NEAR TERM COMMAND AND CONTROL OF
HOMELAND AIR AND MISSILE DEFENSE

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The events of 11 September 2001 revealed that America was no longer impervious to aggression. When terrorists attacked, no defensive forces were immediately available to defend the homeland. One of the comprehensive changes was an update of the Unified Command Plan creating a new command, NORTHCOM, to oversee defense of North America and splitting the Unified Command of NORAD and USSPACECOM. NORAD aligned under NORTHCOM while USSPACECOM was subsumed by STRATCOM. This created the paradox of what to do with the mission of homeland air and missile defense. The geographic combatant command of NORTHCOM retained NORAD?s mission of aerospace defense of the homeland, while STRATCOM?s functional command gained the integrated missile defense mission. Missiles can traverse multiple AORs, yet the defense remains the geographic commander?s responsibility. It is not viable to split the roles and missions of the limited assets performing the dual role of air and missile defense. Applying the FAS test to different COA determined that it is best to maintain the AMD mission but divide the assets between the two commands based upon system capabilities and threat launch locations.

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

ABSTRACT

DETERMINING THE BEST NEAR TERM COMMAND AND CONTROL FOR HOMELAND AIR AND MISSILE DEFENSE, by MAJ Robert J. Phillips, 59 pages.

The events of 11 September 2001 revealed that America was no longer impervious to aggression. When terrorists attacked, no defensive forces were immediately available to defend the homeland. One of the comprehensive changes was an update of the Unified Command Plan creating a new command, NORTHCOM, to oversee defense of North America and splitting the Unified Command of NORAD and USSPACECOM. NORAD aligned under NORTHCOM while USSPACECOM was subsumed by STRATCOM. This created the paradox of what to do with the mission of homeland air and missile defense. The geographic combatant command of NORTHCOM retained NORAD's mission of aerospace defense of the homeland, while STRATCOM's functional command gained the integrated missile defense mission. Missiles can traverse multiple AORs, yet the defense remains the geographic commander's responsibility. It is not viable to split the roles and missions of the limited assets performing the dual role of air and missile defense. Applying the FAS test to different COA determined that it is best to maintain the AMD mission but divide the assets between the two commands based upon system capabilities and threat launch locations.

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LIST OF ABBREVIATIONS

AAC	Army Anti aircraft Command
AADC	Army Air Defense Command; Area Air Defense Commander
ABL	Airborne Laser
ABM	Anti Ballistic Missile
ACC	Air Component Command
AD	Air Defense
ADA	Air Defense Artillery
ADC	Aerospace Defense Command (Air Force)
ADCOM	Air Defense Command (Air Force)
ADUS	Air Defense of the United States
AFDD	Air Force Doctrine Directive
AFRES	Air Force Reserve
ALSA	Air Land Sea Applications
AMD	Air and Missile Defense
ANG	Air National Guard
AOR	Area of Responsibility
ARADCOM	Army Air Defense Command
BMC2	Battle Management Command and Control
BMD	Ballistic Missile Defense
BMDS	Ballistic Missile Defense System
BOS	Battlefield Operating System

BRAC	Base Realignment and Closure
BSFV	Bradley Stinger Fighting Vehicle
C2	Command and Control
C3	Command, Control and Communications
C4	Command, Control, Communications and Computers
C4I	Command, Control, Communications, Computers and Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAPS	Combat Air Patrols
CDRUSELEMNORAD	Commander, U.S. Element NORAD
CINCNORAD	Commander in Chief, NORAD
CINCSPACE	Commander in Chief, USSPACECOM
CMOC	Cheyenne Mountain Operations Complex
CONAD	Continental Air Defense Command
CONUS	Continental United States
CONOPS	Concept of Operations
COP	Common Operational Picture
CRC	Control and Reporting Center
CRE	Control and Reporting Element
CVRT	Criticality Vulnerability Recoupability Threat
DCA	Defensive Counter Air
DII	Defense Information Infrastructure

DII COE	Defense Information Infrastructure Common Operating Environment
DoD	Department of Defense
FAA	Federal Aviation Administration
FAAD	Forward Area Air Defense
FAS	Feasibility Applicability Sustainability
FEMA	Federal Emergency Management Agency
FLIR	Forward Looking Infra Red
GIG	Global Information Grid
GCN	GMD Communications Network
GMD	Ground-based Midcourse Defense
HIMAD	High to Medium range Air Defense
HMMWV	High Mobility Multi purpose Wheeled Vehicle
IAMD	Integrated Air and Missile Defense
ICBM	Intercontinental Ballistic Missile
IFF	Identification Friend or Foe
IMD	Integrated Missile Defense
ITW/AA	Integrated Threat Warning / Attack Assessment
JCIET	Joint Combat Identification Evaluation Team
JCTN	Joint Composite Tracking Network
JP	Joint Publication
JtAMDO	Joint Air and Missile Defense Organization
JTIDS	Joint Tactical Information Distribution System

LEAP	Lightweight Exo Atmospheric Projectile
LAV AD	Light Armored Vehicle Air Defense
MACOM	Major Command
MANPADS	Man Portable Air Defense System
MEADS	Medium-range Air Defense System
MDA	Missile Defense Agency
MTN	Multi Tactical data link Network
NAF	Numbered Air Force
NEADS	North East Air Defense Sector / Squadron
NBC	Nuclear Biological and Chemical
NMD	National Missile Defense
NORAD	North American Aerospace Defense Command
NORAD/USSPACECOM	North American Aerospace Defense Command / United States Space Command (Unified Command)
NORTHCOM	Northern Command
NSS	National Security Strategy
NUMD	NORAD/USSPACECOM Mission Directive
OCA	Offensive Counter Air
ODI	Offensive Defense Integration
PATRIOT	Phased Array Tracking Radar Intercept On Target
QDR	Quadrennial Defense Review
RAOC	Regional Air Defense Centers
SALT	Strategic Arms Limitations Talks

SAM	Surface to Air Missile
SEADS	South East Air Defense Sector / Squadron
SHORAD	Short range Air Defense
SIAP	Single Integrated Air Picture
SIOP	Single Integrated Operational Plan
SLAMRAAM	Surface Launched Advanced Medium Range Air to Air Missile
SPACECOM	Space Command
STRATCOM	Strategic Command
TAA	Total Army Analysis
TADIL	Tactical Digital Information Link
TAMD	Theater Air and Missile Defense
TBM	Tactical Ballistic Missile
THAAD	Theater High Altitude Air Defense
TMD	Theater Missile Defense
TV	Television
UAV	Unmanned Aerial Vehicle
UCP	Unified Command Plan
UNAAF	Unified Action Armed Forces
U.S.	United States
USAF	United States Air Force
USC	United States Code
USJFCOM	United States Joint Forces Command

USNORTHCOM	United States Northern Command
USSOCOM	United States Special Operations Command
USPACOM	United States Pacific Command
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
WADS	Western Air Defense Sector / Squadron
WMD	Weapons of Mass Destruction
WWSVCS	World Wide Secure Voice Communications System

CHAPTER 1

AN OVERVIEW

In the wake of 11 September the Army and the nation have been deeply introspective. How could this happen? The giant was caught sleeping. When awoken, he could not react quickly enough to defend himself from a second and third attack. Terrorists attacked the U.S. by air within its own boundaries. There were no forces immediately available to defend the homeland. Where was the North American Aerospace Defense Command (NORAD)? Aerospace defenses had been looking outward to defend from an external attack and this attack came from within. No Combat Air Patrols (CAPS) were flying and American aircraft could not respond quickly enough. There was neither a homeland defense commander nor plans against such attacks. The Bush administration has already begun steps to address these shortfalls in defense planning.

To prevent such attacks from recurring, the primary question that must be answered is "What is the best near term command and control structure for homeland air and missile defense?" There must be national defense plans and an appropriate command and control (C2) structure to overarch them. This paper will focus on the near term C2 relationships as defined above. This decision should be reviewed as technologies change and communications and computer technologies grow.

America can no longer be considered impervious to aggression. The attack of the nation's military and financial epicenters by an aerial attack and the inability to provide a rapid response has driven a reassessment of defense plans. The Unified Command Plan (UCP) has shown this through the establishment of a new United States Northern

Command (USNORTHCOM) charged with the defense of the homeland. USNORTHCOM will have NORAD, charged with the aerospace defense of North America, aligned beneath them. (Bush, 2002) Assigning NORAD to USNORTHCOM has split the once unified command of NORAD and the United States Space Command (USSPACECOM). This has resulted in USSPACECOM merging with United States Strategic Command (USSTRATCOM) (Garamone, 2002).

As part of the homeland defense strategy, the President has placed National Missile Defense (NMD) as a top priority within the National Security Strategy. (Bush, 2002) There is significant mention of it in the National Security Strategy. So much emphasis has been placed on this arena that the Ballistic Missile Defense Organization has been reorganized as the Missile Defense Agency (MDA) with all the rights and privileges afforded a Department of Defense (DoD) agency. They have been given the lead in the nation's research and development of missile defense technologies.

Due to the similar functions and economy of force, all currently fielded and proposed air defense systems perform both air and missile defense roles on the battlefield. The Phased-Array Tracking RADAR Intercept On Target (PATRIOT) missile system is designed to defeat both air threats and tactical ballistic missiles. Future systems such as Medium-range Air Defense System (MEADS) and surface launched variant of the Advanced Medium Range Air to Air Missile (SLAMRAAM) are being designed in the same way. Shooting down an airliner would incur great civilian casualties and loss of human life. It is a safe assumption that this would require at least a four star general in the approval chain. The question is which one?

In the arena of defense of the homeland from aerospace threats there is historical precedence. In the 1950's, America's defense against large scale soviet air attack was the Continental Air Defense Command (CONAD). The Army component was a ring of defense around its borders in the form of the Army Air Defense Command (ARADCOM), the Air Force Air Defense Command (ADC) manned interceptors and warning radars while the Navy was responsible for defending the sea approaches. Although the mission has changed and the US must also look inward, the command and control relationships merit consideration. A review of how these relationships worked in the past may provide insight from their success. Another topic worthy of review is the SAFEGUARD system that was designed to protect America from Intercontinental Ballistic Missiles. The nation's first missile shield may give us further insights on command and control relationships.

There is much doctrine written on aerospace defense. JP 3-01 and JP 3-01.5 focus specifically on aerospace defense. More doctrine is being written as the Joint Staff writes JP 3-26 on homeland defense and The Air Land Sea Application (ALSA) Center begins its work on an MTTP for Air Defense of The United States (ADUS). As doctrine is the cornerstone to building a solid construct, it merits serious consideration. The Joint Air and Missile Defense Organization (JtAMDO) has been given the responsibility to develop a CONOPS for near-term Integrated Missile Defense, to include all joint systems. In this arena, it is appropriate to address the current thinking of appropriate agencies. MDA is working towards integrated missile defense (IMD) based upon their charter. This term has also been used by JtAMDO to facilitate MDA's efforts and scope their work. A *Concept of Operations for Integrated Missile Defense Baseline: Block*

2004-2006 (IMD CONOPS) was written to this effect with the end goal being to add the air component, integrated air and missile defense (IAMD), in subsequent revisions. One cannot ignore the air component for the present. A gap in doctrine has oft proven fatal. As was seen on 11 September and countless times before that, the enemy does not attack on any nation's time schedule. If no doctrine is in place when fighting begins, it is created as people die.

The thesis question posed is central to solving the doctrinal dilemma. The near-term C2 structure must be addressed so as to avoid a gap in doctrine. Future systems cannot solve current problems. Only current capabilities can be used to deal with current problems. An architecture must be developed that defines the interdependencies of C2 and systems that can grow to meet future requirements and capabilities. For the purpose of this paper, an architecture defines these interrelationships, while the C2 structure associates the appropriate commands. Command and Control relationships cannot be decided in a vacuum without looking at second and third order effects. The proposed architecture must be based upon the missions to be performed with the potential to include future capabilities painlessly. There are implications to delinking the theater missile defense or ballistic missile defense missions from the air defense mission. This paper posits the need to command and control integrated air and missile defense and will address that as a secondary question.

A thorough review of historical precedent and current aerospace defense doctrine will give us a structured form to assess differing possibilities. The primary branches are to make Commander, USNORTHCOM or Commander, United States Strategic Command (USSTRATCOM) the supported commander. Additional sequels will be

explored. The final check comes from the review of law and treaty. Any proposed construct cannot violate treaties or cause insurmountable diplomatic hurdles.

Secondary / Tertiary Questions

The thesis question drives us to additional questions. When addressing the issue of command, the two aforementioned major commands are the primary candidates. Yet when addressing control the appropriate level of execution must also be considered. Should this be centralized or decentralized execution? While it may be argued that the weighty decision of shooting down a commercial aircraft should reside at the highest levels, time constraints for execution may mandate decentralized execution under strict rules of engagement.

All currently fielded missile defense systems perform the both air and missile defense functions. But, can the missions be separated? Current Army and Joint doctrine confirm the unity of air and missile defense functions. Previously the unified command of NORAD/USSPACE would have overseen this role. The responsibility for aerospace defense for North America has been clearly delineated to NORAD. Commander, USNORTHCOM has been designated responsible for homeland security and NORAD has aligned with them bringing the responsibility for aerospace defense of North America. USSPACECOM has merged with USSTRATCOM and now has the mission to deter and defend against weapons of mass destruction (WMD), missiles and long range conventional attacks as well as the edict to employ forces under the Single Integrated Operational Plan (SIOP).

To complicate matters further, MDA has been given research and development responsibility for all missile (and de-facto air) defense systems with a single focus toward

missile defense (Rumsfield, 2002). There are many states of concern that currently have, or will soon acquire, the capability to strike the United Stated or her allies with WMD carried via long range missiles. Some posit that a nation could place a shorter range missile on a barge off of the coastline. With a weapon of mass destruction, accuracy is not essential.

The events of 11 September have shown that aircraft on the ground cannot respond quickly enough to all possible attacks. Combat Air Patrol are an excellent defense and deterrent when properly positioned. The flying of continuous CAPS is cost prohibitive in the long run. Post 9/11 studies, and historical precedent, have shown that effectual point air defense can be accomplished by employing Army air defenses in strategic locations. This has already been seen at locations such as the nation's capitol and events such as the Olympics. Navy Aegis platforms also provide effective air defense, but their powerful radar causes other problems when deployed near population centers. Should the U.S. deploy its air defense systems in support of homeland defense, maintain the internal CAPS missions or some combination thereof? If so, what systems should be deployed? The question must be answered as to whether homeland AMD will be a dedicated or on order mission.

Although National Missile Defense is a key element of national security under the Bush administration, Canada has shown a disinterest in becoming involved. The responsibility of Missile Defense has therefore been given to USSTRATCOM and not the bilateral command of NORAD (STRATCOM mission). The merger of SPACECOM and STRATCOM gives the nation an edge on offensive-defensive integration (ODI). While this ODI may lend itself to a command and control structure for homeland AMD, it is not

imperative. What is essential is whether or not the proposed command can perform all of the pillars of joint air and missile defense. These pillars include active defense, passive defense, attack operations and C4I.

The final question becomes whether or not these systems should function as part of a decentralized, tiered system of homeland air and missile defense. The Army is the only service to have a currently fielded, capable missile defense system. The current system and proposed systems all perform a dual mission of air and missile defense. The exception falls within portions of the proposed Ballistic Missile Defense System (BMDS), which has a pure missile defense mission. Even within BMDS, the proposed sea-based platforms also perform an air defense function and are a part of the carrier group's indigenous defense. Should the air defense mission be split from the missile defense mission and assigned under the appropriate commands? Is this even possible?

Before beginning analysis of these questions there must be some underlying assumptions. For the purpose of this thesis it is assumed that there exists a credible air threat to the homeland. The events of 11 September have shown the ramifications for assuming otherwise. Although General Eberhart stated in NORAD's brief to Congress (Eberhart, 2002) that they will begin looking inward for aerospace defense, there are innumerable obstacles to overcome which are beyond the scope of the DoD. It is also assumed that a credible missile threat exists to the United States. This is part of the present administration's national security platform. In efforts to combat this threat the U.S. withdrew from the 1972 ABM treaty, despite urging from the Soviets. This treaty limited missile defenses to protect either both countries missile fields or capitol. It also precluded the sharing the data across the missile defense systems.

The terms used in this paper are jointly agreed upon definitions found in the Department of Defense dictionary (JP1-02) and other joint doctrine. A few key terms from Joint Publications are listed below. Please note the conflicting definitions of air defense. The definition from JP1-02 is used unless otherwise noted.

Aerospace. Of, or pertaining to, Earth's envelope of atmosphere and the space above it; two separate entities considered as a single realm for activity in launching, guidance, and control of vehicles that will travel in both entities.

Air Defense. Air defense consists of all defensive measures designed to destroy, nullify or reduce the effectiveness of attacking enemy aircraft or missiles. Missiles may include ground-, air-, or sea-launched cruise missiles; and ballistic missiles with range capability less than 3500 kilometers. These operations may also include destruction of airborne missile launch platforms. Air defense includes both active and passive measures. (JP 3-01.1)

Air Defense. All defensive measures designed to destroy attacking enemy aircraft or missiles in the Earth's envelope of atmosphere, or to nullify or reduce the effectiveness of such attack. Also called AD. (JP1-02)

Air and Missile Defense. The integration of joint force capabilities to deter preempt, defend against and destroy adversary aircraft and missiles, both before and after launch. Air and missile defense is accomplished through an appropriate mix of mutually supportive passive missile defense; active missile defense; attack operations; and supporting command, control, communications, computers, and intelligence measures. Also called AMD. (JP3-26, writers draft. Upon approval of this publication, this term and its definition will be included in JP 1-02)

Ballistic Missile Defense (BMD). BMD exists to defeat long-range ground and sea-launched intercontinental ballistic missiles attacking North America. These missiles are those with a range capability greater than 3500 kilometers. BMD operations include all active and passive measures designed to detect, classify, track, intercept, and destroy attacking ballistic missiles, or nullify or reduce the effectiveness of such attacks. (JP 3-01.1)

Integrated Missile Defense (IMD). A layered missile defense that effectively integrates ballistic missile active defense systems in order to defend the U.S., deployed forces, friends, and Allies. Included within IMD is the integration of Theater Missile Defense (TMD), Ground Based Mid-course Defense (GMD), other missile defense forces, and the requisite Battle Management, Command and Control (BMC2). (CONOPS for IMD. Baseline Block 2004-2006)

This 3500 KM demarcation is based in the words of the Strategic Arms Limitations Talks (SALT) treaty and provides a clear separation for defenses. Current systems have been designed with this restriction in mind. Near-term is defined as attainable between now and 2010.

The focus of this thesis is limited to C2. The communications (C3) aspect is assumed away as all current missile defense systems can communicate via the Joint Tactical Digital Information Link, known as TADIL-J or link-16. The forthcoming GMD Communications Network (GCN), augmented with additional communications assets, will provide a secure communications backbone which may be utilized to overcome long haul communications problems. This role is currently filled by the World Wide Secure Voice Communications System (WWSVCS).

Command and control (C2) will be addressed, but C3 (adding communications) will not be specifically addressed outside of the definition of C4I. This thesis is limited to the near term because this issue must be addressed now. It is not viable or expedient to design a communications structure to support a doctrinal solution. These topics must be reviewed to verify the potential C2 relationships, but a materiel solution will not be addressed. Forthcoming systems such as Theater High Altitude Air Defense (THAAD), Medium Extended Air Defense System (MEADS), Ground-based Midcourse Defense (GMD) and airborne laser (ABL), as well as existing systems such as PATRIOT fall under consideration for homeland air and missile defense. Interceptor aircraft must also be considered for the air defense role.

Computers (C4) will not be addressed in this thesis either except in the context of C4I. It will be the responsibility of the supported commander assigned the homeland air

and missile defense mission to establish the appropriate C4 system. Assuming Defense Information Infrastructure-Common Operating Environment (DII-COE) compliance and implementation of the Global Information Grid (GIG), the appropriate commander shall be able to draw the data together to form a Common Operational Picture (COP). Whether current and forthcoming technologies lend to a centralized or decentralized command structure for the aforementioned C2 will be addressed. The JtAMDO CONOPS also stresses the use of supported and supporting commanders; therefore this option must be considered as viable.

Although aerospace defense rests on three mission areas (See figure 1), this paper is scoped to only address air defense and missile defense, not space defense. For the purposes of this paper it is assumed that this responsibility transferred to USSTRATCOM when they merged with USSPACECOM.

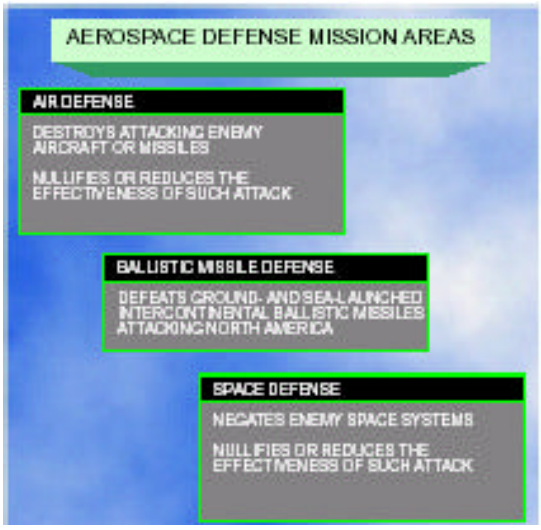

Figure 1. Aerospace Defense Mission Areas

Source: JP3-01.1

SUMMARY

There is no unity of command against air and missile threats. Who, therefore, should command and control dual-mission assets for homeland air and missile defense in the near term? This paper will address whether the air and missile defense missions can be split and propose the best command and control structure. The beginnings of homeland AMD will serve as a starting point.

CHAPTER 2

THE FOUNDATIONS OF AMD

History

Upon initial examination it was determined that the most likely commands to be responsible for homeland air and missile defense were NORAD which has merged with USNORTHCOM, and USSPACECOM, which has merged with USSTRATCOM. This is appropriate since they all had a lineage in homeland air defense. Both of these commands can be traced back to the United States Air Force Air Defense Command (USAF ADC). (See Figure 2).

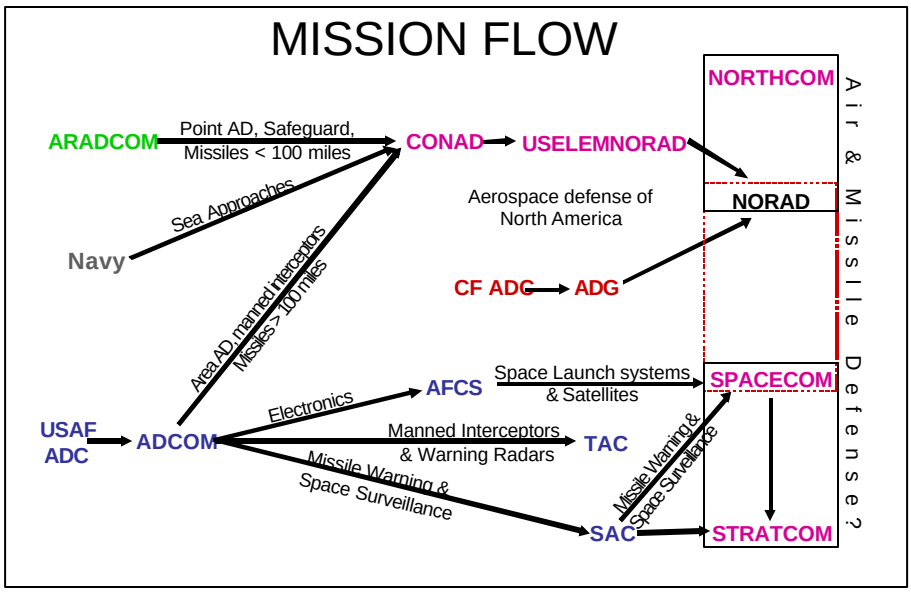

Figure 2. Historical Mission Flow. Source: Multiple Sources.

The most poignant example of homeland air and missile defense was developed during the Cold War under the Continental Air Defense (CONAD). This US component

to NORAD maintained a joint aerospace defense of the homeland. The command began its mission in fear of Soviet sorties coming across the ocean to drop nuclear bombs on American soil. The nation was defended through interceptor aircraft and coastal artillery batteries encircling the coastline that grew into missile detachments at strategic locations. Eventually, the Army fielded the SAFEGUARD system in North Dakota to defend against intercontinental ballistic missile (ICBM) strikes. The Air Force maintained manned interceptors and stood ready with BOMARC missiles while watching the skies with land and sea-based radars. The navy also watched the sea approaches, with carrier based interceptors ready to defend the nation. As units grew in capabilities, the commands changed their names. Army Anti-aircraft Command grew into Army Air Defense Command. Air Defense Command became Aerospace Defense Command. North American Air Defense Command became North American Aerospace Defense Command. There was definitely an integrated, homeland air and missile defense.

Although the robust communications of today did not exist in the 1950s, procedural controls linked with designated areas of responsibility (see figure 2) gave CONAD positive control over their defenses. For example, a Nike Hercules battery would receive early warning from CONAD through their Army Air Defense Command Post. They would then acquire the threat with their own radars and ready the missiles. When the battery control officer manually correlated the track with the information from higher, they procedurally went to a higher alert state and interrogated the target. The battery control officer could then best determine when and upon whom to fire based upon "the plotting board information, his knowledge of the defense area, the geographic limitation of his field of fire, and the method of engagement directed by the Army Air

Defense Command Post." (The last line of Defense, Nike sites in Illinois, Ryder) These copious defenses went unchallenged and were, by default, 100 percent effective.

So what happened? The safeguard system was shut down five months after it was fielded in the name of détente. Post Korea draw downs and financial cuts took the life of the ARADCOM as Mutually Assured Destruction promised to provide the best defense against a Soviet strike. America no longer defended against the missile threat. NORAD remained vigilant with eyes looking outward for an enemy air attack with aircraft at the ready. America's missile defenses slowly disappeared. The ADC allowed the BOMARC missile to drop from their inventory in 1968. By the end of the 1970s the ADCOM had also stood down and distributed its missions to other commands. The last Army Nike site shut their doors in 1974. By the eighties the U.S. was hoping on Hawk and a new system called SAM-D (which eventually evolved into Patriot) to protect us from aerial threats. It wasn't until just before the Gulf War that the U.S. considered tactical ballistic missile defenses. To ensure economy of force and align with the mission areas, the missile defense mission came back under air defense.

Doctrine

The research review continues with the authoritative guidance from the joint publications. Joint Pub 3-01 is the doctrine for countering air and missile threats. Within this publication the Chairman, Joint Chiefs of Staff, delineated the responsibilities for air and missile defenses of the Continental United States as follows:

> The Commander in Chief, NORAD (CINCNORAD) is tasked to provide aerospace warning for North America. Aerospace warning consists of the detection, validation, and warning of an attack against North America whether by aircraft, missiles or space vehicles. The Commander in Chief, US Space Command (USCINCSPACE) supports NORAD by providing

> the missile warning and space surveillance necessary to fulfill the US commitment to the NORAD agreement, and provides integrated tactical warning and/or attack assessment of space, missile, and aircraft attacks on the continental United States and Alaska should NORAD be unable to accomplish the assessment mission. If offensive operations are necessary, USCINCSPACE will provide surveillance and warning to the appropriate combatant commanders, CINCNORAD, or the Commander, US Element NORAD, whose forces will conduct offensive operations. (JP3-01)

These relationships are further defined in Joint Publication 3-01.1, Aerospace Defense of North America.

> Available surface-to-air defense assets are incorporated in the overall defense plan and subjected to the integrated procedures and weapons control measures of CINCNORAD. (JP3-01.1)

This has been an appropriate relationship as CINCSPACE was designated as CINCNORAD under the Unified Command of NORAD/USSPACE. NORAD, however, is a bi-national command and thereby precluded from unilateral action by the United States. This is a key consideration, given the short timelines for missile defense. The current Canadian policy precludes their participation in Ballistic Missile Defense.

The Joint Air and Missile Defense Organization have proposed another solution. Their CONOPS for Near-Term (04-05) Integrated Missile Defense revolves on the concept of supported and supporting commanders. USSPACECOM will always be a supporting commander with their sensor assets. The appropriate combatant commanders will be the supported commander based upon the threat (JtAMDO CONOPS, 2002). In the context of homeland defense, NORTHCOM would be the supported command and would get the assets, i.e. sensors, assigned to STRATCOM at their disposal to address the threat. This type of relationship already existed between NORAD and SPACECOM. Although NORAD was responsible for aerospace warning, SPACECOM was responsible to manage the sensor assets and provide them with notification. As the DoD moves

towards the Joint Vision 2020 concept of netted and distributed fires, this remains appropriate.

Current Positions

Since Joint Publication 3-01 was published a new Unified Command Plan (UCP) has also been released. The UCP split the unified command of NORAD/ USSPACECOM, effective 1 Oct 02. The UCP States that Commander, USNORTHCOM is designated Commander, US Element NORAD (CDRUSELEMNORAD) and will normally be designated Commander in Chief, North American Aerospace Defense Command (CINCNORAD).

Subsequent to this release, Secretary of Defense Rumsfield and Chairman of the Joint Chiefs of Staff Myers announced the merger of SPACECOM and STRATCOM giving them responsibility for "both early warning and defense against missile attack as well as long range conventional attacks. (DOD News release 331-02). This poses numerous hurdles to current doctrine.

In January 2001, before these splits occurred, General Eberhart issued NORAD/USSPACECOM Mission Directive 38-1, Missions and Command Relationships with the following text:

> To execute the NORAD missions of ballistic missile warning and, if assigned, the Ballistic Missile Defense of North America, and the USSPACECOM missions of Theater Ballistic Missile and Shared Early Warning, the Missile Warning and Defense Center (figure 7) will provide the means by which the CINC exercises fire direction and/or fire control. (NUMD 38-1)

The referenced figure from this directive is depicted as figure 3 below. SPACECOMS missile warning center and CDRUSELEMNORAD's missile

Defense center were merged within the Cheyenne Mountain Operations Center (CMOC) as the missile warning and defense center to respond to the unified commander.

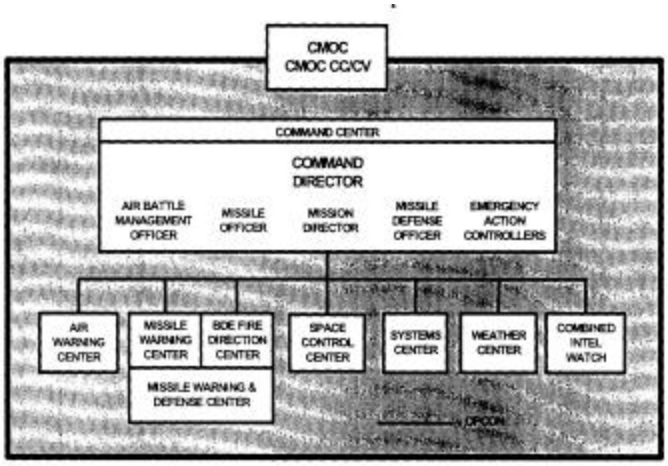

Figure 3. NORAD/USSPACE Command Relationships Source: NUMD 38-1

The logical conclusion to this new UCP construct is the division of the responsibility for National Missile Defenses from the command responsible for aerospace defense of the homeland. Whilst this does allow for an integrated response to a strategic attack against the United States, how does this deal with other missile threats? The Missile Defense Agency and others are considering the possibility of an enemy firing a tactical ballistic missile from a container ship off of the coast. Enemies of the U.S. have had over a decade to analyze the effectiveness of Tomahawk missiles during the gulf war and subsequent strategic strikes. Current off-the-shelf technology is allowing potential enemies greater access to this capability at a much decreased cost. An adversary could

procure an arsenal of cruise missiles for the cost of just one or two fighter jets. This technology is available to terrorist threats as well.

Maintaining a demarcation similar to those separating Air Defense and Ballistic Missile Defense from Joint Publication 3-01.1 may provide the answer. By maintaining the 3500 KM demarcation ballistic missile defense remains separated from air defense CONAD split responsibility for threats between the Army and Air Force at 100 Miles from the American coastline. Should the U.S. continue to separate all missile defenses from air defense to accommodate the integrated missile defense paradigm, maintain the demarcation between air defense and ballistic missile defense or unify them all under one commander?

The literature review has provided a historical overview; let us now turn to doctrine, roles and missions. Based upon the assumption that a four star general directly responsible to the President / Secretary of Defense would need to be in the decision chain for decisions similar to the circumstances of 11 September, the initial review is limited to Combatant Commanders.

Missions

Although all combatant commanders are responsible for "[d]eterring attacks against the United States, its territories, possessions and bases, and employing appropriate force should deterrence fail" (UCP, 2002), one can not expect a commander to operate outside of his assigned area of responsibility; therefore geographic combatant commanders whose area of responsibility (AOR) lies outside of the United States are automatically excluded. Their role should remain as the protection of American interests within their AOR. This leaves USSOCOM, USTRANSCOM, USJFCOM,

USSTRATCOM, USPACOM and USNORTHCOM. Review of functional responsibilities further culls the potential commanders.

Commander, USSOCOM has specific responsibilities delineated under Title 10 USC (Title 10 U.S. Code, Subtitle A, Part I, Chapter 6, Section 167) for special operational forces. Homeland air and missile defense forces do not qualify as special operations activities under section 167 unless their mission was deemed so by the Secretary of Defense. This would be inappropriate. Based upon these specific requirements, Commander USSOCOM should not be considered for the role of C2 for homeland AMD forces.

The responsibilities of Commander, USTRANSCOM are limited to transport, lift, refueling and terminal services "as needed for the deployment, employment, and sustainment of US forces on a global basis" (UCP, 2002). His functional area of responsibility would preclude his role in this mission.

Commander, USJFCOM holds a unique position. USJFCOM no longer holds the functions of command associated with area responsibility. His primary responsibilities "reflect his role in transforming US military forces to meet the security challenges of the 21st century" (UCP, 2002). He is the joint force provider, responsible for joint integration and training. This in and of itself is an ambitious task for any commander. The responsibility for "Planning for the land defense of CONUS, domestic support operations to assist government agencies and the bi-national Canada-US land and maritime defense of the Canada-US region" was passed to USNORTHCOM effective 1 October 2002" (UCP, 2002). He may play a supporting role in homeland air and missile defense, but should not be considered as the supported commander.

The 2002 UCP delineates a command not mentioned above, USSPACECOM. Subsequent to its release, the Secretary of Defense and Chairman, Joint Chiefs of Staff announced that USSPACECOM would merge with USSTRATCOM. As such, continued analyses will role the responsibilities of USSPCECOM under USSTRATCOM. Commander, USSTRATCOM is a functional area combatant commander with the specific responsibility "for strategic nuclear forces to support the national objective of strategic deterrence." He is also responsible for C4ISR capabilities in support of strategic force employment (UCP, 2002).

It is the roles previously assigned to Commander, USSPACECOM that lend specifically to homeland air and missile defense. These include the roles of missile warning, support for missile defense and the responsibility of "planning for and developing requirements for missile defense, space based support for missile defense, and space operations." (UCP, 2002) Joint Publication 0-2, Unified Actions Armed Forces states "The Commander in Chief, US Space Command (USCINCSPACE) conducts space operations, including support of strategic ballistic missile defense for the United States and missile warning and space surveillance in support of US agreements with North American Aerospace Defense Command (NORAD)." (UNAAF, 2001)

The combination of these roles and responsibilities is best expressed in the words of the new USSTRATCOM mission statement: "Establish and provide full-spectrum global strike, coordinated space and information operations capabilities to meet both deterrent and decisive national security objectives. Provide operational space support, integrated missile defense, global C4ISR and specialized planning expertise to the joint

warfighter" (http://www.stratcom.af.mil/). The term "integrated missile defense" clearly points to a role for homeland missile defense.

Geographic combatant commanders are responsible to defend against all attacks in their AOR, to include missiles. Based upon UCP divisions, Commander, USPACOM is responsible for the defense of Hawaii and has is responsible for troops stationed in Alaska. The UCP has created the unusual situation of dividing the homeland between two MACOMs. For this reason, Commander, USPACOM must be considered to have a role in homeland air and missile defense.

The remaining command to consider is USNORTHCOM. Commander, USNORTHCOM is the geographic combatant commander responsible for the homeland. This places homeland defense squarely within his AOR. Under the 2002 UCP he also assumes the responsibilities of Commander USELEMNORAD. By definition, that gives him responsibility for North American Aerospace Defense. NORTHCOM defines their mission as homeland defense and civilian support, including "Conduct[ing] operations to deter, prevent, and defeat threats and aggression aimed at the United States, its territories, and interests within the assigned area of responsibility" (http://www.northcom.mil/). This places him squarely responsible for homeland air defense. It is important to note, however, that Canada has made no commitment to ballistic missile defense under the NORAD agreement. Without a change to the treaty, which looks improbable due to the current Canadian political climate, Commander, USELEMNORAD would be forced to act unilaterally against ballistic missile threats.

As the BMDS is being fielded to offer homeland protection from long-range ballistic missiles, America is finding conflict on the international front. Besides some

foreign protests, to achieve sufficient early warning some sensors may need to be placed overseas. As the President attempts to garner support for national missile defenses, there have been talks of basing missile fields outside the United States to offer protection to its allies. Some BMDS systems may be carrier based and deployed in multiple AORs. Airborne Laser would provide the same conundrum. Overall command and control for a system with global potential may extend beyond the scope of one geographic commander.

Doctrinal Review of Roles and Definitions

Can or should we separate the roles of air and missile defense for the homeland? We must first clarify definitions. As noted at the beginning of this paper, there are differing definitions for air and missile defense, air defense and ballistic missile defense. In the November 1996 version of JP3-01.1, titled Aerospace defense of North America, we can see the aerospace defense mission areas broken down as air defense, ballistic missile defense and space defense. The demarcation between air defense and ballistic missile defense is based upon threat systems with a capability greater than 3500 KM. The 19 Oct 1999 version of JP 3-01, Joint Doctrine for Countering Air and Missile Threats, breaks down the counter air missions of offensive counter air (i.e attack operations), and defensive counter air, which consists of active air defense and passive air defense. The U.S. Army Theater Air and Missile Defense Master Plan captured this concept describing the three pillars of theater air and missile defense (TAMD); active defense, passive defense, and attack operations, built upon the foundation of C4I. The construct passed to the Army Master Plan, Army TAMD Master Plan and the Joint Theater Air and Missile Defense Master Plan. The latest evolution of this doctrine is

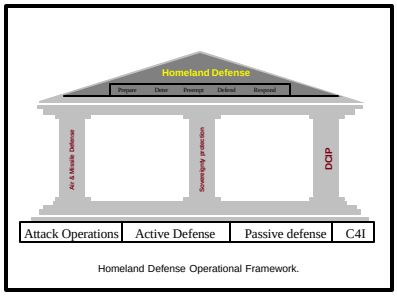

Figure 4. Draft Homeland Defense Operational Format
Source: JP 3-26 Writers Draft

shown in figure 3 from the draft of JP 3-26 where these concepts form the elements for homeland defense operations, and air and missile defense becomes the first pillar or mission set. Per this proposal, air and missile defense combines the mission areas of air defense and ballistic missile defense from JP 3-01.1.

We must be careful to consider threat launch location and impact location when traversing the TAMD pillars or homeland defense operational elements. A Taepo Dong-2 type system fired from Korea may reach Alaska or Hawaii. If it is launched to Hawaii, it is still within the geographic AOR of Commander, USPACOM. If it is fired to Alaska, it crosses into Commander NORTHCOMs AOR. This has significant impact on who can conduct active defense and attack operations.

Based upon these definitions, a missile threat with a range below 3500 KM, which remains endoatmospheric, falls under the definition of air defense. This includes short-range ballistic missiles, such as the Scud, and cruise missiles. A geographic combatant commander has sufficient assets to apply all four operational elements (active defense, passive defense, attack operations and C4I) against these threats. Ballistic

missile defense, which is comprised of long-range ground and sea based missiles, inherently requires cross boundary engagements due to the range of the threat systems. Attack operations become especially difficult. This mission may be more appropriate for a functional combatant commander.

As stated above, USSTRATCOMs has assumed responsibility for the Integrated Missile Defense mission. This term is derived from JtAMDO's Concept of Operations for Integrated Missile Defense Baseline: Block 2004-2006. This CONOPS uses the following definition:

> IMD definition. A layered missile defense that effectively integrates ballistic missile active defense systems in order to defend the U.S., deployed forces, friends, and Allies. Included within IMD is the integration of Theater Missile Defense (TMD), Ground Based Mid-course Defense (GMD), other missile defense forces, and the requisite Battle Management, Command and Control (BMC2). (CONOPS for IMD. Baseline Block 2004-2006)

Based upon this definition and STRATCOM's assumed role we have a continued quandary as to where the responsibility for Theater Missile Defenses (TMD) belongs in Air and Missile Defense. Is the responsibility for short range ballistic defense inherent in the air defense function or as a component of IMD?

It is important to note that the CONOPS for IMD was written as a precursor to an Integrated Air and Missile Defense operational concept and operational architecture. The paper focuses only on the active defense pillar of ballistic missile defense. The specified scope for this paper was;

> 1) to establish a baseline of integrated missile defense for the emergency capability in 2004-2006; 2) gain consensus among the CJCS, CINCs, Services, and Agencies on a framework for conducting integrated missile defense; 3) influence policy for near-term homeland missile defense issues; and 4) support long and short-term efforts to develop missile

defense plans, programs and budgets (MDA, CINCs & Services).
(CONOPS for IMD. Baseline Block 2004-2006)

It is to be expanded by the combatant commander assigned the mission. The CONOPS has been turned over to USSTRATCOM for planning.

One of the reasons for the push towards IMD is that effective June 2002 the United States withdrew from the ABM treaty of 1972 and created new opportunities in the realms of missile defense. The 1972 treaty limited defenses against intercontinental ballistic missiles to one site; either protecting the nuclear weapons site or the Capitol Because of this limitation, ICBM defenses were designed so as not to be interoperable with theater missile defenses. Now that the rules have changed, an opportunity exists to net all sensors to provide all missile defense systems with greater early warning capability and multiple shot opportunities through a multi-tiered defense. The original 3500 kilometer demarcation in joint doctrine is based in the SALT talks and linked to the 1972 Anti-Ballistic Missile (ABM) treaty, so this cold war based demarcation may also become arbitrary.

To determine the proper command and control relationships doctrinal terms must be deconflicted to determine the best place for theater missile defenses within air and missile defense. Should the air defense and ballistic missile defense missions be separated? Is air and missile defense is the correct construct or should it be forfeited to pursue integrated missile defense. All of these questions will be addressed in the next chapter.

CHAPTER 3

METHODOLOGY

To determine the best near term command and control structure for homeland air and missile defense there are two lines of thought which must be explored. First, it must be determined if the air and missile defense missions be separated, or remain joined. Secondly, if a unified structure is appropriate, it must be determined what systems should be included in that structure and their proper method of control.

It has been posited that the air and missile defense missions should be separated. Can and should this be done? To determine this, an assessment of what currently exists and how it is utilized must be made. A review of the roles and missions must be done and it must be determined if another system can perform the mission if a role is changed. Unless sufficient assets exist to perform the separate missions it may not be feasible unless one of the missions is neglected or ignored. Finally, this must be weighed against current positions and joint doctrine.

Assuming the missions cannot be separated and a threat exists, when and how should homeland AMD assets be deployed. The first obstacle is assessing current missions and deployments to determine what assets are available. It must be determined if sufficient assets exist to perform a dedicated homeland AMD mission or if units will be deployed on order. There are three possibilities; a dedicated homeland AMD force, forces deployed on order as the threat dictates, or some assets may be dedicated and augmented by additional units. A Criticality-Vulnerability-Recoupability-Threat (CVRT) assessment must be made to determine what can be defended with available assets, then

shortfalls noted. Finally, a Feasibility-Applicability-Sustainability (FAS) test should be placed against the proposed command and control structure.

Regarding the question as to what is the proper method of control, what has worked in the past must be considered. There are cases where centralized C2 is the most effective or the only acceptable method. There are other instances where a centralized structure has led to disaster leaving subordinates incapable to execute their mission. A review of historical precedent and the systems utilized by other nations will be reviewed. It is understood that when looking at the command structures of other nations many other factors must be considered. For example, a centralized C2 structure is much easier to attain in a small nation with fewer assets, less infrastructure and shorter communications lines, than in a larger nation. Other immeasurable factors must also be considered such as the initiative and audacity of the soldiers and what environment they are used to operating in.

The realities of what is possible must also be considered. If a centralized solution set appears the best solution, yet no structure exists to execute the functions necessary, it is not viable. A suitable communications structure must be attainable to support whatever architecture is chosen. A look at current and planned communications infrastructure for secure voice and data must be conducted. Finally, the solution must be in harmony with joint doctrine or joint doctrine must be changed. A review of current doctrine will address this.

If the best architecture utilizes decentralized execution, the C2 structure must consider the execution and ramifications of a tiered defense. A proper point of demarcation must be established to maximize effectiveness. Cross boundary

engagements take on new meaning when the threat aircraft and missiles can cross multiple combat commanders' areas of responsibility.

Once these questions have been answered, the primary question can be addressed to determine the best near-term command and control structure for homeland air and missile defense. If the air and missile defense missions can be separated, the proper command structure for each must be tackled. If not, a unified commander should be determined.

To decide who should command and control these elements we should look at roles and missions, joint doctrine, historical precedent and current thought from key leadership. Any command considered must be able to apply all four pillars of joint air and missile defense. Finally, the FAS test should be again applied to confirm the appropriateness of the intended command and control architecture.

CHAPTER 4

APPLYING THE ASSETS

Before addressing the best structure for homeland air and missile defense, it is important to decide whether these are the right roles and missions. Each service has a slightly different view, but there is a general consensus. While the Air Force addresses air defense under counterair operations, the Army addresses it as a separate Battlefield Operating System (BOS).

The joint theater missile defense structure, as outlined in Joint Pub 3-01.5 and FM 100-12, provides an excellent framework to address the apparent incongruities. The National Security Strategy (NSS) outlines "We must ensure that key capabilities -- detection, active and passive defenses, and counterforce capabilities -- are integrated into our defense transformation and our homeland security systems." (Bush, 2002) The joint construct outlines four operational elements of air and missile defense; passive defense, active defense, attack operations and command, control, communications, computers and intelligence (C4I). Although all elements are equally important, it is depicted in Joint Publication 3-01.5 and other joint doctrine with the C4I providing the base for the other three pillars as seen in the following figure.

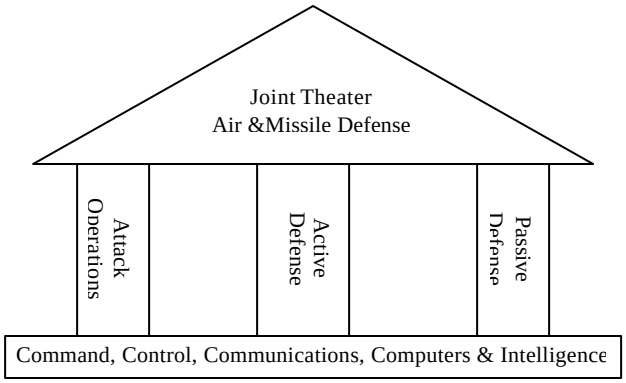

Figure 5. Air and Missile Defense Construct
Source: Derived from JP3-01.5, JP3-01 and IMD CONOPS

The Air Force breaks counterair operations into two categories, offensive counterair (OCA) and defense counterair (DCA). The attack operations pillar best correlates to the Air Force's definition of offensive counterair (OCA). JP 3-01.5 defines attack operations as offensive actions by land, sea, air, space and special operations forces to destroy, disrupt, or neutralize theater missile launch platforms, supporting C3, logistics and RISTA platforms. Air Force Doctrine Directive (AFDD) 2-1.1 states that offensive counterair consists of offensive operations aimed at destroying, disrupting or limiting enemy air and missile threats. While OCA may be a means to conduct attack operations, it is not exclusive. An artillery battery or naval gunfire firing on a position, special operational forces attacking a logistics node, or an electronic warfare attack against a C2 node are all considered attack operations. The commander that has all of these assets available to prosecute attack operations is best suited for this mission. It is essential that he has some attack capability against the threat.

AFDD 2-1.1 states that "The objective of defensive counterair is to protect friendly forces and vital interests from enemy air and missile attacks and is synonymous with air defense." It further divides DCA into two categories; active air defense and passive air defense. These are the two remaining pillars of our model. Active defense deals with the defensive action taken to destroy or reduce the effectiveness of aircraft or missiles in flight. Passive defense consists of all other actions taken to reduce the vulnerability of the assets and the effectiveness of hostile air and missile attacks.

While it may be argued that any commander assigned the mission of homeland air and missile defense can only reduce vulnerability to assets under his control, there are other means to conduct passive defense. Both the Army and Joint publications outline eight: Deception, NBC protection, theater missile early warning, electronic warfare, counter surveillance, recovery and reconstitution, and mobility, dispersal and hardening. While a military commander will be able to provide limited nuclear biological and chemical (NBC) protection for a civilian populace, he should be able to conduct counter surveillance and early warning. Each of these will be looked at in detail later.

Attack Operations

Attack operations pose an unusual situation when operating on home soil. The commander responsible for directing an attack within the United States must have communications with civil and local authorities. Coordination must also be made with the geographic combatant commander if he is not assigned the mission. Had we sufficient notice prior to the 9/11 attacks, communications with the Federal Aviation Administration (FAA) could have grounded the aircraft prior to take off. Special Operations forces might be best suited to eliminate a terrorist cell with minimal collateral

damage. We began traversing into a gray area of violations of Posse Comitatus under Title 10 U.S. Code (USC). Federal military forces may not be used to conduct police actions against Americans. A concept meriting further review would be to use state National Guard forces under Title 32 USC who are not bound by this restriction.

Attack operations beyond the borders of the United States become less entangling. They are more limited by the range of the weapons systems used. Although our neighbors to the north and south are not considered great threats, there is growing concern of a missile attack from a container ship off of the American coastline. If the United States were attacked by Canada, Mexico, or from a sea-based platform the Offensive Counter Air (OCA) assets would be available under the same provisions as listed above for DCA. As the global community gets smaller due to technology, our greatest threats come from other nations that will soon be able to reach us with their weapons of mass destruction. Most attack operations would most likely be conducted by forward deployed forces or long-range strategic assets. This may require coordination for the use of assets assigned to another combatant commander. If no forward deployed assets are available, strategic assets can be deployed from the homeland. STRATCOM controls the space surveillance satellites as well as other assets such as the RC-135V/W Rivet Joint used for the reconnaissance in support of attack operations.

Active Defense

When most people contemplate air and missile defense, the center pillar of active defense is all they consider. When addressing active defense the threat plays a vital role. An F-18 Hornet is effective against aircraft, but cannot address a missile threat. A PATRIOT battery can defeat an aircraft or short to medium range missile, but not an

ICBM. Elements of the BMDS will be able to destroy ICBMs, but be ineffectual against aircraft and short to mid-range missiles. Each system has its own capabilities and limitations which must be considered. For this reason, a multi-tiered defense in depth is the preferred option.

The foundational element of C4I ties all these elements together. Any commander assigned the air and missile defense mission must have "timely and accurate data and systems to plan, monitor, direct, control and report" (JP 3-01.5, 1996). The underlying infrastructure to support these operations will also dictate the level of control a commander is able to exercise. Integration of these pillars through C4I provides the commander with unity of effort and a cohesive air and missile defense force.

Given this framework, a review of the doctrinal interrelationship between air defense and missile defense is necessary. All current doctrine maintains these missions as one. The primary reason for this is that the systems that can execute these functions often perform the same roles on the battlefield. For the near term, those systems currently in the inventory or being procured can be considered. The roles those systems perform may also be addressed. Active defense systems will be addressed first. For ease of discussion, they will be divided into land, air and sea-based platforms in that order.

Land-Based Active Defense

The Army divides its active air defense systems into two categories; High to Medium Air Defense (HIMAD) and Short Range Air Defense (SHORAD). The PATRIOT and THAAD systems fall under the HIMAD umbrella, while the Stinger based systems fall under SHORAD and are used for Forward Area Air Defense (FAAD). The current ratio of active to reserve forces is 60 percent active and 40 percent reserves.

There are seven Avenger battalions, two PATRIOT battalions and one THAAD Battalion currently listed as COMPO 4, which means that the Army has identified the need, but does not have the assets available to fill them (TAA09, 2002).

There are multiple stinger based platforms in the Army and Marine Corps inventories. The stinger missile has a proven capability against aircraft, but no capability against TBM's. There are 10 Active duty and 17 reserve component SHORAD units, however, two of the reserve units have dual missions (QDR, 2002). The Man Portable Air Defense System (MANPADS) variant is utilized by all four services. The stinger based platforms offer an active defense at shorter ranges against aircraft. When enhanced with slew-to-cue technology, which refers to the ability of the turret to rotate (slew) to the azimuth of an enemy target, as yet unseen, due to advanced warning (cue) from a remote sensor (radar), these systems also provide a cruise missile defense capability. The sentinel radar generally serves as the remote sensor, but slew-to-cue systems may receive cues from other systems as well. (Green, 2002) The stinger missile has no capability against ballistic missiles.

The M6 Linebacker is the improved version of the Bradley Stinger Fighting Vehicle (BSFV) designed to protect the heavy force in the forward area. With the Bradley Stinger Fighting Vehicle, the Stinger team must dismount to engage targets. The M6 Linebacker consists of the M2A2 Bradley with an integrated, externally mounted launcher that is armed with four ready-to-fire Stinger missiles while stationary or on the move. An additional 6 missiles can be stowed. The Linebacker corrects the Bradley Stinger Fighting Vehicle limitations with respect to Stinger team survivability, fire control, target acquisition, and identification. Linebacker provides the heavy maneuver

force with dedicated low-altitude Air and Missile Defense against cruise missiles, unmanned aerial vehicles (UAV), helicopters, and fixed-wing aircraft. Linebacker can maintain pace with the armored force while the Stinger team remains under armor protection during engagements. Linebacker gunners can also dismount and perform as MANPADS Teams or individual Stinger gunners. Ninety nine linebackers are fielded to the 3d Infantry Division, 1st Cavalry Division, 4th Infantry Division, and the 3d Armored Cavalry Regiment (OCADA, 2002).

The Avenger provides mobile SHORAD protection to divisions, armored cavalry regiments, corps air defense brigades and the Marine Corps. The Army numbers are 1004 with a requirement of 275 systems for the Marine Corps (Cullen, 2001). The Avenger is a low cost answer to the cruise missile and UAV threats. The Avenger consists of two turret-mounted Stinger missile pods containing up to eight Stinger missiles, a .50-caliber machine gun, a forward-looking Infra-red system (FLIR), a laser range finder, and an identification friend or foe (IFF) system mounted on a High-Mobility Multipurpose Wheeled Vehicle (HMMWV). The Avenger is a light-weight, high mobility, day and night capable system. (OCADA, 2002) The night vision capability coupled with the machine gun adds additional homeland defense capabilities.

Additional Marine Corps active air defense rests in the Light Armored Vehicle Air Defense (LAV-AD) system. The main role of the LAV-AD system is to engage fixed wing aircraft and helicopters, with a secondary role to engage ground targets using its twenty five millimeter cannon. (Cullen, 2001) There are a total of 17 LAV-AD in the inventory assigned to the 4th Light Armored Reconnaissance Battalion at Camp Pendleton. The system maintains a shoot on the move capability and carries eight ready

to launch stinger missiles and eight more in reserve in addition to the cannon. This LAV-AD has day or night capability through the use of the daylight TV and FLIR. Overall, this system has comparable capabilities to the M6 Linebacker, except the slew-to-cue capability that enables cruise missile defense.

There are currently 10 PATRIOT battalions in the active duty Army and two battalions in the reserve component (OCADA, 2002) These battalions are assigned to corps commanders and are normally located in the rear area to protect strategic assets. Patriot is a theater and corps Air and Missile Defense (AMD) system that can simultaneously engage and destroy multiple targets at varying ranges and altitudes in defense of critical assets and maneuver forces. It is also lethal against aircraft, UAV and cruise missiles. The new PAC-3 missile can engage multiple, simultaneous targets. A single PAC-3 Patriot launcher carries 16 missiles and can launch four missiles simultaneously. The PAC-3 missile is a hit-to-kill, surface-to-air-missile capable of intercepting and destroying tactical missiles and air-breathing threats. This platform has much to offer homeland air and missile defense through its capabilities against multiple platforms. The PAC-3 missile provides the range, accuracy, and lethality necessary to effectively defend against tactical missiles with conventional or biological warheads, cruise missiles and UAVs as well as a long range capability against aircraft. (OCADA, 2002) The PATRIOT system can only engage short and medium range ballistic missiles and has only limited capability against longer range missiles. It also has a smaller defensive footprint against missiles than the THAAD or BMDS systems. PATRIOT normally fights as a battalion due to communications concerns and the lack of 360 degree coverage. Engagements can only be made within the 120 degree radar coverage fan.

The THAAD system is currently projected to be fielded in 2013 (QDR, 2002). There are currently assets available with limited capabilities that have been used in the field, so it will be considered for the purposes of this paper. It is not considered part of the BMDS for national missile defense. The THAAD system is envisaged as an easily transportable battery of weapons capable of hit to kill collisions with incoming tactical and theater ballistic missiles at heights as much as 20-150 times greater than those defended by PATRIOT and ranges up to 195 kilometers (Cullen, 2001). The system will be capable of endo- and exo-atmospheric engagements of ballistic missiles with a shoot-look-shoot capability. Combined use with the PATRIOT platform should provide a near leak proof defense. The fielding of a tiered air defense will free additional PATRIOT assets for engagement of air breathing threats.

A Ground-Based Mid-Course Defense (GMD) platform is being fielded for National Missile Defense (NMD). With the initial missile field in Alaska and radar platforms supporting it from around the globe, this system will be able to protect all fifty states from a limited ballistic missile strike. It is projected to have a limited capability against intercontinental ballistic missiles in the 2004/2005 timeframe as part of the Pacific Rim test bed. This system will have the full time mission of homeland missile defense, but will have no capabilities against aircraft.

Comparatively, the other land-based active defenses do have a limited defensive footprint. It is possible to employ a battery of equipment and maintain operations for extended periods; however, multiple assets may be required to protect population centers or key facilities. All land-based active defense assets, save GMD, are mobile. Mobility

must be weighed against early warning and threat speeds to assess effectiveness. This is the primary advantage of DCA assets.

Defensive Counter Air (DCA)

There are countless platforms for defensive counter air. Generally in DCA, rotary wing assets (helicopters) are best suited to defend against rotary wing threats and fixed wing (fighter/interceptor) assets are used to defend against the fixed and rotary wing threat. The fixed wing threat will be addressed first as it has greater precedent. The Air Force apportions assets in accordance with needs and missions. Historically, the Air National Guard (ANG) and reserve component have maintained the role for defense of the homeland under title 10 and 32 demarcations. The primary fixed wing assets and C2 assets for the homeland are affiliated with the 1st Air Force. The 1st Air Force is also the geographic component of NORAD. The 1st Air Force is primarily composed of National Guardsmen, while the Major Commands (MACOM) are part of the active force.

To appreciate the significance of the active and Guard mix, one must understand the three capacities which a Guardsman may serve. The first of which is State duty. It is funded by the state for states' purposes in accordance with states' laws. The second capacity is under Title 10 U.S. Code. Here, federalized National Guard forces are fully incorporated into the active duty Air Force or Army forces "of the United States." They receive federal funding and are under federal control. Finally, they may serve under Title 32 U.S Code. Here the governor makes National Guard forces available to the federal government "in the service of the United States." In this capacity, the federal government provides funding while still under control of the Governor (Gardner Testimony).

The command and control mechanisms for providing the air defense and air sovereignty of the continental United States have transitioned from the active component to the ANG over the past decade. By the early 1990s all the fighter interceptor squadrons defending the CONUS were ANG units. This is due in part to the downsizing of the Air Force and the appropriate fit for the ANG to perform and defend the homeland defense mission from a political perspective. In 1992 the General Accounting Office recommended an end to dedicated continental air defense forces and the Chairman, Joint Chiefs of Staff concurred the following year. In September 1993, as a result of Base Realignment and Closures (BRAC), Secretary of Defense Les Aspin approved the transfer of the Northeastern Air Defense Sector (NEADS) from the Active Component to the ANG. On 28 January 1994, General Killey, the previous Air Guard Director, assumed command of 1st Air Force at the direction of the Air Force Chief of Staff. In October 1995, the Southeast Air Defense Squadron (SEADS) and the Western Air Defense Squadron (WADS) were also constituted and allotted to the NGB. By the end of FY 1997, the ANG had assumed total responsibility for all of 1st Air Force including its three Regional Operational Control Centers, Sector Operations Control Center and headquarters (Air National Guard Heritage).

Command and control relationships under the 1st Air Force are particularly complex. Despite its ANG composition, the 1st Air Force falls under the Air Component Command (ACC); the force provider to NORAD. The ANG ensures resourcing while the ACC is responsible for the organization, training and equipping functions to include major systems acquisition. Performing federal operational missions under NORAD posits a true dilemma because air defense and air sovereignty are federal, not National

Guard, missions and the majority of 1st AF personnel are Guardsmen who are under Title 32 U.S. code. These Guardsmen are on Title 32 status for training, but automatically convert to Title 10 status when conducting federal missions, such as performing DCA of an unidentified aircraft in support of NORAD. Key Commanders in the chain of command, such as the Regional Operational Center and Sector Operational Center Commanders, remain in Title 10 status to ensure an unbroken federal chain of command while others remain Title 32 to perform administrative actions.

Air combat platforms utilized by the ANG include F-16, F-15C, A-10, F-4G, and RF 4C aircraft. ANG units, which provide personnel and cargo transportation capabilities, are equipped with KC-135 C-5A, C-141, and C-130 aircraft. Some B-1s are in the Kansas Air National Guard. Air Force Reserve (AFRES) units are equipped with cargo C-141, C-130, C-5 and KC-135. Combat aircraft in the AFRES include F-16, A-10 and HH/MH-60 (helicopter). As a Federal Reserve the AFRES has an Associate Aircraft Program which provides trained crews and maintenance personnel for approximately 300 active component aircraft. This program pairs a Reserve unit with an AC unit who then share a single aircraft. Aircraft types in the program include C-5, C-17, C-141, C-9, KC-10 and B-52 (Heller, 1994).

The remaining Numbered Air Forces (NAF) are active duty units with traces to STRATCOM. The 8th Air Force provides the Bomber assets for STRATCOM while the 12th maintains their Battle Management responsibilities and refueling assets. The 1st, 8th and 12th NAFs under the ACC are the primary CONUS based assets available to the NORTHCOM Commander as a geographic Combatant Commander or the STRATCOM Commander as a functional Combatant Commander. There are numerous forward

deployed assets which the STRATCOM Commander may more rapidly utilize. This relationship will show further relevance as attack operations are assessed.

The Air Force is also developing an airborne laser (ABL) platform. The concept of the ABL is to destroy ballistic missiles by placing a laser beam from the airborne platform on the missile in the boost phase of flight, thereby causing the fuel supply to explode. There is no anticipated fielding date for this system, but it is being considered as part of the BMDS for NMD.

The Army and Marine Corps also maintain aviation assets which can perform active defense through defensive counter air. They are also effective against slow moving aircraft such as private aircraft or crop dusters. Numbers are hard to quantify as weapons platforms can be mounted on numerous utility platforms, as well as the attack aviation assets in the inventory. These assets can perform a dual role purpose for DCA or attack operations, if the target is sufficiently close.

A primary consideration for the use of defensive counter air as a sole means of active defense is early warning. An effective defense would require aircraft flying Combat Air Patrols (CAPS) and/or being on strip alert. Analysis has shown we had insufficient time and assets to intercept the aircraft involved in the 11 September attacks. Subsequent to that, CAPS were flown continuously to protect key assets. Cost, manpower and maintenance concerns drove this down to a random CAPS schedule thereafter. Once a threat is identified, the time required to intercept is based upon the location and readiness status of the interceptor force. The aforementioned factors and basic physics preclude the coverage of all assets from the limited airbases located within the United States.

Sea-Based Active Defense

Many Navy vessels carry a variety of air defense systems. Systems range from the RIM-116A RAM, a lightweight, quick reaction anti-ship missile system for close in defense, down to various caliber anti-aircraft guns, such as the Phalynx. These are primarily for point defense designed to protect the ship from air attack and have limited range and applicability for homeland defense. The Navy's AEGIS systems are the best suited sea-based active defense platform. There are twenty-seven Ticonderoga Class Guided Missile Cruisers (AEGIS) numbered as CG 47-73. There are forty-one Arleigh Burke Class Guided Missile Destroyers (AEGIS) commissioned as of May 2003, with an additional ten to be fielded by September of 2006 (Saunders, 2001). These ships carry the SM variant missiles. The SM family of missiles was designed to provide air defense protection for the fleet. The latest variant, the SM2 Block IVA, will have a theater missile defense capability. Although initial plans for an SM3 or Lightweight Exo-Atmospheric Projectile (LEAP) variant to protect the homeland against longer range missiles, current plans are to pursue other options for the BMDS. It must be addressed that the AEGIS and it's powerful SPY-1 radar was designed to operate in the open sea and there are some implications with employing the AEGIS and it's powerful radars in ports. The SPS-49V and SPY-1 radars used for air defenses operate in the C/D and E/F bands respectively and the additional surface, fire control and navigation radars operate in the G, I and J bands. A restaurant near the Bath, Maine Aegis radar testing facility identified that the radars interfered with their television reception (NTIA website). There is also a concern that placing an operational AEGIS in port will impact cellular phone usage.

Passive Defense

Passive defense is the hardest element to transpose to homeland air and missile defense because the commander has limited control over the assets being defended. The eight elements mentioned above are: deception, NBC protection, theater missile early warning, electronic warfare, counter surveillance, recovery and reconstitution, and mobility, dispersal and hardening. It is difficult to disperse assets under civilian control. The American public would not be very conducive to having the location of the Superbowl changed at the last minute in the name of mobility or deception. Issuing chemical protective suits at the World Series would receive a comparable response. Many actions short of these, such as hardening of targets, are already being conducted by civilian authorities to prevent terrorist attacks. The bulk of responsibility for passive defense rests with civilian authorities. Recovery and reconstitution, for example, may be the responsibility of the Federal Emergency Management Agency (FEMA). The preponderance of assets for electronic warfare are owned by the Department of Defense. Frequency management within the United States during peacetime is scrutinized much more severely than in a combat zone. This is another instance where coordination with civilian authorities, such as the FCC, is tantamount. The combatant commander responsible for homeland air and missile defense would require continuous communications with governmental and civilian authorities when responsible for passive defense.

There is one aspect that is directly under the control of a combatant commander. Theater missile early warning is a clearly defined responsibility of STRATCOM. The Integrated Threat Warning/Attack Assessment (ITW/AA) functions provide early

warning for both air and missile attack. The STRATCOM Commander is responsible for the dissemination of this early warning to all concerned parties. This will again require interagency coordination with civilian authorities. This mission, previously conducted by SPACECOM, transferred to STRATCOM under the new UCP. As such, the C2 assets for this mission still reside in the Cheyenne Mountain Operations Complex, where the NORTHCOM Commander will have rapid visibility.

STRATCOM also has the preponderance of assets available for surveillance and counter-surveillance, especially outside of the borders of the United States. There are major restrictions on gathering intelligence within the borders of the United States, due to American's rights to privacy, which would severely hamper the efforts of NORTHCOM to conduct these actions within their geographic area of responsibility, but he does have the best linkage with civilian agencies to provide intelligence. The STRATCOM Commander controls the satellites used to conduct much of this surveillance.

Command Control, Communications, Computers & Intelligence (C4I)

The foundation for these pillars rests in the ability of the assigned commander to command and control his assets. The Combatant Commanders each have established communications nets to do so. Both NORTHCOM and STRATCOM have current real world missions requiring them to talk with airborne platforms. As such the communications suites exist for both OCA and DCA. Target identification is done via radio and visual recognition. Communications to sea-based platforms will most likely be passed through the fleet headquarters. This is a consideration for timeliness. Most of the land based active defense assets have the ability to communicate via the Joint Tactical Data Information Link (TADIL-J) also known as link 16. The HIMAD platforms can

link to higher through the Joint Tactical Information Distribution system (JTIDS) network. Army SHORAD units can integrate into this network through Forward Area Air Defense Command and Control (FAAD C2).

The GMD system utilizes a VMF format which is not compatible with TADIL-J. It was designed that way to be in compliance with the 1972 ABM treaty to which we are no longer a party. The GMD Communications network (GCN) is a secure communications network of hardened fiber optics and satellites which will not only provide communications for the system, but will serve as the secure communications backbone for the nation. NORTHCOM and STRATCOM will both be linked to this system. Secure voice communications for GMD will be conducted via WWSVCS and Emergency Action Procedures, Volume 6 protocols, to which both commands are also a party. Originally intended to be commanded by the Commander of the US Element NORAD, this system will integrate directly into the assigned command upon fielding. Terminals are currently contracted to be installed in the Cheyenne Mountain Operations Complex.

Table 1. Projected System Capabilities Against Threats

Source: Multiple Sources

	Fixed wing	Rotary Wing	Cruise Missile	UAV	TBM	ICBM
DCA Fixed Wing	Yes	Yes	No	Yes	No	No
DCA Rotary Wing	Limited	Yes	No	Yes	No	No
MANPADS / LAV-AD	Yes	Yes	No	Yes	No	No
Stinger Slew-to-Cue	Yes	Yes	Yes	Yes	No	No
PATRIOT	Yes	Yes	Yes	Yes	Yes	No
THAAD	No	No	No	No	Yes	No
GMD	No	No	No	No	No	Yes
AEGIS SM2 Block IV	Yes	Yes	Yes	Yes	Yes	No
ABL	No	No	No	No	Limited	Yes

The overall capabilities for active defense are tabulated in Table 1 by platform. The capabilities of fielded systems are listed with the last three systems showing their projected capability for the timeline in question. No one system meets the needs for total air and missile defense of the homeland. In order to defend against all threats a tiered defense is required. Unfortunately, there are insufficient assets in the arsenal to defend the homeland and perform other wartime missions; only members of the BMDS system will be dedicated to the mission of homeland defense.

Based upon the numbers and missions allocated it appears unlikely that the roles or missions are able to be changed. The Quadrennial Defense Review states the requirement that “U.S. forces will remain capable of swiftly defeating attacks against U.S. allies and friends in any two theaters of operation in overlapping timeframes” (QDR, 2002) while still being able to handle small scale contingencies. Service document such as the Total Army Analysis (TAA) confirm the further statement that “Excessive operational demands on the force have taken a toll on military personnel. Since the end of the Cold War, the Armed Forces experienced a reduction of total

personnel but an increase in the demands placed on those smaller forces" (QDR, 8). QDR positions on priorities were reconfirmed by President Bush in the National Security Strategy (NSS) where he stated "our most important priority is to protect the homeland for the American people" (NSS, 31). No change or reduction in roles or missions is possible as available assets are at their limitations.

When referring the to new force sizing construct, the QDR states "…it places new emphasis on the unique operational demands associated with the defense of the United States and restores the defense of the United States as the Department's primary mission." (QDR, 17), yet the TAA places the need for additional air and missile defense forces for homeland defense as compo 4 or unresourced. This apparent incongruity leads us to conclude the necessity for these available assets to be used in a dual mission capacity for all but the BMDS elements dedicated to national missile defense. This chapter explored how the available assets can be utilized; chapter 5 will explore how they can best be commanded and controlled.

CHAPTER 5

CONCLUSION

There are limited assets available to attain President Bush's number one priority of defense of the homeland. Analysis of available assets has shown strengths and weaknesses of all of the available assets to perform these missions of homeland air and missile defense. Land-based active air defense has the ability to maintain long term, around the clock operations, yet it has a limited footprint and one cannot quickly change what is being defended. DCA on the other hand has the advantages of covering a larger area as an aircraft can be revectored in flight to defend another asset. The need to fly CAPS or put aircraft on strip alert to be responsive places high costs on manpower and equipment. To cover all national assets would prove cost prohibitive over the long haul as a sole source.

Sea-based active defenses were designed for protection of the fleet, yet the have utility for homeland defense. The adverse impacts of their powerful radars on the civilian populace provide a planning concern. Attack operations within the homeland require good interagency coordination and consideration of the Posse Comitatus Act concerns under title 10 of the US Code. Attack operations outside of the United States are less entangling, but may require the homeland air and missile defense commander to assume a supported commander role. The majority of Passive Defense missions within the homeland are the responsibility of civilian authorities. Much of this coordination may fall under the mission of NORTHCOM. The primary mission exceptions are theater missile early warning, which is the responsibility of STRATCOM, and surveillance.

Decisions on when and where to deploy homeland air and missile defenses will have ramifications on the command and control structure as well. A dedicated homeland AMD force with fixed sites and relationships better lends itself to a centralized structure. The previous chapter shows that this is only viable with the BMDS elements. A cursory analysis will show the impossibility of protecting even the most critical infrastructures and population centers of the United States against all classes of air and missile threats with the available assets. The lessons learned from flying CAPS after 9/11 show the impracticality of defending everything concurrently and advantages of randomly rotating the locations.

The military uses the Criticality, Vulnerability, Recoupability, Threat (CVRT) analysis to prioritize assets for defense. This CVRT analysis should be made constantly using available intelligence to assess the threat. When sufficient concern exists after reviewing these four factors, it is viable to deploy assets against the threat. The deployment of avenger missile systems around the Olympic Village was a specific example of this. The Combatant Commander assigned the homeland air and missile defense mission should be responsible for conducting this analysis. The hardening of selected assets in this way supports the passive defense pillar.

Once the decision has been made to deploy active defense assets to a location to provide air and missile defense, communications must be established to the appropriate chain of command. In the event of a missile event, both combatant commands establish top secret communications through a missile event conference on the WWSVCS. A conference such as this could also be established to facilitate C2 and possible transfer of authority. It is conceivable, based upon current protocols, to link the land-based elements

to the command and control elements of the 1st Air Force. Air platforms rely solely on the existent secure voice communications channels. HIMAD units routinely establish data communications to a control and reporting element or center (CRE/CRC) which would have a direct linkage to one of the Air Defense Sectors when deployed within the homeland. The three C2 nodes; NEADS, SEADS and WADS, all have and established relationship and linkage to NORAD based upon NORAD's mission.

Sea-based elements could establish secure voice communications, most likely relayed through the existent fleet communications nets. A data link may be possible via JTIDS. Establishment of these communications will not be immediate and new link architectures will need to be established each time a unit establishes a defense in a new location. Establishing these types of communications is practiced at Joint Combat Identification Evaluation Team (JCIET) exercises and other similar events, but will require a much greater degree of practice by all units tasked to perform homeland air and missile defense. This is merely a training shortfall and can be overcome if given the proper emphasis.

Centralized command and control is contingent upon the establishment of a real time common operational picture. Efforts are being made to establish a Single Integrated Air Picture (SIAP) through the Joint Composite Tracking Network (JCTN) which might provide adequate situational awareness to conduct centralized command and control. A white paper published in 2003 states, "In a global missile defense community of interest, transformational communication systems will net sensors across thousands of miles, creating a real-time world-wide composite tracking and engagement scheme" This paper further asserts that the multi-tactical data link network (MTN) will, however,

remain the primary method of distributing track data to the force through 2020. (JCT 2020) That said; a rigorous set of positive and procedural controls must be emplaced to manage a decentralized AMD force for the near term. Short timelines for decision making further lend to decentralized execution. This is already the norm in some theaters for TBM defense. There is well under thirty seconds of decision space to engage a tactical ballistic missile. There is no such thing as a friendly inbound missile. The engagement authority for this decision should be at the lowest levels. When engaging aircraft, each decision must be made on a case by case basis dependent upon the available time, communications, and information. Ultimately, the combatant commander is responsible for the execution, whether it be through direct decision making or ensuring the training of his subordinates.

There are therefore three possible courses of action for command and control; make the NORTHCOM Commander responsible for homeland AMD, make the STRATCOM Commander responsible for homeland AMD, or create a relationship leveraging both commands. A Feasibility, Acceptability, Suitability (FAS) test should be applied to each course to determine the best command relationship.

Placing the NORTHCOM Commander responsible for homeland air and missile defense has many advantages. He has established communications links and relationships with the air defense sector commanders of the 1st Air Force. As such, he has established relationships with the National Guard and reserves. His role as Commander, USELEMNORAD also gives him control over the northern approaches and the additional ability to make early engagements over foreign soil using Canadian assets.

To assess feasibility, it must be determined if the there is a reasonable chance of success for the NORTHCOM commander to effectively command and control homeland air and missile defense with the means available. Understanding the limitations on the means available applies to both commanders; we will focus on whether the commander can effectively execute the four pillars addressed in chapter 4.

NORAD has long performed the defensive counterair mission with aplomb. The historical precedence and established links show his superb ability to control the active defenses. He has established links of communication with the Regional Air Defense Centers (RAOC) utilized by NORAD. This allows him to effectively prosecute both offensive and defensive counterair operations. The NORTHCOM Commander is not able to prosecute attack operations outside of his geographic area of responsibility, this is a shortfall. This means he can conduct attack operations against short range threats, but not long range ones. NORTHCOM has sufficient air assets to conduct attack operations, and will be allotted appropriate forces to meet mission needs per the UCP. The NORTHCOM Commander can conduct active defense with all systems in the terminal phase. Systems such as the airborne laser may be required to operate in another geographic commander's AOR in order to engage missiles in the boost phase. This may also apply to some midcourse systems as well. NORTHCOM is perhaps best suited to conduct the civilian coordination aspect of passive defense due to the linkages with civilian agencies for consequence management. NORTHCOM can adequately conduct passive defense operations, but is dependent upon STRATCOM as the supporting commander for early warning and reconnaissance. The NORTHCOM Commander can

act as the supported commander to accomplish all of the missions he cannot carry out himself.

To determine acceptability in this case we must establish whether the NORTHCOM Commander will be able accomplish this mission without detracting from STRATCOMs ability to accomplish theirs. NORAD has the mission of aerospace defense and has the established policies and procedures to do so. The only new task is the addition of the BMDS missile defense mission. The contract for the GMD system requires consoles be placed in the Cheyenne Mountain Operations Center and at Peterson Air Force Base. Having multiple links in the Defense Information Infrastructure Common Operating Environment (DII COE) control should be manageable for other new systems which are required to be DII COE compliant.

Suitability can best be determined if the responsibility of homeland air and missile defense commander falls within the assigned roles and missions of NORTHCOM. NORTHCOM's mission is to "Conduct operations to deter, prevent, and defeat threats and aggression aimed at the United States, its territories, and interests within the assigned area of responsibility; and as directed by the President or Secretary of Defense, and provide military assistance to civil authorities including consequence management operations." (http://www.northcom.mil) Enemy air and missile platforms pose a definite threat. As Commander, USELMNORAD, he has the over half a century of historical precedent for the air defense mission. By definition, air defense includes defense against missile attacks. There is also historical precedent in controlling the Nike, BOMARC and Minuteman missile units which lend credence to his ability to perform the missile defense mission today. His NORAD mission statement places him responsible for the aerospace

defense of the continental United States, and Alaska. Unfortunately, as a geographic combatant commander, he has no authority over Hawaii, which belongs to PACOM under the current UCP (Bush, 2002). As a geographic commander he will not have control of assets outside of his AOR which may be necessary to prosecute attack operations against long range threats. As a geographic commander he will not be able to command and control forward deployed assets of the BMDS, such as the ABL.

The STRATCOM commander could also conduct the mission of homeland air and missile defense commander. Based upon his mission statement, he is inherently responsible for integrated missile defense. He also has a strategic attack capability and mission which allows him to strike globally. This gives him an offensive-defensive integration capability. For passive defense, STRATCOM has the assets and responsibility to perform early warning and reconnaissance.

Feasibility is based upon STRATCOM's chance of success in effectively executing the four pillars addressed in chapter four. One of STRATCOM's strengths is in conducting the attack pillar. Utilizing their assigned reconnaissance assets, they can direct their strategic bombing assets with global reach. STRATCOM is not bound by the same restrictions of a geographic commander and can quickly respond in any theater. STRATCOM has not traditionally performed the active defense mission. They have adequate communications to conduct this mission, but lack the command and control experience and structure. To physically accomplish this would require a restructure of missions within the command. Additional concerns about mission overlap will be discussed in the following paragraph. Another strength of STRATCOM is that they are not dependent upon any other command to conduct the military aspects of passive

defense. A large degree of civilian coordination is still required. Although not all links are in place, this shortfall can be overcome. STRATCOM is also a hub on the DII and has sufficient communications infrastructure to conduct the assigned missions. With the assets previously assigned to SPACECOM still resident in the Cheyenne Mountain Operations Center (CMOC), there is redundancy in communications. The GMD assets planned to be placed within CMOC could still be controlled by STRATCOM crews assigned there.

Determining STRATCOM's ability to conduct the homeland AMD mission without adversely affecting NORTHCOM defines the acceptability of this construct. The primary concern would lie in the overlapping mission of active defense and the use of defensive counterair. STRATCOM execution of this pillar would require the same assets to perform the same mission required of NORTHCOM in his role as Commander, NORAD. This may, in and of itself would prove unacceptable. Resolution may require STRATCOM being the supported commander and NORAD/NORTHCOM serving as the supporting commander. This would require additional agreements with Canada for the bilateral command to take orders from an outside command. The alternative is assigning the NORAD mission to STRATCOM. Conducting the civilian coordination aspect of passive defense could undermine NORTHCOM efforts to serve as the single point for coordination between military and civilian authorities for consequence management.

The mission of USSTRATCOM is to "[e]stablish and provide full-spectrum global strike, coordinated space and information operations capabilities to meet both deterrent and decisive national security objectives. Provide operational space support, integrated missile defense, global C4ISR and specialized planning expertise to the joint

warfighter" (http://www.stratcom.mil). As such, the suitability of conducting the missile defense mission seems apparent. A problem still exists with the definition of air defense, which also includes the missile threat. The missile warning mission previously assigned to SPACECOM remains the responsibility of STRATCOM. This allows them to conduct the military aspects of passive defense operations internal to the command.

The conflict resident in performing the missile defense mission external to the definition of air defense leads us to the third course of action. Defense against aircraft threatening the homeland is clearly a responsibility of NORTHCOM as Commander, NORAD. The conflict resides with the missile defense role now assigned to STRATCOM. Using a demarcation similar to that used by the ADCOM years ago (see figure 2) resolves many of the conflicts presented by the previous courses of action. JP3-01.5 also established a 3,500 kilometer demarcation between air defense and ballistic missile defense. Table 1 shows the differing capabilities of the available systems and what threat sets they can address. The third construct would focus on where assets must be deployed to conduct the AMD mission.

By assigning elements of the BMDS which operate outside of the NORTHCOM AOR to provide national missile defense to STRATCOM and placing the remaining active defense assets under NORTHCOM we break the mission down against different threat sets. This would place forward deployed assets, such as the airborne laser which destroys missiles in the boost phase, under STRATCOM control. Systems effective against shorter range threats, such as PATRIOT which destroys missiles in the terminal phase, would be under the command and control of NORTHCOM when assigned the

homeland defense mission. Terminal defense systems must be emplaced within the homeland to defend it.

The GMD system is the exception in that it is emplaced within the NORTHCOM AOR to defend the NORTHCOM AOR and cannot be forward deployed. Should additional missile sites be forward deployed to protect our friends and allies, this would need to be revisited. By locating the GMD command and control in CMOC as under contract and shown in figure 3 allows either command to perform C2 as appropriate.

The feasibility of this course of action is shown through seamless execution of the four pillars. By separating the threat sets, NORTHCOM/NORAD can perform active defense and DCA over home soil while STRATCOM can deploy BMDS defensive systems globally. Short-range systems would be launched from within the NORTHCOM AOR; therefore the NORTHCOM Commander could launch attack operations against the appropriate platform. Long-range systems would originate from outside of the NORTHCOM AOR. With this architecture, STRATCOM would be responsible to use forward deployed or strategic assets to conduct attack operations against these platforms. The NORTHCOM Commander would be responsible for civilian coordination for passive defense within the homeland while Commander STRATCOM supports him with early warning and reconnaissance. If the BMDS failed to defeat an incoming threat in the boost or midcourse phases, the terminal defense assets assigned to NORTHCOM would automatically engage. In this case, STRATCOM would retain responsibility for attack operations.

This course of action also passes the acceptability test. Under this course of action there is no overlap of missions and neither command infringes upon the assigned

missions of the other. STRATCOM should assume the responsibility to technically integrate the missile defenses through the Single Integrated Air Picture or the Common Operational Picture while defending against long range threats. This clears up the conflicts in definitions of air defense and the responsibility for integrated missile defense.

The roles and missions aligned with this course of action fits the roles and missions assigned the commands by the UCP. NORTHCOM will continue to perform its NORAD defined aerospace defense mission in its entirety, defending against air and missile threats. STRATCOM would retain responsibility for integrating missile defenses through technical means. They would be integrating the early warning aspects and executing long-range missile defenses. These long range BMDS assets could also be forward deployed in support of other combatant commanders as strategic assets. There would be no overlap of missions or conflicts with the NORAD treaty.

As our command relationships are refined under future UCPs and our communications assets become more robust, this topic will merit further study. As new platforms arise, they must be assessed to determine whose C2 structure they should align with. A fuller assessment should be made as to what assets merit defense. This may vary based upon the threat and must be conducted at the classified level. Once this is accomplished a greater evaluation can be made as to whether sufficient assets exist to confront the threat. Another topic worthy of consideration is the forward basing of active defense assets within the United States. For example, all of the active PATRIOT batteries are located in El Paso, Texas. Dispersing these units would facilitate a more rapid deployment to other parts of the U.S. in the event of heightened security. This assessment is a snapshot and will require periodic review.

Air and missile defense of the homeland poses considerable command and control problems, uncommon to other scenarios. Cross-boundary engagements can occur across multiple combatant commanders AORs with these long range systems. There are significant restrictions on the use of the military instrument of power within the homeland that do not apply to other theaters. Reviewing the above courses of action, it appears the third course of action is the best. By allocating forces in this manner we can avoid conflicts in the current roles, while allowing the combatant commanders the ability to best execute those missions assigned. There still remains significant shortage in resources to conduct these missions with battalions of equipment remaining COMPO 4. We must exercise the forward deployment of the available forces within our boundaries to ensure effective execution

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