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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

Israel: Development Of Military Industries

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
February 1970

INTELLIGENCE MEMORANDUM

Israel: Development Of Military IndustriesIntroduction

Israel is rapidly expanding its military industries and may try to attain a high degree of self-sufficiency in the production of military equipment during the next few years. This memorandum examines the present status of Israel's military industries, that country's technical capacity for further expansion, and the possible cost of such expansion.

Major Items Now Produced*Ground Forces*

1. Israel's military industries now meet most of the army's needs. Several government-owned installations and one privately controlled facility manufacture adequate quantities of rifles, sub-machineguns, mortars, rocket launchers, recoilless rifles, and the associated ammunition and explosives. The current output of many of these weapons now exceeds Israeli needs, and Israel exports significant numbers including weapons as sophisticated as 106-mm guns. No armored or tracked vehicles are produced in Israel, but used tanks and surplus personnel carriers are completely rebuilt in Israel and fitted with improved guns and engines.

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2. Israel could produce its own armor within a year or two. Limited assembly facilities are now available, and the workers that rebuilt the armor clearly have the skills needed to manufacture armor from the ground up. Some heavy machine tools would have to be imported to manufacture tank turrets, as well as all steel requirements. Such items, however, should be readily available in foreign markets.

Air Force

3. Israel's aircraft industry now performs major maintenance on all types of aircraft. Not only are planes refurbished for the Israeli Air Force, but contract work is also done for Iran, Greece, and France. A wide variety of spare parts are manufactured in Israel, and two commercial planes, the Jet Commander and the Arava transport, are being produced in Israeli plants.

4. Israel already has most of the industrial capability to produce a fighter plane, and production probably could be achieved by 1972. Although the completion date is unknown, a project to build a Mirage-type plane reportedly is well along. An official of the French manufacturer of the Mirage claims that Israel has detailed designs and plans for the aircraft's production. Israel at present can manufacture the airframe and the needed electronic components. The major problem would be the manufacture of an engine for supersonic fighter/bombers, which would require considerable technical effort and imports of high-strength and high-temperature metals. These metals can probably be obtained quite readily from various foreign commercial sources. Israel's Bet Shemesh Engines, Ltd. plant is now producing small turbojet engines and probably could produce a Mirage-type engine in a year or two.

5. Aircraft armament and bombs are produced in Israel. An air-to-air missile called the Shafrir, which is similar to the US Sidewinder, reportedly is now in production, and a runway penetration bomb, similar to the Matra developed by the French, is being perfected. Israeli crews

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are installing domestically manufactured 30-mm guns on some of their Skyhawks in place of the US 20-mm guns mounted on the planes when delivered.

Navy

6. Israel's shipyards have constructed landing craft for the navy [redacted]

[redacted] Combatant ships are not now built in Israel, but the Israelis probably could set up the needed facilities and begin construction of high-speed patrol boats by 1971. The Israelis possess the technological capability to build a fast patrol boat, although some basic inputs, such as hull plating, would have to be imported.

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7. The Israelis now manufacture their own naval armament, including the Gabriel anti-ship missile. This missile was designed for use on high-speed patrol boats and reportedly is an effective weapon system. Israel has the capacity to produce more Gabriels than needed by its navy and is attempting to sell the system to Nationalist China, Iran, and Greece.

Advanced Weapons

8. Israel is believed to be producing the 260 nautical mile Jericho surface-to-surface missile. A number of facilities have been identified that probably are involved in the production of the Jericho. These include a solid propellant production plant, facilities for assembling and checking out missiles, and a launch facility. Although production probably is under way, a considerable number of parts, raw materials, and test equipment are being purchased from US and Western European suppliers.

Israel's Technical Capabilities

9. Given the demonstrated capability to overhaul, refurbish, and remodel all categories of major weapons in their inventory, the Israelis probably possess the technical competence to develop the production of most types of military

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equipment during 1970-74. Should Israel encounter unforeseen technological problems, individual expertise can probably be enlisted from foreign sources, especially the overseas Jewish community. In the past, Israel has encountered no significant difficulty in importing technology, as nearly all license applications have been approved. Moreover, Israel may already have acquired much of the technology it would need to expand its military industries.

10. The kinds of specialized raw materials the Israelis now import, and are likely to continue to need, include steel and aluminum plate, some nickel alloys for missile casings, aluminum powder for solid propellants, glass fibers used in the manufacture of rocket nozzles, and honeycomb sheets to fabricate missile fins. Numerous other specialized items and components are, and will continue to be, acquired from foreign commercial sources. In those few cases where restrictions exist on the sale of certain end items, the Israelis purchase basic inputs from various suppliers and fabricate their own finished assemblies.

Possible Israeli Military Production Program

11. The Israelis probably are technically capable of extending the domestic production of finished military goods and components to the point where only basic and intermediate raw materials, such as metals and fuels, would have to be imported. A crash program to develop such a high degree of self-sufficiency, however, is highly unlikely because of high costs and the limited supply of skilled manpower. Moreover, some end items and many components are readily available from foreign commercial sources, and Israel has little reason to produce them domestically, especially since they can usually be obtained more cheaply abroad. Israel, therefore, is more likely to seek a reasonable balance between cost and need by developing production of those end items and components that are most susceptible to foreign embargo, while importing those items not likely to be embargoed.

12. A strategy that might be consistent with Israel's capabilities and needs includes the

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assembly of jet fighters, helicopters, patrol boats, armored personnel carriers (APC's), artillery, self-propelled artillery, tanks, and surface-to-surface missiles as well as the production of several key components, such as aircraft and tank engines. Plausible production rates of the end items are shown in Table 1. Annual production of a "Mirage-like" fighter plane could begin in 1972 with 40 planes and increase to 60 planes in 1973 and 1974. Helicopter production could also begin in 1972 and that of patrol boats, APC's, artillery, self-propelled artillery, and tanks could begin in 1971. The Israeli surface-to-surface missile program also could be completed during the same period, yielding a deployed force of from 24 to 30 armed missiles. Production of key components probably would include the engines for all of these end items and some of the more simple electronic equipment. With the exception of marine diesels for patrol boats, which might take three to four years to produce, production of these components probably could begin in 1971 and 1972.

13. The production targets suggested in Table 1 reflect an estimate of the minimum time required to begin production of each weapon. To estimate plausible production rates for fighter aircraft, it was assumed that existing facilities now being used to build civilian aircraft would be converted to production of jet fighters. The maximum output then was calculated on the basis of available floorspace in existing facilities, using standard ratios derived from US aircraft industry experience. Estimated production of surface-to-surface missiles is probably the minimum rate that is consistent with the existing Israeli program. The production rates of the other weapons listed in Table 1 are based solely on estimates of obsolescence and attrition rates from current inventories over the next five years plus a small margin to provide for some increase in force levels.

Financial Costs

14. The total cost of implementing the production program in Table 1 is estimated at about \$1.2 billion, including about \$100 million in

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investment costs* and \$1.1 billion in operating and production costs (see Table 2). Foreign exchange costs, assuming an import component of 65%, would total nearly \$800 million.

15. Production costs are based on unit cost of producing similar weapons in the United States. This procedure may understate actual Israeli costs because of the small scale of the plants involved. A large part of the costs consists of imported components, however, and these would tend to be roughly equal to those of US manufacturers.

16. The foreign exchange costs to Israel of implementing the assumed strategy would not be prohibitive. Israel's balance-of-payments projections for 1970-74 include planned expenditures of about \$2.9 billion for direct government imports, of which probably not over \$300 million is for civilian purposes. The imports of finished military equipment that Israel has probably scheduled for 1970-74 can be valued roughly at \$1 billion. This leaves \$1.6 billion, or substantially more than the illustrative estimate of \$800 million, for imports of capital goods and production inputs for new military industries. Moreover, the estimate of \$800 million probably is on the high side for the kind of program assumed because production of new weapons is assumed to begin at the earliest possible date and because the import component of

* A considerable amount of investment usable for production of the listed items has already been undertaken and is not included in this estimate. In Table 2, investment costs of dual-purpose facilities were allocated arbitrarily to one of the weapons. The jet engine plant required for fighter engines also would produce the turbo-shaft engine for helicopters and the gas turbine for patrol boats. All of the investment cost for this facility was allocated to fighter planes. Similarly the diesel engine plant required to build patrol boats also would produce the engines for APC's, self-propelled artillery, and tanks. All of the investment cost of this plant was assigned to patrol boats. For surface-to-surface missiles, all of the investment cost is believed to be already expended.

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65% is high in comparison with most types of existing domestic production.

17. The production program from which the illustrative estimate of cost was derived is, of course, only one of many possible production programs. Israel could decide to produce the same items at higher (or lower) rates; however, given the likely requests for weapons imports, much higher production rates than assumed here would raise weapons inventories to levels that probably would appear excessive, even to the Israelis. Israel could also be planning a more complete program, including production of most of the needed components, but it is difficult to understand why they would want to incur unnecessary costs for items readily available abroad.

Effects on the Economy

18. Large-scale development of military production would adversely affect the growth of the civilian economy. The kind of military program that has been assumed, with its high import content, would affect the economy mainly by diverting foreign exchange from civilian uses. A more complete program, involving production of most components, would minimize foreign exchange costs in the long run but would place a much greater strain on domestic resources, especially supplies of engineers and skilled workers.

Import Dependence and Export Potential

19. Despite the probable rapid expansion of military industries, by 1974 Israel probably will continue to import substantial amounts for defense. In addition to a wide range of raw and semi-manufactured materials, these imports probably will include many components for use in assembling end items, plus some end items. The most important inputs for military industries probably would be special types and forms of steel, such as the hull plate for patrol boats, and the more sophisticated types of radar, electronic, and communications equipment. End items that probably would continue to be imported include sophisticated

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types of ammunition, major transport aircraft, and some support equipment.

20. Attainment of the estimated production capability probably would give Israel a significant export potential in major arms after 1974. During the next few years, the Israelis would probably be able to use both the equipment they apparently plan to import and the newly developed production to upgrade, as well as to increase, their inventory. By 1975, however, the process of upgrading should be largely completed, and Israel's demand for additional weapons, with the possible exception of jet fighters, probably would decline substantially. Conceivably, Israel could continue to require 60 new fighters a year for a number of years if air losses rise sharply as the quality of Arab pilots improves. The expected annual production rates of other items (95 helicopters, 24 patrol boats, 250 APC's, 75 pieces of artillery, and 120 tanks), however, almost certainly would exceed potential Israeli needs. The likelihood of Israel exporting this equipment is reinforced by success in exporting other smaller arms in recent years. These exports averaged about \$13 million a year during 1965 through 1967, but jumped to over \$31 million, or about 5% of total commodity exports, in 1968. In 1969, Israeli arms exports reportedly have doubled from the 1968 level.

Conclusions

21. Israel has the technical capacity to achieve a high degree of self-sufficiency in the production of military equipment, but the cost would be large. A more reasonable balance between cost and need would be obtained by limiting self-sufficiency primarily to those weapons that are most subject to embargoes. The cost of such a selective program would not be prohibitive and Israel's major weapons needs would be met. Military import requirements for inputs of components and materials would remain high, but exports of military equipment would grow.

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Table 1

Hypothetical Israeli Production Rates
for Selected Military Equipment

	Units per Year					Total 1970-74
	1970	1971	1972	1973	1974	
Fighter planes	0	0	40	60	60	160
Helicopters	0	0	49	60	95	204
Patrol boats	0	15	24	24	24	87
Armored personnel carriers	0	250	250	250	250	1,000
Artillery	0	75	75	75	75	300
Self-propelled artillery	0	50	50	50	50	200
Tanks	0	120	120	120	120	480
Surface-to-surface missiles	N.A.	N.A.	N.A.	N.A.	N.A.	24-30

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Table 2

Estimated Cost of Hypothetical
Israeli Military Production a/
1970-74

	Million US \$		
	<u>Investment</u>	<u>Production</u>	<u>Total</u>
Fighter planes	55	475	530
Helicopters	7	105	112
Patrol boats	19	270	289
Armored personnel carriers	5	30	35
Artillery	2	15	17
Self-propelled artillery	4	20	24
Tanks	10	89	99
Missiles	0	100	100
<i>Total costs</i>	<i>102</i>	<i>1,104</i>	<i>1,206</i>
Foreign exchange costs	66	718	784
	<u>Percent</u>		
Foreign exchange component	65	65	65

a. Based on the production rates given in Table 1.