A Look at Integrated Air and Missile Defense

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INTEGRATED AIR AND MISSILE DEFENSE

Integrated Air and Missile Defense (IAMD) is the integration of capabilities and overlapping operations to defend the Homeland and US national interests, protect the Joint force, and enable freedom of action by negating an adversary's ability to achieve adverse effects from their air and missile capabilities. It is directly tied to the Counterair Framework that emphasizes a holistic approach of integrating offensive and defensive activities within and among commands. The counterair mission seeks to gain and maintain the air superiority needed by the joint force commander to conduct effective operations. IAMD is a Joint Requirements Oversight Council (JROC) – approved subset of the counterair mission.

Integrated Air and Missile Defense Paper
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EXECUTIVE SUMMARY

This report focuses on Integrated Air and Missile Defense as practiced by the Combined Air Component Headquarters at Osan AB, Korea. The study was conducted during Exercise Key Resolve 2010 (KR 10) and highlights the outstanding integration of Army, Navy, Marine and Air Force planning and execution of the IAMD mission. The report examines the work done in this particular theater of operations in developing a comprehensive Airspace Control Plan (ACP) and Area Air Defense Plan (AADP). While this report looks at only one operational theater and many other theaters face separate and distinct challenges, this report should provide lessons and insights that benefit multiple theaters.

The integration of air and missile defense is a task required as part of conducting the counterair (CA) mission. Counterair is defined as "the mission that integrates offensive and defensive operations to attain and maintain a desired degree of air superiority. Counterair missions are designed to destroy or negate enemy aircraft and missiles, both before and after launch." Under counterair are the missions of offensive counterair (OCA) and defensive counterair (DCA), and integrated air and missile defense (IAMD) is a component of both OCA and DCA. A subset of IAMD, ballistic missile defense (BMD) falls squarely in the DCA category. All the services have a role to play in the CA mission and as a result they all have a play in IAMD. Planning and execution of the CA mission is typically lead by members of the Joint Air and Space Operations Center, under the Joint Force Air Component Commander, in his/her role as the Area Air Defense Commander (AADC) and the Airspace Control Authority (ACA), with the Army Air and Missile Defense Command commander serving as the Deputy AADC.

The Area Air Defense Commander is responsible for defensive counterair (DCA) operations, which includes integrated air and missile defenses for the JOA. DCA and OCA operations combine as the counterair mission, which is designed to attain and maintain the degree of air superiority desired by the JFC. In coordination with the component commanders, the AADC develops, integrates, and distributes a JFC approved joint Area Air defense Plan (AADP). The AADP is integrated with the Airspace Control Plan (ACP) by the AADC and the Airspace Control Authority (ACA). Typically, for forces made available for DCA, the AADC retains TACON of air sorties, while surface-based air and missile defense forces may be provided in support (e.g., PATRIOT missile systems). As such, the US Army Air and Missile Defense Command (AAMDC) should be collocated with the joint air operations center (JAOC), if established, and conduct collaborative counterair intelligence preparation of the battle space (IPB), planning, and execution control. In distributed operations, the AAMDC is not necessarily in the JAOC but is still functionally tied to it. Some of the Aegis-equipped/command ships may be made available and assigned tasks in support of the AADC for C2 of air defense in a maritime or littoral area while remaining under the OPCON/TACON of the appropriate Navy force commander.

JP 3-30

Primary responsibilities of the AADC include the following:

1) Develop, integrate, and distribute a JFC-approved joint AADP.
2) Develop and execute, in coordination with the intelligence directorate of a joint staff (J-2), J-3, communications system directorate of a joint staff (J-6), and joint force components, a detailed plan to disseminate timely air and missile warning and cueing information to components, forces, allies, coalition partners, and civil authorities, as appropriate. Planning for BM defense should include coordination for launch warnings, attack assessments, and other aspects of missile defense, either through the supported CCDR or directly with USSTRATCOM, if authorized.
3) Develop and implement, in coordination with the component commanders and with JFC approval, ID and combat ID (CID) procedures and authorities, and engagement procedures that are appropriate to counterair.
4) Establish timely and accurate track reporting procedures among participating units to provide a COP.
5) Perform the duties of the ACA when directed by the JFC.
6) Establish air defense sectors or regions, as appropriate, and designate RADCs/ SADCs to enhance decentralized execution of DCA operations.
7) Establish appropriate joint, fighter, and missile engagement zones (MEZs) in coordination with the RADCs/SADCs and the ACA.
8) Appoint DAADC(AMD)s as required, to advise on how to integrate and synchronize their Service component DCA capabilities/assets for complex DCA plans and operations.
9) Ensure all support assets, including surface-based and space-based early warning systems, are fully coordinated to support DCA operations.
10) Make DCA recommendations to the JFC/JFACC after consultation with DCA representatives from the joint force components. The AADC should prioritize those desired effects and objectives that may be achieved through the OCA efforts to counter the air and missile threats.

JP3-01

Close review of Joint Force Air Component Commander (JFACC) responsibilities as outlined in JP 3-30, make clear the importance USAF must place on organizing, training and equipping the force to enable the Air Force Component Commander to perform his/her duties as the JFACC. Key among those

responsibilities is the ability to perform the duties of the AADC and ACA, with the key mission being the counterair mission, offensive and defensive counterair to include IAMD.

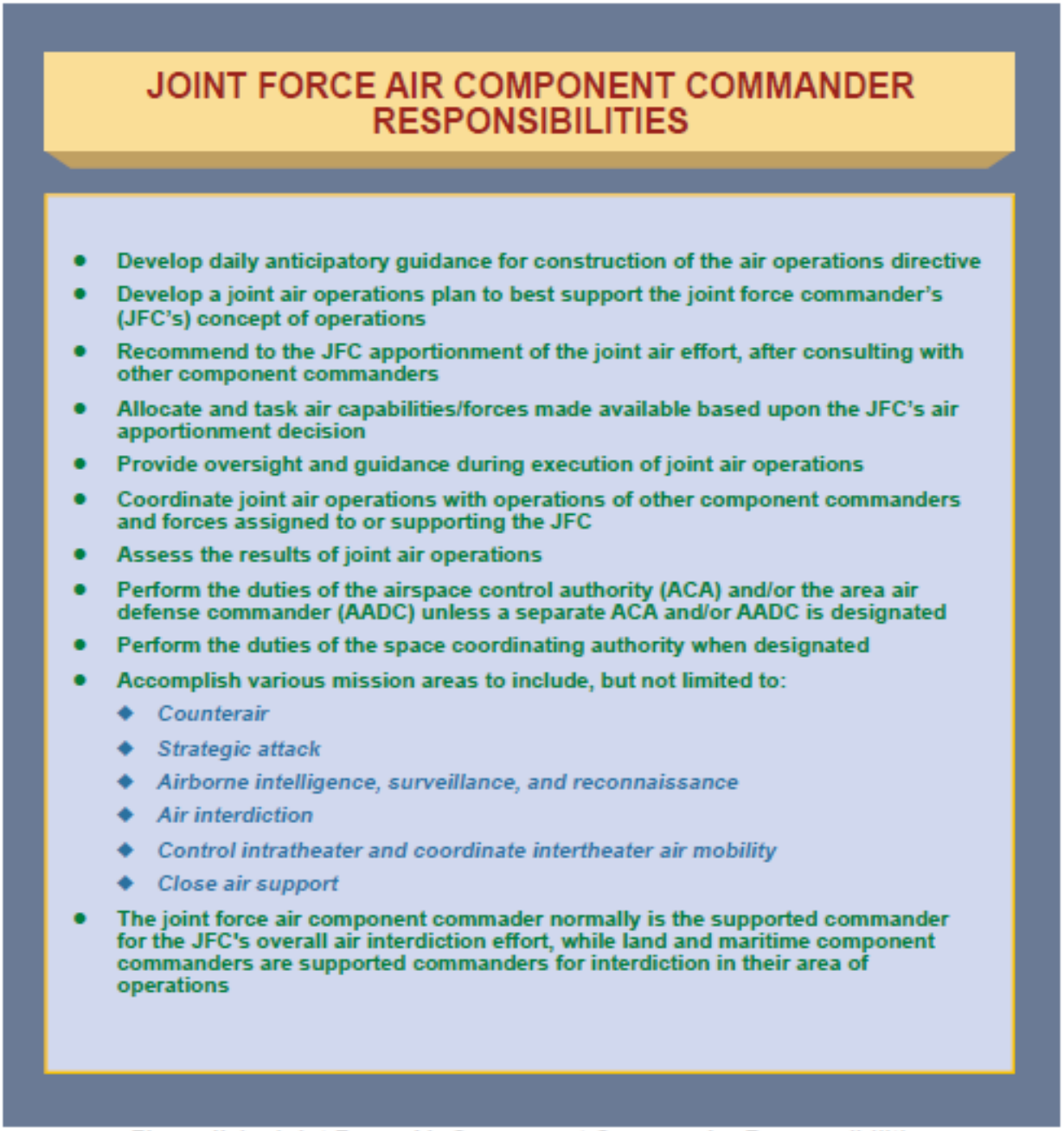

Figure II-1. Joint Force Air Component Commander Responsibilities

JP 3-30

This report focuses on Integrated Air and Missile Defense as practiced by the Combined Air Component Headquarters at Osan AB, Korea. The study was conducted during Exercise Key Resolve 2010 (KR 10) and highlights the outstanding integration of joint force planning and execution of the IAMD mission. The goal of the exercise is to improve ROK and U.S. combat readiness and interoperability across the

spectrum of military operations, demonstrating the ability to "fight tonight" and defeat any incursion from North Korea. This exercise is a major undertaking that reflects the strength of the ongoing US-ROK military relationship.

The report examines the work done in this particular theater of operations in developing the most comprehensive Airspace Control Plan (ACP) and Area Air Defense Plan (AADP) since the end of the Cold War in Europe. The strength of the ACP and AADP have allowed the Combined Air Component Commander to develop an in-depth, comprehensive counterair plan that incorporates a well integrated air and missile defense mission into both the offensive and defensive counterair mission sets. There are five key observations that provide insight into lessons learned from the KR 10 IAMD collection:

OBSERVATION 1: The nature of the theater ballistic missile (TBM) threat has changed and our counterair strategy has changed to meet the threat.

OBSERVATION 2: The well established relationship between the 94th Army Air and Missile Defense Command and the Combined Air Operations Center at Osan serves has improved joint integration.

OBSERVATION 3: Potential exists to improve the training for a host of career fields and better establish a joint cadre of IAMD planners and operators.

OBSERVATION 4: The fidelity of joint kill chain training needs to improve.

OBSERVATION 5: Training and career opportunities for Joint Interface Control Officers need to improve.

SCOPE AND METHODOLOGY

AF/A9L Analyst Mr. Dale Shoupe served as a member of the Operational Command Training Program team during Exercise KEY RESOLVE 10. His duties included serving as the lead Observer Trainer (OT) for the AOC Strategy Division as well as providing support to the AFFOR staff. Working in this role, Mr. Shoupe interacted daily with C-NAF senior leadership, team chiefs, and key members of the staffs participating in KR 10. Data included in this report was gathered during the planning and execution of the exercise, to include conducting 27 interviews with key leadership and staff.

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Actions for many of these observations are being worked at the HQ USAF, Air National Guard, major commands, centers and USAF component command levels via lessons learned or other appropriate doctrine, organization, training, materiel, leadership and education, personnel, facilities and policy (DOTMLPF-P) processes and are being tracked to resolution.

OBSERVATIONS

OBSERVATION 1: The nature of the theater ballistic missile (TBM) threat has changed and our counterair strategy has changed to meet the threat.

Discussion: One of the first comments made during this collection was "the nature of the theater ballistic missile threat has changed." If one thinks of the old SCUD missiles from Desert Storm, with its limited accuracy, fueling requirements, and other associated preparation for launch, you understand the meaning of this comment. Technology has made the modern theater ballistic missile a serious threat and the US has funded the development of systems to defend against the threat. One of the primary missions of USSTRATCOM is to provide space-based theater ballistic missile warning to US forces worldwide. To go beyond simply warning our forces of incoming missiles, we have developed joint architectures, surveillance, detection and tracking capabilities to provide accurate, engagement quality information to the theater commanders around the world. The Korean Peninsula poses a unique problem, with theater missile "time of flight times that are shorter than most decision cycles". Combine with this, a North Korean Air Force with capabilities that are better than any other force we have faced since the Vietnam War. Granted, they are not a peer competitor, but they are a threat that can get at you with aircraft and missiles. This combined capability drives a dynamic, short decision cycle and unless you know what you are going to do, how you are going to react and are prepared to react on launch detection…you may not have time to react and engage and inbound threat. This is a new game, with high speed missiles that are at least as accurate as the GPS guidance provided by your automobiles navigation system. The nature of the threat has changed.

In the early 1990s, the US began to look seriously at near and long term theater ballistic defense options. What has resulted at the operational level is an example of joint integration by the services, an effort that is improving interdependent capabilities. All the services have unique capabilities, that when integrated, provide the combatant commander with the ability not to just defend against airborne inbound missile threats, but in fact to take the fight to the enemy and destroy the missile systems before they are launched. In Korea, the strategy has adapted to the new theater ballistic missile threat, with leaders drawing on the experiences from multiple years of testing, experimentation, wargames, exercises, and major combat operations in Iraq (OIF I). The systems to detect, track, and engage theater ballistic missiles, prior to or after launch, are in place and incorporated into the counterair strategy.

Lessons Identified:

- Ballistic Missile Defense has an offensive counterair and defensive counterair component.

- Without clear preemptive guidance and a force large enough to neutralize the threat at the onset of war, 'defense' has garnered a large share of the attention that has been paid to the TBM threat.

DOTMLPF and Policy Implications:

- **Doctrine:** Ensure doctrine continues to address IAMD as an offensive and defensive counterair mission.
- **Training/Education:** IAMD lessons should be framed as more than BMD, integration of 'air' and 'missile' defense as well as the offensive and not just defensive capabilities should be addressed.

OBSERVATION 2: The well established relationship between the 94th Army Air and Missile Defense Command and the Combined Air Operations Center at Osan has improved joint integration.

Discussion: The 94th Army Air and Missile Defense Command at Fort Schafter, Hawaii is responsible for theater-wide support of PACOM and provides direct support to the Korean and Japanese Theater of Operations. The unit is small, but the talent and knowledge resident in the 94th makes up the bulk of the missile defense expertise in the CAOC at Osan. Members currently travel TDY to Korea, but the plan for the near future is to have two personnel fulltime at Osan with a possible build to a total of eleven members of the 94th stationed fulltime at Osan. The unit is involved in planning and execution of the integrated air and missile defense mission. By combining their knowledge of air and missile defense with the airman's knowledge of the counterair mission, the planning and execution of operations has been greatly improved. As current operational planning efforts are underway, members of the 94th have been fully engaged in development of the new Joint Air Operations Plan. During exercises or real world contingencies, the 94th deploys to Osan and takes up positions in the CAOC. The integration of the Area Air Defense Plan and the Airspace Control Plan is the best I have seen since Cold War Europe in the late 1980's…in-depth detail yet simple and executable.

While the work done at Osan by Army and Air Force planners/operators demonstrates steady improvement in joint interface, we need to continue the effort and make greater strides incorporating the US Navy and Marine Corps. This is not to say that the Navy and Marines are not represented, there are integrated with experts on TLAM, Aegis, and Marine Corp C2 available for planning and execution. But integration that enables this command to "fight tonight" requires constant habitual relationships that are being established between the CAOC and the 94th AAMDC. None of the members interviewed expressed plans for assigning permanent USN or USMC IAMD expertise at the CAOC and that indeed may not be a requirement. But habitual relationships with service subject matter expert planners and operators is a requirement given the dynamics of the threat and the level of integration required to insure timely reaction and engagement of an inbound threat.

Beyond this, there continues to be interface problems with separate service communications systems. Work continues in this area, but focus must be maintained. Constant interaction between the service components leads to increased understanding of true joint capabilities, the early identification of integration issues, and often leads to organizations working at the 'speed of trust'. That speed of trust is critical when you have only seconds to take the appropriate actions in a combat situation.

Lessons Identified:

- The committed integration of USA and USAF resources in support of the Area Air Defense Commander and Deputy Area Air Defense Commander sets a standard for joint integration.
- Continued effort is required to fully integrate all the joint capabilities required to insure success in the IAMD mission.

DOTMLPF and Policy Implications:

- **Doctrine/Training:** The joint doctrine is sound, but further examples could make the concepts easier to grasp; the USAF needs to ensure personnel understand the doctrine.
- **Leadership:** Leadership must continue to push for joint integration and training.
- **Personnel:** Consider increased manning for 94th AAMDC and alignment of Total Force assets to support augmentation packages for AOCs.
- **Material:** Consider purchasing of C2 equipment capable of supporting not just multiple US services, but also the Korean and Japanese Theaters.
- **Facilities:** Consider increasing work space for dedicated joint IAMD working group, located with combat plans and operations.

OBSERVATION 3: Potential exists to improve the training for a host of career fields and better establish a joint cadre of IAMD planners and operators.

Discussion: Almost everyone interviewed opined that there is a requirement for joint training to teach all the various career fields how to better integrate air and missile defense into the planning and execution of the counterair mission. Gathering all the various specialties involved in planning and execution along with the varied backgrounds of all the individuals from the various career fields enables the mission, but a requirement exists for joint training in the mission before these individuals are thrown together in a planning or execution effort. Every officer interviewed felt that learned their duties the hard way, through trial and error on the job. They were unanimous in their call for a joint training course and thought such a course must be created if we are to improve our capabilities.

USAF Air Battle Managers, Army Air Defenders, Marine Airspace experts and the Fighter Pilot serving as the lead airspace planner, all had strong feelings about the joint training requirement. While those that had attended the AOC Course at Hurlburt felt the course was good, they felt it came up short in providing them the rigorous training required to deal with such a detailed and complex problem as IAMD. What they proposed is a short course that brings in Air Force, Army, Navy and Marine personnel that are all involved in the counterair effort and focus the training integrating air and missile defense, offensive and defensive counterair. This step would require Space, Air Battle Manager, Airspace, Air Traffic, Surveillance, Radar Controllers, Army Air Defenders, Navy TBM experts, Joint Interface Control Officers, Pilot and Navigator personnel be assigned to attend a joint training course prior to being assigned to a position where they are involved in planning or executing joint integrated air missile operations.

Interviewees believe the course should introduce all the various career fields to the interdisciplinary processes required to build and then execute a dynamic counterair plan. The instructors would come

from the various services and career fields and would allow the building of a cadre on counterair experts, able to focus on dynamic threat and the multiple methods to counter the threat. The USAF would benefit from the course because it would expose air battle managers, controllers, pilots and navigators to other disciplines required to plan and execute integrated air and missile defense operations. The other services would benefit from USAF perspective and capability to turn the IAMD fight into a combined defensive and offensive counterair mission as opposed to a simple DCA mission. The joint school would also provide first hand training and experience with all the IAMD joint tools available to operational warfighter.

Lessons Identified:

- There are a handful of experts that understand IAMD and that handful feel a need to expand the expert population base.
- The various career fields that support the planning and execution of the IAMD mission think there is a need for a joint training course focused on IAMD.

DOTMLPF and Policy Implications:

- **Training:** USAF personnel require increased training to understand the interdisciplinary processes required to plan and execute IAMD operations.
- **Training/Education:** The joint force would benefit from a joint integrated air and missile defense course.

OBSERVATION 4: The fidelity of joint kill chain training needs to improve.

Discussion: Of the 27 people interviewed, over 80% suggested the joint force needed to improve the fidelity of joint kill chain training. Part of this solution will be to add greater fidelity simulations and integrate live, virtual and simulated events to provide simultaneous operational and tactical level kill chain training. There are also several simulation capabilities that currently exist that could be leveraged to provide joint kill training but some technical issues, as well as security issues of dealing with coalition partners must be addressed.

What is needed is the ability to exercise an Airspace Control Plan and Area Air Defense Plan using live, virtual and simulated assets to bring about high fidelity, realistic kill chain training. Consider that the time of flight of some missiles is less than the time required to currently make an engagement decision. Add to this single event, inbound fighters, an integrated anti-ballistic missile offensive system with defensive counterair sorties, missile engagement zones, fighter engagement zones, high-altitude missile engagement zone, low-altitude missile engagement zone, missile engagement operations area, and much more. How often do we conduct exercises that allow all the players, the Missile Warning Center, The Control Reporting Center, Airborne Warning and Control System, Sector and Regional Air Defense Centers and the Air Defense Artillery Fire Control Officer, to exercise their process in an integrated, timely, accurate manner? If we don't have a positive answer, we may need the high fidelity kill chain training supported by nearly all interviewees.

Lessons Identified:

- Integrated Air and Missile Defense is a mission we must train to...we will fight like we train.
- Without realistic training we cannot be sure how we will fare against an enemy with both an air and missile threat.

DOTMLPF and Policy Implications:

- **Material:** Consider pursuit of high fidelity live, virtual, simulated capability to enhance IAMD training.
- **Training:** Conduct part task training for portions of the joint kill chain and then include training with real time joint kill chain training during major joint exercises.

OBSERVATION 5: Training and career opportunities for Joint Interface Control Officers need to improve.

Discussion: As important as all the pieces of the IAMD puzzle are, one of the most critical roles is played by the Joint Interface Control Officer (JICO). The ability to defend depends on many things as does the ability to take the offensive and bring the fight to the enemy. But the JICO enables the free flowing information that allows us to command and control the fight. The ability of the AOC to lead the counterair fight, to include IAMD, depends in large measure on the JICOs ability to build the integrated air picture that informs command decisions. As critical as this position is, the USAF does not currently have a JICO career field. As complex as the systems are, as important as it is to integrate the systems and provide the information to the AOC and other command and control centers, there is a need to pay more attention to the personnel that provide this capability. No C2, no war winning effort. No JICO, no C2. No need to say more.

Lessons Identified:

- USAF must understand importance of Joint Interface Control Officers and take action to create a sustainable number of trained, educated and experienced JICOs.
- Current policies do not reflect importance of this key position as it relates to the ability of the USAF to conduct its key role…command and control of air, space and cyberspace.

DOTMLPF Implications:

- **Leadership:** Leadership must continue to stress importance of Joint Interface Control Officers
- **Personnel:** Consider adopting policies to reflect importance of this key position, track and assign JICO trained personnel to provide retention and promotion opportunities.

CONCLUSION

Current USAF and joint doctrine adequately addresses the concept of IAMD. It would help if the construct was more clearly articulated, but the current doctrine provides the required structure without being too restrictive. The threat has changed; modern ballistic missiles now present as great a challenge as high tech attack aircraft. The requirement for integrated defense against air and missile threats cannot be overstated nor can we lose sight of the requirement to take the offensive and seek out and destroy air and missile threats before they launch.

The Pacific Theater and the Korean Theater specifically have done a great deal to improve their ability to conduct IAMD. The integration of the 94th AAMDC with all the Pacific theater operations centers is truly a good news story, and the integration at Osan is all the more impressive as the 94th builds to a permanent detachment presence on the peninsula. The integration of USAF and US Army capabilities in PACOM sets the bar for joint integration and while there are not yet joint billets filled by Navy and Marine personnel at Osan, planners and operators from the Navy and Marine Corps are full partners in the IAMD mission.

Tremendous room for improvement exists in training and developing USAF personnel to provide the required cadre of professional specialist to support the IAMD mission. A joint IAMD course would be a good first step in solidifying some of the substantial gains that have been made in IAMD over the past five years. The USAF may consider providing this course as one of the offerings at Hurlburt or Maxwell AFB. Increased fidelity is required in joint kill chain training. This is critical as we will fight like we train. Where is the IAMD "Red Flag" training? The USAF should consider tracking development, education, training, assignment and retention of Joint Interface Control Officers. There is a lack of depth in these positions and things could be very messy if we find ourselves short of required talent during a major war.

APPENDIX A: Acronyms and Abbreviations

AADC	Area Air Defense Commander
AADP	Area Air Defense Plan
AAMDC	US Army Air and Missile Defense Command
ACA	Airspace Control Authority
ACP	Airspace Control Plan
ADCON	Administrative Control
AFDD	Air Force Doctrine Document
AFFOR	Air Force Forces
AOC	Air and Space Operations center
AOR	Area of Responsibility
BMD	Ballistic Missile Defense
C2	Command and Control
CA	Counterair Mission
CAOC	Combined Air Operations Center
CCDR	Combatant Commander
CDR	Commander
C-NAF	Component Numbered Air Force
COMAFFOR	Commander, Air Force Forces
DCA	Defensive Counterair
DOTMLPF-P	Doctrine, organization, training, material, leadership and education, personnel, facilities, and policy
GPS	Global Positioning System
IAMD	Integrated Air and Missile Defense
IPB	Intelligence Preparation of the Battlespace
JAOC	Joint Air Operations Center
JFACC	Joint Force Air Component Commander
JFC	Joint Force Commander
JICO	Joint Interface Control Officer
JOA	Joint Operations Area
JTF	Joint Task Force
MAJCOM	Major Command
OCA	Offensive Counterair
OCTP	Operational Command Training Program
OIF	Operation Iraqi Freedom
OPCON	Operational Control
PACAF	Pacific Air Force
ROK	Republic of Korea
SIT	Strategy Integration Team
TACON	Tactical Control
TDY	Temporary Duty
TLAM	Tomahawk Land Attack Missile
USPACOM	United States Pacific Command
USSTRATCOM	United States Strategic Command

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