Attack Operations

First Layer of an Integrated Missile Defense

LT COL MERRICK E. KRAUSE, USAF*

Editorial Abstract: US forces have a long history of conducting attack operations. The proliferation of theater and long-range ballistic missiles suggests that the concept should be adapted to support missile-defense operations. To do so, we must include missile-defense capabilities in air and space expeditionary force packages, mature technology and doctrine to accommodate such capabilities, and connect Air Force capabilities to joint doctrine and employment concepts. Colonel Krause argues that, although current structures contain pieces of the puzzle, we must fully integrate those pieces within an overall theater missile-defense architecture that includes offensive capabilities.

The gravest danger to freedom lies at the crossroads of radicalism and technology. When the spread of chemical and biological and nuclear weapons, along with ballistic missile technology—when that occurs, even weak states and small groups could attain a catastrophic power to strike great nations. Our enemies have declared this very intention, and have been caught seeking these terrible weapons. They want the capability to blackmail the U.S., or to harm the U.S., or to harm our friends—and we will oppose them with all our power.

—President George W. Bush
West Point, New York
1 June 2002

TO MANY AIRMEN, "Attack!" is the nature of the business. Air Force operations and perhaps even Air Force culture are historically geared toward the offensive application of air and space power to execute combat operations in war. However, the joint community—particularly those members engaged in high-priority missile-defense programs—perceives "attack operations" differently. This article introduces the concept of attack operations in the context of missile defense and similar time-sensitive targets,

*The views in this article are the author's and do not reflect those of either the Joint Staff or the Office of the Chairman of the Joint Chiefs of Staff.

asserting that such operations provide the critical first layer of an integrated missile defense. It also presents key themes, issues, and proposals to increase the capabilities of integrated missile defense.

Attack Operations: A Critical Capability

In a joint environment, attack operations are essentially offensive actions that seek to destroy or disrupt enemy missile systems and support structures, preferably before missiles are fired.[1] Aircraft, special operations forces (SOF), information operations, or uninhabited aerial vehicles can perform attack operations *today*. Although they represent both a joint capability and a multiservice "organize, train, and equip" issue, attack operations are one mission with which the Air Force has considerable practical experience, particularly in the realm of time-sensitive targeting and threats intended to limit US access to a region.

The United States has a long history of conducting attack operations. In World War II, Operation Crossbow attempted to destroy German V-1 and V-2 missile sites, which were terrorizing the British through disruptive and deadly attacks on cities. Between August 1943 and March 1945, the US Army Air Forces and Royal Air Force flew 68,913 sorties and expended 122,133 tons of ordnance in the campaign to destroy German missiles.[2] Indeed, Crossbow was a large-scale counterair and strategic-attack operation that expended substantial effort to delay V-weapon attacks and then limit their effectiveness once Germany began to employ the missiles.[3]

Although the Cold War produced intercontinental ballistic missiles (ICBM) and a variety of specialized missile-defense systems, theater ballistic missiles (TBM) captured the imagination of third world nations as a relatively cheap supplement to bolster both their status and their anemic air forces. Deterrence by a robust American nuclear capability was the counter to the Soviet ICBM threat.[4] Because of the Cold War legacy, however, US missile-defense systems were divided between theater and intercontinental systems, with testing and deployment of the latter severely restricted by provisions in the Antiballistic Missile (ABM) Treaty with the Soviet Union.

The 1991 Persian Gulf War radically increased the priority of TBMs in US national security policy. Once regarded by many military leaders as a tactical nuisance, especially when armed with conventional high explosives, TBMs suddenly became weapons of terror that could cause significant political and diplomatic problems. Although Iraq did not use weapons of mass destruction (WMD) in the 1991 war, when Iraq fired conventionally equipped Scud missiles against Israel, it created a political crisis for the coalition.[5] Moreover, a single conventionally armed Scud produced the greatest number of US fatalities of any single event during Operation Desert Storm when it struck a barracks in Dhahran, Saudi Arabia.

During the Persian Gulf War, hundreds of sorties and thousands of man-hours were devoted to countering the Scud threat. Some people suggest that the resources used against Scuds could have been employed to attack other targets, perhaps ending the war more rapidly. Undoubtedly, "Scud hunts" diverted some of the coalition's military resources; however, the utility of the Scud hunts may be better measured more in political than purely military terms. The experience of Desert Storm helped shape how the United States is now actively investing to better defend against missile threats in the future. These threats include ICBMs and cruise missiles, as well as other theater air and missile systems.

The *Quadrennial Defense Review (QDR)* of September 2001, published in the shadow of the al Qaeda terrorist attacks of 11 September 2001, recognized a changing international strategic environment affected by missile and WMD proliferation. The *QDR* articulated the need for transformational change in the US military.[6] One important directive stated that the Department of Defense (DOD) would examine options for establishing standing joint task forces to address the capability to "continuously locate and track mobile targets at any range and rapidly attack them with preci-

sion."[7] The *QDR* also noted that the continued proliferation of ballistic and cruise missiles is a threat to "U.S. forces abroad, at sea, and in space, and to U.S. allies and friends."[8] Therefore, the *QDR* refocused US missile defense toward research and deployment of a layered system of systems to defend forward-deployed troops and allies threatened by theater missiles and to provide a "limited defense" against long-range missiles for the US homeland.[9]

DOD has spent billions of dollars developing systems to defeat ballistic missiles.[10] Although programs of the individual services frequently overlap, several DOD organizations, including the Missile Defense Agency (MDA) and Joint Air and Missile Defense Organization (JTAMDO), use the concept of an integrated "family of systems" to defeat ballistic missiles.[11] Significantly, on 13 June 2002, the United States officially withdrew from the ABM Treaty, thus enabling expanded testing and deployment of a missile-defense system for the US homeland. That same year, Secretary of Defense Donald H. Rumsfeld directed MDA to develop a single, integrated ballistic-missile-defense system—one that would no longer differentiate between theater and national missile defense.[12]

Integrated capabilities are important because some individuals contend that soon every southern European capital will be within range of ballistic missiles based in North Africa or the Levant (including Syria, Iraq, and Iran).[13] In a military sense, the threat in the Mediterranean region has shifted dramatically as the focus in Europe changed "from the Fulda Gap to the South."[14] Many allies, including the particularly vulnerable southern European countries such as Portugal, Spain, Italy, Turkey, and Greece, lack the ability to defend successfully against missile strikes or to deter WMDs. The United States will face a radically different European security problem if Madrid, Rome, or Athens are at risk to missile attack and if some allies are deterred from joining it in a coalition.[15]

This problem of susceptibility to missile and WMD attacks is not confined to Europe. North Korean threats to Japan and Guam, as well as the persistent and increasing threat of cruise missiles or missiles operated from ships near US coasts, are also near-term concerns. The *National Security Strategy* of 2002 enunciates these threats and presents a US strategy for countering them:

> We must be prepared to stop rogue states and their terrorist clients before they are able to threaten or use weapons of mass destruction against the United States and our allies and friends. Our response must take full advantage of strengthened alliances, the establishment of new partnerships with former adversaries, innovation in the use of military forces, modern technologies, including the development of an effective missile defense system, and increased emphasis on intelligence collection and analysis.[16]

Doctrine

The historical legacy of attacks conducted by the Army Air Forces during Operation Crossbow is evident in Joint Publication (JP) 3-01.5, *Doctrine for Joint Theater Missile Defense*, which defines four operational elements of theater missile defense: passive defense; active defense; attack operations; and command, control, communications, computers, and intelligence (C^4I). Passive defense involves efforts to minimize the effects of theater missile attacks, while active defense includes operations that destroy enemy missile "airborne launch platforms" or missiles in flight. Attack operations seek to "destroy, disrupt, or neutralize theater missile launch platforms and their supporting structures and systems." Finally, the purpose of C^4I is to coordinate and integrate these efforts.[17] Based on DOD's new, multilayered approach and the removal of theater and national divisions from both missile-defense systems and philosophy, this joint publication needs substantial revision.

Although the multilayered, integrated missile-defense concept presents a more holistic view of the missile threat, historically different philosophies toward missile defenses provide a source of conflict. For example, the Air Force argues (as do some air arms of other services and nations) that airpower is best employed offensively. But today, active missile defenses and

investments tend to focus on surface-based systems, which are reactive weapons by nature. Interestingly, JP 3-01, *Joint Doctrine for Countering Air and Missile Threats*, states that "air superiority is achieved through the counterair mission, which integrates both offensive and defensive operations from all components to counter the air and missile threat."[18] Similarly, Army Field Manual (FM) 3-0, *Operations*, recognizes that in large campaigns, offensive and defensive actions occur simultaneously and that defense should be aggressive.[19] Yet, the weight of effort for missile defense typically is geared toward the reactive phase of the engagement.

Offensive counterair (OCA), an obvious amalgam of attack-operations missions, represents the freedom *from* attack and the freedom *to* attack. This concept is based on the Air Force proposition that "air and space forces are inherently offensive and yield the best effect when so employed."[20] When the Airborne Laser (ABL) destroys ascending enemy missiles, it provides defensive counterair and is thus a second layer of defense. Midcourse, terminal, and passive defenses are much deeper layers. This contrasts with using SOF or fighter-bombers first to destroy ballistic missile launchers (OCA) or missile-supply depots (interdiction/strategic attack).[21] The joint term *attack operations* overlaps several US Air Force and other joint doctrinal mission areas. JP 3.01 agrees, stating that, with regard to missiles and support infrastructure, "OCA operations are most effective when conducted against theater missiles before launch. The preemptive destruction of missiles, launch facilities, storage facilities, and other support infrastructure greatly limits subsequent [theater missile] attacks. OCA assets may also be rapidly retasked to destroy time-sensitive targets such as mobile launchers."[22]

An unresolved conundrum derived from this doctrinal ambiguity is that joint doctrine considers attack operations offensive and proactive, but also defensive and reactive. This situation could become more complicated when the new Strategic Command takes functional control of an integrated missile defense; but, contemporaneously, a joint force air component commander (JFACC) and regional commander have different antiaccess, preemption, contingency, or daily air tasking order priorities for limited or multirole assets.

The problems of allocation, command relationships, and use of resources—not yet resolved—are exacerbated when an adversary possesses a variety of long- and medium-range missiles. JTAMDO is moving forward with an integrated missile-defense concept of operations, now in the coordination stage, to attempt to address some of these concerns. However, the entire missile-defense layered system and command relationships to control all of the affected subsystems are evolving and will continue to develop as the new Strategic Command and Northern Command emerge.

Integrated Missile Defense

MDA's system of integrated missile defense consists of terminal, midcourse, and boost segments (fig. 1). The agency does not currently advertise a segment geared to attacking missiles and missile-support assets *before* the boost phase.

Terminal Segment

The terminal segment consists of several weapon systems.[23] These include the Patriot, Medium Extended Air Defense System (MEADS), Arrow, Theater High Altitude Area Defense (THAAD), and a sea-based system.

Patriot. The Patriot Advanced Capability (PAC-3) is an upgraded version of the weapon used during the Persian Gulf War. It is a point-defense weapon that has some ability to defend against cruise missiles, aircraft, and TBMs in their terminal phase of flight. Although the PAC-3 can be airlifted, it is cumbersome and thus a relatively stationary system. It is the most mature of MDA's theater missile-defense systems and is considered America's current premier lower-tier TBM defense system.

An essential feature of the PAC-3 is its "hit-to-kill" capability, which is consistent with MDA's emphasis on using hit-to-kill systems against WMDs.[24] Yet, a concern with the PAC-3, as with

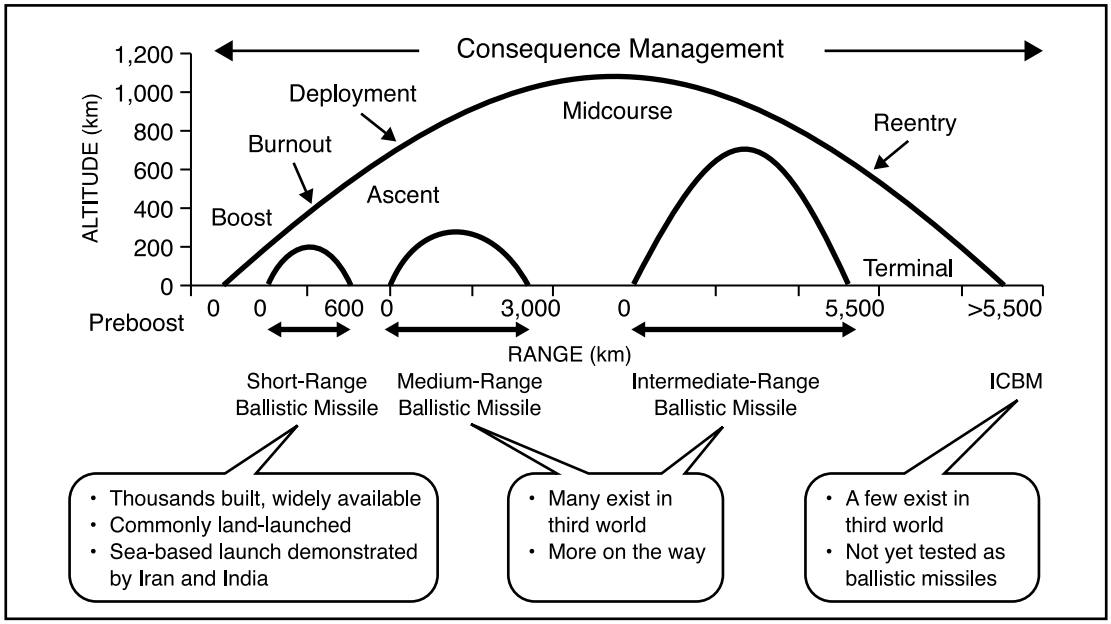

Figure 1. An Integrated, Layered Defense against Missiles of All Ranges (Unclassified) (Adapted from briefing, Defense Science Board, subject: Integrated Missile Defense, 13 October 2002)

all terminal systems, is the risk of debris falling on friendlies following a successful terminal-stage missile interception.

MEADS. The United States has pursued this mobile, lower-tier program on a cooperative basis with Germany and Italy.[25] Planned to reduce the risks to Army and Marine Corps operations, "MEADS will improve tactical mobility and strategic deployability over comparable missile systems and provide robust, 360-degree protection for maneuvering forces and other critical forward-deployed assets against short- and medium-range missiles."[26] It is intended to bridge the gap between handheld man-portable systems, such as the Stinger, and less mobile systems, such as the PAC-3. MEADS will be a multicanister vertical-launch system mounted on a wheeled vehicle.[27] In fiscal year 2003, MEADS will continue design-development activities for system components, including the addition of the capability to integrate the PAC-3 missile with the MEADS system.[28]

Arrow. This joint US-Israeli missile-defense system will be able to operate with US theater missile-defense systems in order "to assist in the protection of forward deployed U.S. and Coalition forces."[29] The Arrow engages enemy missiles at a higher altitude than does the PAC-3, thus providing a better safety margin, particularly for missiles with WMD warheads.[30] The Israeli Ministry of Defense received its first Arrow missile in November 1998.[31] Continuing this partnering effort, operational since October 2000, will support Israeli acquisition of a third Arrow battery and promote interoperability with US missile-defense systems and battle-management command and control (C^2).[32]

THAAD. MDA has categorized THAAD as an upper-tier terminal-defense-segment system because the intercept is planned to occur in the terminal phase of the missile's trajectory, yet on the edge of the atmosphere. As a ground-based, high-altitude weapon system, THAAD will use exoatmospheric and endoatmospheric hit-to-kill interceptors to destroy missiles. The goal of the THAAD system is to destroy incoming medium- and short-range ballistic

missiles far enough from friendly troops or population centers so that the debris is no danger to the intended target.[33] MDA expects fielding in 2007 or 2008.[34] Essentially, THAAD is the most mature upper-tier system, but it is also a terminal-segment system.

Sea-Based Terminal System. In the wake of the cancellation of the Navy Area terminal-defense missile in December 2001, DOD directed MDA to initiate a soon-to-be-completed sea-based terminal study.[35] The Navy continues to have a requirement for a sea-based system and argues that seaborne missile defenses are less expensive because they use current platforms and thereby reduce the demand for airlift and sea lift.[36] The first unit equipped was targeted for fiscal year 2007; however, the results of the 2002 sea-based terminal study will determine new programmatics.[37]

Midcourse Segment

The midcourse segment consists of both ground-based and sea-based systems.

Ground-Based Midcourse System. A successor to the National Missile Defense System, the Ground-Based Midcourse System has as its objectives "1) to develop and demonstrate an integrated system capable of countering known and expected threats; 2) to provide an integrated test bed . . . [and] 3) to create a development path allowing for an early capability based on success in testing."[38] Not intended to be mobile, it will begin with a test bed in Alaska, followed by selective deployments for homeland defense as the system matures.

Sea-Based Midcourse System. The successor to Navy Theater Wide is the Sea-Based Midcourse System, which will intercept enemy ballistic missiles in the ascent phase of midcourse flight. Its emphasis is on the exoatmospheric ascent phase for intercept.[39] Designed to intercept medium-range and long-range ballistic missiles, this system is expected to have a contingency capability in 2004 or 2005, with initial operational capability in the 2008–10 time frame.[40]

Boost Segment

The boost segment includes the ABL, Space-Based Laser (SBL), and kinetic-energy concepts.[41]

Airborne Laser. The primary boost-phase program for theater missile defense is the Air Force's ABL program, which had its maiden flight on 18 July 2002.[42] If the testing schedule is executed, the initial operational capability of the ABL will occur in 2009, with seven aircraft available for combat operations in 2011.[43] Since future generations of TBMs could release multiple warheads and launch large volleys of theater missiles, the laser's boost-phase destruction is designed to provide ascent-phase defenses against ballistic missiles and to deter adversaries because their warheads could fall back on their own territory.

Space-Based Laser. The SBL may provide both missile-defense and space-superiority capabilities although MDA sees it principally as contributing to defense in the boost phase, as well as serving as a potential deterrent. MDA is focusing on design validation and hopes to fly an on-orbit experiment to exhibit a lethal demonstration of SBL technologies by 2012.[44]

Kinetic-Energy Concepts. MDA plans to produce experiments in the 2003–6 time frame, using kinetic-kill concepts for destroying enemy missiles shortly after launch.[45] The goal is a kinetic-boost-phase defense capability in the 2006–10 period, using either a sea-based or space-based platform. Possibly, testing may lead to an operational, sea-based, kinetic-energy interceptor by 2006.[46]

Attack Operations

The main objective of missile-defense attack operations is to prevent the missiles from being used "against U.S. forces, U.S. allies, and other important countries, including areas of vital interest."[47] Attack operations can also contribute to preventing future attacks by destroying launchers after firing but before reuse. Attack operations are a joint capability but one in which the US Air Force has considerable experience, particularly through the C^2 functions resident in the joint air operations center

(JAOC), as well as platforms, sensors, navigation (Global Positioning System), and weapons.

Attack operations are executed through the sensor-to-shooter loop, which finds, fixes, tracks, targets, engages, and assesses mobile and fixed missile systems and equipment, and through "strategic targets," such as factories. In addition, interdiction targets, storage sites for enemy missile and WMD storage/maintenance sites, fixed and mobile C^2 nodes, and supply lines would be subject to attack, as would prelaunch and postlaunch theater-missile sites.[48] Mobile and fleeting opportunities for attack make time-sensitive target strikes integral to attack operations.

Inherent in the concept of attack operations is effects-based operations theory, which involves selecting targets whose destruction would have specific effects that result in second- or third-order levels of disruption, resulting in "control" of an adversary leader's decision-making process, as opposed to traditional goals of attrition or annihilation.[49] Attack operations may not eliminate the missile threat, but they will reduce the threat posed by missiles and WMDs, as well as reduce the options an adversary may employ.

SOFs are also quite relevant to attack operations.[50] Such forces rely on the ability to insert personnel covertly, but they also typically integrate with the C^2 system. With miniaturization and advances in communications technology, SOF attack operations will be improved by using more capable battle-management systems, while faster or stealthier insertion methods would improve SOF capabilities. Furthermore, special-operations activities, when well coordinated with air and space power, create a synergy that makes attack operations more effective.

C^2 and Sensors

MDA considers sensor suites and battlefield-management C^2 the "backbone" of the ballistic missile-defense system and plans to develop these capabilities in parallel with other missile-defense systems to better integrate systems and equipment—including sensors, interceptors, and tactical-control centers—into a joint, layered missile-defense architecture.

Linking sensors to C^2 is critical to the effective execution of attack operations or time-sensitive targeting. Integrating experiments build upon lessons learned in regional air operations centers, including Operations Desert Storm, Northern and Southern Watch, Allied Force, and Enduring Freedom. Among other important tasks, Joint Expeditionary Force Experiment 2002 tested new management and retasking of intelligence, surveillance, and reconnaissance (ISR) sensors, the new Boeing 707 Paul Revere test bed, and the integrated JAOC at Nellis Air Force Base, Nevada.[51] The JAOC gathers information from many sources, condenses the data into "a constantly updated picture that is fine-grained enough to find small, important moving targets in minutes and rationally assign the resources at hand to monitor and strike them."[52] This is an example of a joint effort that builds upon Air Force experience and directly affects attack operations and time-sensitive target capabilities.[53]

The sensor segment includes a variety of research-and-development projects to enhance ballistic-missile detection, midcourse tracking, and discrimination through two primary projects: space sensors and international cooperation.[54] However, multiuse sensors will have the capability for early warning, intelligence, and C^2 for the spectrum of operations from attack operations to terminal-phase missile defense. Technological advances are effectively reducing the time between when a sensor detects a missile and the time that a weapon can destroy that missile by increasing C^2 and sensor capabilities.

Near-Term Missile-Defense Gap

The integrated missile-defense system will lack several key components over the next few years. As a result, the United States faces a near-term *gap* in its capabilities, particularly in theater missile defense during the boost and midcourse phases and in ICBM defense throughout the flight envelope.[55] This gap translates to increased risk and increased vulnerability of US forces, allies, and interests. Such a reality makes preemptive and persistent attack

operations proportionally more critical to bolstering overall near-term US missile-defense and antiaccess capabilities.[56]

The antiaccess threat is noteworthy, given the deployment and operational limitations and risk of debris impacts associated with current point-defense systems, such as the Patriot. The emerging Air Force concept of a global strike task force and other spearhead force conceptions address this threat. At the same time, significant ISR capability is essential for locating missile launchers, C^2 nodes, and support equipment.[57] Indeed, significant equities may be realized through joint participation, and JAOC time-sensitive target experience provides a proven model for attack-operations execution.

Many commanders and senior military officers recognize the value of attack operations, particularly with regard to improved C^2 and the destruction of time-sensitive targets. Attack operations, however, represent an underadvertised capability, which implies that future funding will be limited in comparison with the core activities of MDA. That agency currently does not emphasize attack operations in a prelaunch segment, and no significant breadth of joint or Air Force doctrine specifically emphasizes integrated attack operations.

As with other incarnations of defense against air threats, the metaphor that hitting the eggs in the nest is better than throwing stones at flying birds remains relevant. Furthermore, improving C^2, as well as sensors, makes attack operations more effective than in World War II or Desert Storm. Given growing concern over ballistic-missile attacks, WMDs, and the limited ability of point defensive systems to protect targets, attack operations have become increasingly important. Thus, it is imperative to improve the ability of attack operations with additional training and funding to respond to operational demands.

Proposals

This article proposes three options for improving missile defenses, thus addressing some potential near-term antiaccess threats. First, the Air Force should establish a standing capability within its air and space expeditionary force (AEF) for conducting attack operations and time-sensitive targeting. This capability would serve multiple purposes, including operations against ballistic missiles, cruise missiles, mobile targets, and WMDs, as well as time-sensitive missions and other strike efforts. This approach builds on assets that are capable of conducting multiple missions but requires additional training, equipment, or further specialization to provide effective, reliable options.[58]

An antiaccess task force or a standing capability within existing AEF units would provide a model or perhaps an operational experiment with this concept. For example, tasking specific Air Force Guard and Reserve units for attack-operations missions would give those units a primary or secondary responsibility for conducting attack operations during training and combat. Furthermore, training as part of an AEF, a multirole force (perhaps in coordination with the emerging global strike task force concept), tailored and trained for attack operations/time-sensitive targets, would give commanders a significant standing operational capability. This might be accomplished by emphasizing training and systems required to conduct time-sensitive targeting for certain squadrons. Before becoming an operational capability, these units could exercise their capabilities through a training program and incorporate as a small part of a Red Flag or other exercise venue. Such a tailored AEF concept would not conflict with either current Air Force doctrine or joint publications. Finally, training and maintaining units within the AEF structure would be possible by assigning squadrons a time-sensitive-targeting/attack-operations secondary mission in their wing's mission statements, similar to combat search and rescue or AGM-130 operations.[59]

An additional benefit to an organic attack-operations/time-sensitive-target capability is that expeditionary units trained specifically for these missions may have sufficient offensive credibility to deter states from exposing or employing missiles. However, the capability would have to be communicated to adversaries in order to have a deterrent or dissuasive effect.

Its operational value would rest upon its rapid-response capability, flexible deterrent capability, and ability to destroy missiles and WMDs on the enemy's side of the border. Moreover, effectively and precisely destroying missiles armed with WMD warheads could limit collateral damage.

As F/A-22s become operational, US spearhead force capabilities will improve, but a threat to forward-based (land or sea) forces from enemy missiles will still exist. The global strike task force concept will provide a capability to mitigate the initial antiaccess missile threat by using long-range and stealthy precision attack to suppress initial missile threats. The F/A-22 will be extremely valuable in an attack-operations role as part of a spearhead force performing counterair missions, including attack operations. It will permit daylight, precision, stealthy strikes in conjunction with significant ISR assets throughout a time-phased deployment.

Second, the Air Force can improve how it conducts attack operations in the near term by advancing attack operations, time-sensitive targeting, C^2, ISR capabilities, and Air Force doctrine. A principal reason that Air Force philosophy exceeds joint doctrine is that attack operations overlap numerous missions imbedded in Air Force doctrine. In addition, the Air Force has considerable experience with attack operations, time-sensitive targeting, and the fusion of surveillance and reconnaissance data through an air operations center, as well as using C^2 and disparate platforms and weapons in offensive action. Unfortunately, numerous offices on several staffs contribute to the attack-operations/time-sensitive-targeting picture, which may create difficulties in coordinating a unified message to present to JTAMDO and MDA in programming and doctrine deliberations.

In view of DOD's determination to create effective, multilayered missile defenses to counter WMDs, a logical step for the Air Force is to focus on improving attack operations, including time-sensitive-targeting equipment, procedures, and training. More investment in C^2, time-sensitive targeting, and the development of air operations centers will further the effectiveness of attack operations and thus provide a better first layer of missile defense. Attack operations should also be integrated and defined, just as its doctrinal theory should be more definitively stated in core Air Force doctrine documents. This effort may provide weight to arguments that MDA should provide additional funding for Air Force–sponsored efforts in joint-attack operations.

Finally, joint doctrine should consistently reflect the fact that attack operations are offensive missions, although they may be executed in the context of a proactive defense. The central concept should be that missile defense—or antimissile/counter-WMD missions—include offensive, defensive, and C^2 activities, all of which have implications for interdiction and strategic attack. Clearly, attack operations are not strictly a "defensive" activity. In fact, the decision to attack enemy assets in enemy territory is an inherently offensive operation, and in the case of WMDs, attack operations leverage both deterrence and destruction.[60]

Attack operations require joint-doctrinal consistency. Joint doctrine states that the joint force commander (JFC) will typically select the JFACC to direct attack operations, as well as support other component commanders in their attack-operations efforts.[61] Resource allocation and target-selection priority must be negotiated in a joint environment, weighing long-range threats to the US homeland and allies with threats to friendly fielded forces or population centers. Phasing is also a consideration, particularly the determination of what weight of effort attack operations will take in each phase and how that is coordinated with point missile-defense systems, such as the Patriot; it also includes the balancing of limited allocations of area defenses, such as the ABL or ground-based midcourse. These factors, the command relationships that occur when a missile threat spans regional commanders' areas of responsibility, defense of the United States, and WMDs indicate that changes to joint doctrine are merited.

Conclusion

The proliferation of ballistic missiles, antiaccess threats, and WMDs creates new operational and technological challenges for the United States. In the multilayered missile-defense paradigm, attack operations provide an essential first layer of missile defense. A joint attack-operations capability, backed by a long history of airpower experience with the mission, provides an effective means to reduce an enemy's capabilities through a measured, offensive campaign to remove ballistic and cruise missiles, long-range threats to the US homeland, and other antiaccess and time-sensitive targets. In this strategic and technological environment, efforts made today will enhance the ability of US forces to conduct increasingly more effective attack operations. Furthermore, contemporary, joint organizational changes open a window of opportunity to revisit doctrinal issues worth discussing. If properly fostered, attack operations and time-sensitive-targeting capabilities will yield an improved ability to project joint military power while simultaneously protecting US troops, allies, and the American homeland—thus denying future enemies sanctuary or the leverage provided by WMDs and missile-delivery systems. □

Notes

1. Joint Publication (JP) 3-01.5, *Doctrine for Joint Theater Missile Defense*, 22 February 1996. According to this publication,

> attack operations are characterized by **offensive actions intended to destroy and disrupt enemy TM** [theater missile] **capabilities before, during, and after launch.** The objective of attack operations is to **prevent the launch of TMs by attacking each element of the overall system,** including such actions as destroying launch platforms, RSTA [reconnaissance, surveillance, and target acquisition] platforms, C^2 [command and control] nodes, and missile stocks and infrastructure. Attack operations also strive to deny or disrupt employment of additional TMs that may be available to the enemy. **The preferred method of countering enemy TM operations is to attack and destroy or disrupt TMs prior to their launch** (emphasis in original) (III-10).

2. *United States Strategic Bombing Survey*, vol. 60 (Washington, D.C.: Military Analysis Division, 1945), 26–27.

3. Ibid., 4.

4. In particular, the "second strike" capability was an effective deterrent to the Soviet Union.

5. The Scud is a TBM, initially of Soviet origin, that has proliferated to third world nations as a relatively inexpensive terror weapon. The Scud is capable of delivering WMDs.

6. *Quadrennial Defense Review Report* (Washington, D.C.: Department of Defense, 30 September 2001), 18.

7. Ibid., 34.

8. Ibid., 42.

9. Ibid.

10. Ballistic Missile Defense Organization, "Ballistic Missile Defense Organization Funding," 2001 Submit, on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/html. Although there are multiple sources for the specific funds spent on missile-defense systems, studies, and research programs, this source summarizes specific Ballistic Missile Defense Organization projects in terms of procurement, research and development, and military construction.

11. The term *family of systems* is used by the Ballistic Missile Defense Organization, forerunner of MDA, to describe the multilayered architecture of planned missile-defense systems. *Multilayered* implies more than a single defense system—perhaps defense systems that are effective in different phases of the missile's flight. Before 2002, JTAMDO was known as the Joint Theater Air and Missile Defense Organization.

12. Missile Defense Agency, MDA*link*, "The Ballistic Missile Defense System," on-line, Internet, 13 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/html/system.html.

13. Ian O. Lesser and Ashley J. Tellis, *Strategic Exposure: Proliferation around the Mediterranean* (Santa Monica, Calif.: RAND Corporation, June 1996), x.

14. Lt Gen Richard C. Bethurem, interviewed by author, 23 February 1998.

15. Lesser and Tellis, x, 27, 32.

16. President George W. Bush, *The National Security Strategy of the United States of America*, on-line, Internet, 20 September 2002, available from http://www.whitehouse.gov/nsc.

17. JP 3-01.5, viii, I-3.

18. JP 3-01, *Joint Doctrine for Countering Air and Missile Threats*, 19 October 1999, I-2.

19. FM 3-0, *Operations*, 14 June 2001. "The purpose of defensive operations is to defeat enemy attacks. Defending forces await the attacker's blow and defeat the attack by successfully deflecting it" (par. 8-2). "Successful defenses are aggressive; they use direct, indirect, and air-delivered fires; information operations (IO); and ground maneuver to strike the enemy. They maximize firepower, protection, and maneuver to defeat enemy forces. Static and mobile elements combine to deprive the enemy of the initiative. The defender resists and contains the enemy. Defending commanders seek every opportunity to transition to the offensive" (par. 8-5).

20. Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September 1997, 46.

21. Ibid., 46–51.

22. JP 3-01, IV-2.

23. MDA refers to the systems it manages that would provide defense against missiles during the terminal phase as the "Terminal Defense Segment." The Ballistic Missile Defense Organization (BMDO) previously discussed most of these systems as lower-tier systems (the Theater High Altitude Area Defense System is considered an upper-tier terminal-segment system).

24. US Senate, Lt Gen Lester L. Lyles, director, BMDO, "Opening Remarks," *Congressional Testimony before the Subcommittee on Strategic Forces Committee on Armed Services*, 24 March 1998.

25. William S. Cohen, *Annual Report to the President and Congress* (Washington, D.C.: Government Printing Office, 1998), 64.

26. Missile Defense Agency, MDA*link*, "Terminal Defense Segment," on-line, Internet, 27 January 2003, available from http://www.acq.osd.mil/bmdo/bmdolink/html/terminal.html.

27. Missile Defense Agency, fact sheet, "Medium Extended Air Defense System," January 2002, on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/meads.pdf.

28. Lt Gen Ronald T. Kadish, "The Missile Defense Program," FY 03 Budget Hearings, 16, on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/budget03.pdf.

29. Cohen, 65.

30. Michael R. Gordon, "Israel Set to Use New Missile Shield to Counter Scuds," *New York Times*, on-line, Internet, 6 October 2002, available from http://www.nytimes.com/2002/10/06/international/middleeast/06MISS.html.

31. For statements compiled from multiple news services, see "For the Record," *Washington Post*, 30 November 1998, A20.

32. Missile Defense Agency, MDA*link*, "Terminal Defense Segment."

33. Missile Defense Agency, fact sheet, "Theater High Altitude Area Defense (THAAD)," January 2002, on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/thaad.pdf.

34. Ballistic Missile Defense Organization, fact sheet 204-00-01, November 2000, on-line, Internet, 13 December 2001, available from http://www.acq.osd.mil/bmdo/bmdolink/html. See also Missile Defense Agency, fact sheet, "Theater High Altitude Area Defense (THAAD)."

35. Kadish, 15–16. See also Hunter Keeter, "Service Officials: Navy Terminal-Phase Missile Defense Remains a Requirement," *Defense Daily International*, Potomac, 25 January 2002. The US Navy canceled the point-defense Navy Area Program on 14 December 2001 but retained the Navy Theater Wide Program under the direction of the newly reorganized MDA. The Navy Theater Wide Program is evolving into the "sea-based midcourse" system, which will be part of the new layered-defense concept currently promoted by MDA. See also Philip Sen and Richard Scott, "Pentagon Cancels Navy Area TBMD," *Signals*, Jane's Navy International, 1 March 2002, on-line, Internet, 12 February 2002, available from http://www.janes.com.

36. BMDO, fact sheet 97-18, *Navy Area Ballistic Missile Defense Program*, July 1997.

37. Robert Snyder, "Ballistic Missile Defense Organization Press Release: FY01 President's Budget," 4 February 2000, on-line, Internet, 12 December 2001, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/bmdopress.pdf.

38. Missile Defense Agency, MDA*link*, "Midcourse Defense Segment," on-line, Internet, 13 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/html/midcrse.html.

39. Missile Defense Agency, fact sheet, "Sea-Based Midcourse," January 2002, on-line, Internet, 13 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/seabased.pdf. "The Sea-based Midcourse Defense (SMD) element . . . will provide the capability for U.S. Navy Aegis surface combatants to utilize hit to kill technology to destroy or negate Medium Range to Inter-Continental Ballistic Missiles (ICBM) in the midcourse phase of the exoatmospheric battlespace."

40. Timing for operational capability was initially taken from the National Institute of Public Policy "frequently asked questions" Web site, on-line, Internet, 13 December 2001, available from http://www.nipp.org/Adobe/laymans%20guide%20adobe/No.%2013.pdf. These times were further revised as of January 2002. See MDA fact sheet, "Sea-Based Midcourse."

41. MDA refers to the systems it manages that would provide defense against missiles during the boost phase as the "Boost Defense Segment" (BDS). MDA lists four objectives for the BDS: (1) demonstrate and deploy the Airborne Laser, (2) define and evolve space-based and sea-based kinetic-energy Boost Phase Intercept (BPI) concepts with a development decision in 2003–5, (3) execute a "proof-of-concept Space-Based Interceptor Experiment," and (4) continue Space-Based Laser for a proof-of-concept in 2012. See Missile Defense Agency, MDA*link*, "Boost Defense Segment," on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/html/boost.html.

42. Kenneth Englade, "Airborne Laser Completes First Flight," DE Release no. 2002-27, 18 July 2002, on-line, Internet, available from http://www.acq.osd.mil/bmdo/bmdolink/html/abl.html.

43. Missile Defense Agency, fact sheet, "Airborne Laser," January 2002. It should be noted, however, that the ABL program office estimates initial operational capability two years earlier, in 2007, with full operational capability in 2009. Further, after the demonstrations in 2004, residual operational capability will be left behind, enabling the deployment of the test bed for operational purposes, if required. See the ABL program home page, on-line, Internet, 21 March 2002, available from http://www.airbornelaser.com.

44. Missile Defense Agency, fact sheet, "Space Based Laser (SBL)," January 2002, on-line, Internet, 13 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/sbl.pdf.

45. Missile Defense Agency, MDA*link*, "Boost Defense Segment."

46. Missile Defense Agency, fact sheet, "Kinetic Energy," January 2002, on-line, Internet, 13 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/kinetic.pdf.

47. Archived briefing, XORFS, "USAF Roadmap for Theater Missile Defense Attack Operations," presented 27 July 1997 (unclassified extract dated 5 February 1998). For further information, please consult the Counterair (Theater Missile Defense) Mission Area Plan, FY 1996, 15 November 1995. Obviously, attack operations would be important for suppression and destruction of intercontinental ballistic and other missiles. This sentiment is aligned with the current national security strategy.

48. Briefing, Maj Brad Butz, AF XORFX and SAF AQPT, "USAF Attack Operations," for Lt Gen Lester L. Lyles, 9 February 1998.

49. Maj Gen David A. Deptula, *Firing for Effect: Change in the Nature of Warfare* (Arlington, Va.: Aerospace Education Foundation, 24 August 1995), 11–18.

50. Special operations forces are not discussed in depth in this article. Nevertheless, they definitely provide attack-operations capabilities, both in conjunction with direct conventional air and space power attacks and as an additional intelligence-gathering source.

51. David A. Fulghum, "Paul Revere Designers Critique New Configuration," *Aviation Week and Space Technology*, 23 September 2002, 52–53. See also idem, "USAF Streamlines Air Operations Center," *Aviation Week and Space Technology*, 23 September 2002, 53–55.

52. Fulghum, "USAF Streamlines Air Operations Center," 53.

53. Fulghum, "Paul Revere Designers," 53. Lt Gen William T. Hobbins, commander, Twelfth Air Force, was quoted as saying that the Paul Revere Multisensor Command and Control Aircraft was "meant to replicate the execution piece of the Joint Air Operations Center."

54. Missile Defense Agency, fact sheet, "Sensors," January 2002, on-line, Internet, 14 March 2002, available from http://www.acq.osd.mil/bmdo/bmdolink/pdf/sensors.pdf.

55. Pat Towell, "Bush's Missile Defense Plan Harks Back to Father's 'Layered' Approach," *Congressional Quarterly Weekly*, 16 March 2002, 718. "Nearly $2 billion of the fiscal 2003 request is for systems designed to protect relatively small areas by striking enemy warheads in the 'terminal' phase of flight—as they near their targets. . . . All the systems currently funded are designed to deal with shorter range—and slower—missiles, such as the Scuds."

56. Preemption, in this case, refers to the time before missiles have been employed but could also mean the time before a second salvo. This article does not enter the debate over preemptive use of military force or proactive defensive measures through attacks—although attack operations certainly can accomplish preemptive strikes against missiles and WMDs.

57. C^2 (and sensors) also provide warning for passive defense measures and point defense through the PAC-2 or -3.

58. The AEF Battlelab at Mountain Home AFB, Idaho, could address the organizational issues and configuration decisions facing attack-operations missions in order to refine this concept.

59. The AGM-130 is a guided bomb, steered in flight through a data link by a weapon-systems officer. Experienced F-15E crews are usually asked to perform AGM-130 missions due to their complexity.

60. According to AFDD 1, antimissile attack operations may be more like suppression of enemy air defenses (SEAD) than defensive counterair. As noted in the XORFS attack-operations road map, "Because air and space forces are inherently offensive and yield the best effect when so employed, **OCA is often the most effective and efficient method for achieving the appropriate degree of air superiority.** *This function consists of operations to destroy, neutralize, disrupt, or limit enemy air and missile power as close to its source as possible and at a time and place of our choosing* [emphasis in original]. . . . The aircraft and missile threat may include fixed- and rotary-wing attack aircraft, reconnaissance aircraft, unmanned aerial vehicles, air-, land-, and sea-launched *cruise missiles, ballistic missiles* [emphasis added], and air-to-surface missiles" (46–47). Gen Ronald R. Fogleman noted that attack operations are offensive because

> pre-emptive precision strikes against point targets and application of denial weapons will greatly hinder near-term enemy TBM activity. Meanwhile, lethal precision attacks against the TBM support tail will undercut the enemy's ability to sustain long-term ballistic missile operations. . . . If the enemy succeeds in launching a mobile TBM, detection of the launch event will key our attack operations. We will capitalize on the inputs from overhead and surface sensors, special operations forces, JSTARS, AWACS, Rivet Joint aircraft, U-2s and unmanned aerial vehicles—uninhabited aerial vehicles. Those inputs will identify the launch point and cue Air Force and other service assets for time-critical strikes on the enemy TEL.

See Fogleman, "The Air Force Role in Theater Ballistic Missile Defense," remarks delivered to the American Defense Preparedness Association / National University Foundation Breakfast Seminar Series on Missile Defense, Counter Proliferation, and Arms Control, Washington, D.C., 16 June 1995.

61. According to JP 3-01.5,

> the joint force air component commander (JFACC) plans for the theater / joint operations area-wide attack operations effort. The JFACC is also responsible for executing attack operations outside other components' areas of operations (AOs). Component commanders are normally designated as supported commanders for attack operations inside their AOs [sidebar]. **The JFC will normally assign responsibility for the planning and execution of JTMD attack operations outside the other component commanders' AOs to the JFACC.** Since the location of these AOs may change with the maneuver of forces or with changes in JFC guidance, **the JFACC should also plan for and maintain visibility on the theater / joint operations area (JOA)-wide attack operations effort.** This will ensure the JFACC is prepared to support the other component commanders when, for example, they request JFACC support in conducting JTMD attack operations within their AOs. **Inside their AOs, component commanders are normally designated as supported commanders for attack operations** (emphasis in original) (xi).

See also JP 3-01, II-1: Joint publications affirm that the JFACC is "normally the supported commander for counterair."