U.S. Air Force and naval aircraft fly over USS *Abraham Lincoln*, USS *Kitty Hawk*, and USS *Ronald Reagan* carrier strike groups during exercise in Philippine Sea

U.S. Navy (Todd P. Cichonowicz)

Delivering Air Sea Battle

By MARK P. FITZGERALD

Reminiscent of the capabilities in a Tom Clancy novel, the Services have teamed together to deliver a new concept of operations called Air Sea Battle (ASB). Chief of Naval Operations Admiral Jonathan Greenert and Chief of Staff of the Air Force General Norton Schwartz have provided in their recent article[1] an excellent high-level look at the challenges they face, yet many questions remain about the concept of operations and the programs that will underpin this effort.

For the first time since the Cold War, the Services have a chance to design coherent, interoperable capabilities against a common, agreed upon challenge. Getting the requirements correct will be vitally important to our national defense. While ASB and the higher level Joint Operational Access Concept counter–antiaccess/area denial (A2/AD) strategy will be the yardstick against which future programs will be funded, this ASB imprimatur must bring with it capabilities that are interoperable and networked and that hold entire enemy capabilities at risk. It is not clear that current programs are moving in that direction.

Free access to the maritime commons remains the foundation of our maritime strategy. However, the growing threat from long-range antiship ballistic missiles—such as the Chinese DF-21D, long-range cruise missiles such as the Chinese DH-10, advanced combat aircraft such as the Chinese J-20 or Russian PAK-FA, and improved mobile ballistic and air defense missiles including the Russian S-300/400/500 and Chinese HQ-9 variants—allow potential adversaries to threaten our naval and air freedom of movement hundreds of miles from an adversary's shore from bastions deep inside its territory. While the United States may never fight China or Russia,

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the inevitable proliferation of these types of systems to many other countries increases the threat to the maritime commons and to our allies and partners. A2/AD attempts to deny freedom of strategic mobility as well as the ability to hold any target at risk, anywhere and anytime within the denied battlespace. The response to these threats has to be multidimensional and provide the necessary "offense-in-depth" to hold all enemy capabilities at risk.

The Services have shown that they can work together in the air defense and strike warfare missions, but this has been accomplished largely through the use of uncontested rear area bases both afloat and ashore. How will the United States fare against an enemy that has learned the lessons of America's power projection advantages and is determined not to let us have that advantage in the future? I believe there are three aspects to this future challenge that must be examined to define the systems and architecture that will provide "networked, integrated, attack-in-depth" capabilities and ensure the force can operate in this new environment.

First Challenge: Countering the Missile Threat

A large salvo of ballistic and cruise missiles against our land and sea bases has the potential to deny us the advantages we have used in the past to win. The fact that launchers and delivery aircraft can be hidden deep in enemy territory far from our air/sea umbrella demands new capabilities to reduce salvo size and accuracy. In some cases, an adversary can leverage political and geographic factors to allow a mix of high- and low-tech systems to prevent U.S. forces from conducting "business as usual" air-centric intervention operations from nearby bases and seas. To counter this threat, persistent intelligence, surveillance, reconnaissance, and strike (ISR-S) systems will be required to operate at significant range from land and sea bases to counter efforts to inhibit freedom of navigation and to intimidate the adversary's neighbors.

Missiles provide a means to rapidly and reliably strike airfields, air and missile defense sites, and naval battle groups in the opening minutes of a campaign. For air bases and carriers, the missile strikes are designed to "paralyze" operations for several hours. This allows followup attacks by fixed-wing aircraft and/or cruise missiles to "annihilate" the bases/carriers before critical mission capabilities are brought back online. The key to countering the "paralyze first, annihilate later" doctrine is to operate from ranges beyond the effective reach of the follow-on systems. Systems such as the Air Force Long-range Strike Bomber (LRS-B) and the Navy Unmanned Carrier-launched Airborne Strike and Surveillance Aircraft (UCLASS) are keys to future success. They will enable us to originate far from the adversary's effective radius of action while holding his strategic systems at risk.

Furthermore, countering missile attacks will require dedicated network attack aimed to deceive, deny, disrupt, and destroy enemy networks. It will additionally require electronic and kinetic attack to disrupt targeting solutions on our ships and aircraft as well as enemy command and control. It will require ISR-S capable of locating transporter erector locators and bombers as they uncover, and then destroying them. If the salvo size can be reduced, leaker missiles can be defeated using theater, area, and point defense ballistic and cruise missile interceptors and directed energy weapons systems.

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Disabling adversary bases will not be enough. We will need to track down and kill aircraft on the ground and ballistic missile support systems, which will require rapid, dynamic targeting enabled by persistent ISR-S and enterprise architecture. A dedicated and coordinated effort against these missile/aircraft systems will be required to allow operations against an A2/AD adversary.

Persistent deep strike capabilities are not in our inventory now in the quantities and with the capabilities needed, but the advent of survivable long-dwell systems are in the Planning, Programming, and Budgeting process. However, the requirements and networks for these systems have not been well articulated or particularly stable. Future warfare will demand that these systems operate in the deep battlespace and be capable of linking together with surrogate stand-in jammers, collectors, and weapons to achieve the attack-in-depth envisioned by the Service chiefs. They will have to be tightly coordinated and use each other's capabilities to avoid enemy defenses far from other supporting capabilities. Only then will we be able to hold the entire battlespace at risk. The requirements process for defining these systems must look to the future, not the past, as we bring new capabilities such as LRS-B and UCLASS online.

Second Challenge: Operating in a Highly Contested Electromagnetic Environment

ASB postulates reducing our dependence on satellite communications and Global Positioning System in the future warfighting environment. For systems operating near or over enemy territory, it will be important to find ways to hide or harden within the electromagnetic spectrum. The ability to bring groups of systems together to manage and fight the local tactical battle will be critical to survivability.

The use of self-forming network architectures, both line of sight and wide area networks using surrogate air-breathing satellites and point-to-point laser or radio frequency satellite communications, will be critical to maintaining our network advantage. Regarding missile defense, the battlespace is at risk if our networks cannot survive in this environment. There seems to be little progress in this area, and too many of our systems are unable to communicate with each other. The Office of the Secretary of Defense (OSD) and Services must agree on a communications architecture that provides wide-band and line-of-sight digital networks. Too many systems link into a "cloud"—one without lightning bolts—that has yet to be defined or developed. As new weapons systems have come on line, it has become quickly apparent that the communications architecture is woefully inadequate and well behind the weapons systems' development timelines. Network architecture and systems need to be agreed on and programmed now.

Third Challenge: Providing Long-range Strike against Time-critical Targets in Contested Battlespace

Our current processes in the Air Operations Center (AOC) and the Maritime Operations Center (MOC) rely on operational

command and control to make the correct weapons/target pairing assignment for a target and then deliver the effect. As we have seen in the above two challenges, these operations centers may not have the necessary communications, bandwidth, or reaction time to accomplish this mission in the future battlespace. To the extent that they are either at fixed sites or have large communications signatures, they may be at high risk of attack by enemy long-range precision weapons. We must look at how these tasks will be accomplished from survivable locations/platforms inside the enemy's observe, orient, decide, and act loop.

The future AOCs and MOCs must be tightly linked and able to pass control to forward local area battle managers. New ISR collection methods using time-stamped signal, electronic, electro-optical infrared, and other data will allow rapid target mensuration and prosecution of time-critical targets. Tactical data links must allow for collection, local compilation, and dissemination of the data to the systems within the network. Every system will be a sensor. Assignments to surrogates within the network for enterprise architecture, tactical-level computer network attack, and kinetic attack should be made within this local network. In deep battlespace, this can be done automatically between unmanned systems.

In the future battlespace, the AOC will provide a continuous flow of resources into the fight and *shift* the battle management tasks forward. Providing on-scene aircrew/systems with "mission-oriented orders" and trusting them to implement solutions and adapt as conditions evolve may be less efficient than the highly controlled operations we have conducted over the past two decades against weak opponents. But delegating these tasks forward will require far less real-time, long-range communication and is therefore more robust against enemy network attacks.

Conclusion

ASB is a timely and proper concept that the Services' requirements and acquisition authorities should embrace. To deliver ASB, the shortcomings highlighted above must be fixed soon. Most important will be to quickly define and fund our network architecture and systems. OSD and the Services must come together on this requirement in short order so we fight as a truly networked force.

As we develop our future systems, they will be designed with common functionality to create an attack-in-depth capability to counter the A2/AD threat. A Family of Systems (FOS) tightly integrated and synchronized will be the key to survivability, particularly in the deep battlespace patrolled by unmanned aircraft and surrogates. This FOS will be critical to solving the problems of missile defense, and time-critical targeting must be enabled by a flexible, hardened network that will enable the rapid dissemination of data and near real-time targeting.

Unmanned systems in the deep battlespace will be a critical part of the high-level strategy of providing "networked, integrated, attack-in-depth" capabilities that hold an adversary at risk. We must clearly define the requirement and how these future platforms will perform within the FOS. Too many divergent views currently exist on this requirement.

It will also be important that the concept be properly constructed and that a truly joint solution emerges that Congress understands and supports. As Representative Randy Forbes (R-VA) stated in his article in *The Diplomat*,[2] "Air-Sea Battle will remain incomplete without the enduring political and budgetary support of the Congress. Similar to the role it played in the early 1980s, it will be up to the Congress to ensure the shifting balance of power in the Asia-Pacific region is reversed by properly investing in the capabilities necessary to project power throughout the region." To gain the support of Congress, the ASB concept must be solidly vetted, wargamed, and funded. ASB is too important to the Nation to fail. **JFQ**

NOTES

[1] General Norton A. Schwartz and Admiral Jonathan W. Greenert, "Air-Sea Battle Promoting Stability in an Era of Uncertainty," *The American Interest*, February 20, 2012.

[2] Representative J. Randy Forbes, "America's Pacific Air-Sea Battle Vision," *The Diplomat*, March 8, 2012.

U.S. Air Force (Jason Robertson)

California Air National Guard F-16s, exercise RIMPAC