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**Israel:
The Economic Impact
of the Defense Industry**

[Redacted]

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An Intelligence Assessment

State Dept. review completed

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*NESA 82-10500
September 1982*

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Israel: The Economic Impact of the Defense Industry

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An Intelligence Assessment

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This paper was prepared by [Redacted]
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This assessment has been coordinated with the
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**Israel:
The Economic Impact
of the Defense Industry**

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Key Judgments

*Information available
as of 15 July 1982
was used in this report.*

Israel's modern and rapidly growing arms industry will undertake a major weapons program over the next 10 years designed to reduce the country's dependence on foreign suppliers and maintain its qualitative edge in weaponry over the Arabs. The major weapons include the development and production of the Lavie jet fighter, improved versions of the Merkava tank, and new combatants for the Navy.

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To reduce the economic burden of this major undertaking Israel will:

- Look to the United States for additional financial assistance.
- Press the United States to facilitate third-country purchases of Israeli military materiel.

Since the Israelis view the modernization program as vital to their national security, they will proceed even if additional US aid is not forthcoming.

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The growing demand for Israel's wide range of high-technology military items and its aggressiveness in the export market should enable Israel to double defense exports by 1985. Small arms, ammunition, communications, and electronic equipment have constituted the bulk of exports, although sales of major military equipment, including the Kfir aircraft, account for an increasing portion. A general relaxation of US restrictions on Third World transfers of items incorporating US technology would improve Israel's position in the foreign marketplace.

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Building and maintaining Israel's military capability has absorbed a large part of the government's resources, contributing to budget deficits that play a major role in causing triple-digit inflation. Even with increased exports and US assistance, Israel will continue to divert substantial funds to the military from the civilian sector. As a result, the economy's ability to sustain real growth in the future will be increasingly limited.

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**Israel:
The Economic Impact
of the Defense Industry**

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The Israeli Government is undertaking an ambitious arms development program that includes the domestic production of a new fighter aircraft, an improved main battle tank, and new combatants for the Navy. Such a program is immensely costly and will severely test the country's research and development capabilities. The Israeli Government can be expected to push for increased assistance from the United States and to exploit the overseas market for sales of its defense products to help pay for this program. We believe the Israelis will proceed with their plans even if additional US aid is not forthcoming because they believe it is vital to their national security.

major weapons systems for its armed forces (see appendix). This effort will help Israel maintain its qualitative edge in weaponry over the Arabs and increase the technological base of its defense industries. Major weapons programs designed to help Israel achieve this goal of self-sufficiency and promote growth in its defense industries include the multi-billion-dollar Lavie fighter aircraft project, continued production of the Merkava tank for the armored forces, and an ambitious shipbuilding effort for the Israeli Navy. Israel will also continue to develop the defense industry's capability to produce a host of high-technology communications equipment, electronics, and other sophisticated weapons for export.

The Israeli Government's involvement in the defense industries ensures that sufficient resources are allocated to allow them to grow and that their products respond to Ministry of Defense requirements and the needs of the Israel Defense Forces (IDF). Israeli defense industries wholly owned by the government include Israel Aircraft Industries (IAI), Israel Military Industries (IMI), Bet Shemesh Engines Limited, and Israel Shipyards. They account for most of the military equipment produced in Israel. Exports by IAI and IMI alone amounted to three-fourths of total foreign defense sales in 1981. There are also hundreds of privately owned defense-related companies and contractors that contribute to Israel's overall defense production.

We believe the Israelis want to reduce their dependence on the United States for finished military equipment. Most of the IDF's current inventory of equipment—aircraft, tanks, artillery, and other sophisticated weapons—has been supplied by the United States. When US equipment is purchased, the Israelis must agree that it will be used only for defensive purposes. The Israelis maintain this limits their freedom to conduct preemptive military actions, a basic part of their military philosophy. US aircraft deliveries were suspended for several weeks in 1981 in the wake of the Israeli attack on the Iraqi nuclear reactor in which US-supplied planes were used, and deliveries of cluster munitions are currently suspended because of the use of cluster bombs in Lebanon.

Israel's arms industry is capable of producing a wide range of weapons from the basic to the relatively sophisticated. The economic feasibility of producing sufficient quantities of major military items to supplant a significant portion of imported military equipment is constrained by limited research and development capabilities, the level of military exports, and the amount of financial and technical assistance that the United States is willing to provide.

Economic Parameters

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Total military and economic aid provided by the United States has amounted to \$21 billion—almost half in grants and the bulk of the remainder in concessional or long-term loans. This aid has enabled the Israelis to develop a fighting force qualitatively much superior to those of the Arabs. At the same time, Israel has developed a European standard of living for its citizens; per capita GNP last year was \$5,250—on a par with Italy and Spain.

Key Production Goals

Israel's primary goal for its defense industry during the next 10 years, according to Defense Minister Sharon, will be the development and production of

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Table 1
Major Israeli Defense-Related Industries ^a

Firm	Functions	Employees	Ownership and Affiliation
Koor Industries ^b Electric & Electronics Co., Ltd. Eltek, Ltd. Keren Electronics, Ltd. Koor-Babcock, Ltd. Koor Systems, Ltd. Meeda Scientific Instrument, Ltd. Penguin Electronics Industries Telkooor Telrad Telecommunications and Electronic Industries, Ltd. Koor Metals, Ltd. Agan Engineering Works Gichner Ramin, Ltd. Hamat Engineering Merkavim Metal Work, Ltd. Vulcan Engineering	Largest industrial enterprise. Building materials, chemicals, advanced metals, pharmaceuticals, electronics, and diamonds	26,200	Comprises 60 major production and 30 commercial companies. Of this total, 40 are wholly owned by Koor (which in turn is owned by the nongovernmental Israeli Labor Federation), and 50 are owned partly by Koor and partly by other firms—foreign and Israeli.
Israel Aircraft Industries, Ltd. (IAI) Aircraft Manufacturing Division Bedek Aviation Division Elta Electronics Industries, Ltd. Engineering Division Golan Metal & Electronics Industries, Ltd. MBT Weapon Systems Orlite Engineering, Ltd. Precision Mechanisms, Ltd. Ramta Systems and Structures Division Servo Hydraulics, Ltd. Taman Precision Instruments Industries Turbochrome, Ltd.	Everything from design, development, and manufacturing of parts and components to production of total systems—aircraft, missiles, boats, and ground equipment	22,500	Israeli Government
Israel Military Industries (IMI) ^c Ammunition Division Central Laboratory Chemical Division Forging Division Plant Operations Rockets Division Small Arms Division	Small arms, ammunition of all types, ^d aircraft cannon, rockets, and bombs	14,500	Israeli Government
Tadiran Israel Electronics, Ltd.	Largest electronics developer and manufacturer; 50 percent of sales is communications equipment	8,000	50 percent US (GTE Sylvania) 50 percent Israel (Koor Industries)
Soltam	Ground forces equipment, including artillery; specializes in design and production of mortars, associated ammunition, and sights	1,800	50 percent Finland (Tampella) 50 percent Israel (Koor Industries)

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Firm	Functions	Employees	Ownership and Affiliation
Elbit Computers, Ltd.	Computers, displays, and training simulators; 50 percent of sales is commercial computer products, minicomputer systems, and terminals; 50 percent of sales is military systems, primarily to Israeli Government	1,400	55 percent US (Control Data Corporation) 45 percent Israel (Elron)
Israel Shipyards, Ltd.	Civilian and military ships	1,000	Israeli Government
Motorola Israel, Ltd.	Communications equipment and command and control systems	1,200	US (Motorola, Inc.)
AEL Israel, Ltd.	ECM, EW, and SIGINT equipment; 40 percent of sales is commercial communications switching equipment produced under license from Siemens/West Germany; 60 percent of total output is for electronic warfare systems	800	37 percent US (American Electronic Laboratories), 37 percent Swiss bank and Siemens of West Germany, 26 percent Israel (Tadiran—see above for ownership)
Bet-Shemesh Engines, Ltd.	Jet engines and parts and castings	1,000	Israeli Government
Israel Electro-Optical Industry (ELOP)	Gunsights, cameras, rangefinders, head-up displays, and night-vision devices	750	50 percent Dutch (NV Optische Industries), 50 percent Israeli Government
Ormat Turbines, Ltd.	Turbogenerators for telecommunications	Unknown	France (Turbomeca)

^a An industrial conglomerate named CLAL, composed of 180 companies and 12,000 employees, is one of the largest Israeli enterprises in the defense field. It is not included in this list because, apparently, only a small percentage of its work is defense related; information on the names of the associated companies is incomplete; and ownership of the firms under the CLAL rubric has in most cases been impossible to determine.

^b Although Koor Industries is Israel's largest industrial enterprise, a majority of its output is not defense related.

^c IMI is made up of 12 major government-owned plants producing hardware and more than 200 small nongovernmental establishments producing parts.

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Israel's defense effort has not been without cost. The most important has been the diversion of investment to the military from the civilian sector. As a result, the economy's ability to sustain growth in the future is increasingly limited. Without new investment in plant and equipment, the economy's productive capacity will remain stagnant. Moreover, government outlays for defense have increased the budget deficits—a major factor in Israel's setting the world's highest inflation levels in recent years.

Exports. Exports are necessary to reduce the economic burden of Israel's arms industry. It has become increasingly dependent on foreign military sales to offset constantly rising research and development costs. Because of the relatively short production runs on major items of military equipment, an aggressive export program is needed to help offset the large capital investments and high overhead involved in the production process.

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The Israelis have also been marketing their military equipment abroad to earn foreign exchange to pay for imported materials and weapons. Roughly half of the components used in domestic defense production are purchased abroad, which added an estimated \$720 million to the 1981 import bill. Export revenues help cover the cost of weapons purchased from Western Europe—usually about \$250 million a year. [redacted]

According to data provided by Israel to US officials, foreign sales of Israeli-manufactured military equipment have risen from \$400 million in 1977 to an estimated \$1.2 billion in 1981. Small arms, ammunition, communications and electronic equipment, as well as obsolete military equipment, constitute the bulk of the exports. Sales of major military equipment, however, account for an increasing portion of the total sales volume. [redacted]

Nearly one-third of Israel's total military export sales in 1981 were manufactured by Israel Military Industries. IMI's reported export sales of \$350 million amounted to 70 percent of its total business last year. A sales leader for IMI was its highly successful M-111 tungsten antitank ammunition. [redacted]

IMI has also found a growing market for its Uzi submachineguns, and the Israelis report that they sold 60,000 of these weapons in the United States alone last year. According to the Israelis, exports by Tadiran, a manufacturer of high-technology electronics equipment and remotely piloted reconnaissance drones, climbed from 6 percent of total sales in 1977 to over 40 percent of its \$340 million total sales in 1981. [redacted]

Latin America has become Israel's prime market for military exports—followed by Europe, Asia, and Africa. Sales of Israeli-manufactured military equipment have included the Arava transport aircraft—now in the inventories of eight Latin American countries—Dabur patrol boats, Gabriel antiship missiles, Shafir air-to-air missiles, and substantial quantities of automatic weapons. Israel recently sold 12 Kfir fighter aircraft to Ecuador after receiving US approval for

third-country export of the US engine used in the plane. It was the first foreign sale of the Kfir, and deliveries began in late March. This sale, reportedly for \$196 million, could open up additional sales to other Latin American countries of the IAI-produced aircraft. [redacted]

The key limiting factor for exports of Israeli-manufactured military equipment, in addition to intense competition, has been US Government restrictions on third-country transfers of items manufactured under US license or incorporating US technology. With US permission to sell the Kfir to Ecuador, the Israeli Government hopes that the door will be opened to US consent to future Kfir sales. Israel also would like the United States to allow the use of Foreign Military Sales (FMS) credits by Third World countries for purchasing Israeli-manufactured military equipment. Another factor limiting Israel's exports is the reluctance of some Third World countries to purchase high-visibility military hardware from Israel because of their economic ties with Arab oil producers. [redacted]

The demand for Israel's military equipment is growing. Israel's increased capabilities in the production of high-technology military items and the growing demand for this equipment will serve to boost foreign sales. The market for Israeli-produced equipment will be enhanced because its effectiveness in combat was demonstrated in Lebanon. The picture would brighten for Israeli military exports even more if the United States permits Third World transfers and assists the Israelis in their exports to the US market. [redacted]

Unlike past years, the government may be able to increase future defense exports by at least enough to cover increased military imports and higher debt servicing on defense loans. If the Israelis succeed in promoting sales of their military equipment to the extent we believe likely, export revenues together with current levels of US FMS funds would outstrip

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Table 2
Israel: Foreign Sales of Military Equipment by Selected Firms
as a Share of Total Sales, 1981

Million US \$

Selected Defense Firms	Major Products	Total Sales	Foreign Sales	Percent
Total		1,716	1,079	63
Israel Aircraft Industries (IAI)	Kfir fighter aircraft Arava transport aircraft Gabriel antiship missile Shafir air-to-air missile Picket antitank missile Scout mini-RPV Radar/electronic warfare equipment	800	575	72
Israel Military Industries (IMI)	M-111 antitank round B-300 antitank rocket 52-mm to 120-mm mortar ammunition Galil and Uzi automatic weapons	500	350	70
Tadiran Israel Electronics, Ltd.	Mastiff mini-RPV Electronics equipment	340	136	40
Motorola Israel, Ltd.	Communications equipment	45	18	40
Israel Electro-Optical Industry (ELOP)	Laser rangefinders Gunsights Avionics Night-vision equipment	31	NA	NA

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military-related foreign exchange outlays by several hundred million dollars. This money could be used, for example, to defray some of the development costs for the Lavie program. [redacted]

Investment. By investing large sums of money in the arms industry on the part of both the government, through its wholly owned companies, and the private defense-related companies, resources available for civilian plant and equipment and housing have been less than otherwise possible. Plant and equipment investment for industry fell at an annual rate of 2 percent between 1975 and 1981. Investment for defense purposes cannot be broken out separately, but investment by civilian firms must have declined at a greater rate since defense industries continued to expand. Investment in housing, which is in very short supply in Israel, fell at an annual rate of 3 percent. [redacted]

The heavy government involvement in the defense industry ensures that sufficient funds are available to finance the plant and equipment required to produce

weapons. The government directly funds some of this investment, which, to the extent that it is covered by government borrowing, diverts money that would otherwise be available on the capital market. Defense industries that compete for loans—monetary policy is carried out by setting credit limits to Israeli banks—have an advantage; we believe that bankers assume the government will bail out any defense-related firm in financial difficulty. Since officials of defense industries know that they can probably count on government support, they can afford to take greater risks on expansion. [redacted]

Government Budget. Building and maintaining Israel's military capability has absorbed a large part of the government's resources. Roughly one-third of the budget in recent years has been allocated to defense, and the proportion has been even greater during and immediately after periods of conflict—half of the FY 1973 (April to March) budget was spent on

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Table 3
Israel: Foreign Exchange Requirements for Defense

Million US \$

	1977	1978	1979	1980	1981 ^a	1982 ^b	1983 ^b	1984 ^b	1985 ^b
Gross foreign exchange requirement	987	1,153	1,202	1,415	1,792	1,404	1,639	2,261	2,316
Self-financed military imports	210	293	250	250	497	-141	-76	396	306
Military import payments	1,325	1,690	1,420	2,018	2,404	2,055	1,958	2,133	2,014
US FMS aid ^c	1,115	1,397	1,170	1,768	1,907	2,196	2,034	1,737	1,708
Total debt service	357	390	482	525	575	645	715	765	820
Interest on defense loans	192	220	302	340	400	515	605	685	750
Principal repayment	165	170	180	185	175	130	110	80	70
Indirect defense imports	420	470	470	640	720	900	1,000	1,100	1,190
Defense exports	400	555	640	730	1,200	1,600	2,100	2,300	2,500
Net foreign exchange requirement	587	598	562	685	592	-196^d	-461^d	-39^d	-184^d

^a Estimated.

^b Projected.

^c Includes Sinai redeployment aid.

^d Minus sign indicates a surplus.

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defense, and its share remained nearly 40 percent over the next three fiscal years. With the end of the redeployment from Sinai and the defense cuts accepted by Defense Minister Sharon, the share of the budget for the military approved for FY 1982 would have dropped to 27 percent. With the invasion of Lebanon, however, this has fallen by the wayside; Israeli officials have already acknowledged the need for a supplemental budget. [redacted]

Purchases from the defense industries contribute to the government's deficits—\$2.7 billion in FY 1981. While most direct military imports are funded by US aid, principal and interest payments on the loan portion of the aid and borrowing to finance past deficits—30 percent of budget outlays—add to the present deficit. These budget deficits contribute to Israel's triple-digit inflation. [redacted]

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Information concerning the financial arrangements between the government and the defense industries, particularly IAI and IMI, is closely held. While IAI and IMI, as government enterprises, are required to adopt policies on the basis of economic criteria, the government can and does provide economic inducements to carry out the development and production of items that meet the IDF's military requirements. Approximately one-third of the government's defense budget is allocated for domestic purchases and construction; a major portion of these funds probably is spent on goods produced by the defense industries. [redacted]

Attempts by previous finance ministers to reduce government expenditures have foundered because other defense ministers have been able to block cuts in the traditionally sacrosanct defense budget, including procurement from the defense industries. As a result, officials in these firms had become reasonably confident that the government would follow through on weapons procurement once the decision to produce had been made. Sharon, however, has broken with the past and pursued spending cuts; before the invasion of Lebanon domestic defense spending was to have been cut by 2.3 percent in real terms for FY 1982.

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Table 4
Israel: Defense Expenditures ^a

	1976	1977	1978	1979	1980	1981	1982
Defense (million US \$)	4,211	3,948	3,293	4,330	4,834	5,826	5,000
Total government budget (million US \$)	10,350	11,545	11,238	14,070	15,491	18,776	18,269
Defense share (percent)	40.7	34.2	29.3	30.8	31.2	31.0	27.4

^a Fiscal year, 1 April–31 March.

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Although Sharon has given the go-ahead for the Lavie after stopping work for several months, the delay has probably led to concern on the part of top-level defense industry officials that Sharon, who has not been part of the close-knit defense establishment, would suddenly halt a project after large sums of money had been invested. [redacted]

With defense and debt servicing slated to receive more than half of the budget, the remaining funds are allocated for such things as welfare, education, and development projects. These social services have traditionally been target areas for budget trimming since servicing the debt is a legal obligation and cutting defense had proved impossible. With Sharon's help in cutting the defense budget, Finance Minister Aridor is getting grudging support from other ministers to keep the lid on social spending. [redacted]

Employment. Although defense industries employ less than 5 percent of the civilian labor force, a disproportionate share of this manpower is highly skilled. These workers would have difficulty finding jobs in the civilian economy because their training is highly specialized and geared to military requirements. Concern that aircraft engineers and technicians, now involved in the nearly completed production of the Kfir fighter, would emigrate is one of the factors involved in the recent decision to proceed with the Lavie aircraft project. [redacted]

There is a consensus in Israel that has evolved from the original Zionist work ethic that the government

should provide an economic climate that gives job opportunities to everyone who wants to work. We believe that an unemployment rate higher than 5 percent—it averaged 5.1 percent in 1981—is considered by most Israelis to be unacceptable. Israel has a relative abundance of skilled workers who have been hardest hit by unemployment. One of the major arguments by officials of defense companies against any cutback in procurement from domestic defense industries is the unemployment or emigration that could result. [redacted]

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Implications for the United States

Israel looks to the United States for the bulk of its aid largely because there are no other countries willing to provide large sums of money and because the United States makes available almost the full range of its military technology. There has been a public debate in Israel, however, over the wisdom of relying too closely on US aid, and a vocal minority has argued in the Israeli press that more effort ought to be directed toward achieving self-sufficiency. We believe most Israelis recognize that they have little choice but to look to the United States if Israel is to maintain its qualitative superiority. [redacted]

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The Israeli Government will point to the costs of enhancing its defense capabilities to justify additional aid on better terms. The United States is currently providing \$1.4 billion in regular FMS credits and

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proposes to increase this to \$1.7 billion in FY 1983; additional FMS aid is being provided for the Sinai redeployment. Israel is required to spend this money on US military equipment or technology. In addition, Israel receives \$785 million in economic aid that could be used for military purposes since the only requirement is that Israel import civilian goods from the United States of equivalent value. [redacted]

A portion—\$500 million annually—of the FMS credits that Israel receives does not have to be repaid. The remaining loans have a 30-year term with a 10-year grace period on principal. Military loans carry the same rate of interest as the US Treasury is paying on the date of disbursement. Economic aid has been entirely in grants during the past two years, but the proposal sent to Congress for FY 1983 would restore the previous terms of two-thirds grant and one-third loan. [redacted]

To help fund Israel's defense plans, Prime Minister Begin's government has made a number of proposals to the United States aimed at reducing debt servicing and increasing defense exports. It wants the United States to:

- Provide all economic aid as grants.
- Restore the share of FMS credits that does not need to be repaid to 50 percent—the proportion prior to FY 1981.
- Provide military loans at concessional interest rates as an alternative to increasing the forgiven share.
- Assist in promoting Israeli military exports to the Department of Defense and US defense contractors, with a target of \$200 million annually.

- Provide an additional \$150 million annually in FMS credits that could be spent on the defense industry in Israel. (A precedent was set when Israel was allowed to use \$107 million in FMS funds for development and production of the Merkava in 1977.)

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- Allow third countries to use a portion of their FMS funds to buy military equipment from Israel. [redacted]

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The Israeli Government will push for increased aid even though the additional foreign exchange may not be needed in the near term if its effort to exploit the overseas arms market is successful. It does not want to rely on an unpredictable export market, preferring to have an assured flow of US funds. Moreover, it sees US aid as a measure of US willingness to support Israel and as a way of substantially reducing the burden imposed by the defense industries on the civilian economy. [redacted]

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Major Israeli Weapons Programs

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The Lavie Aircraft

Defense Minister Sharon decided in February to proceed with the development of the Lavie (Lion) fighter aircraft. Israel Aircraft Industries (IAI) has been working on the design and development of the Lavie since at least mid-1979, having persuaded the Ministry of Defense that it could produce a new generation fighter equal to one available from the West. The Lavie will be lighter and more maneuverable than the F-16, and, although designed primarily for a low-level ground attack mission, it will also have an air-to-air combat capability. [redacted]

IAI plans an initial production run of 300 Lavies for the Israeli Air Force with delivery scheduled to begin in 1991. The Air Force plans to replace its aging A-4s and some of its Kfirs with the Lavies, and the first Lavie squadron could be operational by 1992. We estimate that the Air Force's inventory in the late 1990s could include the 300 Lavies, 150 F-16s, 50 F-15s, and 100 upgraded F-4s. [redacted]

The Israelis are considering the production of 400 additional Lavies for export. Competition from Western aircraft likely to be available on the market in the next 10 years could hurt foreign sales of the Lavie, essentially a product of 1970s technology. While there is a growing market for Israeli aircraft in the Third World, as recent sales of the Kfir fighter have shown, Israel's plan to sell 400 Lavies abroad would appear to be no more than wishful thinking. [redacted]

In November 1981 Sharon ordered IAI to suspend all planning and contractual negotiations on the Lavie in order to allow the government to reassess the program. The Israelis considered alternatives to the Lavie program, including coproduction of the US F-16 or F-18 and the purchase of an additional 250 F-16s. They concluded that the Lavie could be produced at less cost—an estimated \$10.5 million per plane—than the F-16, which costs about \$15 million. Even if the costs were the same, the Israelis would

still have given the green light to the Lavie because it would boost their domestic defense industry. The Lavie program would sustain employment of thousands of workers in the aircraft industry, and the talents of hundreds of highly skilled engineers and technicians could be retained. A domestically produced aircraft would also give Israel greater independence in its use; if a market can be found, export sales would help defray some of the costs. [redacted]

The primary obstacle to Israel's production of the Lavie is the immense cost of design and development of the aircraft. These costs have risen from an estimated \$600 million in mid-1980 to the current estimate of \$1.1 billion. Lacking sufficient funds for development of the Lavie in the defense budget, Israel is seeking increased technical and financial assistance from the United States. This assistance could come from coproduction, offset agreements with US aircraft manufacturers, or the use of Foreign Military Sales (FMS) funds. Israel has already requested the conversion of \$100 million in FMS credits to purchase products for the Lavie program. Israel has also suggested, as one of its arguments for US aid, that the US Air Force adopt the Lavie as a multipurpose trainer in the 1990s. [redacted] 25X1 25X1

Israel must now decide whether IAI will produce most of the airframe, engine, and avionics for the Lavie or enter into a massive coproduction program with a US aircraft manufacturer. [redacted]

[redacted] Israel signed a licensing agreement in early February with the US firm Pratt and Whitney to manufacture the PW1120 engine for the Lavie at Israel's recently expanded Bet Shemesh engine plant. Discussions with US manufacturers are still under way, and proposals are being formulated for the coproduction of Lavie

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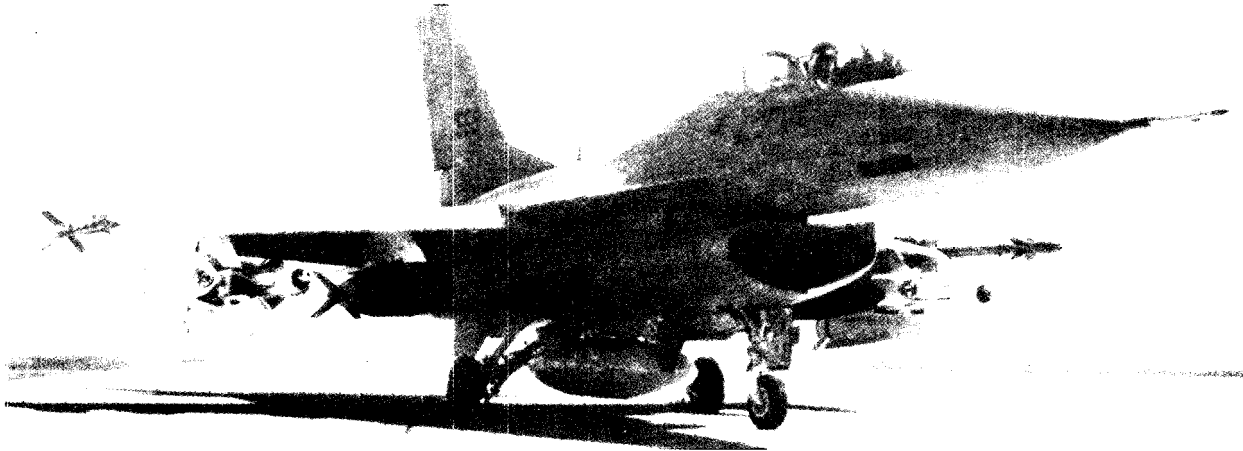


Figure A-1. US F-16.

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Figure A-2

Estimated Lavie Aircraft Development and Production Timetable

Key Milestones	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Prototype Development												
• Preliminary Design	→											
• Prototype Design and Manufacturing		→										
• Prototype Flight Tests				▲▲▲▲▲								
Series Production												
• Pre-Series Production				→								
• Flight Tests							▲▲					
• Low-Rate Series Production								→				
• High-Rate Production and Delivery of Series Aircraft										→		

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components or provision of offsets by US firms in exchange for Israel's agreement to purchase additional US fighter aircraft. The primary candidates for partnership in the Lavie program are General Dynamics, manufacturer of the F-16, and McDonnell

Douglas, builder of F-15s and F-18s. Northrup, which manufactures the F-18L and F-5G, apparently has been edged out of the race because the F-5G would be a major competitor of the Lavie in the export market.

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Figure A-3. Israeli 56-ton Merkava tank. [redacted]

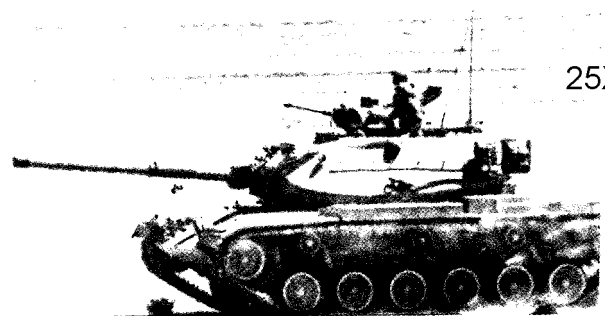
Camera Press ©

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Merkava Tank

The Merkava (Chariot) is the first main battle tank developed and produced by Israel for the Israel Defense Forces (IDF). Production of the tank, over 50 percent of which is manufactured in Israel at government-owned facilities, will probably continue through the 1980s. A follow-on model, the MARK-II, is scheduled for production by late 1983, and development of an updated MARK-III is already under way. Production of the MARK-III is expected to begin by the late 1980s. [redacted]

Future purchases of US M-60s by Israel could be cut back considerably as Merkava production increases, and production of the MARK-III, possibly beginning as early as 1986, could obviate major purchases of the US M-1. Based on the current estimated Merkava-I production rate of 80 per year and a rate of 125 tanks per year for the MARK-II and MARK-III, Israel could have over 1,000 Merkavas in its inventory by 1990. [redacted]



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Figure A-4. Israeli M-60A1 tank. [redacted]

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Since the first tanks rolled off the assembly line in December 1979, more than 200 Merkavas have been deployed with Israeli armored units. The IDF is very enthusiastic about the tank's performance and expects

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Table A-1
Comparison of Main Battle Tanks

	Merkava		M-60	M-1	T-72	Leopard-II	Improved Chieftain
	Mark-I/II	Mark-III					
Producer	Israel	Israel	US	US	USSR	FRG	UK
Combat weight (kilogram)	56,000		49,000	54,000	41,000	55,000	58,000
Engine (horsepower)	900	1,200/1,500 (turbine)	750	1,500 (turbine)	750	1,500	1,200
Main armament (millimeter)	105	120	105	105	125	120	120
Ammunition on board (rounds)	65		63	55	40	42	64
Maximum road speed (kilometers per hour)	40	50	48	72	80	72	48
Cruising range (kilometers)	400	600	500	450	500	550	500
Crew size	4	4	4	4	3	4	4

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to make it the mainstay of the armored forces. With the flexibility of being able to modify and make improvements to the tank while it is in production, Israel can build a tank ideally tailored to the IDF's needs. [redacted]

manufacture of the Merkava. The Merkava's 105-mm main gun is manufactured by IMI, its laser range-finder is made by ELOP, and the turret is cast by Urdan. [redacted]

25X1

25X1

The Merkava-I is the equivalent of the US M-60 in size and firepower, but, with a larger engine, improved armor, and other innovations, it outperforms the M-60 and has greater survivability. Each Merkava reportedly costs over \$1.6 million to produce, approximately half of which is in US equipment or materials, including the tank's Continental 900-horsepower (hp) diesel engine, transmission, and armor plate. If the more than \$200 million in development and tooling costs reportedly spent by Israel during the last 10 years on the tank is excluded, the cost of each Merkava comes to a little over \$1.2 million. Using this figure, the Merkava is less expensive than the US M-60, which has a price tag of \$1.4 million. Forty Israeli defense contractors and 200 smaller suppliers, employing over 5,000 people, are involved in the

To keep pace with the new generation of main battle tanks, major changes and improvements are planned for subsequent models of the Merkava. MARK-II will have the same 900-hp engine as the Merkava-I but will have an improved transmission and special armor claimed to be 100 percent more effective than the armor on the current Merkava. The MARK-III, still on the drawing boards, will have a 1,200-hp engine, improved suspension, and a 120-mm main gun, making it equivalent to the US M-1, West German Leopard-II, and British Chieftain tank. Israel is also considering the possibility of producing, with a US firm, a gas turbine engine for the MARK-III similar to the 1,500-hp turbine in the M-1. [redacted]

25X1

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25X1

Figure A-5. Israeli Flagstaff-II hydrofoil.

Naval Shipbuilding

The Israeli Government is expected to provide \$25 million over the next few years to improve and expand the capacity of Israel Shipyards in Haifa. Israel's plans to modernize its Navy and increase the size of its guided missile patrol boat fleet during the 1980s will be a major shot in the arm for its domestic shipbuilding industry. Israel Shipyards hopes to produce a new 850- to 900-ton guided missile corvette currently under development for the Navy, as well as a hydrofoil missile attack boat of US design. The

shipyard is currently involved in a program to modernize several of the Navy's Reshef-class missile patrol boats. It is expected to be completed by 1983.

25X1

The Israeli-designed guided missile corvette—designated the Saar-V—would be the largest ship in the Israeli Navy. The Navy hopes to have six to seven of these ships by the late 1980s. The Saar-V is estimated to cost \$115 million for the first unit and \$73 million

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**Table A-2
Current and Projected Inventory of Guided Missile
Patrol Combatants in Israeli Navy**

	1982	1987
Total	19	26
Flagstaff-II hydrofoil PGG	0	12
Saar-V missile corvette PGGH	0	2
Aliyah-class extended Reshef PGGH	2	2
Romat-class extended Reshef PGG	0	3
Saar-IV Reshef-class PGG	8	7
Saar-III PTFG	6	0
Saar-II PTFG	3	0

25X1

for the follow-on units. Funding for the Saar-V is not available in the current Israeli military budget, and Israel is reportedly looking to the United States for help in financing the project. [redacted]

25X1

The first of two Grumman Flagstaff-II hydrofoil missile boats contracted for in 1977 is scheduled to be delivered to Israel later this year. The second vessel is being built by Israel Shipyards and is to be completed next year. The Navy will decide whether to enter production on the Flagstaff-II under a licensing agreement with Grumman following its operational evaluation of the craft in 1983. Design changes and technical problems have raised the cost estimated for the first production hull from \$30-40 million to over \$60 million. [redacted]

25X1

25X1

Defense Minister Sharon's reductions in the defense budget could threaten the Navy's modernization programs. US financial assistance would become even more critical if Israel plans to develop a "blue-water" navy that can operate widely in the Mediterranean and Red Seas. [redacted]

25X1

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