

Why are we ignoring the Nautilus?

By Oded Amichai, Ha'aretz, 12 September 2004

Two field trials were held in California on August 26, part of two separate projects in which the United States and Israel are cooperating. In one, which received a great deal of media attention, an attempt was made to intercept an advanced ballistic missile with the use of the Arrow anti-ballistic missile system. In the second, which enjoyed more modest coverage, an attempt was made to shoot down mortar rounds using a ground-based laser system that goes by the name of Nautilus.

The Arrow test failed because of a problem described as "technical," but the laser worked, intercepting and destroying mortar shells fired in single and burst modes.

Israel is leading in the Arrow project, while its role in the Nautilus is minimal. Israel is not involved in any way in a project by Northrop-Grumman - the same contractor that is involved in the Nautilus - to develop an airborne laser (ABL). The ABL is planned to intercept and destroy ballistic missiles from hundreds of kilometers away.

The Arrow system has been declared operational after a series of successful laboratory experiments and before proving its abilities against real targets. In the failed test in California, the Arrow system was meant to distinguish between a missile's warhead and its rocket engine, and this was only partially achieved.

In order for the successful interception of fast ballistic missiles, like the Iranian Shihab 3 or 4, the project will require more development, its spokesmen say. The Nautilus system is still experimental, even if since 2000 it has met with success in tests involving dozens of artillery rounds, rockets, and now also mortars. The Arrow system is the only one of its kind in the world for intercepting ballistic missiles, and it attests to the advanced technological prowess of Israel. The problem with the concept behind the Arrow is not technological but systemic.

The attacking missile uses the force of gravity and its speed naturally accelerates after it reaches maximum altitude. In contrast, the Arrow must accelerate to high speeds against the force of gravity, which requires that massive quantities of fuel be used, making the missile heavy, complicated and expensive. The Arrow system will continuously find itself at a disadvantage in the race of trying to intercept missiles that are faster and more maneuverable, armed with or without multiple, independent warheads. The Arrow will also fail in the test of cost versus value, because the cost of a single Arrow missile, estimated at \$2 million, is much greater than the cost of an attacking missile.

The Nautilus system is tasked for different uses from that of the Arrow and they do not compete with one another. The Nautilus, which intercepts using a ray of light, is not sensitive to the speed of the incoming rounds or the distance from which they were fired. It may provide efficient defense to specific targets against artillery, mortar, rocket, unmanned aerial vehicles, helicopters, attack aircraft and cruise missiles. The system is capable of following the target close to its firing point and intercepting it in a fraction of a second once it emerges through the clouds at distances of as far as 10 kilometers. The cost of firing the laser, estimated in the thousands of dollars, is minimal.

It is puzzling that, despite the fact that Israel has invested more than \$2 billion in the Arrow project, it still hesitates to become involved in the U.S. Army's plans to incorporate the Nautilus into a mobile, operational system. This at a time when Israel lacks a comforting solution against the threats posed by the Qassam rockets that target the residents of the northern Negev, and the long-range rockets of Hezbollah in Lebanon.

Even more puzzling is Israel's total disregard of the inherent potential in the airborne laser, which is a central project in the U.S. against ballistic missiles. The ABL can be an efficient and inexpensive response to the ballistic missile threat. It is efficient against fast and maneuverable missiles, and its chances of scoring a hit are maximal. Its price is low, and its range and ammunition load are great. The laser system can operate at a high altitude against surface-to-surface ballistic missiles and serve as an air defense system against attacking aircraft, in place of anti-aircraft systems and interceptor aircraft.

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