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Israel: Missile Defense Cooperation With the United States

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Summary

The growing number and sophistication of ballistic missile threats in the Middle East has prompted the United States to help Israel develop several missile and rocket defense programs. The centerpiece of these efforts, the Arrow Weapons System, has demonstrated successes in tests and Israel unveiled it to the public on March 14, 2000. Some argue that these efforts cannot guarantee Israel's security, and that Israel's national interests are better served by peace agreements with its neighbors and other measures. Others believe that even if peace agreements are achieved, Israel will need a robust defense. This report will be updated to reflect regional and legislative developments. See also, *CRS Issue Brief IB98028, Theater Missile Defense: Issues for Congress*; and *CRS Issue Brief IB82008, Israel-United States Relations*.

Background

In the mid-1980s, at the height of the Iran-Iraq war, Israel began to perceive a growing potential threat from ballistic missile programs in the region. Iraq was reported to be working to extend the range of Soviet-supplied Scud missiles to enable it to hit Tehran, some 400 miles from the Iran-Iraq border. In early 1988, Israeli concerns about Iraq's missile capabilities were confirmed when Iraq successfully began raining its "Al Husayn" missile – an extended range Scud – on Tehran. At about that same time, Israel tested its own Jericho-2 missile with a range of over 900 miles.

During the 1991 Persian Gulf war, Iraq fired 39 Al Husayn missiles at Israel in an apparent effort to bring Israel into the war and divide the anti-Iraq coalition. Although all the missiles were armed only with conventional warheads and no Israelis were killed as a direct result of the missile strikes, the launches caused panic in Israel. Some observers say that the deployment in Israel of six U.S. Patriot anti-missile batteries substantially eased the panic in Israel, even though subsequent studies found that the Patriot did not

perform as effectively as was initially believed.¹ The positive psychological effect of the Patriots contributed to Israel's redoubling of its missile defense efforts after the Gulf war, according to Israeli defense experts.²

Israel's threat perception escalated yet again in late 1996 when it learned that Iran, with substantial help from Russian entities, was developing a ballistic missile, the Shahab-3, with a range of about 800 miles—capable of hitting Israel if launched from western Iran. Iran flight tested the Shahab-3 on July 22, 1998, although statements by U.S. officials indicated that the missile might have malfunctioned, if Iran's intent was to test it at full range. Despite the apparently inconclusive test, Iran subsequently declared the missile operational and began production. Israel's threat perception was compounded by numerous reports that Iran is working to mount chemical and biological warheads on its ballistic missiles.³

Israel also faces potential threats from missiles acquired or sought by Syria, Libya, Egypt, and Saudi Arabia,⁴ as well from short-range rockets used by the pro-Iranian Hizbollah militia in Lebanon. However, Egypt and Israel have been at peace since 1979, and Syria and Israel have been engaged in peace talks off and on since 1993. Since 1992, Saudi Arabia has participated alongside Israel and other Middle Eastern countries in U.S.-Russian sponsored multilateral regional peace talks.

Program History and Status

The following sections discuss the three major joint U.S.- Israeli missile defense programs.

Arrow Weapons System

The Arrow anti-missile system has emerged as the centerpiece of Israel's missile defense effort. The program grew out of a U.S.-Israel memorandum of understanding, signed in May 1986, that formalized Israel's participation in the U.S. Strategic Defense Initiative (SDI). In 1988, the United States and Israel agreed that Israel, with financial and technical help from the United States, would develop the Arrow program as a means of providing Israel with its own missile defense capability—complementing but remaining independent from that of the United States. The Ballistic Missile Defense Organization (BMDO), the arm of the Defense Department that spearheads U.S. missile defense efforts and coordinates with Israel on the Arrow program, maintains that protecting Israel, long considered the closest U.S. ally in the Middle East, furthers U.S. interests. According to BMDO, the Arrow project contributes to the theater missile defense (TMD) capabilities

¹ Feuerwerger, Marvin. *The Arrow Next Time? Israel's Missile Defense Program for the 1990s*. *Washington Institute for Near East Policy*, paper No. 28. 1991. P. 10.

² CRS conversation with Israeli defense experts. October 6, 1999.

³ Biological Warfare: The Poor Man's Atomic Bomb-Iran. *Jane's Intelligence Review*, March 1, 1999.

⁴ See CRS Report RL30408, *Weapons of Mass Destruction in the Middle East*. January 14, 2000.

of the United States by providing access to test data that allow the United States to learn from Arrow's successes and failures.⁵

BMDO adds that a "paramount objective behind U.S. involvement" in the Arrow is to promote interoperability between U.S. and Israeli systems.⁶ Israel already fields three U.S.-made Patriot anti-missile batteries. The Arrow, which intercepts missiles at a higher altitude than the Patriot, is intended to work with that system to provide a multi-tiered missile defense capability, according to BMDO.

The initial phase of the program was the Arrow experiments program. The second stage was designated the Arrow Continuation Experiments (ACES), which ended with a successful test against a virtual target on September 14, 1998. This progress ushered in the next phase of the program, the Arrow Deployability Program (ADP), which was intended to produce a working prototype. Following Iran's July 1998 test of its Shahab-3 missile, which is faster than the Scud, Israel decided that it would need to deploy three Arrow batteries to provide coverage for all of Israel.

On November 1, 1999, the Arrow-2 passed its most critical test, intercepting a live target missile launched from a vessel at sea. All parts of the system appeared to work well together, including the interceptor, made by Israel Aircraft Industries; the Green Pine radar, made by Elta; and the Citron Tree fire control system, made by Tadiran. On March 14, 2000, Israel unveiled the Arrow-2 in a public ceremony and said the battery would soon have an "initial operational capability." According to observers, Israel is concerned that the Arrow technology needs to be upgraded to handle enemy decoys and more sophisticated missiles, and Israel is discussing with the United States a follow-on program to address these weaknesses.

Some potential U.S.-Israel differences center on Israel's apparent plan to eventually share or export the Arrow to countries such as Great Britain, Turkey, Japan, India, or Jordan. The United States, which must approve any re-exportation of the technology, has thus far dissuaded Israel from discussing the sale of Arrow technology with potential foreign buyers. However, BMDO has said it supports discussing future Turkish involvement in the Arrow program.⁷

Boost Phase/Launcher Intercept (BPI/BPLI)

During 1995-96, the U.S. Air Force analyzed alternatives for a theater missile defense system that could intercept missiles shortly after launch, when they are the most vulnerable. In the first few minutes of flight, ballistic missiles are relatively slow-moving and have bright exhaust gases that can be easily detected and tracked. In June 1997, the United States and Israel began a joint research program to develop a fleet of unmanned aerial vehicles that could deliver weapons that would intercept ballistic missiles immediately after launch (boost phase, BP). The Boost Phase Intercept (BPI) system

⁵ Department of Defense, Ballistic Missile Defense Organization. *Fact Sheet: Arrow Deployability Program*, February 1999.

⁶ Ibid.

⁷ Turkey Adopts Two-Tier BMD Concept. *Jane's Defence Weekly*, February 16, 2000.

under consideration featured an unmanned aerial vehicle made by Israel Aircraft Industries, a missile designed by Rafael Armament Development Authority, and a command and control element made by Tadiran.

In late 1999, apparently because of the complexities of the technology involved and disagreements between the United States and Israel over the potential merits of the system, Israel decided not to move toward full demonstration of the BPI system.⁸ Development of a prototype would have cost about \$500 million between 1998 and 2002.

Although the BPI concept has not been abandoned entirely, Israel is now focusing on a modification of the concept that envisions striking missile launchers – a Boost Phase Launch Intercept (BPLI) system.⁹ Under this concept, an unmanned aerial vehicle would detect a missile launch and then direct an interceptor to destroy the launcher. The Arrow (see above), according to the plan, would destroy the first missile launched. One difficulty with both the BPI and BPLI concepts is that the planned unmanned aerial vehicle might have to hover over the territory of a potential adversary in advance of actual hostilities, which could be viewed as politically provocative. Apparently reflecting the uncertainty of the directions of these programs, BPI/BPLI research was not funded by Congress for FY2000. Nonetheless, the Senate Armed Services Committee, in its report on S.1059 (S.Rept. 106-50), the defense authorization bill for FY2000, directed the Secretary of Defense to study and report on (by February 15, 2000),¹⁰ the feasibility of the BPI or a related system. The Senate report also noted that the ability to “defeat ballistic missiles before and during their launch phase could significantly enhance the security of the United States and its allies...”

Tactical High-Energy Laser Program (THEL)

The THEL program is not intended to intercept ballistic missiles, but rather to destroy short-range rockets, such as those launched by the Russian-made mobile “Katyusha” multiple rocket launcher (25 mile range). During periods of fighting over Israel’s occupation since 1985 of a ten-mile wide “security zone” in southern Lebanon, members of Hizbollah have occasionally used the Katyusha to fire on towns in northern Israel. Israel is concerned that Hizbollah will continue its fight after Israel’s planned withdrawal from southern Lebanon (scheduled for July 2000) if the withdrawal is not accompanied by a broader peace deal with Syria. On the other hand, many observers believe that Hizbollah will abandon armed conflict after Israel’s withdrawal because Hizbollah would have accomplished its key goal of ending Israel’s occupation of south Lebanon.

The THEL is a follow-on to an earlier program, called Nautilus, begun in May 1995 to test the effectiveness of lasers against short-range rockets. In February 1996, the Nautilus program ended with a successful interception of a Katyusha rocket at the U.S. Army’s White Sands missile range in New Mexico. In April 1996, the United States made

⁸ Sirak, Michael. BMDO Says Israel Is Not Expected to Pursue UAV-BPI Demonstration. *Inside Missile Defense*, December 1, 1999.

⁹ Opall-Rome, Barbara. Israel Proposes Mission to Target Missile Launchers. *Defense News*, March 29, 1999.

¹⁰ The report is scheduled to be released in April 2000, according to observers.

a commitment to Israel to help develop the THEL as a successor to the Nautilus program. Technical difficulties and financial disagreements with the prime contractor, TRW, over cost overruns plagued the program in late 1998 and early 1999.¹¹ These problems were ultimately resolved but they delayed testing of the THEL until well into 1999. On December 3, 1999, Israel announced that the THEL had successfully intercepted “a number” of Katyushas in tests at White Sands, and that additional tests would be conducted in 2000 to determine whether to declare the system “operational.”¹² Additional funding would be needed to complete testing and move the first THEL prototype to Israel. Defense experts maintain that Israel would need about 15 THEL batteries to fully defend its northern border. The GAO report, cited above, notes that “Lessons learned from the THEL program will be beneficial if the United States decides to develop a THEL-type system for its military forces.” To protect its own combat formations, the United States would need a mobile version of the weapon, according to the Department of Defense.

U.S. Funding

Congress and successive Administrations have shown strong support for the joint missile defense projects. The following chart depicts U.S. contributions to the three programs, by fiscal year, since U.S. contributions began.

U.S. Contributions to U.S.-Israel Missile Defense Programs
(figures in millions of U.S. dollars)

	90	91	92	93	94	95	96	97	98	99	00
Arrow	52	42	54.4	57.76	56.4	47.4	59.352	35	94.874	46.924	81.65
BPI/BPLI							5.705	24.3	16.385	6.5	
THEL							10	45	61	12.5	10

Source: Figures provided by the Department of Defense, and the American-Israel Public Affairs Committee (AIPAC).

The United States is not shouldering the entire burden of Israel’s missile defense programs. Israel is funding slightly more than half the total costs of the Arrow program, and somewhat lower percentages of the BPI/BPLI and THEL programs.

According to the Department of State, the United States expects to provide Israel with about \$100 million for theater missile defense research out of the \$1.2 billion for Israel contained in Wye Memorandum supplemental funds (appropriated in the fiscal year 2000 foreign aid appropriations, as referenced in the omnibus FY2000 appropriations, P.L. 106-113). However, State Department officials say the breakdown of the Wye monies for specific programs might be subject to change.

¹¹ See General Accounting Office report GAO/NSIAD-99-50 (Defense Acquisitions), Tactical High Energy Laser: Status, Cost, and Technical Challenges. March 31, 1999.

¹² Israel Working on Katyusha Rocket Killer. *Reuters*, December 3, 1999.

For FY2001, the Ballistic Missile Defense Organization has requested \$81.2 million to complete the Arrow Deployability Program and fund the third Arrow battery. No funds have been requested for FY2001 for either the BPI/BPLI or the THEL. Israeli officials have said they want additional U.S. funding for missile defense as part of a broader defense package that would accompany any peace agreement with Syria.¹³

Conclusions

Most observers appear to believe that the existing joint Israeli-U.S. missile programs—particularly the Arrow—will continue to receive support from Congress and the Administration. According to the Administration and language in reports on recent defense authorization and appropriations bills, these programs provide tangible benefits to U.S. theater missile defense programs and help demonstrate the longstanding U.S. commitment to Israel's security. Supporters of the joint programs maintain that this type of U.S. security assistance to Israel gives Israel the confidence it needs in order to offer the concessions required to make peace with its Arab negotiating partners. Some maintain that, if a crisis were to erupt in the region, possession of missile defense could dampen any Israeli impulse to strike its potential adversaries preemptively.

Others believe that the joint programs are of limited direct benefit to U.S. theater missile defense efforts and could be counterproductive if they prompt Israel to act aggressively toward its perceived adversaries. Some maintain that Israeli missile defense will cause potential adversaries in the region to accelerate their missile development programs in an effort to be able to overwhelm Israel's defenses. Israel asserts that its adversaries currently lack the financial and technical resources to be confident that they can overwhelm a layered Israeli missile defense network.

Some question the viability of the missile defense programs by pointing primarily to the technical difficulties and financial burdens—both to the United States and to Israel—of constructing a comprehensive missile defense. Opponents of the Arrow maintain that demonstrating success in tests is far from proving that the system would be effective in a real crisis.¹⁴ Some maintain that Israel has far cheaper and easier alternatives, such as civil defense measures and reliance on a strategy of deterrence. Other critics believe that Israel should concentrate on negotiating a comprehensive peace with its Arab neighbors which, according to this view, could eliminate the need for missile defense. On the other hand, some believe that no peace treaty can guarantee Israel's security and that Israel should pursue as many defense programs as possible, no matter what the outcome of any peace negotiation.

¹³ Marquis, Christopher. Israel's Request for \$17 Billion in U.S. Weapons Stirs Concern. *Fort Worth Star-Telegram*, February 8, 2000.

¹⁴ Heller, Mark. Is the Arrow Really Needed? *Jerusalem Post*, November 5, 1999.

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