
A COMMENTARY

DR. RONALD J. KURTH

JAMES J. WIRTZ'S article "A Joint Idea: An Antisubmarine Warfare Approach to Theater Missile Defense" offers a concept for organizing the solution to a growing problem in military operations: defense against theater missiles. That concept is Navy doctrine for antisubmarine warfare (ASW). The basic problem for the Navy in ASW involves the reduction of a suspected target location in a vast ocean area to a localized datum with sufficient criteria to warrant an attack. An ASW unit seldom sees the submarine it attacks. Most often, sound-through active or passive means—is electronically converted to a fix on the target, offering a combination of bearing and distance. Augmenting information may be present—magnetic anomaly detection, for example. In his article, Wirtz assumes that defense against theater missiles is similar to defense against submarines.

The difference in the "battlefield" environment of a submarine and a transporter-erector-launcher (TEL) is immense. ASW surveillance and prosecution operations in peacetime have the important advantage of the principle in international law of freedom of the seas. Furthermore, submarine operations are naval operations of a special kind: they are always secretive and never admitted, and are not responsive to schemes for a control regime that has been basically impossible. Consequently, US naval forces could practice localization procedures in peacetime—against Russian submarines, for example—and not hear much about it. ("Incidents at sea" experience is relevant here.) No

such freedom exists for gaining similar experience in theater missile defense (TMD).

The contrast in wartime for airborne operations in ASW and TMD is even more stark. An ASW aircraft flies over open-ocean areas during submarine search operations with little fear that a lurking submarine can threaten it. Nor does the aircraft normally violate any sovereign territory during its search. The competition between hunter and hunted normally occurs in and over the vast but open and accessible ocean areas. Searching over defended land areas for TELs is a more difficult endeavor.

A locatable object must exhibit characteristics that allow the seeker to differentiate it from its surroundings. The submarine is foreign to its operational environment. As a result, acoustic ASW has many characteristics to exploit—so many that the submarine can be detected when ambient noise exceeds the submarine-generated sounds by orders of magnitude. The cycle leading to this result is straightforward. After scientists identified sound as a potentially exploitable characteristic, they designed equipment to enhance the desired differentiation. At sea, testing established the optimal use of the equipment. Lessons learned at sea became the genesis of a better definition of the exploitable and/or the building of improved equipment, allowing the cycle to perpetuate.

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One should consider other major differences. Technology advanced to make submarines less discoverable, but the march of technology in ASW tended to match progress in submarine development. I do not see developments in TMD comparable to the developments in theater missiles. It did take years to cope with the advances in propulsion and secretiveness offered by nuclear power, but ASW advances occurred. They did so principally because submarines in an open-search environment retain characteristics that make them discoverable: they make noise, their screws cavitate, and their machinery has identifiable frequency characteristics. They generate heat, ocean disturbances, and magnetic anomalies.

What are comparable characteristics of TELs? Except when firing, they are quiet. Furthermore, they are mobile and easily hidden from air and satellite search. Could we search for TELs in any way comparable to open-ocean ASW operations? Can space-based platforms do it? I don't know. As I mentioned earlier, submarines at sea do not fight airborne ASW units, although they may fight surface and submarine ASW units. But ASW operations can be integrated in all three regimes. TMD is still in its infancy in terms of multiregime attack.

The natural state of all objects (man-made or natural) on land is to be at rest on the ground. Many objects share characteristics with TELs, including weight, size, shape, composition, color, density, temperature, and so forth. Differentiation (presumably at some distance) is problematic because the hidden TEL shares the same natural states as its surroundings. When in motion, the TEL is easier to locate because it is in an unnatural

state. After launch, a missile is foreign to its environment and easily detected. A missile in flight currently may be the most—possibly the only—exploitable characteristic leading to a high probability of locating a hidden TEL. The several implications are obvious.

Do I sense in Wirtz's article another example of the Gulf War syndrome: open areas, desert, air superiority easily established, small area, the opponent's relatively backward technology? What if we were looking for TELs in China (vast), Japan (advanced), Vietnam (jungle), Yugoslavia (rugged and covered), and Russia (vast, maybe advanced, and masters of cover)? How would we exercise to assure ourselves of capability? And when would we begin overflight, which could be an act of war? Further, the concepts of special operations presented by Wirtz, I think, are naive. How many times could we put teams into remote, hostile territory for the same mission? I'd go on the first but not the 10th. Decoys and maskirovka would be rather easy.

The discussion of exploiting characteristics of submarines or other things requires consideration of the nature of each characteristic. Some are continuous; some are persistent. All have ranges at which detection becomes difficult. One ideal for ASW is a continuous, nonpersistent (i.e., it doesn't remain after the submarine has passed—unlike a tire track in the mud after a land vehicle has passed) noise source of constant frequency. Exploiting this type of sound required the development of specialized equipment and techniques. Prosecuting other types of energy (acoustic and other) released into the water by a submarine necessitated different equipment and tactics. The nature of the telltale characteristic is critical to the development of the technology to locate a submarine (or a TEL). If the nature of the telltale characteristic for locating a TEL is similar to the nature of one or more acoustic characteristics of a submarine, the development of anti-TEL tactics may be analogous to the develop-

ment of ASW. The bottom line is that this ASW concept may be worth pursuing for its value in integrating an all-source and all-defense concept. But if it becomes techno-

logically feasible, destroying an incoming missile appears to be a much simpler concept.

