and what they are doing.
- Level 3 - interpret/determine/predict. Interprets enemy events and actions, determines enemy objectives and how enemy elements operate, and predicts enemy future actions and their affects on friendly forces. This is a threat refinement process that projects current situation (friendly and enemy) into the future. Level 3 Fusion tells you what it means and how it affects your plans.
- Level 4 - assess. This level consists of assessing the entire process and related activities to improve the timeliness, relevance and accuracy of information and/or intelligence. It reviews the performance of sensors and collectors, as well as analysts, information management systems, and staffs involved in the fusion process. Level 4 Fusion tells you what you need to do to improve the products from fusion level 1-3.
- Level 5 - visualize. This level connects the user to the rest of the fusion process so that the user can visualize the fusion products and generate feedback/control to enhance/improve these products

future combat systems (FCS) A family of advanced, networked air- and ground-based maneuver, maneuver support, and sustainment systems that will include Manned and Unmanned (MUM) platforms. FCS will operate as a System of Systems (SoS) that will network existing systems, systems already under development, and new systems to be developed to meet the needs of the UA. [JROC approved ORD for FCS dated 14 April 2003]

global information grid (GIG) The globally interconnected, end-to-end set of information capabilities, associated processes and personnel for collecting, processing, storing, disseminating and managing information on demand to warfighters, policy makers, and support. The GIG includes all owned and leased communications and computing systems and services, software (including applications), data, security services, and other associated services necessary to achieve Information Superiority. The GIG supports all DoD, National Security, and related Intelligence Community missions and functions (strategic, operational, tactical and business), in war and peace. The GIG provides capabilities from all operating locations (bases, posts, camps, stations, facilities, mobile platforms and deployed sites). The GIG provides interfaces to coalition, allied, and non-DoD users and systems. Includes any system, equipment, software, or service that meets one or more of the following criteria:

- Transmits information to, receives information from, routes information among, or interchanges information among other equipment, software and services.
- Provides retention, organization, visualization, information assurance, or disposition of data, information, and/or knowledge received from or transmitted to other equipment, software and services.
- Processes data or information for use by equipment, software and services.

[Defense Information Systems Agency (DISA) definition contained in DoD Chief Information Officer (CIO) Guidance and Policy Memorandum (G&PM) No. 11-8450, Department of Defense (DoD) Global Information Grid (GIG) Computing Signed by the Deputy Secretary of Defense on 6 April 2002].

hemispherical a half of a sphere bounded by a great circle. A half of a symmetric, approximately spherical object defined by a plane of symmetry. [Webster's Dictionary]

high payoff target (HPT) A target whose loss to the enemy will significantly contribute to the success of the friendly course of action. High-payoff targets are those high-value targets that must be acquired and successfully attacked for the success of the friendly commander's mission. The failure to affect HPTs

may cause the friendly commander to change his concept of operations. See also high-value target; target. [JP 3-60]

high value target (HVT) A target the enemy commander requires for the successful completion of the mission. The loss of high-value targets would be expected to seriously degrade important enemy functions throughout the friendly commander's area of interest. [JP 3-09]

hub and spoke distribution system A distribution method utilizing a distribution terminal (hub) which receives shipments from multiple sources and reconfigures/redirects/throughputs these shipments over designated routes (spokes) to specified supply support activities and/or end users. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

identification In ground combat operations, identification is the discrimination between recognizable objects as being friendly or enemy, or the name that belongs to the object as a member of a class. This definition combines two distinct ideas – target identification, "the name that belongs to the object…" (what the target is), which provides the basis for combat identification; and combat identification which establishes whether the target is friendly, enemy, neutral, or non-combatant. Combat identification is usually a judgment based on target recognition or identification combined with situational awareness. Example: target identification would determine a potential target as a T-72 tank; combat identification would determine the target is an enemy or neutral T-72 tank. [Derived from JP 1-02}

infantry carrier vehicle (ICV) Provides the mobility for 11 personnel (two-man crew and nine man infantry squad) on the battlefield. Located within the infantry platoons and companies within the combined arms battalion, it delivers the dismounted force to the close battle, supports the squad by providing self-defense weapons support, and carries the majority of equipment freeing the individual soldier from being burdened with equipment. [JROC approved ORD for FCS dated 14 April 2003]

information The representation of facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing by humans or automatic means. That information in a format suitable for storage and processing on a computer. [Encarta New World Dictionary coupled with Army Fellowship Research contained in The New Information Technology Model].

information assurance (IA) Operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities. [JP 1-02]

information exchange requirement (IER) The requirements for transmission and receipt of information to be performed by the Family of Systems, System of Systems or systems (i.e., with C/S/A, allied and coalition systems. Information exchange requirements identify who exchanges what information with whom, why the information is necessary, and how that information will be used, as well as the required quality (i.e., frequency, timeliness, security) and quantity (i.e., volume, speed, and type of information such as data, voice, and video) for each of the information exchange requirement. [CJCSI 6212.01B]

information fusion Fusion of information produces a picture of the battlespace that is accurate and meets the needs of warfighters. If they have concise, relevant, accurate, and timely information, unity of effort is improved in uncertainties reduced. The goal is achieved by fusing i.e., reducing information to the minimum essentials and putting it in a form that people can act on. [JP 6-0]

information management (IM) The provision of relevant information to the right person at the right time in a usable form to facilitate situational awareness and decision making. It uses procedures and information systems to collect, process, store, display, and disseminate information. [FM 3.0]

information operations (IO) Actions taken to affect decision making processes, information and information systems of adversaries and influence those of others, while protecting friendly decision making processes, information and information systems. [TRADOC Pam 525-3-90, UA O&O Plan; derived from JP 1-02, by using a current term as the base and modifying to meet the future concept requirement]

information pull User generates all information requirements and the source provides the information in response to them. An information-pull system can help focus scarce resources on critical tasks the

8222 commander identified; it can deliver information specifically tailored to the commander's information
8223 needs and only produce information that the commander requests. [FM 6-0]

8224 information push A system that collects information by pushing it from the source to the user either as the
8225 information becomes available or according to a schedule. The advent of common DIDb allows either
8226 time-driven or event-driven information push in a format usable to the receiver with database-to-database
8227 transfer. [derived from FM 6-0]

8228 information superiority (IS) That degree of dominance in the information domain which permits the
8229 conduct of operations without effective opposition. (Army) – The operational advantage derived from the
8230 ability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying
8231 an adversary's ability to do the same. [FM 3-0]

8232 information superiority cell (ISC) A cell that exists as part of TACP in UA Bde HQ and whose functions
8233 also are found at the CA Battalion. Develops and maintains the knowledge edge over the enemy, and
8234 coordinates, plans and manages the UA information network. This cell has staff expertise traditionally
8235 represented by signal, intelligence, and information operations. Space and public affairs tasks are
8236 performed with augmentation. When planning for network operations, the ISC provides deception,
8237 intelligence, collection management, and intelligence planning and analysis. The ISC also coordinates
8238 and manages UA frequency spectrum requirements, and the communication network infrastructure both
8239 internal and external to the UA. For a full description of the functions, refer to Annex D of the O&O.

8240 information systems 1. The entire infrastructure, organization, personnel, and components that collect,
8241 process, store, transmit, display, disseminate, and act on information. 2. The equipment and facilities that
8242 collect, process, store, display, and disseminate information. These include computers--hardware and
8243 software--and communications, as well as policies and procedures for their use. [JP 1-02]

8244 information technology (IT) Any equipment or interconnected systems or sub-systems of equipment, that
8245 is used in the automatic acquisition, storage, manipulation, management, movement, control, display,
8246 switching, interchange, transmission, or reception of data or information if the equipment is used directly
8247 or is used by a contractor under a contract which (it requires the use of such equipment, or (ii requires the
8248 use of such equipment in the performance of a service or the furnishing of a product. Includes
8249 computers, ancillary equipment, software, firmware and similar procedures, services (including support
8250 services), and related resources. [Defense Information Systems Agency (DISA) definition contained in
8251 DoD Chief Information Officer (CIO) Guidance and Policy Memorandum (G&PM) No. 11-8450,
8252 Department of Defense (DoD) Global Information Grid (GIG) Computing Signed by the Deputy Sec Def 6
8253 April 2002].

8254 infosphere the rapidly growing global network of military and commercial command, control,
8255 communications, and computer systems and networks linking information data bases and fusion centers
8256 that are accessible to the warrior anywhere, anytime, in the performance of any mission; provides the
8257 worldwide automated information-of-exchange backbone support to joint forces; and provides seamless
8258 operations from anywhere to anywhere that is secure and transparent to the warrior; this emerging
8259 capability is highly flexible to support the adaptive command and control infrastructures of the twenty-first
8260 century. [FM 100-6, Information Operations]

8261 intelligent munitions system (IMS) An integrated system of sensors, lethal and non-lethal munitions,
8262 software and communications that may be emplaced by multiple means and is capable of autonomous,
8263 unattended employment for the detection, classification, identification, tracking and engagement of selected
8264 targets in accordance with the commander's intent. [Appendix G (OMS/MP) to JROC Approved FCS ORD
8265 dated 14 April 2003 and Maneuver Support O&O (DRAFT)]

8266 interoperable 1. The ability of systems, units, or forces to provide services to and accept services from
8267 other systems, units, or forces and to use the services so exchanged to enable them to operate
8268 effectively together. 2. The condition achieved among communications-electronics systems or items of
8269 communications-electronics equipment when information or services can be exchanged directly and
8270 satisfactorily between them and/or their users. The degree of interoperability should be defined when
8271 referring to specific cases. FCS Family of Systems must be Joint interoperable. [JP 1-02 and KPP 1
8272 JROC Approved FCS ORD dated 14 April 2003]

knowledge Information stored in the mind [Encarta New World dictionary, Army Fellowship Research contained in The New Information Technology Model; A Paradigm Shift in Information Technology System Development that focused on Enroute Mission Planning and Rehearsal and as briefed to the Army and Defense Science Boards]

lead service responsibilities When one service assumes responsibility, based upon DoD/combatant commander directive authority, for procuring and providing specified services/support to all or part of a U.S. or multinational force. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

leader development The deliberate, continuous, sequential, and progressive process, grounded in Army values that grows soldiers into competent and confident leaders capable of decisive action. It is achieved through life-long synthesis of the knowledge, skills and experiences gained through the developmental domains of institutional training and education, operational assignments, and self-development. A part of the DTLOMPF function. [FM 7-0]

lethality A system of systems construct that leverages UE and joint surface to surface, surface to air, and air to surface fires, as well as organic fires to overmatch the threat beyond stand-off in all dimensions. Includes the capability to destroy enemy formations at longer ranges, with smaller calibers, greater precision and more devastating target effects. Overmatches the enemy in all conditions and environments, and based on one shot – one kill, disciplines and designs. [United States Army White Paper, Concepts for the Objective Force]

lethal overmatch A quantitative or qualitative disparity in lethality of such magnitude that it enables one force to overwhelm the other force. [Derived from FM 3-0]

line of sight (LOS) The traditional form of direct fire used by assaulting elements as they conduct fire and movement to close with and destroy an enemy. The target in a LOS engagement is not masked from the firing platform or soldier; the sensor and shooter are the same. The masking effects of terrain, however, limit both the range and fields of fire available in a direct fire (LOS) engagement. Direct fires (LOS) have the advantage of point and shoot immediacy against targets that can be directly seen or sensed from the combat platform. [Concept derived from work developed in TRADOC Pam 525-3-90, UA Maneuver O&O Plan]

local area network (LAN) A computer network, consisting of workstations and/or personal computers that span a relatively small area (usually confined to a single building or complex). [FM 1-02 and JP 1-02]

loiter attack munitions (LAM) One of the missiles in the NLOS-LS system that has a 100 km range and 30-45 minute loiter time that allows it to hover over the ground, identify targets and send calls for fire to Precision Attack munitions or other killing systems to destroy targets with precision fires. Has the capability to engage targets at any time during flight but is not optimized to defeat an armor vehicle or personnel targets. [JROC Approved FCS ORD dated 14 May 2003]

logistics civil augmentation program A program to preplan for the use of civilian contractors to perform selected support functions during contingency operations to augment Army forces. Includes the option for supported commanders to purchase specific services during operations through a pre-existing umbrella contract. [AR 700-137]

maneuver 1. A movement to place ships, aircraft, or land forces in a position of advantage over the enemy. 2. A tactical exercise carried out at sea, in the air, on the ground, or on a map in imitation of war. 3. The operation of a ship, aircraft, or vehicle, to cause it to perform desired movements. 4. Employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect to the enemy in order to accomplish the mission. [FM 3-0].

maneuver air and missile defense The tailored, multi-functional UE air and missile defense units designated to protect tactical formations from the asymmetric threat. Maneuver AMD replaces the current term SHORAD; there is nothing short range about UE maneuver AMD systems. Maneuver AMD will not only defeat high end UAVs and rotary wing beyond standoff, but will overmatch cruise missiles at extended ranges and in Increment 2, will defeat incoming rockets, artillery and mortars. Common C2 enables incorporation of other UE AMD shooters if required. [Objective Force O&O for Air and Missile Defense (AROC Approved) 10 April 2002]

8323 maneuver support Maneuver support shapes, leverages, and mitigates the effects of the operational
8324 environment to enable, enhance, and protect strategic, operational, and tactical freedom of action.
8325 [TRADOC Pam 525-4-0, Maneuver Support Operations]

8326 maneuver and support cell (M&SC) A cell that exists as part of TACP in UA Bde HQ and whose functions
8327 also are found at the CA Battalion. This cell performs those staff functions traditionally associated with
8328 mounted, dismounted, vertical and operational maneuver, and maneuver support including engineer,
8329 chemical, military police tasks to plan and coordinate maneuver and maneuver support. The Operational
8330 Maneuver Section, Deployment Team and Brigade Operational Law Team are found in this cell. For a full
8331 description of the functions, refer to Annex D of the O&O. [TRADOC PAM 525-3-90, UA O&O Plan]

8332 maneuver sustainment The essential capabilities, functions, activities, and tasks necessary to sustain
8333 Army forces throughout the range of military operations and across the spectrum of conflict. It includes
8334 but is not limited to that support rendered by National and Army providers in ensuring the aspects of
8335 supply, maintenance, transportation, force health protection, and other services required by combat
8336 troops to permit those units to accomplish their missions in combat. [Conceptual work derived from
8337 TRADOC Pam 525-3-90 Maneuver O&O]

8338 manned-unmanned teaming A combination of manned and unmanned assets enhancing survivability
8339 and lethality by extending battlespace coverage and situational awareness. [Conceptual work derived
8340 from TRADOC Pam 525-3-90 Maneuver O&O]

8341 meta data Information about information; more specifically, information about the meaning of other data.
8342 [JP 2-03].

8343 mission configured load A mission-configured load is a load of supplies built for a specified mission and
8344 used for a specified purpose. [Conceptual work derived from TRADOC Pam 525-3-90 Maneuver O&O]

8345 mission staging operations (MSO) Operations that are intense and time sensitive which include all
8346 preparations for an upcoming mission -- planning, troop leading, rehearsals, training, ISR, reconstitution,
8347 tailoring for the next mission, information operations, etc. This is a planned, deliberate operation.
8348 [TRADOC Pam 525-4-0 Maneuver Sustainment Operations]

8349 mounted combat system (MCS) A weapons platform in the MCS companies of the CA Battalion that
8350 provides both LOS and BLOS fires. The MCS was formerly known as Mobile Gun system. The FCS
8351 Mounted Combat System (MCS) provides offensive maneuver to close with and destroy enemy forces.
8352 When teamed with the reconnaissance and surveillance detachment and Comanche's integrated
8353 acquisition and fires capability, MCS provides the primary ground lethality of this hunter-killer team. The
8354 MCS is capable of conducting mounted operations, mounted operations supported by dismounted, and
8355 supporting dismounted infantry operations in all environments. The MCS delivers precision fires at a rapid
8356 rate to destroy multiple targets at standoff ranges quickly and complements the fires of other systems in
8357 the UA. It is highly mobile and maneuvers out of contact to positions of advantage. It is capable of
8358 providing direct support to the dismounted infantry in an assault, defeating bunkers, and breeching walls
8359 during the tactical assault. The MCS provides a counter-air capability against slow moving rotary wing
8360 aircraft and UAVs. [TRADOC PAM 525-3-90, UA O&O Plan and JROC Approved FCS ORD dated 14
8361 May 2003]

8362 mobile command groups (MCG) Two mobile command groups, one with the commander and one with
8363 the deputy commander are each built around a C2V and organic security element. In the MCG C2V are
8364 an ISR officer, Effects Officer, Operations Officer, Operations NCO and Sustainment Officer in addition to
8365 the dedicated driver and track commander. The staff elements can control execution of ISR, fires,
8366 maneuver and sustainment operations. These groups can independently plan branches or collaboratively
8367 plan operations or sequels with the tactical command post. The CA Battalions are similarly staffed with a
8368 MCG and TCP. The brigade TCP is built around a core of six C2Vs. Each C2V has six workstations
8369 linked to the network or should the network go down, linked wirelessly or by cable to the other TCP
8370 vehicles. This ensures the synergy of a current operations section MCG forward on the battlefield with
8371 the commander, yet linked to the rest of the staff as if they were in the TOC. The MCG facility that
8372 provides the processes and analysis that exists at a static TOC and allows the UA to exercise BCOTM.

8373 modularity Designed with standardized sizes or dimensions for flexible use. The characteristic of the UA
8374 that enables it to attach and detach current, SBCT, and/or objective subordinate elements without
8375 sacrificing operational momentum or flexibility. [Webster's Dictionary and Derived from conceptual work
8376 in TRADOC Pam 525-3-90, Maneuver O&O]

8377 most dangerous target The target that has the most capability of destroying a platform/individual and is
8378 based on the level of command it is detected at. This target is generally not planned and usually is not
8379 part of a High Payoff Target List. The construct of the UA fight implies that CA Battalion and above
8380 fires/effects will focus on High Payoff Targets. Companies and below will focus on most dangerous
8381 targets using organic fires and links to fires at echelons all the way to the UE and JTF. Small units will
8382 use this as a method of fire distribution and control to engage most dangerous targets first. [Concept
8383 derived from work on TRADOC PAM 525-3-90, Maneuver UA O&O Plan]

8384 multifunction utility/logistics and equipment vehicle (MULE) . Unmanned robotic platform that provides
8385 transport of equipment and/or supplies in support of dismounted maneuver. This is a multi-functional
8386 platform, capable of following maneuver systems or being directed to move to positions not along the line
8387 of movement. It will be capable of being armed in the role of support to dismounted infantry in the close
8388 assault. It will be picked up and distributed to the dismounted unit on an "as needed" basis from the CA
8389 Battalion support platoon or equivalent unit. The system will be configured such that mission equipment
8390 packages (such as the communications relay package) can be changed out with organic tools and
8391 personnel available (no specific tools or MHE). The envisioned mission equipment packages for the
8392 MULE include: Load carrying, non-standard CASEVAC, Communications Relay, and assured mobility
8393 equipment. The anticipated requirement to support dismounted operations away from the ICV is two per
8394 platoon. [JROC Approved FCS ORD dated 14 May 2003]

8395 multi-level security WIN-T must seamlessly interoperate with strategic/sustaining base, DISN, Joint,
8396 Coalition, US commercial, NATO and Allied networks, which operate at multiple security levels (crypto
8397 logically separate networks)and voice network using multiple level security, i.e., end to end encryption
8398 (Secret, Top Secret, Top Secret SCI) of voice terminals. [WIN-T ORD]

8399 multiple security levels (MSL) WIN-T's common communications backbone will support exchange of
8400 information across multiple security level classifications; i.e., TS/SCI, Secret, and Confidential. WIN-T
8401 provides end-to-end security consistent with the classification of information passed over the WIN-T
8402 network, by providing an integrated Defense in Depth approach that starts at the DISN and extends down
8403 to individual user devices by leveraging the JTRS. IA capabilities will be integrated and/or embedded in
8404 each FCS platform to protect the WIN-T/JTRS network. The IA capabilities provided by WIN-T will detect
8405 network attacks; provide immediate protection, and alert users and IA managers. [WIN-T ORD]

8406 mutual support (MS) That support which units render each other against an enemy, because of their
8407 assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities [JP
8408 1-02]

8409 national providers The national-level capabilities to manage, resource, and control the materiel
8410 management, maintenance, services, procurement, distribution, and deployment functions for the Army
8411 and other joint and multinational customers. This involves the integrated efforts of a number of national
8412 strategic-level organizations. [Concept derived from work on TRADOC PAM 525-3-90, Maneuver UA
8413 O&O Plan]

8414 near real time (NRT) Pertaining to the delay introduced, by automated data processing, between the
8415 occurrence of an event and the use of the processed data, e.g., for display or feedback and control
8416 purposes. For example, a near-real-time display depicts an event or situation, as it existed at the current
8417 time less the processing time. The distinction between near real time and real time is somewhat
8418 nebulous and must be defined for the situation at hand. This implies that there are no significant delays.
8419 [JP 1-02].

8420 networked fires A component of the Battle Command system and supporting communications
8421 architecture. It is a combination of relevant sensors, effects capabilities, Battle Command system tools
8422 and communications capabilities available across the UA. Networked fires enable dynamic application of
8423 lethal and non-lethal destructive and suppressive effects. Networked fires is fully integrated from theater
8424 to platform, allowing the UA to rapidly establish, alter and terminate linkages between sensors and LOS,

BLOS, NLOS, UE, and Joint systems to achieve a wide set of lethal and non-lethal effects. The automated systems and fire and effects personnel will use the network to allow the commander to dynamically tailor his guidance and refocus sensors and effects capabilities to meet the requirements of changing situations. [Concept derived from work on TRADOC PAM 525-3-90, Maneuver UA O&O Plan]

network management Network management capabilities to configure, monitor, and maintain WIN-T's infrastructure, IA systems, and user interface devices will be automated and embedded where operationally suitable. Where required, network managers have the capability to remotely manage, configure, and monitor the wide area network, local area networks, and terminal devices throughout the UA. The WIN-T Network Management System will provide an interface to the Joint Network Management System and be able to host the JNMS software when supporting an ARFOR, JFLCCC, or JTF. [WINT-ORD]

network operations An organization and procedural framework for integrating Network Management, Information Dissemination Management and Information Assurance. {JROC Approved FCS ORD dated 14 May 2003}

network reliability The user shall have the probability to access the network at a random point in time during operational missions (as specified in the Operational Mode Summary/Mission Profile and exchange information with another user. The network must be sufficiently robust and redundant to provide and meet the communications requirements of the Objective Force Warfighter that ensures mission completion. [Derived from the WINT-ORD]

non-lethal effects Weapons, munitions, and other capabilities are explicitly designed (and primarily employed) to achieve non-lethal effects. Non-lethal effects include incapacitation, suppression, dispersion, or engagement of personnel, places, or things denying personnel access to, use of or movement through a particular area/point/facility. [TRADOC Pam 525-3-90, UA O&O Plan; derived from JP 1-02 and Non-Lethal Operations Concept]

non line of sight (NLOS) NLOS is the current method of indirect fire support where a sensor or decider directs a firing platform to engage targets in response to a requirement for fires. The soldier or sensor identifies a target and passes a fire mission through the Battle Command system. The receiving soldier/weapon fires on the target without seeing/sensing the target based on the sensing of the requestor. [Concept derived from TRADOC Pam 525-3-90, Maneuver UA O&O Plan]

non-line of sight launch system (NLOS-LS) A self-contained system with multiple munitions, it can be fired from the ground and is capable of being transported and fired from FCS manned or unmanned combat vehicles and tactical transport vehicles. NLOS LS consists of: the launch unit with individual containerized munitions and an on-board command and control capability. Munitions capabilities described in subsequent paragraphs may require the development of more than one munition variant to meet operational requirements. Variants should be the smallest number that satisfies all requirements. The system has an external mission planning software application that runs on the OF battle command system for planning and execution of multiple and simultaneous missions including engagement with different munitions. [JROC Approved FCS ORD dated 14 May 2003]

operational availability Unlike inherent availability, covers all segments of time that the equipment is intended to be operational. The same up-down time relationship exists but has been expanded. Up time now includes operating time plus non-operating time (stand-by) time (when the equipment is assumed to be operable). Down time has been expanded to include preventive and corrective maintenance and associated administrative and logistics lead time. All measured in clock time. [Test and Evaluation of System Reliability Availability Maintainability]

operational environment (OE) The composite of all conditions, circumstances, and influences which affect the employment of military forces and bear on the decisions of the unit commander. [JP 1-02]

overmatch A quantitative or qualitative disparity of such magnitude that the stronger force overwhelms the weaker. Overmatch applies to one or all of the elements of combat power in combination. Rapid tempo, offensive information operations, and lethal fires combine to disrupt enemy C2 and create a condition of information superiority. Fire support, force protection capabilities, and maneuver neutralize

enemy fire support. Supported by indirect and joint fires, maneuver forces close with the enemy complete his destruction with close combat. [FM 3.0]

pattern analysis The examination and comparison of activities to determine the correlations between events, behaviors, or relationships. [Fm 34-10]

position of advantage Encompass key and decisive terrain within the area of influence when a commander has limited numbers of forces for the size of his AO. Key terrain is any locality, or area, the seizure or retention of which affords a marked advantage to either combatant. Decisive terrain, when present, is key terrain whose seizure and retention is mandatory for successful mission accomplishment. Positions of Advantage are the primary reason a commander may decide to establish noncontiguous AOs. There is risk associated with establishing non-contiguous AOs. Overcoming this risk places a premium on situational awareness and tactical mobility. [Concept derived from TRADOC Pam 525-3-90, Maneuver UA O&O Plan]

point and shoot A subset of cooperative engagement that allows a soldier or platform to designate a target for lethal engagement by another platform. The information is immediately displayed on the COP. Point and shoot implies the immediacy of effects and generally occurs within the same echelon. [TRADOC Pam 525-3-90, UA O&O Plan, by merging applicable terminology from current terms and refining them to adequately support future concepts]

precision attack munitions (PAM) One of the missiles in the NLOS-LS system that has a direct fire range of 500m to 12 km and a Glide trajectory of 12 – 50 km. Designed to kill armor vehicles it responds to mission requests from Loiter Attack Munitions or other sensors that required killing munitions. It is not designed for personnel attacks and does not have an adjust fire capability [JROC Approved FCS ORD dated 14 April 2003]

precision guided mortar munitions (PGMM) A mortar munitions that executes top attack with first round kill capability with a range of at least 12 kms. [JROC Approved FCS ORD dated 14 April 2003]

precision maneuver Enabled by information dominance, precision maneuver represents a change in the tactical maneuver paradigm. Instead of engaging the enemy in a movement to contact to develop the tactical situation, the UA is designed and equipped to develop the situation before contact. With all of its capabilities the UA has a much better chance of finding or creating the seam or the covered route through or around the enemy defense than current heavy forces do today. (TRADOC PAM 525-3-90, UA Maneuver O&O0

The explicit engagement of high payoff enemy capabilities, unencumbered by contemporary requirements, to develop the situation out of contact and engage incidental enemy forces enroute to the decisive point. A commander can develop the situation with information, fires and agile supporting actions.

pulsed sustainment The intermittent multi-modal flow of goods and services (to include personnel services) integrated into the maneuver commander's battle rhythm to sustain or rebuild combat power. It obviates the requirement to maintain secure LOCs at all times and in all places within a non-contiguous battlespace; and may be used in conjunction with either sustainment replenishment or mission staging events. Force protection assets are required to temporarily secure LOCs and event sites as determined by mission, enemy, terrain and weather, troops and support available, time available and civil considerations (METT-TC). [TRADOC PAM 525-4-0, Maneuver Sustainment Operations]

quality of firsts (QoF) See First, Understand First, Act First, and Finish Decisively [Outlined in the US Army White Paper "Concepts for the Objective Force"]

quality of service (QoS). Transport systems provide QoS capabilities that ensure that information identified as priority is delivered ahead of regular traffic 99% of the time (WIN-T ORD Threshold, KPP) and 99.9% of the time [WIN-T ORD] Required QoS factors include:

- Prioritization. End users assign a priority to information targeted for transport.
- Response time. Transport capabilities designed to meet or exceed customer stated response times.

- Precedence. Data receives expedited handling during transport in accordance with the commander's policy and user assigned priority.
- Reliability. Deliver information guaranteed in accordance with its assigned broadcast level.
- Latency. Deliver information in real and/or near real time as required.

real time Pertaining to the timeliness of data or information, which has been delayed only by the time required for electronic communication. This implies that there are no noticeable delays. Real time is directly related to the delivery of survival information that requires immediate action such as to attack the enemy, avoid being attacked, and/or to prevent fratricide. It is, therefore, extremely time sensitive. (IAW Table C real time delivery of survival information is ≤ 5 seconds) (IDM CRD) [WIN-T ORD]

recognition 1. The determination by any means of the individuality of persons, or of objects such as aircraft, ships, or tanks, or of phenomena such as communications-electronics patterns. 2. In ground combat operations, the determination that an object is similar within a category of something already known; e.g., tank, truck, man, the results of bombing, or on enemy movements, concentrations, activities, and forces. The primary purposes do not include making maps, charts, or mosaics.

refugee Someone seeking a safe place: somebody who is seeking or taking refuge, especially from war or persecution, by going to a foreign country [root definition taken from Encarta]

reliability - The probability that an item will perform its intended function for a specified interval, under stated conditions. It does not take into account the age of the system. [Test and Evaluation of System Reliability Availability Maintainability]

running estimate The continual flow of actionable information, predictive intelligence, visualization and presentation capabilities enabling tactical decision making and Battle Command. This provides the basis for situational awareness needed to enable the commander's understanding of the battlespace. [derived from JP 1-02 and JP 3-0]

schema An organizational or conceptual pattern in the mind based on Kant's philosophical principle that it is a method that allows the understanding to apply concepts to the evidence of the senses. [TRADOC Pam 525-3-90, UA O&O Plan; derived from Encarta Dictionary definition of schema, modified using numerous texts and academic research papers, to ensure linkage to SA and future concepts; UA O&O Concepts as taken directly from the results of Army Fellowship Research contained in The New Information Technology Model; A Paradigm Shift in Information Technology System Development]

self healing The network management capability will sense any degradation of the network and, based on user or system profiles, automatically adjust the allocation of network resources to ensure the continued flow of critical information. Responses could include dynamic reallocation of bandwidth, or restricting user access to the network or to certain network features based on command-established parameters. [TRADOC Pamphlet 525-3-0.1]

sensor An equipment which detects, and may indicate, and/or objects and activities by means of energy or particles emitted, reflected, or modified by objects. [Concept derived from worked developed in TRADOC Pam 525-3-90, Maneuver O&O]

sensor fusion A process in which data, generated by multiple sources (sensors), is correlated to create information and knowledge. Sensor information, when fused, may yield immediately actionable combat information and/or intelligence. The capabilities are of four essential types: Detection, Classification, Recognition, and Identification. [Objective Force Fusion White Paper, 14 March 2003]

sensor to shooter The information link from a target acquisition capability to the fires platform(s) that engage(s) the target. [Concept derived from worked developed in TRADOC Pam 525-3-90, Maneuver O&O]

shielding fires Fires capability that eliminate the enemy's long-range precision fires. To accomplish these tasks, the UE requires "reach" to Joint sensors and fires, and organic precision, extended range fires capabilities, linked to precise sensors. UE echelons must be provided with capabilities for long range shaping and interdiction. Of particular importance, is the ability to destroy the enemy's long-range ballistic and cruise missiles, rockets, artillery, mortars, UAVs, and command systems. Objective Force

UE will have organic capabilities to conduct long-range strike, or temporarily influence operations within the UE's operational area. Fire UA's, located with the UE, will provide a broad array of lethal and non-lethal precision munitions with ranges extending beyond 40 km. [Concept derived from worked developed in TRADOC Pam 525-3-90, Maneuver O&O]

single integrated air picture (SIAP) The product of fused, common, continuous, unambiguous tracks of all airborne objects in the surveillance area. Each object in the SIAP has one, and only one, track number and set of associated characteristics. The SIAP uses fused near real time and real time data, scaleable and filterable, to support situational awareness, battle management, and target engagements. [2010 Theater Air and Missile Defense Concepts]

situational awareness (SA) The perception of elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the future. In generic terms the three levels of situational awareness are level 1 (perception) level 2 (comprehension) and level 3 (projection). There is both individual and group (sometimes called Team) situational awareness. {Concept derived from TRADOC Pam 525-3-90, Maneuver O&O, Modeling and Measuring Situational Awareness in an Infantry Operational Environment (Endsley, Holder, Leibrecht, Garland, Wampler, Matthews – U.S. Army Research Institute for the Behavioral and Social Sciences Report) and Theoretical Underpinnings of Situational Awareness: A Critical Review (Endsley)].

soldier as a system (SaaS) An integration concept that will provide a means to ensure Soldier DOTMLPF issues are addressed in a holistic manner and result in fully integrated Soldier system solutions for the Army. Enables the soldier to have the same situational awareness and access to the Battle Command system as if he were in his platform. The concept consists of three interrelated components:

- proposed management structure and process
- fully integrated and documented Soldier requirements
- fully integrated Soldier System architecture

[Derived from TRADOC Pam 535-1-1, Soldier as a System (coordinating DRAFT, dated 18 February 2003]

soldier system The soldier and those items and equipment that are worn, carried, or consumed by the Soldier to include items of equipment required to accomplish unit missions that must be carried by the soldier.

soldier system architecture The technical design, arraignment, and assembly of systems (or subsystems) that are compatible with and provide a capability for the Soldier (human) to perform individual tasks and unit missions in order to fulfill Army operational concepts.

space The part of the universe that extends from the upper limits of the Earth's atmosphere outward . While a precise limit cannot be ascertained, in general it begins at about the altitude above the Earth that corresponds to the lowest stable satellite orbits and above which aerodynamic forces can no longer support the control of conventional aircraft. This is usually an altitude in excess of 100 kms. [JP 1-02]

space systems All devices and organizations forming the space network. These consist of: spacecraft; mission package(s); ground stations; data links among spacecraft, mission, or user terminals, which may include initial reception, processing, and exploitation; launch systems; and directly related supporting infrastructure, including space surveillance and battle management, command, control, communications, computers.

spherical error probable Radius of a sphere within which is a 50% probability of locating a point or being located. SEP is a three-dimensional analogue of CEP. [FM 3-14 Space Support to Army Operations]

standoff Stand-off is achieved when the friendly action is accomplished outside or beyond the enemy capability to affect the friendly action. Stand-off is situational. [TRADOC Pam 525-3-90, UA O&O Plan]

survivability The ability to combine systems, tactics, operations, and processes that afford optimum protection to deployed Army forces. The combination of lethality and speed with situational awareness and a holistic approach to active and passive capabilities are essential for achieving survivable forces.

Ground and air platforms that employ the best combinations of low observability, weapon effects protection, long-range acquisition and targeting, early attack, and high first-round hit-and-kill technologies will be required to ensure the desired degrees of survivability. [derived from JP 1-02, by merging applicable terminology from current terms and refining them to adequately support future concepts and KPP 7]

sustainment replenishment operations (SRO) A quick, in-stride, sustainment operations that are conducted within a unit's battle rhythm. Sustainment replenishment can be either a deliberate or hasty operation if an opportunity exists or circumstances allow. . [TRADOC Pam 525-3-90, UA O&O Plan]

sustainment replenishment site Designated site where sustainment replenishment operations occur. [TRADOC Pam 525-3-90, UA O&O Plan]

system of systems (SoS) A set or arrangement of systems that are related or connected to provide a given capability. The loss of any part of the system will degrade the performance or capabilities of the whole. [Derived from CJCSI 3170.01 by merging applicable terminology from current terms and refining them to adequately support future concepts]

tactical engagement simulation An advanced collective training methodology supported by a family of TADSS used in free-play, force-on-force, field training exercises. The Tactical Engagement Simulation training system consists of three subsystems: the simulator subsystem which includes TADSS and supporting procedures that simulate casualty-producing effects of weapons in real time; the control subsystem which includes a staff of trained observer-controllers who referee, ensure realism, record events, and report actions observed through AAR's and unit take home packages; and the management subsystem which includes activities and computers to plan, schedule, conduct, and evaluate the training of battle-focused METL tasks to standard. This live simulation training system includes unique curriculum, specially trained military and civilian instructors, and life cycle contractor support personnel worldwide. [Draft CRD for the Army Training System]

tactical command post (TACP) The brigade headquarters and headquarters company has the capability of employing two separate Mobile Command Groups (MCG) and a Tactical Command Post (TACP). The TACP consists of a Command Integration Cell (CIC) that integrates and prioritizes the actions of the Information Superiority Cell (ISC), Fire and Effects Cell (FEC), Build and Sustain Combat Power Cell (BSCPC), and Maneuver and Support Cell (M&SC), which contains the Operational Maneuver Section. The UA XO resides in the CIC and is overall responsible for the TACP operation. The TACP can operate continuously 24-hours a day. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

tactical infosphere (TI) The layered, integrated network of information and communications capabilities required supporting effective tactical operations within the UE and UA. [Derived from concetuel work in TRADOC Pam 525-3-90, Maneuver O&O]

target location error (TLE) Generally characterized as the percentage of locations computed that are within a certain distance of the actual firing location for a specific type of projectile. TLE is generally characterized as the radius in meters from the actual weapon locations that 90% and 50% of the computed weapon locations would be located. TLE is an important factor in determining the method of target attack. [FM 3-09.12 Tactics, Techniques, and Procedures for Field Artillery target acquisition]

teaming The linking of platforms, forces, or systems to complete a mission or task collectively that would be more difficult to do if the units acted separately. The process is characterized by distributed operations and high tempo maneuver, which demands rapid synchronization, swift adaptation of plans and control measures, flexible groupings of distributed staff elements, direct exchanges between commanders across hierarchies. For example, manned and unmanned platforms can be teamed to emphasize their complementary strengths. . [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

terrain The physical features of the ground surface, to include the subsurface. These physical features include both natural (e.g., a hills) and manmade (e.g., pipelines) features. Major terrain types are delineated based upon local relief, or changes in elevation, and include: flat to rolling, hilly and mountainous. Other important characteristics used to describe the terrain include: hydrologic features (e.g., swamps), vegetation characteristics (e.g., forests) and cultural features (e.g., cities). Complex

terrain includes any characteristics or combination of characteristics that make military action, such as maneuver, difficult. Mobility classes are also used to describe the trafficability of the terrain. The three mobility classes are: unrestricted, restricted and severely restricted. [Derived from FM 30-10, Military Geographic Intelligence (Terrain) and FM 34-130, Intelligence Preparation of the Battlefield]

terrain visualization A component of battlefield visualization that provides a detailed understanding of the background upon which enemy and friendly forces and actions are displayed. Terrain visualization provides common terrain background for all users and all applications. Additionally, terrain visualization allows interactive planning and mission rehearsal. Terrain visualization includes both natural and man-made features to include impacts of terrain on vehicle speed, maintenance, river-crossing operations, cross-country trafficability, and maneuverability. Terrain visualization includes the subordinate elements of data acquisition, analysis, database management, display and dissemination. [Derived from TRADOC Pamphlet 525-41, Topographic Support for Terrain Visualization and TRADOC Pamphlet 525-70, Battlefield Visualization Concept]

theater missile defense (TMD) The integration of joint force capabilities to destroy enemy theater missile in flight or prior to launch or to otherwise disrupt the enemy's theater missile operations through an appropriate mix of mutually supportive passive missile defense; active missile defense; attack operations; and supporting command, control, communications, computers, and intelligence measures. Theater missiles are those that are aimed at targets outside CONUS (ballistic, cruise, or air-to-surface missiles not including short-range, non nuclear, direct fire missiles, bombs, or rockets). [JP 3-01.5 Doctrine for Joint Theater Missile Defense]

theater support vessel (TSV) The next generation of Army watercraft to support the Army's doctrinal intra-theater lift mission. Capable of operational maneuver from stand-off distances and into five times as many ports, it provides rapid, intra-theater lift of ready-to-fight combat forces together with their equipment. TSV offers the Joint Force Commander a multi-modal and multi-purpose platform to support joint operations that complements C-17 and C-130 airlift capabilities. [Theater Support Vessel Mission Needs Statement]

total asset availability (TAV) The capability to immediately access timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, materiel, and supplies. It also includes the capability to act upon that information to improve overall performance of the sustainment system. [TRADOC PAM 525-4-0, Maneuver Sustainment Operations]

transportability The ability of material to be moved by towing, self-propulsion, or carrier via any means, such as railways, highways, waterways, pipelines, oceans, and airways. [JP 1-02]

unattended ground sensors (UGS) Small, low cost, robust sensors, capable of operating in the field for extended periods of time (30 days or more). They will consist of modular groups of sensors utilizing tailorable ground sensing technologies, such as seismic, magnetic, infra-red, acoustic, radio frequency, and CBRN detection and other advanced sensing capabilities. UGSs self-organize into a networked sensor array (sensor web) by locating the most efficient gateways for transmission of information. They are also self-healing, able to quickly bypass a neutralized gateway and locate a functional one within the sensor web. [Derived from conceptual work in TRADOC Pam 525-3-90, Maneuver O&O]

understanding The ability to perceive and explain the meaning or nature of somebody or something. [Encarta New World Dictionary, Army Fellowship Research contained in The New Information Technology Model; A Paradigm Shift in Information Technology System Development that focused on Enroute Mission Planning and Rehearsal and as briefed to the Army and Defense Science Boards establishes the critical linkage between SA and the training required to achieve future force capabilities.]

unit configured load A unit-configured load is a load of supplies built to fill specific unit requirements. [TRADOC PAM 525-4-0, Maneuver Sustainment Operations]

unit of action (UA) Tactical level organizations that accomplish discrete sets of functions in accordance with prescribed mission-essential tasks. UAs are further designed as modular organizations that can be combined and integrated as the basic building blocks of combined arms combat power to form larger formations. Represented today by the echelons of section through brigade, units of action will vary in size

and number of organic sub-units, dependent on the battlefield functions performed by the unit and its organic capabilities. [TRADOC Pam 525-3-92 dated 2 June 2003]

unit of employment (UE) Highly tailorable, higher-level echelons that integrate and synchronize Army forces for full spectrum operations at the higher tactical and operational levels of war/conflict. Focused on major operations and decisive land campaigns in support of joint operational and strategic objectives, units of employment participate in all phases of joint operations from initial entry to conflict termination in any form of conflict and operating environment. The UE will be capable of command and control (C2) of all Army, joint, and multinational forces. It will be organized, designed, and equipped to fulfill C2 functions as the Army Forces (ARFOR) Component, Joint Force Land Component Command (JFLCC), or the Joint Task Force (JTF). The UE will also have the inherent capacity to interact effectively with multinational forces as well as with interagency, non-governmental organizations, and private volunteer organizations. In historical terms, UE represents the field army, corps and division. [TRADOC Pam 525-3-92 dated 2 June 2003]

unmanned aerial vehicle (UAV) Organic aerial systems to the UA and its subordinate organizations, functioning under a tiered approach. UAVs are part of this approach, enabling air-to-air, and ground-to-air teaming. This section contains the requirements common to at least two of the UAV within this ORD. There are four echelons of UAV capabilities covered by this section. The echelonment is expressed in terms of classes of systems and expressed in terms of the unit echelon they normally support: UAV Class I – Platoon Level; UAV Class II – Company Level; UAV Class III – Battalion Level; and UAV Class IV – Brigade Level. Each of these classes has an appendix attached below. The UAVs in the FCS FoS will all be modular and multifunctional capable of multiple, tailorable capabilities. [JROC Approved FCS ORD dated 14 April 2003]

unmanned ground vehicle (UGV) A family of systems to include ARVs (Light, Assault and RSTA), MULE, and SUGV. This array of UGVs performs routine and dangerous missions. The “robots” reduce risks to soldiers and frees soldiers from routine tasks like guarding a perimeter to allow those soldiers to do other tasks or sleep. The UA has a combination of high end and low-tech robots. This combination is important. High-end robots give you increased capabilities and precision. Low-end robots are expendable in high-risk tasks. They can be outfitted with mission equipment packages carried on-board the ICV, such as RSTA. The bottom line is when UA infantry platoons dismount they have the same capability as they had from its ICV. [Derived from concepts in TRADOC Pam 525-3-90, maneuver O&O]

vertical envelopment An operational and tactical maneuver in which troops, either air-dropped or air-landed, are by their initial positioning able to launch attacks the rear and flanks of a force from an unexpected direction and position of advantage. [FM 3-0 and FM 3-90]

wisdom The knowledge and experience needed to make sensible decisions and judgments; accumulated learning; accumulated knowledge of life or in a particular sphere of activity that has been gained through experience. [Encarta New World Dictionary, Army Fellowship Research contained in The New Information Technology Model; A Paradigm Shift in Information Technology System Development that focused on Enroute Mission Planning and Rehearsal and as briefed to the Army and Defense Science Boards]

ANNEX B UE CONSIDERATIONS

Units of Employment (UE's) are highly tailorable, higher-level echelons that integrate and synchronize Army forces for full spectrum operations at the higher tactical and operational levels of war/conflict. Focused on battles, major operations and decisive land campaigns in support of joint operational and strategic objectives, UE participate in all phases of joint operations from initial entry to conflict termination in any form of conflict and operating environment. The UE is capable of command and control of all Army, joint, and multinational forces. It will be organized, designed, and equipped to fulfill C2 functions as the Army Forces (ARFOR) Component, Joint Force Land Component Command (JFLCC), or the Joint Task Force (JTF). The UE will also have the inherent capacity to interact effectively with multinational forces as well as with interagency, non-governmental organizations, and private volunteer organizations. In historical terms, the UE represents the field army, corps and divisions.

B.1 Joint Framework Missions
B.2 UE Employment
B.3 UE Enablers to the UA
B.4 Multifunctional UAs

B.1 Joint Framework Missions

The decision to create a formation at a certain echelon is primarily based on the mission the unit (component) is tasked to execute. As Figure B-1 illustrates, missions can relate to objectives at the National level, as part of the Strategic Theater campaign strategy, for subordinate campaigns and major operations, and finally, for battles and engagements. Tasks that must be executed in performing those missions are also divided into four hierarchical categories ranging from Strategic National down to the Tactical level. Joint and Army doctrine maintain that those tasks must be executed in order to realize the corresponding objectives. As the execution of those tasks relates to echelonment, the question is not whether the tasks must be accomplished, rather at what echelon does task accomplishment occur.

Joint Framework	
Joint Tasks Organized as	**Accomplished Objectives of:**
Strategic National	**National Military Strategy**
Strategic Theater	**Theater and Campaign Strategy**
Operational	**Subordinate Campaigns and Major Operations**
Tactical	**Battles and Engagements**

Figure B-1 Joint Framework for Task Accomplishment

If certain tasks must be completed at each level, then the next question is whether an echelon need be established to execute those tasks. The nature of the tasks themselves assists us in this determination. As one moves from the tactical to the strategic level, certain characteristics of those necessary tasks becomes apparent. First, the duration of task accomplishment and complexity involved in performing the tasks increases (i.e., operational level tasks are more complex and take more time to execute than tactical level tasks).

Second, the magnitude, or degree of risk if not executed, of task accomplishment increases. Finally, the amount of joint, interagency and multinational coordination and integration necessary in task accomplishment increases. Figure B-2 illustrates these points.

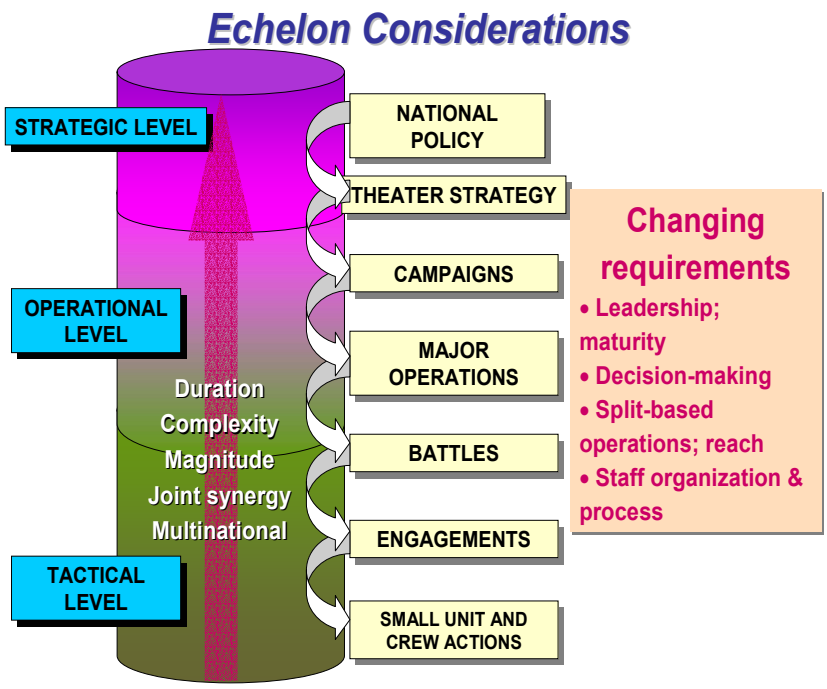


Figure B-2 Echelon Considerations

The implications in terms of echelonment of this discussion are: because tasks of variable duration, complexity, magnitude, Joint-Interagency-Multinational (JIM) integration must be executed, the decision on where those tasks are executed determines the echelons that need be formed for that contingency. Our work to date has led us, using a "Units of Purpose" analytical framework that categorizes echelons as either Units of Action or Units of Employment, to the construct depicted in Figure B-3.

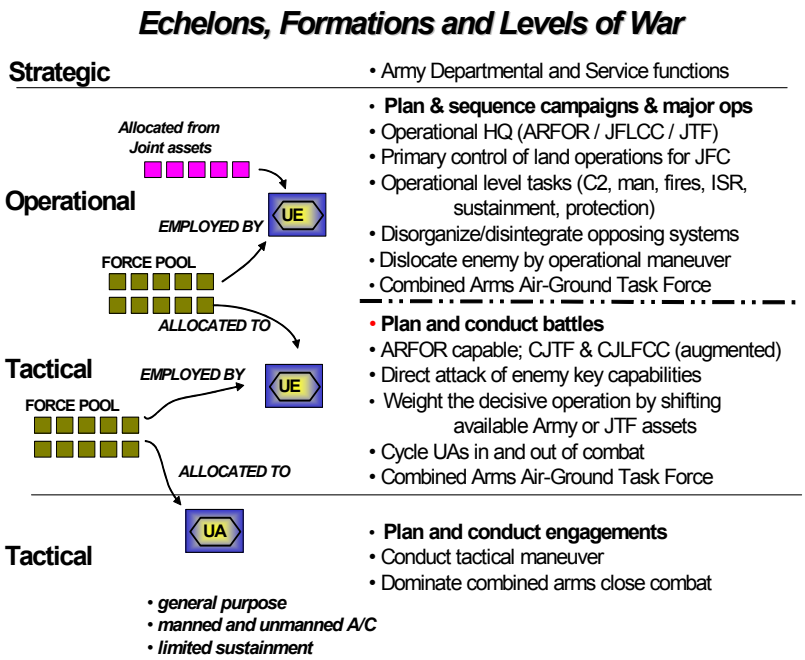


Figure B-3 Echelons, Formations and Levels of War

B.2 UE Employment

UEs both employ assets/capabilities from a force tailored pool of subordinate units and allocate assets to subordinate formations. The major functions of each level of UE, as well as the inclusion of Strategic Theater responsibilities and the identification of Units of Action as a necessary subordinate formation is summarized above. The number of Units of Employment necessary to provide Combatant Commanders the capabilities needed and their specific organization may certainly vary from mission to mission. Depending on the contingency one or more UE echelons will be committed and organized appropriately. Figure B-4 illustrates different examples of UE echelonment. In the first case, a single UE is employed given the expected duration and complexity of the mission with an equal focus on operational and tactical task execution/supervision. In the second, multiple UEs are required because of changes in those conditions.

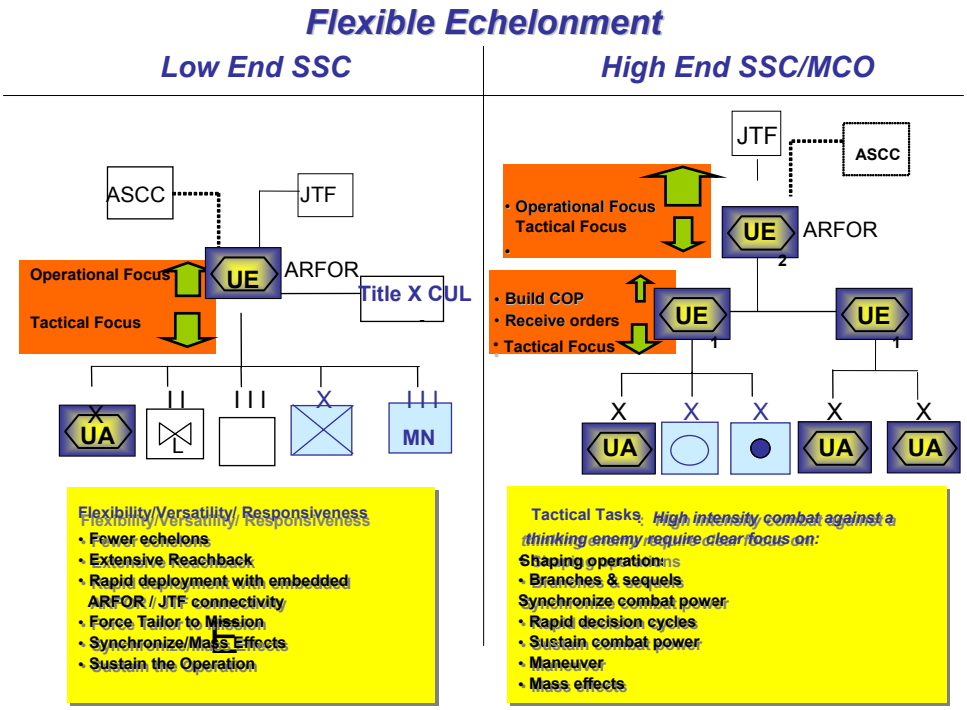


Figure B-4 Examples of Flexible Echelonment

UE operations will always be preceded by the “prepare and posture” phase. UE prepare and posture activities will include: home station readiness activities and preparation for deployment; campaign force tailoring from force pools, augmentation, if required, of C2 to perform roles as JTF or JFLCC; initial deployment and campaign planning, accomplished collaboratively with joint C2 echelons; configuration of the strategic-to-JOA sustainment linkages required to support the campaign; establishment of C2 linkages within the JTF/CJTF structure (and with forward deployed elements, such as SOF); initial efforts to posture the C4ISR network of networks necessary to support operations; and other critical actions to enable rapid, effective strategic response.

At this stage in the development process, we see the UE being comprised of a multifunctional HQ, with most or all other elements of it tailored based on mission. This relatively small organization facilitates rapid deployment for strategic responsiveness, yet provides all the C2 and functionality necessary for rapid augmentation and initial operations. The UE headquarters will be sufficiently robust to detach one or more task force C2 elements from its organic structure, when required, in order to establish temporary subordinate echelons Each subordinate organization provides the functions and capabilities that are likely to be required during contingency operations. They will also be staffed and equipped to immediately exploit capabilities and infrastructure that may already exist within the operational theater,

such as existing communications networks, other-than-military forms of support, local sources of information, and host nation military infrastructure. When alerted for deployment, the UE will be rapidly expanded into a larger formation through force tailoring, per the specific requirements of each conflict. The unit of employment relies on the concept of force pooling and habitual peacetime associations to build cohesive, effective larger formations in conflict. An example of UE force pooling and association appears below.

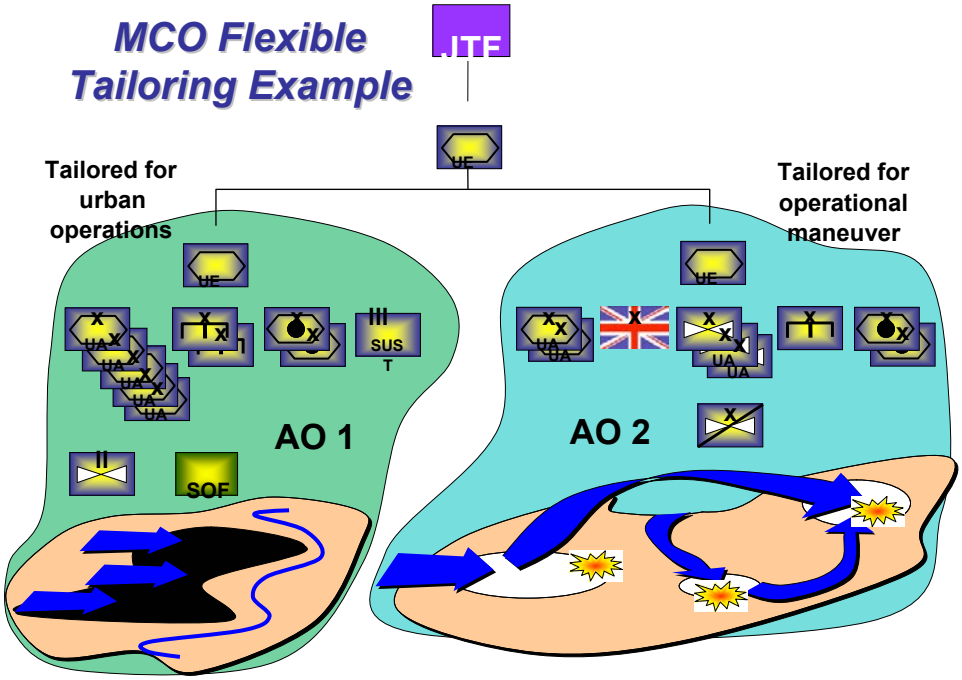


Figure B-5 Example of Mission Tailored Units of Employment

Typically, UEs will require assignment of subordinate units of action representing all tactical task areas. However, as suggested above, the numbers and types of those UAs will vary for each conflict. For example, one contingency may present conditions wherein a single aviation lift unit of action is all that is required in terms of aviation augmentation for the UE, while another may require the combination of several aviation UAs into a larger (temporarily established) aviation formation subordinate to the UE. In most cases, the broad geographic and extensive functional requirements of the operationally focused UE will require a large variety of subordinate, functionally based formations to be mission tailored to it for each conflict. Mission tailoring may also include augmentation by both RC units and staff elements, the UE being the echelon most suitable for incorporation of RC elements. The modular nature of subordinate UAs and the commonality inherent within their organization permits rapid initial tailoring as well as retailoring during the course of an operation to adapt to the changing situation.

As described here, force/mission tailoring differs from traditional practice in two primary respects. First, because of the combined arms capabilities organic to UA force tailoring or task organization may be required less at that level. Second, the organizational principles of modularity, commonality, and force pooling should make force tailoring easier and introduce fewer of the C2 and sustainment challenges that sometimes complicated traditional task organization in the past. As a result of this process, the elements of combat power and sustainment will be appropriately balanced for each contingency, campaign, and battle. Units of Action and Units of Employment are generally interdependent. The external support UA commanders can employ or benefit from during the fight is fundamental to success at the small unit level; thus, the somewhat traditional relationship between the UE and the UA will be different in this construct. Continual development of the UE over time will further refine how UE considerations effect UA operations.

B.3 UE Enablers to the UA

In Chapter 1 paragraph 1.4 we discussed the roles of the UE. One of the roles of the UE is to provide the enablers to the UA whose mission is to accomplish full spectrum operations in all terrain sets. Based on METT-TC, the UA may require UE augmentation in order to accomplish its assigned missions. The following task lists are examples of enablers that the UA may require from the UE.

B.3.1 Exercise Command and Control

- Establish network backbone and communications in a Joint environment.
- Provide the C2 for the aerial envelopment of a UA.
- Execute JIADS.
- Provide the necessary A2C2 architecture.
- Provide the C2 and synchronization for several UA's fighting battles or campaigns.
- Integrate Army and Joint assets.
- Coordinate for HSOC reach back capability.

B.3.2 Deploy/Conduct Maneuver

- Support to initial UA entry operations.
- Secure austere points of entry (semi-permissive/non-permissive).
- Provide air assault support for:
    - Lift (UH-60/CH-47) for battalion size air assaults.
    - Lift security and initial LZ security.
    - SEAD for operations beyond FCS ranges.
- UE augmentation for:
    - Engineer mobility functions (gap crossing, mine neutralization).
    - Breaching capabilities.
    - Construct/emplace obstacles.

B.3.3 Develop Intelligence

- Provide Counter Intelligence, HUMINT and Electronic Warfare.
- Provide initial layered sensor collection.
- Integrate SOF.
- Execute deep surveillance and reconnaissance.
- Provide intelligence fusion of Joint and national assets.

B.3.4 Employ Firepower

- Provide Air and Missile Defense for counter-air and counter-recon.
- Ensure overlapping counterstrike target acquisition coverage of UA AO.
- Shape and isolate the battlespace.
    - Fix enemy for operational maneuver.
    - Provide deep attack.

- Execute deep fires.
- Provide deep recon.

- Deliver/employ layered sensors (UGS, IMS, etc.).

B.3.5 Protect the Force

- Shield forces from event TBM, rocket, long range artillery, provide ADA network.
- Provide survivability operations (digging assets).
- Provide MP functions and augmentation (EPW, CI operations, MSR security).

B.3.6 Perform Logistics and Combat Service Support

- Provide aerial resupply and CASEVAC.
- Provide mission staging operations.
- Perform selected platform and aviation maintenance
- Provide general engineer support (CMO).
- Execute personnel action and legal support.

B.3.7 Operate in a CBRN Environment

- Execute CBRN recon and decon.
- Provide obscurant employment (large areas/generation).

B.4 Multi-functional Units of Action

The creation of the Stryker Brigades and the UA brigade as true combined arms teams, with most of their critical capabilities organic to the brigade, demonstrates the utility of creating full time combined arms teams. This approach recognizes the realities of both employment and training in combined arms. For those capabilities that are normally employed together, and that have significant training requirements, putting these assets permanently in a single organization facilitates training and employment by creating a strong bond between the various elements and allowing for much stronger cohesion at small unit level than is possible when disparate elements are only brought together as a task organization.

Multi-Functional UA

Means to Achieve Multi-Functional UA

- **Purely Ad Hoc** – No special design; created out of existing HQ with tailored forces.
- **HQ Design** – Based on branch pure UA, but HQ designed for an additional specific task. Unit must be tailored for the task.
- **Standing Combined Arms UA** – HQ designed for a functional task and all routine assets required are assigned to the HQ.

Criteria for Organizing

Means / Criteria	Ad Hoc	HQ Design	CA UA
Frequency of use as Multi-Functional UA	Infrequent / Moderate	Moderate/ Frequent	Frequent
Utility to Joint Forces	Low/ Moderate	Moderate/ High	High
Complexity of CA Training Task	Low	Moderate	High
Risk of failure without training	Low	Moderate	High

Figure B-6 Multifunctional UAs

This idea is being explored for its application to other potential combined arms teams. In order to assess the utility of other combined arms teams of permanently organized forces with multiple branch components, the UE ICT has used two concepts to move this idea forward. First, it has looked at three ways to create combined arms teams. Second, it has established a set of criteria to evaluate the utility of a given permanently organized combined arms team. Both of these concepts are depicted in Figure B-6. Several different Multifunctional UAs, beyond the FCS equipped maneuver UA, are being considered and evaluated against these criteria.

ANNEX C UA MISSIONS

C.1 Introduction

UA Mission. The UA rapidly deploys anywhere in the world in 96 hours after liftoff as a fully integrated combined arms force to conduct combat operations as part of either a UE or JTF. The UA conducts the full spectrum of military operations including deterrence, homeland security, stability operations, support operations, SSC to restore peace and stability, global war on terrorism, and is optimized fir the offense in MCO. It is organizationally designed to conduct these operations in all types of terrain and in any weather condition.

C.1 Introduction
C.2 Army METL
C.3 Full Spectrum Operations
C.4 Tactical Constructs
C.5 UA Missions

The UA is optimized to:

- Perform fully integrated tactical maneuver and assaults to close with and destroy the enemy.
- Take advantage of overmatching lethality in standoff.
- Use mobility, survivability and knowledge against threats in any organizational environment.
- Perform integrated air ground operations.
- Develop the situation with external and organic assets.
- Synchronize the elements of combat power through an assured network centric command and control structure.

C.2 Army METL

The Army METL is derived from statutory requirements, operational experience, strategies for employing military forces and operational requirements of the combatant commanders. They're an operational expression of the Army's Core Competencies. (JP 3-0)

- Shape the security environment.
- Respond promptly to crisis.
- Mobilize the Army.
- Conduct forcible entry operations.
- Dominate land operations.
- Provide support to civil authorities.

C.3 Full Spectrum Operations

For war to be decisive, its outcomes must be conclusive. The Army forces of today are the unsurpassed land force in the world. This preeminence, translates into the ability to dominate land operations, the decisive component to air, sea and space operations. Land operations seize the enemy's territory and resources, destroy his armed forces and eliminate his means of controlling his population. Ultimately, it is the ability of Army Forces to close with and destroy the enemy that allows the Army to dominate land operations. Sustained land operations establish the conditions required for long term national objectives. Army forces can conduct sustained, large scale full-spectrum operations throughout the theater of operations. Full spectrum operations include offensive, defensive, stability and support operations (FM 3-0).

- Offensive operations aim at destroying or defeating an enemy. Their purpose is to impose US will on the enemy and achieve decisive victory.
- Defensive operations defeat an enemy attack, buy time, economize forces, or develop conditions favorable for offensive operations. Defensive operations alone normally cannot achieve a

decision. Their purpose is to create conditions for a counteroffensive that allows us to regain the initiative.

- Stability operations promote and protect US national interests by influencing the threat, political, and information dimensions of the operational environment through a combination of peacetime developmental, cooperative activities and coercive actions in response to crisis.
- Support operations employ Army forces to assist civil authorities, foreign or domestic, as they prepare for or respond to crisis and relieve suffering.

C.4 TACTICAL CONSTRUCTS

IAW with Universal Joint Task List (UJTL) the Tactical Constructs listed below will be incorporated to replace the current Battle Field Operating System (BOS) and Battlefield Functional Area (BFA). The purpose is to instill a common “joint” language with the other services. This is critical given the Units of Employment will be both Army and Joint by design, and the UA must be able to work directly for Joint Task Force in a small- scale contingency.

- Deploy/conduct maneuver.
- Develop intelligence.
- Employ firepower.
- Perform logistics and combat service support.
- Exercise command and control.
- Protect the force.
- Operate in a CBRNE environment.

C.5 UA Missions

Based on the definitions of tactical missions and operations in FM 3-0, the UA will be able to execute the following missions:

- Conduct offensive operations.
  - Movement to contact.
  - Attack.
  - Exploitation
  - Pursuit
- Conduct defensive operations.
  - Mobile defense.
  - Area defense.
- Conduct stability operations.
  - Peace operations.
  - Foreign internal defense.
  - Security.
  - Human and civic assistance.
  - Support to insurgencies.
  - Support to counter drug operations.
  - Combating terrorism.

9015 ▪ Noncombatant evacuation operations.
9016 ▪ Arms control.
9017 ▪ Show of force.
9018 • Conduct support operations.
9019 ▪ Domestic support operations.
9020 ▪ Foreign humanitarian assistance.
9021 • Conduct security operations.
9022 ▪ Screen.
9023 ▪ Guard.
9024 ▪ Area security.
9025 ▪ Local security.
9026 • Conduct reconnaissance operations.
9027 ▪ Zone.
9028 ▪ Route.
9029 ▪ Area.

Critical Task is a collective or individual task a unit or individual must perform to accomplish their mission and duties and to survive in a full range of Army operations. Critical Task must be trained.

TRADOC Reg. 350-70

9030 The UA is able to conduct the following critical tasks:
9031 • Conduct sensor fusion and pattern analysis of combat information and intelligence.
9032 • Conduct ISR operations.
9033 • Deploy within 96 hours.
9034 • Conduct aerial envelopments to operational depth.
9035 • Conduct a terrain-oriented attack.
9036 • Conduct a force-oriented attack.
9037 • Conduct area security operations
9038 • Conduct battalion size air assault operation.
9039 • Conduct combined arms breach.
9040 • Conduct urban operations.
9041 • Employ networked fires.
9042 • Conduct JAAT.
9043 • Conduct defensive CBRN operations.
9044 • Establish liaison for Current, Joint and Coalition forces.
9045 • Maintain the DIDb to provide a COP.

- Execute A2C2.
- Conduct BCOTM.

ANNEX D BRIGADE STAFF FUNCTIONS

D.1 Unit of Action Staff Design

D.1 Unit of Action Staff Design
D.2 Command Integration Cell
D.3 Information Superiority Cell
D.4 Fires and Effects Cells
D.5 Maneuver and Support Cell
D.6 Build and Sustain Combat Power Cell
D.7 Religious Support Team
D.8 Staff Process
D.9 Human Resource Support

The staff assists the commander with his battlefield visualization by collecting, processing, analyzing, and transforming data into knowledge, allowing the commander to apply his judgment to achieve understanding of the situation in the form of his vision. The staff then helps him communicate his battlefield visualization to his subordinates by preparing orders and informational products to achieve a common operational picture and situational awareness. An information network must be in place and operating to support battlefield visualization. The Objective Force UA staff structure is comprised of a Command Integration Cell, an Information Superiority Cell, Fires and Effects Cell, a Build and Sustain Combat Power Cell, and a Maneuver and Support Cell. While the Command Integration Cell has the specific task of integration, all cells interact with each other as well as through the Command Integration Cell. A control feature of this framework is the staff link to reach for additional help.

This model applies to the brigade and battalion constructs and will be refined through further analysis and CEPs. At the battalion level, some of the capabilities will not be as robust as at the Brigade due to manning/ primary functional area expertise. However, the battalion staff will be able to query UA and higher staffs as needed for resources and expertise.

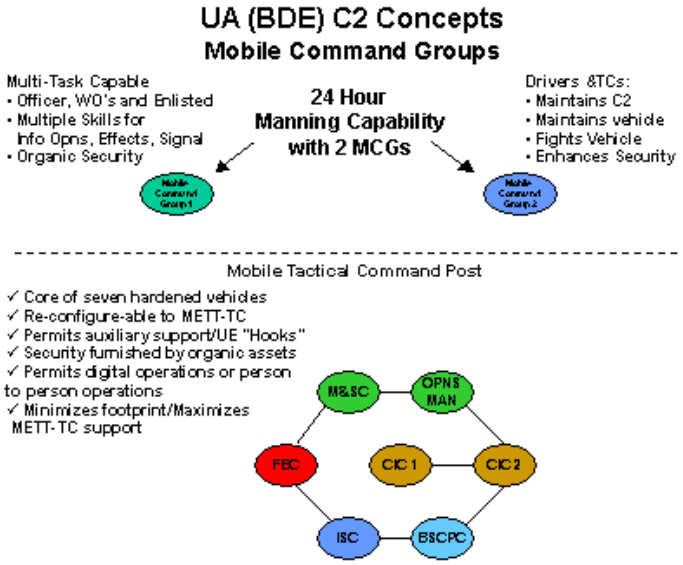


Figure D-1 Concept of the Tactical Command Post

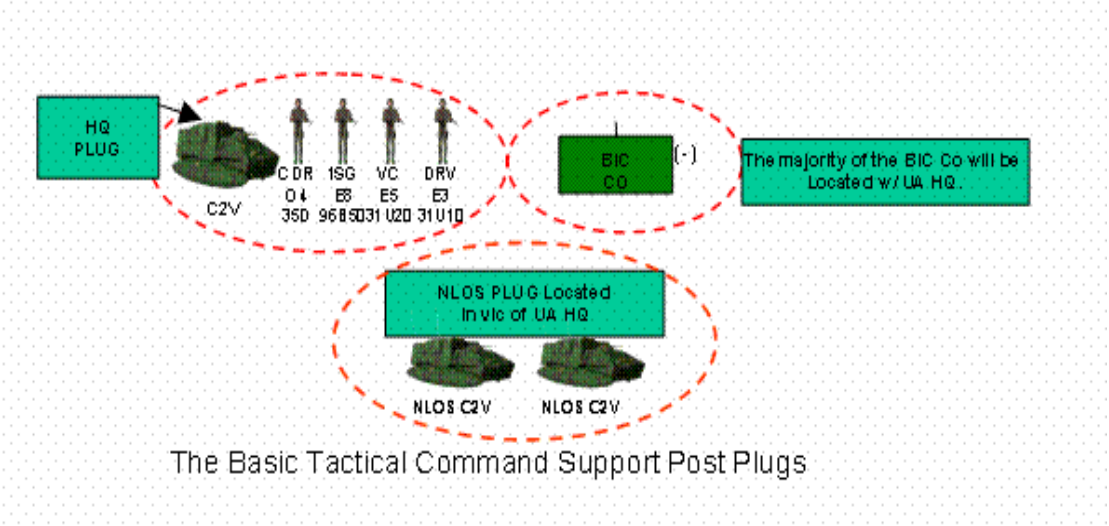


Figure D-2 TACP Supporting Plugs

D.2 Command Integration Cell

The Command Integration Cell's (CIC) primary focus is facilitating the commander's leadership and decision-making functions by integrating and synchronizing the efforts of the multi-functional cells. This cell will be composed of a small number of multi-functional officers/NCOs conversant with the expertise afforded by the four multi-functional nodes.

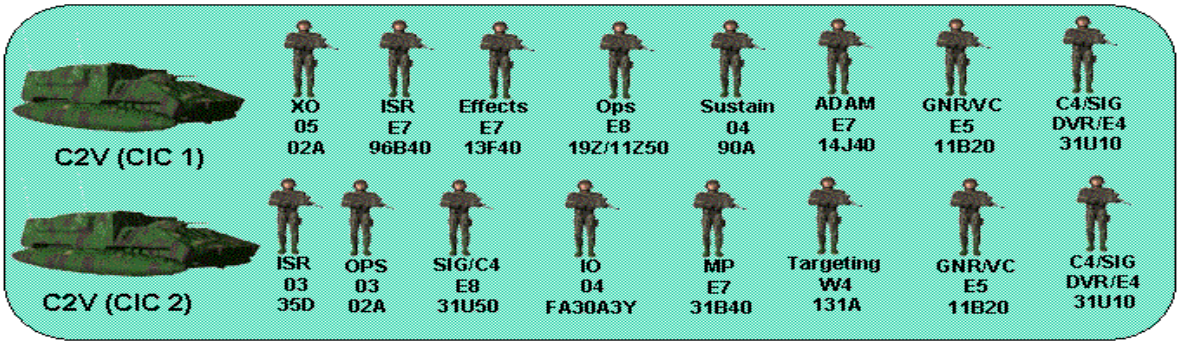


Figure D-3 CIC Organization and Manning

Specific additional areas of responsibility for CIC are:

- Initiates the planning process by providing intent and guidance.
- Synchronizes the execution of the planning process.
- Develops the overall concept for operations at the macro, "mission order" level with sufficient detail for the multi-functional nodes to provide executable fidelity.
- Monitors the development and refinement of nodal plans ensuring unity of effort between nodes.
- Performs the overall battle tracking function during execution.
- Monitors and presents the COP.
- Orchestrates and supervises all friendly force operations.
- Synchronizes C4ISR operations.

- Provides liaison with higher and adjacent headquarters.
- Responsible for anticipating and managing transitions between operations (i.e. offensive/defensive, delays, stability operations and air assaults).

D.3 Information Superiority Cell

The Information Superiority Cell (ISC) has two primary focuses: to develop and maintain the knowledge edge over the enemy, and to coordinate, plan and manage the UA information network. This cell will have staff expertise traditionally represented by signal, intelligence, and information operations. Space and public affairs tasks are performed in the ISC with augmentation.

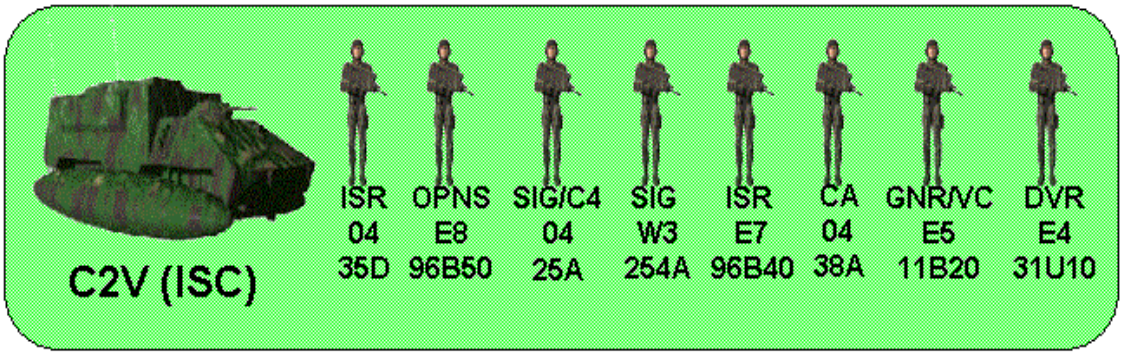


Figure D-4 ISC Organization and Manning

The information superiority cell executes staff planning functions to reach this knowledge advantage. These include planning, focusing, synchronizing and executing employment of surveillance, reconnaissance and communication assets. When planning for network operations, the ISC provides deception, intelligence, collection management, and intelligence planning and analysis. The ISC also coordinates and manages UA frequency spectrum requirements, and the communication network infrastructure (radio nets, IP addressing schemes, address/phone control, COMSEC) both internal and external to the UA. While it is the primary duty of the ISC to manage the collection and sensor effort, the CIC also ensures overall sensor fusion (local sensor fusion occurs at multiple levels and staff nodes). The Info Superiority Cell:

- Directs the planning and management functions essential to all knowledge based warfare.
- Determines collection requirements as part of the planning process.
- Manages human and technical sensors to produce the COP.
- Employs intelligent ‘assistants’ throughout the force to quickly correlate and de-correlate information and employs learning algorithms to compare this data to a historical repository for pattern and predictive profiling.
- Refines the threat picture by processing spot reports, BDA and combat assessment analysis and updates the COP.
- Assists the commander in reaching an understanding of the battlespace by applying analysis and judgment to the COP.
- Directs dissemination of analysis consistent with the commander’s intent, to facilitate a tempo of operations which our adversaries cannot cope.
- Supports the targeting process.

- Coordinates for external ISR support.
- Analyzes and presents information to support timely SA and force protection.
- Coordinates internal and external to UA frequency spectrum requirements. Manages the UA frequency spectrum.
- Coordinates internal and external to UA satellite requirements. Manage UA satellite interfaces.
- Coordinates internal and external to UA IP addresses and IP router configuration requirements.
- Manage UA IP router network.
- Coordinates internal and external COMSEC and TRANSEC requirements.
- Coordinates internal and external Information Assurance requirements (Policies, Procedures, Firewalls, Intrusion Detection System, Network Access Control Lists, Host protecting software and updates).
- Manages UA IA systems.
- Coordinates internal and external airborne communication relay needs to insure full access to UA element to the network.
- Manages airborne communication layer.
- Coordinates internal and external Information Dissemination Management requirement (User Profiles, Information Priorities, External information gathering points and speed of service).
- Manages the UA's Information Distribution Management.
- Coordinates internal and external to UA Network Management requirements (WIN-T Points of-Present interfaces, and internal UA network health status). Overall responsible for UA network management.
- Coordinates internal and external to UA voice, data and collaborative planning requirements (radio nets, phones, multi-conference bridges).

D.4 Fires and Effects Cell

The primary focus of the Fires and Effects Cell (FEC) is to plan and coordinate the production of effects resulting from the application of lethal and non-lethal capabilities. The fires and effects cell supports the commander's intent through physical destruction, information disruption and denial, enemy system collapse and erosion of enemy will.

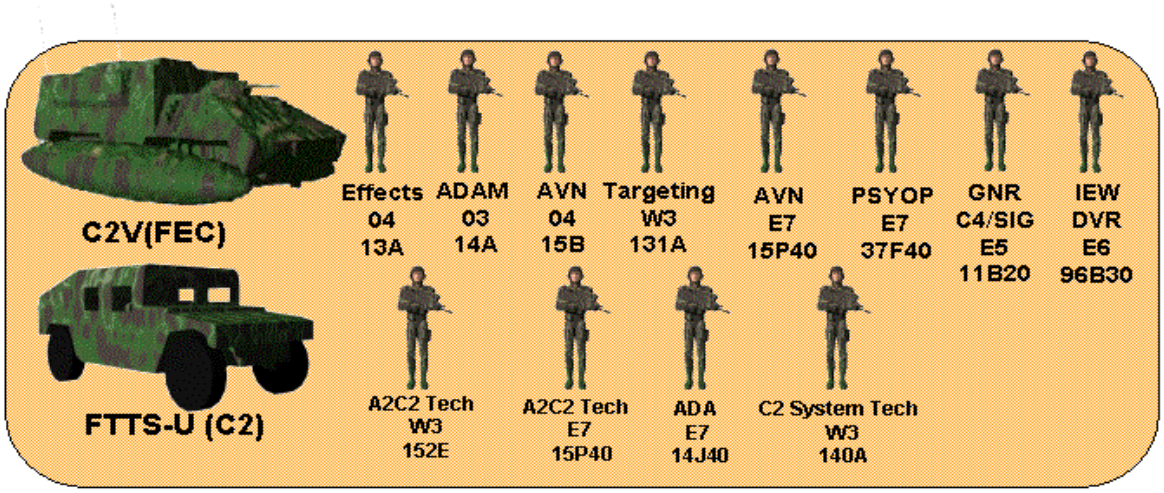


Figure D-5 FEC Manning and Organization

Additional functions of the FEC include:

- Facilitate the targeting process.
- Collaborate in the Intelligence Preparation of the Battlefield (IPB) ICW the CIC and the BIC Company to coordinate the tasking of sensors during development of the collection plan.
- Coordinate, integrate and synchronize information operations into combined arms operations.
- Coordinate and manage the counterfire program and radar employment.
- Maintain situational awareness of maneuver space for the positioning of target acquisition assets (predominately radars).
- Manage the establishment of and changes to Fire Support Coordinating Measures (FSCM).
- Advise on the establishment of maneuver graphics.
- Coordinate clearance of lethal and nonlethal attack against targets (clearance of fires).
- Perform combat assessments (more than just BDA) as a result of employing lethal and nonlethal effects.
- Coordinate requests for additional fires and effects (UE and higher), both lethal and nonlethal.
- Coordinates electronic warfare support to tactical operations.
- Plan, coordinate, and monitor Civil Military Operations in the UA, which includes Humanitarian Assistance, Populace Resource Control (including Non-Combatant Evacuation Operations and Displaced Civilian operations), Foreign Nation Support, and Emergency Management Disaster Mitigation.

When not augmented by UE, lead execution of UA airspace management, implementing positive and procedural measures to deconflict, synchronize and integrate third dimension operational requirements with fires in time and space. When not augmented by UE AMD or ATC units of action, execute direct liaison with local air traffic control and JIADS. The FEC is also responsible to integrate organic and external rotary wing support to the UA.

D.5 Maneuver and Support Cell

The primary focus of the Maneuver and Support Cell (M&SC) is to plan and coordinate maneuver and maneuver support. This cell performs staff functions traditionally associated with mounted, dismounted, vertical and operational maneuver, and maneuver support including engineer, chemical and military police tasks. The Operational Maneuver Section Also is also in the M&CS. This section contains a Deployment Team and a Brigade Operational Law Team (BOLT). The BOLT is a small highly mobile team that accompanies the UA to provide expert legal advice to the commanders, units, and soldiers. At a minimum, the BOLT consists of one judge advocate and one paralegal specialist. The BOLT provides legal support in Operational Law (OPLAW) and the six core legal disciplines of military justice, international law, administrative law, claims, civil law, and legal assistance, and assists the UA Commander with the discharge of responsibilities imposed by Title 10 of the United States Code.

The Deployment Team provides technical expertise and coordination authority for all deployment, redeployment, movement control, and multi-modal transportation issue the UA The cell has the ability to develop air load plans and synchronize support of strategic, operational and tactical air and vessel movements. During operations, the cell conducts concurrent planning and coordination with other staff elements to deconflict movements through highway regulation and traffic control. This includes positive in bound clearance and first destination reporting point (FDRP) into the UA's area. The Deployment Team develops the traffic circulation plan for both maneuver and sustainment operation in coordination with other UA and UE staff elements.

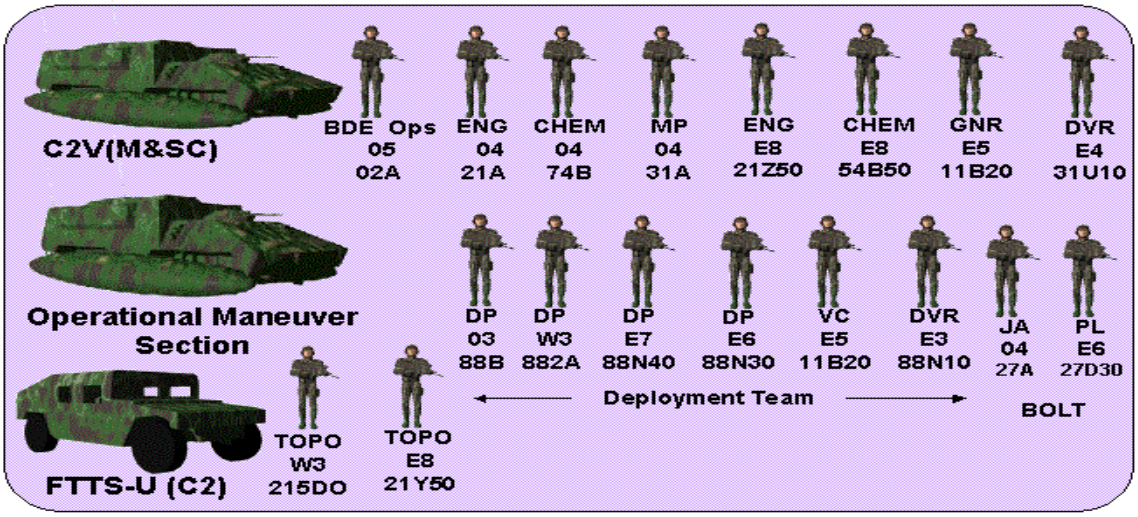


Figure D-6 Maneuver & Support Cell and the Operational Maneuver Section (M&SC /OMS)

The Maneuver and Support Cell:

- Identifies critical choke points, operating areas, and operating airspace and develops a shaping plan to affect these areas enroute to the AO.
- Develops the traffic circulation plan for sustainment operations ICW UA and UE staff elements.
- Provides technical expertise and coordination authority for all deployment, redeployment, and movement control issues.
- Identifies maneuver alternatives to avoid detected impediments to battlespace mobility.
- Plans and coordinates to provide assured mobility.
- Provides environmental situational awareness/analysis to populate the COP; this analysis could include or affect: mounted and dismounted maneuver, ground force protection, fires (both impacts on our ability to fire and actions to mitigate enemy fires) mobility, counter-mobility, survivability, Maneuver and Mobility Support (MMS), and chemical, biological, radiological, nuclear, and asymmetric situational awareness.
- Plans and coordinates population control, internment and resettlement operations (EPW and dislocated civilians), land order operations and intelligence operations. Actual operations performed with augmentation from the UE.
- Plans and coordinates intra-theater movement; assists in planning and coordinating inter-theater movement.

D.6 Build and Sustain Combat Power Cell

The primary focus of the Build and Sustain Combat Power Cell (BSCPC) is to plan and coordinate operations that generate combat power. Its charge is to continually anticipate the commander's needs to generate and maintain fighting strength. It must provide multiple options for the commander to execute the overall operation at a tempo that gives adversaries no respite from relentless pressure, and keeps soldiers and systems in the fight. The BSCPC includes staff functions traditionally represented by transportation (materiel, equipment, and personnel replacement), supply, maintenance, medical, ordnance, human resource, religious support, financial management, and "contractors on the battlefield".

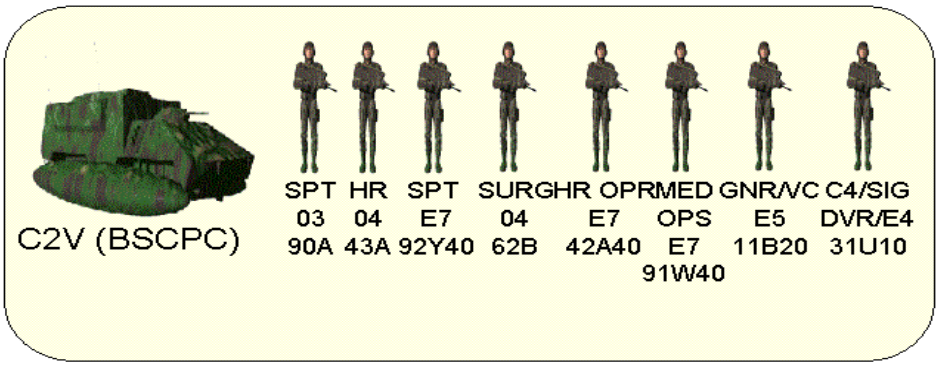


Figure D-7 BSCPC Organization and Manning

The Build and Sustain Combat Power Cell's functions include:

- Build and sustain combat power ICW the Commander's plan activities.
- Provides maneuver sustainment input to future CONPLANS, OPLANS/OPORDS, and FRAGOs.
- Orchestrates pulsed resupply activities.
- Oversee health services.
- Coordinate soldier support activities.
- Conducts/monitors system health checks for both platforms and crew.

The Brigade Surgeon Section (BSS) is responsible for determining medical requirements, evaluating courses of action for medical supportability, recommending task organization of brigade medical assets, and identifying appropriate tasks to brigade units. The BSS, comprised of 1 x 62B04, and 1 x 91W40 also advises the commander on all aspects of operational medicine to include, but not limited to the health of the command, force health protection, and medical aspects of non-lethal weapons. As the senior health care provider in the brigade, the surgeon also provides technical supervision to the brigade medical personnel. Also located in the brigade headquarters are a medical treatment team and a Preventive Medicine (PVNTMED) team. The treatment team is mounted in a MV-T and consists of a Physician Assistant (PA) and three 91W's that provide level I health care to brigade headquarters personnel. The PVNTMED team is mounted in an FTTS-U (SPT) and consists of one environmental science officer and one 91S that provide preventive medicine support to all units assigned or attached to the brigade.

D.7 Religious Support Team

Religious Support Teams (RST) provides religious support to the Objective Force on behalf of commanders. Religious support includes the personal delivery of rites, sacraments, ordinances, services, pastoral care, counseling, spiritual fitness training, and religious education and advising the commander on matters pertaining to morals, morale, and the impact of religion on the operation. Chaplains are part of the commander's special staff. They offer advice on ethics, morale, spiritual health and welfare, and the impact of local religions on the mission. They can do this in person, by staff coordination, or use of the Battle Command System. When directed by the commander to serve as a liaison with faith-based NGOs, private volunteer organizations, or local religious leaders, chaplains will also consult with the Staff Judge Advocate and Civil Affairs officers.

The RST will deploy with the UA into theater. They function in the following roles:

- Anticipates, plans, and prepares to provide religious support for the UA operation; trains, and supervises subordinate RSTs.
- Coordinates with UE and joint and combined religious support assets.

- Co-locates with the UA medics during the fight to provide religious support to casualties.

D.8 Staff Process

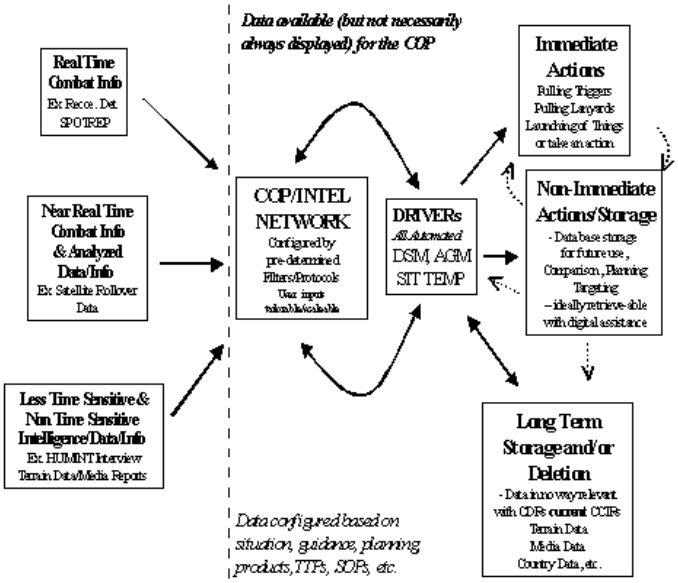


Figure D-8 Staff Process

The end result of the Objective Force MDMP is an automated battle staff oversight process that facilitates actions (at the lowest possible echelon) that reduce the traditional number of "man in the loop" actions. The nodal staff for battle command will deploy the minimum amount of staff required to plan, coordinate and execute branches, sequels and transitions from the base plan. The Home Station Operations Center (HSOC) provides part of the reach support for the staff. It will assist the UE deliberate planning and provide subject matter expertise to deployed units. It creates the UE base plan and provides the majority of ongoing staff production and analysis through reach operations.

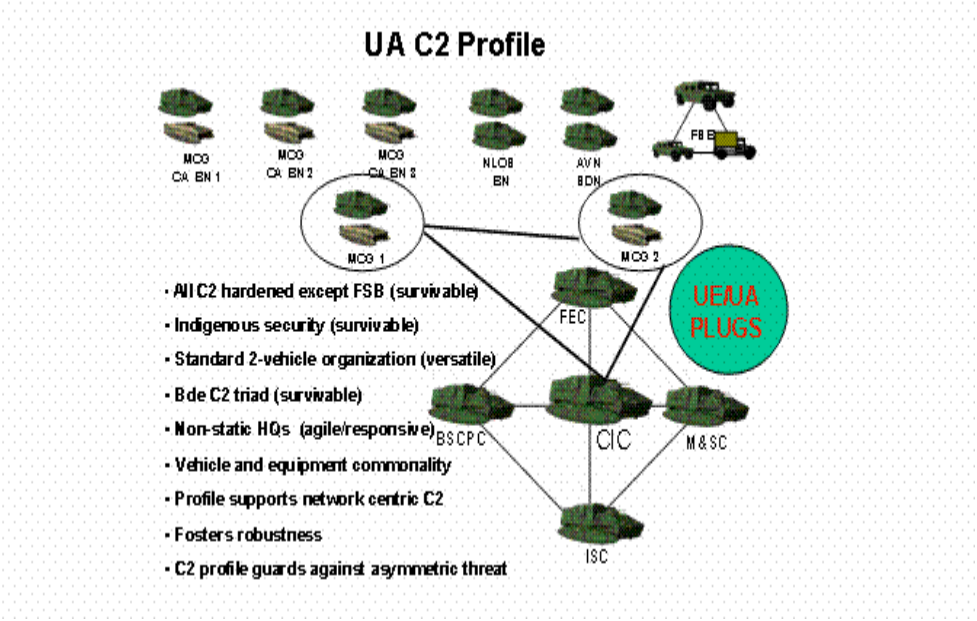


Figure D-9 UA C2 Profile

Within the nodal staff, whether in the HSOC or in one of the deployed command posts, the CIC articulates the commander's intent and guidance and then synchronizes the detailed planning work accomplished within the multi-functional cells. It provides the same synchronization function between the multi-functional cells during execution. The multi-functional cells plan and coordinate the execution of their assigned roles in information, fires and effects, maneuver and support and combat power respectively. The UA staff is a very streamlined organization with staff activities such as advising, planning, coordinating, and supervising being more informal than at UE levels. When augmented, the UA staff has the complete array of functional representation. Otherwise, it depends on reach and collaboration to perform these functions.

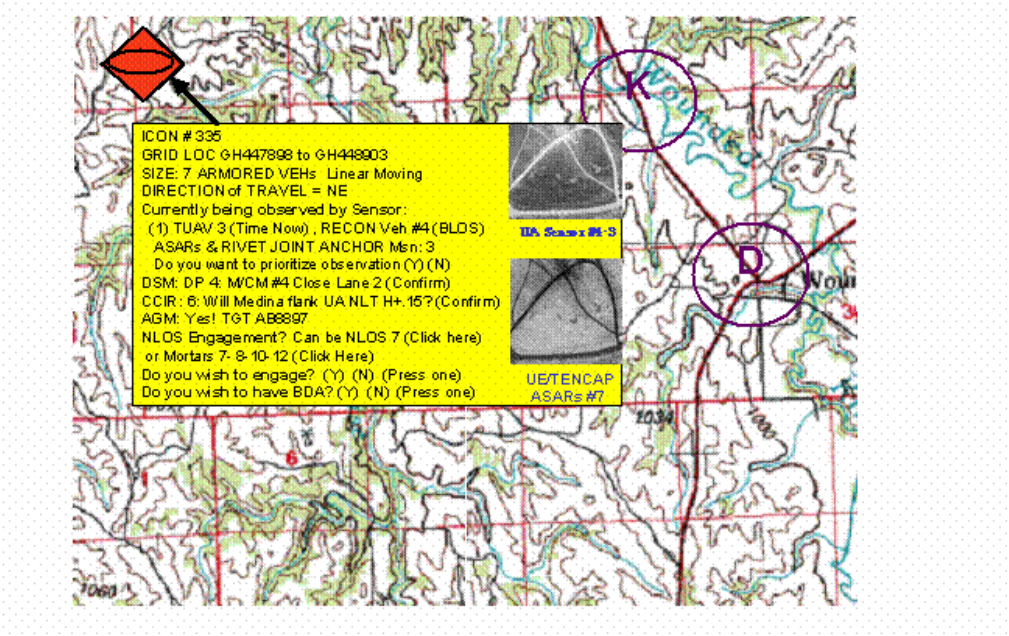


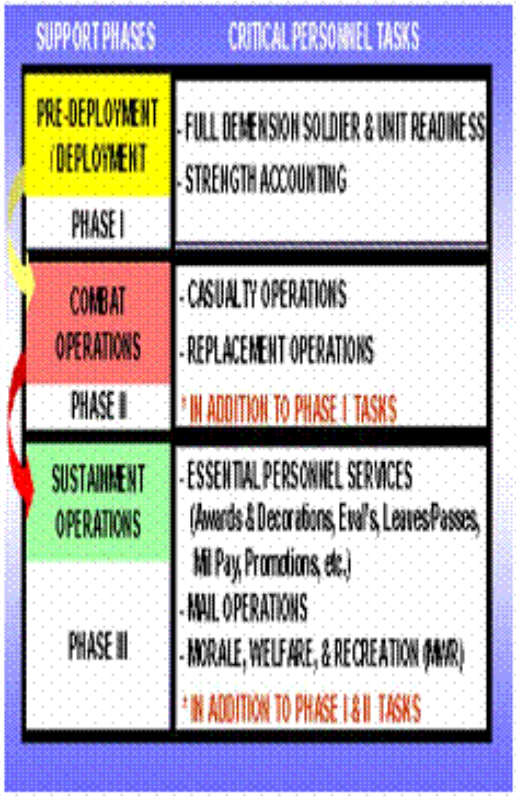
Figure D-10 Example of Icon

Figure D-10 is an example of an idealized concept of a single icon providing all the data conceived during the MDMP process presented in a highly automated and digitized format. Based on the icon's list of options, the viewer would simply have to make a choice about how to respond to this timely piece of combat information.

D.9 Human Resource Support

A key staff function is the Human Resource Officer, who is the commander's principal assistant to manage, organize, coordinate, and accomplish human resource support in the UA. The UA Human Resource Officer is the conduit for ensuring the UA commander's Title 10 responsibilities of manning the force are accomplished. Manning is a critical UA battlefield function that provides the commander with the ability to assess the capabilities of human resource combat power (crews, teams, and individual soldier human resource strengths) and perform casualty and replacement operations. The UA Human Resource Section, supported by the Human Resource Company, provides the UA the capability to perform essential human resource services and support in all phases of combat operations, including manning the force. The manning function includes tasks directly affecting the combat readiness of the UA, which must be performed in the pre-deployment, and deployment and combat operations phases of operations. Sustainment operations are tasks, while necessary to support the UA, may be accomplished during operational pauses, replenishment operations, or as the commander directs. Each phase serves to focus on human resource support tasks critical to the command at that time even though some tasks cross all three phases. Figure (D-11) shows these phases and the critical tasks of each.

The UA Human Resource Section receives the human resource support it needs through a balance of structure and automation within the UA and reach capability to the supporting human resource service support providers. The UA Human Resource Section of the brigade and each battalion headquarters elements provides human resource support for critical UA battlefield functions only. Additional support to perform sustainment operations is resident in the Human Resource Company or, if the UA is employed independently, through the HSOC or an attached Human Resource Platoon. The full range of human resource support capabilities for the UA is provided by a combination of the functional support provided by the UA Human Resource Section, the Human Resource Company, and the HSOC. These functional differences permit the UA Human Resource Section to deploy while the HSOC initially provides the reach capability. Based upon METT-TC and the deployment of a division, all or part of the Human Resource Company may be deployed to conduct human resource support sustainment operations supporting one or more UA.



Passive accounting enhances the battlefield manning function and allows a small human resource service support footprint in the UA to perform strength accounting, casualty reporting, and replacement operations tasks. Passive accounting reduces much of the data gathering required to accomplish these tasks. Soldiers register on FCS systems architecture equipped platforms by a variety of methods, to include the common access card (manually, automatically, or voice entry). Once a soldier registers on a platform, the system at all levels is able to track the soldier's status. Critical data (not readily accessible digitally) will be entered (by either the Human Resource Section, Human Resource Company, or HSOC) via automated update, manual entry, or by voice command using voice-to-text technology. Once data is passively entered, the commander or UA Human Resource Section can track the soldiers' status whether it is for unit manning, casualty reporting, or replacement status. Unit readiness information can be viewed throughout the reporting chain.

During pre-deployment/deployment, the focus is readiness of the UA. The Human Resource Section tracks individual soldier status, specifically items affecting readiness and deployability. The UA Human Resource Section manages and coordinates soldier readiness processing tasks such as legal, financial, human resource, medical and dental, family support, and soldier well being matters affecting the preparedness for immediate deployability. This includes human resource requirements affecting the combat power of the UA and factors affecting the health, welfare, morale, and discipline of the command. The Human Resource Section calculates unit strength including pending gains and losses, and attached and detached soldiers, and coordinates critical human resource requirements affecting the combat power of the UA with higher headquarters human resource support providers. When the UA is engaged, the Human Resource Section conducts strength reporting and is prepared to perform casualty operations and replacement operations in the AO. The Human Resource Section also receives and tracks attached and assigned soldiers, civilians, and contractors in the UA AO. The Human Resource Section provides the commander human resource information impacting the combat capability of the UA – crew status, critical human resource shortages, and unit strengths. Human resource losses and shortages prompt the replacement operations process, which provides a status on pending gains, including human resource in medical facilities being returned to duty. Human resource sustainment operations generally follow conclusion or lulls in combat operations as units prepare for the next mission. These sustainment operations may take place anywhere in the battlespace at determined by the commander's requirements and METT-TC.

Annex E LAND WARRIOR

E.1 Land Warrior
E.2 Land Warrior Components
E.3 Land Warrior Battlefield Role

Land Warrior is the soldier operational framework within the Unit of Action. Objective Force Warrior (OFW) is the flagship science and technology program that develops technologies for inclusion in the Land Warrior materiel acquisitions program. The Land Warrior family of systems begins with a core soldier ensemble upon which different variants will be built based on the soldier's duty position.

The Land Warrior family of systems connects soldiers to the full suite of FCS technologies and capabilities in the UA. This relationship enables soldiers to dominate adversaries anywhere and at any time on the battlefield. Soldiers dominate the battlefield by leveraging improved netted communications, information and situational awareness overmatch, advanced precision weapons and munitions, superior maneuver and unmanned systems which in turn increase soldier responsiveness, agility, versatility, lethality, mobility, survivability, and sustainability. This concept focuses principally on the Infantry soldier; however, Land Warrior systems support all soldiers in the UA.

E.1 The Land Warrior and the UA

The soldier is the centerpiece of the Objective force. Land Warrior supports every soldier in the UA with greater access to information and better situational awareness. Whether it is an infantryman requesting networked fires, a mechanic requiring point tracking of a mobility asset part, or a FTTS-MS driver needing the most current dirty battlefield obstacle graphics, all soldiers are better equipped to access the information or obtain the resources required to perform their missions more effectively. The Infantryman receives the greatest benefit from the combat power accessed through the Land Warrior system. Lethality, using organic and non-organic weapons, enables the Objective Force Infantryman to overcome an enemy's tactical and/or numeric advantage. The increased range, precision and effectiveness of FCS weapons and the ability for every soldier to direct these assets require new ways of organizing, training, and equipping units. Land Warrior provides the infantryman reliable connection to the enhanced capabilities of FCS technologies and combat infrastructure (e.g., common operator unit to remote control capability for manned and unmanned ground vehicles and selected unmanned air vehicles). This improved technology helps the soldier overcome the conditions that favor the enemy in close combat, complex, or restrictive terrain.

E.2 Components of the Land Warrior System

The Objective Force Land Warrior System consists of a fully integrated, modular, and computerized Integrated Combat Ensemble replaces the BDU and a majority of the associated tactical gear for combat and training. This sophisticated suit integrates survivability protection (chemical, biological, radiological and nuclear; flame; kinetic energy impacts), thermal body temperature controls, physiological and medical monitors, and a computer interface. Each

ensemble is tailored to the size, shape, and duty position of the individual wearer. Each ensemble provides the same configurable software capabilities the same situation awareness software capabilities, networked communications, planning and embedded training and mission rehearsal capabilities; however, the soldier's duty position determines the access level to the secure, networked communications architecture and data. Each soldier will be provided a capability that enables access to networked communications and the tactical internet. This security feature allows the Objective Force soldier access to the appropriate resources of the UA. The ensemble requires a wearable power source that provides power to the soldier's ensemble for 24 hours of operation. Through the integration of the components of the Combat Ensemble a weight reduction benefit is expected for the individual soldier.

The ensemble integrates a series of physiological and medical sensors that monitor various physiological statuses. This system displays this information to the soldier and allows leaders and medical personnel to monitor his current physical status. This system monitors characteristics such as heart rate, body temperature, hydration level, stress level, and fatigue. The objective is for technology to mature to a point where the ensemble sensors can detect points of penetration from KE type effects. The ensemble then provides triage information based on the probability of damage to the ensemble's outer layers, as well as features for self-triage such as tourniquets integrated into the combat suit. The nature of the Infantry mission places the infantryman in the closest proximity to the effects of the enemy. When future Infantry forces conduct operations, speed, stealth technology, signature reduction, and advanced biological and chemical defenses help achieve force protection. Therefore, the soldier will have integrated survivability protection in the modular combat uniform ensemble. The modular design of the combat ensemble provides the layering of protection; however, the layers and components will be designed within the context of the entire system, not as independent items – providing multi-functionality and reduced overall weight. The current combination of protection layers is no longer sufficient. The Integrated Modular Combat Ensemble must include low visibility camouflage, CBRN, KE impact protection, and objectively, thermo baric protection. In addition, modular parts can be attached to protect various appendages. The suit ensemble's survivability structure must integrate the human dimensions of fit, size, dexterity, modularity and lightweight properties into one "fightable" combat ensemble.

The Land Warrior ensemble helps the soldier maintain body temperature in all terrain and weather conditions. The ensemble's design must enable effective cooling and heating as required based on its proximity to the body, and based on the operating environment and mission. The ensemble fabric, in conjunction with the remainder of the ensemble, creates a system that allows body temperature regulation. The ensemble does not fully maintain the soldier's body temperature, but it does assist passively in regulating temperature. The system should include a positioning system that supports situation awareness by taking advantage of the GPS and providing alternatives for position location in GPS denied environments. The information is presented to the soldier and their leaders. Whether interfacing through a head mounted display, a moldable wrist display and keypad, or a visor display within the headgear, the soldier must receive, store, process, and send digital information with greater efficiency and effectiveness. The interfaces that link the soldier to his combat ensemble must be tailorable for all modes of human interaction to streamline processes and minimize data entry and data entry errors. The soldier must focus on the close fight without distraction from laborious tasks required for data processing. The system should use software that is user-friendly for the soldier and not require new training to develop full proficiency. The software and computer subsystem streamlines information and processes required to provide information typically contained in joint variable message formats such as call for fire, spot / salute report, field order and MEDEVAC request. Tactical memory aids remind the user of certain required actions (e.g., TTP recall). The software/computer subsystem supports mission data such as maps, graphics, icons and control measures for combat orders and overlays.

The software system must enable training on the use the combat suit ensemble as well as all infantryman skill level tasks and collective tasks. The Embedded Training and Rehearsal ensemble software includes information that is comparable to current electronic training manuals and digital libraries. System interactive training challenges the soldier decision capabilities in various mission settings and provides feedback. Objectively, this system feedback includes explanations of the second and third degree effects of decisions made. The system may access a local area network to facilitate collective training through collaborative participation. The system interfaces with virtual reality simulation capabilities so that the soldier uses his personal ensemble during simulation training.

The future headgear provides not only survivability capabilities but may also include integrated displays, radio input/output, video camera, video monitor or HMD capabilities, as well as total enclosure to provide protection in CBRN environments or latch on points for attaching inhalation protection systems. Protection systems integrated into the design for the headgear for acoustic, laser, chemical, non-lethal weapons, and direct and indirect fires enhance Soldier survivability on the battlefield. In limited visibility operations, using improved image intensification fused with thermal imagery, the Infantryman sees the enemy first, allowing time to maneuver and engage. Increased visibility at night heightens unit command and control and allows increased dispersion.

Networked Communications, the COP, and situational awareness are not hardware solutions. They are products of the capabilities inherent in the ensemble interfacing with the mobile tactical network. Continuous interface via the secure network communications architecture facilitates real-time information feeds to and from soldiers. This capability filters all information that is required and relevant to a soldier's current situation and mission, resulting in a common operational picture. The soldier maintains situational awareness through access to networked communications in all weather conditions, even while he keeps a low profile in covered and concealed positions during close combat. Soldiers and small unit leaders possess the information to make sound and timely decisions required to gain a decisive advantage in the close fight. The small unit leader can quickly synchronize effects of available weapons to exploit enemy weaknesses. Netted communications thus facilitates netted fires at both the small unit level and via linkage to FCS assets. As a part of the Land Warrior system of systems approach, individual soldiers and squads use Unmanned Ground Vehicles (e.g., MULEs) to carry equipment for organic sustainment and to enhance readiness by reducing fatigue due to decreased soldier-borne load. Future small unmanned systems (e.g., SUGV) also provide force protection by performing required, but dangerous tasks such as early threat warning and detection, minefield clearing, and explosive ordnance disposal, close attacks and close reconnaissance. The soldier controls these unmanned system tasks through the Land Warrior systems interface. Micro-air vehicles will also provide additional organic ISR capabilities.

Food sciences and new training regimens produce food products that are smaller and more nutritionally dense. The Land Warrior ensemble carries and delivers to the soldier these smaller packages of high yield nutritional sustainment. This improvement reduces the soldier's load. Water purification sources will be smaller, more portable, and will be able to convert a greater amount of non-potable water than ever before. This improvement will allow the soldier to use water anywhere he is at as opposed to carrying it or having it transported to him. Power sources must provide at least 24 hours of sustainable power. The soldier uses soldier-borne power when away from any mobility platform and is able to recharge his power source from any FCS manned platform and unmanned ground vehicle platforms when so configured. While riding in the FCS infantry carrier the soldier is able to trickle recharge his system while drawing his main power from his vehicle connection. The objective requirement is 72 hours of sustained power. As a minimum, each Land Warrior equipped soldier carries a soldier radio that can communicate in secure and non-secure modes as well as communicate or interact with sensor fields, UAVs, UGVs, and netted fires. Team leaders and above have an additional capability allowing them to operate in other radio nets and greater range. The soldier radio enables the soldier to transmit (the computer enables the soldier to originate) and receive digital messages, orders, reports and graphics. It is able to send and receive digital voice, text, video, pictures, operational graphics and overlays. Through the embedded GPS software and linkage to the Battle Command system through the communications network the Land Warrior equipped soldier is able to distinguish between friendly, enemy, and neutral personnel on the battlefield. This embedded Combat Identification capability prevents fratricide and unintended damage to friendly personnel and equipment. Laser detectors in the system will also enhance training by serving as an integrated MILES-type capability.

E.3 Land Warrior Battlefield Role

The Land Warrior plays a key role in the execution of the Objective Force concept. Land Warrior is the reliable medium supporting the connection of soldiers at the small unit level and to all aspects of the Future Combat Systems FoS and Battle Command. The ensemble facilitates soldiers using FCS technologies and infrastructure to bring the power of the entire Objective Force to bear in executing the fight.

E.3.1 Land Warrior Quality of Firsts

Chapter 4 discusses the "Quality of Firsts", the new tactical paradigm unique to Unit of Action operations. Land Warrior enables soldiers to "See First" and "Understand First". They have access to information from a variety of sources and are able to quickly select and synthesize it, understand it and translate their superior perspective into actionable decisions. UAVs, SUGVs and UGS enable Soldiers to more quickly "See First" to achieve higher levels of fidelity about the enemy situation and location. The unmanned systems are deployed and will be controlled through the Land Warrior ensemble. Information is delivered to the soldier ensemble for viewing, analysis, decision-making and action allowing them to "Understand First." Information Superiority enables a higher degree of planning and execution certainty. This translates into Commanders tailoring small units to complete more demanding missions because of lower inherent risks. Land Warrior enables soldiers to "Act First" and "Finish Decisively" by supporting their access to superior mobility, firepower and effects capabilities while they maneuver. Land Warrior enables soldiers to operate and remain connected to the Battle Command system in mounted or dismounted modes while they use embedded capabilities to focus overwhelming combat power on enemy weaknesses or decisive points at the time of their choosing.

Unmanned systems extend the observation and target acquisition/designation capabilities of soldiers. Land Warrior enables soldiers to act on this information by facilitating requests for networked fires or enabling direct control of extended LOS/BLOS fires and effects by unmanned systems. This translates into greater standoff (reach) by Soldiers without a loss in precision and lethality, and with greater survivability. Land Warrior enables the Soldier to control unmanned systems when mounted or dismounted and complete high risk tasks once delegated to the Soldier. Soldiers remain protected from enemy fires and effects while the unmanned systems execute tasks such as minefield identification, negotiation and clearing, and obstacle identification and breaching. New unmanned system capabilities enhance soldier survivability and task execution in the close fight. Organic squad and individual weapons are complimented by robust and responsive networked fires that include NLOS, BLOS, mortar and air-based systems. This is a material change unique to the OF concept. Networked Fires are available to the squad to execute the fight. Access to this capability and coordination of fires is supported by embedded Land Warrior capabilities. Enhanced soldier power capabilities (power sources, power management, and power replenishment), enhanced high-density rations, water purification, physiological status monitoring, and embedded training allow the Land Warrior soldier, as the center of the Objective Force, to "Sustain and Endure."

E.3.2 Full Spectrum Objective Force Fight

Land Warrior's ability to support the connection of all the soldiers and assets focused on an Objective Force mission also provides Commanders the flexibility to tailor combat force to address multiple sub-missions simultaneously while maintaining effective command, control and communication across large noncontiguous Areas of Operation. Land Warrior is an integral and key component in the diversification of small unit mission capabilities. Flexibility at the soldier level is maximized through Land Warrior and supports the UA's ability to successfully execute the full spectrum of possible missions and operational requirements in a broad range of environments and conditions.

ANNEX F UNIT OF ACTION VIGNETTES

This annex consists of six vignettes that describe how the Maneuver Unit of Action will accomplish six very different tactical operations. The purpose of the vignettes is two-fold. First, it provides an illustration of how the concepts described in chapter four will be applied in the context of a specific terrain and enemy set. Second, it facilitates further combat development by providing tactical tasks and required capabilities with which TRADOC schools and centers can build specific scenarios for combat development work. These vignettes are distinct and not intended to portray the conduct of a unified campaign.

F.1 Characteristics of Terrain Sets

F.2 Entry Operations

F.3 Combined Arms Operation in Major Urban Areas

F.4 Mounted Exploitation and Pursuit

F.5 Rapid Advance to Enemy COG

F.6 Air Assault Enabled in Mountainous Terrain

F.7 Dismounted Operations to Conduct Raid on Decisive Point in Jungle

F.1 Characteristics of Terrain Sets

For combat development purposes, terrain can be described within the three broad categories of open and rolling, urban, and other complex terrain consisting of dense forest, jungle, or mountains. To accomplish the full spectrum of missions, the Army currently employs nine different types of ground combat formations (See Chapter 1.3). These brigade level organizations account for the entire range of threat and all conditions and variables in which these forces will be employed from jungle to mountainous to urban to open, rolling terrain in all weather conditions. These organizations; light and mechanized infantry, heavy armor, armored cavalry, etc– can operate in each of the terrain sets. However, they are each optimized for particular terrain sets and are degraded when operating in other terrain sets.

In future fights, the adaptive threat will have the “home-court” advantage. UA soldiers and leaders must negate this advantage by equally understanding and operationally using terrain. The UA organizational design incorporates the characteristics for six of the current brigade level organizations (all except SOF, airborne and rangers) to increase capabilities when operating within all terrain sets. Currently, a JTF Commander’s options for employing units are constrained by terrain, ie: employment of a light division in complex or urban terrain or a heavy brigade in open and rolling terrain. With the UA, the JTF Commander can employ a unit with the characteristics to fight across all terrain sets with equal lethality, mobility, survivability and networked battle command. The vignettes in this annex will illustrate the Unit of Action’s ability to conduct operations across the full range of terrain sets described below.

F.1.1 Open and Rolling

Open and rolling terrain primarily includes the topographic characteristics of flat desert and vegetated plains. This environment provides advantages to both the enemy and Objective Force units. The tempo of operations in this terrain places an emphasis on speed of attack, isolation, and shielding that enable the UA to rapidly close in on the enemy from multiple directions, assault, and transition. Maneuver on multiple axes is both an operational advantage and an imperative for protection. Target acquisition and engagement will be rapid and deadly in this environment, demanding speed, stealth, and dispersion to improve survivability. Standoff acquisition and engagement will be routine. UA commanders and leaders will need to maximize both standoff and both suppression and obscuration fires. Mobility in this terrain is less of a challenge. Open areas allow for approach from virtually any direction. FCS mobility will make this factor uniform throughout this terrain set and includes bypassing of most natural and constructed obstacles.

F.1.2 The Urban Fight

Even with advanced capabilities, MOUT will be an increasingly challenging but common feature of future operations. These factors will be even more influential in urban areas where the enemy has the benefit of tight terrain compartments and can rely on an indigenous population for logistic and reconnaissance support. Multi-dimensional aspects of the terrain to include airspace, super-surface, intra-surface, surface and ground, and subterranean corridor, requires the UA to continually assess the urban terrain, infrastructure, and human dimensions before, during, and after each urban engagement. This includes the requirement for precision engagement of identified enemy formations while minimizing collateral damage and civilian casualties. Additionally identifying enemy combatants from non-combatants, fleeting targets due to short inter-visibility lines, cover and concealment and numerous unobservable lines of communications will also pose a challenge to Objective Force formations.

F.1.3 The Complex Terrain Fight

Complex terrain is characterized by steep and heavily dissected terrain containing steep slopes with sudden elevation changes, circuitous gaps and passes with a large number of severe slope variations. This includes arid and jungle environment. The diverse terrain and vegetation, including austere to non-existent infrastructure, challenges the mobility and agility of the UA. Critical to mobility is aviation lift support from the UE that enables the unit to bypass choke points and achieve positional advantage against identified enemy forces. In less challenging, but still complex terrain sets, FCS levels of mobility present throughout the entire unit will enable it to traverse terrain the enemy disregards as impassible. UA commanders must use lethal and nonlethal munitions precisely on enemy formations and systems, destroying or suppressing them depending on proximity to civilian population resupply centers or sites of historical significance. Attack aviation and guided munitions may be the most agile and reliable means of engaging enemy positions. BLOS, cued by overhead sensors and pattern analysis tools, will mitigate the challenge of fleeting targets and short engagement ranges.

F.2 Vignette 1: Entry Operations

F.2.1 Background

In 2018, after twenty years of independence for the Trans-Caucasus States, the region found itself in serious socio-political, ethno-religious, and economic conflict spreading throughout the region. Azerbaijan emerged as the leading economic power through the exploitation of Caspian and Central Asian oil reserves. Azerbaijan's politics were deeply divided; its citizens and Karabakh refugees demanded the government take military action against the Armenian Karabakh that forced them to flee. The Azerbaijani government refused to act, and refugees from the Nagorno-Karabakh Internal Liberation Organization [NKILO], using terror and armed force to achieve their goals, began a cross-border unconventional campaign designed to force a confrontation between the two countries. Observing these developments, Armenia and Iran viewed the Azerbaijani government's instability as an opportunity to expand their influence in the region for political gain. Armenia began massing maneuver forces along the Azerbaijani border and repositioned mobile theater ballistic missile launchers. Both countries perceived a low risk of failure in executing their campaign strategy and were willing to impose a military solution upon "the Azerbaijani problem."

In November 2018, initial reports of the Caspian Sea Peninsula crisis caused the U.S. to take steps to improve its awareness of the developing situation. The Secretary of Defense redirected intelligence assets to focus on the region and directed political and military planners to formulate contingency plans for U.S. engagement in the region. They determined an Army OF UE, operating as the Army component of a joint force, would be required to accomplish U.S. goals in the region and assigned operational control of the 15th Unit of Employment for planning purposes. A warning order was issued to the 15th UE and supporting attack and lift aviation assets to begin their planning. In late November, the Azeri Islamic Brotherhood (AIB), a coalition of anti-government factions supported by NKILO and ANFAR military forces, subverted the bulk of an Azeri Motorized Rifle Brigade, which mutinied to realign with this faction. The brigade seized control of most of the historically significant Icheri Sheher (Inner Town) district in Baku. Meanwhile, two armed clan-based factions of the Azeri Islamic Brotherhood, the Aziz and Daha, extended their control of the eastern and western outskirts of Baku.

As a last resort, the Azerbaijani government requested assistance from the Russian Federation to defeat the insurgents and preclude an anticipated invasion by Armenian forces. On 15 December, Russia proposed a coalition of U.S. and Russian forces to restore order within Azerbaijan and stabilize the government. Two days later, the U.S. agreed to the proposal and the two nations created a coalition force and outlined its employment plan. Initial efforts were focused on developing the situation in the region. As the 15th UE matured its plans, SOF teams provided coverage of the airfields the UE planned to use as tactical points of entry for its brigade-sized UAs. The wealth of information being collected was processed into usable intelligence and, through an integrated C4ISR Network, distributed to all forces involved in the planning phase of the operation. In the UE Hqs and its UAs, the steady stream of real-time intelligence information was fused with other information on the operational area and the status of friendly forces to create a COP of the current situation. Additionally, input from the JTF on all relevant data on throughput capability to the status of C-130-capable airfields and potential re-

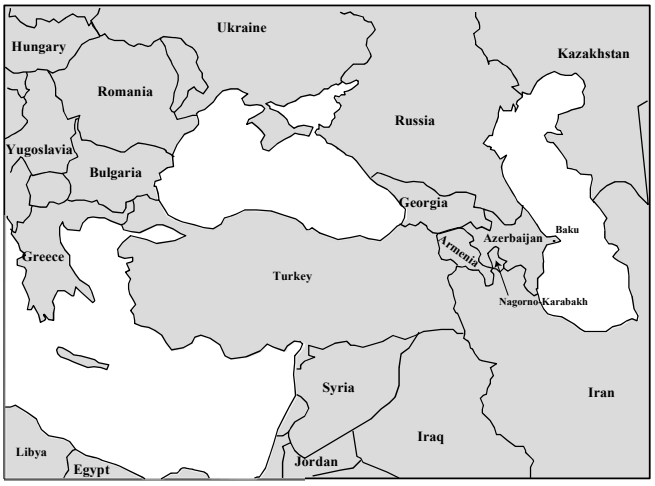


Figure F-1. Caspian Sea AO

supply drop zones in the JOA was integrated with the results of intelligence collection to give commanders at each echelon an accurate assessment of the conditions in theater.

F.2.2 Mission

On H Hour, D Day, 1st UA conducts entry operations into theater at multiple points of entry and conducts tactical movements to secure initial positions. On order, conduct offensive operations to destroy AZERI Islamic Brotherhood forces in the vicinity of BAKU. On order, defeat AZERI insurgents in order to stabilize the AZERI government.

F.2.3 Conduct of Operations

When the 15th UE issued warning orders to alert the designated Units of Action, it integrated each UA into the force's C4ISR Network, ensuring the developing situational awareness was available to commanders at each echelon as they received initial planning guidance for their mission Available intelligence from national and theater assets, as well as information on friendly forces, weather, and geo-spatial products provided through the global information grid, flowed through the UA and CA Battalion Command Information Center's COP. This information was pushed directly to the UA FCS platforms, allowing commanders at each echelon to do their planning and rehearsals on the same systems they used in daily garrison training and operations. With the help of FCS-embedded planning and decision-making tools and the developing situational awareness being collected at the Corps level Home Station Operations Center, the commander began to develop his initial plan. Terrain reasoning tools integrated with enemy status feeds showed him certain axis of advance would be preferable to others. He settled on three particular converging axes into the city.

The commander of the 1st UA used information from USTRANSCOM fused with intelligence reporting from airborne assets and SOF teams operating in the area to select six airfields in vicinity of Baku (25 to 60 km away from the city) as his planned points of entry. In accordance with the commander's intent, the staff planned for the simultaneous deployment of all three CA Battalions. Based on his plan for the attack on the city and the capabilities of each airfield, his staff used their FCS-embedded planning tools to develop a scheme for tailoring the UA's forces into packages for deployment into the six airfields in the objective area.

UE reconnaissance and surveillance assets are integrated into the UA's force packages. The R&S assets along with engineers habitually attached to the UA for the purpose of assured mobility and MOUT breaching, ensures critical assets are available to support UE shaping operations and UA entry operations. The UA commander knows a key part of the operation will be the period of transition – that time when his own assets are on the ground, but he is still heavily reliant on ISR as well as lethal and non-lethal fire support from echelons above the UA. He and his staff planned to plug into those external assets en route to the area of operations and to deploy an Early Entry Control Party to accept Battle Command upon arrival.

Even as the UA staff conducts it's planning at home station, their work is distributed across the network, allowing the battalions to conduct their planning in parallel. During planning, both

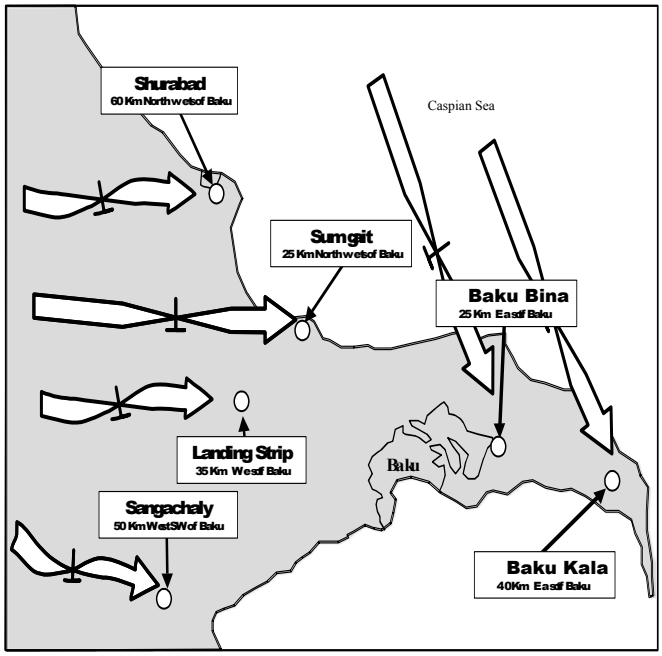


Figure F-2 Initial Planned Entry Points

the UA and its subordinate units refine their plans as required based on the information derived from the continually updated common operational picture. As their plans mature, commanders identify and refine critical information requirements that focuses national, theater, joint, and coalition intelligence collection activities, and shapes the area where the 1st UA would enter the fight.

Earlier, Turkish authorities authorized the deployment of strategic Air Force and Army AMD assets into Turkey to establish staging bases for the deployment of U.S. forces into the Caspian region. Shortly afterwards, the U.S. 15th UE was alerted and initiated movement from its garrison at Fort Stewart to the nearby departure airfield. While staging from its garrison, the UA staff maintained connectivity and planning coordination with the UE through the HSOC and continued mission planning. The UA's elements, now tailored for the fight and accompanied by the UE Early Entry Command Post (EECP), departed from aerial port of embarkation at Fort Stewart's Hunter Army Airfield and Savannah International Airport by strategic airlift (C-5/C-17). The commander capitalized on the available situational awareness enabled by his En route Mission Planning and Rehearsal (EMPR) system to further refine his planning and conduct virtual rehearsals. H refined his initial R&S plan using en route access to Joint ISR. Every commander in the UA, whether already deployed or still deploying, had access to the information being fed into the COP from JIM assets.

The commander of the 1st Brigade UA was flying over the Atlantic Ocean when the JSOTF HQs alerted him that two of the six airfields he planned to use were no longer feasible. Examining the common operational picture, he saw that SIGINT from Aerial Common Sensor collection had detected Azeri Islamic Brotherhood insurgent forces occupying positions overlooking the two airfields east of the city. Using the collaborative and integrated terrain tools, the commander and his staff re-examined his plan. Before the UA arrived in Turkey, they developed a branch to the ground tactical plan that used Army aviation to move one battalion into Baku, and had nearly completed adapting the airflow and intra-theater movement plan required to support it.

Since the new plan required Army aviation lift assets for an air assault, the staff coordinated with UE staff to make these assets and their necessary support elements available – all while still airborne over the Atlantic Ocean. The updated plan was transmitted throughout the UA, and each commander and leader digitally acknowledged receipt of the change and began to rehearse the changes. The first C5 and C17 aircraft landed at air bases in Turkey on D+2, quickly reorganizing into force packages for trans-loading to C-130s. FSB elements were included in the force packages, allowing them to be delivered to positions where they could provide sustainment for newly planned aviation operations in the objective area. As UA elements trans-loaded into C-130s for the intra-theater operational maneuver into the objective area, the UA extended its infosphere to support force protection operations in Turkey as well as entry operations into Azerbaijan. Meanwhile, the UE commander used joint and coalition assets to isolate the area of operations and conduct shaping operations in preparation for the 1st UA's entry into four airfields selected as their tactical points of entry (shaping effort). Shaping operations focused on the points of entry previously selected for use, but planned alternate points of entry were monitored so they would be available on demand, assuring operational flexibility and surprise.

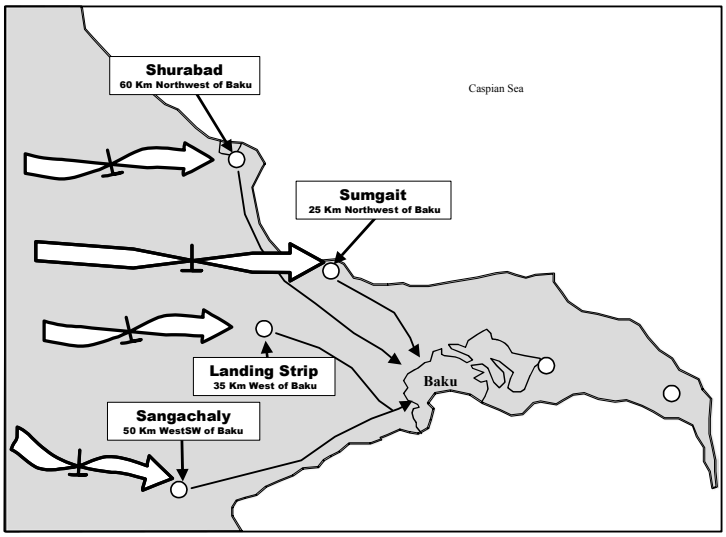


Figure F-3 Refined Multiple Landing Sites

To assure operational mobility, the UE commander initially focused this shaping effort on those threats capable of interdicting his chosen routes and locating and destroying threats to air deployment into the airfields. The shaping force uses space-and airborne reconnaissance assets in conjunction with SOF

teams conducting reconnaissance in the vicinity of each airfield. This element can also emplace IMS and UGS to supplement the shaping effort. With those conditions satisfied, the UA Commander shifted the emphasis of his shaping operations towards the objective area and disseminated his plans and intent for the shaping operations to the UA and its subordinate units. The UA Commander's shaping criteria, those conditions that were to be met before committing the CA Battalions to the attack, included:

- UA elements (including UAV CL IV/UAV CL III elements) set in surveillance positions over key NAI in the objective area.
- Identification and isolation of the Icheri Sheher Brigade.
- Isolation of key routes and locations in Baku.
- Identification and destruction of enemy command and control nodes of the Icheri Sheher Brigade.
- Identification and destruction of long range cannon and missile artillery.
- Identification and destruction of all SA-18's and similar man-portable ADA systems that could interdict Army aviation landing at LZs in Baku.

UA reconnaissance elements were the first to arrive at each airfield. They quickly deployed into pre-planned observation positions that gave complete sensor over-watch of NAI on the approaches to the airfield, bringing the first of the organic sensors into the objective area. These sensors, consisting of unattended ground sensors and UAVs, established an improved degree of resolution to the COP of all forces operating in the area. It was not a "perfect" intelligence picture; nonetheless, the synchronized network of organic and links to external sensors gave the UA commander reasonable certainty about the environment where he would be operating.

The UA's deployment plan used two tactical points of entry to deliver the 2nd CA Battalion. By splitting the battalion across two airfields, the UA commander reduced the battalion's closure time from 36 to 18 hours. As platoons closed at each airfield, they moved immediately to occupy positions that isolated the airfield, reinforcing the initial entry reconnaissance and sapper teams while protecting the point of entry from ground attack. When the companies closed at each airfield, the platoons left their positions to move out on separate axes to occupy positions that isolated Baku and brought the UA's sensors into range of their objectives in Baku. Comanche aviation assets had self deployed into the area of operations and were conducting reconnaissance, close support, and command and control missions as the "quarterback element" in support of the UA's shaping operations using both manned and unmanned teams. RAH-66 Comanches from the UA's Aviation Squadron destroyed enemy artillery and armored vehicles according to the attack guidance matrix. Additionally, sensors in the Comanches continued to feed detailed information on enemy forces into the COP.

Reconnaissance continued to cover NAIs to locate suspected elements of the Icheri Sheher Brigade. Reconnaissance elements of the combined arms battalion maneuvered manned and unmanned sensors to conduct reconnaissance and surveillance of additional NAIs around Baku. Class IV UAVs now teamed with RAH-66 Comanches loitering over the outskirts of the city, acquired armored personnel carriers and mortars, and provided immediate cooperative engagements. IMS verified the contacts were enemy armored personnel carriers, and then disrupted them with linked wide area munitions. To minimize collateral damage within the city, the UA commander directed his fires elements to place loitering and precision attack munitions to destroy the armored personnel carriers and mortar systems. UA UAVs, employing SIGINT collection and emitter mapping capability, acquired an enemy command post and associated mortar position inside the Inner City. A UAV was dynamically re-tasked to the reported location and identified the targets. Networked fires receives target acquisition data from the UAV and selected available NLOS systems to engage the targets within minutes, in accordance with the commander's attack guidance matrix. The UAV remain on station to assess BDA from the engagement. As combined arms battalions moved from their tactical points of entry, they deployed on separate, dispersed axes. The Comanches teamed with Class IV UAVs provided reconnaissance support out front, looking for any enemy forces that could threaten the CA Battalions as they moved toward Baku.

The reconnaissance troop of the 2nd CA Battalion located several obstacles, minefields, crater charges, abatis and a bridge, along the battalion's direction of attack. With the new obstacles now visible, terrain-

reasoning tools automatically recalculated alternate routes. The 1st Platoon Leader (Infantry Company) launched his Class I UAV from the back of his ICV to get a better look at a bridge crossing just ahead. Concern for the security of the crossing stemmed from movement indicated by sensors in the area. The UAV quietly lifted off and followed the programmed route to a vantage point providing reconnaissance and surveillance of the bridge. Moving to a position of advantage on his platforms, the platoon leader then dismounted a squad of infantry to secure the bridge. They moved by covered routes, infiltrating under the watchful eye of MCS crews and sensors. In addition a sister MCS Company is providing overwatch. Some 1500m ahead of the platoon, the UAV slowly hovered toward the bridge. The UAV's sensors detected dismounted personnel in the wood line over-watching the bridge and transmitted their image back to the platoon leader's display. Quickly, NLOS mortar assets fired into the wood line to protect the bridge seizure. Once at the secured bridge site, the platoon leader directed fires and the next infantry squad moved across and assaulted into the woodline, killing the enemy squad as fires continued to suppress and obscure them.

During the fight, the support battalion's elements intensively tracked consumption across classes of supply through the COP and worked with the Theater Support Command and national providers to throughput mission-configured loads down to unit level with minimal requirement for handling at tactical points of entry. These configured loads of fuel and ammunition were capable of either ground or aerial delivery, with minimal readjustment, as indicated by the UA commander. Operating from their positions near the tactical point of entry at Sumgait, they moved ammunition and other supplies to where they were needed to sustain the momentum of the attack. Having covered the 25-60km distances in a matter of two hours from the point of entry to areas in vicinity of Baku, the UA had a series of small, localized fights, such as described above, to destroy pockets of enemy resistance along the dispersed routes.

F.2.4 What Endures

CA Battalions are the UA's principle maneuver units, capable of independent operations. They receive attachments and may themselves be attached to other units. Commanders mitigate risk through anticipating and planning for uncertainty and the friction of war. They achieve flexibility and agility by developing contingency plans allowing for rapid execution of branches and sequels to the adopted course of action. Control measures communicate their plans and provide a common frame of reference for communicating changes.

Army forces provide the nation and its leaders with responsive, full spectrum options for the employment of military force. Commanders consider all aspects of the situation while planning, preparing for, and conducting their operations. They and their staffs communicate their plans and intent across the force to synchronize operations. Staffs track the progress of the battle to ensure commanders have the information required to make effective decisions. Commanders and their staffs adapt their plans to changing situations, ensuring they maintain the initiative and impose their will on the enemy.

During entry operations, the UA is part of an integrated team, heavily reliant on the contributions of UE, Army, Joint, and interagency assets to enable situational awareness during the entry / transition into theater. Combat units maintain awareness of the units on their flanks and establish coordination and liaison links as required. Adjacent units deconflict their operations while insuring they are mutually supporting. Conventional units operating with or in the vicinity of special operations forces establish coordination links to prevent fratricide and enhance mutual operations. Combined arms organizations and warfare maximize the unique capabilities of each system and present the enemy with tactical dilemmas.

F.2.5 What Changes

The UA's inherent deployability and modular design enable strategic and operational responsiveness. Enhanced systems and networks ensure that all elements of the force are working from the same common operational picture. Information on the status of friendly forces and the environment is continually merged with ISR input and reporting and distributed across the force, even as units are deploying. Shared group situational awareness enables parallel planning, distributed decision making (in accordance with commander's guidance and intent), and effective Battle Command.

Situational awareness and embedded tools that support networked, collaborative planning provide the commander the ability to see first, understand first, act first and finish decisively, even in the face of changing conditions. CA Battalions are completely capable of autonomous operations. They may operate autonomously and non-contiguously, perhaps within the depth of the enemy's defense. Modular design, in equipment and organization, allows them to receive attachments that immediately integrate into the unit's C4ISR system and networks, maximizing the effects of fires and other support. Units are tailored in anticipation of mission requirements and retailored as requirements change.

Situational awareness that includes friendly, enemy and non-combatant situations reduces uncertainty of the present situation and allows the commander to focus planning on the action-reaction-counteraction sequence of the coming battle. Control measures will be more dynamic, disseminated via the network as they are developed and changed in the course of the battle. Awareness of the location and status of all friendly forces will reduce the need for restrictive control measures. The UA's modular design allows rapid force re-tailoring, giving the commander flexibility. Enhanced C4ISR Networks and collaborative planning tools enable effective Battle Command on the move, maximizing UA's inherent agility.

As the UA's ISR assets are brought to bear and feed their own collected data and intelligence into the COP, the UA is less reliant on echelons above the UA for Level 1 situational awareness used to form Level 2 and Level 3 situational awareness. Enhanced C4 networks, improves the granularity of their COP, feeding it from the bottom up to all echelons of the force. While on the move (deploy and employ), units maintain shared situational awareness of their battlespace domain via the common operational picture and other level one inputs supported by decision aids from the systems of systems. Reporting from special operations forces will be one of the inputs to the COP, enhancing the situational awareness of conventional forces operating in their vicinity. Virtual liaison is accomplished via the Battle Command network. Battalion-level organizations are inherently combined-arms. The presence of both UAVs and armed helicopters as organic elements of the brigade-level UA add the synergistic effects of air-ground teaming to the UA's capabilities.

F.3 Vignette 2: Combined Arms Operations in Major Urban Areas

Urban Operations are planned and conducted where the area of operations is complex terrain composed of man-made construction and/or high population density. The urban environment is particularly operationally and tactically challenging because of its terrain and continually changing battlespace where peacekeeping, security operations, and full combat often occur simultaneously within city blocks of each other. Small-unit battles dominate operations complicated by communication challenges, non-combatants, limited mounted maneuver space, wide variance in terrain, and masking of precision location devices and munitions. Where conventional operations occur in open one-dimensional terrain, the urban fight is conducted in a highly compressed three-dimensional environment where relatively small elements can produce immediate radical changes to the situation.

The steady increase in global urbanization mandates the UA is capable of conducting urban operations as part of a UE in support of a JTF. A significant and unique strength of the UA over current forces is its ability to conduct urban operations using standoff engagement, temporary ground force presence, and sustained ground force presence singly or in combination. The UA replaces the traditional approach to urban warfare characterized by massive firepower and significant friendly and non-combatant casualties with soldiers teamed with technology in a maneuver approach. Although the individual soldier remains the ultimate weapon in the urban fight, technology enables the UA to understand, shape, engage, consolidate, and transition to control and win the urban fight. Casualties and collateral damage are minimized while operational success is expedited.

F.3.1 Background

This scenario takes place in Baku, Azerbaijan. Baku is a typical major urban area with compartmentalized, multi-dimensional landscapes and a large population (two million). It contains the normal mix of seven basic types of urban terrain. Its cultural center is characterized by sports complexes, theaters, museums, religious places, and similar culturally sensitive sites. The financial district consists mostly of high rise buildings and similar structures. Baku's high density inner city areas are the usual dense tenement housing and small business infrastructure servicing that population. The cityscape includes heavy industry with large factory complexes, rail and ship yards, oil production and refinement facilities, while light industry consists of smaller manufacturing processes, warehouses, and distribution centers. As with all typical urban areas, Baku has an economically depressed section of lightly constructed shanty buildings. Moving out from the city core itself is the inevitable urban sprawl of housing and associated social structure. The challenges facing the UA are increased by subterranean structures consisting of subways, sewers, utility tunnels, fallout shelters, and trenches running below all surface terrain types. They provide cover, concealment, and avenues for rapid movement. The re-enforced composition of urban structures in all but shanty areas provides cover from direct and indirect fire.

Rooftops throughout the surface terrain provide helicopter-landing zones and sites for air defense ambushes. Observation in the urban canyons and subterranean complexes is generally restricted to distances of 50m or less. Proliferating these terrain types are manmade and natural obstacles that impede ground and aerial movement of units, supplies, and munitions. Poorly mapped towers and wires are difficult for overhead imagery to detect and pose special hazards to airborne systems and indirect fires. Narrow streets and alleys (averaging three meters or less in width), particularly in shanty and high density inner city areas, severely restrict movement, especially if reinforced with hasty or preplanned obstacles.

Key nodes supporting the population (water, power, and communications facilities) are dispersed throughout the variety of terrain types. Maintaining these basic services for the population is essential for the government to retain its legitimacy and for coalition forces to maintain support from the local population. Other key nodes throughout Baku include the few open areas that provide LZs for air assault operations and locations for indirect fire units. Fields of fire average less than 40 meters in most places. In addition to the permanent structures, construction material and refuse provide concealment. Journalists and NGO personnel occupy hotels near or next to critical military targets. The UA must account for the advantages these conditions provide an enemy familiar with both the culture and terrain. Once engaged, the enemy will attempt to mitigate UA ISR capabilities and precision munitions as well as cause collateral damage to civilian and sensitive sites by positioning military forces and equipment in or

near hospitals, schools, religious centers, and other non-combatant and culturally sensitive locations. He will strive to achieve surprise by engaging at distances of less than 40 m. He will also engage with direct and indirect fires from hide positions and exploit dead space within the urban terrain types to move to ambush or attack positions. Journalists will move to areas of contact and readily mix with combatants and non-combatants to cover the events.

To counter these techniques, the UA must use its capabilities to understand the enemy intent and dispositions using its ISR capabilities to provide early warning on enemy dispositions and actions. It must shape the battlespace to defeat the enemy from out of contact and restrict his mobility and options supported by a communications network that enables the force to maintain cohesion regardless of terrain. The UA will engage using networked rapid response to time critical targets, precision attack, three dimensional (to include underground) targeting and from stand-off using LOS, BLOS, and NLOS fires while using multiple routes. The force will consolidate gains both in terms of terrain, security (through mutual support between units), support of civilians and infrastructure repair. Finally, the UA will transition to civilian authorities when the desired end state is achieved.

The enemy in this scenario is the Icheri Sheher Brigade composed of trained motorized infantry units with organic artillery and air-defense. The brigade is a highly motivated force of 1,500 soldiers equipped with T72 tanks, wheeled armored personnel carriers, light truck mounted machine-guns, rocket-propelled grenade launchers, shoulder-fired air defense systems, mortars, and anti-tank missiles (AT-3/5). The threat will establish company-sized strong points within the inner city and control the key water, power, and communications nodes. The threat will also position up to 50% of their strength outside the strong point in sniper hides, ambush positions linked with chokepoints or obstacles (urban rubble in many cases), and in concealed positions to provide observation of approach, flank routes and target indirect fires. The situation is complicated by armed clans that control the outer city. These small, irregular elements are well armed with machine-gun equipped light trucks, mortars, shoulder-fired air defense systems, rocket-propelled grenade launchers, anti-tank missiles, and small arms. They will move to reinforce the Icheri Sheher Brigade positions as necessary and readily swarm onto friendly forces that become isolated or vulnerable. Fundamentalist propaganda fuels distrust by the local population in outsiders. Religious differences prevent some neighboring states from supporting coalition operations.

F.3.2 Mission

The UA attacks to seize Baku City Center to neutralize or destroy the Icheri Sheher Brigade and armed clans, return control to the host nation's elected government officials.

F.3.3 Conduct of Operations

As operations commence, the UE builds understanding. Space assets use multi-spectral imagery and other means to detect and monitor enemy movements, strengths, and positions. UAVs conduct RSTA at higher altitudes, loitering high above to track key opposition leaders and forces. Special Forces and Air Force aircraft disperse micro sensors, establishing a networked sensor web across the urban area and surrounding critical locations and routes. NGOs provide data on the non-combatant population. The quantity of information is tremendous but automated analytical tools rapidly discern regional normalcy patterns for communications, movement, power, and social interaction as well as the enemy's order of battle. These "evolve" as country, region, and target data are collected. Three dimensional terrain representations are rapidly generated by penetrating sensors, including building and subterranean interiors, the location and type of mines, booby traps and other obstacles. UA forces en route to the area and their objectives rehearse virtually and interactively with adjacent and supporting UA forces and/or Air Force and maritime forces. Smart alarms embedded in command and control systems alert the UA to enemy strongholds, crew-served weapon positions, enemy weaknesses, changes to his normal order of battle, and movement of critical targets to include recommended actions. Enemy aircraft and ships are located, classified, and tracked in all weather conditions. Even cellular phone calls are monitored. Taskable software agents assess the population from the threat perspective and potential impact from friendly actions. Forces determine what effects to employ to achieve the desired end state so transition to

the elected government is facilitated, the infrastructure preserved, and the need for prolonged occupation and costly re-building mitigated.

Using this understanding the UE shapes the battlespace for subordinate units, (Figure F-5) building the necessary combat information to ensure success. The UE uses lethal and non-lethal fires to control or destroy enemy critical assets while isolating or segmenting his forces by restricting mobility for both his vehicles and troops. The UE also employs electronic attacks to control enemy information and the psychological environment. This contributes to the enemy forming and maintaining incorrect shared situational awareness throughout his force. These shaping actions restrict enemy options. They are based on coordinating UA and UE abilities to see first, understand first, and then engage with the appropriate effect. The ability to combine these capabilities to produce the desired effect depends ultimately on the operational art of the commander enabled by the science of FCS.

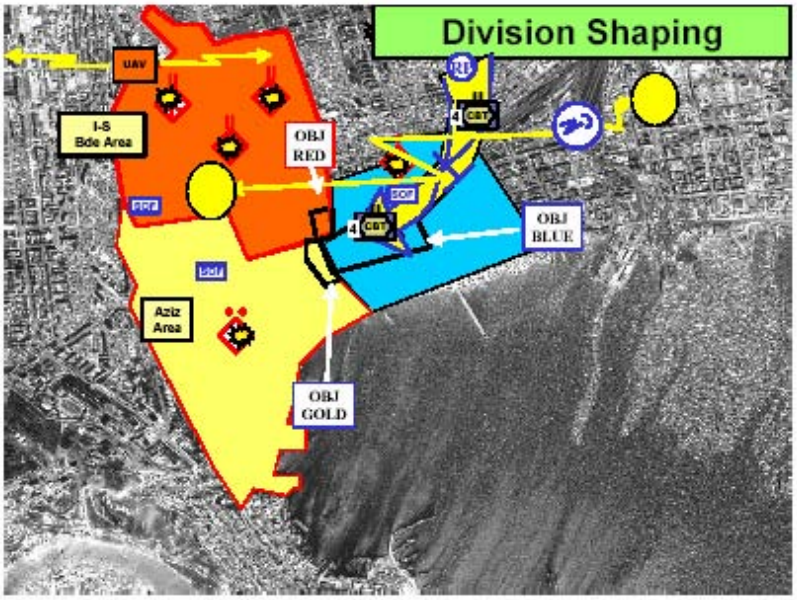


Figure F-4 UE Shaping Operations

Having deployed early as part of SOF, CA and PSYOP units supporting the UE join NGOs already present in the area. They establish refugee camps and sanctuaries for non-combatants outside Baku and safe passage to them. Automatic real-time language translation systems allow forces to interrogate prisoners, read captured documents, and communicate with coalition forces, aid workers, and the local population without the need for human interpreters throughout the operation. Counters to government anti-coalition propaganda are developed and implemented using organic systems and control over the indigenous radio, television, and other media. Covert, selective, secure, and passive tagging (tracking) of noncombatants and sensitive sites provides location, status, and associated significances. If non-combatants leave safe zones and take up arms, their tags are re-programmed from stand-off to threat status within the system.

The UA's tailored sensor packages facilitate maintaining understanding as the situation changes during shaping and all subsequent phases. This provides the UA with C2, A2C2, operational, and tactical flexibility to facilitate the commander's ability to rapidly adjust to changes in the battlespace resulting from his effects then pick the time and place for decisive combat. To accomplish the mission in Baku the UE employs two mutually supporting UAs that conduct standoff engagement, temporary ground force presence, and sustained ground force presence operations. Supported by UE fires and ISR assets, they will oust opposition forces and regain control of critical nodes that include water, power, and communications/ TV-Radio. One UA operates as the supporting effort and conducts three battalion air assaults employing dismounted troops with organic ARV-L (with LOS and BLOS capability) delivered to LZs to the north, west, and east of the inner city. The first air assault battalion attacks to the west of Baku, secures overwatch locations, and blocks reinforcing routes into the inner city. The second battalion

air assaults and attacks to seize similar positions in the north, further isolating the enemy. The third air assault battalion attacks into Objective Blue to seize critical nodes. These temporary ground force positions established by all three battalions deny the enemy re-enforcement or escape while diverting enemy attention from the main effort advancing from the southeast. The main effort UA and elements within it continually collaborate and coordinate virtually between themselves and the UE using the en route mission planning and rehearsal capability embedded in FCS Battle Command systems.

When attempts to influence enemy forces to surrender or leave the urban area fail, Joint networked fires isolate selected routes and engage his forces from tactical stand-off. Armed UAVs and precision munitions guided from space, ground operatives, and UAVs/UGVs attack every moving target that attempts to reposition or flee. The enemy's only course of action is to remain in their fixed strongpoint positions. They are isolated by lethal and non-lethal effects. With the enemy fixed, and his options limited, the second UA commences the main attack with a sustained ground force presence. It attacks with three mounted CA Battalions from the southwest, opening three ground lines of communications into the inner city where it will secure the key infrastructure nodes and destroy the Icheri Sheher Brigade. The main effort UA, executes its mounted attack from the southwest with three CA Battalions. The 1st CA Battalion accompanied by the platforms from the northern air assault battalion and the battalion in objective blue and supported by UE and Joint ISR and networked fires, moves to isolate selected routes and objectives to include Objective Blue. Once on Objective Blue they link-up with the air assault battalion to protect the western flank of the 3rd CA Battalion conducting the main attack. The main effort UA assumes control of the air assault battalion in objective Blue on link-up. Simultaneously, the 2nd CA Battalion, as the UA's secondary effort employs, Joint ISR and networked fires to isolate the selected routes and objectives before moving through Aziz clan territory to secure Objective Gold. This protects 3rd Battalion's southern flank. On order, 3rd CA Battalion conducts the main effort attack to seize the city center and transition political control back to the host nation government.

As the main effort, the UA attacks, refining and maintaining understanding of the battlespace including the enemy's strength, disposition, and probable actions using information from external Joint and UE sources as well as organic UA manned and unmanned reconnaissance capabilities covering gaps and dead space. Before and during movement, Level 1 situational awareness facilitates fusion and Battle Command functions, enabling shared correct higher levels of situational awareness at all echelons as CA Battalion Commanders continue to collaborate with each other and subordinates en route to objectives. The UA's most critical role is to shape the battlespace, first by isolating the portion of the urban area the CA Battalion will enter. It destroys identifiable high payoff targets and isolates the objective area, physically (with lethal and non-lethal fires), electromagnetically, and psychologically using combinations of obscurants, jamming, signature reduction, deception, disinformation, and/or pattern avoidance. The UA is responsible for areas between and beyond CA Battalion engagements and filling the gaps in battalion assets.

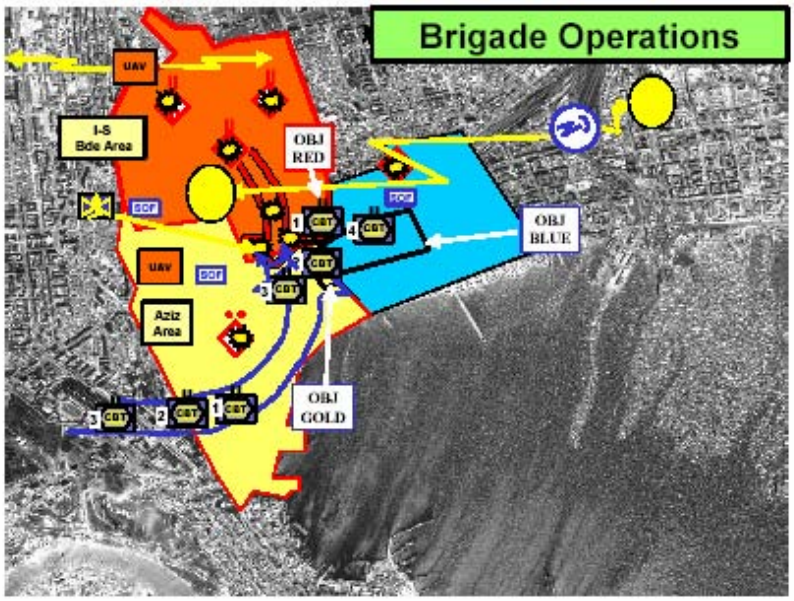


Figure F-5 UA Operations

The UA enables awareness across CA Battalions by synchronizing and integrating its efforts with UA reconnaissance elements and UE support to enable maneuver. The Aviation Squadron's Comanches work as a team with Class IV UAVs to support reconnaissance and surveillance ahead of maneuver, observe gaps and dead space, provide early warning of enemy movement, and detect their reaction to UA actions. These assets, regardless of echelon, can direct internal and external fires. R&S through all phases of the operation support continued awareness by enabling the UA to gain and maintain higher level correct individual and group situational awareness during day and night conditions. R&S is initially mobility-oriented to facilitate the infiltration attack of maneuver companies, with Reconnaissance Detachments committed to detecting mobility problems, establishing observation along routes, and emplacing unmanned ground sensors at potential enemy ambush locations. R&S assets then focus on enemy strong points and indirect fire systems that may disrupt maneuver. They maintain surveillance of lateral, reinforcing or withdrawal routes.

As information from networked soldiers, sensors, manned and unmanned systems flow to the UA, its organic MI assets fuse it with input from UE and Joint sensors (including SOF) to enable correct shared situational awareness among commanders and leaders throughout the operation. The UE and UA support the CA Battalion reconnaissance plan by inserting sensors north of phase line Patton allowing the CA Battalion to focus its sensors south of PL Patton. Subordinate CA Battalion, Company and Platoon ISR capabilities can then be deployed to provide the highest fidelity directly supporting the close fight. Organic systems use the feeds from all levels to build a 3-D virtual representation of the battlespace. The UA conducts shaping actions to set favorable conditions for engagement activities to begin. These include using ground, air, space, and likely naval assets to identify and control movement of personnel and equipment. Assets at all echelons support shaping. The UA reconnoiters potential BLOS attack by fire positions and approaches to the objective. Situational awareness development, facilitated by organic and external sensors, enable to the battalion to maneuver into positions of advantage. These locations support the assault and provide overwatch fires from tactical standoff. To isolate the objective, the UA coordinates employment of UE and Joint assets to neutralize enemy forces and sensors.

The UA employs NLOS and BLOS non-lethal fires to dislodge enemy forces from and/or isolate critical and sensitive nodes. Joint CAS scaleable effects are directed against potential enemy counter attacks and dislocated enemy elements attempting to withdraw or relocate. Electronic attacks on enemy C2, air defense, and reconnaissance assets together with networked Joint and UE fires on those routes and objectives supported by BDA from sensors verifies friendly ground and air routes are clear and update enemy location and strength information. Friendly sniper teams linked with ground and airborne sensors are posted at key locations to provide manned overwatch of critical NAIs to detect enemy elements that

may attempt to disrupt UA movement. Once enemy forces are isolated, UA ISR detects, finds, and facilitates the destruction or neutralization of enemy sensors to deny the enemy correct situational awareness. UA and UE NLOS assets deliver scatterable mines to fix enemy reserves and deny him cross-mobility routes. NLOS units engage the enemy on the objective and along egress routes with precision lethal and non-lethal fires. CA Battalion and UA fires focus on destroying and suppressing high payoff targets, such as enemy indirect fire systems.

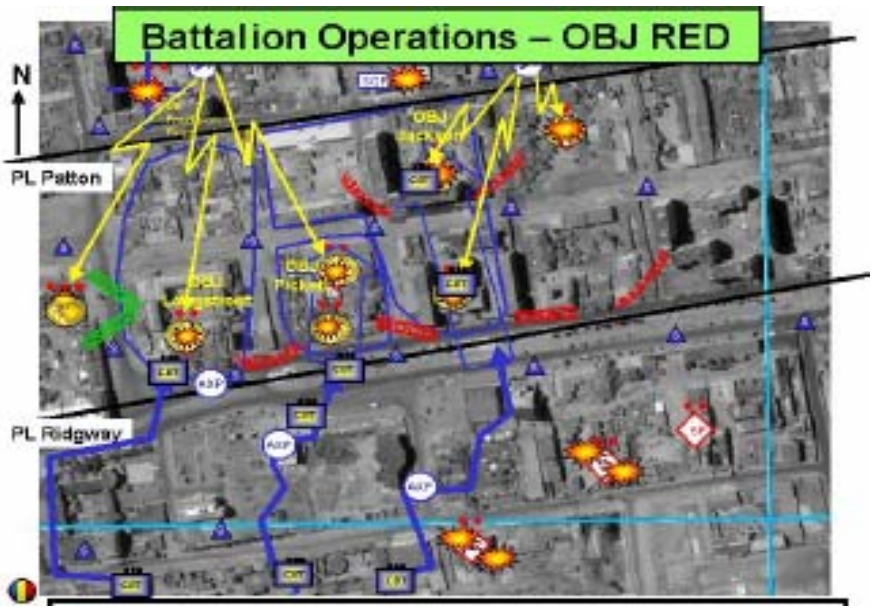


Figure F-6 CA Battalion Operations on OBJ Red

The UA engages with two supporting battalions attacking to seize Objectives Red and Gold to secure a foothold in the city while the air assault battalion seizes Objective Blue. Networked fires prioritize and engage enemy forces using the best available assets as they are identified. As the UA maneuvers toward Baku, the lead battalion meets unexpected enemy resistance. The platoon in contact returns fire while taking advantage of available covered positions. BLOS fires from adjacent MCS platoons and companies destroy enemy platforms, while precision NLOS fires destroy enemy troops in buildings allowing the CA to continue the attack without losing momentum. As the UA nears its objectives, the CA Battalion initiates decisive combat at the time and place of its choosing. Man portable UGVs maneuver into surrounding urban areas establishing roadblocks and other security positions and locate in and around buildings. Autonomous hand launched UAVs perch on high urban terrain to monitor key facilities and routes. Both monitor subterranean entrances and exits. They “see” and “sense” through structures, inside subterranean complexes, and through urban clutter including electronic interference and battlefield rubble to detect personnel and equipment. Accompanying packages discriminate between civilians on the battlefield and combatants, detecting weapons, explosives, and other threats. The operational and tactical plans are adjusted from increased understanding.

MCS Company BLOS and Battalion NLOS mortar fires initiate a concentrated attack against the most dangerous targets left on the objective. This includes driving enemy forces from a main communications facility for the government in Baku without destroying it. Recon troops supported by UA Comanche Helicopters and UAVs employ BLOS and NLOS non-lethal munitions to dislodge the enemy and observe his withdrawal and reinforcement routes using lethal fires to destroy him when clear of any sensitive sites. As units clear and pass subterranean entrances, unmanned sensors are placed to provide warning of the enemy use. The CA Battalion continues to develop the situation in contact using its reconnaissance capabilities to maintain continuous surveillance of the objective while the assault companies move to the objective. The UA’s MI analysis capability supports the battalion commander’s CCIR. The battalion’s UAV’s watch for enemy attempts to reinforce the objectives and assist in targeting enemy movements outside buildings. The battalion uses the network to integrate maneuver, fires, and ISR. The commander

and staff use 'running estimates' to adapt to the situation, influence enemy decisions, and adapt faster than the enemy. Joint Close Air Support (JCAS) and the aviation detachment support company operations through networked fires while small units continue to move forward, employing LOS, BLOS and NLOS fires as appropriate.

Figure F-7 Company Operations at OBJ Jackson

As their situation grows increasingly desperate, the enemy fires ground to ground missiles previously placed next to culturally sensitive sites at advancing forces and fleeing refugees in an attempt to force the UA to attack them and cause collateral damage to the civilian population and culturally sensitive sites. Chemical agents are released in various parts of the city killing non-combatants and in advance of UA forces. Space assets detect rocket launches, pinpoint their origins, determine trajectories, and feed them to networked ground and airborne systems that destroy them in-flight. UAVs and special operations forces guide precision munitions eliminating launchers without collateral damage. PSYOP and Civil Affairs units neutralize any attempted propaganda. UAVs and UGVs from the UA enter contaminated areas. Information from their sensors map contaminated areas and project their expansion, help medical personnel determine treatment for effected non-combatants, and assess when the threat dissipates. Their self-protection systems engage threats with direct fire (LOS and BLOS) or networked NLOS fires. As other UA forces move toward their objectives, micro-weather visibility as well as CBRN modeling over rapidly generated 3-D terrain allows them to adjust routes and insertion points based on any chemical threat or weather changes. To seize company Objective Jackson, one platoon augmented with unmanned systems seizes Objective Stuart passing another platoon to seize Objective Grant. The main effort then seizes Objective Lee.

Figure F-8 Platoon Operations of OBJ Lee

In one incident as the UA advances, threat forces incite a large civilian mob to march on UA units. Some forces attack using women and children as human shields. Their goal is to produce fratricide and ideally trap non-combatants in a cross-fire, influencing public opinion through news footage of civilians killed or injured by heavily armed forces. UA forces quickly maneuver vertically to establish positions in front of the advancing mob. As they approach, an enemy soldier prepares to engage the lead helicopter with a rifle propelled grenade. An Army UAV detects the threat and relays the information into the Battle Command system. An orbiting Air Force gunship eliminates the threat. UA forces use non-lethal malodorants, directed energy, acoustic, and other means to disrupt and disperse the advancing crowd and attacking forces using human shields. Those who remain are incapacitated by non-chemical stun effects and secured. Airborne manned and unmanned platforms immediately notify the force if any elements return. Simultaneously, unmanned systems maintain surveillance and the company deploys ground sensors and UAVs to develop a higher fidelity of the enemy situation and facilitate collaborative planning between the company and the platoons. When assaulting buildings is required, ground and aerial sensors help the company commander pinpoint entry points while en route to the assault position. These capabilities increase the tempo of operations. The company facilitates cooperative engagements by establishing BLOS overwatch positions to support maneuvering elements. Battalion UAVs, UGVs and UGSs provide BDA while company and platoon UAVs are positioned to assist small unit leaders in observing dead space and determining suitable building entry points. Battalion NLOS mortar fires eliminate targets with precision fires in designated buildings based on real time information provided by scouts and unmanned systems. All company, platoon, and squad formations move with continuous overwatch by remote precision fires. Mutual support remains a fundamental principle of maneuver.

Ground and aerial sensors allow infantry squads to determine the best available covered and concealed locations to dismount before continuing their attacks to clear identified buildings and structures. As the dismounted element assaults, the FCS platforms outside the buildings provide overwatch to prevent enemy reinforcement of the objective area. The dismounted platoons use their UAVs to recon routes and watch dead space providing real time information to each platoon. Units conduct actions on contact against surprise encounters with previously unidentified enemy strong points, security elements or local counterattacks. Platoons use point-and-shoot capabilities to destroy enemy forces from cover or tactical standoff. Platoons coordinate internal UAV employments to ensure coverage of the company AO. Devices on UAVs designate enemy positions on building rooftops allowing platoon leaders to direct PGMM fires. LOS/BLOS capable MCS systems maneuver through ‘urban defiles’ to support rapid forward movement, with dismounted elements securing choke points and obstacles. Recon units supported by MCSs engage targets with point-and-shoot capabilities at ranges of 50 meters and less.

This permits highly responsive (5 seconds or less) first round effects allowing small units to achieve lethal overmatch through mutually supporting and reinforcing fires.

As operations continue, knowledge of what buildings do and do not contain threats allows selective clearing and bypassing. Manned and unmanned platforms maintain security at the exteriors and engage enemy forces attempting to reinforce or flee. When buildings must be cleared, obscurants blind the enemy and non-lethal munitions are used to force evacuation. When an assault is necessary, UGVs conduct deception breaches, causing the enemy to reposition away from actual entries. Soldiers enter structures from any level based on the threat and most advantageous clearing strategy. For ground breeches they use rifle launched munitions and unmanned systems to breach doors and walls from protected positions. Assault elements move quickly by any route without being constrained by doors, windows, and other openings. Squads conduct breaches and systematically clear predetermined floors. In one case, an Army squad is about to clear a building when it learns the enemy holds several journalists inside. Small UGVs are released into the building's air ducts while others climb outside walls to peer in and determine the exact location of friendly and enemy personnel. Other platforms observe exteriors and roofs to warn of reinforcements. The journalists are in a room guarded by several militia. The remaining enemy force is in the adjacent room, where they've constructed crude barricades of sheet steel. Both rooms are breached simultaneously using variable penetration and distance effects small arms munitions. As soldiers fire at forces guarding the journalists, the few stray rounds that miss during the engagement lose lethal effect (beyond 25m) before reaching non-combatants at the far end of the room who experience only minor bruises.

In the second breach, the team enters the room and penetration munitions pass directly through the steel door to kill the enemy. Heat sensitive, they dissipate on entering the human body, eliminating any risk of passing through and harming friendly forces and non-combatants in adjacent rooms or floors. Precision engagements with OICW bursting munitions complete the destruction of enemy forces. Another squad suppresses several enemy soldiers located down a hallway using a SUGV with a nonlethal payload, then engages those who do not capitulate with lethal bursting munitions. UGVs teamed with and controlled by Land Warrior equipped soldiers participate in clearing operations. Rooms cleared by UGVs are marked with a UMASS sensor to designate critical areas and ensure rooms remain secure as the platoon moves through the building. Support elements clear subsurface areas and hand emplace the UMASS to monitor the locations as they move to Objective Stuart. Manned platforms and ARV-Ls maintain security on building exteriors and destroy enemy forces attempting to reinforce the objective. The assault element is positioned to be able to observe the SUGV breech and secure a foothold. Once the charge is blown, a second SUGV enters the building with a UMASS dispenser and recons the immediate hallways to its front and sides, establishing a foothold in the building. The Platoon Leader is able to see and open/shut doors as well as observe people moving. He directs his SUGV to take up a security position to watch a designated hallway or stairwell. Squads move along the most advantageous routes while friendly force tracking and positive control of lethal effects prevents fratricide. SUGVs "leap-frog" forward, staying ahead of the squads, clearing rooms. The squads or the SUGV emplaces UMASS in hallway junctions, rooms, stairwells or other critical areas as they clear.

Forces continually share awareness of each other through three dimensional position locations showing where each soldier is in any structure (above ground or subterranean) both horizontally and vertically. Lightweight individual body armor offers protection against enemy small arms and dissipates energy, preventing or reducing internal injury and protecting against thermobaric weapons. Solider and system status is monitored. Casualties are triaged and evacuated aided by bio-sensors in soldier uniforms and MULEs that autonomously recover and evacuate wounded while providing ballistic protection. Networked sensors overwatch casualty evaluation and unmanned resupply. Enemy threats are engaged with networked fires to reduce soldier exposure. When maneuvering forces run low on ammunition and other supplies, system monitors initiate automatic resupply by manned platforms and unmanned MULE. Systems operate for several days without recharge and soldier systems are powered by a single source using the kinetic energy produced during warrior movement to re-charge. The MCS and other platforms provide immediate direct fire support of the dismounted force. Direct fire BLOS fires from MCS platforms and CA Battalion NLOS mortars provide overwatching lethal and non-lethal fires to attack enemy locations masked by buildings. Sensor coverage is maintained throughout the assault to see enemy reactions, exploit enemy vulnerabilities, and determine BDA. Additionally, dismounted force in buildings

receives mutual support by precise BLOS fires through networked point-and- shoots capabilities. The network enables LOS, BLOS, NLOS and aerial fires to support the Infantry elements as they clear and secure objectives.

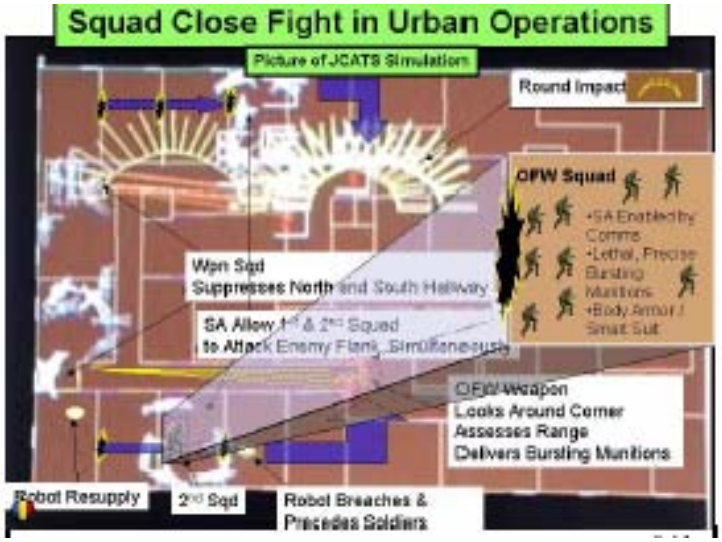


Figure F-9 Squad Close Fight

The result of teaming technology with soldiers is the ability to control two squads clearing simultaneously at the small unit level and multiple synchronized, mutually supporting operations against multiple objectives at the UA level. Force cohesion is maintained through a layered network that provides communications and information to the UA while operating in buildings and in subterranean spaces. With their objectives secured, forces transfer routine control to local civilian authorities and/or international organizations. Involving NGOs from the start enhanced understanding, shaping and engagement, and reduce or eliminate operational pauses during the traditional “hand-over” with a seamless transition. Overall, operational and tactical success is achieved by using technology as a warfighter enabler rather than a means of urban destruction.

F.3.4 What Endures

For the foreseeable future the close fight will continue to characterize urban operations. This close fight will continue to be combined arms and Joint. UAs will close with and destroy the enemy inside buildings, in streets, and underground. The multi-dimensional nature of the urban battlespace will not change but global urbanization will increase.

F.3.5 What Changes

Several aspects of urban combat will change as UAs, enabled with improved doctrine, training, leader development, organizations, and materiel, conduct operations. FCS systems, enabling the UA to develop and maintain correct shared situational awareness, will allow it to understand, shape, engage, consolidate and transition faster than the enemy and current forces. The need to clear unoccupied sections of urban areas will be reduced, so the UA can focus available combat power on key terrain. Battle Command from anywhere in the battlespace will allow leaders to react to changes in the enemy situation, adjust plans on the move, and control dispersed forces to a far greater degree than current forces. The UA shapes the battlespace with electronic, lethal and non-lethal effects in addition to forces. UAVs, UGVs, and UGSs will assume many manpower intensive and dangerous tasks, such as sensing breeching, clearing, surveillance, sensor emplacement, and clearing buildings/subterranean structures. Unattended sensor systems feed fusion and enable higher level situational awareness supporting greater force protection, enabling swift, sure movement through urban areas.

F.4 Vignette 3: Mounted Exploitation and Pursuit

The UA attacks an enemy in open and rolling terrain with some variance of complexity, such as defiles and small villages. Explicitly, the discussion showcases the UA's tactical agility to exploit offensive success and pursue a fleeing enemy. The UA is operating under the Objective Force UE, which is the ground component of the JTF, and a JFLCC. The enemy is a combination of conventional forces, paramilitary, and special purpose forces challenging the UA forces with both direct military combat engagements and asymmetric means. In this vignette the UA must develop the situation out of contact, integrating ISR from UE and Joint assets, targeting the most dangerous enemy systems, and engaging those systems with accurate, assured lethality from both internal and external assets. This requires robust ISR, speed, and very flexible, adaptable networked fires.

In this scenario, the second UA to arrive in theater will conduct an aerial envelopment to operational depth using intra-theater airlift in conjunction with a ground pursuit operation. This operation represents a 400 km operational maneuver done in all weather across widely varied terrain in about 48 hours without resupply. The terrain runs the gamut from Baku, a coastal city the size of Houston, over open and rolling terrain to the rugged mountains west of Agdam. The weather across this operational distance can run the four seasons in a 24-hour period. These operations are designed to maintain pressure on delaying forces, dislocate them, and force them into a battle in the open and rolling terrain. This allows the JTF or UE commander to simultaneously deploy and employ his forces, and create multiple dilemmas for the threat forces.

F.4.1 Background

The UA experienced initial success against enemy forces in the AOR, defeating the Icheri Sheher Brigade during the attack into Baku. ANFAR forces, which attacked across the border, seized Agdam, and continued eastward in an attempt to relieve the beleaguered Icheri Sheher Brigade. Surprised by the rapid defeat of forces in Baku, they suddenly found themselves in an exposed position in the wide valley between Agdam and Baku. Aware that US forces were mounting an operation to secure Agdam and restore the border, ANFAR forces began a delaying operation, designed to buy time for establishing a defense of Agdam while slowing and inflicting casualties on the attacking US force. Keys to their hopes of success were preservation of the delaying force and effective use of target acquisition systems linked to long-range artillery systems.

F.4.2 Mission

The 2nd UA is ordered to conduct rapid, simultaneous exploitation and pursuit operations along multiple axes to destroy dislocated enemy forces withdrawing towards Agdam through integrated fire and maneuver, and close tactical assault in order to restore stability and sovereignty to the region.

F.4.3 Conduct of Operations

The 1st UA, successfully completing its engagement in Baku against the Icheri Sherer Brigade, transitions to Mission Staging Operations and prepares for the next mission. A 2nd UA conducts this operational maneuver to the west to destroy an enemy brigade before it reaches sanctuary in the mountains and urban areas around Agdam. The main effort battalion (1st CA Battalion) is conducting an aerial envelopment at an operational depth of 400 km to take away the enemy's option of using his sanctuaries in those mountains. Two supporting efforts are launched by ground. The 2nd CA Battalion is in a pursuit of the dispersed enemy battalion, supported by USAF and USMC ground attack aircraft. The 3rd CA Battalion envelops from the south, led by a Comanche detachment to fix the southern enemy battalion.

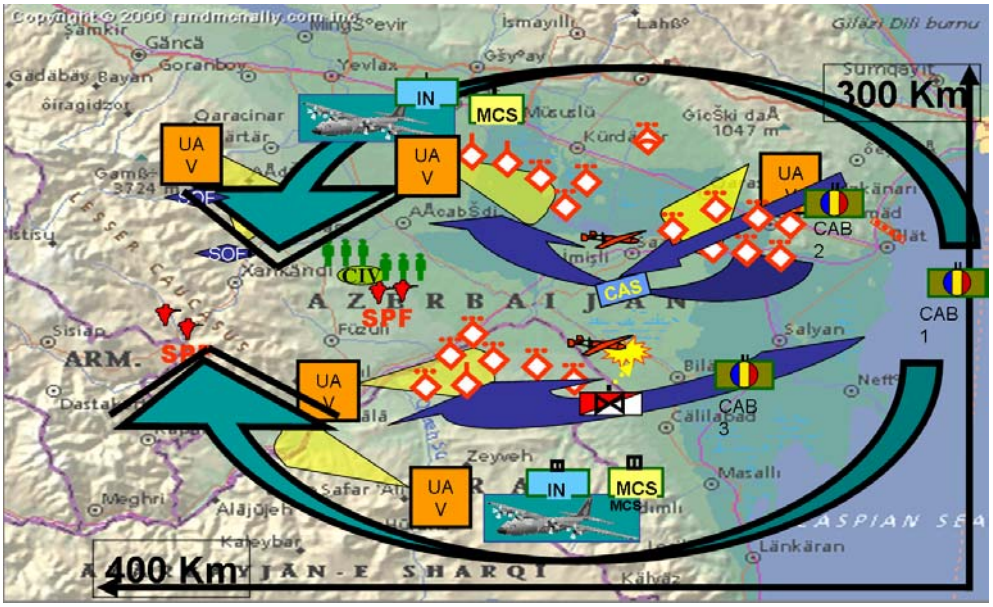


Figure F-10 UA Pursuit Operations

One of the JTF commander's critical requirements is locating and destroying the enemy's long-range artillery assets, such as the Purga cannon (60 km range) and Igla missile systems (100 km range). UE Maneuver Air and Missile Defense facilitate the JTF Commander's intent by leveraging its capability to destroy incoming rockets, artillery, and any aerial sensors designating for those assets. The UA staff develops an ISR collection plan to ensure sensor coverage of likely HPT locations within 100 kms of the UA's elements. The Fires and Effects Cell enters the commander's criteria, attack guidance, and target selection standards to facilitate the responsive attack of HPTs. As part of his shaping operation, the UA commander identifies a number of potential engagement areas on the approaches to Agdam where he plans to use UE and Joint fires, his own attack aviation and long-range NLOS fires to isolate withdrawing threat forces. He requests UE and JTF emplacement of Unattended Ground Sensors and Intelligent Munition Systems along the key approaches to Agdam and around NAIs. By isolating the city from the delaying forces (his immediate objective), he denies access to the sanctuary offered by a defense within the city and creates the conditions for their defeat in detail in the more open terrain. Additionally, the operational maneuver of the CA Battalion via C-130 intra-theater lift into a blocking position north of Agdam will deny the enemy access to complex, mountainous terrain northwest of Agdam.

As the UA Aviation Squadron and the CA Battalions' reconnaissance assets locate enemy systems withdrawing towards Agdam, the UA uses networked fires to access integrated UE and Joint effects to engage from tactical stand-off. The UA separates the enemy from his supporting fires through a virtual sensor-to-shooter link, while protecting friendly forces from the enemy's lethal systems. Direct communications between the Air Force and Navy pilots operates in the area and the reconnaissance assets designating the targets, all visible on the COP, ensures effective application of effects, while eliminating the risk of fratricide. The JTF commander further supports this shaping effort by emplacing SOF teams near the proposed landing sites for the intra-theater operational maneuver. Accessing satellite data and evaluating HUMINT source information, the SOF teams quickly determine the suitability of each landing site and confirm the absence of enemy forces. After uploading this data to the sensor network, the SOF teams and indigenous forces occupy positions to maintain continuous surveillance coverage and provide security for the arriving UA elements. Based on the SOF information, 1st CA Battalion utilizes the mobile command group's embedded planning tools to quickly determine its sequencing of forces for the 400 km operational maneuver. Elements begin loading into C-130 and C-17 aircraft for the intra-theater movement, while finalizing their plans and conducting virtual rehearsals using EMPR tools.

The JTF commander releases twelve C-130s and six C-17s to UA control for this operation. Based on the number of landing sites (each with a MOG of 2), available aircraft and expected sortie times, the CA

Battalion will complete its intra-theater movement in approximately twelve and a half hours. This capability to rapidly infuse combat power over operational distances significantly enhances the UA commander's ability to exploit positions of advantage and engage the enemy at a time and place of our choosing. Continuously updated through the COP, each company arrives ready to fight, quickly linking up its platoons and sections, and rapidly moves to assigned positions. As combat power builds at each landing site, SOF forces conduct an intelligence handover and phase security of the sites over to the CA Battalion. Meanwhile, 2nd and 3rd CA Battalions review the COP derived from the ongoing fight in Baku. Satisfied there is no threat from the enemy force in the east, the CA Battalion leaders begin executing their plans formulated in collaboration with the UA commander. Their reconnaissance elements, having departed several hours earlier, gain sensor contact with the withdrawing ANFAR forces and refine the COP information. Departing from their dispersed APODs, the CA Battalions rapidly close the distance on the ANFAR forces, using their superior cross-country mobility and precise knowledge of the routes. This assured mobility is gained through a detailed understanding of the terrain and weather's effects along their axes, and sensor coverage of identified obstacles and enemy forces depicted on the COP.

The Fire and Effects Cell coordinates a plan to provide continuous NLOS fires coverage along each battalion's axis. CH-47 helicopters from the UE aviation brigade air assault NLOS-LS platforms to carefully selected sites along the depth of the UA's Area of Influence. The CH-47s remain prepared to quickly relocate these systems as the battle unfolds. Additionally, an FCS Cannon battery maneuvers within each CA Battalion's battlespace to provide responsive precision fires due to the 100km separation between 2nd and 3rd CA Battalion. As aviation and CA Battalion reconnaissance assets continue to develop the situation out of contact, the UA commander exploits an opportunity to employ air-ground teaming with the southern CA Battalion. First, he directs the Comanches to use their air-to-air capability to destroy the threat UAVs attempting to locate the UA's elements. This counter-reconnaissance effort quickly denies valuable information to the delaying enemy battalion and enables the CA Battalion to continue maneuvering out of contact. UE Maneuver Air and Missile Defense complement the UA's offensive operations by protecting the force against any incoming IGLA rockets and defeating other asymmetrical aerial threats. Next, the Comanches begin controlling teamed with Class IV UAVs from the Aviation Squadron to extend the UA's sensor coverage an additional 75 km. This manned/unmanned teaming provides a synergistic effect: Manned systems provide the judgment and curiosity (man in the loop), while unmanned systems provide coverage and precision.

This layered sensor approach will ultimately provide the JTF commander with immediate options due to an unexpected turn of events. National sensor assets focused near the northern Iranian border (south of Agdam) detect what appears to be a battalion-size formation of threat artillery systems. The JTF commander alerts the UA commander of this potential threat and directs him to further refine the information. The UA commander diverts the Class IV UAVs from their current mission of observing the enemy battalion conducting a delaying action, to focus their efforts on the suspected artillery systems. The 3rd CA Battalion commander compensates for this loss in sensor coverage by employing organic Class III UAVs from his Recon Troop and unattended ground sensors to maintain coverage over the area previously covered by the Class IV UAVs. The Comanche pilots monitor the Class IV UAV sensor data and quickly confirm the initial sensor reports: Igla artillery systems capable of ranging 100 km are positioned to engage any force approaching Agdam. The JTF commander considers this both a significant threat to the UA and a tactical center of gravity for the ANFAR forces. The loss of the Igla systems will enable the UA ground and air elements to destroy the withdrawing ANFAR forces unimpeded by long-range artillery systems.

The UA's Battle Command on the Move capability enables the JTF commander to rapidly respond to the threat while maintaining pressure on the fleeing ANFAR maneuver forces. The UA commander receives the order to destroy the Igla battalion and immediately disseminates the information through the network to the 3rd CA Battalion Commander in the south. Because that commander was able to monitor the situation via the COP in real time, he already has a course of action prepared using his embedded planning tools. He conducts a virtual conference with his company commanders and quickly explains his concept, simultaneously sending the information digitally to all units. The UA commander's intent now is for 3rd CA Battalion to bypass the delaying enemy battalion and maneuver out of contact using terrain and threat information depicted on the COP to destroy the Igla battalion. He requests additional CAS sorties from the JTF and focuses NLOS-LS and FCS Cannon fires to fix this formation. He directs employment of

IMS to further reduce the enemy battalion's ability to impede 3rd CA Battalion's maneuver. The JTF commander approves the additional CAS sorties, and further orders a CA Battalion from the 1st UA to assume the mission of destroying the delaying enemy battalion.

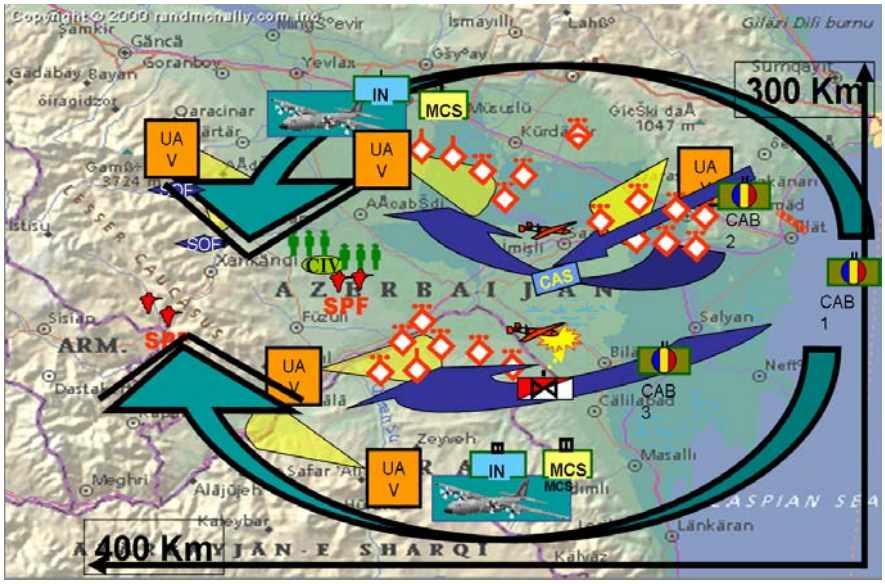


Figure F-11 UA Operational Plan

Meanwhile, the 2nd CA Battalion rapidly closes the distance between its lead combat elements and another fleeing enemy battalion. A Comanche section from the aviation detachment identifies an enemy defensive position 60kms in advance of the CA Battalion's lead elements. The position was carefully selected to protect the withdrawing threat force and overlooks the best approaches to a river crossing along their line of withdrawal. Knowing the CA Battalion will close on the reported location in just over an hour, the Comanche section focuses its sensors to identify specific target locations within the enemy position. Other sensors, mounted on the Class IV UAV, are diverted from adjacent areas to further develop the situation. The layered sensors reveal the position is well defended by a combination of dismounted infantry elements, Draega tanks, and Garm missile launchers in hastily prepared survivability positions. Minefield preparations to protect the position from direct assault are still incomplete. The Comanche pilots and UAV operators locate several exploitable gaps and transmit the information for inclusion on the COP. Quickly adapting his scheme of maneuver to the developing situation, the 2nd CA Battalion Commander directs his Reconnaissance Troop to locate river crossing sites that are beyond the line of sight of the defensive position. When a recon section locates one north of the defensive position, the battalion commander uses his embedded collaborative planning tools to locate an ideal engagement area on routes the defenders will probably use as the UA dislodges them from their positions. He directs Alpha Company to cross north of the river and occupy positions allowing them to place direct fires (LOS and BLOS) on defending forces as they enter the engagement area. Teamed with the RAH-66 Comanches, the company-sized air-ground team brings the integrated fires of the UA's network to bear on the withdrawing forces.

Figure F-12 UAV and Comanche Air Ground Teaming

A second company is directed to cross the river some distance south of the defensive position and occupy positions that canalize the withdrawing enemy towards the engagement area. The 2nd CA Battalion Commander orders the remaining two companies to attack the enemy position and compel the defending forces to withdraw, enabling their defeat in detail. The battalion commander again uses his embedded collaborative planning system to update his scheme of maneuver and digitally transmits the supporting graphics to all elements of the battalion. Simultaneously, he uses voice communications to ensure his subordinate commanders understand his intent. Still 30 km from the enemy position, the alpha company commander reviews the continuously updated common operational picture for obstacles along his intended axis of advance. While he watches, a newly identified minefield is posted to the display. The appearance of the minefield prompts an audible alert in his earphones to ensure he is aware of the obstacle on his route. Using his planning tools, he quickly determines new routes for each of his platoons. He directs them towards bypasses around the minefield, using LOS evaluation tools to ensure the force remains beyond the enemy's lethality envelope, maneuvering out of contact around the flank of the defending forces.

Moments later, another audible alarm alerts the commander to the appearance of two new icons on his screen, indicating the arrival of additional enemy forces. Each icon represents a single vehicle, flagged with additional icons indicating the direction and rate of their movement. They are moving west, apparently in an attempt to reinforce the forces in the defensive position. Almost as quickly as they appear, they fade to black, indicating the same Comanches whose sensors located and identified them also destroyed them. When the NLOS mortars are 15 km from the threat's main defensive position, they initiate a preemptive attack. Using targetable data from the networked fires application of the Battle Command system, they deliver precision munitions aimed directly at the vehicles defiladed in the survivability positions within the enemy's defense. Their lethal, top-attack precision munitions quickly destroy all but five vehicles. Still too far away to visually observe the enemy's defensive positions, the company commander selects the split screen option on his display to monitor both the map display on the COP and live video feed from the Class III UAV observing the enemy's position. He watches as the five surviving vehicles, three Draega tanks and two Garm infantry missile carriers hastily flee their positions and head towards Agdam. This leaves the remaining dismounted defenders easy prey for the mounted supported by dismounted combined arms assault.

The icons on the company commander's COP indicate the fleeing vehicles are taking an unanticipated route and will bypass the planned engagement area. The commander employs an organic Class II UAV to reconnoiter a route his display indicates will allow his 3rd platoon to outflank the retreating vehicles.

With other Class III UAVs indicating the route is clear of obstacles, the 3rd platoon advances rapidly and quickly overtakes the fleeing enemy vehicles. The platoon destroys two of the enemy tanks with direct fire (LOS), with the platoon maintaining contact with the fleeing enemy force. The remaining three armored vehicles find what they believe is cover behind a low ridge separating the two forces. However, the platoon leader uses the sensor data from the company's Class II UAV to regain contact with the enemy vehicles. He then maneuvers his platoon to a position affording engagement from tactical stand-off. Creating a sensor to shooter link with the Class II UAV, he employs BLOS fires to destroy the remaining enemy vehicles.

The Recon Troop's Class III UAVs confirm BDA, so the platoon leader orders the platoon to continue movement to the west. Though the remainder of the company is still beyond his direct observation, his COP display reassures him they are moving on parallel routes. The platoon is well within mutually supporting range of the company's fires, as well as those of the battalion's NLOS mortars and nearby NLOS cannon battery. With all elements of the UA fully networked, it can achieve virtual teaming, 3-D overwatch and mutual; in short, the ability to mass effects without massing forces. UA platoons gain lethality by the networked systems, vice adding a bigger gun. FCS gains an acquisition and lethality overmatch and overwatch using beyond line of sight/non-line of sight attacks. What this means at platoon level is new overwatch techniques. Current overwatch techniques require physical proximity of units. The UA, with every manned and unmanned platform a sensor linked to the network, allows the UA to overwatch at greater ranges providing leaders more tactical options. In the UA, NLOS and BLOS systems permit mutual support between small units on dispersed axes while moving. At the platoon and higher level, this near simultaneous shaping of the battlespace extends its operational reach, increasing its options for the attack and decreasing the enemy's ability to react.

The company commander orders a platoon leader to detour his force into a small village along the platoon's line of march towards Agdam. Using embedded language conversion tools, the platoon leader learns from village residents that enemy dismounted forces are occupying the next village. SPF teams are hiding in the forested areas of the valley, observing for long-range artillery assets located closer to Agdam. Using his collaborative planning tools, the platoon leader adds the suspected defensive position to the COP. He used automated reporting software to draft and transmit a text message of his conversation with the villagers to all forces operating within the area. The company commander requests emplacement of a UGS sensor array to confirm the location of these suspected threat forces in the forest and near the village. Within minutes, a HIMARS battery emplaces a 400m x 600m ISR UGS field along the forested area and at precise locations around the village per the Company Commander's direction. The UGSs immediately begin detecting movement of personnel in the village and locate stationary track vehicles near the forest. The UGSs transmit that data to the Infantry Company's C2V for Level 2 sensor fusion and portrayal on the COP. As the positions of the defending forces become clear, the company commander begins planning his company-size attack. To minimize the risk to the civilian populace, his attack will use mounted forces to isolate the village from standoff, while dismounted forces infiltrate to destroy enemy forces within the village. Even as that attack unfolds, the remainder of the battalion continues its pursuit of other withdrawing enemy elements.

The lead platoon, controlling the company's Class II UAV to remain out of contact, maneuvers to a position close to the reported enemy position. The Class II UAV locates an enemy machine gun position, showing it to be well-sited near a building with exposed approaches. The platoon leader further refines the contact by maneuvering a SUGV. The location also precludes the platoon from employing its organic BLOS fires due to intervening multi-story buildings. To engage the enemy position, the platoon leader sends the Class II UAV sensor data to the Battle Command system. This system facilitates establishing a sensor to shooter link via networked fires with the CA Battalion NLOS mortars. This enables a cooperative engagement in which the NLOS mortars employ precision NLOS fires from 4 km away, destroying the enemy position with minimal collateral damage to the building.

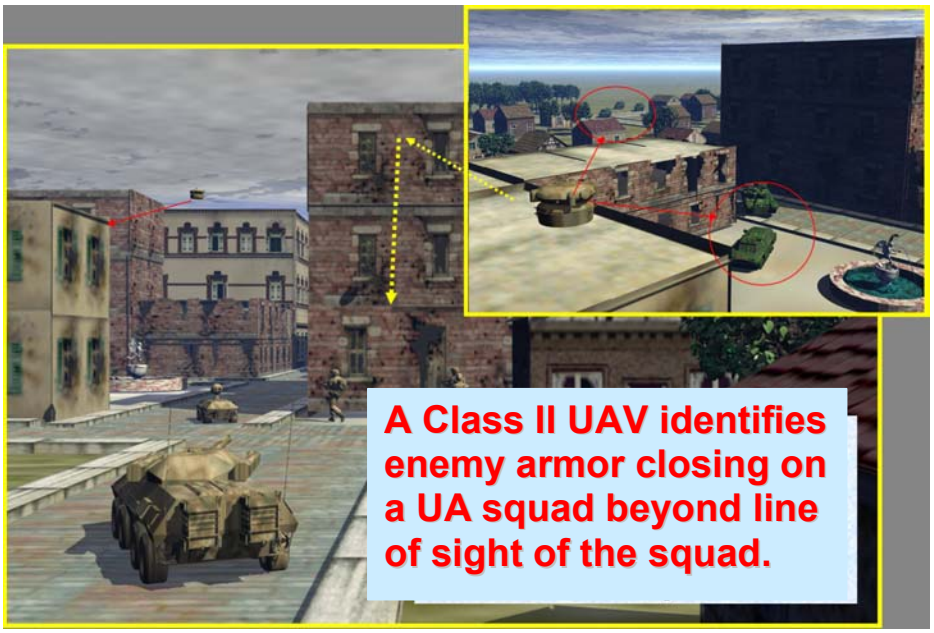


Figure F-13 UAV Locates Targets out of Contact

Meanwhile in Baku, the CA Battalion Commander from 1st UA receives the FRAGO to attack the delaying threat force while his unit is completing its MSO after cycling out of the Baku urban fight the night prior. Now, fully replenished and well rested, the unit is able to rapidly transition from the MSO into the pursuit operation. With only a few keystrokes, the CA Battalion enters the 2nd UA network and begins receiving updates to its COP. Recognizing time is of the essence, the CA Battalion commander issues immediate movement orders and sends a WARNO across the network to his subordinate commanders. En route, the battalion's leaders review the COP and collaboratively formulate their tactical plans, disseminating them over the network and conducting virtual rehearsals. The 1st UA CA Battalion accesses the maneuver graphics 2nd UAs 3rd CA Battalion used during its movement towards the enemy battalion prior to receiving the Igla FRAGO. Making minor corrections based on updated weather analysis and identified enemy positions, the CA Battalion is able to rapidly close the distance. The CA Battalion commander conducts a virtual teleconference with the 2nd UA commander to review his intent and scheme of maneuver. The UA shaping effort, using CAS, Comanche and NLOS fires, has fixed the enemy battalion conducting the delay. This enables the CA Battalion from the 1st UA to close on the enemy force after a rapid 200 km ground movement from Baku.

The reconnaissance troop begins receiving updates from the Joint/UE sensor assets and focuses its sensors on high payoff targets and potential ambush locations. The CA Battalion Commander, monitoring this sensor data, notes the enemy battalion's dispositions are leaving an approach in the north uncovered. He immediately orders his two northern most companies (Infantry and MCS) to maneuver against this apparent weakness. The remaining two companies establish positions to assist in fixing the enemy battalion from tactical stand-off. Synchronized with the CA Battalion's scheme of maneuver, the UA commander orders the NLOS-LS sections to engage the enemy battalion's artillery and tank systems to shape the fight. The NLOS-LS unit fires PAM munitions with pinpoint accuracy after receiving targetable sensor data from the Recon Troop's Class III UAVs and ARV-RSTA platforms. With the CA Battalion now able to mass its effects ICW UA assets, the UA commander releases the CAS back to JTF control. He does retain control of the UE Comanches to further assist with the CA Battalion attacking the Igla battalion.

The two companies approaching from the north each locate excellent positions 15 km away from which to employ NLOS-Mortar and BLOS fires from tactical stand-off. They employ their organic Class II UAVs and ARVs to recon small towns on their flank as added security. The enemy battalion quickly becomes combat ineffective due to the lethal effects of direct and indirect fires from the CA Battalion. Recognizing they are not achieving their purpose of delaying the UA forces, its leaders frantically look for a way to

escape the destructive cauldron. A recon section happens across a draw that leads away from the fight northwest towards Agdam. The remaining enemy elements seize upon the opportunity and break contact wherever they can, heading for this apparent escape route. Unbeknownst to them, Intelligent Munitions Systems (IMS) emplaced earlier by UE assets as part of the shaping effort are covering this draw and feed the location of the enemy units to the COP. Simultaneously, the IMS munitions close enough to enemy units begin attacking targets per their programming, causing even further confusion. By now, the two northern companies are altering their routes to block the escape route, aided by the updated COP information. They quickly reach positions that enable application of BLOS fires without exposing the forces. As the remaining enemy elements break into non-cohesive formations, the infantry company completes their destruction with a rapid tactical assault made possible through their ability to determine concealed routes to masked dismount points. Surviving enemy soldiers quickly drop any pretense of resistance and begin surrendering to the CA Battalion elements.

With this direct fire fight and close tactical assault culminating, it becomes apparent the surviving enemy forces in the north (2nd CA Battalion's area) are now fully on the run, withdrawing in less cohesive formations. This is the opportunity the UA commander has waited for. Confident he can complete their destruction with the 1st CA Battalion and 2nd CA Battalion in the north, he directs the CA Battalion from the 1st UA to handle EPWs, and be prepared to assist 3rd CA Battalion's attack on the Igla battalion in the south. With 2nd CA Battalion maintaining direct pressure in the north, the UA commander begins employing the NLOS-LS platforms he previously emplaced with devastating effect. Employing precision and loiter attack munitions, the NLOS-LS platforms severely attrit the enemy force, causing further piece mealing of the formations. CAS from the JTF adds to this destruction, using Link 16 data from the Comanches to direct their efforts. This suits the UA commander just fine, as it sets the conditions for his CA Battalion in the blocking position to defeat the remaining enemy forces in detail. As the UA elements continue their pursuit towards Agdam, embedded logistics planning tools monitoring the UA's ammunition and fuel expenditure in the recent engagements automatically transmits an update to the FSB's Support Operations Officer (SPO) in the Distribution Management Cell. The SPO uses this information to begin planning a Sustainment Replenishment Operation (SRO) to resupply the UA without impeding its momentum or ability to transition to subsequent operations.

The 1st CA Battalion Commander in the blocking position north of Agdam patiently monitors the COP as the pursuit operation unfolds. As the last of its elements arrive from the landing sites, the initial elements complete their defensive preparations. The CA Battalion Commander positions his organic sensors in depth along the expected approach of the enemy force, relying on UA and Joint/UE sensors in his area of interest to further develop situational awareness. He emplaces several UGS fields, delivered by UE HIMARs assets, near the complex terrain along his northern flank to screen his battalion and provide early warning against any SPF forces. Wanting to maximize the shock effect of his force, he verifies the positioning of NLOS-LS platforms and the NLOS cannon battery, which accompanied his element during the intra-theater lift, are able to range the depth of his battlespace. His fires and effects cell coordinates with their joint counterpart to ensure access to CAS and HIMARS to leverage those effects. MCS platforms are well-sited to maximize their BLOS capability, while using that same terrain to protect them from enemy fires. The infantry prepares positions along dismounted avenues of approach, sitting in ATGM positions for their Javelin missiles to deny access to enemy tanks. The infantry carrier vehicles establish positions to provide mutual support with their direct fire (LOS) systems.

The JTF commander employs JSTARs and Aerial Common Sensor (ACS) aircraft to provide security for the CA Battalion and enable its deception plan to remain undiscovered. Further out, IMS and UGS supplement the sensor coverage and provide additional means of canalizing the enemy forces towards the blocking positions. ARVs are positioned to engage remnants after the initial engagement by the CA Battalion's main body. Within the companies and platoons, small group leaders conduct virtual rehearsals, weapons system checks and monitor their COPs for last minute updates. At last, the threat forces come within the layered sensor network of 1st CA Battalion in the blocking position. 2nd CA Battalion in pursuit halts its movement, but continues employing FCS Cannon precision fires to maintain pressure on the enemy. As the enemy force enter the designated engagement areas, NLOS-LS precision fires strike first, followed immediately by LOS and BLOS fires ripping through the formations. Along the entire 30 km front and throughout the depth of the battlespace, no enemy elements escape

unscathed. These devastating fires are only part of the overwhelming lethality at the disposal of 1st CA Battalion; CAS and HIMARS fires add to battalion's destructive effects.

Joint assets join in the fight, with Comanches teamed with Class IV UAVs providing near instantaneous Battle Damage Assessment. Demoralized and totally unprepared for the shock of encountering such a lethal force blocking their path to safety, this final engagement proves too much for the remaining threat forces. As swiftly as it began, the devastation comes to a close. The UA commander orders an immediate cessation of fires and turns his attention to the fight culminating in the south against the Igla artillery battalion. 1st CA Battalion is still fully prepared to continue the fight, having expended less than a one day supply of Class III and V in this operation. The UA Commander orders that battalion to begin movement south to complete the destruction of remaining ANFAR forces near Agdam. 2nd CA Battalion from the pursuit operation secures the landing strips as the FSB begins aerial delivery of supplies as part of the SRO for the CA Battalion and evacuates wounded UA soldiers.

F.4.4 What Endures

The principles of war haven't changed; how we employ them has. We will no longer be an attrition based force. The UA will be enabled by information allowing for increased speed and movement, with a lighter and smaller logistical footprint.

The five forms of maneuver remain fundamentally the same with regards to their employment within the battlespace. The ability for the commander to engage his forces in dynamic and rapidly paced operations within todays constructs remains consistent when looking at tomorrows' maneuver and offensive operations. Movement techniques/formations at company level and below remain similar with regards to employment; however, the company's Battlespace fin which it operates in will expand based on technological advances.

F.4.5 What Changes

Movement techniques and formations at battalion and company level will merge with the enhanced capability of BCOTM. Movement techniques and formations will be enabled through the use of sensors (unmanned and manned), information superiority and networked fires. BLOS fires, linked to networked fires and greater SA via the COP, will allow for mutual support from adjacent units, thus enabling a greater dispersion of equipment and personnel, allowing for company and platoon movement along multiple axes. This ability to simultaneously maneuver with enhanced mutual support enables the massing of fires and effects without the massing forces. Companies can approach on multiple axes, clear defiles and resume dispersed movement. The enhanced capability of air-ground teaming provides an additional 3-D effect, which influences the tempo and reach capability of the maneuver elements.

Situational awareness, precision fires and tactical stand-off will allow rapid force oriented tactical assault. The commander will have an unprecedented ability to identify the enemy's composition and disposition through layered networked sensors, allowing for precision maneuver and targeting. Fires and maneuver are fully integrated and synchronized, enabled by a dynamic Battle Command system, increasing the ability to conduct rapid exploitation and pursuit. This alters today's techniques of expending the preponderance of effort on the movement to contact offensive operation. This allows for a focused effort of equipment and resources to attack and pursue to the final defeat of the enemy.

F.5 Vignette 4: Rapid Advance To Enemy Center Of Gravity

The UA is nearing completion of its pursuit and exploitation. The UA has been given an additional mission to advance to an enemy center of gravity. The terrain is open and rolling with numerous villages along the route to the final objective. Explicitly, the discussion showcases the UA's ability to master transitions, not allowing the enemy any rest throughout the battlespace.

F.5.1 Background

The 1st UA entered Azerbaijan through multiple APODs in January, defeating the Icheri Sheher Brigade during the attack to Baku. The JTF commander cycled the 2nd UA into the fight to maintain operational momentum as the ANFAR forces began fleeing west towards Agdam. The 2nd UA employed two CA Battalions in pursuit to maintain direct pressure, while the 3rd CA Battalion conducted an operational maneuver via intra-theater airlift to establish a blocking position near Agdam. As the UA conducted its ground pursuit operations, UE SIGINT and HUMINT sources received indicators of ANFAR Igla MRL batteries approximately 65 km to the southwest near the town of Fusuli, just north of the Iranian border. With a range of 100 kilometers, the Igla batteries remain dispersed and hidden, and precise targeting information was not yet possible for engagement by UE/JTF assets. The Igla batteries are defended by artillery, para-military and air defense units, as well as their hidden locations near populated areas.

F.5.2 Mission

3rd CA Battalion attacks to destroy Igla batteries (threat COG) vicinity of FUSULI in order to provide freedom of maneuver to 1st UA to complete the destruction of ANFAR forces began fleeing west towards Agdam.

F.5.3 Conduct of Operations

Comanche pilots from the Aviation Squadron employ manned and unmanned teaming with Class IV UAVs to extend sensor coverage another 75 km. They receive a FRAGO to further refine their search for the Igla batteries based upon information from Joint assets. Monitoring the UAV Class IV sensor data, the Comanche pilots quickly confirm the initial sensor reports: Igla artillery systems are positioned to engage any force approaching Agdam. The JTF Commander considers this both a significant threat to the force and an operational center of gravity for the ANFAR forces. The enemy's successful withdrawal and destruction of the UA all hinge upon retaining these long range Igla fires. The enemy commander believes the batteries are too far out of the UA sensor range and can remain undetected until he is ready to strike. The loss of the Igla systems would enable the UA ground and air elements to destroy the withdrawing ANFAR forces unimpeded by long-range artillery systems.

The UA Commander receives a FRAGO from the JTF Commander ordering him to locate and destroy the Igla batteries. He immediately disseminates this information throughout the UA via the DIDb. The 3rd CA Battalion Commander is monitoring the situation via the COP in real time, and has a plan already prepared using his embedded planning tools when given the mission by the UA Commander. The 3rd CA Battalion Commander conducts a virtual conference with his company commanders and staff cells, and quickly explains his concept, simultaneously sending the information digitally to all units. He articulates the operational significance to the overall campaign to all participants: If the CA Battalion destroys the Igla batteries, the UA has the ability to tactically affect an operational center of gravity.

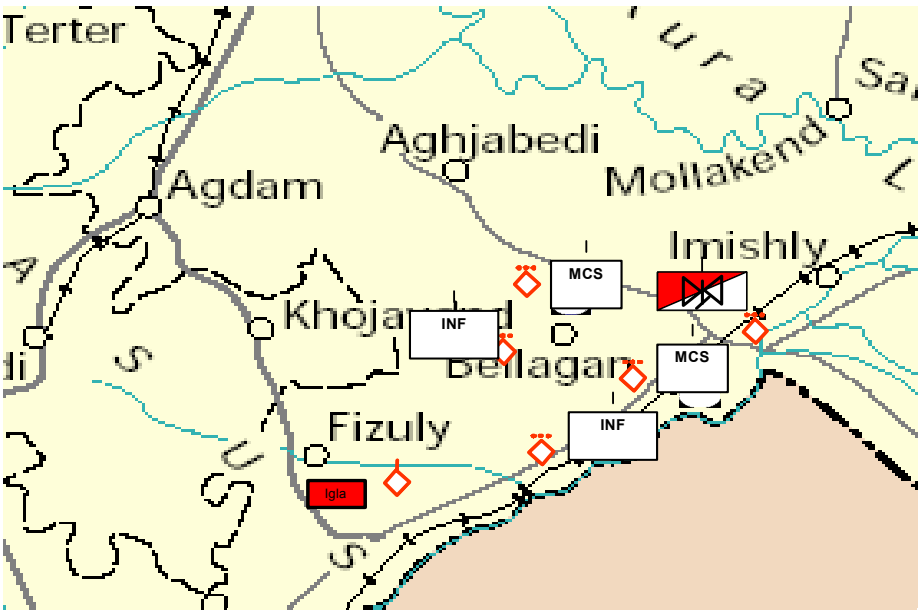


Figure F-14 3rd CA Battalion Dispositions

The 3rd CA Battalion commander's intent is to bypass the delaying enemy battalion, using routes identified on the COP to remain out of contact. The COP provides the maneuver commanders the tools to locate enemy forces and obstacles to allow his forces to navigate through enemy controlled territory without making contact. To reduce the enemy's ability to impede 3rd CA Battalion's maneuver, he requests additional Comanche support and CAS sorties from the JTF. He focuses NLOS-LS and FCS Cannon fires on HPT's and employs IMS to further fix the enemy formation. The 3rd CA Battalion commander employs his suite of on-hand decision-making aids within his C2V, reach-back capability to higher intelligence sources, and real-time collaborative planning with the battalion staff to refine his order. He uses real time weather information from the DIDb to determine potential impacts to his maneuver. Finally, he calls up current vehicle status reports on all battalion platforms. These embedded planning tools enable the commander and his staff to quickly refine the plan and conduct a collaborative rehearsal, while the battalion is moving towards the objective.

Higher intelligence feeds indicate that the Igla batteries are located in and around the town of Fusuli. The Igla batteries are using the buildings within the town to mask their location and provide protection from JTF fires and air strikes. Each battery consists of four launchers spread across a 3 km wide area, and must relocate to firing positions each time they shoot. The Igla commander clearly understands the avenge kill capability of the UA, having seen a sister battalion destroyed after firing one volley. The 3rd CA Battalion commander's plan is to rapidly advance his companies along multiple, mutually supporting axes of advance. He does not want the battalion to get tied down fighting small engagements; he is focused on the Igla battery. He wants to maximize the FCS platforms' speed and ability to see the enemy first with his increased UAV sensor capability and engage at standoff ranges. As the 3rd CA Battalion nears the Fusuli, it employs air-ground teaming of Comanche and Class IV UAVs with the lead elements. One infantry company takes the lead along the northern axis while an MCS company leads on the southern axis. The infantry platoons and company headquarters launch Class I and II UAVs to recon the canalized terrain in the north for potential ambush sites. The UAVs are looking for positions that may hide lone gunners with RPGs, snipers, and similar sized threats. One enemy hunter-killer team engages and damages a Class II UAV with small arms fire. Their position now compromised, the enemy ambush team displaces and attempts to occupy alternate positions. Within seconds, the NLOS mortar battery uses a sensor to shooter link from another Class II UAV to engage them. Two other enemy hunter-killer teams and one fire controller are quickly located and destroyed with NLOS mortar fires.

While still 10 kms from Fusuli, sensors from the Recon Troop detect a surface-laid antitank minefield along an infantry company's intended axis. It maneuvers an ARV forward to determine the minefield's dimensions and identify booby traps. The information is immediately portrayed on the COP; the Troop commander

employs NLOS fires to reduce the obstacle and detonate the mines using thermobaric munitions. As the infantry company bypasses the reduced obstacle, a lone gunner with an RPG pops up from his camouflaged hide site. He intends to get a quick kill and retreat to an alternate hide position. He fires a tandem warhead RPG at the lead ICV, but the onboard warning system alerts the crew of the incoming round. The ICV's active protective system (APS) automatically engages and defeats the incoming round. As the ambush team attempts to depart, an ARV engages and kills them. An infantry squad dismounts to secure the crossing site and provide protection for the unit as it passes by the small town en route to their objective. A Class III UAV acquires an enemy BMP beyond LOS fires of the infantry platoon. The UAV transmits this information to a nearby MCS platoon, who immediately provides the BLOS fires to destroy the enemy BMP.

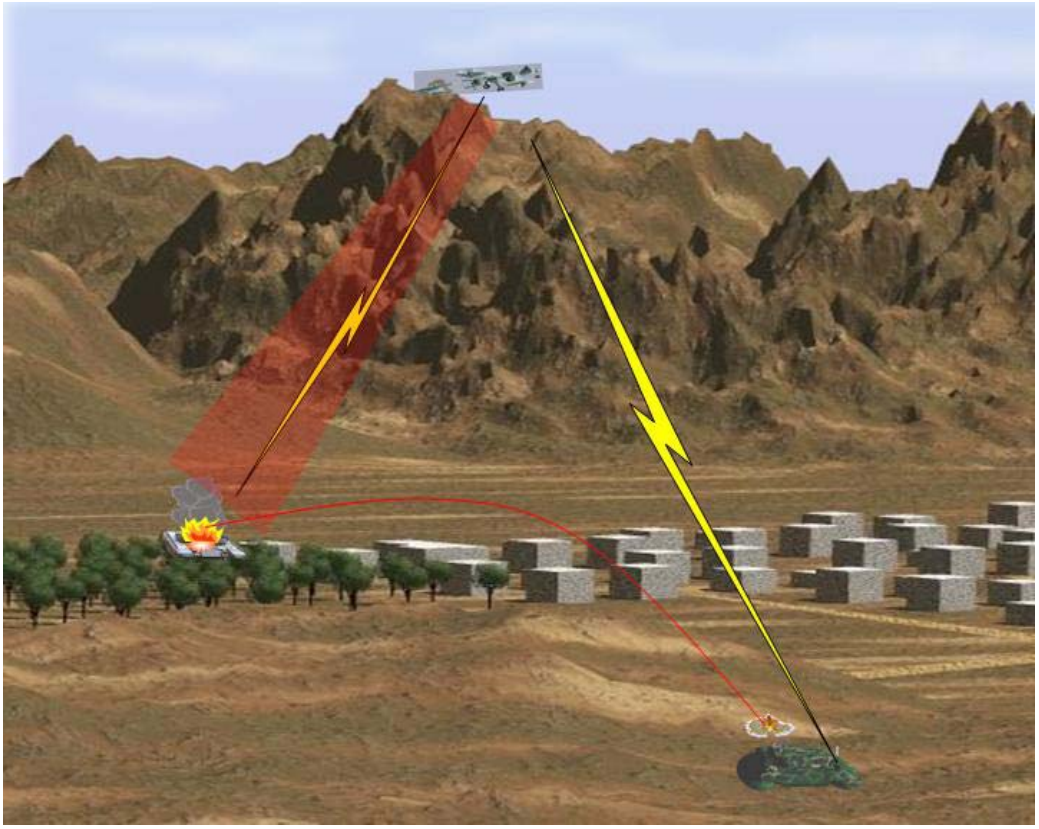


Figure F-15 BLOS Engagement

As the 3rd CA Battalion maneuver elements close on Fusuli, the battalion ISR Cell finalizes implementation of its ISR collection plan. The ANFAR forces are keeping their IGLA batteries hidden inside buildings dispersed throughout the town. The ISR and Operations Cell coordinate positioning of manned and unmanned sensors to establish a comprehensive layered sensor network around Fusuli. UE HIMAR systems deliver ISR Unattended Ground Sensors (UGS) near key known hide sites, with Class III UAVs supplementing coverage of these NAIs. Comanche teamed with Class IV UAVs and Loiter Attack Munitions maintain ISR coverage on suspected hide sites in warehouses near the town's rail yard. Unmanned systems (ARVs, SUGVs and Class II/III UAVs) from the Recon Troop execute R&S of buildings near the center of town. Joint and UE assets (Rivet Joint, Global Hawk, etc) provide ELINT/SIGINT coverage to detect radar signatures and monitor transmission of tactical orders. UE air assets emplace an Intelligent Munition System (IMS) array astride a bridge crossing site to prevent reinforcements from the adjacent town. MCS and Infantry companies establish overwatch positions along major avenues of approach to preclude displacement of the IGLA systems. NLOS-LS and FCS Cannon systems are positioned to provide immediate effects within a 45 km radius of Fusuli. Joint air assets remain in loitering positions out of visual range.

Satisfied all assets are in place, the UA commander relays a coded signal to the UA commander. Two F-15E Strike Eagles drop ARGUS pods filled with electronic decoys in a pattern 45 km due north of Fusuli. The decoys begin emitting the electronic signature of a Forward Support Battalion. A Commando Solo aircraft transmits false traffic indicating a logistical resupply operation for two MCS companies. The ANFAR force radars and SIGINT assets detect the apparent UA sustainment operations and seize the opportunity to create mass casualties on the US forces. IGLA launchers and PURGA artillery within the town and surrounding area come out of hiding and fire direction radars go active. Each launcher and artillery piece fires one volley before coming under attack. 3rd CA Battalion's ISR sensors immediately begin providing target data on the acquired IGLA and PURGA systems to the networked fires component of the Battle Command system. Most of the threat missile and artillery rounds land harmlessly in the open desert surrounding the decoys. The remaining missiles that acquire and target actual friendly elements are identified and destroyed by the Air and Missile Defense assets positioned to support the UA.

The best application of effects are matched against each threat system with the networked fires architecture, allowing a combination of effects against each threat system. A combination of LAMs, PAMS, precision guided FCS Cannon munitions and BLOS fires systematically destroy one threat system after another. Unmanned systems in the town utilize See-Thru-The-Wall sensors to locate additional launcher systems in warehouses next to a hospital. Joint air assets employ JDAM precision guided munitions to destroy these systems, leaving the hospital completely untouched. Comanches teamed with the UAVs provide immediate BDA of the effects generated by this lethal application of fires.

An orbiting JSTARs aircraft detects several moving target indicators moving north from Fusuli; the UGS array emplaced earlier confirms the contacts. The MCS companies maneuver to a concealed position 12 km from this threat; the recon troop diverts Class III UAVs to supplement the UGS sensors. The Class III UAVs gain acquisition and provide targetable data directly to the MCS companies to execute a cooperative engagement. Within minutes, the threat column is destroyed with accurate BLOS fires. Meanwhile, the IMS array south of Fusuli detects a platoon size track vehicle movement across the bridge from the adjacent town; networked fires select the IMS array to engage this threat. The IMS sensor array identifies a civilian bus traveling in front of this platoon. IMS allows the bus to pass, as it doesn't meet its attack criteria, but does pass the information through the network for additional analysis. The munitions detonate as the BMP platoon enters its engagement area, achieving mobility kills on three BMPs; the fourth BMP makes a rapid dash across the bridge. A Loiter Attack Munition supplementing ISR coverage of the bridge engages and destroys the remaining vehicle. The UA commander, receiving real time assessments of the attack, determines the IGLA/PURGAs no longer pose a threat to the UA elements conducting the pursuit towards Agdam. He directs the 3rd CA Battalion commander to maintain sensor coverage of Fusuli, and move north towards Agdam to secure a location for subsequent sustainment replenishment operations.

F.5.4 What Endures

The CA Battalion maintains the ability to conduct detailed planning and rehearsal for all operations. As the CA Battalion moves as a part of the UA, they received a FRAGO and immediately began to develop their battalion level FRAGO. The CA Battalion also maintains the offensive spirit to quickly adapt to changes and maintain the momentum of an attack without breaking stride. Small unit leadership has always been the hallmark of the US Army and that has not changed with the UA. Leaders at the Company, platoon and squad levels are responsible for the lives of their soldiers while still accomplishing all tasks.

F.5.5 What Changes

With immediate access to the data base and a shared COP, the speed by which the commander can develop a FRAGO is drastically decreased. He has immediate access to the readiness status of all platforms within the battalion, a full understanding of the terrain and its implications on the unit and a clear picture of where the enemy is located. FRAGOs which used to take staff time for preparation are now developed in significantly less time with more detail.

F.6 Vignette 5: Air Assault Enabled In Mountainous Terrain

This vignette demonstrates the UA's ability to conduct complex offensive operations over extended distances in complex terrain by vertical envelopment of an enemy and dismounted maneuver (fire and movement) to achieve the combat mission. The threatening force, the Nagorno Karabach Liberation Front (NKLF), has the goal to frustrate and defeat regional stability efforts by the United Nations. Several units of the 23rd and 24th Separate Mechanized Brigades (about 3-5 battalions with an assortment of equipment), comprised of approximately 1500 to 2500 personnel, and other smaller elements of the 5th OSC have dispersed to the mountainous areas in the Nagorno Karabakh (NK) region near the town of Baku to continue resistance against UN intervention forces. These forces control or significantly influence communities to the west of the Area of Operations and have civilian support in the areas controlled. An Objective Force UE, organized as a - Combined Joint Task Force (UE-CJTF), is operating in the theater and is directed to achieve three distinct operational goals: conduct combat operations to decisively engage and defeat NKLF combat forces, facilitate a westward pursuit, and set conditions to restore stability to the region that enable a continuation of the UN mission.

A UA is ordered to carry out a focused attack in mountainous terrain. Lines of communication are extended in excess of 150km. The UA Commander's strategy requires successful rapid establishment of a secure forward operating base from which the UA conducts lethal and non-lethal combat operations. This is accomplished by a deep air assault to attack and destroy the NKLF command and control center of gravity, rapidly establish a FOB and FARP, and quickly flow in of follow-on combat power to sustain offensive operations. The mountainous terrain and conditions restrict the pace and/or channel the direction of ground and air movement. The channeling effects of the terrain present the defending force with tremendous advantages and the UA with major risks. The enemy uses the terrain as a combat force multiplier by positioning surveillance assets for advanced detection of an attack, focusing anti-aircraft resources to influence likely routes into landing zones in the battlespace, and using the terrain to shield forces from intelligence gathering efforts, air attack and long-range fires. At the appropriate moment, small enemy teams and individual soldiers exit covered and concealed positions. They disperse across the terrain to vantage points with good observation and fields of fire. This requires the UA and attacking force to address a wide range of operational requirements and threats across a broad area while maintaining focus on the mission's decisive point. The UA leverages information overmatch to find, fix, isolate and destroy the enemy's capability and will to fight. FCS technologies enable the Objective Force overcome the challenges and limiting effect terrain has on maneuver support and sustainment operations.

F.6.1 Background

Following a UN negotiated settlement/ceasefire, remaining Anfar military forces withdrew from Azerbaijan and returned to garrison in Anfar with remaining personnel and equipment. The returning military age males face widespread unemployment, homelessness and an unstable infrastructure within their country. Under the UN agreement with the Anfar government the Anfar military units outside the sovereign territory of Anfar are directed to place all military equipment in designated cantonment areas under UN force supervision. Several units of the 23rd and 24th Separate Mechanized Brigades and other smaller elements of 5th OSC refuse the order to surrender their equipment and begin movement to the mountainous areas in the NK region to continue resistance against UN intervention forces. These units are dubbed as the Nagorno Karabach Liberation Front (NKLF).

The ANFAR military tell the international media "the proud soldiers under his command will continue to resist the illegal intervention of foreign forces into a domestic issue". There is evidence indicating that certain members of the Anfar government sanction this position and provide covert support for the military elements that have withdrew to the mountains. The situation threatens regional stability and interest. The recalcitrant military organization actively threatens the authority of the recognized government and presents the possibility of the evolution of a rogue government. To assist in stabilizing efforts, the UN has a large NGO/PVO presence in the region. The UN has 16 NGO/PVO agencies throughout NK totaling 1450 personnel. Based in Stepanakert, these agencies operate refugee camps and hospitals in several towns.

The local population strongly supports the NKLF. The United Nation's humanitarian effort is reluctantly appreciated by the civilian population. The enemy has tremendous non-technical information and intelligence network in place that must be considered at all phases of the operation. The enemy forces commingle and/or seek refuge with the non-combatant population for tactical advantage. Prudence is emphasized in decisions leading to contact with civilians in surrounding towns and engagement of questionable combat targets. Rules of engagement are tight due to concerns that remaining support for UN activities will evaporate if the enemy commander has an opportunity to use civilian casualties, resulting from combat operations, to ferment anti-coalition sentiment.

F.6.2 Mission

The 2rd UA mission is to attack and destroy the NKLF command and control infrastructure in the vicinity of a cave complex east of Bahka (OBJ Terror), establish a FOB in the vicinity of OBJ Silver, effect linkup with attacking UE forces and, on order, continue the attack to the west in order to restore governmental control.

F.6.3 Conduct of the Operation

The UA Commander orders the 1st CA Battalion to attack and destroy enemy forces in the vicinity of a cave complex east of Bahka (OBJ Terror) and secure ground approximately 15km east/southeast of OBJ Terror (OBJ Silver) to establish a FOB. The battalion also executes a linkup with attacking UE forces and, on order, continues the attack to the west in order to restore governmental control. It conducts company air assaults with (1) Company A (A Co.) to destroy enemy forces in the vicinity of OBJ Terror and (2) Company B (B Co.) to establish the FOB at OBJ Silver. B Co. then protects the force that establishes an Army Airfield (AAF) to receive follow-on forces and forward area rearm and refueling point (FARP) to sustain offense operations.

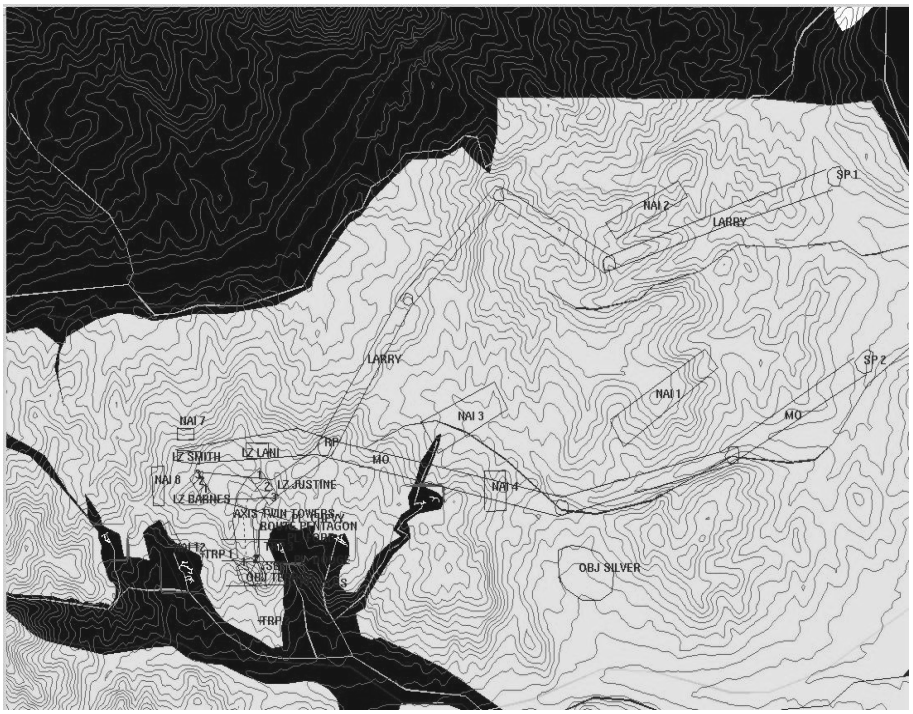


Figure F-16 Company Level Air Assault Graphics

The UA conducts intensive ISR operations that enhance the COP and success of shaping efforts that enable battalion maneuver. The UE establishes an intense network of ground based unmanned and unattended ISR assets to monitor key points of interest around and in the AO. This network is functional

for several days and yields tremendous information on enemy patterns of movement and key asset locations. The ISR network is supplemented by space and air based resources. The CA Battalion Commander integrates the company CCIRs with battalion priorities and requests GMIT (ground movement) and SAR (stationary) surveillance boxes on the objective and at named areas of interest - Bahka (west), Shahmasoor (east), Tsmakaor (east). The UA Commander requests support through the SOCCE embedded in the UE for SOF assets to augment and clarify several issues related to major LOCs, mobility routes and activities in population centers. Of particular interest to the UA Commander is the disposition of non-combatants in the AO. The UE provides specific population densities and a statement of infiltration risks for specific areas. The information is based on Coalition Command analysis of Operational Net Assessments and tactical SOF assessments. The UA Commander directs ISR assets to clarify and/or confirm questionable non-combatant activity of the AO. Elements of the enemy's major force occupy complex terrain 3 - 4 km south of Bahka. This force includes one tank platoon, four infantry companies, one SPF Platoon, two mortar platoons, and two ADA elements. A second tank platoon, one infantry company and one mortar platoon are located 2-3 km east of Bahka and within or immediately adjacent to a cave complex. A second SPF platoon is operating within Bahka and another is operating 5-7 km east of Bahka in Tsmakaor.

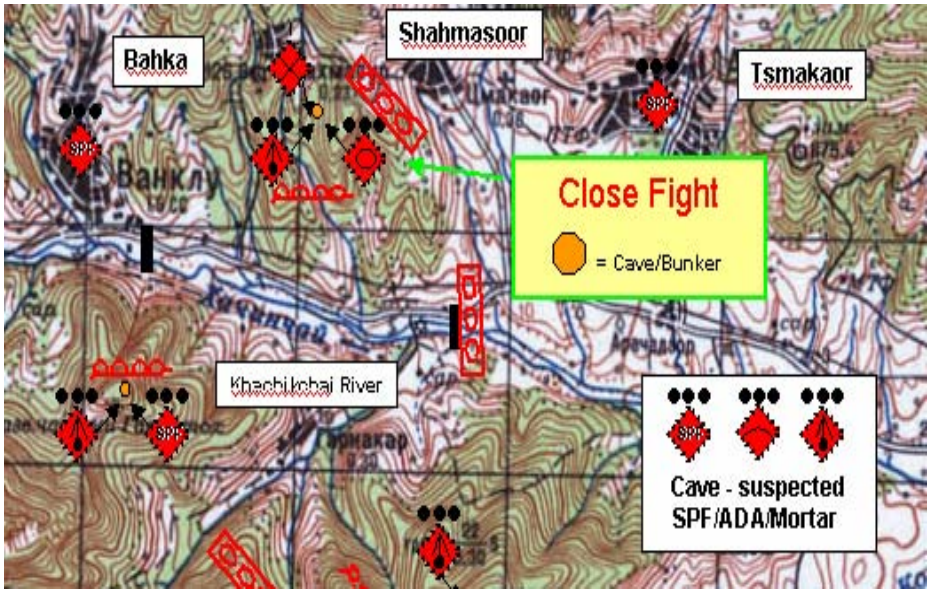


Figure F-17 Detailed Enemy Situation

Artillery/MRL (2A36/Purga) units of undetermined size are located in dispersed areas to the north and west to provide indirect fires from dispersed locations. Air defense is located throughout the area of operation including SA-7s, SA-15s, and SA-18s. The air defense systems are positioned to conduct air defense ambushes on likely rotary wing avenues of approach into this difficult terrain. Anti-helicopter mines are used in and near prospective landing zones. The NKLF is estimated to have 60+ days of supplies that were cached for the earlier offensive operation and can expect some covert re-supply from Anfar as the situation permits. The integrated UE, UA and CA Battalion ISR efforts pay off. A tremendous volume of quality information pertinent to the impending operation is gathered, integrated and analyzed. The enemy's defensive posture and patterns is confirmed. The CA Battalion Commander studies the available ISR and confirms the tactical CCIRs. An ISR plan is executed to confirm the location of enemy forces, hide positions and weapons systems (air defense systems in particular) along routes in and around the battlespace and objectives, confirm the location and activities of non-combatants, and assess the suitability and security of potential LZ, axis and routes that are used in the attack.

Activity in a major cave complex at OBJ Terror is confirmed. The surveillance and reconnaissance intensity on the objective increases. The UA Commander's goal is achieved and a hand off of 65% data fidelity of the COP is made to the CA Battalion Commander. Once the UA CCIR are adequately address, the commander initiates shaping actions that degrade threat C4ISR and enemy combat capabilities. The UA Commander shapes the fight geometry of the battlespace. The UA contribution to the success of the CA

Battalion operation is isolation of the enemy force using precision air resources and extended NLOS fires so the CA Battalion can execute an unimpeded air-assault and focus combat resources on the objectives. The UA Commander selects high payoff targets and continues precise long-range destructive fires en route to the objectives and in the three towns in that vicinity. Long to medium range air defense systems are identified and neutralized along the flight routes to the objectives and in locations that threaten key axes and routes in the objective vicinities. Comanches work in tandem with UAV CL IV along axes in the AO. They search for and kill enemy artillery systems, and provide LZs surveillance and security. The enemy C2 network is severely degraded by the long-range fires causing the enemy force to become fragmented. Their ability to communicate advance warning of CA Battalion's entry to the battlespace to maneuver small units or to direct indirect fire assets is severely undermined. However, dispersed and undetected man-portable air defense systems remain a viable threat. The UA focus then shifts to neutralizing artillery systems that present the next threat level to the mission.

The psychological effect of the UA shaping actions severely constrains the enemy's ability to maneuver to counter the CA Battalion air-assault. The layered UA ISR network is able to track and fix almost every enemy movement. There are several instances of UAV observation and targeting of enemy forces entering caves that are followed by the precise delivery of long-range precision munitions on cave openings. These actions degrade non-combatant support of the enemy force as the consequences become apparent. The actions also render the enemy uncertain about the ability to move freely. The attacking CA Battalion leverages enemy caution as a mobility multiplier. The limited enemy action enhances of freedom of maneuver in the attack. The CA Battalion's extended nature of the air assault operation (approx 150 km) also motivates the UA Commander to develop a firm idea of topographical risks en route to the AO. Approximately 95% of the UA vertical maneuver assets are engaged in the air assault. The Commander emphasizes the need to confirm contingencies in the event there are air movement disruptions and actions to protect the force in the event of unexpected enemy air defense contact. The establishment of FOB commences with the positioning of unmanned reconnaissance and surveillance assets at key points to electronically survey key points around the objective areas, to provide additional intelligence, and to identify and designate targets for engagement with long range fires. A layered network of UGS and IMS is established. These assets are delivered by helicopter to the battlespace well in advance of main force movement.

The CA Battalion Commander both taps into HUMINT resources provided by UE tasked SOF in the area of operations and deploys a Reconnaissance Platoon to confirm the ground situation, secure entry points and provide covering LOS fires as air assault forces flow into the objectives. The successful continuation of the fight depends on establishment and security of the FOB, including the FARP and army airfield operations. The platoon immediately moves west to screen, put eyes on OBJ Terror, report on the status of LZs and engage enemy forces that threaten the main assault. At the time of his choosing, the Commander orders Bravo Co. to air assault into OBJ Silver. Once on the ground, ARVs move to secure critical points around the FOB. The ARV assets link with forward deployed unmanned systems, supplemented with unattended ground sensors to create a security network around the FOB. Soldiers assume positions within this network to maintain continuity and a high level of responsiveness to enemy infiltration attempts. Dismounted 81mm Mortars provide NLOS fires on demand, quickly acquiring targets with their Lightweight Counter Mortar Radar. Interoperability and the Battle Command system allows assured access to networked JIM fires and effects.

The Commander expands security around OBJ Silver using UAV CLII and UAV CLI assets. NLOS-LS assets flow into the FOB, occupy positions near OBJ Silver and join the distant fight at OBJ Terror. A UA EECP conducts a movement into OBJ Silver to manage the flow of follow on resources into the FOB. The EECP commences the flow of the FARP and air field assets into the FOB. The A Company Commander updates attack plans based on the enhanced COP and rehearses actions at the objective with subordinate leaders using the EMPR systems. Mission responsibility, priority fires and special resource allocations are confirmed as the small units flow into the battlespace. Resistance emerges, as expected, from caves and concealed positions; however, the Reconnaissance Platoon, using unmanned systems, detect these threats and initiate suppressive actions followed by the concentrated action of the main force once on the ground. A Company is ordered to commence the air assault at OBJ Terror. As the company approaches the objective, enemy soldiers come out of their hide positions and engage. Enemy artillery and mortar system fires from hide positions in the towns. Tanks and other armored

assets commence movement towards the cave complex as the focus of the attack becomes clear. These systems avoided detection and could not be engaged during the shaping effort. Additional UA and Battalion reconnaissance assets are deployed. New enemy targets are confirmed. A combination of precision NLOS (LAM, PAM) and BLOS air and ground-launched fires are used to neutralize the threat.

Now that the CA Battalion Commander's plan is underway, the UA Commander shifts a portion of the ISR focus to the confirmation and interdiction of enemy lines of communication. The goal is to leverage the restrictive terrain in favor of the Objective Force fight by limiting or channeling enemy movement into and out of the area. The UA continues the projection of force into the battlespace using ISR and coordinated UE and UA level combat power. Refinement of the COP and coordination of efforts to support the tactical fight are ongoing. The UA Commander achieves higher levels of confidence as the tactical assault progresses. This enables the Commander to reallocate some attention to the next phase of the operation. Selected UA and CA Battalion reconnaissance assets flow to the west to accomplish three objectives: observe and gather intelligence of NKLF force and LOC flows using UGS, position of IMS to further restrict enemy mobility, and identify and target key enemy assets for opportunity kills. Initial BDA indicates an estimated 60% of the enemy force neutralized and 15% attempting to hold portions of the cave network. Intelligence reports confirm the balance of the enemy force, approximately 25%, escaped the area and filtered into the surrounding towns and villages. The NFLK force commander and several key members of his staff were killed during the shaping operation. A Co. learned this while one team processed prisoners. A second element found bodies and important documents while it established a hasty defense to maintain control of the objective until arrival of additional Battalion support. The prisoners and new physical information helped the commander achieve tremendous fidelity about the situation beyond OBJ Terror. The Reconnaissance element at LZ Barnes monitored activity in and around Bahka, the town directly south, and acted as the CA Battalion link-up element with UE elements approaching from the north/northwest.

F.6.4 What Endures

Maneuver (movement enabled by fire) continues to be crucial whether an attack involves a force comprised of 100% soldiers or a mixed force of ground and aerial unmanned systems and soldiers. Survivability is enhanced when an overwatching force aggressively suppresses the observation, targeting and fires of the defending force during the assault. Deception increases the possibility of surprise and overmatch in the assault. Efforts made to distract the enemy's awareness of the attacking forces intent, avenues of approach and maneuver enhance the survivability of units during air maneuver. Deception is an essential force survivability factor and multiplier in every operation.

F.6.5 What Changes

Information Superiority enables swift and efficient maneuver to the enemy's weakness for exploitation. Superior SA enables the flowing and focus of combat power on the enemy center of gravity at decisive point in the fight. Unmanned systems extend the commander's eyes and ability to act on information. The systems contribute information that enhances the quality of decision-making, which translates into more effective maneuver (fire and movement).

Unmanned systems protect the force, execute dangerous tasks and possibly allow reallocation of soldiers to more value-added tasks in support of the mission. This increases soldier survivability. Confined space (caves, narrow passages) clearing, CBR detection, mine detection and obstacle clearing are just a few of the basic tasks once executed by soldiers that are successfully completed by unmanned systems under the OF Concept. Armed unmanned systems maneuver in advance of the attacking force and provide early detection and lethal/non-lethal responses to enemy force. Consequently, soldiers more readily avoid ambushes, mine fields, detection and suppression by enemy indirect or direct fires. Unmanned systems also quickly respond to the hazards they sense which accelerates the soldier's response and sets the stage for successful immediate action.

F.7 Vignette 6: Dismounted Operations To Conduct Raid On Decisive Point In Jungle

A raid is a complex offensive operation, a strike operation, conducted behind enemy lines against strategic objectives, targets of high tactical value, time-sensitive targets, or key personnel and facilities in enemy rear areas. It normally involves an array of deception actions to confuse the enemy followed by a swift penetration of hostile territory, violent and precise action at a decisive point and equally swift withdrawal. The UA executes a raid in a jungle environment in this vignette. The capture and extraction of sensitive documents and, if possible, key personnel from an enemy command and control center is the success criteria for the operation. Due to the extended operational distances, this mission includes an air assault of the raid force and air extraction of the raid target. Surprise is critical to the success of the raid. Consequently, the UA executes the shaping phase of the fight by launching several raids and limited attacks on command, control and logistic sites to desynchronize the enemy's defense and limit understanding of the primary target for the raid. Surveillance and reconnaissance of the objective area is accomplished through means that do not alert the enemy and telegraph the strategic intent and tactical focus for the ground operation.

The breadth of simultaneous low intensity shaping actions across the Area of Operation limits the UA Commander's use of SOF to conduct this particular raid. Therefore, the Commander's plan includes the use of Objective Force Combined Arms Battalion forces to support the multiple and specialized actions required for his concept's success. The raid plan ensures maintenance of a high tempo. A break in the progression of the raid provides the enemy an opportunity to shift momentum through active defensive actions and counter attack. The jungle environment presents unique challenges to this type of operation. Terrain and weather limit the coordination and effectiveness of fires and/or freedom of maneuver. The thick foliage, rugged terrain and water features of most jungles limit fields of fire and maneuver. Soldiers are exposed to a wealth of physical (animals, reptiles, insects, and poisonous vegetation) and health (skin disease, heat injury, infectious disease) hazards. Natural conditions and man-made obstacles limit equipment operation and effectiveness. The features and effects of restricted terrain act as combat multipliers for the defending force. Small teams and individual soldiers exit concealed positions and disperse across the terrain to vantage points with advantageous fields of observation and fire. This degrades the initial reliability of high situational awareness and renders a poorly updated COP useless. Consequently, the UA maintains an intense ISR effort as the raid progresses.

F.7.1 Background

The PACIFICA region has a volatile and lethal history. 1965, the Surranian ethnic minority within PACIFICA began an insurgency on the region's southern islands to gain independence from the Luzon-based PACIFICA government that was viewed as a puppet of the West. They adopted the name Surranian Peoples Movement (SPM). The situation spiraled into chaos by 1966 and PACIFICA's President Luna declared martial law to restore government control. The United States initiated military aid to PACIFICA. Likewise, the SURRAN government (southwest of PACIFICA) declared support for PACIFICA. These efforts are to no avail as evidenced by the development of instability in the region.

September 2002, several UN troops were killed by snipers along the zone of separation in the south. Several UN detachments were captured and held "hostage" by the PPF. Soon thereafter, UN forces withdrew from PACIFICA. On 25 October 2002, the PACIFICA Defense Minister was assassinated by Surranian sponsored terrorists. Immediately, the United Nations Security Council approved a U.S. plan to intervene. On 26 October 2002, the President directed JTF Pacifica to commence offensive operations.

Currently, Surranian forces in the area of operations (AO) are considerable. An Armored Brigade operates in the vicinity of cities to the East. The force is highly mobile. Units in the vicinity of the raid decisive point have access to high-speed avenues of approach and can arrive at the objective in less than 30 minutes. A Light Infantry Brigade has a considerable network of political encampments and security points strategically positioned at key terrain points in jungle low lands and highland passes. The

force is well armed and considerably versed in jungle operations. The Light Brigade is augmented by a well equipped SPF that is supporting security operations in the vicinity of the decisive point.

The UN coalition agrees on a geo-military goal. The commencement of decisive combat operations is authorized. The NCA directs the use of military action to forcibly evict Surranian forces from Luzon in support of the strategic mission. A UE - CJTF is deployed to achieve the coalition goal to “repulse” the threatening Surranian military force and “control” the strategic environment. Accomplishment of the goal in successive phases facilitates the elimination of barriers to resolving the political aspects of the conflict through progressive diplomatic efforts. A sensitive point in the political battle with Surranian leadership is the denial that they possess outlawed chemical munitions. Confirmation of Surranian possession has significant political consequences in that Surranian leadership’s integrity is proven to be questionable. The diplomatic advantage gained in negotiations is significant. Likewise, the discovery broadens the range of acceptable military options for consideration by the coalition. The establishment of chemical and biological weapons possession is a key strategic step in compelling Surranian withdrawal from Luzon.

F.7.2 Mission

The 2nd UA is ordered to conduct the necessary operations with the appropriate force to capture and extract chemical and/or biological documents, and key personnel from a command and control facility deep in the Luzon jungle.

F.7.3 Conduct of Operations

The UA Commander directs 1st CA Battalion to execute a raid. The CA Battalion Commander determines that required deception operations include several simultaneous raids in the vicinity of Simimbaan as diversions from the target area. A company is ordered to conduct a raid on the command & control facility the company is organized to conduct an air assault and a dismounted maneuver to the decisive point in the jungle. The company is augmented with organic CA Battalion, UA and UE support. An AC-130 gun ship is also available in support of the main effort during the exfiltration phase of the operation. UE assets support air-lift and air assault requirements. UH-60 and CH-47 helicopters insert the force and CA Battalion and Company asset (ARV, UAV, MULEs, NLOS-LS and 81 mm mortar systems) at combat positions during the air assault. Comanche and UAV Class IV systems support ISR requirements during the shaping phase of the operation. The UA initiates development and refinement of the COP throughout the AO. This is accomplished in a manner that does not reveal the true intent of subordinate unit operations. The CA Battalion Reconnaissance Platoon deployed to the area works in tandem with Special Operating Forces on the ground to flow Human Intelligence (HUMINT) into the GIG and through the appropriate

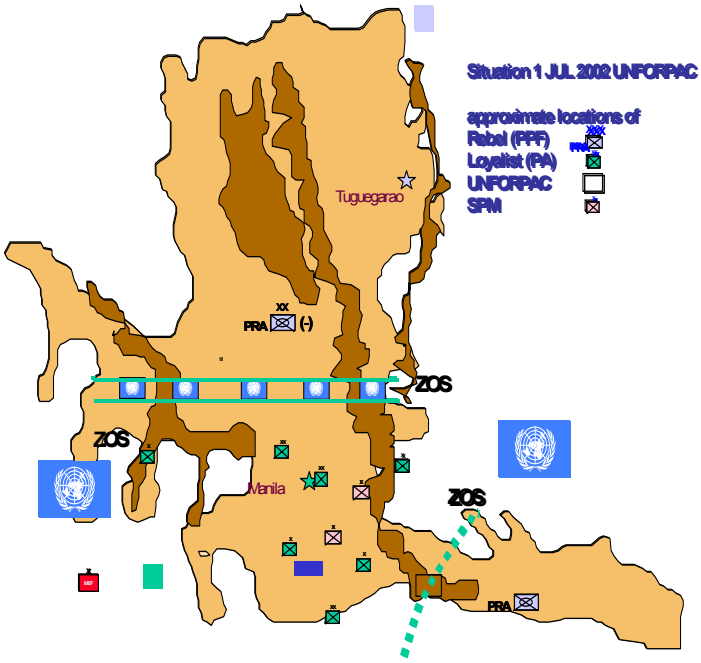


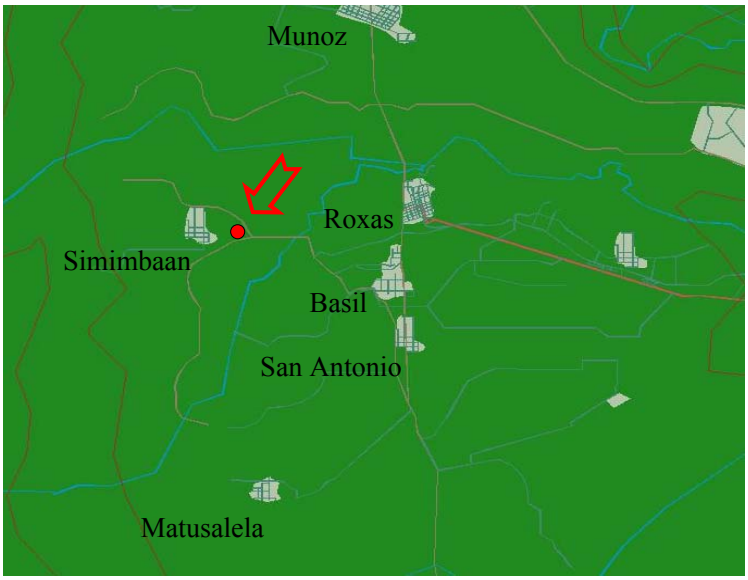
Figure 18. Luzon

channels to the ground commanders.

The Company Commander develops his precise information requirements for the raid and provides those to the CA Battalion Commander. The CA Battalion requirements are consolidated and a priority request is submitted. The UA secures UE support for the tasking of space-based and high-atmosphere assets to provide photographic and imaging intelligence. Persistent stationary and moving target observation is established with space-based assets. This information flows through the COP to the commanders at all levels and is instrumental in supporting the Company Commander's distribution of current guidance to subordinate leaders through Land Warrior based en route mission planning system. The CA Battalion Reconnaissance Platoon initiates low intensity ISR activities in the vicinity of the decisive point 48 hours in advance of the raid. A link up is planned with A Co. to facilitate passage through enemy early detection, anti-personnel minefields and ambush zones. The Recon Platoon continues to support the development of the COP, with a focus on tasks that address the CCIR. The raid is executed in five phases:

- Insertion or infiltration into the objective area.
- Isolation of the objective area from outside support or reinforcement (to include the enemy air threat).
- Neutralization of any enemy force at or near the objective by surprise and violent attack, using all available firepower for shock effect.
- Quick accomplishment of the mission before any surviving enemy can recover or be reinforced.
- Rapid withdrawal from the decisive point and extraction from the area.

See-Through-Foliage and Mine Detection technologies reside on ARVs and SUGVs. The systems enable the force to maintain surprise by seeing the enemy first, detecting obstacles and hazards as well as safe routes around them. The SUGVs are fitted with modular Chemical-Biological-Radiological detection packages that alert the Objective Force soldiers of impending contact with hazards. The systems directly message the soldiers through their Land Warrior ensembles. The soldiers immediately initiate personal protective measures. The Comanche Troop supports the operation by killing mobile targets consistent with the Commander's intent. Comanche and UAV Class IVs conduct ISR runs at NAIs to ensure surprise and intent are not compromised. The UAV Class IVs support ISR requirements, then they transition to an additional role of designating targets for Comanche and NLOS-LS launched PAM engagements once the assault commences. NLOS-LS launched LAMs are used to the north along the road from Muzon. Several tanks and vehicles are killed prior to reaching the objective.



IMS and UGS fields are executed on identified avenues of approach from the east and chokepoints leading into the objective area. Enemy tanks and personnel carriers encounter the IMS fields as they attempt to reach the objective area. Several vehicles and their inhabitants are killed. Trailing vehicles stop. NLOS-LS support this first line of isolation with concentrated fireboxes at the remote blocking position. If UGS sense that vehicles have breached the blocking line, LAMs are launched to interdict the vehicles' progression. A dismounted 81mm Mortar Section occupies a fire position in the vicinity of PZ Mary (northwest of the objective, east of the objective rally

point (ORP) to support the raid. Surveillance and security around the fire position are accomplished with two of the company ARVs inserted with the section. The ARVs do not maneuver with the company due to the restrictive terrain and requirements for noise discipline during the maneuver. They are stationed at likely avenues of approach including the roads near the fire position. The two 81-mm mortars deliver concentrated fires in support of the blocking action as soldier dismount are detected in the jungle by UGS as they attempt to bypass the IMS fields. The NLOS fires successfully prevent an enemy team from maneuvering south of the road. At a certain point the mortar priority of fires shifts to the support the main assault.

The engagements demonstrate the successful integration of intelligent munitions, unmanned systems, and NLOS fires to effectively block an enemy counter attack to regain control of the decisive point. This action effectively isolates the Simimbaan area by interdicting enemy reinforcements from eastern cities, Roxas, Basil and San Antonio after raid begins. This action enables the reallocation of soldiers that once would conduct the blocking action to other tasks in support of the main effort. On order, A Company conducts an air-assault into LZ JUSTINE, southwest of the decisive point. The Company links up with the Recon Platoon. element and conducts an 11 km maneuver north through the jungle to the objective rally point in the vicinity of Simimbaan, northwest of the objective, then maneuvers to designated assault positions.

The movement is supported by GPS guide markers pre-positioned by the Recon Platoon. See-Through-Foliage and mine detection capabilities help the force avoid enemy detection and engagement. The unmanned systems are manually directed through the jungle to ensure unintended events do not compromise the force's maneuver. The unmanned systems are transferred to semi-autonomous control when the raid progresses out of the assault position into the objective area. If decisively engaged during maneuver to the ORP, the commander will determine whether the mission is compromised and exfiltration orders are necessary. The cornerstone of a raid, surprise, is lost and the distance required to maneuver to the decisive point does not support execution of a successful hasty attack to regain the initiative.

The Reconnaissance Team moves to a blocking position north of the objective area and screens that portion of the AO. When the assault commences, the team quickly maneuvers to a distant PZ north of the objective and conducts an air-exfiltration. The force's movement north also serves as a deception. The enemy senses this activity and anticipates the main force will be extracted in northern PZs. The main force PZs are immediately west of the decisive point and alternates are to the south/southwest. The raid launches in the early morning, approximately 0300 hours, to achieve surprise and leverage the technological advantages of the Objective Force. The company successfully completes the raid breach, assault and support-by-fire tasks. The withdrawal commences as a UH-60 navigates to the extraction point. While the raid is underway, several trees west of the ammo dump are cut using shape charges. An electronic marker guides the UH 60 to the location. A tether is lowered to the ground and the sensitive material secured on a MULE is quickly slung. The package is hoisted and outbound. The balance of the company quickly moves from the objective area to PZs, and complete the main force withdrawal. Another lift includes CH-47s protected by Comanche. The aircraft come under fire as they enter the primary PZ and abort the mission. The AC-130 gun ship is called in to commence a sweep of the facility. The intense fires block enemy

movement westward across the area while the company recovers casualties and moves to the primary PZ. The Mortar section, with mortars loaded on MULEs, rolls onto a CH47 at the PZ. Enemy tanks and vehicles continue to attempt to breach the IMS fields along the high-speed avenues of approach but are repelled. A couple of soldiers even attempt to deactivate one of the IMS sensors. They activate the sensors' anti-tampering facility and are killed when the sensors explode. The mission is completed with minimum loss of life and FCS assets.

F.7.4 What Endures

Surprise remains essential to the successful execution of the raid. Tactics, Techniques and Procedures (TTP) that enable surprise are critical to the force getting in a position to use firepower and lethality offered by unmanned systems. A critical skill soldiers will develop is the ability to maneuver in concert with unmanned systems while leveraging their capabilities to secure and protect the force.

Rapid violent attacks remain essential to the successful completion of the raid. Once detected or once the assault commences the quick completion of mission essential tasks and intense delivery of lethal fires and effects ensure the enemy is denied the opportunity to gain control of the situation and disrupt the operation. Violent blocking actions deny reinforcement or counter-attack by enemy soldiers and heavy weapons.

F.7.5 What Changes

Unmanned sensors enable the force to effectively maneuver to the decisive point unobserved and undetected. Potential enemy observers are detected by the FCS See-Through-Foliage technology and bypassed. The sensors also protect the force from engagement by enemy mines or exposure to CBR hazards by providing reliable early warning. The modular reconfiguration aspects of the unmanned ground vehicles provide the OF with tremendous flexibility for tailoring to mission requirements.

Unmanned system lethality enables force protection without exposing soldiers to enemy fire or effects. The systems also replace soldiers at observation posts to secure remote bases. Intelligent munitions systems, unmanned ground sensors, and NLOS fires are combined to create remote ambushes and active obstacles that severely affect the freedom of enemy maneuver. Additionally, unmanned systems free Soldiers to address other mission critical tasks and maneuver more freely because they are not tied to static surveillance or support missions.

ANNEX G ARMY, JOINT, INTERAGENCY, AND MULTI-NATIONAL (JIM) INTEROPERABILITY

G.1 Overview

G.1	Overview
G.2	Army Interoperability
G.3	Joint Interoperability
G.4	Interagency Interoperability
G.5	Multi-national Interoperability
G.6	Information Exchange Requirements

The Maneuver Unit of Action requires information to build and sustain combat power. The availability of accurate information prior to deployment sets the conditions for successful operations. The available information is merged to form an understanding of the battlespace and the threats within that space. Battlespace understanding is used as the basis and framework for developing operational plans. UA plans are refined as more and more information becomes available and a better understanding of the battlespace is achieved. The UA has no organic capability to produce information prior to arriving in the area of operations. The UA must be Joint interoperable and will rely extensively on its ability to interface with other Army, Joint, Interagency, and Multi-National systems to gain and build an increased understanding of the battlespace. Interoperability is defined as the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. It also includes the condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users. The degree of interoperability should be defined when referring to specific cases.

Upon arrival in the AO, the UA's requirement for current and accurate information continues to increase. This information enables an understanding that directly equates to the UA's ability to survive in a hostile environment. Once the UA deploys its sensors (i.e. human, UAV, manned platforms, etc.), it is capable of producing vast amounts of information. This perishable information is very valuable to the UA, as well as to Army, Joint, Interagency and Multi-National forces. In order for information to flow freely between the UA, other Army, Joint, Interagency and Multinational systems, the UA's command and control systems must be interoperable with a multitude of available external data systems.

G.2 Army Interoperability

UA command and control systems must be interoperable with all current and future Army C4ISR systems. This capability must be resident in UA command and control (C2) systems to allow the UA to collaborate with other Army units. Not all Army units will have identical systems, but UA forces are required to be interoperable with current and future Army units to leverage the capabilities resident in other units. This interoperability will cause a synergistic effect that greatly increases the UA's combat power. As non-transformed units are task organized under C2 of the UA, both the UA and the task organized unit must rely on their organic C4ISR systems to operate effectively while maintaining an accurate understanding of the battlespace.

G.3 Joint Interoperability

The UA will always operate in a Joint environment; KPP #1 specifies the FCS FoS must be Joint Interoperable. Each sister service has organic robust C4ISR systems. The UA must be able to share information with other US services to facilitate the command and control of the UA, to allow the UA to leverage other services' C4ISR systems, and to give Joint forces an accurate and real-time picture of UA information, capabilities, activities, and plans. The more information that feeds the UA's understanding of the battlespace, the more effectively the UA will be able to accomplish its missions, and the more survivable the UA becomes.

G.4 Interagency Interoperability

There are over a hundred United States governmental agencies with specializations ranging from intelligence to agriculture. Depending on the type of operations the UA conducts, the UA may need to interact with any number of these agencies. These agencies are the repository and maintainers of valuable information that will allow the UA to better understand the battlespace and accomplish its mission. Conversely, governmental agencies may rely on information the UA provides to accomplish their mission. It is incumbent upon the UA to facilitate the exchange of this information. This capability becomes critical during domestic support operations.

G.5 Multi-national Interoperability

The UA is optimized for major combat operations, but operates across the full spectrum of operations. These combat operations will most likely take place in a foreign country, with the UA operating as part of a multi-national force. Operating as a multinational force brings with it special considerations. In order to operate effectively, the UA must share information with other multi-national forces. We must be able to share information with forces from other countries while safeguarding sensitive information we do not want to share. Information that is shared with our systems must also be safeguarded so as not to compromise the source. It is incumbent upon the UA to facilitate the exchange of information with the multi-national forces. United States SOF forces will play a critical role in the exchange and safeguarding of information with multi-national forces.

G.6 Information Exchange Requirements

The FCS equipped UA will operate as part of a Joint Team across the DOTMLPF. The FCS Family of Systems supports top-level Information Exchange Requirements (IER) detailed in Annex J of the FCS Operational Requirements Document. This enables the exchange of information vertically and horizontally, from alert through deployment, to conduct operations with Joint forces.

ANNEX H BATTLE COMMAND NETWORK

H.1 Purpose

H.1	Purpose
H.2	Network Centric Warfare Enabling Understanding Centric Operations
H.3	Network Capabilities
H.4	Battle Command Network Systems
H.5	Operational Capabilities
H.6	Sensor Fusion
H.7	Cognitive User Interface
H.8	Multi-Modal, Self-Adaptive, User Interface
H.9	Collaborative Planning and Execution
H.10	Participatory Collaborative Rehearsal

This annex provides a conceptual framework of how the Battle Command network supports the Maneuver Unit of Action commander prior to and during operations. The network supports the UA commander and his staff by enabling each of the seven Operational Capabilities. These seven Operational Capabilities are outlined in the US Army White Paper "Concepts for the Objective Force" and applied throughout the base chapters within this O&O. While the Capabilities are addressed as separate characteristics within the White Paper, the nature of the supporting network is that in reality all of the operational capabilities are intertwined into a true System of Systems supporting the commander.

The characteristics and requirements of the network that enable the lethality operational capability also contribute significantly to survivability and versatility. With UA platforms able to destroy enemy forces at longer ranges with greater precision (increased lethality), reciprocally they will not come under enemy direct fire (increased survivability) and the UA is able to move directly on to the next mission (increased versatility).

H.2 Network-Centric Warfare Enabling Understanding-Centric Operations and Situational Awareness

The human dimension of warfare remains preeminent. The UA requires a mentally agile, intuitive and adaptive leader at all levels. In order to make the right decisions, leaders must receive a constant flow of timely and accurate information to facilitate and support situational awareness development. Information technology systems, properly networked, simultaneously share information with virtually any warfighter, regardless of location by a high performance information grid and access to multiple information sources. This is network-centric warfare. The approach facilitates collaboration that helps groups rapidly form and distribute correct shared situational awareness. This, in turn, enables rapid decision-making and execution. In the network-centric approach each operator and organization has access to the same information compiled from all available sources. Users make their own determination of what is important from the totality of available data. Network-centric warfare is a systems approach to effectively provide the same or similar information throughout the force. Converting information to situational awareness requires a complimentary human factors approach. Knowledge is not information displayed or presented. Knowledge is information stored in the mind. Simply getting information to platforms and presenting it to users does not generate knowledge. The general awareness or possession of information in the mind is only level 1 situational awareness. This approach fails to account for the fact that knowledge by itself is not enough.

Achieving higher levels of situational awareness and bridging to decision-making requires a cognitive process to comprehend (Level 2 situational awareness), project (Level 3 situational awareness), and implement a decision to achieve the desired end-state based on that projection. This is understanding. When understanding is coupled with experience and becomes a long-term source for human case-based reasoning used to make sensible decisions and judgment, it is wisdom. The process of obtaining and

providing information based on cognitive and other human factors to enable comprehension, projection, and develop wisdom is the understanding-centric approach. The capabilities of the digital information technology environment are used to provide the right information to the right operators/groups at precisely the time it is required. The critical information necessary for correct situational awareness are found and delivered to users. Individuals and groups receive information in a form that facilitates knowledge development as well as enable comprehension and projection. This re-enforces developing and sharing correct situational awareness.

Current information technology systems focus on data capture and information passing, not the knowledge, understanding, or wisdom required. With interoperability defined as the receipt and use of information, the current approach focuses almost exclusively on information receipt by the system not the human. It ignores the use of information required to achieve interoperability. The type of information the system provides is also a factor affecting the situational awareness formed. Information is positive, negative, or neutral. Positive information is valid, helping humans form correct situational awareness. Negative information is inaccurate and contributes to developing incorrect situational awareness. In complex and cognitive workload intensive environments, the more correct situational awareness is formed, the easier it is to differentiate between positive and negative information as the amount of information increases. Neutral information, although not wrong, has little or no direct impact on the validity of the situational awareness developed. It is “nice to know” and may enhance the detail of the level 1 situational awareness, but the person does not need it to achieve higher levels of correct situational awareness.

If negative information were black, and positive information white, neutral information would be gray. Mixed with positive and negative information, it obscures the contrast between information types. Large amounts of neutral information can mask positive information like critical cues and create a dangerous situation. This is particularly true when humans scan under heavy workloads, attending to only selected information. This significantly increases the potential that positive information is not perceived. It can increase the amount of negative information misperceived as valid and result in incorrect situational awareness. Without a complementary understanding-centric approach for humans, the power of network-centric systems will increase the danger of wrong information influencing situational awareness development. The networked environment can not only overwhelm users with neutral information and proliferate incorrect information, but it can spread incorrect individual/group situational awareness throughout the force. This creates the catastrophic situation where individuals share the same but incorrect situational awareness. The networked systems in the UA will enable the force to leverage the almost unlimited power of network-centric warfare by linking it with systems developed using the complimentary understanding-centric concept.

H.3 Network Capabilities

The network collects, fuses, deconflicts and displays a seamless, fully integrated, multidimensional, and tailorable COP to leaders at all level. The COP shared by all leaders supports the cognitive decision making process and a dynamic mission rehearsal capability. The network enables real-time virtual collaborative planning and decision making based upon the commander’s and battle staff’s detailed knowledge of the battlespace and the ability of their own forces to influence it to their advantage. The network ensures the UA is able to:

- Maintain a continuous running estimate of the situation even while on the move.
- Share information contributing to an integrated COP enabling the early understanding of threat actions/intentions.
- Visualize and disseminate tactical orders with graphic overlays.
- Disseminate FRAGOs to appropriate levels with shared COP.
- Conduct continuous collaborative mission planning from alert through deployment to employment to include continuous collaborative mission planning, rehearsal, battle command, and ability to integrate into gaining theater command during movement by air, land, and sea.

The network ties the UA into a multi-layered communication and computer network with unprecedented range, capacity and dependability. The network provides secure, reliable access to and distribution of information throughout the GIG from extended distances and over complex terrain. Unleashing the power of Networked Operations (NETOPS) consisting of network management requires advanced Network Management, Information Assurance, and Information Dissemination Management and Information Management systems and procedures insures dissemination of critical information among sensors, processors, and organizations internal and external to the UA. The network is not reliant on a large and separate infrastructure, but rather upon an embedded capability within each platform that moves with the combat platform. Further, the network's design facilitates the achievement of superior battle command on the move capabilities to achieve the kind of offensively oriented, high tempo operation that is the hallmark of the UA.

In the current force, the Army sponsored and developed numerous systems for the different BOS and individual branches to assist them to fight "their portion of the fight". These systems loosely collected under the Army Battle Command network, produced products and information in a "stove piped" fashion. They rarely interacted with each other successfully or provided the commander the timely and formatted information that he required to make decisions. These independent BOS systems supported the individual staff officers rather than supporting the commander. Although great improvements were made to mitigate this problem for the current force, the Battle Command system in the Objective Force fully integrates information in the UA. This allows each staff cell to interact with another at differing echelons all of which provide the timely and accurate information needed by the commander to make decisions. Current systems strive to provide all the information available to every soldier everywhere on the battlefield. The power of the network-centric approach coupled with the understanding-centric operations will provide the right information to the right person at precisely the time it is required. This is a fundamental tenet of the network by which all other capabilities will be measured. The UA network focuses on ensuring every soldier, regardless of location, understands the operation.

The network enables the commander and his staff to conduct simultaneous and collaborative planning. Previously, the commander and his staff had a limited capability to collaboratively plan dependent upon the ability of staff members, commanders and dependent upon the capabilities of the communication network. In the UA, the network allows the commander to work in real time to conduct collaborative planning and executes those plans. With the embedded decision making tools and planning aids, the commander is able to quickly develop a plan, coordinate with higher, lower and adjacent units, conduct rehearsals even while on the move to the objective, then execute the plan while maintaining collaboration throughout.

H.4 Battle Command Network Concept

The Army remains a vital component of the Joint Force through continued transformation. The key to transformation and eventual application by Warfighting Commanders is the ability to incorporate the battle command network as the heart of the UA. The network in itself is not a single system, but rather a true system of systems that enables Battle Command by the commander and execution of the capabilities found in the operational characteristics. The network possesses robust multi-layered communication architecture of ground, aerial and spaced based relay platforms that ensure continuous connectivity for all users. The network ensures that Battle Command remains a commander and execution centric capability to cope with the rapidly changing battlefield of the future.

H.4	**Battle Command Network Concept**
H.4.1	**Supporting Equipment, Personnel, and Infrastructure**
H.4.2	**Enabling and Supporting Capabilities**
H.4.3	**Commander/Unit Integration and Synchronization**

Battle Command enabled through the network allows the commander to command his forces no matter where he or they are located on the battlefield. The network supports the commander at any location in

the battlespace. This allows him to place himself at the critical point on the battlefield and still maintain complete access to all information influencing his decisions. The network is comprised of three separate components. These components are reliant upon each other for the establishment of a complete networked structure. The three components of the network are:

- Supporting equipment, personnel and infrastructure.
- Enabling and supporting capabilities.
- Commander/unit integration and synchronization.

H.4.1 Supporting Equipment, Personnel and Infrastructure

H.4.1	**Supporting Equipment, Personnel and Infrastructure**
H.4.1.1	**Communications Network Infrastructure**
H.4.1.2	**Characteristics of the Network**
H.4.1.3	**Information Distribution Management**
H.4.1.4	**Information Assurance**
H.4.1.5	**Network Management**
H.4.1.6	**Enabling and Supporting Capabilities**

The foundations of the network are the hardware, software applications, communication devices, and the computer and communications skilled supporting personnel. These critical components allow the system to operate in a secure, timely and accurate fashion. The network consists of multiple computers, programs, communications means and nodes to provide required interconnectivity to all users with sufficient throughput and system responsiveness. Through the supporting equipment, personnel and the infrastructure, the Battle Command network enables users to access all the necessary information about the enemy, terrain, weather, friendly forces and other information to make informed decisions. By ensuring the dynamic interoperable connectivity of all users with universal access to information, the supporting equipment, personnel and infrastructure lay the basis of the network.

As computers and communications associated equipment designed for military applications increase in both power and speed, there exists the potential for the user to become so inundated with negative and neutral information in the form of Level 1 situational awareness that it impedes or prevents developing correct Level 2 and Level 3 situational awareness. These new information systems permit the commander and staff to create and transmit more information than ever before. The key to the success of the network is the assurance that newly developed information remains relevant and actionable by the commander and that the right information, relevant to the commander's needs, is located and provided to him at the precise time he requires it.

H.4.1.1 Communications Network Infrastructure. The network will consist of multiple communication layers, including terrestrial, airborne, and space layers. Network components in each layer will be interconnected with those in the other mutually supporting layers to form a survivable, self-configuring, self-healing backbone. Layered redundancy ensures there is no single point of failure. Reliance on multiple layers also reduces technological and programmatic risks incurred by over-dependence on the communications assets in any single layer. For example, a decade ago the DoD planned to exploit commercial satellite assets to a far greater extent than has actually been

4.1	**Supporting Equipment, Personnel and Infrastructure**
4.1.1	**Communications Network Infrastructure**
4.1.1.1	**Terrestrial Communications Layer**
4.1.1.2	**Airborne Communications Layer**
4.1.1.3	**Space Communications Layer**

possible. The unforeseen economic advantage of deploying commercial fiber-optic networks versus launching satellites shifted the business case and resulted in less commercial satellite capacity than had been predicted. The lesson is that the Army must be prepared to exploit all available commercial and military communications resources, in all three layers. These resources will be combined to operate as a single integrated network, fully integrated with the GIG.

H.4.1.1.1 Terrestrial Communications Layer. The terrestrial communications layer interconnects all ground-based elements (including possibly subterranean elements), and is especially critical for interconnecting highly mobile tactical elements. Line-of-sight wireless links interconnect dispersed tactical elements, and are further extended by the automatic routing capability of Joint Tactical Radio System (JTRS) and linkage with airborne and space layers. The terrestrial layer itself can be "thickened" as needed using ground-based relays, including unmanned systems. Wherever possible, forces will tap into commercial fiber optic networks in theater to gain access to high-bandwidth connectivity.

H.4.1.1.2. Airborne Communications Layer. The airborne communications layer contains manned and unmanned aerial vehicles carrying communications payloads. Aerial communications relays packages (CRP) will be present at relatively low altitudes on vehicles controlled by the tactical commander, such as Class I through Class IV UAVs. These UAVs will be critical for the UA to maintain connectivity while on the move during extended operations or all terrain sets. At higher altitudes, Army forces will rely on larger joint, national and commercial aerial platforms such as mid-altitude airships, aerostats, or Global Hawk to provide coverage to a wider area. High-altitude aerial vehicles also route traffic to the space layer. Since these platforms are not under direct control of the tactical commander, policies must be established to ensure these assets can be readily used as needed.

H.4.1.1.3 Space Layer. The space layer includes Low Earth Orbit, Medium Earth Orbit, and Geostationary Earth Orbit satellite constellations. This layer provides reach from deployed forces to other forces in theater and reachback to the sustaining base. Warfighter Information Network- Tactical (WIN-T) will embed on key FCS platforms the WIN-T Point of Presence (POP) systems that will provide increased UA internal and external connectivity and bandwidth capability. The WIN-T POP systems provide Ka SATCOM OTM, Global Broadcast Service and Gateway services that will leverage high-capacity downlinks to distribute large volumes of data to multiple users. JTRS UHF Demand Assigned Multiple Access (DAMA) waveform will allow the UA to access warfighter nets currently using Spitfire and other similar radio systems. A combination of commercial and military satellites will be needed to provide sufficient bandwidth and to ensure protected communications capabilities are available. The Army will leverage the follow-on military satellite communications systems resulting from the OSD-C3I directed Transformation Communications Study to provide the protected, SATCOM-on-the-move capabilities required to support Objective Force needs.

Objective Force units effectively create their own infosphere comprised of the integrated information capabilities available to formations within UA or UE echelons. These infospheres interconnect information systems within the formation and extend connectivity to external information resources throughout the GIG. In reality, operational and tactical infospheres are integral segments of the GIG, but it can be useful to view unit or echelon infospheres as organic assets of the formations. In the same way this concept proposes that echelonment of command is not the same as echelonment of unit formations, it must also be understood that network assets forming a tactical infosphere are configured flexibly, tailored to the needs of the supported formation.

H.4.1.2 Characteristics of the Network. The network possesses the following characteristics:

- Unprecedented Dependability - The Objective Force will be enabled by a robust information network assuring the transport of critical information through network dependability. Dependable Network [Reliability] is defined as “the probability of a warfighter accessing the network at a random point in time, during an operational mission, and exchanging information with another warfighter”. Network dependability results from the network’s redundant, multi-layered architecture, the reliability of network components, and the network’s capability to withstand attack. Dependability requires advanced network operations capabilities to maximize network resources, ensure delivery of information at the required quality of service, and safeguard information. Unprecedented dependability does not imply that network components will never fail

or that every possible link between nodes will always be available. Rather, overall network dependability is a combination of equipment reliability and redundancy measured together. The bottom line is that the network will virtually guarantee the transport of critical information to ensure Objective Force mission accomplishment.

- Deployable – Objective Force communications elements and equipment become more deployable (and mobile) because they rely more on embedded systems and access to the three-dimensional multi-layered backbone. To a great extent, warfighters will carry their network systems with them as components of their combat platforms. Since Objective Force elements will "fight on arrival," they must also be able to "communicate on arrival". The current communications planning concern about ensuring signal systems are front-loaded in the limited deployment airflow sequence will be lessened not just by the embedded signal equipment but also by the application of high-altitude UAVs. These external to the UA UAVs can be flown into position from outside the theater as required to support deployment and operations upon arrival. Other SATCOM terminals and organic UAVs can thicken the network as they arrive later in the flow.
- Interdependent – Army information networks are interdependent with related Joint and commercial systems, creating a significant system-of-systems integration challenge. For example, even though Objective Force networks will rely on airborne communications components for high capacity extended range connectivity, the airborne platforms themselves are not a part of the WIN-T program. Some related systems, such as the high-altitude airborne platforms, will be joint or commercial systems. The challenge is to develop these interdependent systems so they readily form integrated parts of a single network.
- Interoperable – Army networks must be interoperable across joint, current, and SBCT elements. The Army must avoid segmenting network operations at brigade and below from those above brigade. For this reason, UA and UE network concepts and solutions must be closely aligned to form a single GIG-compliant network.
- Mobile **–** Users must be continuously connected to the network while on the move, in any terrain, throughout the three dimensions of the battlespace, in all environmental conditions, and through all phases of the operational continuum. Objective Force communications elements and equipment become more mobile (and deployable) because they rely more on embedded systems and access to the three-dimensional multi-layered backbone. The network will seamlessly maintain connectivity during "hand-off" from one layer to another, utilizing the most efficient communications path while on the move.
- Modular and Scalable – Common modules of networking equipment will provide deployable network services tailored to the specific mission, task and purpose at hand. These suites of modular gear can be expanded as needed to dynamically match the changing mission requirements. As they scale up or down, the components continue to automatically maintain network connectivity. The need for special interface devices to achieve connectivity should be very rare. Modularity also facilitates maintenance and upgrading of components.
- Secure – The system must be secure but must also simplify the user and management processes required for implementing security. Keying/re-keying must be performed automatically and remotely with minimum to no operator intervention. The system must accommodate access to all security levels, complying with GIG guidance to enable "one terminal with multiple security modes, 'colorless' backbone, data labeling, allied/coalition, unclassified through TS/SCI." Security requirements drive system development to an application-based security structure in which the need to encrypt network traffic is removed.
- Self-configuring – Network management experts and automated functionality will constantly monitor the common operational picture, assess how well the physical and logical configuration of network matches the demands of the current mission, and adjust the network as required. This automatic reconfiguration, guided by network specialists, will be especially fluid at tactical echelons where the shape of the battlefield and flow of the fight may change significantly and unpredictably.

- Self-healing – The network management capability will sense any degradation of the network and, based on user or system profiles, automatically adjust the allocation of network resources to ensure the continued flow of critical information. Responses could include dynamic reallocation of bandwidth, or restricting user access to the network or to certain network features based on command-established parameters.
- Spectrum-efficient – The Army cannot expect future technology to provide unlimited bandwidth. Mobile, deployable communications systems will never provide bandwidth on par with the ubiquitous cabled and fixed wireless infrastructure network widely available in developed countries. Especially at tactical echelons, the need for utmost mobility will continue to limit the amount of wireless connectivity available. Hardware and software developers must therefore consider bandwidth efficiency as a key consideration in any design. The network must be able to make opportunistic use of shared spectrum as policy and physical constraints allow. As a key network resource, access to electromagnetic spectrum should be viewed as a pacing item to be efficiently managed with the aid of automated tools. Efficient use also demands that whenever possible, information should be pre-positioned with the unit or platform to ensure a "basic load" of information such as map data is available upon deployment. Other measures that reduce the demand for bandwidth must be incorporated into Objective Force TTPs and unit SOPs.
- Survivable – This feature is a combination of Information Assurance protections, plus the inherent robustness and redundancy resulting from the multi-layered architecture. With no single point of failure and a built-in ability to automatically respond to degradation, the network presents a difficult targeting problem for an opponent. Survivability is also enhanced by wireless waveforms that provide low probability of intercept and low probability of detection (LPI/LPD) characteristics.

H.4.1.3 Information Distribution Management Information Distribution Management (IDM) is the technical means for providing the correct information to the correct person or system at the necessary time and in the proper format. It addresses the awareness, access, and delivery of information from the Distributive Information Database (DIDb) and other servers, ensuring management of information flow to users in accordance with the commander's information policy. IDM will sort and filter information as specified in a preprogrammed user profile. The Objective Force will deploy innumerable sensors throughout the battlespace, all capable of transmitting updates over the network. IDM ensures only relevant information will be widely distributed, so network capacity is not overwhelmed and related information systems, such as targeting processors, are better able to respond. IDM is not a separate stand-alone system, but rather a set of integrated information tools, applications, processes and services residing on all GIG-enabled systems. These tools must address the following IDM issues:

- Timely distribution of time-critical information.
- Delivering information in ways that optimize the use of GIG resources.
- Packaging, storing, and "advertising" information so it is accessible to a widely dispersed community of users with a variety of needs.
- Implementation of individual user and system "profiles" so information can be intelligently and automatically pushed or pulled.
- Dynamic methods to allow flexible updating of user profiles as the situation changes.
- Restricting access to classified information to ensure information security is maintained.
- Commander's control over information delivery priorities based on operational conditions and information network capacity.
- Integration of IDM tools into all GIG-enabled information systems.
- Development of common interface and data standards and methods to interface dissimilar data repositories.

H.4.1.4. Information Assurance Information Assurance (IA) ensures the availability, integrity, identification, authentication, confidentiality, and non-repudiation of friendly information and systems, and

forbids access to friendly information and systems by hostile forces. Information Assurance (IA) includes provisions for protection, detection, and response capabilities. These capabilities include systems that ensure emission security, communications security, computer security, and information security. IA also includes the detection capability needed to identify attacks, damage, or unauthorized modifications in the network. IA implies a response capability to restore normal network operation and to initiate a possible follow-on information operations response.

UA communication systems are designed with a level of information assurance normally found in fixed facility computer networks today. The Army defines IA as a defensive component of Information Operations that protects and defends friendly information and information systems by assuring their availability, integrity, authentication, confidentiality, and non-repudiation. IA incorporates a defense in depth that protects the global information grid against exploitation, degradation, and denial of service by employing vigorous protection, detection, reaction, and restoration capabilities. This incorporation allows for effective defensive measures and/or timely restoration of debilitated networks and information systems.

The five traits found in Information Assurance are availability, integrity, authenticity, confidentiality and non-repudiation.

- Availability is the timely, reliable access to data, and services by authorized users
- Integrity is protection from unauthorized change, including destruction
- Authentication ensures certainty of user or receiver identification and authorization for specific categories of information
- Confidentiality means protection from unauthorized disclosure
- Non-repudiation means proof of message receipt and sender identification.

IA contributes to defensive IO by protecting friendly information and information systems against friendly intrusion and enemy attacks. IA uses a defense in depth that includes computer defense network to counter adversary computer network attack. IA defense in depth protects all networks, including their information systems (such as computers and radios) and infrastructure (such as gateways, routers, and switches). To contain damage and restore the networks, IA systems and procedures provide information protection, intrusion/attack detection, and reaction. Information protection is accomplished with a full range of security means to prevent unknown users or data from entering the Battle Command network. External means include communications security; router filtering/access control lists; and security guards. Where necessary, we can physically isolate and establish protective barriers between protected and unprotected networks. Internal perimeter protection consists of firewalls and router filters. These serve as barriers between echelons or functional communities.

Intrusion/attack detection is accomplished by monitoring the internal perimeter protection tools and devices to identify activities that constitute violations of security policies. Selected events or occurrences (such as numerous log-on attempts within a specific period) are monitored to detect unauthorized access and inadvertent, malicious, or non-malicious modification or destruction of data. Network managers react to counter the effects of an incident on the Battle Command network. Reaction to a network or information systems intrusion incorporates the capability to restore essential information services, as well as attack response. Disaster recovery capability requires stopping the breach and restoring the Battle Command network.

H.4.1.5 Network Management Network Management comprises all the measures necessary to ensure the effective and efficient operation of networked systems. Objective Force network management systems will be highly automated, compliant with joint network management standards, and capable of remotely managing and controlling the network. They will enable dynamic reallocation of communications resources to effectively expand or contract the network. Modeling and simulation will be incorporated into the network management system so the network can proactively and predicatively allocate resources based on METT-TC considerations. Frequency spectrum management is also incorporated.

H.4.1.6 Enabling and Supporting Capability The Battle Command network employs automatically generated informational views of the COP and other system outputs, individually tailored to individual

learning and working styles specified in unique user profiles. The data that creates the views is pushed or pulled from multiple databases, and stored in standardized formats. Where the databases physically reside will be irrelevant, and the network paths used to deliver the data will be transparent to the commander.

H.4.2 Commander/Unit Integration and Synchronization

The capabilities of the Battle Command network work in unison to provide the commander the tools to fight the future battle. The UA will have the capability to coordinate and synchronize force employment into the JOA and the ability to coordinate with applicable component and joint Headquarters, NGO/PVO/ OGA, etc., in execution of entry operations. The UA leadership will conduct real-time collaborative planning and execution with all locations to ensure both the coordinated flow of forces and exercise the ability to modify that flow based on changes to the situation in the Area of Operations. The Battle Command network consistently collects, updates, displays and disseminates the COP throughout the UA force structure as well as to higher and adjacent forces. The Battle Command network enables the commander to:

- Execute Battle Command: Put a plan into action by applying military power against an adversary to accomplish the mission, and use situational awareness and case-based reasoning to assess progress and make execution and adjustment decisions.
- Monitor/direct intelligence operations: The commander drives intelligence collection. He establishes his CCIR that leads to the PIR and IR that focuses the ISR resources. Throughout tactical operations, intelligence operations are evaluated to ensure they adequately enable level 2 and level 3 situational awareness development.
- Monitor/direct maneuver operations: The commander takes full advantage of terrain and combat formations in his scheme of maneuver. The commander moves tactical organizations or units and their systems within an area of operations from one position of advantage supported by LOS, BLOS, NLOS fires.
- Monitor/direct effects: The effects coordinator in the command group tracks the status and execution of all fires and effects (lethal and non-lethal) for the commander using the networked fires capabilities of the Battle Command system. The effects coordinator ensures direction and guidance on fires from the commander is acted on by the other headquarters as appropriate. This information also enables the effects representative to provide advice and recommendations to the commander on effects.
- Monitor/direct current operations: The commander requires near real-time inputs that will enable developing and maintaining higher levels of situational awareness to effectively control and shape the battlespace, which, allows him to make decisions to affect the outcome of battle. The command integration cell monitors the network and insures the commander's COP and the overall COP are both functional and current.

The Battle Command network provides the commander an increased awareness of the friendly, enemy and neutral forces location, strength and intentions throughout his area of interest. The information is presented to him in a logical and easy to read format that allows him to instantly act on the information. With the information provided through the network, the commander is able to instantly make decisions to possibly alter his plan after talking with subordinates who are seeing the same information. The capabilities of the Battle Command network ensures the commander is able to exercise Battle Command and that all the pieces (operational characteristics) are brought together and synchronized at the right place and time to ensure a continuous unified fight.

H.5 Objective Force Characteristics

H.5	**Objective Force Characteristics**
H.5.1	**Responsiveness**
H.5.2	**Deployability**
H.5.3	**Agility**
H.5.4	**Versatility**
H.5.5	**Lethality**
H.5.6	**Survivability**
H.5.7	**Sustainability**

The Battle Command network for the UA is built around the seven OF characteristics. In supporting these characteristics, the Battle Command network will provide the UA the capability to obtain operationally significant information on friendly and enemy forces, to include non-combatants. Throughout the operation, the Battle Command system allows the UA to maintain and share operational information and force status, monitor the strategic, operational, and tactical situations through joint connectivity, and facilitate information exchange between component forces. Commanders have the ability to access the Joint operational situation when evaluating information received through reports and other personal observations from component and special operations forces. The Battle Command network and connected systems enable human case-based reasoning and leverage the fact that collaboration produces the highest level of information retention and situational awareness. A robust collaborative planning capability, linked to networked command and control systems, enables the translation of decisions directly into action.

H.5.1 Responsiveness

Routinely, UA commanders and staffs collaboratively and virtually team with other elements through a global Battle Command network. Commanders access the networked capabilities of the interdependent joint teams to leverage the capabilities of a robust HSOC. The HSOC has routine connectivity with interagency organizations, MACOMs and other elements of the national infrastructure to begin the planning and deployment process. The HSOC establishes connectivity with the gaining combatant commander and other selected commanders appropriate to the mission, task and purpose.

Developing correct situational awareness and a complete understanding of the operation begins well before the UA departs from its' home station, through networked access to and virtual collaboration with, joint, multinational and interagency assets and organizations. Mission tailored FCS teams with the appropriate mix of battle command and functional capabilities maneuver from strategic distances to the appropriate JOA configured in packages that facilitate combat upon arrival rather than administrative deployments in the traditional manner. The commander and staff continue the planning process, develop orders and conduct rehearsals while enroute. Enabled by the Battle Command network, FCS equipped units are capable of conducting distributive, simultaneous, and combined arms full spectrum operations against any threat in any terrain. This capability affords the commander numerous options of where and when to fight the UA. The UA is capable of entering the theater through multiple points of entry. Connected by the network, UA organizations are fully responsive to any circumstance.

H.5.2 Deployability

The UA is capable of quickly and rapidly concentrating combat power in an operational area. It is immediately capable of conducting distributed and continuous combined arms and full spectrum operations. The UA conducts operations in day and night, close and complex terrain, throughout the battlespace without undergoing reception and staging. The UA has mission tailored teams that enter the JOA through multiple points of ingress to thwart adversary anti-access strategies. The UA maintains unit cohesion and control through a Battle Command network embedded in all FCS platforms and systems.

The combination of rapid strategic maneuver, virtual teaming, enroute planning and rehearsal, and near simultaneous arrival of FCS equipped organizations with little or no Reception, Staging, Onward Movement and Integration, all enabled by superior battle command capabilities, result in an unprecedented level of responsiveness by providing the right force, at the right time, at the right place.

Throughout the deployment process, the commander and staff can conduct joint enroute planning and rehearsal with subordinates, supporting joint assets, adjacent units, and receive updated information on the enemy. The commander and staff also have instant access to the location and status of all units. The Battle Command network provides the commander this capability and knowledge across all platforms, even when dispersed.

Prior to departure, there will be little or no time to conduct training on the platforms or with the various systems. Through the Battle Command network, the UA conducts training on the platforms on a daily basis with embedded virtual full task training designed to develop individual, crew and small unit functional capacities.

H.5.3 Agility

The network enables the UA to transition quickly between changes to the task, purpose and mission; maneuvering into and out of contact without sapping operational momentum. The UA possesses the ability to adapt to changes faster than the enemy can, thereby denying him the initiative. The Battle Command network is capable of supporting decisive maneuver, horizontal and vertical, in all weather and terrain as a mounted or dismounted unit without compromising tactical unit integrity. The network with unprecedented range capacity and dependability provides secure, reliable access to information over extended distance and all terrain sets. The embedded network within the FCS moves as the UA formation deploys and maneuvers, while maintaining connectivity with higher, lower and adjacent elements. The network facilitates Battle Command anywhere, anytime by providing information and knowledge and enabling the commander to make more informed and timely decisions. The network will consist of multiple tiers or layers, including terrestrial, airborne, and space layers. Network components in each layer are interconnected with those in the other mutually supporting layers to form a survivable, self-configuring, self-healing backbone. Layered redundancy ensures there is no single point of failure. Reliance on multiple layers also reduces technological and programmatic risks incurred by over-dependence on communications assets in any single layer. The network ensures commanders and units have the ability to see and understand where and what the enemy is doing and take those proactive steps to combat his actions.

The Battle Command network enables agility in the UA through its' capability to conduct Battle Command on the Move. Through the network, the commander exercises continuous command over his units no matter where he is located. Connected to the network through the GIG, the commander has the ability to simultaneously conduct one operation while planning for the next. This capability ensures there is no break in the OPTEMPO. Immediately after completing one operation, the UA is ready to immediately transition to the next. The UA will have full networked connectivity to all component forces at their deployed locations. This provides the UA the capability to change the sequence, and other aspects of the forces, at any phase of the operation, even enroute to the objective, in response to changes in the deployment assets, activities in the JOA, or enemy actions. Throughout the early entry phase, the UA must have the capability to coordinate actions that will deploy, shift, regroup, or move joint formations as they flow into the JOA as well as those already committed.

H.5.4 Versatility

The UA has the inherent capability to conduct decisive maneuver synchronized with Army and joint fires to dominate any point on the battlefield. Formations adapt to changes in mission with minimal adjustments. The UA has unsurpassed mobility over operational distances as an integrated combined arms team capable of operating with current, SBCT and objective forces. Future Battle Command systems empower commanders with a far greater capability to "see first, understand first, act first, and finish decisively." Across the future battlefield, commanders and staffs collaborate to develop and refine plans before and during operations. The future battlefield will feature teams of subordinate and adjacent commanders, supported by their linked staffs, cooperating from distributed locations to execute land operations.

To a much greater extent than today, these teams of commanders will form without prompting or direction from the senior commander, although that commander may be part of the collaboration. Effective collaboration eliminates awkward transitions between one operation and the next. This ability to team across the battlefield blurs the traditional hierarchy of command and function as control and direction of particular actions and forces shift according to operational requirements. The network enables

commanders to perform on demand collaboration and mutual support. As the UA moves to objectives, the COP, with input from sensors, portrays the enemy force down to platform level. As one unit moves to a position of advantage, the mutually supporting unit in the adjacent terrain compartment provides the supporting fires to fix the enemy. As the maneuvering unit encounters a second enemy force, both commanders are able to plan and execute mutual support to defeat the enemy forces.

H.5.5 Lethality

Lethality brings together a triad of sensors, effects capabilities and battle command that enables the dynamic application of lethal and non-lethal destructive and suppressive effects to achieve the commander's intent. The network enables the dynamic application of the UA Commander's intent for lethal effects at the time and place of his choosing. As an example, networked fires are fully integrated from theater to platform, allowing the UA to rapidly establish, alter and terminate linkages to all relevant sensors and organic, external and Joint systems with a wide set of lethal and non-lethal effects. The Battle Command network ensures that the LOS, BLOS and NLOS systems provide the precise, cooperative and autonomous fires needed by the organization.

The network allows the commander to dynamically tailor his guidance and refocus and task sensors and effects capabilities to meet the requirements of changing situations. With all elements of the UA networked, the UA can achieve virtual teaming, mutual support and the ability to rapidly mass effects when required, without massing forces. The Battle Command network is capable of rapid fusion of sensors to produce targetable data. It is also capable of routing and rerouting targeting data to sensors or shooters when established sensor-to-shooter linkages become inappropriate. Networked fires facilitate rapid clearance of fires and airspace coordination. As a sensor acquires a target, this targetable information is displayed on the COP via the network. All FCS systems tied into the COP now have instantaneous knowledge of enemy locations. Armed with this information, the commanders at all levels can issue mission oriented orders to conduct cooperative engagements against the enemy targets. BLOS or NLOS fires can quickly augment LOS fires to destroy the enemy. If the commander desires, he can engage the target with non-lethal capabilities to achieve his desired effects.

H.5.6 Survivability

The UA provides maximum protection to mounted and dismounted soldiers. Ground and air systems employ the best combination of low observable, ballistic protection, long range acquisition and targeting and first round hit and kill technologies. The UA organizations possess passive and active survival capabilities to detect and counter enemy acoustic, visual and electromagnetic acquisition means and defeat both threat air and ground attacks.

As stated earlier in the O&O, survivability is not just placing more armor on platforms to defeat the next generation of weapons. Survivability is dependent upon the availability of information through the network. Seeing and understanding first will give commanders and their formations the situational awareness necessary to act first, maneuver out of contact and then make contact on the commander's terms. Target acquisition systems and sensors enable the commander to see where the enemy has positioned his forces and obstacles, allowing the UA to maneuver away from potential enemy engagement areas, if desired. The COP enables real-time dissemination of reported obstacles throughout the force, including mines (side-attack as well as conventional), booby-traps, and unexploded ordnance. Friendly and enemy obstacles are recorded in the DIDb. As units advance, their sensors are able to detect obstacles and minefields and mark them for following units. The Battle Command network enhances unit and platform survivability by cueing platforms to activate Active Protective Systems and enabling avenge kills on enemy targets. As an example, an ATGM is launched at an FCS platform. An airborne sensor with persistent staring capability identifies the launch, triangulates the path of the missile and cues the on-board active protection system of the targeted FCS vehicle. The platform under attack automatically informs all other platforms via the Battle Command network of where the fires are coming from. Armed with this information, FCS units to the flanks are able to immediately engage the enemy with massed destructive effects.

H.5.7 Sustainability

Building and sustaining combat power in full spectrum operations is just as important to executing fires and maneuver during those same operations. It is an integral, not separate function of commanders. Sustainability cannot be a separate system that is appended later. Embedded sensors on each platform provide an accurate picture of the sustainment status of the vehicle, weapons systems and soldier supporting systems. This enables the sustainment providers within the UA to monitor the maintenance status, asset visibility, resupply requirements and medical operations while providing logistical leaders with this information. This running estimate eliminates the need for the daily Logistical Statistics Report from the units in contact.

With the information provided by the Battle Command network, the commander and staff have the ability to track the sustainment status of every vehicle and platform in a timely manner. Through the COP, the Battle Command network enables the commander to review a simply displayed, but comprehensive, logistics picture. With this knowledge, the commander is able to quickly shift priorities and plan replenishment operations. Possibly the most significant contribution provided through the Battle Command system, is the reduction of the logistical footprint associated with the UA. The sustainment related information provided via the Battle Command network reduces the total number of platforms, quantities of supplies and numbers of soldiers dedicated to sustainment operations.

H.6 Sensor Fusion

Fusion is the combining or blending of data and information from single or multiple sources (sensors, logistics, etc.) into information. It involves the process of comparison, evaluation and related activities to ensure proper correlations of data or information exist and draw out the significance of those correlations. New data, when fused with other data, can become information. Information, when fused with additional data and/or information can become combat (actionable) information and/or intelligence. Fusion involves the process of comparison, evaluation, and related activities to ensure that proper correlations of data or information exist and draws out the significance of those correlations. Information fusion occurs as sensor and other information is continuously fed to the distributed information database. That database acted on by automated means or a man in the loop displays selected data on the COP. Fusion occurs as redundant, layered, and overlapping sensors provide the effective real time updates to the COP. The new data is simultaneously deconflicted and validated throughout the process.

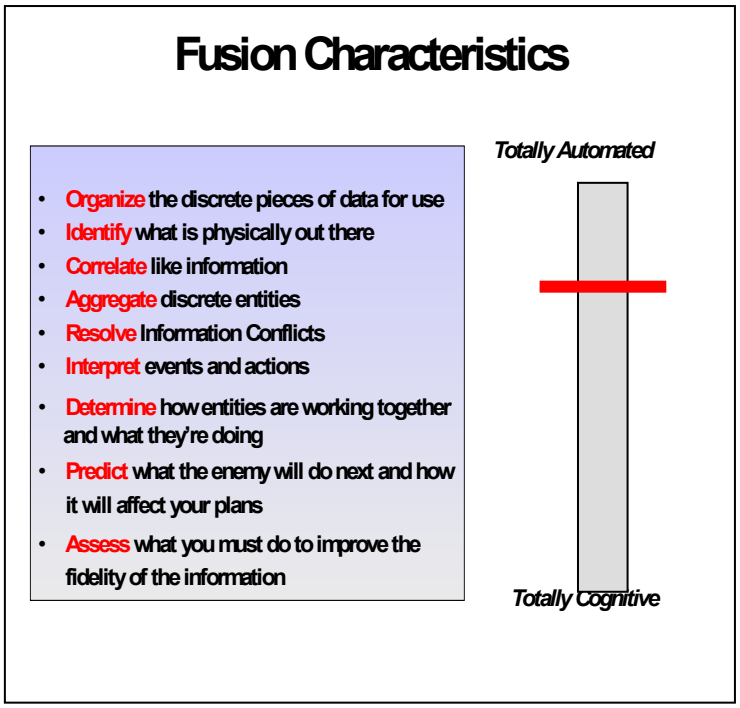


Figure H-4 Fusion

For example, magnetic, acoustic, seismic, and motion detectors, all linked as one array, provide their specific data to the collection platform, where it is fused. The sensor data helps build the picture of what is currently in motion and activating the sensors, in effective real time. This information stream, when fed with a separate information stream concerning electronic voice intercepts, becomes intelligence. This information stream is also actionable

targeting information providing enemy direction of travel, speed, location, and platform types. The fusion architecture fuses artificial and human information with intelligence, coming from many sensors, in a way that it is provided directly to the action agent in actionable form. Today, information is collected in functional databases, then analyzed and synthesized prior to dissemination. The architecture must process a variety of observations from different but complementary sources, and produce timely and actionable information. A function of the Battle Command system will be a set of filters, easily input into the plans process and changeable during battle allows the system to create knowledge and facilitate comprehension and projection to facilitate understanding – not just a series of reports.

Fusion is a series of processes performed to transform observational data into more detailed and refined information, assist it being transformed by the human into knowledge, and enable human understanding. These processes, by their very nature, involve both automation and human cognition. Fusion takes place at the lowest level possible. Some sensors with on-board processing capability will fuse information themselves, such as an ELINT sensor linking a radar signature to its associated air defense system, while other fusion occurs among nodes within the Battle Command network. It is important to note that fusion systems can assist, but not replace human intervention. As opponents understand the Objective Force sensor system, they will develop countermeasures designed to deceive or confuse those sensors. Additionally, some degree of error is inherent in every form of collection, and through the foreseeable future these will demand human analysis and intervention to resolve. Lastly, not every sensor will be capable of collecting every observable entity. A static, well-camouflaged enemy in radio listening silence can avoid detection by an electro-optical UAV, and COMINT collectors as well. A thermal collector may identify the enemy, but will introduce the ambiguity as to specific identity and purpose. Fusion of data, information and intelligence remains an organizational, technological, and leadership solution.

Also included as part of fusion are the databases, human interfaces and information portrayal, and the control and feedback of the fusion process. To be relevant, the products of fusion must be accurate, timely, usable, complete, precise, and reliable. These products can be presented in formats like the COP, running estimates, and any other format that assists the commander in visualizing and understanding the battlefield. Fusion helps alleviate information paralysis by providing a means to merge the various sources of data into a more coherent picture for commanders. Fusion in and of itself is not the end state commanders seek; it is only a means to an end. The staff assists the commander in understanding the battlespace. Achieving understanding is a human capability. While there may be some remote technological prospect for machine attainment of understanding, this will probable not be achievable technological goal within the projected timeframe of the Objective Force. The basic building block of fusion is the cognitive hierarchy. Webster's Dictionary defines "cognition" as the "mental faculty or process by which knowledge is acquired or knowledge gained, as through perception, reasoning or intuition." Cognition is the act of learning from, and integrating, various pieces of information. The cognitive hierarchy depicts the different levels of meaning assigned as fusion takes place. Data, information, intelligence, and knowledge are transformed, through fusion, by adding progressively greater meaning at each level. This transformation occurs from the lowest level (data) to the highest (understanding). At each level in the hierarchy there are different values, which support Battle Command. Data is the lowest level in the cognitive hierarchy. Data is rarely useful until it is processed to give it meaning.

Until data is processed, it is has minimal relevance to Battle Command requirements. Information consists of data to which meaning and relevance is applied. It is data in context. Data is processed and / or analyzed to become information. This processing and analysis may include filtering, formatting, organizing, collating, correlating, plotting, translating, categorizing, and arranging. Technology can create information from data. Humans create knowledge and form understanding from information. While not traditionally considered a level in the cognitive hierarchy, it results from the application of cognitive skills to provide relevance and meaning to data and information. Intelligence entities produce knowledge on adversaries. Knowledge is the result of the evaluation and analysis of information and/or intelligence. It is information in the human mind. Understanding is the ultimate goal of fusion and purely a human endeavor.

The commander comes to know what is happening, and through the application of judgment, to transform knowledge into understanding. Judgment is based on experience, expertise, and intuition. When the commander achieves higher level situational awareness, he sees patterns emerging from events, and he

anticipates consequences of the operational environment and the interaction between his force and those of the adversary. While understanding should be the basis for the commander's decisions, he must recognize that uncertainty and time preclude perfect situational awareness before deciding and acting. The commander normally conveys his understanding through dissemination of his intent, planning guidance, or information requirements. There are six levels of fusion. The levels are labeled Level 0 through Level 5.

- Level 0 Fusion is the initial processing accomplished at or near the sensor that organizes the collected data into a usable form for the system or person who will receive it. For example, an imagery sensor organizes an analog picture into a digital format by means of a sensor processor. At this point data is formatted, so it can be transmitted to another system or person for processing. When using technical sensors, this fusion level is automated, but adds a cognitive aspect when the sensor is a human, (e.g., interrogator, scout or SOF team).

- Level 1 Fusion takes new inputs and normalizes its data. Level 1 Fusion correlates it into an existing entity database and updates that database. This fusion level reduces redundancy, provides the last known disposition or status of an element, and makes the information available in a database. At this level, the information is assigned an identity and, through correlation, is subjected to a series of comparison referencing characteristics such as unit identification, item name, location, date/time of information, and key word descriptions. Information is combined and represented as a single element if the comparisons indicate an identical match (or what constitutes a match through normalization). The correlated element of information still retains information from the originating report(s) for future reference. However, it would appear as a single piece of information in the database or a single icon on the COP. This fusion level can be automated, but requires some analysis for information, which does not necessarily fit into the parameters of the system programming. Level 1 Fusion shows what is out there and can result in actionable information.

- Level 2 Fusion aggregates individual entities or elements, analyzes those aggregations, and resolves conflicts. This fusion level captures or derives events or actions from the information and interprets them in context with other information. It takes dissimilar information, analyzes it, and combines it into a product. Level 2 Fusion tells you how they are working together and what they are doing. This is where fusion begins to enable humans to develop Level 2 situational awareness: knowing the state of targets and understanding their relationships to each other and the environment. Level 2 consists of interpretation of relationships between objects and events, force aggregation, order of battle determination, contextual analysis, and environment assessment. Aggregation of various items is based on criteria such as location or identity. Conflicts are resolved through analysis, tasking or re-tasking of Intelligence, Surveillance, and Reconnaissance (ISR) assets for collection, and continually updating new information to ensure that there are no information conflicts or misrepresentations in the databases or on the COP. This fusion level requires cognitive thinking (analysis) with the assistance of automation. A key illustrative product of Level 2 Fusion is the COP.

- Level 3 Fusion interprets enemy events and actions, determines enemy objectives and how enemy elements operate, and predicts enemy future actions and their affect on friendly forces. Staffs predict enemy future actions and their affects on friendly forces by developing courses of action to include most likely and most dangerous courses of action. It requires analysis of all available information and intelligence and uses the COP to visualize the battlefield. Level 3 Fusion is a threat refinement process that projects current situation (both friendly and threat) into the future and draws inferences on the threat and vulnerabilities for both sides with the goal of predicting intent and strategy. Level 3 Fusion indicates what information means and how it affects your plans. Level 3 produces outputs intended to actually assess and quantify the target or threat's capability, suggests the intent, and provides the user with prioritized enemy COAs. In this stage of fusion, it would identify threat opportunities, vulnerabilities and begin to suggest possible tactical opportunities, which exist on the battlefield that the friendly forces could exploit. Level 3 fusion is primarily cognitive (analysis) aided by automated processing. Information resulting from Level 3 Fusion will be incorporated into the intelligence running estimate.

- Level 4 Fusion consists of assessing the entire process and related activities to improve the timeliness, relevance, and accuracy of information and/or intelligence. It reviews the performance of sensors and collectors, as well as analysts, information management systems, and staffs involved in the fusion process. Based on the assessment, Battle Command elements decide what adjustments to make concerning the procedures and systems involved in the fusion process. Level 4 Fusion is a process that evaluates and controls the correlation of the fusion system to determine collection needs and to allocate them to sources and sensors. Level 4 Fusion tells the user what he needs to do to improve the products from Fusion Levels 1 through 3. Level 4 is the critical feedback loop that allows modification of any part of the fusion process to include algorithms. Tasks involving feedback and optimization occur here. Implicit in Level 4 is arguably the most powerful potential force multiplier: autonomous learning behavior of the system, which translates into the capability to learn from experience and adapt to, changes to improve future performance. At this level, situational and support databases are clearly required in the form of threat, friendly, environmental, sensor and other data sets. This level of fusion results in decisions by the commander to make full-spectrum operational adjustments.
- Level 5 Fusion is the process that connects the user to the rest of the fusion process, so that the user can visualize the fusion products and generate feedback/control to enhance/improve these products. Level 5 Fusion allows users to visualize and interact with the products from Fusion Levels 1 through 4. Understanding gaps are determined. This level of fusion results in guidance from the commander, which causes the Senior Intelligence Officer or subordinate commanders to redirect ISR assets to fulfill requirements.

There are four types of fusion: data fusion, information fusion, intelligence fusion and knowledge fusion.

- Data fusion is a process that combines data processing (correlating data from one or more sensors) with human cognition. It can be accomplished through automation, and it may be performed on the collection platform (sensor). Data fusion pertains to data from any sensor / collector; therefore it is synonymous with sensor fusion (as defined in the UA O&O). Data fusion results in information.
- Information fusion is a process that combines information processing with human cognition. Information fusion resolves ambiguity using both automation and cognitive abilities to correlate and aggregate information. It can result in actionable information, intelligence, and knowledge.
- Intelligence fusion is a process that interprets information through cognitive abilities (analysis) assisted by automation. It provides context and meaning to information, which results in the ability to determine adversary intentions and make predictive assessments. These predictive assessments take the form of course of action development and include the most probable and most dangerous adversary courses of action. Predictive intelligence is a cornerstone of Objective Force operations. Predictive intelligence embedded in the intelligence running estimate, must enable the UA Commander to select the right time and location for combat operations.
- Knowledge fusion is a cognitive process, which combines information and intelligence with experience and expertise. It is the point at which all available information and intelligence are utilized for situational awareness and decision-making. Knowledge fusion enables Battle Command elements to adjust and synchronize operations. This occurs after two or more persons achieve their individual knowledge and understanding of the information and then combines it to produce products that can be shared with others.

The human provides attributes that automation alone can not: curiosity, judgment, experience, and intuition. The priority of automated fusion is to rapidly present actionable information to decision makers and shooters at every level. Additionally, it is important to feed information to analysts and provide them automated support so they can quickly present intelligence to decision makers and shooters. Humans enabled by automation will present information and intelligence that enhances the ability of commanders to understand the situation rapidly. To some degree automated fusion and cognitive processes are performed at all echelons. In the environment of future conflicts and complex emergencies, the universal element binding the strategic, operational, and tactical levels is people. People develop and share situational awareness then develop and share understanding of their

environment, decide on a course of action and implement decisions. The three levels of situational awareness can be favorably compared to the Levels of Fusion and Cognitive Hierarchy.

- Level 0 Fusion from humans acting as sensors and Level 1 fusion are roughly equivalent to Level 1 situational awareness in human cognition terms.
- Level 2 Fusion is roughly equivalent to Level 2 situation awareness in human cognition terms.
- Levels 3 Fusion and Level 4 Fusion are roughly the equivalent of Level 3 situational awareness in human cognition terms.

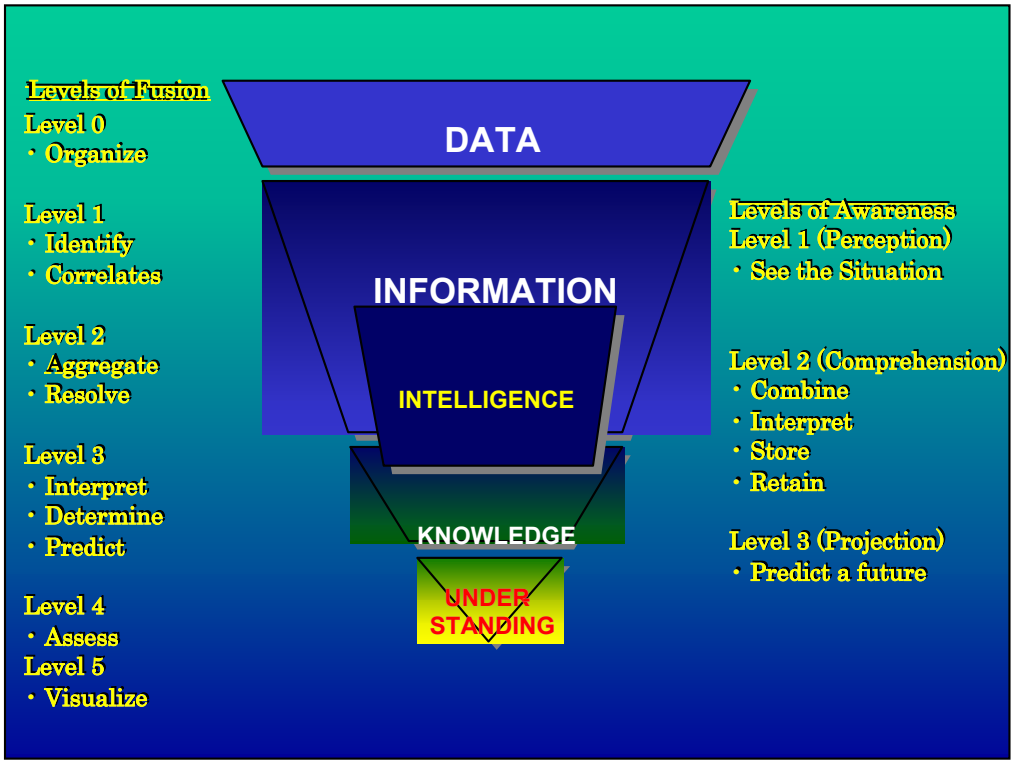


Figure H-2 Comparison of the Levels of Fusion with Levels of SA

The UA utilizes a full spectrum of layered sensors to collect and disseminate ISR data from organic, UE, National and Joint assets and directly display that information/intelligence on the COP. When the Battle Command network is fully operational, each echelon of command will access the COP and the DIDb to maintain SA as they continue their mission. They will use the organic sensors to fill in gaps or answer questions not answered by external sources. During times when the Battle Command network is degraded and the lower echelons don't have full connectivity with the updated DIDb or higher headquarters, they will rely more on their organic sensors and processors to maintain or advance their SA.

Preprocessing at the Sensor or on the Platform: The process begins with raw information or data collected from sensors in the UA; collateral sources (HUMINT) and assets above the UA. This data undergoes preprocessing which ensures that data is recognizable to the fusion engine. In addition to sensor specific information, it includes time, location, type and signature. Preprocessing includes steps like scanning, background clutter rejection, redundancy elimination logic, data compression and extraction of primary features from the raw signal. Primitive features are characteristics of the target that are recognized by a particular kind of sensor. Because of the volume of incoming data, preprocessing must occur onboard the individual platform.

Individual platforms with sensors are the outer most nodes in the network. Preprocessing must be done at the sensor or on the sensor platform, because the acquisition/sensing is "raw" data. Individual

platforms should not connect directly to the COP over the communications back-bone, as the multitude of sensings would overload the band width, and the data is of limited use until it is processed to give it meaning. This data must go to initial processing done on the C2Vs in the UA before being collated and ultimately feeding the COP. As data is passed from echelon to echelon of the fusion environment, generally corresponding to echelons of command, data from more reliable sensors, like humans are sent along faster and more weight is assigned to that data in correlation.

Processing at the Platoon and Company Level : After data is preprocessed, it enters the data fusion environment, probably onboard the platoon or company C2V, which will have larger servers and more sophisticated software for executing fusion. Beginning with data alignment, data is processed so that it is represented in a standard format. The information is also registered here. Registration is the process of spatially and temporally matching the location reported by the sensor to a point on the map in the COP. Association is the process that describes an entity. This involves gating, a coarse test that partitions measurements into two groups; those potentially assigned to an existing target or not. It also involves correlation which finalizes observation-to-track assignments. Correlation consists of a means of making comparisons between candidate assignments and a logic scheme that permits consistent selection of the best set of assignments.

Tracking is the process of maintaining a dynamic collection of information on a specific entity, such as a position, velocity, bearing, or any other defined feature. Tracking depends strongly on an effective association algorithm, as well as an adequate sample rate and sensor density. After Association and Tracking, Identification can take place. This is not the sensor level of combat identification, but the process where the fusion engine compares the attributes of the target to an ideal representation of a class of targets. The Joint Director's Laboratory describes this process in terms of typing and templating. Typing assigns weights to a general feature. Templating is a logic-based pattern recognition technique that matches a set of extracted features to entries in a database of standard templates.

Processing by the Maneuver Companies and/or the Battalion Information Superiority Cell. Here we begin to develop situational awareness; not just knowing the state of targets, but understanding their relationships to each other and the environment. This process consists of interpretation of relationships between objects and events, force aggregation, order of battle determination, contextual analysis and environment assessment. The process is probably optimized in a battalion level information cell with more analysts dedicated to processing the data. All C2Vs will have on-board ability to access DIDb, but the DIDb management function will probably reside at CA Battalion level or higher. This is the first stage that information/intelligence might be placed on the COP through human interaction.

Processing at the Battalion and Brigade Information Superiority Cells: Processing produces the outputs intended to actually assess and quantify target or threat capabilities. This process suggests intent and provides the user with prioritized enemy COAs. In this stage we would identify threat opportunities, vulnerabilities and begin to suggest possible tactical opportunities which exist on the battlefield that the UA could capitalize on. The Brigade Information Cell at the UA level has more analysts than Battalion and Company levels, and thus has more capability to perform this process.

Processing at the Brigade Information Superiority Cell: This cell provides the critical feedback that allows the modification of any part of the fusion process. Tasks involving feedback and optimization would occur here. Implicit in this process is arguably the most powerful potential force multiplier; autonomous learning behavior of the system which translates into the capability to learn from experience and adapt to changes to improve future performance. At this level, situational and support databases are clearly required, in the form of threat, friendly, environmental, sensor and other data sets.

H.7 Cognitive User Interface

The most important characteristics of the Battle Command network and its associated systems are the user interfaces. The cornerstone will be an optimized user – system relationship. To accomplish this, the Battle Command network and associated systems will adhere to basic interface principles. The five basic principles are user in control, no blind choices, proactive information delivery, cognitive correspondence and palatability.

User in control is the first and most important principle. Case-based reasoning, case-based teaching, and the ability to achieve individual and group level 3 situational awareness requires system users to understand their tasks and how they relate to the desired end state. The user must be in control of the system to enable him/her to fully comprehend the actions that can be taken in the system. This will make the system more effective. The interfaces must empower users by giving them control over the information displayed. Applicable primarily to screen design, this ensures a screen does not appear that the user does not specifically request. Information discovery by the user must occur at the appropriate time. In doing so, the interface must provide the user an ability to “simplify the problem” or task at hand. If, for example, the normal system process to manipulate data is too complicated for a novice user, that user can request the system to “simplify” the process and even assist in accomplishing it. This provides the ability for users to access the system without extensive training. Most importantly, it leverages the individual’s natural curiosity and drive for discovery to produce a participatory “self-teaching” environment. The result will be a reduced training requirement and higher retention of system operation and information obtained from the system by users. The dominance of visual orientation in humans for information input makes video presentations particularly critical. The amount of video available in the systems (UAV, VTC, etc.) must be manageable to the extent that it appears only as required and requested. The system will allow the user to control the nature of the video input, as well as its presentation (play, stop, playback, slow motion, still frame, etc.). This is particularly important as it supports collaborative planning. On demand controls will extend across all components (audio, radios, etc.).

No blind choices are the second critical design criteria. This capability eliminates the potential of users being forced to make random decisions (a blind choice). Information technology systems must offer users appropriate choices at appropriate times, and must provide the information necessary in order to make those choices effectively. This ensures users have the proper information, a characteristic required to achieve Level 3 situational awareness and make effective decisions. To facilitate this, the network and the systems working with it will provide the information necessary and, more importantly, serve as an enabler to help the user achieve situational awareness and make decisions.

This cannot be effectively accomplished, however, without the third characteristic, “proactive information delivery”. Network users will always have a cogent path through the software, utilities, and creative tools. The displays and other user interfaces will continually be assessed to ensure the user remains continually aware of the options and functionality available. They will clearly define where the user has been, where he/she is going, and how to reach that point. The user will never be left to resolve problems without assistance from the system. When users experience difficulty completing a task using the system software, the system must be able to know what assistance to offer and bring it to the user’s attention.

Proactive Information delivery is a characteristic, without which, it is impossible to achieve “no blind choices”. A critical component in moving from Level 1 situational awareness to Level 2 situational awareness is that the correct information is made available to the user at the exact point in time when the information is needed to either make a decision or take an action to achieve the desired end state.

The next critical system feature, cognitive correspondence, provides functionality in the service of no blind choices and proactive information delivery. The cognitive correspondence of the system enables the user to comprehend the relevance of choices/projected actions available (Level 3 situational awareness). To do so, the user must be supported in comprehending how the choices available relate (correspondence) to the information and the task (task environment). Most importantly, what the user and the system are doing together must match the user’s model (case) of what they are doing. This is essential to reducing workload on user short-term memory, particularly under stress. The final characteristic is palatability. Simply stated, it is that users “feel good” about using the system and want to use it.

H.8 Multi-Modal, Self-Adaptive, User Interface

An over-arching characteristic of network systems is the relationship between the user and the computer. This is commonly referred to as the "man-machine interface". The relationship is what John R. Tiffany defined as "bandwidth". Just as there are bandwidth requirements to move data between digital hardware systems, there is a bandwidth requirement for the man-machine interface to facilitate passing information between the soldier/user and the system/computer. The primary impact of this interface approach is on the situational awareness's first and foundational step in perception. Broadening the bandwidth between the user and the system requires re-defining the perceptual portion of situational awareness. User/System bandwidth is most often small, constrained to keyboard input, or at best, limited voice recognition. The current approach doesn't often take full advantage of the procedural, participatory, spatial, and encyclopedic properties of the digital environment. The proliferation of digitization to increasingly lower levels in the force collaterally increases the impact of individual learning styles on achieving all three levels of situational awareness. The effect of stress on optimum individual reception modes demands that UA networked systems includes a multi-modal, self-adaptive user interface. The multi-modal self-adaptive user interface that enables the common hardware/software to be quickly and easily optimized their input and output to individual user requirements. This capability is both for information flow and the individual user's learning, working, and cognitive styles. It is adaptive as they change under stress and heavy workload.

H.9 Collaborative Planning and Execution

The power of collaborative planning in the UA is an ability to provide real time use of the decision making process and deliberate planning/crisis action planning tools and techniques in a seamless architecture "federated" from home stations and service nodes through the area of operations. Headquarters and staffs, adjoining units, and joint elements coordinate, collaborate, and execute in dynamic real-time synchronized sessions throughout the operational deployment. In the dynamic and fluid 21st century battlespace, this may include coalition, NGO, PVO and IO elements as well. Collaborative planning utilizes Level 1 situational awareness, facilitates Level 2 situational awareness, and must provide tools to ensure level 3 situational awareness at the group level. Most importantly, this collaborative planning will enable collaborative execution.

H.10 Participatory, Collaborative Rehearsal

The network and associated systems will enable the UA at all echelons to conduct joint, fully participatory rehearsals throughout all phases of the operation from deployment to re-deployment. The rehearsal problem facing joint contingency force operations results from the fact that in virtually all scenarios, the force consists of disaggregate units and headquarters planning, rehearsing, and deploying from a myriad of locations. While a collaborative planning capability will significantly enhance the planning phase, it does not, by itself, meet the full requirement to rehearse and adjust plans and orders to the lowest level that must execute them. It will support all three situational awareness levels, and leverage human cognitive and learning styles to ensure the plans and orders are understood to the lowest levels in the force.

Level 1 situational awareness provided by the rehearsal environment must immerse and provide the commander and his subordinates the full perception of both the physical environment (terrain, weather, sound, etc.) and the operational environment (enemy, friendly and neutral locations, description, strength, capabilities, etc.) The rehearsal system will simultaneously facilitate Level 2 situational awareness by providing essential information in a manner that facilitates soldier understanding, retention, and application of information to the mission and physical environment in the JOA. Finally, the network and its associated systems will facilitate Level 3 situational awareness by providing COAs and other decision enablers through embedded creativity tools. These include the capability for participants to rehearse virtually in a multi-sensory simulated JOA with the same perceived depth as they would in physical mock-ups or on the actual terrain (in the case of ground forces). To achieve this, the rehearsal system must be fully interactive, not just between the soldier and his/her "environment", but also among the participating joint forces. The level of detail in simulation will be commensurate with the participant's level in the

mission (i.e. pilots in a virtual "fly through", staff officers in command posts, and ground forces in the JOA environment). The system will have the ability to adapt and respond to actions by the participants according to known or anticipated enemy courses of actions, likely changes in the environment, and other "rule sets". Participants in rehearsals must have the ability to alter courses of action and "rehearse" based on the results of the interactive simulation. UA rehearsal and training systems will provide learning through expectation failure from adaptive case-based simulations. Overall, force components at all levels must have the ability to fully participate in interactive rehearsal sessions from any location and a variety of air, ground, surface, subsurface, fixed and mobile locations.