A Plan to Make ISRAEL Financially Independent in 1990

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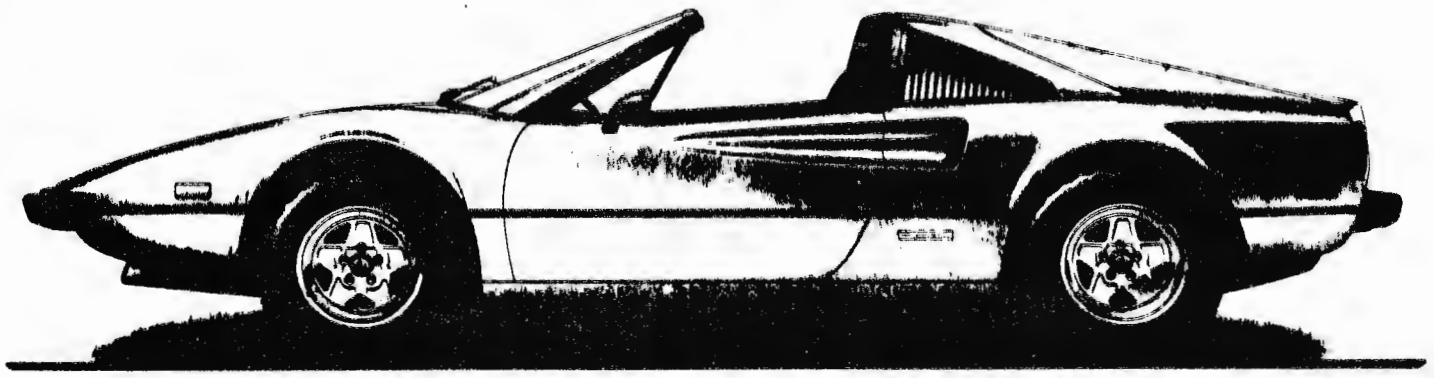
In approaching the challenge to make Israel financially independent in 1990, let's adopt the slogan of the manufacturer of the Ferrari car:

"WHAT CAN BE CONCEIVED

CAN BE CREATED"



Ferrari

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INTRODUCTION

The question is often asked:

"Can Israel reach a point where she can 'go it alone' -- become independent of financial support from the USA?"

The answer is -- and must be -- "Definitely yes."

Israel must be in a position where her government can make decisions without regard to granting or withholding of funds by the US. Recently, US Ambassador to Israel, Sam Lewis, made some very important statements:

> "Israel today is far too dependent on the US for Israel's own good and also for the good of the US." Sam Lewis pointed out, "Some of Israel's own leaders have been saying this more and more often, saying how crucial it is that Israel regain its own economic independence so that it will not be subject to American pressure or to the vagaries of American policy-makers. I couldn't agree more with those Israeli leaders."
>
> Ambassador Lewis further stressed, "Israel has not been able to achieve national independence in the total sense so long as its budget and its military acquisitions depend on the good will of anybody else, even a country as well intentioned as the United States. This over-all dependence produces a sense of frustration in Israel and also in the US."

In the past several months, numerous voices have been raised against continuous financial support of Israel by the United States. The US General Accounting Office (GAO) issued a comprehensive examination of the US aid program to Israel. A number of editorial writers have interpreted this report to be an expose' of the US aid program to Israel. Evans and Novak, in their syndicated column, refer to this report as follows:

> "The study, between the lines of bureaucratic prose, tells a mournful tale of the US repeatedly deceived by Israel. Pleas for a one-time-only concession become a pattern for the future, at high cost to American taxpayers. According to the study, Israel has camouflaged efforts to obtain US financing for the Lebanon invasion."

They conclude by stating:

> "The congressional watchdogs are barking that the burden of bailing out Israel may be too much for American industry and labor to bear."

Actually, the GAO report confirms that US aid to Israel benefits America in many ways and that Israel needs aid to repel the external threat to its existence. However, a number of editorial writers have interpreted the GAO report to be critical of aid to Israel.

In my opinion, Israel cannot depend for long periods of time on the type of economic support that she is receiving from the US. It is far too risky to operate on this basis.

While Israel is presently in need of its current financial support from the USA -- and will be in that position for a period of time -- plans should be developed now to reach the desired goal of financial independence.

The question must be answered: "How can Israel replace, over a period of time, the $2.5 billion which the US has provided to Israel in 1982 and 1983?" In 1983, while Israel had requested $3 billion, the US budget calls for $1,535 billion in grants and $950 billion in loans -- a total of $2,485 billion.

It is the purpose of this paper to present ideas and recommendations that will bring about a stepped up movement leading to Economic Independence for Israel -- 1990.

A WORD ABOUT THE AUTHOR

Elmer Winter serves as Chairman of the Committee for Economic Growth of Israel. He was requested in 1976 by former Prime Minister Y. Rabin to set up an organization to assist Israel to expand her business relations with the United States. This includes increased investments by American companies in Israel; expansion of exports from Israel; the exchange of technology; joint research; etc.

The Board of Directors of CEG-I consists of 115 American business executives and 28 Israeli executives.

During the past seven years, CEG-I (a nonprofit organization) has worked with over 200 Israeli companies and several thousand American companies to expand business relations between the two countries. CEG-I works on a business-to-business basis.

Elmer Winter was a co-founder of Manpower, Inc., the world's largest temporary help service. Manpower operates 987 offices in 31 countries. Elmer Winter served as President of the company from 1948, when it was founded, to 1976, when the company was sold to the Parker Pen Company. Upon the sale of the company, Elmer Winter was retained as Consultant to Manpower, Inc., a position which he still holds.

During the 28 years that Elmer Winter served as President of Manpower, Inc., he had occasion to open many foreign offices. He played an integral role in the marketing of the services of Manpower, Inc.; not only in the United States, but in the other countries in which Manpower operates as well.

During the years of 1974 to 1978, Elmer Winter served as President of the American Jewish Committee. During that period of time, Elmer Winter worked with high government officials both in the United States and in Israel, trying to interpret Israel's needs on the American scene.

THE OBSERVATIONS AND RECOMMENDATIONS MADE BY ELMER WINTER IN THIS PAPER ARE HIS OWN. THIS PLAN WAS PRESENTED TO THE US BOARD OF DIRECTORS OF CEG-I AT ITS MEETING HELD IN NEW YORK ON JUNE 21, 1983. THE BOARD ACCEPTED IN PRINCIPLE "A PLAN TO MAKE ISRAEL FINANCIALLY INDEPENDENT IN 1990."

Note: We, in CEG-I, believe that the voice of our group in the USA should be heard. Many of our directors have business interests in Israel -- more will in the future. We have a stake not only in Israel's security and well being, but in her economic viability as well. We offer our recommendations because of our mutual interest and concern in the financial stability of Israel.

THE THRUST OF THIS PAPER

I believe that the time has come for a frank discussion and analysis amongst Israelis and Americans as to what steps are necessary for Israel to become financially independent in 1990. That is the purpose of this paper. It is to present thought-starters and challenges that will lead primarily to increased foreign investment and expanded exports from Israel.

There is much that can be done by American and Israeli corporate executives working together. I believe that, in approaching this problem, there must be a matching effort. By that I mean Israeli business executives and American business executives must match each other's efforts in moving the programs that I have recommended forward.

In the past, there has been an attitude in the USA of "doing it for the Israelis." I believe the time has come where that concept on the economic side should be changed to "doing it with the Israelis."

I am constantly reporting to the American business community the economic miracle that has taken place in Israel. There is much for all of us to be proud of as we observe Israel moving into an era of supremacy, particularly in the hi-tech area. The Israel of today can proudly point to an outstanding cadre of man-

agers, scientists, engineers, academicians, etc. The Government of Israel has had great foresight in providing incentives to not only attract foreign capital, but to provide substantial loans and grants to expand the research and development that is taking place in Israel. Chief Scientist Lavie, and his predecessors, deserve considerable credit in moving forward many important R&D projects through grants and loans by the Government of Israel.

Obviously, the attainment of economic independence must and will be the result of the work of the business community, the government and institutions. We, in America, can offer our assistance wherever possible on the matching effort basis; as well as our experience in marketing in the US. We can also assist in finding new investors; locating new technology; assisting in production techniques and buying products and services from Israel.

The thrust of this paper is to challenge Israelis and Americans to step up their joint activities to assure Israel's financial independence in 1990.

A SPECIAL NOTE OF EXPLANATION TO OUR ISRAELI FRIENDS

This plan is designed to provide a framework for discussion between Israelis and Americans as we search for new answers. This is not intended as a final blueprint -- it is only the first step in the process to design new programs to meet our mutual goals. There will be revisions as we examine the various recommendations included in this plan. Obviously, it is impossible to spell out the details needed to implement these recommendations at this time.

One thing is certain -- we need new answers -- particularly in the area of marketing. Our biggest weakness is in this area. We have the marketing skills in Israel and the USA, but we haven't put them together. All too often, some Israelis rely on the goodwill of American Jews to do more than it is reasonable to expect in the business sector. We need to rely more on more "for profit" organizations to do the job.

To accomplish the goal of economic self-sufficiency in 1990, it will require a more active approach by the Government of Israel to attract additional US investors and R&D joint ventures. Our friends in Israel will have to motivate the Government to face up to the problems which concern potential investors to bring about the necessary changes.

This is not intended to be an analysis of the economy of Israel. I leave that to others. I intend to point out new directions -- new alternatives -- new strategies that will bring Israel to the desired goal of financial independence. I urge your support and continued interest in moving from recommendations to implementation.

WE NEED TO FACE UP TO THE CURRENT ECONOMIC FACTS OF LIFE IN ISRAEL

Before we analyze the required ingredients of "A Plan to Make Israel Financially Independent in 1990," it is important that we face up to Israel's current economic facts of life.

There is reason for concern as we review the following:

ISRAELI DEFICIT IN HER BALANCE OF PAYMENT

Year	Deficit
1981	$4,339 million
1982	$4,720 million
1983 (est.)	$5,000 million

It is proposed that Israel's 1983 deficit, $5 billion (est.), will be financed as follows:

US Aid	$2.5 billion
World Jewry	$0.5 billion
West Germany	$0.5 billion
Money Transfers	$0.5 billion
Loans	$1.0 billion

Israel's debt has reached $21 billion. It is important to note that 70 percent of this amount ($14 billion) is not owed on a commercial basis. Israel owes $14 billion to two governments and to the Jewish people throughout the world who purchase Israeli bonds. The remaining 30 percent is owed to banks, Israeli and others. Only half of the remaining 30 percent is in short term loans.

Debt service to the United States Government in 1983 will be $910 million, making net aid from the United States for 1983 equivalent to $1,575 billion. The amount required to service Israel's debt exceeds the economic aid provided by the US Government.

Basic to Israel's thrust for "Economic Independence -- 1990" is the need to substantially increase her exports worldwide.

The 1982 results were:

Exports	$10,906 million
Imports	$15,774 million
Deficit	$4,868 million

There was a decline of 2 percent in exports in 1982, compared to 1981 ($10,906 million).

It is estimated that the exports for 1983 will reach $11,620 million versus $10,906 million for 1982.

In reviewing exports from Israel, it is important to understand the breakdown of figures in this category:

Est. 1982 Exports	
Industrial	$3,500 million
Diamonds	887 million
Agricultural Products	555 million
Exports to Administered Areas	590 million
Exports of Services	5,330 million
Other	34 million
TOTAL	$10,906 million

A breakdown of Israel's imports for 1982 shows:

Import of Goods	$7,962 million
Import of Services	5,747 million
Direct Defense Imports	1,652 million
Miscellaneous	385 million
TOTAL	$15,744 million

Israel's defense expenditure absorbs about 30 percent of the State budget. As a result, the share of the State's resources available for economic development and other national purposes is limited. Giving effect to the extraordinary rate of inflation, Israel has experienced a decline in gross and net investments during the past four years.

High rates of inflation have been experienced over the last few years. During calendar year 1982, the Consumer Price Index increased from 293.3 to 679.0 (1980 average = 100) or by approximately 131.5 percent in 1982 as compared to 116.8 percent for the calendar year 1981.

This inflation is considered to be the result of both external and internal influences. Several of the external factors which have led to the high inflation rates included the sharp rise in international prices, particularly those of grains and oil, in 1973 and 1974 and again in 1979, and the frequent devaluations of the Israeli Pound. Significant internal factors include both large government deficits caused by the heavy defense burden and substantial social service expenditures which have been required to absorb past and current immigration and to protect the members of the lower income segments of the community.

WE NEED TO RECOGNIZE THE TREMENDOUS ACCOMPLISHMENTS OF ISRAEL IN DEVELOPING THE ECONOMY OF THE COUNTRY OVER THE PAST 35 YEARS

We salute Israel for her economic advances over these past 35 years. The world needs to know that Israel has performed an economic miracle. For the past three and a half decades, the Israeli economy has been characterized mainly by continuous expansion and a high rate of growth of its production capacity.

At the same time, the pattern of this vast economic development has been marked, throughout this entire period, by a steady diversification and an increasing degree of industrial sophistication.

Today, Israel produces and exports not only such exotic and traditional items as diamonds, oranges, ladies' swimwear and flowers; but also -- and even more so -- a wide range of high technology products such as computers, lasers, nuclear medical imaging systems, computerized irrigation systems, executive jet aircraft, computerized graphic equipment and a broad spectrum of electronic equipment.

Israel's industrial success is a dramatic instance of how a small country, by dint of sheer brainpower, can compete on the world market in such advanced areas as medical engineering, solar energy, computer graphics, biotechnology and similar fields. In 1970, Israel had less than 10 science-based companies, compared with 500 today. For every 10,000 citizens, there are 30 scientists involved in research and development; the corresponding figures for some of the world's most industrialized countries are 25 for the United States, 24 for Japan and 13 for France.

AN URGENT MESSAGE TO THE GOVERNMENT OF ISRAEL

To reach the goal of financial independence in 1990, it appears necessary for the Government of Israel to take certain steps in the following areas:

1) Israel must make it attractive for an additional 50 US hi-tech companies to open facilities in Israel. While exports will be increased through substantial expansion and production by Israeli and foreign companies operating in Israel, Israel will need new hi-tech companies with high export potential.

   To attract 50 US companies, it may well be that the incentives will have to be increased by the Government of Israel. These increases, however, will be offset on a cost effective basis by additional taxes earned by these companies on increased subsequent sales.

2) It will be necessary to hire a professional staff in America to:

   A. Review the incentive programs presently offered by the Government of Israel.

   B. Review and redesign the marketing strategies of the Government of Israel to attract American industries.

   C. Develop advertising and public relations programs targeted for the high technology companies Israel seeks to attract.

   D. Develop an advertising campaign in the US to attract investors.

      The current budget for advertising and PR is not adequate to compete against the many other countries, cities and states within the US, that are trying to attract high technology companies.

3) Israel must attract an additional 50 US companies to conduct R&D in Israel. To do this, there may have to be an increase in the amounts allocated for R&D to support these programs.

Basic to attracting foreign investments, is having an economy that runs smoothly. Foreign investors are hesitant to open facilities in countries where the economy is operating with high deficits, high inflation, etc. To attract foreign investment, it will be necessary to reduce Israel's annual deficit and reduce the inflationary rate, which is estimated to be 140 percent for the year 1983.

The Government of Israel must be able to document the claims that it makes in its efforts to attract foreign investment. This

is particularly true in the area of the claims that Israel has substantial numbers of scientists and engineers available for new companies opening facilities in Israel. The classified ads in Israel and the constant efforts being made by Israeli companies to recruit personnel in the USA give potential investors reasons to doubt that there is an adequate supply of qualified scientists and engineers available to them in Israel.

The Government will have to prove to potential foreign investors that, in truth and fact, it operates a one-stop service to assist investors to enter into Israel.

It is important that the Government be able to prove that American companies conducting R&D in Israel have been successful -- that the results of their R&D in Israel have produced marketable products at a profit.

Further, it is important that the Government of Israel be able to prove that American companies doing business in Israel have produced a high return on their investments.

A task force of American and Israeli business executives, as well as Israeli Government personnel, should be created to address these problems.

IS IT REALISTIC TO EXPECT THAT ISRAEL CAN BECOME FINANCIALLY INDEPENDENT OF THE UNITED STATES IN 1990?

There are a number of positive factors at work in Israel that will assist in moving Israel forward to financial independence in 1990. They are:

1) The Innovative Imperative

In an article in the "Israel Economist," it was pointed out by Professor Lavie, Chief Scientist of Israel, who stated:

"In Israel's case, innovation has proven itself to be the appropriate response because of what we have and because of what we do not have. We possess a scientific establishment which, for its size, is one of the most vigorous in the world."

Israel is characterized by a high level of R&D expenditure (as a proportion of the GNP) in original products in the field of high technology.

2) Israel concentrates on scientific eduation.

According to Israel Pickol, Israel's Economic Minister to the United States, 88 out of every 10,000 Israeli workers are involved in research. In the United States, the figure is 56 per 10,000 and in Japan, 49. Moreover, 29 percent of Israel's 56,000 university students are studying either sciences or engineering.

3) Israel has a large cadre of engineers, scientists, etc.

Joseph Morgenstern of the "Jerusalem Post" reported:

"Since the 1970s, the development of science-based industry has been a national goal. Today Israel is Number One in the world in terms of the percentage of its population involved in research: An average of three out of every 1,000 Israelis are engaged in full-time research and development activities. The US is in second place, with 2.5 percent, followed by Japan with 2.4 percent and Sweden and Switzerland with 1.7 percent.

Israel has also achieved a high rank in terms of the percentage of its gross national product (GNP) which is devoted to research and development. Israel and Switzerland both spend 2.3 percent of their GNPs on R&D. Great Britain is the only nation with a higher percentage."

4) Israel's R&D has developed excellent commercial products.

Chief Scientist Lavie reported:

"A survey of 2000 projects supported in the past show that 41 percent of them resulted in commercial products and 26 percent of the projects were considered a success in the export market. These figures are at least twice the success rate for R&D projects in Europe and America. We sponsored a survey by the Centre for Policy Alternatives at Massachusetts Institute of Technology where we asked them to study what Israel's specific advantages were in industrial R&D and to pinpoint why we seem to have an unusually high percentage of success in R&D projects. Their report indicated that those very factors which are connected with Israel's difficult economic situation provided an impetus to succeed, to innovate, to produce and to sell. We must succeed and we will."

It is important to keep in mind that it is anticipated that there will be a substantial shortage of electrical and computer scientists in the USA over the next five years. In a recent survey conducted by the American Electronics Association, it is reported that a shortage of about 113,000 electrical and computer scientists is expected in the United States over the next five years. It is reported that the industry expects only a 46 percent increase in the total employment through 1987 and a need for 197,000 new engineers. This shortage in the US offers very substantial opportunities to attract American companies to open facilities and conduct R&D in Israel.

A recent study in Israel points to the fact that it is realistic to expect that Israel can become financially independent of the United States in 1990. The report is as follows:

OUTPUT, EXPORT EMPLOYMENT in the in Years 1978, 1983, 1990
(in fixed 1980 prices and in percent)

	OUTPUT IS billion			EXPORT US $ million			EMPLOYEES (000)		
	1978	1983	1990	1978	1983	1990	1978	1983	1990
Food, Beverages & Tobacco	16.1	20.5	30.0	275	385	550	40.4	44.0	48.8
Textiles, Clothing & Leather	8.6	12.1	19.6	317	535	935	62.5	71.8	84.9
Wood, Paper,Print. Miscellaneous	7.3	10.3	16.7	249	470	910	41.55	47.5	56.8
Mining, Quarrying & Non Met.Minerals	4.1	5.9	9.7	177	275	470	14.45	16.5	19.7

OUTPUT, EXPORT EMPLOYMENT in the in Years 1978, 1983, 1990
(in fixed 1980 prices and in percent)

Continued

	OUTPUT IS billion			EXPORT US $ million			EMPLOYEES (000)		
	1978	1983	1990	1978	1983	1990	1978	1983	1990
Chemicals, Rubber & Plastics	19.5	27.6	44.4	659	1190	2300	26.0	30.3	38.8
Metals, Machinery Electr. & Transport Equipment	22.3	31.9	54.0	990	1710	3360	114.35	132.2	161.0
Total (excluding diamonds)	77.9	108.3	174.4	2667	4565	8525	299.25	342.3	409.0
Diamonds	7.6	9.9	13.6	1585	2050	2890	8.75	9.7	11.0
INDUSTRY TOTAL	85.5	118.2	188.0	4552	6615	11415	308.0	352.0	420.0

Uzia Galil, President of Elron Electronics Industries of Israel, places great emphasis on the availability of venture capital to expand Israeli exports. He stated:

"'Another significant signpost is the fact that venture capital is now also available in Israel. This is a relatively new phenomenon: previously, investments were channelled to more traditional industries which appeared to carry less risk.' If these trends continue, Galil predicts that Israel's high technology exports will pass the $5 billion mark by the end of the decade, showing a cumulative growth of about 20-25 percent a year in real terms.

What is the profile of the typical company Galil envisions as playing a major role in this progress? 'While modest enterprises aimed at very specific market niches will undoubtedly continue to succeed, the main leverage and impetus for growth will be supplied by companies oriented towards rapidly expanding markets, and eventual target sales of $50-100 million a year. Offering highly innovative systems and products, they will select a market segment that is being transformed by technology.'"

PUTTING POLITICAL CONSIDERATIONS ASIDE

In designing this particular plan for financial independence in 1990, I have gone on the premise that the citizens of Israel will make the decisions as to the changes, if any, that they wish to bring about in the economy of Israel. We cannot, in the United States, urge belt-tightening, increased unemployment, steps to bring down inflation, as we have in the United States. Decisions of this type must be made by the Israelis. We can, however, point out that the economy of Israel impacts strongly on future investments by American companies in Israel. (See later discussion on this subject.)

Israel needs to reduce its inflation. Unfortunately, during the current year, 1983, it appears that the inflation rate in Israel will increase over 1982. This impacts heavily on American investors who have an interest in opening facilities in Israel. It is true that a good portion of the inflation is offset by the devaluation of the shekel against the dollar; however, American companies tend to shy away from opening facilities in countries where the inflationary rate increases rather than decreases.

Mr. Kaufman, senior official in the Israeli Treasury, recently pointed out:

> "The balance of payments problem of this country can be solved by bringing up production levels on par with those prevailing in the western world. Production in Israel per industrial worker is $20,000 a year, compared with an average of $10,000 in the western world. If we could double our productivity, it would mean an extra $4 billion worth of exports. And this is no mere fantasy, since in Israel Aircraft Industries production per worker is already $40,000 a year."

What about inflation? What is the government doing about it?

> "The government is taking moderate steps against inflation. Despite the fact that the population as such is not duly affected, since savings and salaries are linked to the cost-of-living index, inflation is one of our most pressing problems because it creates an atmosphere of uncertainty which deters investments and the growth of economic activity. Businessmen do not like rapid changes in the value of currency.
>
> But you should realize that drastic steps against inflation like cutting government expenditure, which is a main cause of inflation, will bring about a sharp fall in demand and a serious recession accompanied by unemployment in the hundreds of thousands. The economic model of the US and Great Britain is not practical here. We could be transforming an inflationary system which can be lived with, into a social volcano, with which we can definitely not live."

Many question whether Israel can work her way out of high inflation without:

1) Belt-tightening;

2) Layoffs in Israeli industry; and

3) Substantial cuts in defense and social programs.

Professor Haim Ben-Shahar was recently interviewed by the "Jerusalem Post" (July 1983). It was reported:

> "Ben-Shahar's remedy is to restore a sense of national pride and motivation to build up the country, especially its productive base. 'Let's go to the people and say frankly: The party's over. Let's clean up the mess we've made and tomorrow we'll roll up our sleeves and get down to some serious work. Let's start making ends meet.'
>
> AND IT CAN be done, he believes. 'We are one of the most talented and hard-working people in the world. From 1950 to 1973 we increased our real GNP by 10 percent a year. No other country, not even West Germany or Japan, can match this. And what we've done in the past, we can do again.'
>
> His economic steps do not even seem harsh. They do involve belt-tightening -- but only one notch, perhaps one-and-a-half.
>
> The standard of living would be lowered by 5 percent. Then expenditures would be linked to output. 'This is not so extreme. We didn't live so badly a few years ago, before we went on this money-spending binge.'
>
> However, there must be an immediate change of direction. A substantial devaluation of the over-valued shekel, compared to the dollar, is urgently needed -- but this would bring the required results only if it were supported by a reduction in government spending and an increase in private savings (which have dropped because people have been encouraged to believe that 'if they spend today, there will always be more money coming in').
>
> At present, Israel's GNP is about $20 billion; another $4 billion can be expected in aid from abroad. We should live quite well on this sum, and even expand our productive base substantially, if we only make up our minds to do so.
>
> Ben-Shahar would, however, like to overhaul totally the present 'super-subsidy-system' which doesn't discriminate between the very rich and the very poor. 'Why should a well-to-do family, which can finance several expensive trips abroad, receive subsidized goods and services from the government? Why should the exporters get subsidies instead of a proper rate of exchange? And why should private houses in the West Bank be sold under cost?'

Surprisingly, Ben-Shahar doesn't think taxes are high in Israel. None the less, he would not increase them. 'They only seem high. But the larger part of what is collected is given back in various subsidies. So our real net tax burden is less than half of what it appears to be.'"

I cannot comment on these suggestions except as they affect potential US investment. The Government of Israel and the electorate of Israel will have to resolve how much belt-tightening -- reduction of subsidies is acceptable. I can, however, point out that Israel's high inflationary rate, despite devaluations, and its increasing deficit, are strong negatives in trying to attract US investors.

WHAT ASSUMPTIONS ARE BEING MADE TO REACH THE CONCLUSION THAT ISRAEL CAN BECOME FINANCIALLY INDEPENDENT IN 1990?

In forecasting the 1990 independence target, many assumptions were made. They are:

1) There will be no further wars in which Israel will become involved.

2) Trade between Israel and Arab countries, as well as with the residents of the West Bank, will increase.

3) The US will expand its business relations with Israel.

4) The US will adjust Israel's debt service requirements.

5) Existing Israeli companies and US companies operating in Israel will expand their export sales 10 percent annually.

6) The Government of Israel and the US will expand funds available for R&D in Israel.

7) 50 US high technology companies will open factories in Israel in the next five years. Israel's attractions to US investors are manifold. A 1981 "Business Week" survey found that US businessmen are impressed with the quality, availability, and low cost of Israel's skilled labor. Moreover, a shortage of highly trained engineers in the US is sending a growing number of US high technology companies to Israel.

8) 50 US companies will start R&D projects in Israel in the next five years.

9) Israel will reduce her budget.

10) Israel will reduce inflation each year.

11) Israel will reduce imports and substitute products made in Israel for imports.

12) Many of the recommendations contained in this report will be implemented.

THE IMPORTANCE OF INCREASED EXPORTS IN THE ECONOMIC DEVELOPMENT OF ISRAEL

Since Israel has virtually no natural resources, it becomes necessary to concentrate on industries in which a minimum of raw materials are required, or in which these materials represent a relatively small portion of the finished "product." Thus, the key to Israel's exports is "value added" -- this is, the difference between the actual cost of producing the product and the price for which it is sold.

Israel possesses "brainpower." By utilizing this most unique and foremost asset, Israel discovered that it could develop products for industry with the greatest added value. Israeli know-how and expertise has resulted in a significantly growing volume of exports in the science-based and high technology area, such as medical equipment, aircraft, agricultural control systems and computers. Israel must build on these strengths to gain financial independence.

WHAT ARE THE BASIC INGREDIENTS THAT ARE REQUIRED FOR ISRAEL TO BECOME FINANCIALLY INDEPENDENT OF THE UNITED STATES IN 1990?

Bottom line: Israel must attract foreign investment and foreign R&D operations.

1) Existing manufacturers in Israel must increase exports 10 percent per annum.

2) There must be an acceleration of new entrepreneurs producing for the export market.

3) Israel must attract 50 US high technology companies to open factories.

4) Israel must attract 50 US companies to conduct research and development programs in Israel.

If these four goals were to be accomplished, the exports of Israel would increase substantially to the point where Israel's balance of payments could zero out in 1990.

The US companies that Israel must attract are those that will manufacture products with high added value and whose products are mainly for export purposes. This is a narrow segment of US

industry . . . a segment that is sought after by many US cities and practically every foreign country. The competition is keen. Israel must have the "extras" to attract US companies that others can't offer. These "extras" are the brainpower of Israel, its educational institutions, its incentives, its tax structure and the ability to ship to EEC markets and US duty-free.

A recent example that Israel has the advantage that an American company seeks is the case of Intel. Their entry into Israel was reported in "Electronic Weekly" (April 10, 1983) as follows:

> "Intel is constructing a wafer fabrication plant in Jerusalem. Production at the facility is projected for late 1984 or early 1985.
>
> Intel has had a design centre in Israel since 1974 which presently employs about 100 people. The fab is expected to employ around 600 eventually. Cox said: 'We're very pleased with the quality of the people we've been able to attract.'
>
> The Design Centre is in Haifa. Its managing director, Rafi Naveh, commented: 'Intel set up its Israeli subsidiary because of the high quality human resources which we have here. Such abilities are scarce even in the United States.'
>
> The Israeli wafer fabrication plant will give Intel a tariff-free entree into the EEC. Although she is not a member of the Community, Israel has a Free Trade Agreement with it. Under the Agreement, certain goods, including integrated circuits, are exempt from duty so long as they are wholly produced in Israel, are consigned directly from Israel to an EEC country, and have a certificate of movement called a EUR1.
>
> Consequently, Intel products manufactured in Israel will escape the 17 percent EEC tariff which now attaches to all Intel European integrated circuit sales.
>
> Intel Israel could become a formidable force -- it sounds like a chip off the old pioneering block. 'Our method is straightforward,' said Naveh. 'We pay a man what he's worth. He doesn't have to wait until his superior dies in order to get a promotion. If he's good we create a path for his advancement. Our people have motivation. They like working hard. On average they do 20-30 percent overtime -- without extra payment. It's the achievement which counts.'"

RECOMMENDATIONS TO HELP MAKE ISRAEL FINANCIALLY INDEPENDENT IN 1990

Let's get to work now on "How do we make it happen" -- how do we specifically move it forward. Let's together consider a series of recommendations that will help reach the desired goal of financial independence in 1990.

RECOMMENDATION #1 - WE NEED TO ADD A NEW DIMENSION TO THE RELATIONSHIP BETWEEN ISRAELIS AND AMERICAN JEWS.

We can point with pride to the close and important relationship that's been built up over the years between American Jews and Israelis. Substantial sums of money have been contributed by American Jews to assist in the development of Israel through the United Jewish Appeal. Further, American Jews have lent substantial sums of money to the development of the infrastructure of Israel through the purchase of Israeli bonds. We need now to add a new dimension which, in effect, says to American Jewry:

"Yes, we urge you to support Israel through contributions and loans, but we need for you to consider making investments in Israel -- conducting R&D in Israel and buying products made in Israel."

We need to get away from the answer that is often given when an investment in Israel is suggested, "Don't talk to me about investments in Israel; I give to the UJA and I buy Israeli bonds, and that's the extent of my commitment."

We are not appealing to American Jews to invest in Israel on an emotional basis. We are asking that they consider an investment in Israel on a sound business basis, looking to a high return on their investment in Israel. Over 150 American companies are operating in Israel. They are making satisfactory -- yes, high -- profits on their investments in Israel. It is fair to say that no foreign company would continue operating very long in Israel if they were operating at a loss. We are asking American business executives who have for long periods of time supported Israel through contributions and loans to now say, "It's time that we took a good look at Israel for investment or R&D purposes."

It's time for American business executives to further say, "Let's take a look at what is being made in Israel to see whether we can import Israeli products, either for resale or to be included in the manufacture of some of our products in the United States."

There are many Israeli companies that are seeking subcontracts; they have the expertise, the equipment and the manpower to supply the needs of American manufacturers. We need to bring US and Israeli companies together to use the plant facilities of Israel.

Speaking frankly, the time has come to add this new dimension of doing business with Israeli companies. We need to promote this concept. It is a valid one based upon good business sense.

RECOMMENDATION #2 - WE NEED TO INVOLVE A NUMBER OF JEWISH NON-PROFIT ORGANIZATIONS IN ASSISTING ISRAEL TO BECOME FINANCIALLY INDEPENDENT IN 1990.

Most Jewish nonprofit organizations operating in the USA have an Israel support component. They encompass religious, philanthropic, educational and political involvement in Israel. Their interest has been most helpful in support of Israel.

We need to turn now to each of these organizations and ask them to add on a new dimension -- namely, helping to build the economy of Israel. These organizations have the capabilities and expertise within their membership roles to help produce investments, find new technology for Israeli manufacturers, interest US companies to conduct R&D in Israel, etc.

A plan needs to be designed to solicit the support of the following organizations to help make Israel financially independent in 1990:

1) The Council of Jewish Federations & Welfare Funds

2) Individual Federations

3) UJA

4) Young Leadership of the UJA

5) Israel Bonds Organizations

6) Temple and Synagogue Groups

7) Friends of Various Institutions

8) Jewish Women's Organizations

9) Jewish Welfare Board

10) B'nai B'rith

11) Zionist Organizations

Each of these organizations can set up task forces to assist in locating investments, expanding exports from Israel, etc.

These organizations should expand their missions to Israel. Each mission should have a component, "Meet your business counterparts in Israel and start to talk about doing business together."

It is important to show the industrial and technological strength of Israel to American visitors from abroad. This will give them an increased sense of pride in Israel and a further involvement if they start doing business together.

RECOMMENDATION #3 - LOCAL US FEDERATIONS AND WELFARE FUNDS SHOULD DEVELOP PROGRAMS TO HELP EXPAND THE ECONOMY OF ISRAEL.

At the meeting of the Council of Jewish Federations held in Los Angeles on November 11, 1982, Martin Citrin, President of the Council, called upon the membership "to think about the possibility of developing a network of know-how and investments between the affluent and experienced Jewish communities of the world and Israel to help bring to full fruition the industrial and economic opportunities available there -- a people-to-people link, not just a dollar link. We have our first glimpse of the power of this kind of relationship in Project Renewal."

The local federations have the expertise, knowledge and financial strength within their membership to take an active role in expanding the economy of Israel. In participation in this plan, a federation would not be involved in supplying funds for business enterprises. It would merely serve as a catalyst in stimulating certain of its members to consider investments in Israel, increased export purchases, exchange of technology, etc.

For this program to succeed, there must be a change of thinking within federations. Certainly, fund raising will be the major emphasis of the federation, but this plan calls for the recognition that long-term security and well-being for Israel depends on economic development. I believe many federation people would welcome the opportunity to participate in programs to expand the economy of Israel. This may well provide additional cement to hold and advance membership and participation in the federations.

An example of interest expressed by America's largest federation is contained in a letter from Ernest Michel, Executive Vice President and Campaign Director of the New York Federation, as follows:

> "I read, with a great deal of interest, your 'Plan to Make Israel Financially Independent by 1990.' Having been involved in the support of Israel since its creation in 1948, I concur with many of the points you make.
>
> Specifically, I wish to refer to your recommendation #4, pertaining to UJA's assisting in the development of investments

and exports from Israel through visits and missions. Speaking for New York UJA, let me assure you that we would be very willing to participate in a program which would expose New York businessmen and women to the Israeli business community. Understandably, not every one of our missions would be suitable for this kind of programming. However, I can assure you of our interest and willingness to participate in this effort whenever feasible and appropriate.

Let me congratulate you on an especially thoughtful and well presented document. I hope it finds the response you seek and thereby opens doors to providing Israel with the greater independence she needs in the years to come.

Again, you have my wholehearted support and admiration and I do hope we can be of some help."

EACH PROJECT RENEWAL PROGRAM SHOULD ENCOMPASS THE DEVELOPMENT OF A PRIVATE BUSINESS ENTERPRISE

Exports could be expanded dramatically through the building of factories in Project Renewal areas. Over 100 US communities have entered into twinning arrangements with Project Renewal communities. The goal of Project Renewal is to remedy the social problems that have been left unattended over the years. Funds are being poured into these projects by American communities. However, there is an important ingredient that is missing; i.e., the development of an industrial component in each area.

I propose that each Project Renewal program encompass the development of an industrial plan financed by US companies with guaranteed markets in their twin community. This will provide jobs for many of the unemployed in Israel. It will make taxpayers rather than welfare recipients out of many who will work in the newly constructed factories in Project Renewal areas.

We would be pleased to make available to federations:

1) A plan for federations to assist in the economic development of Israel.

2) A plan to develop a factory in your Project Renewal community.

RECOMMENDATION #4 - THE UNITED JEWISH APPEAL SHOULD ASSIST IN THE DEVELOPMENT OF INVESTMENTS AND EXPORTS FROM ISRAEL.

The United Jewish Appeal has played a very important role over the years in assisting Israel. Gideon Patt, Israel's Minister of Commerce and Industry, recently pointed out:

"In 1948 charity collected by Jewish communities throughout the world provided us with almost 49 percent of our needs in foreign currency. In 1982 these donations represent less than two percent."

I believe UJA can add another dimension to its work through working with its members and local communities to help build the economy of Israel. UJA has a group of young leaders, many of whom have a business background. Their interest in UJA might well be heightened if UJA were to expand their efforts to include participation in business development within Israel.

UJA conducts many missions to Israel. Many of the people that are brought to Israel have been there before and have visited many of the customary places of interest. A good number of those who visit on missions are business executives who, if exposed to the business community in Israel, could become buyers of Israeli products and investors in Israel.

I propose that a task force be established within the United Jewish Appeal to examine how the UJA could, on its missions, present the business opportunities that exist within Israel. I believe that the Israel Manufacturers Association, the Israel Chamber of Commerce, CEG-I, etc., and others would be very willing to work out programs where there would be business seminars on "How to do Business in Israel." I believe that a very effective forward step could be taken by exposing those who come on missions to Israel to the opportunities that exist within Israel for investments and importing products made in Israel.

RECOMMENDATION #5 - THE ISRAEL BONDS ORGANIZATION SHOULD ASSIST IN DEVELOPING PRIVATE INVESTMENTS AND EXPORTS FROM ISRAEL.

The Israel Bonds organization brings many corporate executives to Israel. It is proposed that a plan similar to the one suggested for the United Jewish Appeal be adopted by the Israel Bonds organization. I propose that a task force be structured within the Bonds organization for the purpose of designing programs for those who come to Israel on Bonds missions to be exposed to the opportunities for investments and imports from Israel.

The Bonds organization recently brought a group of 38 young Israeli businessmen to the US as part of "Operation Enterprise." They participated in 1125 meetings in the US, including 125 with prominent non-Jewish executives.

This represents an important start in a new direction for the Bonds organization. Hopefully, plans will be developed for an expansion of this program.

RECOMMENDATION #6 - ISRAEL AND THE US MUST DEVELOP EXPANDED ECONOMIC RELATIONSHIPS.

There are many areas of mutual interest that should be developed between Israel and the US -- beyond the grants and loans provided annually to Israel by the US. The following areas will materially assist in bringing about Israel's economic independence.

1) The US should reallocate the use of funds allocated to Israel military.

The "Jerusalem Post" reported (July 31, 1983):

"Secretary of Defense Casper Weinberger and visiting Defense Minister Moshe Arens last week established a joint US-Israeli working group to consider several pending Israeli requests for additional US financial support in a variety of military areas.

In addition to receiving permission to use a portion of the $1.7 billion in annual FMS credits for the Lavi program, Israel is also seeking approval to use other FMS credits for the purchase of Israeli-made weapons. Normally, this US financial assistance is supposed to remain in the US for the purchase of American weapons.

Israel is also hoping that the Americans will waive that rule and allow third world countries receiving US FMS credits to use some of them for the purchase of Israeli military equipment."

2) Reinstatement of the Memorandum of understanding dated November, 1981, between Israel and the US.

This important agreement was suspended by the US after Israel extended its law into the Golan Heights. This agreement provided for a number of economic and military programs which could benefit both countries. It should be reinstated.

3) The US should grant Israel's request that it be allowed to use $200 million in foreign military sales credits in Israel for the purchase of Israeli-made military equipment.

Israel wants to revive its request that it be allowed to use $200 million in US foreign military sales credits in Israel, for the purchase of Israeli-made military equipment. Normally, FMS credits have to remain in the US. This $200 million "shekel conversion," as it has been dubbed, would be in addition to the $150 million, per year FMS request for the Lavie over the next ten years.

4) There is a need to develop a Center for the Development of Alternate Sources of Energy in Israel.

The American Government, as well as private companies, will be spending billions of dollars on research and development to provide alternate sources of energy. Israel has done a considerable amount of work in many of the areas, particularly in the solar energy field. I propose that there be developed a private profit-making organization to be known as the Center for the Development of Alternate Sources of Energy. This group will bring together the best of research and development personnel in the United States to develop alternate sources of energy in Israel.

5) Israel and the US should increase its joint research fund (BIRD-F) to $100 million.

The United States and Israel have developed a unique arrangement for funding of joint research projects. The two governments have set up a fund of $60 million to sponsor joint research between American and Israeli companies. Only the interest can be spent for these projects. These funds need to be supplemented. I propose that a $100 million joint research corporation be created and funded by American and Israeli companies for research in Israel. This will increase the number of US firms that will conduct R&D in Israel.

6) There is need to establish an Agro-Technology Research Foundation.

Water is a precious resource in the US and Israel. Israel, as a result of its meager water resources, has developed techniques and sophisticated equipment to make optimum use of irrigating its water and to make the desert bloom. Israel's research and development into irrigation techniques, as pointed out by "Scientific American" (January, 1981), has produced an extensive list of sophisticated products with wide application. The use of either microprocessors or larger minicomputer systems, cleverly integrated with software and agro-technological know-how, is bringing computerization both to the smallest farming units and larger farms. Much of this technology is applicable to the US farmers.

Joint research in Agro-technology would substantially benefit farmers and water conservation in both countries...and eventually the world. A US-Israeli Foundation, designed for this type of research in Israel, would benefit both countries.

7) There is need to increase the purchase of arms manufactured in Israel by the United States.

For its own preservation, Israel has developed and produces many sophisticated weapons. Its defense related exports doubled in the 1980-81 year to $1.25 billion. America could benefit by stepped up purchases of Israel's weaponry such as new surveillance radar systems, Gabriel sea-to-sea missiles, etc. These purchases by the US would assist Israel in reducing its negative balance of payments on trade with the US.

A task force should examine and implement ways for Israel to expand its co-production of arms with the United States. Israel's Aircraft Industries produces 350 military and civilian products and services. It employes 22,000 people and devotes 18.7 of its sales of $560 million to R&D. Israel has the capacity and expertise to effectively manufacture military equipment on a co-production basis with the United States.

8) The US should refinance Israel's obligations to the US.

Israel needs breathing room in meeting her future financial obligations to the United States. Last year Israel paid $3.2 billion in principal and interest on her debt -- a sum larger than the total aid package approved by Congress for the same period. Included in this amount was the payment of $800 million to the US.

9) The US should provide for future transfer of arms to Israel on a grant basis.

It is appropriate that America provide the future arms to Israel to be transferred on the basis of grants rather than loans. It is to America's interest to support not only Israel's military capability, but its ability to pay on a less onerous basis. This should be part of the US-Israel strategic cooperation.

10) The US Congress should pass the double taxation treaty between Israel and the United States.

A bill has been considered in the US Congress calling for the ratification of a double taxation treaty between the Governments of Israel and the United States. The treaty would avoid double taxation on profits earned in Israel by American companies.

The final bill was not acceptable to the Israelis. A new bill -- mutually satisfactory to the US and Israel -- should be promulgated and passed at the earliest moment. This would encourage more American companies to open plants in Israel.

11) The US should assist in fulfilling reciprocity agreements by US vendors.

When American manufacturers sell their products to the Government of Israel, they agree to use their "best efforts" to purchase Israeli products in an amount equivalent to 15 percent of the sales price. There are in excess of $800 million of unfilled commitments in existence. A task force should be created to design methods to get American vendors to honor these reciprocity agreements.

12) The US should purchase medical equipment in Israel.

The US should stockpile medical supplies in Israel as part of a strategic cooperation plan. The US should purchase medical supplies in Israel and conduct medical research in Israel's outstanding medical institutions.

13) The US should develop maintenance units in Israel to service US military equipment.

Israel has the technical capability, the seaports and the infrastructure to service US planes, equipment, ships, etc. Israel could readily and effectively serve as a supply depot to service America's fighting units deployed to the Mid East.

14) There is need to develop a Tri-National Consortium to develop trade between US-Israel-Egypt.

It is to America's interest to help develop the economy of Egypt as well as Israel. A Tri-National Consortium could develop plans for the three way economic development of Egypt and Israel using the infrastructure and research facilities of Israel and the labor resources of Egypt to benefit the economies of both countries.

15) Israel should develop a free trade agreement with the US.

Israel is exploring with the US the feasibility of Israel entering into a free trade agreement with the US. The Government of Israel reports:

"It would be open as well to Egypt and other countries in the region as they join the peace process. We believe that the international obligations of the United States would permit such an arrangement, and that its implementation would be in the best interests of both the US and Israel.

A free trade area (FTA) is defined in the GATT as 'a group of two or more customs territories in which the duties and other restrictive regulations of commerce...are eliminated on substantially all the trade between the constituent territories on products originating in such territories.' An agreement which satisfies the GATT criteria for an FTA is automatically excepted from the GATT requirement of most favored nation (MFN) treatment among contracting parties. Both Israel and Egypt now have FTA agreements with the European Communities. Effective 1989, Israel will accord duty-free treatment to all products from the EC covered by the agreement.

In our view, such an arrangement would be of positive benefit for several reasons. First, the arrangement would foster efforts by the United States to encourage peace in the Middle East by facilitating trade between Egypt and Israel. In addition, the possibility of participating in an FTA could provide an incentive to other Middle Eastern countries to join in the peace process.

Second, the FTA would enable US exporters to compete on the same basis with EC exporters which are enjoying increasing benefits from the EC agreements with Israel and Egypt.

Third, an FTA would help to stabilize the economies of Egypt and Israel. Currently, a large percentage of products from those countries enters the United States duty-free under the Generalized System of Preferences (GSP). The GSP program, however, is scheduled to expire in 1985. Additionally, increasing use of the competitive-need limitation creates uncertainty among exporters from those countries, especially from Israel. An FTA would create a sense of permanency which would encourage exports and investment."

RECOMMENDATION #7 - WE NEED TO EXPAND ISRAELI MARKETING EFFORTS IN THE USA.

As I have analyzed the various opportunities Israel offers in the USA, I continuously reach the conclusion that considerably more must be done to expand Israel's marketing efforts in the USA. We need to sharpen Israel's skills in marketing the following:

1) Market Israel's image as a country that has brought about an economic miracle. All too often we play up Israel's social problems and pay little attention to Israel's economic development over a few short years. I believe the time has come for us to accentuate the positive -- Israel -- a country that has performed economic miracles. I believe this image will help in producing investors, R&D, etc., from abroad.

2) We need to market the brainpower of Israel. Too few US business executives understand what is taking place in Israel's R&D institutions and the caliber of the scientists and engineers who are making major breakthroughs. We need to present this information in the US to a much greater degree.

3) We need to market Israel as a place to invest. We are not using our capabilities -- private and public -- to market Israel's investment opportunities. (More on this later.)

4) We need to market the many products that are made in Israel but can't find their way to the American market. (See discussion of trading companies.)

5) We need to market the various R&D institutions on a combined basis. Each institution is trying to sell its R&D capabilities on its own. We need to mount a massive combined program to sell the R&D of these institutions.

6) We need to market the availability of research parks, free zone ports, etc.

7) We need to market Israel trade shows and conferences. Israel offers many attractions to professionals and executives by way of trade shows and conferences. We need to market them more effectively in the US to expand attendance.

8) We need to expand the marketing of Israeli securities in the USA.

RECOMMENDATION #8 - ISRAELI BANKS SHOULD CONSIDER EXPANDING THEIR ACTIVITIES INTO LOCATING US INVESTORS, SPONSORING TRADING COMPANIES, FINDING NEW TECHNOLOGIES, ETC.

There are a number of Israeli banks operating in Israel and in the United States. These banks have done remarkably well in their traditional banking operations. They service many American companies in their banking and financing arrangements.

It would be most helpful to building the economy of Israel if these banks in their US and Israeli operations were to move into the areas of locating US investors, sponsoring trading companies, finding new technologies, etc. Some of the banks work in these areas, but more facilities and programs are required to reach the desired goal.

Consideration should be given by the Government of Israel to enact laws similar to the Export Trading Company Act passed in the United States in October, 1982. This law provides new incentives to business for the establishment of export trading companies. For the first time in US history, banking organizations may be part or sole owners of businesses formed principally for the purpose of exporting. These businesses are export trading companies (ETCs). The ETC Act also provides for an antitrust certificate of review issued by the Department of Commerce which will give combinations of exporters greater immunity from antitrust liability than currently prevails. In short, this law lays the groundwork for a new US business team effort to search out and sell to foreign markets.

An ETC can enhance the services that American companies may already be receiving from an export service company. The US Department of Commerce, in urging American companies to set up an ETC, has stated: "In addition to representing your product overseas, performing market research and making documentation and shipping arrangements, an ETC can provide additional services that can further strengthen your efforts to export successfully. These services include the following:

-involving banking institutions as part or sole owners of international trade ventures,

-increasing access to capital for small to medium-sized businesses,
-encouraging cooperation by exporters of goods and services for the purpose of selling to foreign markets more profitably,
-providing a one-stop service for business that includes existing export services plus the combination of services encouraged by the ETC Act."

RECOMMENDATION #9 - WE NEED TO ATTRACT AMERICAN FUNDS TO ESTABLISH BUSINESS-RELATED CHAIRS IN ISRAELI INSTITUTIONS OF HIGHER LEARNING.

Over the years, many Americans have funded special projects to assist in solving the social and educational problems of Israel. We need now to interest American executives to set up chairs in business schools so Israel can be in the forefront of changing business technologies.

A good example is the Sir Leon Bagrit Chair in Computer Aided Design at Ben Gurion University. We need to sell American executives on the value of funding a micro-electronics center, research parks, science cities, special R&D projects, etc.

Another example of an important privately sponsored business activity at Technion is the Neaman Institute for Advanced Studies in Science and Technology. This Institute was established by Sam Neaman to help find solutions to problems in economic, scientific and social development in Israel. It aims to raise Israel's standard of living and to facilitate its integration into the Middle East by the following means:

-Providing aid for advanced research in subjects studied at the Technion.
-Organizing international academic conferences to enable Technion scientists to collaborate with visiting experts.
-Providing the means and creating the atmosphere to encourage scientists to conduct research which aids Israel's society, economy and industry.

The Institute utilizes the resources of scientific and technological personnel at the Technion and mobilizes teams for limited periods.

INVESTMENTS

RECOMMENDATION #10 - ISRAEL NEEDS TO ATTRACT 50 MORE HIGH TECHNOLOGY US COMPANIES TO OPEN FACTORIES IN ISRAEL.

Israel needs to attract 50 US hi-tech companies. This will not be an easy task because of the competition worldwide for hi-tech companies. Israel has a major advantage to offer; i.e., its major natural resource -- its brainpower.

Israel needs to design a targeted marketing strategy to attract these companies. This will require the setting up of a task force of American and Israeli business executives and government representatives to analyze Israel's potential for investments, its incentives, its marketing strategies, etc.

Israel should establish target companies and find the best way to present Israel to the chief executive officers of these companies. An appropriate marketing program should be designed and implemented -- a program created by a highly qualified US marketing organization familiar with the US market.

A starter list are the 100 hi-tech companies listed inhi-tech books. Some are operating in Israel -- more need to be attracted through careful planning.

RECOMMENDATION #11 - THERE IS NEED TO APPOINT A MINISTER FOR ECONOMIC DEVELOPMENT OF ISRAEL.

To reach the goals outlined in this proposal, I believe it is important that one person have the total responsibility for the economic and business development of the country. This person would be the Minister for the Economic Development of Israel. At the present time, there is a split ministerial responsibility which, in my opinion, does not permit the accomplishment of a total and dynamic plan for the business development of Israel. While the existing Ministries attempt to carry out their responsibilities in an effective way, there is no overall responsibility placed on one person for the development of the economic growth of Israel.

I propose that a Minister for the Economic Development of Israel will have the following responsibilities:

1) Prepare short and long range economic plans with heavy emphasis on substantially reducing Israel's inflation.

2) Develop plans to expand investments in Israel. This includes attracting new industry and the expansion of operations of existing foreign owned companies in Israel.

3) Develop plans to expand exports from Israel.

4) Reduce imports into Israel.

5) Take action to fulfill Reciprocity Agreements excuted by the Israel Government and foreign governments.

6) Sell some government-owned operations to private industry.

7) Develop plans to offset the Arab boycott.

8) Prepare plans to reduce the numbers of people employed by the government so they can be utilized in industrial work.

9) Coordinate the work done by the various ministries in the economic area.

10) Coordinate the work done by various organizations outside of Israel in the field of economic expansion.

RECOMMENDATION #12 - THE GOVERNMENT OF ISRAEL SHOULD DEVELOP AN INDUSTRIAL POLICY FOR FOREIGN INVESTORS.

I urge that there be appointed by the Government of Israel a Commission for Expansion of Foreign Investment in Israel. This Commission would be made up of ten major business executives from Israel, ten major business executives from the US who have business interests in Israel, and ten business executives from other countries who have business interests in Israel. This task force would:

1) Design a program for expansion of foreign investment in Israel.

2) Examine the activities of the Government of Israel offices in the US in attracting investments abroad.

3) Examine the activities of the Government of Israel in handling investment applications in Israel.

4) Develop plans for the expansion of the activities of Israeli businessmen in selling investments abroad.

5) Review the activities of the Israel Manufacturers Association, the American-Israel Chamber of Commerce, CEG-I and others in promoting investments in Israel.

An overall plan should be designed that will substantially step up the investment activity in Israel. This plan will be submitted to the Government of Israel for approval.

RECOMMENDATION #13 - THE GOVERNMENT OF ISRAEL SHOULD MAKE IT CLEAR THROUGH ACTIONS THAT IT WELCOMES FOREIGN INVESTORS.

The Government of Israel actively encourages private foreign investment as an important source of the capital and technical expertise needed for industrial development. Significant incentives are available to stimulate investment. These include tax reductions, liberal investment law, safeguarding of the rights of foreign investors, full rights of repatriation of profits and investments, no limit on dividends, and no discrimination or restrictions on foreign ownership.

In carrying out this policy, the Government of Israel should not compete with its citizens or foreign companies. The late Simcha Ehrlich, while serving as Minister of Finance of Israel, stated:

> "One of the deep-rooted and serious problems throughout the years is the exaggerated involvement of the government in all the economic sectors and that by anesthesing and sometimes even suffocating private initiative. Sometimes, suffocation was due to too much coddling of the producer and consumer at the same time.
>
> In this area we are going to ensure conditions under which any citizen will be able to develop his initiative and talent with an ensured remuneration for his efforts and achievements.
>
> The government should not compete with its citizens, either in the field of direct economic activity or involvement in investment and production or in the capital market. The government shall be involved and invest only in these areas where it cannot interest the private investor."

Israel might well take a page from the Puerto Rico ads where the following statements are made:

> "Puerto Rico has a positive can-do attitude. The government makes things happen."
>
> "Our people adapt easily to high-tech manufacturing. And they're intensely loyal."
>
> "We get things done."

RECOMMENDATION #14 - THE GOVERNMENT OF ISRAEL SHOULD CARRY OUT ITS ANNOUNCED POLICIES TO SELL SOME OF THE GOVERNMENT-OWNED BUSINESSES.

The Government of Israel should consider selling a number of its government-owned businesses. The Israeli Government has a financial interest in 181 companies. When Menachem Begin became Prime Minister in 1976, he announced his New Economic Policy (NEP). One of the major thrusts of NEP called for the sale of government-owned companies. To date very few government-owned companies have been sold.

By selling certain companies, Israel can eliminate the losses which it incurs through operating some of these companies, thus moving further towards economic viability.

Aharon Dovrat, Managing Director of Clal, Israel's largest private conglomerate, reported his attitude toward government ownership of business as "This is very bad. The government should withdraw from the ownership and management of business. The government, by definition, is not a profit-making organization. It should divest itself from all the companies it owns." The telephone system? "Everything!!" El Al? "If it is possible, why not? However, El Al is a special problem. I know. I was on the board of directors for two years. But," he asks, "why should the Government of Israel be the owner of a railway if we can find a private enterprise ready to take it and manage it? The government could keep control of it. The function of government," Dovrat declared, "is to give permits and to control. Not to run business."

(See Appendix A which contains the list of some of the companies owned by the Government of Israel and The Jewish Agency.)

RECOMMENDATION #15 - THERE SHOULD BE AN EXPANSION OF THE FREE ENTERPRISE SYSTEM IN ISRAEL.

Israel will need to attract many foreign companies to open facilities in Israel. These companies prefer to operate in a free enterprise environment. Israel would do well to eliminate many of the restrictions which limit the free competition needed for growth.

It is recommended a commission be created to study the question of how to reduce the number and impact of regulations imposed by the Government of Israel on corporations doing business in Israel -- both domestic and foreign. The thrust of this study should be to determine how to make it easy -- rather than difficult -- for corporations to operate within Israel. As we say in America, "Let's get government off our back." This would be an appropriate goal for Israel.

RECOMMENDATION #16 - WE NEED TO DESIGN AN OVERALL MARKETING PLAN TO SELL AMERICAN EXECUTIVES ON THE VALUES OF OPENING FACTORIES IN ISRAEL.

Israel offers incentives to foreign investors; i.e., grants, loans, access to EEC countries duty-free, etc., -- BUT these benefits are meaningless unless there is a strong marketing program to attract US companies to operate in Israel.

I believe there have been weaknesses in the marketing strategies to sell Israel investments in the past few years. We need to strengthen the marketing of investments in Israel now that the US is pulling out of a serious recession. It was difficult to sell an Israeli investment to American executives during 1981 and 1982, while they were running their plants at 60 percent of capacity and trying desperately to hold their corporate heads above water.

With the turn around in the US economy, the time is ripe for an expanded effort -- public and private -- to sell Israeli investments in the USA.

The Government of Israel needs to hire US professionals to review the record of past investment applications -- why some US companies backed off after applying -- why others by-passed Israel, etc. A professional survey of US companies by a US survey company will supply many answers for a new and expanded thrust to sell Israeli investments in the USA.

Further, a US marketing organization should be retained to design a program to advertise and sell Israeli investments. A strong PR program should be launched.

I believe the efforts to market Israeli investments should be targeted to high technology companies -- possibly 2,000 in number.

There is no need to spend advertising dollars in general circulation magazines, newspapers, if the intent of the Government of Israel is to attract high technology companies. An overall marketing strategy should be designed on a professional basis by a US company familiar with the US market.

RECOMMENDATION #17 - THE GOVERNMENT OF ISRAEL NEEDS TO EXPAND ITS MARKETING EFFORTS TO SELL US COMPANIES TO OPERATE FACILITIES IN ISRAEL.

As Israel moves forward to attract a minimum of 50 US high technology companies to open facilities in Israel in the next five years, Israel needs to make certain that she has the strongest sales staff in the US to sell American corporate executives to operate facilities in Israel.

Most of the sales work in the US is done by the Israeli Investment Authority which operates through its offices in Israel, New York, and several other centers throughout the United States. These offices are staffed by Israelis who come to America for a three-year period, then return to Israel. They are conscientious and try their best to do their job in a very difficult situation. However, there is a lengthy breaking in process for any Israeli who comes to the US to work in the Investment Authority offices. At the end of three years, the Israeli representative packs up and goes back to Israel. There is a constant turnover in the Investment Authority staff which has an adverse effect on the selling of investments in Israel. No business could be successfully run if there was a complete turnover of staff at the end of every three years.

One way to overcome this problem and to strengthen the Israeli Investment Authority, is to employ some Americans in the US to work along with the Israelis who are assigned to the US. The Americans selected will provide not only continuity, but marketing strength based upon their previous experience in selling. Multi-national companies have found that the best way to manage and run their foreign operations is to use the nationals of those countries. I believe the same applies to selling investments by Israel in the US.

The Israeli budget restrictions limit amounts that can be spent for advertising and public relations in the US and understandably so. However, we must keep in mind that Israel is competing against Ireland, Puerto Rico, Mexico, etc. These countries have very large budgets and large sales staff in the US. Israel cannot afford advertising of an institutional nature. It must use rifle shot approaches. It must fish where the fishing is best to attract American investors. It is also important that Israel have a strong public relations program in the US to present Israel in a positive way. Much more information has to be furnished to the US press as to the success of American companies in Israel. This will form the basis for good, solid business reporting in the US trade press.

I recommend that there be appointed an Investment Authority Board of Directors consisting of a number of experienced Israeli businessmen. These men could advise the Investment Authority and help in finalizing investments. They would serve on a dollar a year basis and would meet with foreign businessmen to maximize

the time that they spend in Israel. This group of businessmen would also attempt to finalize results of the visits. They would stay with the prospect until the discussions develop into an investment. Beyond that, the board would make certain that every effort is made so that the investment turns out to be a profitable one.

RECOMMENDATION #18 - ISRAELI BUSINESS EXECUTIVES SHOULD BE ENLISTED TO PARTICIPATE IN THE MARKETING OF ISRAELI INVESTMENT OPPORTUNITIES.

A SPECIAL MESSAGE TO ISRAELI INDUSTRIALISTS

In order to meet the goals of attracting 50 US companies to Israel to open factories and another 50 companies to conduct R&D in Israel, we will need the support and active participation of the business sector of Israel. It would be helpful if we were to have a statement from the Israel Manufacturers Association stating that foreign companies are welcome in Israel and that the Association will lend its services and facilities to ease the way for American companies to enter into Israel. In some countries, foreign investment is not welcome by existing corporations. It is important to make it clear to American companies that Israeli business executives not only want foreign investment, but that they will assist in whatever way possible so that the American companies will be successful in Israel.

It would be most helpful if the Israeli industrialists participate in selling American executives on opening facilities in Israel. American businessmen respond better to other businessmen than to government officials.

The Israel Manufacturers Association might well consider having a small office in New York, staffed by a retired Israeli business chief executive of a high technology company. This person would have had many contacts with hi-tech companies in the United States and would be in a very good position to influence them to open facilities in Israel.

* * *

Israel might well take a page from the book of Ireland, from state and local Chambers of Commerce in the US in promoting investments. While government offices certainly play an important part in selling investments, it has been found that the best salesmen of investments are businessmen seeking to attract investments to their countries, to their states and to their communities. A group of top-flight Israeli business executives should be enlisted to serve in this capacity.

RECOMMENDATION #19 - THERE IS NEED TO COMPUTERIZE ISRAELI PLANT LOCATION INFORMATION.

In a recent article in the "Site Selection Handbook/83" it was reported:

> "In the four years since 'Site Selection Handbook' last queried development organizations about their use of the computer to meet the information needs of site selection experts, such use has increased by 67 percent. The 1983 survey of development organizations reveals that 10 percent of the agencies responding presently employ a computerized data base of sites, buildings, location factors, and community characteristics -- up from the six percent reported in May 1979. The latest survey shows, further, that an additional 16 percent of agencies responding intend to computerize their site files within a year.
>
> Twenty-four states -- virtually half the country -- now possess operational data bases, with an additional 11 planning to establish one by early 1984. These agencies have already computerized and are continuously updating the location data that most of the smaller, local agencies still handle by traditional methods. Data from these state agencies have been, in turn, entered into a master data base, SITENET, now on-line from Conway Data, Inc., and freely accessible to facility planners. Thus, the application of the computer to the collection, updating, and distribution of location data today enables the site-seeking executive to have comprehensive, accurate, and timely information summoned to the screen of his desktop computer in a matter of seconds."

There are numerous industrial and technological parks in Israel -- all competing to attract American investors. A computerized program showing available Israeli sites would be most useful to potential US investors.

RECOMMENDATION #20 - THE GOVERNMENT OF ISRAEL NEEDS TO WORK WITH US COMPANIES SPECIALIZING IN PLANT LOCATION SERVICES.

Many US companies consult with specialists in plant location services. A good example of this type of consulting company is the Fantus Company which represents many federal, state and local development agencies, as well as private corporations. Fantus possesses a unique computerized techno-economic data bank covering 124 location factors for 1900 product lines:

Fantus conducts a first-hand assessment of industrial operating conditions in many areas. Fantus advertises:

> "Positive findings are presented as a series of plant location aids for use in prospect sales situations. Obstacles blocking industrial growth are identified, and remedial recommendations for upgrading your area's competitive position

are tendered. Corrective measures cover such diverse subjects as information systems, financing tools and incentives, plant security, industrial training, zoning, land assembly, and public/private sector coordination.

Employing our corporate site selection expertise, we can assist you in the following areas: objective analyses of existing industrial parks or stand-alone parcels, zoning restrictions, land-use plans, design criteria, and the advisability of constructing shell buildings. Comprehensive industrial real estate sales strategies, including identification of target industries, recommended land prices, and proven marketing strategies, are also furnished. Additionally, upon request, Fantus will select properties that should be developed for future industrial or commercial use and tell you why."

In addition, Fantus offers a business climate improvement and economic growth strategy service as follows:

"Factors such as taxes, government attitudes, responsiveness of development organizations, perceived image, workmen's compensation laws, permit approval processes, training capabilities, etc., can exert considerable influence on the facilities location decision.

Based on our corporate location work, Fantus knows the relative impact business climate variables have on specific industries. We can supply you with a blueprint featuring administrative and legislative recommendations to upgrade the investment environment for business in general and individual industries in particular.

Prior to drafting steps necessary to stimulate local employment levels, Fantus will take stock of your area with respect to its development potential. Projections are made on labor force size and future job opportunities to determine possible imbalances. Impacts resulting from probable economic growth are also measured. In addition, we will identify specific economic activities locationally-fit for your area and recommend physical modifications, changes and improvements that are needed to accommodate the desired growth."

It would be well for the Government of Israel to consult with an organization such as Fantus to determine how to improve Israel's business climate and to develop economic growth studies.

RECOMMENDATION #21 - WE NEED TO DEVELOP A PRIVATE MARKETING ORGANIZATION TO SELL INVESTMENT OPPORTUNITIES IN THE USA.

We need to move from an era where Israel relies upon American volunteer organizations and the Government of Israel to bring

about increased investments in Israel by US companies. We need to encourage the development of a private, for profit, company to market investments by US companies in Israel. A privately owned and operated marketing organization should have sales offices in Boston, San Jose, San Diego, etc. -- markets where high technology companies have their headquarters.

This company operating on a fee basis would offer these services:

1) Locate potential American investors for Israel.

2) Consult and provide investment advice.

3) Find potential joint venture partners.

4) Handle the negotiations with the Government of Israel.

This company will also provide to US companies comprehensive site location service in Israel. All locational criteria will be suitably weighed in accordance with their importance. Studies will recommend specific locations listed in order of their desirability, with supporting reasons for this rating.

RECOMMENDATION #22 - THERE NEEDS TO BE AN UNDERSTANDING OF HOW AMERICAN COMPANIES MAKE DECISIONS TO OPEN FACILITIES ABROAD.

The following facts of life must be considered in attempting to attract investments by American companies in Israel:

1) American investors must believe they are welcome in Israel. Statements of welcome by high government officials are important. On the other hand, if these statements are nothing more than providing lip service, they will not attract American investors. The manner in which these welcome policies are carried out is what controls. Americans open operations in countries where there is an ease of doing business; where there is a minimum amount of red tape; where commitments are met promptly by government officials; where they are not subjected to competing against government subsidized companies; where there are not monopolies that prevent them from effectively operating; etc. In other words, there must be a commitment by the Government of Israel beyond issuing a welcome policy, to adopt every reasonable measure to make Israel an attractive place for American investors to open and operate their factories.

2) American companies will not invest in Israel unless there is an opportunity for a very substantial return on investment. American manufacturers, seeking foreign investment, examine carefully opportunities that various countries offer. They select the country where they have the potential for the highest return on investment. The opportunities offered

in Israel are compared to Puerto Rico, Ireland and other countries. Unless there is a potential for a very high return on investment in Israel, companies will go to other parts of the world to open factories.

3) American companies make investments in countries where there is a minimum involvement by government in private business matters. Every effort should be made to reduce the amount of government regulation in the operating of private business. American investors, when considering Israel, find an over-involvement on the part of government in private companies. Our custom in the United States is to limit the degree of government intervention in the operations of a private business. There is a minimum of reliance upon the government. American companies want to do business in this same type of "noninterference by government" climate.

4) Israel must accept the fact that US investors will open plants in Israel on the basis of potential for profit and not emotion. Israel cannot expect American companies to open plants in Israel on an emotional level. Jewish entrepreneurs will give money to UJA and will buy Israel Bonds, but they will not open plants in Israel unless they foresee a high return on their investment. Arguing that American companies with Jewish ownership have a responsibility to open a factory in Israel will not be productive. Persuading companies to open plants in Israel on the basis that they will make a high return on investment is the only language that potential investors will listen to and accept.

5) Stability of government is required. An American investor will not put his capital to risk in a country where he thinks that tomorrow there will be war or there will be a likelihood of long periods of reserve duty on the part of the company's employees, etc. Talk of war scares off investors. There must be a recognition that "War and Investments don't mix." Investors will make investments where there is political stability.

While investors may obtain insurance from OPIC, it must be recognized that OPIC insurance does not cover loss of profits due to a close down during a war. It does not cover disruptions in production caused by wars; call up to military reserves; etc.

6) American investors will not invest in countries where certain companies have monopolies. There is a perception amongst many investors in the United States that they will not be able to get a share of the local Israeli market because of certain monopolies that exist, both in the private sector and in the public sector.

7) American investors do not want to open a factory in Israel unless there is an opportunity to sell some portion of the

manufactured products to the local Israel market. While there is a limited market in Israel, American companies generally do not want to be 100 percent dependent upon selling products for export only. They want a local market in which to experiment; in which to test out products; in which to fall back on if the export market declines; etc. If they are confronted by a monopoly that controls all of the local market, the chances are very good that they will open a plant in another country where a monopoly does not exist.

8) American investors must find an abundance of well-motivated and properly trained labor in Israel. The perception exists in the US that Israel's labor force is not always well-motivated; and as a result, productivity is low. However, this can be disputed by many American companies who can show that the productivity of their Israeli work force is equivalent to that of their work forces in other parts of the world, including the United States. It's important for American companies to know that when they operate in Israel, there is an abundant supply of well-qualified labor. They do not want to be in a position of training their people only to have another company steal away their work force.

9) American companies do not want to operate in a country where there is an overpowering union. There is a general perception in the United States that the Histadruth is an overpowering union that makes it very difficult for American companies to operate in Israel. Further, Americans are not accustomed and do not welcome a union owning a number of business enterprises, some of which may be competitive to theirs. They do not want to have to compete against a union that may have subsidies provided to the companies which they own. They want to operate in a country where the union is similar to what we have in the United States -- a union that is engaged only in representing employees for labor relations.

10) American investors need to be assured that the Arab boycott will not adversely affect their operations. The Arab boycott rears its ugly head from time to time. American companies want to manufacture and sell their products in the Middle East. They have choices as to where to open factories. If a chief executive officer believes that the marketability of his company's product will be diminished by having the factory in Israel instead of an Arab country, the decision may well go towards opening outside of Israel. It is important to offset this problem by proving the values of selling to the European Common Market, as well as the opportunities that exist to sell Israeli manufactured products, duty-free, to the US.

11) There must be a minimum of loss days due to strikes in Israel. US executives prefer to operate where there are a minimum amount of strikes, not only within the private sector

but in the public sector as well. They are concerned if there are an excessive number of airline strikes, or strikes on sea going vessels. They depend upon getting their materials in and out of Israel promptly. An undue number of strikes puts a chill on an investment decision.

These are overriding considerations that must be in the forefront of Israeli Government planning to attract American investors.

RECOMMENDATION #23 - THERE IS NEED TO REVIEW THE INCENTIVES OFFERED BY THE GOVERNMENT OF ISRAEL TO PROSPECTIVE FOREIGN INVESTORS.

While the Government of Israel has increased the incentives offered to foreign companies seeking to invest in Israel, some argue that these incentives are not competitive to what is offered by Puerto Rico, Ireland, etc.

The Government of Israel must keep in mind that there are many options open to American companies. They can step up their production in the United States. They can open in small American communities where there are generally lower labor costs, higher productivity, etc. They can open a plant in the Far East or in Mexico across the border, etc. The question always has to be answered, "Why should an American company open a factory in Israel -- some 7,000 miles away from the United States?" As explained in other parts of this memorandum, Americans will only open plants in Israel if there is a very good return on their investment; proper business climate in which to do business; etc.

A company does not know when it starts an operation what the return on its investment will be. It does know the nature of the incentives that are being offered by Israel as well as incentives offered by other countries. Israel must recognize that it is dealing in a competitive world.

I recommend that a task force be created to study the incentives being offered by Israel in relationship to other countries. The task force, after analyzing various incentive programs, will be in a position to recommend a new incentive program that will make Israel more attractive for more American investments.

RECOMMENDATION #24 - WE NEED TO SELL THE IDEA THAT 160 US COMPANIES ARE AT WORK IN ISRAEL AND MAKING A SATISFACTORY OR BETTER RETURN ON THEIR INVESTMENT.

One of the best kept secrets in Israel is the work that is being done by American companies in Israel. This includes not only their product lines that they manufacture, but their sales export figures and profits earned in Israel.

We need to provide considerably more information to American companies as to how well other American companies perform in Israel. We need to sell the fact that there is an expanding number of American firms with facilities in Israel. These include some of the top names in US business; 23 of them are in "Fortune" magazine's list of the 250 largest industrial companies.

As best that we can determine, the following is a partial list of US electronics, computer and instrumentation companies operating in Israel:

AEL American Electronics Laboratories, Inc.
Astronautics Corporation of America
AVX Corporation
Babcock Electronics Corporation
Bell Telephone Laboratories, Inc.
Celesco Transducer Products, Inc.
Computer Consoles, Inc.
Control Data Corporation
Designatronics, Inc.
Deutsch Electromechanical Industry
Digital Equipment Corporation
Electro Materials Corporation of America
Fibronics International, Inc.
General Dynamics Corporation
General Telephone and Electronics Corporation (GTE)
Gerber Scientific Instrument Company
Grumman Corporation
HCC Industries Ltd.
High Voltage Engineering Corporation
Hughes Aircraft Company
Information Magnetics Corporation (Infomag)
Intel Corporation
International Business Machines Corporation (IBM)
International Telecommunication & Teleprocessing, Inc.
Kulicke & Soffa Industries, Inc.
M/A-Com, Inc.
Mennen-Greatbatch Electronics, Inc.
Mennen Medical, Inc.
Modgraph, Inc.
Mica Corporation
Motorola, Inc.
Microwave Associates
National Semiconductor Corporation
Pentacom, Inc.
Phasecom Corporation
Raychem Corporation
Systems Engineering Laboratories, Inc.
Veeco Lambda Corporation
Vishay Intertechnology, Inc.
Wideband Data Corporation
Zenith Radio Corporation

(Please see Appendix B for a full listing of American companies doing business in Israel or having facilities in Israel.)

This is an outstanding group of companies. We need to have information as to why they are operating facilities in Israel; what are their export sales; how profitable are their Israeli operations; etc. We need success stories to sell other American companies.

Potential US investors are interested in the fact, for example, that Intel, a US manufacturer of electronic hardware, decided to establish production and research facilities in Israel, earmarking $130 million for the project. Until now, Intel has spent $40 million and the $90 million balance will probably be invested by the end of 1983.

Veeco Instruments, Inc., a New York based company with worldwide sales of $100 million, according to the "Israel Economist," searched for months to find a country suitable for setting up a plant to manufacture devices which convert alternating current to direct current. In 1979, Veeco established Lambda Electronics in Karmiel, Galilee, with a $3.4 million investment. Merrill Simon, a Veeco vice president, noted that Israel was the only country to meet all of Veeco's criteria. The first criterion was government financial help. While many countries were prepared to provide aid, some, such as West Germany, France and the UK, were not enthusiastic about a plant which would compete with local factories. The second criterion was political stability, which ruled out Spain, Portugal, Turkey and Greece. The third criterion was low labor costs, which excluded West Germany and Sweden. A fourth demand was that the country possess a pool of locally trained workers with technological skills. The fifth criterion was that the country possess the technological and industrial infrastructure so that Veeco could design its products to meet the specific demands of Western Europe. Finally, Veeco wanted a country which had a duty-free agreement with the Common Market. Only Israel and Ireland met all of these requirements. However, Ireland was ruled out because its local market was tiny -- smaller than Israel's -- and because it could not supply the same amount of R&D. Moreover, Israel has commercial and diplomatic relations with Rumania, a country which Veeco hopes to use as a gateway to Eastern Europe.

Established in 1948, Motorola Israel, Ltd., has emerged as a national leader in the communications field. It manufactures a wide range of products in Israel including radio communications systems, computerized irrigation control systems, industrial and energy control and management systems, electronic warning and alarm systems, data communication networks and military electronics.

The company's annual sales in Israel exceed $50 million. Exports to the United States and Canada have doubled in the past

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Fibronics International, Inc.
General Dynamics Corporation
General Telephone and Electronics Corporation (GTE)
Gerber Scientific Instrument Company
Grumman Corporation
HCC Industries Ltd.
High Voltage Engineering Corporation
Hughes Aircraft Company
Information Magnetics Corporation (Infomag)
Intel Corporation
International Business Machines Corporation (IBM)
International Telecommunication & Teleprocessing, Inc.
Kulicke & Soffa Industries, Inc.
M/A-Com, Inc.
Mennen-Greatbatch Electronics, Inc.
Mennen Medical, Inc.
Modgraph, Inc.
Mica Corporation
Motorola, Inc.
Microwave Associates
National Semiconductor Corporation
Pentacom, Inc.
Phasecom Corporation
Raychem Corporation
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The company's annual sales in Israel exceed $50 million. Exports to the United States and Canada have doubled in the past

five years to reach 40 percent of the company's sales. Through the parent company's worldwide distribution and marketing network, Motorola Israel also exports to Europe, Africa, South America and Australia. It has been reported that the Israeli subsidiary has launched a drive to increase exports to 60 percent of sales and plans to export about $70 million worth of its products by 1985.

Steady growth has prompted the company's expansion to new quarters. A production and office building with a floor area of 160,000 square feet was scheduled for completion in 1982 near Motorola Israel's current Tel Aviv facility. The new building can comfortably accommodate the company's 1,200 employees and can allow Motorola to double production and expand its line of products.

The company has also shown a growing commitment to research and development of new systems and processes. Company investment in research and development increased from 3.3 percent in 1975 to 7.5 percent of sales in 1980. More than 100 Israeli engineers and technicians work exclusively on development and have close ties with the laboratories of the parent company.

We need to design a program to present more of these success stories to the American business community.

RECOMMENDATION #25 - WE NEED TO SELL THE BRAINPOWER OF ISRAEL.

One of the most attractive features that Israel offers to a potential investor is the skilled work force existing within Israel. There exists within Israel a reservoir of highly trained manpower consisting of professional engineers, scientists, technicians and skilled workers. Israel has 23,000 scientists engaged in the exact sciences, life sciences and various technological sciences. There are 25,000 engineers in Israel. From this highly trained force, 3,500 men and women are directly involved in research and development (R&D).

Former Israeli President, E. Katzir, has pointed out, "One should note that for every 10,000 citizens, we have about 30 scientists involved in R&D. The corresponding figures are 25 for the United States, 14 in England, 24 in Japan and 13 in France. Thus, the number of brains at work in Israel is, per capita, the highest among the technologically advanced countries in the world."

This is Israel's most important natural resource. We need a strong marketing effort to sell this resource in the USA.

RECOMMENDATION #26 - IT IS NECESSARY THAT THERE BE AVAILABLE IN THE UNITED STATES ECONOMIC INFORMATION TO SATISFY THE NEEDS OF POTENTIAL INVESTORS IN ISRAEL.

American corporations -- interested in opening facilities in Israel -- need to have available current information in the United States which will provide the following:

1) Labor Supply: Up-to-date information on labor force potential by skills, work experience, education levels, sex, age, wage rates, productivity and training programs and facilities.

2) Water: Complete information on (a) municipal supplies including storage capacities, pumping, filtering and chemical analysis; and (b) underground and surface supplies, locations, volume and chemical analysis.

3) Resources and Raw Materials: The costs, availability and analysis of coal, oil, gas, high calcium limestone, brines, rock salt, sand, gravel, shale, clay and other raw materials. Also sources, costs and availability of iron foundry products, steel, alloys, aluminum, chemicals, timber, pulpwood and other products.

4) Utilities: Electric, gas, water and telephone services -- capacities, characteristics and rates.

5) Transportation: Current rail, highway, air and river data, too. Transit times, rates, services, terminals and interchanges.

6) Communities: Complete and current knowledge of community population, characteristics, attitudes, forms of government, bonded indebtedness, housing, banking, commercial establishments, schools, hospitals, churches, cultural facilities, recreation, civic organizations, municipal services and industrial development activities.

7) Taxes: Tax costs and trends, plus appraisal and assessment practices.

8) Educational Facilities: Information about curricula, specializations, enrollments of schools, colleges, universities and specialized institutions.

9) Industries: Manufacturers' names and locations, including products and employment data.

10) Industrial Fuels: The costs, analyses and thermal values of coal, electric power, oil and gas.

11) Research Facilities: Information on basic and educational research facilities, testing laboratories and services -- both independent and corporate.

12) Industrial Sites: Available data on industrial sites and districts: location, size, utilities, transportation.

13) Available Industrial Sites: A catalog of these facilities as to former use, age, type of construction, floor area, clearances, cranes, plus other equipment and utility services, as well as sale and lease terms.

RECOMMENDATION #27 - THE GOVERNMENT OF ISRAEL NEEDS TO CONSIDER PUTTING UP A NUMBER OF BUILDINGS IN INDUSTRIAL PARKS ON A SPECULATIVE BASIS.

In response to a continuing demand for existing buildings and in an attempt to provide production space in minimum time, speculative industrial buildings have been constructed in many communities across the country.

An existing "spec" building offers the important advantage of production with minimum delay following the location decision. In addition, it is physical proof of the concern and aggressive action of the local community in preparing for and welcoming new industry. In nearly every case, the complete financing package has been assembled and allows for quick completion of the structure to the specifications of the prospective tenant. "Spec" buildings can either be purchased or occupied under terms of a leasing or lease-purchase agreement.

RECOMMENDATION #28 - THERE IS NEED TO DO A STRONGER JOB TO SELL THE FACT THAT ISRAEL CAN SERVE AS A SPRINGBOARD TO THE WORLD'S LARGEST DUTY-FREE MARKETS -- THE EEC AND THE USA -- WITH PREFERRED ACCESS TO OTHER WORLD MARKETS, TOO.

Israel provides duty-free access to half a billion people. Foreign investors now have the opportunity, through a location in Israel, to sell their products duty-free to the world's largest markets: the European Economic Community and the United States.

The EEC is by far and away Israel's most important trading partner, absorbing about 36 percent of Israel's exports and supplying about 41 percent of her imports. The EEC Free Trade Area agreement puts Israel in a favorable competitive position relative to other non-European industrialized countries, mainly North America, Japan and Australia. The exports from the US to the EEC buyers are subject to the full external tariff rates.

By manufacturing products in Israel and selling to buyers in the EEC, an American company will eliminate the duty that must be paid on shipments from the US to EEC countries.

For example:

Name of Product	Average Duty Paid by US Manufacturers on Shipments to European Countries
Calculators, Electric or Electronic	14%
Automatic Data Processing Machinery	7%
Input, Output Devices, Storage Devices, etc.	7%
Parts & Accessories for Data Processing Equipment	6%
Electrical Machinery, Motors of All Types	6% to 8%
Printed Circuits	10%
Insulated Wire and Cable	11%
Electrical Insulators	10%
Telephone & Telegraphic Line Equipment	7.5%

We need to sell this substantial advantage to US manufacturers.

RECOMMENDATION #29 - WE NEED TO PLACE GREATER EMPHASIS ON THE ABILITY TO SELL ISRAELI-MADE PRODUCTS "DUTY-FREE" TO THE US MARKETS.

Israel enjoys favorable treatment under the US Generalized System of Preferences (GSP), which allows tariff-free entry into the USA for over 2,700 Israeli-made product categories, including the following branches: metal, machinery, electrical goods, electronics, chemicals, pharmaceuticals, computers, instruments, jewelry and furniture.

The meaning of GSP treatment is that, while European goods exported to the US pay relatively high customs tariffs, a subsidiary or a joint venture based in Israel may export to the US duty-free. This enables the product manufactured in Israel to compete under more favorable conditions in the American market.

Israel is also accorded GSP treatment in other industrialized countries. This enables most Israeli-made industrial goods to be imported free of duty or almost free of duty into the following countries: Austria, Australia, Canada, Finland, Japan, New Zealand, Sweden and Switzerland.

Israel's trading position is made more attractive by its location: at the crossroads of three continents, there is direct access to both the Mediterranean and the Indian Ocean.

RECOMMENDATION #30 - THERE IS NEED TO DEVELOP A PROGRAM IN THE UNITED STATES TO "PROVIDE OPPORTUNITIES FOR ISRAELIS LIVING IN AMERICA TO RETURN TO ISRAEL."

There are a substantial number of Israelis who have moved to the United States and are employed in US high technology industries. We need to develop plans which will offer opportunities to many Israelis to return to Israel and utilize the skills that they have learned in the United States. A good example of an Israeli who returned home is Efi Arazi, head of Sci-Tex. Arazi headed the R&D Department at Itek, an American company. He returned to Israel and developed the very successful company, Sci-Tex. The best evidence of Sci-Tex's success is output achieved per employee: $65,000 a year. The figure for Burroughs ($3b. turnover) is $50,652; for NCR (over $3b. turnover) is $48,858; for Honeywell ($5b. turnover) is $50,665; for IBM ($26b. turnover) is $76,808. Sci-Tex is already up to American productivity standards.

Israel needs to attract other Efi Arazis and thereby bring about a very extensive expansion of exports in the high technology field.

Carl Alpert, in a recent report, stated: "A recently published survey conducted by Manpower Ltd., which operates here (and whose international headquarters are in Milwaukee), serves to confirm our own superficial impressions. In the first quarter of 1983, the press in Israel published 46,474 help-wanted ads, an increase of more than 5,000 over the same period last year. Of these, 16,736 were for academically trained personnel, up 21.7 percent over the same period last year; technical workers, 4,327, up 76.4 percent."

We need a private search firm to do this job of bringing Israelis back to Israel.

RECOMMENDATION #31 - THERE IS NEED TO INCREASE THE PRODUCTIVITY OF ISRAELI WORKERS.

To meet the goal of economic independence, Israeli manufacturers will need to increase the productivity of the work force.

Eliahu Hurvitz, President of the Israel Manufacturers Association, has stated:

"The task that Israel places on the shoulders of industry is the expansion of production for export, and the replacement of imports by local production so that the net income in foreign currency will at least cover the deficit in the balance of payments. In 1980, this deficit was some $4,000 million.

How is this to be achieved? In 1980, the annual production of an Israeli worker was about $20,000. The corresponding figures for a number of European countries was: Holland $40,000, Switzerland $35,000 and Germany $34,000. So as a first step, we must raise the figure of Israeli workers by about $10,000 to bring us more into line with the industrialized countries, which will continue to advance in efficiency.

If we can quickly create the conditions and resources to make this possible, we will be able to halve the deficit. The achievement of this goal is possible. To a great extent, it is in our hands. Increasing productivity must be the foundation of our efforts to reduce this deficit."

A commission should be created to design new ways to increase the productivity of the Israeli work force.

EXPORTS

RECOMMENDATION #32 - THERE IS NEED TO SUBSTANTIALLY EXPAND THE EXPORTS FROM ISRAEL.

To become financially independent by 1990, Israel must expand her exports by 10-15 percent per year. This expansion will come about as a result of increased export sales of:

1) Existing Israeli companies;

2) Newly developed Israeli companies;

3) American companies operating in Israel;

4) A large number of foreign companies that will be attracted to operate facilities in Israel.

In spite of the extraordinary obstacles and pressures of the past 35 years, Israel has achieved a remarkable level of industrialization, and has made much progress toward realizing economic self-sufficiency. More than most nations, Israel is highly dependent on foreign trade for economic development. With a population of less than four million, its domestic market is too small to permit manufacturers to achieve the economies of scale required for efficient, modern industries.

As a result, Israel must continue to look far beyond its borders to the world at large. Today a series of mutual trade agreements link it to the most industrialized nations. Exports constitute about half of the Gross National Product, and Israel is ranked among the eight leading exporting states on a per capita basis.

The steady expansion of Israeli exports toward eventual elimination of the country's balance of payments deficit, is a primary goal of Israeli national policy. To that end, all efforts are being made to encourage the development of industry and the growth of exports -- industrial exports in particular. Only in this way can Israel afford to buy all of the items necessary for survival and ensure its economic viability and independence.

Gideon Patt, Israeli Minister of Commerce & Industry, recently reported:

> "The focus is on exports, which have been the biggest success in the present government's economic policy. They rose from $2.4b. in 1976 to $5.5b. last year -- of which 85 percent were industrial exports.

These came to $4.75b. Our plan deals with industry only. Its foreign sales are due to go up by an average of 9 percent annually, to reach $11.5b. by 1990, the minister said.

Chief accent is on the high technology branches, and that means pushing the creation of new products based on local research and development. The trend is reflected in the figures. The growth-rate for electrical and electronic equipment will be 12 percent a year.

If we take the entire sector of metals, electrical and electronic products, the rise will be from $1,250m. to $3,466m. This sophisticated and science-intensive branch will account by then for 40 percent of Israel's industrial exports excluding diamonds.

Diamonds are to expand more slowly by 7.5 percent, and textiles at a lower rate still of 5 percent. But clothing should rise by 8 percent a year, thanks to big strides made by the fashion industry.

This high pace of industrialization will not happen by itself. Needed is $900m. of investment per annum in the production sector. At present one-third of our industrial exports are original Israeli developments, based on an outlay of $80m. a year on R&D -- half of it grants from the government.

We intend that the proportion of original Israeli commodities should climb from one-third to 40 percent. That can be done if R&D is stepped up from $80m. to $275m. by the end of the decade.

All this represents considerable effort, since industry must expand faster than other branches. Productivity will rise and so will employment. The 9 percent yearly expansion of exports will necessitate a 2.5 percent increase in manpower. The number of industrial workers should augment from 300,000 in 1980 to 350,000 in 1983, attaining 420,000 by the start of the nineties, according to Patt."

Unfortunately, there was a drop in exports in Israel in the last half of 1982. Elisha Shahmoon, Chairman of the Israel Export Institute and General Manager of Motorola Israel, reported that the fall in exports was due to three main factors:

1) The insufficient fall in the value of the shekel, expecially against the European currencies (see chart), thus reducing exporters' shekel income in relation to their foreign currency receipts.

2) The fall in demand due to the economic recession in the industrialized world.

3) The overt policy of trade protection of some of Israel's trading partners.

THE INADEQUATE DEVALUATION OF THE ISRAELI SHEKEL
January - November 1982

Foreign currency	Shekel (1.1.82)	Shekel (30.11.82)	Change in shekel's value against foreign currency	The Percentage of exports to each country
Dollar	15.6041	32.3929	+107.59	13.92
Pound Sterling	29.8819	53.1357	+ 77.82	10.63
Deutsche Mark	6.929	13.2913	+ 91.82	9.81
French Franc	2.7352	4.699	+ 71.72	6.81
Dutch Guilding	6.3111	12.0577	+ 91.06	5.27
Swiss Franc	8.681	15.5046	+ 78.60	2.8
Japanese Yen	7.096	13.973	+ 96.91	0.77

Note: Inflation rate during same period = 119%

There has been strong pressure within Israel, from the manufacturers particularly, to devalue the shekel. It was reported in the "Jerusalem Post" (February 6, 1983):

> "As to the devaluations, they did lag behind the currency's depreciation. Finance Minister Yoram Aridor seems to be more concerned for the moment with fighting inflation than bridging the trade gap.
>
> The dollar was worth IS15.60 in December 1981, and IS33.65 in December 1982 -- a drop of 115.5 percent. Israel's price index rose during that same period by 131.5 percent; so the shortfall comes to 13.85 percent."

Israel devalued the shekel by 7 percent on August 11, thus freezing the currency at about 57 to the US dollar from 53 the day before. This cut, plus others brought the reduction of the shekel rate in August 1983 to more than 11 percent.

The devaluation will make Israeli products more attractive on foreign markets and make imports more expensive in Israel. This dovetails with the recent moves of the Government of Israel to cut the budget by $1 billion. Ezra Gada, Israeli Finance Minister, projects that the net reduction in Israel's operating budget would be about 10 percent a year.

These moves by the Government of Israel should be of considerable help to Israeli manufacturers in the expansion of their exports.

An insurance program has been established within Israel to protect Israeli exporters as a result of this shortfall.

RECOMMENDATION #33 - WE NEED TO EXPAND THE FACILITIES OF THE ISRAEL EXPORT INSTITUTE.

Israeli manufacturers who export products abroad belong to an organization known as the Israel Export Institute. This organization provides ongoing services to the exporters. In past years, most efforts were directed to exporting to the European markets. Now, however, there is a move towards exporting to the US rather than to Europe because of the strong US dollar.

I recommend that the Israel Export Institute set up specific training programs for its members to better acquaint them with the US market. The Institute might well hire several Americans who have a strong US marketing background and who live in Israel. These consultants could be most helpful to Israeli companies who have an interest in the US market. They could better prepare them for their entry into the US market. In a number of cases, they would discourage certain Israeli manufacturers from trying to sell their products in the United States where they are not adequately prepared and sufficiently financed.

The Export Institute could create "fly-ins" to the United States, where Israeli chief executives or marketing personnel would be brought to the United States for 10 days to two weeks to visit technical institutions, corporations, etc. By being on the ground floor in the United States, those who participate in the fly-in would get an important indoctrination as to the way the US market functions and how best to approach this market.

RECOMMENDATION #34 - THERE IS A NEED TO IMPROVE THE DESIGN OF PRODUCTS MADE IN ISRAEL TO INCREASE THEIR MARKETABILITY ABROAD.

While many products manufactured in Israel are well-designed for the Israeli market, this is not always true for the American market. There must be a greater interchange of design engineers between the US and Israel to increase the marketability of Israeli manufactured products in the USA.

Israel might well take a page from the Italian book. "Business Week" reports in an advertising section on Italy:

> "Italian designers and engineers are directing their unmatched talent for integrating form, line, color and the functional toward creating elegant and practical surroundings in which to live and work. They design appliances to make both these endeavors more efficient and pleasant, automobiles, motorcycles and aircraft that in some cases are practically handcrafted -- able to stand on their own as art, and they provide much of the affluent world with clothes, jewelry and other accessories that honor the human form as did the Renaissance sculptors of Florence.

Italy has quietly become recognized as one of the great centers for the rare combination of both esthetic and engineering expertise. Clients who have turned to Italian creativity to help them compete in an increasingly competitive world include the International Business Machines Corporation, which has brought in an Italian designer as a major consultant; Sony, which has asked an Italian to design its new stereo line; and Volkswagen and Renault, who both want their new lines of cars to look Italian.

Besides supplying the world's industrial giants with styling and meaningful visual appeal, Italy sells a wide variety of read-to-use products. Last year, Italian exports amounted to $77.9 billion, a quarter of the country's Gross Domestic Product. Of this, the United States' share amounted to $4.3 billion. Germany, France, Scandinavia and the Arab countries imported far greater dollar volumes.

The reasons North America doesn't avail itself of an even larger share of the good things Italy has to offer, according to the Italian Trade Commission, are America's lack of familiarity with what Italy can offer and the somewhat higher cost of Italian products. To remedy this, the Commission has set up Italian Trade Centers in six key cities in the United States: Los Angeles, San Francisco, New York, Houston, Chicago and Atlanta.

The Center in New York, inaugurated in February, is the largest trade center ever established in the US by a foreign government. The 33,000 square foot complex at 499 Park Avenue occupies four floors and costs $8 million a year to operate. The lower level of the Center contains a 10,000 square foot exhibition center for year-round showings of Italian merchandise timed to appropriate market weeks in the United States. Periodic showings of Italian footwear, fashions, leathers, furs, ceramic tiles and other products from Italy are planned.

'We have an educating job to do in Italy and the United States,' says Fauso De Franceschi, director general of the Italian Trade Commission in Rome.

'To get to know the market, we are currently conducting research in 10 different merchandising sectors,' De Franceschi says.

To build up the American furniture market, Italy's National Association of the Furniture Industry contracted a research firm to conduct a $200,000 study on the furniture market in the United States. Findings from the study are now being disseminated to the Association's 700 member companies in Italy.

'To launch our promotional program -- Atlanta was chosen to handle the campaign because of its proximity to High Point, North Carolina, the furniture "capital" of the United States -- we're going to bring a 30-year retrospective exhibit of Italian design to the US that we presented in the State Museum of Cologne in Germany,' said Antonin Azzarello, director of the Italian Trade Center in Atlanta. The exhibition gives a broad view of our most important designers, such as Gio Ponti, Joe Colombo, Magistretti and Frattini.

We'll take it to New York, Chicago and other major cities. We also plan to work closely with interior designers and decorators and with editors of architectural and design magazines. We'll hold seminars here in the US and we'll invite them to Italy.

This month some 25 Italian furniture manufacturers are attending the furniture trade show, Neocon, in Chicago. 'They are meeting with the people who can actually design Italian furniture into new office buildings, condominiums and houses: contractors, architects and interior designers,' said Giulio Castelli, president of the National Association of the Furniture Industry in Milan."

Israel needs to analyze the Italian program and adopt appropriate steps to improve design of her products for the US market.

RECOMMENDATION #35 - THERE IS A NEED TO DEVELOP AN ADDITIONAL FIVE LARGE TRADING COMPANIES.

In our work with Israeli companies, we have found that many are unable to penetrate the American market because they are unwilling to make the full commitment required in exporting to the US. They do not possess adequate capital and their marketing strength is inadequate. Many of these companies do not have management that is sophisticated in terms of export. They do not have adequate warehouse facilities in the US. They are unfamiliar with the US market in terms of distribution channels, regional marketing, etc. They do not have the capital to maintain inventory in the US.

There are several trading companies operating in Israel. An additional five would substantially increase the flow of exports from Israel. Private investors are needed to expand this program. These trading companies would have a staff in Israel and in the United States. The staff in the United States would consist of Americans who are skillful in marketing. The Israeli staff would supervise production, quality controls, adherence to delivery schedules, etc. These trading companies should provide the following aids to affiliated manufacturers:

1) Management Assistance: The trading company would supply knowhow to the companies serviced in such areas as overall management, quality control, pricing, packaging, catalog development, new product development, etc.

2) Capital: The trading company would assist in providing, either on its own or through assistance from various banks, the necessary capital for work in process, new plant equipment, inventory, accounts receivable, etc.

3) Automation: In order to be competitive, many Israeli manufacturers will have to become further automated. The trading company will be in a position to provide this type of service to their companies.

4) Marketing Services Abroad: The trading company will provide sales and marketing efforts in foreign countries. The trading company will have offices abroad and will develop appropriate marketing strategies to sell the products of the sister companies. This eliminates the need for the sister companies to open sales offices abroad.

It would appear that it would be best to go with the "winners" -- companies that have done exceedingly well in their own businesses. Examples:

1) Tadiran, Israel's second biggest industrial enterprise, could set up a trading company for high technology products.

2) Elscint could set up a trading company for medical instrumentation.

3) Elron, an industrial holding company, could set up a trading company in advanced military electronics, commercial computer applications, communications and factory automation, etc.

4) Israel Chemicals could set up a trading company to handle various chemical products coming out of Israel.

5) Polgat could set up a trading company for apparel.

6) Clal and Koor are presently operating trading companies. Hopefully, their work could be expanded to increase the exports from Israel.

RECOMMENDATION #36 - WE NEED TO DOUBLE THE EXPORTS OF US COMPANIES OPERATING IN ISRAEL OVER A FOUR-YEAR PERIOD.

US companies operating in Israel play an important role in providing exports from Israel. These US companies have the potential for considerable export expansion, if the conditions in Israel are conducive to expansion.

I would urge that the appropriate agencies of the Government of Israel call on each US company operating in Israel to help design an expansion program with them. This will call for new plant facilities, new equipment, added training facilities . . . all accompanied by appropriate grants and loans to make the expansion attractive. It must be cost-effective for US companies to expand in Israel rather than in other countries. It is to Israel's benefit to interest these companies to expand in Israel through new and creative incentives.

RECOMMENDATION #37 - WE NEED TO ASSIST IN THE EXPANSION OF PRODUCTS MANUFACTURED IN ISRAEL'S KIBBUTZIM.

Israel relies upon 360 industrial enterprises in kibbutzim to expand the exports from Israel. Today, the income of approximately 300 kibbutzim is derived about equally from industry and agriculture. The kibbutzim enterprises employ a total work force of 17,500. Total exports from the kibbutzim in 1982 were approximately $200 million. Kibbutzim industries occupy a dominant position in such branches of industry as plastics, metals, furniture, plywood and canning.

There is a need to develop and expand marketing strategy between the kibbutzim and US marketing organizations. Most kibbutzim are too small to have their own marketing organizations. They are well equipped to manufacture products -- the marketing should be left to a US marketing structure.

RECOMMENDATION #38 - WE NEED TO EXPAND THE MARKETING OF ISRAELI TRADE SHOWS, CONFERENCES, SEMINARS, ETC.

Israel schedules many fine trade shows, exhibitions, conferences, etc. that should attract worldwide attention. Oftentimes there is not adequate information about these events in the USA. In some cases sufficient time is not provided between the announcement of the show and the event itself.

A task force should be appointed to review the program and develop plans to increase attendance. At this moment a strong effort should be made to launch Isratech May 1983. This is an important trade show displaying Israel's new technology. We need to get many groups in the US to put together missions to Isratech.

RECOMMENDATION #39 - WE NEED TO ASSIST ISRAELI MANUFACTURERS TO EXPAND EXPORTS IN TARGETED AREAS.

There are numerous well-developed products manufactured in Israel that should capture a greater share of the US market. This requires targeted marketing in the US, or "fishing where the fishing is best."

Areas of concentration for expanded marketing of Israeli products in the US are as follows:

Electronics

There are over 100 electronics companies now operating in Israel. Six may be considered major firms. Though the 25,000 people they employ only constitute about 8 percent of the nation's industrial work force, this includes approximately 40 percent of the total number of industrial engineers in the country. This is a reflection of the high degree of advance technology and know-how which characterizes production. The industry's major divisions are the military, medical and industrial branches, telecommmunications and control systems, computer equipment and components. Each of these areas offer large potential for expanded exports.

Computers

Israel is one of the most highly computerized societies in the world. Most of its computers are concentrated in the manufacturing sector. In the home and the small business sector, Israel lags somewhat behind Europe, and quite a bit behind the US.

Software

Israel's computer industry must concentrate its efforts on the creation and export of software systems. Israel's small local market and the intensive competition among the world's hardware manufacturing giants makes software production the only logical path. Such a direction also best suits what is generally considered Israel's appropriate program of industrial development with its emphasis on high value added products in which the manufacturing content is low. Israel's programming is at the international standard. The challenge is to commercialize these abilities.

After many years of preparation, Israel's computer software industry is now growing into an increasingly important exporter.

Mashov, Ltd., a leading firm in the field has announced the sale of 20 of its hotel reservations and guest registrations of software packages to a major customer in the United States, a deal reportedly worth more than a quarter of a million dollars.

Architectural Computer Aids Ltd. of Tel Aviv reports having sold a $200,000 computer-aided design program which simplifies and speeds preparation of detailed construction plans, to a London firm, the first transaction in a $3 million package. And a third firm, Ariely Programming and Computers of Tel Aviv, says it has concluded an agreement with a major US company for the distribution of its software package for printing firms.

We need to develop better marketing strategy to assist Israeli software manufacturers to penetrate and serve the US market.

Medical Instruments

Israel's healthcare industry has earned an international reputation for its development, production and export of high-quality, innovative equipment and supplies for hospitals, laboratories and treatment facilities.

There are over 100 Israeli manufacturers who manufacture a wide range of products including: advanced micro-computer supported products for critical-care applications; care-oriented modules; electro-medical instruments for clinical diagnosis, treatment and research; nuclear medicine and laboratory instrumentation; cryogenics and vacuum systems; miscellaneous instruments and equipment for diagnosis, nursing and treatment; laboratory equipment; orthopedic devices and artificial organs; optical equipment; dental equipment for laboratories and treatment.

Elscint Ltd. of Haifa is a world leader in nuclear imaging equipment. Their CAT (computerized axial tomography) scanners have captured a sizeable portion of the American market. Essentially, these computerized machines make it possible to see inside the body. They survey data about the body and convey information on the function of organs to TV monitors for rapid analysis. Although competing against giants in the international market, Elscint's sales for the year ending March 31, 1983 increased to $110.3 million from $71.9 million for the previous year.

Elscint announced that it has signed two contracts, one for 15 and the other for 22 whole-body CAT scanners. The first contract, with Transmobile Nuclear Corporation of Cleveland, is for 15 of the medical body-scanner units, to be mounted on vans. The units will be delivered before July 1984. This order totals $11.4 million.

The second contract, with the Imaging Network of America of Salt Lake City, is for 22 units. This contract specified a blanket agreement for ordering and delivery before March 31, 1985, with a total value of $10.8 million to $19.6 million, depending on the configurations to be selected.

Israel has also been a pioneer in laser surgical instruments. Laser Industries is the world's leading developer, manufacturer and marketer of carbon dioxide laser systems for freehand and

microsurgery. Of every 25 CO-2 lasers in use in the US, it is estimated that 17 are Laser Industries. The device, which takes the place of a scalpel, allows surgeons to destroy and cut tissues selectively and precisely with minimum blood loss and maximum sterility. The laser units can be used for neurological, reconstructive and gynecological surgery.

Telecommunications

One of the strongest areas of electronics for industry is telecommunications, an area in which Israel excels in sophisticated and unusual equipment -- and exports. Tadiran Israel Electronics Industries and Electronics Corporation of Israel (ECI) were recently awarded the coveted Rothschild Prize for advancement in communication technology.

Tadiran was signaled out for its development of Shamir, a tactical radio connection in which the sender can switch frequencies at will to avoid enemy interference. The firm is Israel's leading electronics manufacturer, supplying both military and civilian markets at home and abroad with sophisticated electronic equipment. Tadiran's 1982 sales approached $400 million.

ECI was recognized for its telephone line doubler, in which the number of telephone conversations carried on the same line can be multiplied by using a computer to exploit the natural pauses in speech.

Telrad, a division of Israel's giant Koor Industries and the country's leading manufacturer of telephones and related equipment, projects $25 million in exports for 1983. Its leading product now is its Key BX automatic business telephone exchange. This system's advanced features include a memory of up to 160 numbers, conference calls and the automatic transmission of recorded messages. Marketed so far solely in the US, the Key BX has won great popularity here.

Solar Energy

The solar energy field has, in recent years, become a major growth sector in Israeli industry. Israel is a world leader in this area, and as a result, solar energy systems for buildings of all types have become an important export item.

Various methods of solar absorption and collection are available today, and these are linked into systems which range from water heating installations for private homes and swimming pools to sophisticated systems for large scale buildings like apartment blocks, factories, hospitals, hotels and other institutions.

Apart from water heating, several systems have been developed for space heating, to power central air conditioning units and to supply other energy needs, including those of industry.

According to estimates by the Ministry of Energy, 11 percent of Israel's energy needs in the year 2000 will be met by solar energy. Of this, 12 percent will come from passive energy, direct absorption not using collectors, 30 percent from flat plate collectors, another 30 percent from concentrating collectors producing industrial process heat, 16 percent from photovoltaic systems and another 12 percent from solar ponds generating electricity.

An exciting new project, also a world first, is the Dead Sea Solar Pond project, initiated by Dr. Harry Tabor of the Hebrew University, who has been called the "father of solar energy" in Israel. The project centers around a 7,000 square meter pond at Ein Bokek, probably the largest solar collector anywhere, which utilizes the large temperature differential between lower and upper levels of water to generate steam, which then drives an electric turbine. If the present experiments prove the system economically feasible, ponds with a potential of 2,000 MW will be installed on the Dead Sea by the end of the century.

Recently an agreement for the construction of a 15 MW solar power electricity generating plant in California has been finalized between Luz International, Ltd. of Jerusalem, and the Southern California Edison (SCE), one of America's most progressive public utilities. The plant will draw its energy input from computerized solar steam generating modules, developed and manufactured by Luzs' experts.

It is reported that the Luz solar generating plant to be built in Southern California will have a total collector area of 125,000 square meters (approximately 1.3 million square feet), installed on a 100 acre site provided by the power company. Most of the equipment for the project will be fabricated in Jerusalem. Total cost, including fabrication, installation and all necessary on site work, has been estimated at some $100 million.

Like other Luz systems already sold to several industrial firms in the United States, the present project also will be financed by a group of private investors, and operated by a Luz subsidiary. Those investors in effect form a "utility," which is eligible for significant tax benefits, by virtue of the oil savings it realizes.

Southern California Edison will not need to master the technology of operating Luzs' solar system. In fact, its only obligations are to provide a plot of land for the collector array, and to buy the power produced over the next 30 to 40 years, at a price which always will be substantially less than that of electricity from alternate conventional sources. Reportedly that price has now been pegged at 22 cents per kwh, about 10 percent below the present cost of SCE's own marginal peak production.

After its completion, in more than three years, the Luz system's total output will be 15 MW -- enough to cover the needs of some 8,000 California households. However, the plant will begin to produce power long before its 1985 completion date. Intermediate stages call for the production of 3 MW at the end of 1983, and of 9 MW some time in 1984.

We need to attract the following US companies involved in solar energy to conduct R&D or open manufacturing facilities in Israel:

Acurex Corporation of Palo Alto, California
Chronar Corporation
Energy Conversion Device of Troy, Michigan
Energy Materials Corporation
Honeywell
IBM
Arthur D. Little
Mobil-Tyco Energy Corporation
RCA
Solarex Corporation
Sunmaster Corporation of Corning, N.Y.
Suntime Corporation in Bridgton, Maine
The Southwall Corporation of Palo Alto, California
Texas Instruments
Westinghouse

Desalination Plants

Israel has developed great expertise in the design of desalination plants. It has been reported that drinking water for 55,000 people in the US Virgin Island community of St. Thomas is now supplied by a low temperature desalination unit, built and installed by Israel Desalination Engineering Ltd. A second IDE plant, on nearby St. Croix, will cover the needs of nearly 30,000 inhabitants there.

Both installations utilize inexpensive low temperature heat sources. The needed energy is supplied almost entirely by 70 degree C (less than 160 degree F) exhaust steam from nearby generating stations, which until now was simply vented into the atmosphere.

It was reported in the "Jerusalem Post" that the Bechtel Corporation, one of the world's largest construction firms, which at present is carrying out projects worth $15 billion in Saudi Arabia, recently assessed the methods used by Israel Desalination Engineering (the Zarchin process) as the most advanced in the world. Nathan Berkman, head of Israel Desalination Engineering, stated this at a press conference.

Berkman thinks that some of the Israeli-made units are functioning in Saudi Arabia, but not through Bechtel. He believes that they reached Saudi Arabia as an offshoot of the knowledge the Americans acquired as joint financiers of the Ashdod plant. The plant cost $27 million to construct and produces 20,000 cubic meters of sweet water a day.

Berkman said that the Israeli system was the cheapest in the world, producing a cubic meter of water for 70 cents and that this would soon be lowered to 60 or even 50 cents a meter. (The original process as developed by Alexander Zarchin, who is now retired and living in Tel Aviv, was not used. Rather two other methods, "multi-effect distillation," which uses steam and "vapor compression," which uses electricity, were being sold.)

So far, Israel Desalination (which was acquired from the government by Israel Chemicals early in 1982) had sold plants to five Latin American countries, to Spain and to Italy. The biggest project so far was three plants for the Virgin Island, each costing $5 million, with another three smaller plants, each costing about $3.5 million now being installed. The latter three had originally been ordered by Iran before the revolution.

Furniture

Furniture today is one of Israel's fastest growing consumer exports, and Israeli furniture manufacturers are making a concerted effort to penetrate the international, and especially American, market to an even greater degree.

There are currently more than 1,500 separate furniture enterprises in Israel, ranging from the small scale carpenter to large factories. But only about 30 of these, medium and large companies, are engaged in export, and are responsible for Israel's total furniture exports of $15 million in 1981 -- primarily to the US.

Agricultural Products

Today, Israel grows an astounding array of crops. In fact, with the exception of wheat, meat and sugar (all partially imported) and food and grain oils (fully imported), modern Israel has achieved self-sufficiency in food supply and has emerged as a major exporter of fresh and processed foods. Last year, Israel exported well over $1 billion in food, beverages and agricultural products to the four corners of the globe.

In the near future, ornamental plants will constitute a greater share of Israel's total farm exports. Already one of Europe's main suppliers of flowers during the winter, Israel expects to achieve a similar marketing position in ornamental plants within a few years. Products derived from organic agriculture are also increasing in importance in response to changing tastes of consumers everywhere. Cotton, peanuts and crop seeds are other products which add to Israel's year-round variety of fresh exports.

Processed Foods

While fresh agricultural produce is still the industry leader, Israel's processed food exports are gaining rapidly. In 1981,

Israel exported close to $350 million in processed food, mainly to the United States and Europe, an indication that Israel's food industry is geared to the needs of the most sophisticated markets in the world.

Fifty varieties of non-citrus fruits and vegetables are marketed abroad under the "Carmel" label.

Poultry products are another substantial export, with turkey products particularly successful, because of their widely appreciated qualities of being non-fattening and having a low albumin content. Goose livers and meat have become an export specialty alongside smoked, roasted and frozen poultry.

Other important processed food exports are: dehydrated vegetables for soups and other purposes; prepared and frozen foods; wines and spirits; chocolate and sweets; pasta and baked goods; spices and additives; oils; snacks and many other categories of products designed to please the most discriminating palates of modern consumers everywhere.

Aviation

Sophisticated transportation equipment and services are today a major Israeli world export. Aviation accounts for the bulk of these exports, and in recent years, Israel has won international recognition for its aviation-aerospace products and the rapidly growing services it supplies.

Most of the credit goes to Israel Aircraft Industries Ltd. which from a modest beginning as a repair and overhaul station, has grown into a 25,000 person, multi-unit organization now recognized as a major contributing member of the world's aviation community.

IAI's well-known Westwind series of executive (business) jets has captured about 27 percent of the entire world and US market. More than 225 have been delivered in the less than five years the Westwind has been in production.

IAI also manufactures the Arava STOL passenger transport-cargo plane, described as a "rugged versatile aircraft, designed for maximum capability with minimum maintenance;" the Sea-Scan maritime surveillance plane and Scout Mini, remotely piloted vehicle.

The successor to the Westwind, the swept-wing Astra, will be introduced to the market later this year. According to its designers, the Astra 1125 is "the executive jet of the future" whose "supercritical" wing will give greater range, altitude and speed than the Westwind jet it is to replace. The Astra will feature intercontinental range, mach 0.8 cruise speeds and exceptional fuel efficiency, while maintaining the Westwind's economical life-cycle costs.

Besides manufacture and export of aircraft, IAI, its subsidiaries and other Israeli aviation manufacturers export components to the world's leading companies in the field, often on a subcontracting basis. In addition, skilled services, including overhaul, maintenance, retrofit, precision machining and finishing and testing are offered to many foreign airlines.

Apparel

The apparel industry is continuing to develop by stressing export quality products. Approximately 30 percent of the industry's output is already exported, a direct result of the deliberate strategy to produce to the demanding standards of sophisticated overseas markets.

Industry analysts predict record exports for 1983, thanks partly to improved international economic conditions; to technological advances within the industry; and to buyer identification of Israel as an important resource for medium-price fashions of high quality and standards and sophisticated design. A recent agreement with the US under which certain Israeli textile imports are eligible for reduced duties, is expected to have an extremely positive effect on the US market.

Some 90 percent of Israel's ready-to-wear and textile exports at present go to Europe, most of the balance to the US. Britain is Israel's foremost fashion customer; with West Germany second; France third; and Holland fourth.

While there are some 1,500 companies which manufacture textiles and clothing in Israel, only about 300 are involved in export. Of these, about 100 manufacturers -- who cover virtually every ready-to-wear merchandise category, every price and style range -- account for the bulk of Israel's fashion export. And 10 large companies account for fully 50 percent of the industry's foreign trade.

As is the case in other advance countries, these leading concerns are vertically integrated operations whose activities cover all phases of production from the processing of raw materials to the manufacture of intermediate products and then final goods. Moreover, these firms are equipped with state-of-the-art machinery which enables them to achieve the highest production standards and maximum cost efficiency.

Metals

Generally speaking, the metal industry encompasses four distinct divisions. In basic, metals, Israel's exports include pipes and the varied production of iron and steel industries and foundries as well as that of non-ferrous metal plants. A second category covers a wide array of manufactured hand tools, plumbing fixtures of kitchenware, and air conditioning to furniture.

Israel's industrial machinery and equipment manufacturers, who comprise a third distinct division, have achieved a degree of quality and diversification on a par with the most advanced nations. In this field, the rich assortment of products includes irrigation and control equipment, valves, pumps, heat exchangers, notching, punching and folding machinery, fitting of all sorts, tools and bits, discs and molds -- just to name a few. Indeed, the branch fills the needs of numerous specialized industries such as metal working, electronics, chemicals, agriculture and food processing, construction and engineering, material handling and many more.

The metal industry's fourth branch manufactures and exports sophisticated transportion equipment and parts for air, sea and land use -- a field of activity whose foreign sales have more than doubled since 1977. In addition, export derived from subcontracted general machining and the construction of complete metal industry plants are beginning to account for an impressive share of overall foreign sales.

Plastics

In the plastics branch, a great part of production for export is based on modern injection-molding techniques. An especially significant share of total output consists of various types of irrigation and agricultural equipment innovated in conjunction with agricultural development. Recognized as the most advanced in the world, these products are exported around the globe and have earned Israel's plastics industry an outstanding international reputation.

At the same time, the expansion of exports has been connected to developments in packaging. The building trades are also major consumers of plastics from Israel, as are such other fields as agriculture.

The rapid growth of Israel's plastic industry is one of the country's outstanding achievements. Today, that industry is world-renowned for its advanced technology, product quality, uncompromising precision and guaranteed delivery dates. Several hundred plants located throughout the country manufacture virtually thousands of products in the fields of agriculture, industry, construction and defense. And the plastics industry, which started out in Israel to seek substitutes for the vital natural resources Israel lacked, exported over $60 million worth of products in 1981 -- mostly to developed countries with highly demanding standards.

Israel currently exports a broad range of finished products and raw materials as well. The main objective over the past decade has been to specialize in the manufacture of sophisticated products based on polyethylene, PVC and polystyrene. Recently, the fastest growing field has been packaging. Irrigation components and an unusual plastic sheeting are other outstanding

exports. New developments in solar energy research have resulted in the pioneering of revolutionary solar collectors made entirely out of plastic.

Chemicals

Exports of chemical products made in Israel continue to expand rapidly. "Israel Business" reports:

> "Tradition has it that Israel is a land devoid of natural resources. This assertion, of course, is false: although not blessed with some of the world's better known types of mineral wealth, this is not a poor land. Geologists have not yet found significant deposits of coal, iron ore, gold or oil, but they have located other sources of wealth, with which human intelligence and labor can do wonders, to produce prosperity for the country's inhabitants.
>
> The Dead Sea, with its vast wealth of dissolved minerals, is only one such 'deposit.' In addition, there are large reserves of phosphate rock, in different parts of the Negev; there are immense quantities of salt; there is a variety of sands and clays; there are great deposits of oil shales, waiting for new technologies to make their exploitation feasible.
>
> During just over three decades of Independence, Israel already has done a great deal to utilize this great potential wealth. Large and flourishing enterprises have been developed, to extract minerals from the soil and the Dead Sea brines, and to convert them into commercially viable products. These ventures are engaged in a never-ending process of development and growth.
>
> The projects now already in progress suggest further growth will take place in the next few years, as a world hungry for food eagerly buys the fertilizers and plant protection chemicals produced in Israel. By 1984/85, say present forecasts, Israel Chemicals' exports should reach the $600 million level."

Pharmaceuticals

The Israeli pharmaceutical industry has grown to more than 30 companies which employ some 3,000 people. The combined sales of the industry have been growing over the past five years at a rate of 5 to 10 percent per year in real terms, to about $105 million in 1982. Israel's pharmaceutical exports have nearly doubled over the past five years, from $25 million in 1978 to $45 million in 1982.

The key to the industry's dramatic growth, like comparable achievement in other Israeli high technology industrial sectors, is R&D. Israeli firms are currently developing a new generation of pharamaceutical products, such as advanced antibiotics, human diagnostics and medical instrumentation, and interferon-related treatments, as well as cardiovascular agents, and anti-cancer drugs with lower toxicity and improved efficacy.

Irrigation Technology

Because of its special conditions, Israel has emerged as a world leader in developing modern technology for water supply and distribution. Since Israel's water resources are so limited, they must be managed for maximum efficiency -- especially in light of enormous fuel prices for pumping and distribution.

As a result of its breakthroughs, Israel has not only been able to increase its total irrigated area substantially and cost-efficiently, but has become a major exporter of irrigation equipment and systems.

One revolutionary innovation has been the method of drip irrigation which brings water directly to plant root systems through carefully placed flexible tubes and specially designed trickle fittings.

Another Israeli innovation involves computer-controlled irrigation systems in which everything is automatic; a method which can be used for both sprinkler and drip irrigation networks.

There are numerous other irrigation control and regulating devices, including systems in which shut-off is automatic when a pre-set volume of water has flowed through a meter; and modular solid-state electronic controls which may be connected to water meters with electrical output to achieve a simple remote reading.

Chemigation, the supply of chemicals through irrigation systems to improve yields, is also viewed as a crucial development for the future.

Robotics

Robots have been targeted as a special growth area by Israel's Chief Scientist, with $40 million earmarked for investment in robot development in Israel in the next few years. At present, Israel has 22 industrial robots, compared with 16,000 in Japan, 7,000 in the US and 4,000 in the rest of the world. But a concerted effort is underway on many fronts. Technion, Israel's technological institute, has established a robotics laboratory toward creating an Israeli capability in the field, and is already involved in 10 specific robotics research projects. Israel's highly trained manpower, know-how in electronics, control theory, computer software and hardware and image processing are expected to provide a head start for the fledgling robotics industry.

The development of a second generation welding robot is the aknowledged goal of a major R&D project, now underway at Elco Robotics Ltd., with the support of the Chief Scientist's office, in the Ministry of Industry and Trade. Elco Ltd., parent firm of Elco Robotics, is an experienced manufacturer of transformers and other large scale power distribution equipment; it is now diversifying its activities into several high technology fields, including robotics.

Professor A. Lavie, Chief Scientist of Israel, believes that Israel can successfully compete with the US and Japanese giants in two main areas: "clever robots with multiple senses and robots for use in agriculture." He also believes that many spin-offs from the defense industry will result and that these will play an important role in Israel's robotics industry.

RECOMMENDATION #40 - AN ADDITIONAL NUMBER OF ISRAELI COMPANIES NEED TO PRODUCE OFFICE AND HOME COMPUTERS.

There is an information explosion in the USA. It is reported: millions of new jobs will be created in the USA in information systems. They will be so different that today's laid-off workers will be hard pressed to fill them. The net outcome will be more jobs, probably better jobs at better pay. Companies are now moving to integrated office and factory systems with hierarchies of computers and robots. The number of robots will grow from a few thousand to an estimated 100,000 by 1990, and the number of electronic work stations from four million to 25 to 30 million.

"Nation's Business (USA)" reports:

"There are about 50 million white-collar workers and only 4% on electronic equipment, according to Data General, a manufacturer of small computers. The estimate for 1985; computers on 15% of office desks. International Data Corporation, a research and consulting firm, says that in 1981, for the first time, 1 million computer systems were shipped by US manufacturers. In 1986 the number will reach 5.9 million, and the growth of desktop computers will be 'staggering.' Another prediction: SRI International, a research firm, says that what it calls 'electronic work stations' will outnumber electric typewriters in offices by the end of the decade.

There is general agreement that a big percentage of office computers will be networked in the years ahead. That means that desktop computers, word processors, central data libraries and electronic printers will be linked by wire or cable. Information can then speed from machine to machine within one office building or between office and factory. The reason for all these predictions of dazzling computer growth is simple. America's white-collar payroll totaled US $1 trillion last year. Companies believe the computer can give them more productivity for all those dollars.

This phenomenon should carry over into Israel where there is demonstrated capability to design new products to meet the increased demands for computers in the years ahead."

RECOMMENDATION #41 - ATTENTION SHOULD BE DIRECTED TOWARDS EXPANSION BY ISRAELI COMPANIES INTO WORD PROCESSING.

Israeli companies have effectively developed computer hardware and software. Attention should now be directed to word processing.

"Nation's Business (USA)" reported:

"Relatively few US companies are working hard on improving office productivity, according to the American Productivity Center in Houston, Texas, but those that are doing so have scored significant gains. The chairman of the Center says that 'companies with in-place office productivity efforts show an average gain of 9.5% in effectiveness and efficiency.'

If procedures used by the 99 companies studied were universally applied, more than US $95 billion could be saved each year, according to a study by Steelcase, a manufacturer of office furniture systems. Reflecting that office electronics is still concentrated on clerical and secretarial tasks, the companies said word processing, which eliminates retyping, is the leading contributor to improved productivity. 55% of the firms plan to extend their productivity programs to reach more workers. By 1990 this kind of effort will pay off in a time savings of 13% for salesmen, 14% for managers and 25% for professionals.

Boosting office workers' productivity is crucial because they comprise 53% of the workforce today and may approach 65% as early as 1985. Although the number of office workers in the US is gigantic, the capital investment per worker is still relatively small -- US $2,500, compared with about US $23,000 per manufacturing job.

We need to determine how Israel can become a major factor in the production of word processing equipment."

RECOMMENDATION #42 - WE MUST ASSIST IN THE DEVELOPMENT AND MARKETING OF PRODUCTS DESIGNED BY THE ISRAEL AIRCRAFT INDUSTRIES.

From every vantage point, Israel Aircraft Industries (IAI) is Israel's premier enterprise. The mammoth company offers 350 military and civilian products and services, employs 22,000 skilled scientists, managerial specialists, practical technologists, as well as highly trained production workers, occupies approximately 500,000 square meters of built-up area, and had a budgeted turnover of $1.4 billion for the 1981/82 fiscal year, for which its anticipated exports are $700 million.

IAI markets its combined and integrated defense systems in 50 countries throughout five continents and devotes millions of dollars to research and development. Moreover, it is an international innovator and leader in a number of key air and sea defense systems.

Since 1953, IAI has achieved an established record for research, design, engineering, test, manufacture and service, offering high quality performance in virtually every phase of tri-space defense systems. Civil and military aircraft, sea-to-sea weapon systems, patrol boats and missile crafts, multi-mission combat vehicles, tri-space radar systems, communication and navigation systems, industrial and shipborne monitoring and control systems, microelectronics, computers, computerized communications and control systems, flight control systems, total civil and military aircraft support, security systems, industrial test and maintenance eqiupment, and training simulators basically delineate the major fields of IAI activity.

We need to determine how we can assist IAI in marketing these products in the USA.

RECOMMENDATION #43 - THE VARIOUS ISRAELI RESEARCH CENTERS SHOULD COMBINE THEIR MARKETING ACTIVITIES.

Israel's research institutions are well-known and highly regarded. Israel research organizations have their own marketing organizations and operate on their own. The Hebrew University has the Yissum Research and Development Company, Tel Aviv University has Ramot, and the Weizmann Institute has Yeda, to name only a few such companies. They seek to find investors and markets individually. There needs to be a total marketing strategy for the sale of this research. A privately funded organization with staff both in Israel and in the United States, could effectively market the products developed by Israel's research facilities.

RECOMMENDATION #44 - THE BRAINPOWER OF ISRAEL MUST BE USED IN THE DEVELOPMENT OF MORE CONSUMER PRODUCTS FOR EXPORT SALES.

Many Israeli manufacturers of industrial goods have effectively introduced unique items into the American market. Unfortunately, the brainpower of Israel has not been built into the manufacture of many consumer items. Substantial exports could be affected by applying Israel's brainpower into consumer goods products as is the case for industrial goods.

RECOMMENDATION #45 - THERE NEEDS TO BE A MUCH GREATER ACCEPTANCE OF THE LABEL "MADE IN ISRAEL."

We have found in many instances that the products designed in Israel are not acceptable by many American buyers. They are not comparable to the products designed in Italy, France, Scandinavian countries, etc.

It is proposed that we bring the best design brainpower to Israel to establish a line of products that will have widespread acceptance under the label, "Made in Israel."

At the present time, products by and large carrying the label, "Made in Israel," do not have any specific attraction in the American market. There are a few buyers who seek out products made in Israel. Israel needs to bring in top-flight designers, buyers, marketing specialists from throughout the world to develop unique lines such as Cardin, Levis, Jordache, Adidas, etc.

Israeli designers ought to be working on the Cuisinarts of tomorrow, the talking games, etc. Israel cannot and should not be relegated to being copiers. Israel has the capacity and needs to be the innovators of unique product lines to give great meaning and acceptance to the label, "Made in Israel." We should utilize the design skills of artists and design personnel in Israel. In addition, we should bring in people from outside Israel to help establish an exciting and unique line of products under the label, "Made in Israel."

RECOMMENDATION #46 - WE NEED TO DEVELOP "BUY ISRAEL" WEEKS IN MAJOR US COMMUNITIES.

The American-Israel Chamber of Commerce of Florida has designed a program which they refer to as "The Big Idea." Barry Schreiber, Chairman of BIG Week, describes this program as follows:

> "Most of us are aware that Israel exports bathing suits, chocolates, citrus and gold chains. An increasing number know that Israel has made tremendous inroads in the high technology sectors. But few are aware of the incredible array of consumer, industrial and hi-tech products that Israel today produces and exports to the United States.
>
> Even when purchasing Israeli products, buyers today are oftentimes unaware that they are doing so -- from automotive parts to lawn sprinklers, from electronic equipment to wall units. They are probably similarly unaware that the American-made shoes they are wearing were sewn on an Israeli-made machine; that the private jet in which they have flown is Israeli-made; and that the laser used in the surgery they just underwent, was developed and made in Israel.

Friends of Israel who wish to 'buy Israeli' whenever possible will have to be continually alert for Israeli-made merchandise of all types, to look for and request products made in Israel for all their needs.

Even though we have witnessed a tremendous increase in Israeli goods available in Florida in the last couple of years, it is still only the beginning. We have every confidence that Floridians will in the future experience an unprecedented selection of attractive, high-quality, innovative products made in Israel."

We can take a page from the book of the British-Israel Chamber of Commerce in promoting the month of May as "Buy Israel Goods" Month. It was reported in the "Jerusalem Post" that:

"A major promotion of Israeli goods will take place in Britain throughout the month of May. Sponsored by the British-Israel Chamber of Commerce, the promotion is being launched under the slogan, 'BIG (Buy Israel Goods) Month.' It follows the successful 'BIG Day' of 1981 and 'BIG Week' last year.

The main emphasis of the month will be on Israeli food exports to Britain, which play a large role in the 500 million pounds sterling (IS 3.5 billion) worth of trade between the two countries. Demonstration and tastings will be held in selected supermarkets and smaller stores throughout the country, where posters bearing the slogan, 'Put on a happy taste -- the taste of Israeli foods,' will be displayed.

Travel and tourism will also play a prominent role in 'BIG Month,' which is being organized by a committee under the chairmanship of Monty Sumray, chairman of the British-Israel Chamber of Commerce."

RECOMMENDATION #47 - WE NEED TO DEVELOP WITHIN MAJOR US CITIES A BUYING INFLUENCE DIRECTED TO THE PURCHASE OF ISRAELI PRODUCTS ON A YEAR-ROUND BASIS.

Many potential purchasers of Israeli products report: "I'd like to buy products made in Israel, but I can't find them on the shelves in the stores where I buy food and clothing. How do people go about finding products that are made in Israel in their local stores?"

This is a problem that is of concren to many people, particularly those that live in the Middle West and in the South and Far West. Oftentimes, Israeli products are sold on the East Coast and are not made available to buyers in other parts of the country. The best way to get products into the stores is for a group of people in a community to talk to the management of local stores and ask that they put in a line of Israeli foods,

apparel, etc. If the demand is there, the store managers will make contact with the necessary wholesalers who handle Israeli products and stock them on their shelves.

"I understand that your organization has encouraged community leaders to prepare a registry showing where Israeli products are on sale. How does this program work?"

We should encourage community leaders, primarily through local federations, to survey the community to find out where Israeli products are being sold. Once this information is obtained, it should then be printed either in the Anglo-Jewish press, or a separate booklet prepared, that will serve as a ready reference for indivivduals who want to buy products made in Israel. This is not a difficult project to develop. It can be done by any local organization that is interested in promoting the sale of Israeli products.

RECOMMENDATION #48 - THERE IS A NEED TO DEVELOP A PROGRAM TO PICK UP UNUSED RECIPROCITY COMMITMENTS.

We need to develop a program to fulfill the "buy back" agreements which many American companies have with the Israeli government -- particularly in the Defense Department. I believe that one of the most important ways of expanding Israeli exports is by getting American companies to live up to the commitments they made when they sold products to Israel.

The American companies agree to purchase from Israeli manufacturers, on a best effort basis, an amount equivalent to 15 percent of the purchase price of the items sold to Israel. We have been advised in our discussions with Israeli government officials and business leaders that there is over $800 million of unused reciprocity agreements. What better way is there for us to help increase the exports from Israel to the United States than getting American companies to buy products from Israeli manufacturers.

RECOMMENDATION #49 - THERE IS NEED FOR ISRAELI COMPANIES TO MOVE INTO THE AREA OF EXPORTING SERVICES.

Israel possesses a considerable amount of know-how that is exportable to other countries in developing facilities. A good example of this is Koortrade. In an article in the "Journal of Commerce" (February 24, 1983) it was pointed out by Amir Segev, head of the International Projects Division of Koortrade, that:

> "We began working some time ago on the basic assumption -- which has proved true so far -- that it is getting harder and harder to sell products as such, especially in the Third World.

We know that these countries are in a hurry to modernize, and even if they have the skills to fit together the various parts of the jigsaw puzzle called a project, they wanted outside help to speed up the process.

On our part, he said, we saw a chance, not only to sell individual products from Israel, which we would supplement with goods we could obtain abroad through one of our 40 offices scattered throughout the world which are commercial barometers of the countries where they are found, but also to supply the preliminary feasibility study, the planning, the economic and technical know-how, setting up the project, getting the project into production, training the local personnel, managing it until it functioned smoothly, and even longer; and if necessary, doing everything possible for the host country to get a financial package together."

So far, scores of requests have been received for more information. Some projects are in various stages of development. However, due to various considerations, Mr. Segev is willing only to reveal the location of four: a poultry ranch in Nigeria, cotton plantations in Jamaica and Swaziland, and a seed and vegetable farm in Mexico.

RECOMMENDATION #50 - THERE IS NEED TO DEVELOP A PROGRAM TO MARKET TECHNOLOGIES DEVELOPED BY THE ISRAEL ARMAMENT DEVELOPMENT AUTHORITY.

The following program has been included in Region 2000 and offers commercial possibilities for export to the United States:

"RAFAEL, which is the Hebrew acronym for 'Armament Development Authority,' the largest R&D organization in Israel, is entrusted with the development, production and supply of complex weapon systems to the IDF. RAFAEL has a workforce of 6,000 people, out of which 2,000 are engineers, including 300 PhD's. The rest of the staff are mostly diplomaed technicians.

RAFAEL is unique in having under one roof almost every discipline in the area of modern technology: from explosives and rocket propulsion to computers, software, signal processing, etc. RAFAEL is also engaged in basic technologies like composite materials, metallurgy and solid-state technology.

In July 1981, the Government of Israel decided that RAFAEL's potential should be used to advance the country's economy and not be limited to the supply of weapons to the IDF. Moreover, Israel's defense expenditure has practically reached its peak. RAFAEL, an organization based on continuous growth, has to get ready for reduced defense orders. Thus, a company called GALRAM has been established as a government-owned company with the aim of commercially exploiting RAFAEL's products, technologies and capabilities.

GALRAM's policy in general is to establish subsidiaries for specific technologies, projects or markets, as joint ventures with private capital, or with partners that can contribute complementary know-how or marketing. Presently GALRAM is in the process of establishing two companies; the first will manufacture electro-optical devices based on RAFAEL's know-how; the second will manufacture and market electronic systems and products which are spun off RAFAEL's projects. Another company, MICROKIM, which is a joint venture of the US based M/A-COM Corporation and RAFAEL, will join GALRAM's roster of companies. MICROKIM is producing microwave components and systems and has recently changed its strategies to fit into GALRAM aims. Another operation, LASERON, was formed by RAFAEL and the Fibronics Company for the production and marketing of GaAs lasers based on RAFAEL's technology.

A few other activities are being studied now by RAFAEL and GALRAM as candidates for GALRAM companies.

GALRAM also owns 45 acres of land in Carmiel for developing a high technology industrial park. This industrial park, GAN-GALRAM, will house most of GALRAM's plants, and will also accept other high technology industries as tenants. Plants that will be established in GAN-GALRAM will enjoy government investment incentives as a Development Zone A, which means that out of every $4 of capital investment, only $1 has to be put up by the entrepreneurs -- the rest of the investment is partly a government grant and partly a very favorable low interest loan."

We need to design a marketing strategy for American companies to tie in with GALRAM.

RECOMMENDATION #51 - WE NEED TO SELL THE US AIRCRAFT INDUSTRY ON REPAIRING THEIR EQUIPMENT IN ISRAEL.

Israel offers excellent facilities for the repair of aircraft equipment. It was recently reported in "Innovation" (May 1983):

"Cyclone Aviation Products Ltd., (CAP) located in Carmiel, a Galilee development town, has won approval as a qualified maintenance and repair station for all types of Bell helicopters. The company maintains extensive facilities, capable of servicing, repairing and rebuilding helicopters and light aircraft up to a gross weight of 5,700 kg (about 12,900 lbs.).

CAP was established in 1970, a subsidiary of the diversified Etz Lavud group. Its Galilee location was selected deliberately, also, in order to provide employment for people with aircraft experience who live in the northern part of Israel.

Cyclone's first major job was the manufacture of subassemblies for the Kfir, the modern combat craft designed and built in Israel. However, the scope of its activity expanded; the light aircraft and helicopter maintenance facility was created, and then a division for the manufacture and maintenace of aircraft structural components. A sophisticated laboratory makes it possible to carry out all required tests."

RECOMMENDATION #52 - THERE NEEDS TO BE A COMBINED MARKETING EFFORT TO SELL THE FACILITIES OF THE FIVE RESEARCH AND INDUSTRIAL PARKS IN ISRAEL.

The Ministry of Commerce and Industry, in cooperation with the institution of higher learning, has taken the lead in establishing science-based industrial parks close to university campuses. These parks have access to the research facilities of the universities and their subsidiary research and development companies. In addition, company and university personnel are involved in exchange programs, conduct joint seminars and work together on specific projects. The government bears the cost of the park's infrastructure.

Four parks are already in existence and a fifth is being built. The buildings are constructed and maintained with the eventual tenants' special requirements and specifications in minds. Central services and facilities, such as a direct connection to the university's electronic computer center or link-up with its testing laboratory, are readily available.

Each park has its own individual marketing program. We must develop a combined marketing strategy to sell the availability of sites in these parks, the advantages they offer, etc.

RECOMMENDATION #53 - CONSIDERATION SHOULD BE GIVEN TO ALLOWING ISRAELI EXPORTERS TO SET UP DOMESTIC INTERNATIONAL SALES ORGANIZATIONS.

A review should be made of the US laws relating to Domestic International Sales Corporation (DISC) to determine if these laws have applicability to Israel.

In the US an exporter can set up a separate corporation called a "Domestic International Sales Corp." (DISC), which enables an exporter to defer paying taxes on half of all foreign income indefinitely. That means that as long as a DISC qualifies -- 95% of its assets must be export-related and 95% or more of gross revenues must be from foreign sales of US made products -- it can distribute half its income as dividends to its shareholders (either individuals or a parent corporation) and pay income tax

on the other half. A DISC can also own a FISC, or Foreign International Sales Corporation, located offshore, which protects American assets from any liabilities the foreign export venture might encounter. FISC profits can be distributed to the DISC as dividends. We need to determine if this has applicability to Israel.

RECOMMENDATION #54 - THERE IS NEED TO DEVELOP WITHIN ISRAEL A US EXPORT TRAINING INSTITUTE.

Foreign trade has become extraordinarily complicated, demanding comprehensive knowledge of a whole series of subjects: customs, the technical side of shipping, foreign exchange questions, insurance, financial problems and much else besides. Practical experience still plays an important part, but in addition, the intensive training of specialists in the field of exports has become essential.

In Sweden, the problem of training has been solved by the establishment of the Swedish Export School. The aim of the Swedish Export School is to provide practical experience in export matters and to offer a stimulus to making export business more efficient. Representatives from the industral and business sectors are requested to provide the necessary training.

Since the US offers so many opportunities for Israeli exporters, consideration should be given to the development of special export courses for the US market.

RECOMMENDATION #55 - THERE NEEDS TO BE AN EXPANSION OF THE INDUSTRIAL TRADE SHOWS HELD IN ISRAEL.

Recently, Israel opened a new convention center at the Tel Aviv Fair Grounds with a capacity for 7,000 visitors. There is an opportunity to bring many US congresses and trade shows to Israel. We need to assist in publicizing these shows and helping to bring participants to Israel.

RECOMMENDATION #56 - THERE NEEDS TO BE ESTABLISHED A PRIVATE TRADE CENTER IN TEL AVIV.

There is need for a privately funded and operated trade center in Tel Aviv where products manufacturerd by Israeli companies can be on display on a permanent basis.

There are thousands of business executives coming to Israel each year. A large number of them are potential buyers. A permanent display in an area close to the major hotels in Tel Aviv would be visited by many business executives who could be stimulated to do business with Israeli manufacturers.

We need to make it easy for Americans to locate products and manufacturers in Israel. A privately operated profit-making organization could serve as the selling agent for these companies in working out a trade center in Israel. This same group could operate a sales center in the United States. Again, there are many American buyers who would like to be exposed to Israeli products.

RECOMMENDATION #57 - CONSIDERATION SHOULD BE GIVEN TO BARTER (COUNTERTRADE) TO EXTEND ISRAEL'S MARKETING REACH.

At lease 25,000 companies in the United States are now trading products for goods and services. There are companies that have been set up in the United States that offer brokerage services through barter. Some examples that have been pointed out in the "AMA Forum" are as follows:

> "The Xerox Corporation, which has bartered its office copiers abroad for several years, last September started offering its goods for barter in the United States, as a test of its potential as a marketing technique. It has since traded in excess of one million dollars of office copiers in exchange for such things as hotel accommodations, advertising, carpeting, printing services, forklift trucks, fuel, and executive meeting facilities.
>
> Allis-Chalmers, headquartered in Milwaukee, Wisconsin, last year exchanged ten industrial forklift trucks retailing for up to $25,000 each for photocopiers, airline tickets, and a new roof on one of its plants.
>
> Republic Airlines, based in Minneapolis, Minnesota, last year traded $1.4 million worth of airline tickets in lieu of cash for pickup and forklift trucks, air compressors, office supplies, hotel accommodations, and so forth.
>
> 'On the whole it's working out very well,' reports Dennis Needham, manager of barter contracts for Republic. 'There are no problems. For us, bartering is no different than cash transactions'.
>
> 'I think we are going to see a lot more of this (bartering) in the United States in the future'.
>
> 'The US Department of Commerce, in fact, estimates that barter in this country will account for more than 15 percent bartering to improve our cash flow,' says Needham of Republic Airlines. 'It also is able to make use of unused assets, in this case, unsold seats on planes'."

"Fortune" magazine of February 7, 1983, had an extensive article, "The Explosion of International Barter." The article pointed out:

> "The word of the new year with hip international business people is 'countertrade.' In its broadest sense, the term covers all international trade in which goods are swapped for goods -- a kind of Concorde-class barter business."
>
> David Hill, head of the GM Countertrade Division, stated:
>
> "'If swapping goods for goods sounds less efficient than using cash or credit, that's because it is.' But as David Hill, the head of General Motor's countertrade subsidiary, Motors Trading Corporation, says, 'It's more attractive than having no sales in a given market, and we're finding it increasingly difficult to conduct business without being prepared to countertrade.' Motors Trading has been around since the end of 1979, and though he won't be precise, Hill puts annual sales in the hundreds of millions. 'Our volume tripled in the second year and doubled in the third year,' he says. 'Right now we're only limited by the shortage of skilled staff.'"

Elisha Shahmoon, Chairman of the Israel Export Institute, recently stated that he thinks the Government of Israel should encourage exports by different means and should examine ways to trade on a barter basis. "Israel should buy basic goods, like metals, cereals and other commodities and the exporting country would have to buy a corresponding amount of industrial goods manufactured in Israel."

There are in the United States a number of newly formed companies that operate barter programs for American and foreign companies. We need to give consideration as to whether a barter company could be operated in Israel.

This may well be an area for Israel banks to explore as well as some of the larger conglomerates in Israel.

RECOMMENDATION #58 - MINI-INDUSTRIAL TRADE EXHIBITS SHOULD BE SET UP IN THE US.

Israeli manufacturers cannot expect American buyers to beat a path to their doors in Israel. Many American buyers do not have a budget for transportation to Israel. They are accustomed to seeing merchandise on display in the US. Mini-trade shows should be set up in the US to display industrial products manufactured in Israel.

We need to consider ways to develop traveling shows -- particularly of Israeli hi-tech products -- in the USA. This will increase investment opportunities in Israel and open doors for export sales.

RESEARCH & DEVELOPMENT IN ISRAEL

RECOMMENDATION #59 - ISRAEL MUST ATTRACT 50 US COMPANIES TO CONDUCT THEIR RESEARCH IN ISRAEL.

Israel must sign up 50 American companies in the next five years to conduct joint research with Israeli companies in Israel. Conducting research in Israel oftentimes is the first step for American companies leading to a subsequent permanent investment in Israel.

Intel, a major American company, recently announced plans to build a facility in Israel. This company is a major factor in semiconductors. They will build a $100 million wafer factory in Jerusalem. Prior to this development, Intel conducted some of its R&D programs in Israel.

As a matter of official policy, Israel goes all out to support new science-based industries. A positive attitude about research and development is back up with (1) generous government cost participation; (2) an industrial climate geared to technological involvement; (3) a labor pool trained for science-based development; and (4) government assistance for purchasing equipment needed for technological growth.

Hundreds of high technology multinational firms -- attracted by Israel's unique advantages and investment incentives -- have located in Israel for the purpose of manufacturing for export and/or carrying industrial research and development projects. The roster includes dozens of America's largest industrials participating in technological projects in Israel, either within the framework of their own subsidiaries' operations or in joint venture. Among these are: Motorola, Chromalloy American, Control Data, Intel, General Telephone & Electronics, IBM, Dexter, Esmark, National Semiconductor and Miles Laboratories.

INDUSTRIAL R&D SPENDINGS 1976-1979
AND
FORECASTS FOR 1980-1990

Budgetary Year	Alternative A*		Alternative B*	
	Approved	Applied For	Approved	Applied For
1976	1400	1955		
1977	1510	1961		
1978	1713	2469		
1979	1852	2836		

	Approved	Applied For	Approved	Applied For
1980	2040	3120	2220	3400
1981	2240	3430	2670	4080
1982	2470	3770	3200	4900
1983	2710	4150	3840	5880
1984	2980	4570	4610	7060
1985	3280	5020	5530	8470
1986	3610	5530	6640	10160
1987	3970	6080	7960	12190
1988	4670	6690	9560	14630
1989	4800	7360	11470	17560
1990	5280	8090	13760	21070

A* - The forecast based on 10% real growth (in 1979 million IL).
B* - The forecast based on 20% real growth (in 1979 million IL).

A survey of 2000 R&D projects supported in the past shows that 41 percent of them resulted in commercial products and 26 percent of the projects were considered a success in the export market. These figures are at least twice the success rate for R&D projects in Europe and America. Israel sponsored a survey by the Centre for Policy Alternatives at Massachusetts Institute of Technology to study what her specific advantages were in industrial R&D and to pinpoint why Israel seems to have an unusually high percentage of success in R&D projects. Their report indicated that those very factors which are connected with Israel's difficult economic situation provided an impetus to succeed, to innovate, to produce and to sell.

In discussing the reasons for selecting Israel as the site for R&D, Walter Schafer, Chairman of the Board of Schafer Associates, claimed: "Israel was the only country that offered us the combination we were looking for -- advanced R&D capabilities including research facilities and skilled manpower; financial assistance from the government; and a gateway to the US, Common Market, the Orient and other important markets."

RECOMMENDATION #60 - THERE IS NEED TO SUBSTANTIALLY INCREASE THE RESEARCH AND DEVELOPMENT FUNDS IN ISRAEL -- LEADING TO EXPANDED EXPORTS.

Israel has set a goal to export $5 billion of self-developed products by 1990. The expansion of new research and development will be a major factor in reaching this goal.

Over 500 industrial companies now engage in R&D in Israel. Such activity is supported by liberal government grants, motivated by the understanding of the importance of new product development. Science-based high technology products lead Israel's export drive. They not only sell well in overseas markets, but also offer rising profitability for the companies concerned and for the national economy.

The direct export of Israeli products which resulted from the country's original R&D is probably the best measure of Israel's success in developing technology. In 1970, the foreign sale of R&D projects -- original items designed in Israel and goods made by innovative processes developed there -- brought in $100 million. It rose to $770 million in 1979 and $1 billion in 1980.

Industrial goods with a high Israeli research and development content held their own against the general tide of falling exports in 1982. Gideon Patt, Minister of Industry and Trade for Israel, recently was quoted in the "Jerusalem Post" to have said, "Israel's R&D based industrial exports had constituted about one-third of all industrial exports in 1981-82, and the percentage was expected to rise to 50 percent by the end of this decade."

"Each year 30 new factories that use R&D are founded," he said. "Moreover, another 30 established plants are switching over to using R&D."

"By the end of this decade, the percentage of engineers in the labor force will be 4.5 to 5 percent," Pat said, noting that "the percentage of engineers in the industrialized labor force in the industrialized western countries was 3 to 4 percent."

Chief Scientist Lavie reports:

> "Experience shows that any dollar invested in R&D results in 8 to 10 dollars exports of locally developed products. Within the next 10-20 years, we intend to complete the change of the industrial products based on R&D. This sector of industry will then supply the local market more efficiently and more important, will be able to compete in the export markets with up-to-date technology.
>
> Israel'a goal to export $5 billion worth of self-developed products by 1990 is an ambitious goal and calls for an extra-

ordinary effort, with government, industry, labor and academia joining forces to tackle the task ahead. The government will have to increase its R&D contribution to $50 million annually. The industrialists will have to match this amount. Foreign investment equivalent to the same amount again must be raised, bringing the total investment in high technology industry to $200 million annually. But investment alone will not be enough: If Israel is to achieve a five-fold increase in exports, new companies are needed to spearhead the development program. They will create employment for 80,000 people, in addition to the 30,000 already working in these industries. The new labor force will include up to 15,000 people with academic training thus bringing the total number engaged in industrial R&D to 20,000.

Many of these scientists and engineers will be drawn from among the nearly 50,000 professionals working in Israel, whose ranks will be reinforced each year by 3,000 new graduates. If the rate of industrial growth meets expectations, it will also be possible to accommodate many hundreds of new immigrants or returning Israelis who have acquired their professional skills abroad."

RECOMMENDATION #61 - ISRAEL AND THE US SHOULD EXPAND THE FUNDS OF THE US-ISRAEL BINATIONAL INDUSTRIAL RESEARCH AND DEVELOPMENT FOUNDATION, BETTER KNOWN AS BIRD-F.

The Binational Industrial R&D Foundation (BIRD-F) was established by the Governments of Israel and of the United States in order to promote research and development activities likely to be of benefit to both countries. The Foundation's activities are funded by a $60 million endowment, provided in equal parts by the two governments.

The amounts available for R&D grants annually are $2-3 million, representing the income on the $60 million endowment. Obviously, if this could be increased to a $100 million endowment, there would be greater opportunities for increased joint R&D projects in Israel.

The BIRD Foundation is the first of its kind for both the United States and for Israel. Its success should pave the way for similar organizations with other countries for both of the original partners. It is useful to list some of the projects supported by the Foundation, since the relatively small amount of money available has forced the Foundation to choose its projects very carefully -- and they thus represent a cross section of Israeli technology which has specific value for the world's most prosperous and advanced country (the USA):

1) Automatic telephone system based on microprocessor technology (Telrad/Pentacom).

2) Computerized Irrigation Systems (Motorola Israel/Motorola USA).

3) Cardiac Diagnostic Imaging System (Elscint Ltd/Elscint Ind).

4) Viscosity Instrument for Medical Diagnosis (Elron Iscar/Ovutime Inc).

5) Pre-development Study for Advanced Laser Plate Exposing Device (Sci-Tec Ltd/Sci-Tex Inc).

6) A Cost Optimized Production Time-Table (Creative Output Ltd/Telecom Inc).

7) Implantable Pacemakers (MG Electronics Ltd/Mennen Medical Systems Inc).

8) Barium Titanate Semiconducting Ceramcis (Galai Ltd/Supco Inc).

9) Magnesia Production by Precipitation (Israel Chemical Ltd/General Refractories Inc).

10) Radicidized Pathogen Free Poultry Feed (Matmor Ltd/High Voltage Engineering Inc).

Recently, the Binational Industrial R&D Foundation approved five additional projects as follows: A computerized electrolytic metal plating system, a computer terminal for a truck scale, computerized instruments for the graphic representation of data, a line of ceramic heat-sensitive switches for electric motors, and the further development of an electrolytic aluminum plating process.

The BIRD Foundation has thus far made grants totaling $12.5 million to some 38 projects.

We need to design a marketing strategy in the USA to increase the number of US companies who will do joint R&D in Israel.

RECOMMENDATION #62 - CONSIDERATION MUST BE GIVEN TO EXPANSION OF RESEARCH IN A NUMBER OF CRITICAL AREAS.

These are very substantial opportunities to increase the R&D in Israel. This will hasten the process of economic independence. R&D should be expanded in the following areas:

1) Projects of National Importance (PNI)
These are projects with potentially greater contribution to industry and Israel's economy as a whole, but on which industry is not ready to embark upon because of financial risk, shortage of funds and length of time it takes to perform. When the Chief Scientist, after examining the case most thoroughly, is convinced that there is enough justification for it, he may classify the

project as a Project of National Importance. If approved, the participation of the government in such a project will be as high as 80%. The routine of appraising such a project is similar to the regular ones, but more refined and thorough. Often, a special committee of experts is nominated to advise the Chief Scientist on monitoring the project and on current decisions relating to it. The OCS has interested international bodies to participate in this program of PNI in order to benefit from the experience gained.

2) Energy Research

It has been reported: "Oil and its various refined products power Israel's electric power system, pump its water, fuel its industrial plants and allow transportation to move on land, at sea and in the air.

Important processes to alleviate this single-fuel 'monopoly' already are under way. The country's first coal-fired power station nears completion, and by the end of this decade perhaps less than half the electricity generated here will be based on oil. Several important industries -- cement kilns and major chemical industry plants -- also have begun the costly and complex process of conversion to coal, which is a much more plentiful and politically less sensitive material.

But the diversification of imported fuels, however important, is widely acknowledged to be not enough. On top of that, Israel scientists and engineers are engaged in a very broad effort to develop alternate energy sources, including the country's own minerals -- oil shales are relatively plentiful -- and various types of renewable energy.

By its very nature, research in these spheres tends to concentrate at governmental R&D institutes and in institutions of higher education, such as the Technion, Ben Gurion University and the Weizmann Institute. However, Israel industry also has entered the field and several firms are engaged in energy-oriented R&D efforts.

Such work already has yielded palpable results. The solar water heater is a standard household appliance, used by nearly one-fourth of all Israeli families, and more sophisticated devices are in various stages of advanced development. Most promising of all these, perhaps, is the solar pond generating station, but other projects also offer great promise.

Some of the R&D now in progress is of specific interest only to this country; the Mediterranean-Dead Canal is one example of such a project. Much, however, is potentially of international applicability. In fact, many observers believe that this research is the beginning of another thriving export industry."

3) The development of the Dead Sea Canal

It has been reported: "A hydroelectric scheme, to exploit the 400 meter (about 1,300 feet) of difference in elevation between the Mediterranean and the Dead Sea, has been proposed many times; it was one of the major development projects envisaged by Theodor Herzl in his prophetic book, Altneuland, published almost eighty years ago.

More recent developments have lent the proposal an additional rationale: because both Israel and Jordan utilize about 80% of all the water that used to flow down the Jordan River, the Dead Sea is rapidly drying up. During the last twenty years its surface dropped by about seven meters, from 393 to about 400 meters below sea level, and it continues to go down by about a foot a year. This may not only affect the area's climate adversely; it also adds great difficulties to the exploitation of Dead Sea brines, one of Israel's very few mineral resources.

The Neeman Committee examined a number of possible routes, by which Mediterranean water can be made to fall into the Dead Sea. One of these crosses Israel in the North, along the line of the Jezreel and Bet Shean Valleys, and then goes south along the Jordan. A second would begin not far south of Tel Aviv, using a tunnel through the Judean Mountains. The third leaves the Mediterranean coast near Rafiah or Ashkelon, crosses the northern Negev and drops into the Dead Sea not far from Massada.

After considering many factors the committee opted for the last of these possibilities. Study had shown that it offers significant energetic and economic profits, and also carries the potential of considerable additional benefits.

Calculation shows that the project will carry water at a long term rate of 50 cubic meters (about 12,500 gallons) per second during its first twenty years of operation, and about 35 cu.m. (nearly 9,000 gal.) thereafter. During the first two decades this adds up to a power production of about 150 MW around the clock, or 600 MW if the turbines are operated only to meet peak demand. By 1990, the year the system could be completed, that will cover about 15% of Israel's overall peak consumption.

At a projected cost of $680m., the project will be a little more than twice as expensive as a conventional power station of similar capacity, but its day-to-day operation will, of course, be much cheaper. In the long run, it can save the national economy $1 billion, mainly in terms of fuel which will not have to be imported.

In addition, the Neeman Committee explains, such a canal system can yield as yet incalculable fringe benefits. First of all, it can provide the necessary coolant for a nuclear reactor, for which suitable sites might be found in the Judaean Desert. Secondly, it might provide the large quantities of water that will be needed for extensive solar ponds (see elsewhere in this paper), once it is decided to build installations of that type.

On top of all that comes the recreational potential of new lakes and canals in a desert environment."

4) Investigation of Israel's Oil Shale Potential

It has been reported: "Tel Aviv -- The establishment of Energy 2000, a partnership of leading business firms, marks an important step forward in the study of this country's oil shale utilization potential. The companies participating in the venture are the country's three major fuel distributors: Paz, Sonol and Delek, the Haifa Oil Refineries Ltd., and Israel Chemicals Ltd. (ICL).

Several large oil shale deposits are known to exist in Israel, in various locations in the central and southern parts of the country. Information now available suggests there are at least four billion tons of this material, with an organic matter content of perhaps 14%.

This could be an important energy reserve. A petroleum equivalent of something like 300 million tons adds up to all the fuel Israel would need, at its present rate of consumption, over a period of twenty years. The premature enthusiasm aroused by this information in the popular press, on the basis of incompletely understood data, is understandable.

The difficulty is that the world does not yet possess a proven oil shale utilization technology. In spite of heavy expenditure, mainly in the United States, work in this sphere is only now really getting under way. There simply is no way in which Israelis can begin to mine the stuff, to cover their country's fuel needs in the near future.

Recognition of those facts, however, does not deter scientists and policymakers here from embarking on a serious study of the subject. Given the world's increasingly severe, albeit politically inspired energy crisis, efforts to find even partial solutions are to be applauded.

The Energy 2000 team proposes to investigate ways and means of utilizing the oil shales found here in three possible ways. The first is direct combustion, to produce steam and electric current; the second hopes to extract petroleum or similar materials from the shale; and the third envisages partial or complete gasification."

5) The development of Israel's Nuclear Energy Capability

It has been reported in "Innovation" (May 1982):

"The construction of a nuclear electric generating facility, somewhere in Israel, has been on the agenda for more than two decades. Even before the oil price crisis, imposed upon the world by the OPEC cartel, many of this country's economic and scientific leaders were on the record, as favoring the construction of at least one atomic power plant.

The matter again was brought to the public's attention by recent statements by the Minister of Energy and Infrastructure, that the acquisition of such a station now seems more practical, than in the past. Negotiations are said to be in progress with several potential suppliers.

That Israel has not yet embarked on such a project is due to several causes. One of those is political: every government here has refused to acceed to the international treaty against the proliferation of nuclear arms. Israel has absolutely no confidence in International Atomic Energy Agency's ability to monitor that treaty's implementation, and cannot agree to make its facilities accessible to representatives of an organization that is largely under the control of its sworn enemies.

However, it must be stressed that this stand is not motivated by any opposition to the non-proliferation treaty's declared objectives: Israel has long been on the record against the use of nuclear arms and pledged not to be the first to introduce such weapons to the Middle East. Notwithstanding frequent rumors, reported in the world press at the likely instigation of hostile sources, there is no hard evidence at all that practice on this point here varies from that principle."

RECOMMENDATION #63 - WE NEED TO PROVIDE FURTHER FINANCIAL SUPPORT FOR TECHNION, TEL AVIV UNIVERSITY, BEN GURION UNIVERSITY.

Israel looks to Technion for its engineers to staff the increased number of companies required to reach the 1990 goals. Finance Minister Yoram Aridor recently noted:

"Our technological future is, in fact, dependent on the Technion, upon graduates already in industry and all those who will follow in their footsteps. The State of Israel would not have reached its current high level of technological achievement without the Technion. We have no advantage over other nations in natural resources, but we have the human advantage, academics and engineers, and we must exploit them to the very limit.

Today, some 6,000 undergraduates and 2,000 graduates are enrolled in Technion's 20 departments: Civil Engineering, Architecture and Town Planning, Mechanical Engineering, Materials Engineering, Electrical Engineering, Chemistry, Biology, Chemical Engineering, Food Engineering and Biotechnology, Physics, Mathematics, Computer Sciences, Biomedical Engineering, Agricultural Engineering, Nuclear Engineering, Medicine, Industrial Engineering and Management, General Studies and Education in Science and Technology.

In over half a century, the Technion has trained over 24,000 engineers, scientists, architects and physicians. The Tech-

nion adds approximately 1,000 new graduates to Israel's technological work force each year.

By 1992 Israel will face a shortage of 5,000 engineers. The shortage will begin to be felt by industry next year, according to a report published recently by the Ministry of Trade and Industry.

The Technion Research and Development Foundation, Inc., a wholly-owned subsidiary of the Technion, administers sponsored research projects carried out at the Technion, provides testing and laboratory services, and offers consultation services. Founded 30 years ago, its volume of overall research activity stands today at over $20 million. Its services are used by major industrial firms around the world.

As a further service to the industry, the Technion's Gutwirth Science-Based Industries Center makes available facilities to new Israeli companies. Firms that have had their start at the Technion include Fibronics and the Lidex Corporation, the latter still located at the Center.

The work of the Technion must be expanded if it is to close Israel's predicted personnel gap. With ever greater emphasis on high technology branches of production, Israel will need many more engineers than it already has. A recent study by the official Economic Planning Authority suggest the number of such trained professionals will have to be doubled by 1990.

According to current estimates, there are approximately 25,000 active engineers in Israel, of whom about 40 percent work in industry. During the decade now in progress, nearly 30,000 more will be needed to fill positions now opening up and also to make up for retirements.

Just where to find that many well trained people seems to be something of a problem. In the past, a significant portion of rising demand was satisfied by immigration: several hundred engineers, at all levels of skill and specialization, arrived in this country annually, during the late 1960s and early 1970s. Since then the number of immigrants to this country has dropped precipitously, with a concomitant decline in the number of arriving engineers and other professionals.

Available data pegs demand during the 1980s at an average of about 3,000 new engineers every year, with a smaller number at the beginning of the decade and perhaps as many as 4,000 needed annually as 1990 approaches. The supply of new graduates from the country's universities is substantially smaller than that, on the order of 2,000 or fewer a year.

Three institutions of higher education -- Tel Aviv University, Ben Gurion University of the Negev, and the Technion-Israel Institute of Technology -- now offer studies towards an

engineering degree, accounting for about two-thirds of the total engineering student body and graduates.

Technion representives say they could expand their programs quickly, by as much as one-third, with only marginal additional expense. The situations at the other institutions may be similar, with some excess capacity now available for quick and relatively inexpensive growth."

RECOMMENDATION #64 - ISRAELI INDUSTRY MUST OFFER FURTHER SUPPORT TO ISRAEL'S RESEARCH FACILITIES AT VARIOUS UNIVERSITIES.

Many Israeli manufacturers support the R&D work being done in Israeli educational institutions. In view of the move to increase the R&D in Israel, more industrial support must be forthcoming:

In the United States, it has been reported as follows in "High Technology" (May 1983):

"Of the $5 billion annually spent on US university research, less than 5 percent comes from industry, yet industry is probably the greatest beneficiary. To improve the balance, universities and industry are forging new relationships to support academic research and industrial R&D. Joint programs not only fill the gap caused by the reduction in federal funding, but also strengthen the competitiveness of US industry. Cooperation has taken many forms, including faculty members consulting for industry and corporations donating equipment to schools.

Among the most promising of the new ventures are university/industry cooperative research centers. Most will be located in colleges and funded primarily by corporate sponsors. Ironically, this departure from traditional government-dominated research support was spearheaded by an experimental NSF program.

To increase industry's contribution to academic research, NSF helped establish university/industry research centers. The agency gave approximately half the funds necessary for each facility; industrial sponsors contributed the remainder. In the 10 years since NSF's program started, MIT's Polymer Processing Center (PPC) -- the first -- has become entirely industry supported. These centers investigate topics of interest to industry and promote technology transfer from lab to factory. In addition, corporate members receive access to center research and staff. And new cooperative facilities are coming: Stanford's Center for Integrated Systems, Rutgers' Center for Ceramic Research, and several semiconductor research centers being started by a group of companies within the industry.

It's about time. The US has been less supportive of industrial/academic collaboration than the Japanese and Europeans. 'Breakthroughs take the brainpower of the universities and the management of industry,' says Fred Fraikor, manager of research and engineering systems and plans, Rockwell International. Research at these centers can strengthen the international competitiveness of American industry.

The government is still needed, however, if only for seed money. NSF has granted start up funds to nine existing facilities; six more universities have received grants to develop detailed proposals for new centers. But booming demand for centers has led some schools to initiate their own projects. Stanford, for instance, snared its corporate sponsors, then requested government supports on the basis of industry contributions. Even industry is testing the water: Semiconductor companies have pooled resources to establish centers at selected universities.

At any center, the main criterion for research is its industrial potential in such dynamic areas as robotics, ceramics, computer graphics, signal processing, and VLSI chip design. Rensselaer Polytechnic Institute's Center for Interactive Computer Graphics, for example, has used computer graphics to simulate two aspects of production -- rolling and pouring -- solving problems that Bethlehem Steel would have had to tackle by laborious trial and error. In the rollpath evaluation, software created an interactive design of the roll passes (gates that bump back and forth to shape the steel as it's moved through the mill) and predicted how the metal would flow through them. On the basis of the study, RPI recommended rollset alterations to minimize structural defects and optimize metallurgical composition."

Israel can benefit from an examination of the work being done in the United States as described above.

RECOMMENDATION #65 - ISRAELI INSTITUTIONS MUST FURTHER THEIR COOPERATIVE RELATIONSHIPS WITH US INSTITUTIONS.

There are a number of cooperative ventures sharing technology and experience between Israeli and US institutions. Recently, Professor Ephraim Katzir, former President of Israel, initiated a joint agreement between Region 2000 high technology center in the Galilee and the Center for Industrial Innovation at Rensselaer Polytechnic Institute (RPI) in Troy, New York.

There are numerous institutions in the United States that might well form the basis for further high technology relationships. These institutions are as follows:

Biotechnology:	Center for Biotechnology Washington University St. Louis, MO
Building Technologies:	Advancement of Building Technologies Iowa State University Ames, IA
Computer Graphics:	Interactive Computer Graphics Rensselaer Polytechnic Institute Troy, NY
Manufacturing:	Ceramics Research Rutgers University New Brunswick, NJ
	Laboratory for Manufacturing and Productivity Massachusetts Institute of Technology Cambridge, MA
	Welding Research Ohio State University Columbus, OH
Microelectronics:	Center for Integrated Systems (CIS) Stanford University Stanford, CA
	Communications & Signal Processing North Carolina State University Raleigh, NC
	Engineering Excellence for the 80's Arizona State University Tempe, AZ
	Microelectronics and Information Sciences (MEIS) University of Minnesota Bloomington, MN
	Microelectroncis Center of North Carolina NC State, Duke, University of NC/Chapel Hill, NC A&T, Research Triangle Institute, University of NC/Charlotte Raleigh, NC

	Semiconductor Research Corporation P. O. Box 12053 Triangle Park, NC
Polymers:	Center for Applied Polymer Research (CAPRI) Case Western Reserve University Cleveland, OH
	Polymer Processing Program Massachusetts Institute of Technology Cambridge, MA
	Polymer Research Center University of Massachusetts Amherst, MA
Robotics:	Center for Robotics and Integrated Manufacturing (CRIM) University of Michigan Ann Arbor, MI
	Robotics Center University of Rhode Island Kingston, RI
	Robotics Institute Carnegie-Mellon University Pittsburgh, PA

RECOMMENDATION #66 - CONSIDERATION SHOULD BE GIVEN TO THE EXPANSION OF SEMICONDUCTOR RESEARCH IN ISRAEL.

The following was reported in the "New York Times:"

"To fend off growing Japanese competition, manufacturers of silicon memory chips today announced plans to expand university research spending to $20 million over the next two years.

The original program, announced in December, called for spending $5 million.

The program is intended to encourage long-term semiconductor research and to increase the supply of professional staff, said Robert N. Noyce, vice chairman of the Intel Corporation and chairman of the Semiconductor Industry Association. The trade group, which includes about 50 companies, is sponsoring the effort through a new, nonprofit affiliate, the Semiconductor Research Cooperative.

The semiconductor industry in Japan has adopted a similar approach. The major difference has been that the Japanese

Government has acted as both the catalyst and the major financial contributor. The American program, to go into effect May 1, will operate without the direct support or participation of the American Government.

The cooperative expects to spend $6 million in the first year of its operations and $10 million to $15 million in its second year. The participants will be assessed on the basis of their annual sales of semiconductors, with no one company bearing more than 10 percent of the total annual budget.

'Whatever is patentable, we expect to patent,' said Mr. Bloch of I.B.M., noting that the universities would get the patents and issue licenses and that a participant's financial contributions to the program would be considered as prepayment of royalties.

Mr. Sumney said the sponsors insisted on a free flow of information, but it was unclear how this would mesh with Government concern over access to information related to national security. The Government has already acted in some cases to restrict information flows from universities where research work is related to national defense."

Thought should be given as to whether this type of program can be developed in Israel.

RECOMMENDATION #67 - WE NEED TO EXPAND THE SALE OF ISRAELI R&D PARTNERSHIPS IN THE USA.

There are a number of limited partnerships that have been created in Israel coupled to a loan from the Government of Israel. These have been sold to US investors. Israel Rosen, President of Amira, a New York corporation, has developed a unique program to expand Israeli R&D. Amira funded four projects in 1982 through the sale of limited partnerhips, to conduct in Israel R&D work in medical diagnostic kits; a unique transmission for busses utilizing a fly wheel; a special form of vitamin D3 which will prevent and cure osteopolosis; and a vital bioengineering project to develop human interferons, monoclonal antibodies and other items.

We need to have the appropriate vehicle to sell these R&D limited partnerships to Israeli companies without regard to a government loan.

"High Technology" magazine recently reported (July 1983) about US limited partnerhips as follows:

"One of the hottest new corporate finance vehicles is the research and development limited partnership--where outside

investors shoulder the risk, gain tax breaks, and then share in any profits. In the past two years, technology companies from Boston to Seattle have been using such funds to support specific company research projects. R&D partnerships have been used as a means of capitalizing entirely new companies. It's been estimated that in 1982 alone, companies raised $500-600 million in this manner.

While the majority of the partnerships offered are relatively small, speculative and aimed at startup or early stage companies, lately the method has gained more widespread credibility. Large companies such as Control Data, Genentech and Syntex have begun to form limited partnerships, and a number of them are for $20 million or more. 'In the general marketplace, it seems to be heating up,' says Nicholas More, managing partner of Coopers & Lybrand in San Jose, who has prepared tax and accounting opinions on these partnerships for six years.'

Corporate executives are swarming to these funding vehicles because they view them, in the words of one, as 'magic.' The partnership provides much-needed capital for R&D projects without forcing the company to sell stock or raise debt. Investors, for their part, receive a tax write off of up to 99 percent of their investment and the chance to make five to 10 times their money, usually as long-term capital gains taxed at a maximum rate of 20 percent. 'I think it's a fantastic deal,' says James Glavin, president of Seattle's Genetic Systems, who completed a $3.4 million partnership last December.

The limited partnership is not magic by any means, but it is a break for technology companies that spend millions of dollars on high-risk research. Here's how it works:

Investors put up the money and form a partnership. Scientists from the company are hired by the partnership to conduct research and development for a new product. The company has no obligation to repay the investors or to commercialize the product. But when the project is completed (say three to five years later), the company has the option of buying the developed technology. If it exercises the option, investors receive royalty payments of anywhere from two to 10 percent of the sales. Fees for lawyers, accountants, and investment bankers generally range from 10 to 15 percent of the amount raised.

There are three major benefits for the sponsoring company. The limited partnership provides an off-balance-sheet form of financing. In financial statements to shareholders, publicly owned companies include only a footnote identifying the

partnerships. Secondly, it permits the company to shift the high cost of research to the investors. If the project fails or does not produce a commercial product, it's the investors who lose money, not the company. And finally, although basically a joint venture, the limited partnership gives the company ultimate control over the developed product.

The capital raised in these partnerships is funding a wide range of projects. For example:

-- Control Data is developing a mini-computer that will be compatible with its entire line;
-- Genentech is doing research on human growth hormone and gamma interferon;
-- Micropure Co. is working on a process of charging water droplets with electrostatic energy to maximize the distribution of pesticides;
-- California Biotechnology is devising products for relief of hypertension and related heart disease;
-- Genetic Systems is developing monoclonal antibody-based products for diagnosing respiratory diseases;
-- Agrigenetics is spending 75 percent of its $55 million partnership to fund seed research by university scientists. (The company will spend the balance conducting its own basic research.)
-- A pooled fund of $16.6 million raised by the Los Angeles brokerage firm, Bateman Eichler, Hill Richards, has funded four companies conducting seven separate research projects on such items as laser discs and computer maintenance programs."

It would be well to explore in great depth how to expand the sale in the USA of limited partnerships to finance R&D for Israeli companies.

RECOMMENDATION #68 - CONSIDERATION SHOULD BE GIVEN TO THE DEVELOPMENT OF A PLAN THAT ALLOWS ISRAELI CORPORATIONS TO COOPERATE ON HIGH RISK RESEARCH.

"Business Week," August 8, 1983, reported:

"'We are in trouble when even an IBM cannot compete with a Japan, Inc.' says D. Bruce Merrifield, Assistant Commerce Secetary for technology. This problem has obsessed the chemist ever since he left his post as vice-president for technology and venture management at Continental Group, Inc., a year ago to join the Administration. Now he has an elegant scheme that he believes will enable US industry to leapfrog its foreign competition in more than a dozen fields, from aerospace to semiconductors.

Merrifield, 62, has already convinced a surprisingly large number of high technology executives, venture capitalists, and investment houses that major corporations can create the kind of research and development limited partnerships that have spawned 10,000 startup companies in recent years. By raising private venture capital from limited partners looking for tax advantages, big corporations can band together to fund massive high risk research efforts like the target projects of Japan's Ministry of International Trade & Industry.

Limited partnerships would permit companies to cooperate on common research problems and raise interest-free money without tapping R&D budgets. Venture capitalists would be limited partners, thus qualifying for two tax breaks: an immediate 50% write off on their investment and capital gains treatment of future royalties from sale of the technology. 'The advantage is obvious,' says Larry W. Sumney, executive director of the Semiconductor Research Corp. (SRC), the research cooperative formed in 1982 by a dozen electronics companies. 'The money would come from outside the industry.'

The scheme is rapidly gaining support. Jordan J. Baruch, a management consultant who held the technology job at Commerce in the Carter Administration, says: 'Bruce's idea is a notch short of genius. I think we should see Japan in the dust.' While small limited partnerships typically have started with $1 million or less in capital, the agreements that Merrifield envisions are on a grander financial scale."

We need to determine if this program has applicability in Israel.

RECOMMENDATION #69 - CONSIDERATION SHOULD BE GIVEN TO THE DEVELOPMENT OF ISRAEL AS AN INFORMATION AND BRAIN CENTER.

Israel might well take a page from Singapore's book. A recent United Press International report stated:

"The campaign to computerize Singapore has started. This small island state with few natural resources has joined the computer revolution with an eye to becoming the brain center of Asia.

Prime Minister Lee Kuan Yew says he believes Singapore's best chance for economic survival is to develop itself as 'an information and brain service center' by the 1990s.

Twenty computer service companies, six computer manufacturing companies, and 91 school computer clubs with more than 5,000 members have been set up in two years. 'We have a fair luxury of time to develop because we are ahead of the other countries

in the region,' said Wee Tew Lim, vice president of the Singapore Computer Society. Mr. Wee said that while Japan had the advantage in hardware development, Singapore was in a better position to provide computer software services because the Japanese have difficulty communicating with the English-speaking world.

To boost the development of sophisticated computer industries and services, the government launched a $47 million program to computerize civil service. The National Computer Board, established last year to guide the development of computer industries in Singapore, said computerization improved the productivity of the civil service and provided a large market for the industry. Three ministries already have had their computers installed and the target is to fully computerize nine ministries within five years.

Many computer firms, lured by substantial government incentives and eager for a share of the lucrative computer contracts, are setting up offices in Singapore. 'The most attractive is the pioneer status scheme which allows selected companies a 5-to-10 year tax holiday,' said Edmund Tham, an Economic Development Board officer. 'Only sufficiently sophisticated and specialized companies offering services and products unavailable in Singapore are eligible,' he said.

Companies engaging in advanced research and development in Singapore also can deduct double the amount they spend for tax purposes. The US home computer firms, Apple Computer, started a $50 million expansion program early this year only seven months after the company began operations in Singapore."

Israel might well examine the recent moves of the French Government in the computer field.

The French Government has developed a plan to transform its electronics industries into a single, integrated whole. Scorning sectorial approaches, the French Government is insisting on a global strategy weaving together every "thread" in the "fabric" of electronics -- from the simplest component to the largest computer.

The blueprint report for the plan, argues that the French electronics industry is now strong only where the state has played a substantial role -- military electronics and telecommunications. With strong cooperation between government and industry, the report said, France can now push ahead where it has been relatively weak -- information processing, microelectronics, consumer electronics and automation.

France's grand strategy is to pour money into 14 national projects, including speech synthesis and recognition modules, computer-aided design and manufacturing systems, mini- and micro-computers and a very large mainframe computer model.

These projects might well apply to Israel.

RECOMMENDATION #70 - ISRAEL SHOULD DEVELOP "THE HAIFA HIGH TECHNOLOGY PARK."

I propose that the City of Haifa develop "The Haifa High Technology Park" for local and foreign firms to do research and production.

A good example to follow is the Research Triangle Park of North Carolina. This park was established to enhance North Carolina's economic growth. The park is an amazing success. Developed for industrial and governmental research, occupancy in the park is limited to organizations engaged in research, development and scientifically-oriented production. With the resources of academic achievement on the parts of three major universities -- Duke University, North Carolina State University and the University of North Carolina -- meeting the resources of industry and government, the end result is an environment of research and development unique in the United States.

The Research Triangle Foundation is responsible for the founding and development of the Park Concept. The Foundation is a nonprofit corporation with a primary objective of encouraging new research activity in the park and in the state. Since its organization in 1959 with contributions from corporate and individual citizens of the state, the Foundation has been funded by the liquidation and lease of tracts of land within the confines of the Research Triangle Park.

The Research Triangle Institute, created by the three universities but operated under separate management, is involved with contract research for private agencies on the federal, state, and local levels. This research unites the endeavors of numerous disciplines, maintaining close ties with the universities and serving as a focal point of the research complex.

Currently, 27 agencies operate in the Research Triangle Park, representing an investment of over a quarter of a billion dollars.

A most impressive list of tenants, representing private industry, includes Becton Dickinson, IBM, Monsanto, and the corporate offices of Burroughs Wellcome. Equally impressive are the installations of the E.P.A. -- National Environment Research Center, the National Center for Health Statistics, the National Institute of Environmental Health Sciences, and the National Humanities Center.

The Research Triangle area ranks first nationally in the number of PhD scientists and engineers per 100,000 population. Educational opportunities abound with cooperative research involving the personnel groups of the universities and the Research Triangle Park. An open exchange of information and resources among academic and research organizations confirms a dedication to the principle that research and education are necessary forerunners to industrial growth. This is the philosophy of North Carolina's Research Triange Park.

TRW, Inc., a diversified, worldwide company specializing in high technology products and services, moved its Environmental Engineering Division to the Research Triangle Park in 1979. The Division provides a diversity of multimedial environmental engineering and scientific services to government and industry. These services include field sampling and analysis, an analytical chemical laboratory, consulting engineering for pollution control and assistance in interpretation and compliance with federal and local regulations.

The Instrument Society of America is an international, individual membership society that is dedicated to education and the advancement of instrumentation and automatic control technology.

RECOMMENDATION #71 - THERE IS NEED TO DESIGN UNIQUE APPROACHES TO CREATE THE SILICON VALLEY OF ISRAEL.

It is important to realize that there is tremendous competition to attract US hi-tech companies to open factories and conduct R&D. A recent article in the "San Francisco Examiner" spelled out the problem facing Israel in trying to build a Silicon Valley:

> "It sometimes seems that every locale in America wants to turn itself into a Silicon Ridge, Microchip Oaks, or Random-Access-Memory Manor.
>
> Hawaii, for instance, has a state-funded effort to develop tropical applications of biotechnology and microelectronics. A small town in Indiana, building on its strengths as a light manufacturing center, has developed a healthy industry that manufactures plastic keys for computer keyboards.
>
> Overall, the Office of Technology Assessment (OTA) turned up 150 state government economic development programs that had at least some features aimed at hi-tech.
>
> Twenty-two states have narrower programs exclusively designed to create, attract, or retain firms that design and manufacture hi-tech products.
>
> The oldest of these narrow programs, North Carolina's famous Research Triangle Park, was established in 1959. But most of the efforts have been founded only in the last three years."

Israel must fine tune its approach and incentives to interest US companies in this highly competitive field.

An analysis of the competition would be most helpful to Israel in designing its future approaches.

RECOMMENDATION #72 - THERE IS NEED FOR A JOINT MARKETING EFFORT TO SELL "REGION 2000" -- A HIGH TECHNOLOGY REGION IN THE GALILEE.

An exciting program has been created and designated "Region 2000 -- a High Technology Region in the Galilee." This plan incorporates a number of towns and settlements in the Western Galilee, including Tefen, Segev and Ma'alot, with Karmiel as its urban center.

The main objective of the project is to develop a region geared to the future, in which people will be able to draw on the fruits of science and technology to make their lives more pleasant and satisfying, more specifically, the project aims at the following:

** to develop a region which will be equipped to meet the needs and demands of an advanced society as it enters the 1st century;

** to lay the foundation for this model society by opening the way to the large-scale development of science-based high technology industries in the Region;

** to benefit other areas as a result of the region's industrial development;

** to promote constructive co-existence and good relations between Jews and Arabs in the Galilee.

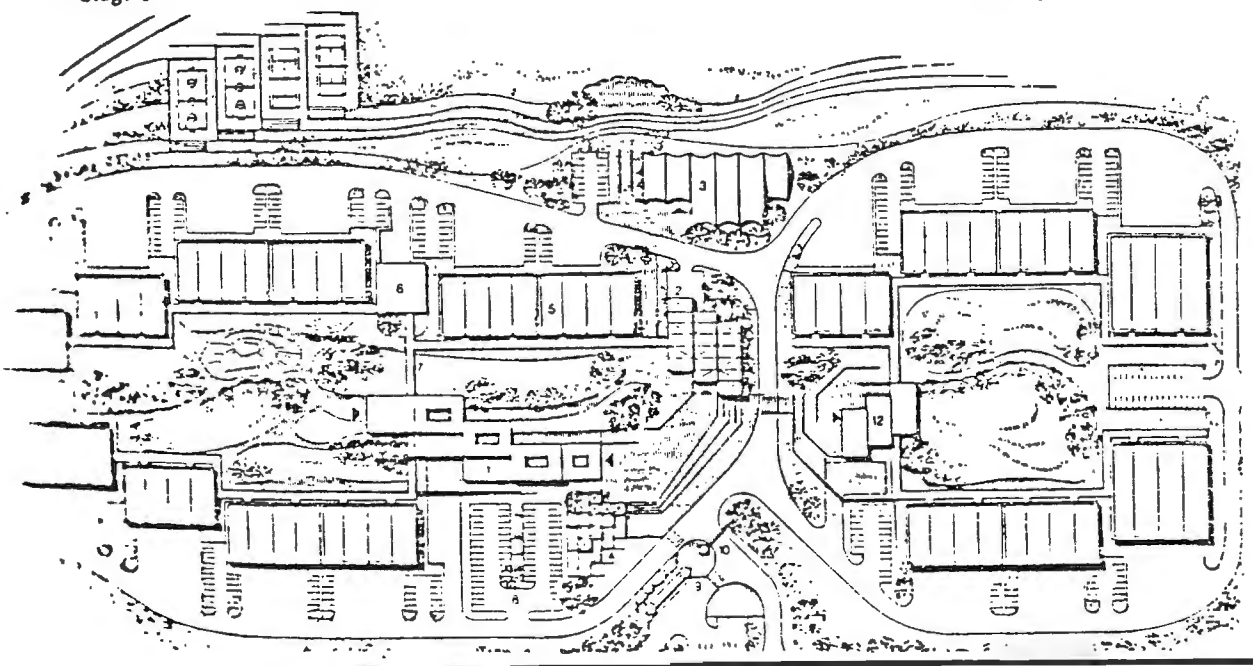
This plan encompasses the following site plan for Tefen Bridging Services Park:

Key:

1. Central services building
2. Training center
3. Recreation center
4. Day-care center
5. Manufacturing areas
6. Electro-mechanical plant
7. Covered Walk-way
8. Carpark
9. Busstop
10. Gate house
11. Sport fields
12. Secondary service center

Stage 1

Stage 2



The Inter-Urban Tefen and Ahihud

Tefen, lying 6 km to the south of Ma'alot and 12 km north of Karmiel, has been chosen as the site of the country's first "Bridging Services Industrial Park." This is a new concept in industrial park design and has been tested over a period of five years in a number of model enterprises. It houses small to medium sized manufacturing plants, and provides them with the administrative, communications and computer facilities that normally only the much larger organizations can afford on their own. It offers an umbrella of specialized services over the critical initial period of operation on a "use as you need" basis. In addition, leading Israeli industrialists are voluntarily assisting prospective foreign promoters to become familiar with the Israeli production environment, which will include a network of recreation facilities for employees and their families.

This concept is one of the initiatives of Mr. Stef Wertheimer, the founder and general manager of Iscar Ltd., which will be one of the larger enterprises operating in the Tefen Park.

Tefen draws its manpower from Ma'alot, Kfar Vradim and small settlements in the area. The new settlements are expected to provide the highly skilled workers, whereas the young people now growing up in the older settlements will fill the intermediate range of skills.

Ahihud, about 10 km west of Karmiel, halfway to Acre, covers an area of 600 dunams (150 acres). Ziklon Aircraft Industry has established itself there, and plans to start assembling helicopters in the near future.

The area is within easy commuting distance from the coastal plain and from the various settlements of the region, and is well placed to draw manpower from all directions. It is intended that the Ahihud Park will house major metal working industries complemented by smaller satellite workshops and specialized teams in automation and electronics.

Ahihud already has a small landing strip which can be developed to serve internal flights.

Another industrial park with an area of 100 dunams (170 acres) is planned for a site 20 km from Ahihud, just north of Beit Ha'emek.

We need to develop a marketing strategy in the United States to sell Region 2000 to American corporations. This offers exciting profit making opportunities for Americans to not only manufacture products but to conduct research in Region 2000.

RECOMMENDATION #73 - THERE IS NEED TO EXPAND THE MARKETING OF THE HIGH TECHNOLOGY PROGRAM IN JERUSALEM.

It was recently reported that the doors of Jerusalem's high technology industry opened for President Chaim Herzog, who was shown items ranging from a micro-computer to a do-it-yourself pregnancy detection kit.

The president toured the industrial zone at Mishor Adumim and the science-based industrial park at Har Hahotzvim as the guest of Industry and Trade Minister Gideon Patt, the President of the Manufacturers Association, Eli Hurvitz, and the Jerusalem Economic Corporation.

The Har Hahotzvim industrial park -- just a stone's throw across the Ramot Road from the ultra-Orthodox neighborhoods -- is the site of 11 hi-tech companies in the fields of electronics, pharmaceuticals, energy, optics and cables.

Herzog's first stop was at the site of the $100 million Intel electronics plant that is scheduled to open next year. The local subsidiary of the American electronics giant will produce computer memory "chips" and micro-computers. It plans to employ about 1,000 people by 1990.

The highlight of the visit was a tour through the large Teva Pharmaceuticals plant that specializes in antibiotics. The Teva group is owned by the Hurvitz family.

The president said that he was "very impressed by the high degree of sophistication" he witnessed during the tour. He added that Israel needs more export-oriented hi-tech industries as a means of attaining economic independence.

Science-based industries in Jerusalem now employ about 7,000 people in 35 plants, with most of their products going for export. Teva plans to start marketing its do-it-yourself pregnancy detection kits next year in the US at a $12 retail price.

We need to review how we can assist in marketing Israel's industrial zone.

RECOMMENDATION #74 - THERE NEEDS TO BE DEVELOPED A PRIVATE COMPANY ENGAGED IN THE SALE OF RESEARCH CONDUCTED IN ISRAEL.

It is well known that Israel has the potential for outstanding research which can be performed by American companies using the brainpower of Israel. To date, the marketing of potential research projects in Israel has, for the most part, been in the hands of government agencies and research institutions.

Additional marketing assistance is needed. There are numerous Israeli research projects that are waiting to be sold in the US. A private company will go out into the American market and sell Israel's research programs to US companies, particularly

in the northeastern part of the United States where we believe the greatest potential exists.

I believe that there is a very definite role that a private company can play in the rapid expansion of the research and development programs by American companies in Israel.

RECOMMENDATION #75 - ISRAEL SHOULD DEVELOP A MICROELECTRONICS CENTER.

I recommend that the Government of Israel consider the creation of a Microelectronics Center in Haifa. This will require the creation of a coalition of private companies, Technion and government to establish an education and research center designed to make Israel more competitive in microelectronics technology. The center would be designed to train electrical, mechanical and chemical engineering students as well as technical and technology personnel in the design, development and production of semiconductor devices.

The State of Massachusetts has recently designed a $40 million education and research center. The state guarantees $20 million in bonds issued by the Massachusetts Technology Park Corporation. High technology companies will provide $20 million in a combination of money, teaching and equipment donations. The State and private industry will split the annual operating budget targeted at $3 million. During its start-up phase, the corporation would consist of nine directors -- three each from industry, education and the public sector -- all appointed by the Governor of the State of Massachusetts.

North Carolina has appropriated $25 million for a Microelectronic center. Stanford University has proposed the expenditure of $7.5 million to construct a prototype lab to investigate problems associated with integrating systems in silicon.

Haifa has a great opportunity to capitalize on the capabilities and skills of its people based on its central role in electronics technology. Haifa has people in organizations with the knowledge of electronics design, electrical systems and electronic devices that are necessary to utilize the new Microelectronic technology in ways which will keep Israel's electronics industries economically and competitively viable.

Under this plan there will be a foundry for manufacturing integrated circuits where students at universities can implement their designs on silicon. The proposed new center will enable students to learn the design process, to have their designs fabricated and to test the resulting chip. This will also provide a site where small business, without the capital to invest in their own factories, can have limited quanitities of integrated circuit devised of their own design fabricated for new products.

By providing a site where engineering students and professionals can develop a deep understanding of the design and fabrication process, where technical support staff can be trained in fabrication techniques, where local industry can have integrated circuits manufactured, you are creating the synergism required to build on the existing strengths that are present in Massachusetts. It is a most important initiative for the future of Israel's economic and competitive position.

General Electric has constructed the first phase of its Microelectronics center in North Carolina. One half of the center will be devoted to research and development and the other half will be devoted to production of the results of that R&D. The product will be integrated circuits, or "chip" which GE will use in its products.

Israel would take a giant step forward if it set up a microelectronics center.

RECOMMENDATION #76 - CONSIDERATION SHOULD BE GIVEN TO THE DEVELOPMENT OF A PRIVATE COMPANY TO BE KNOWN AS "ISRAEL MICROELECTRONICS AND COMPUTER TECHNOLOGY CORP. (ISMI)."

"Microelectronics and Computer Technology Corporation" (MCC) was recently organized in the USA. This company was founded by 15 large US computer manufacturers. "Time" (February 7, 1983) reported:

> "Admiral Bobby Inman, who stepped down as deputy director of the CIA last June, is no stranger to high-stakes research in the face of a tough challenge from abroad. Last week he was named point man for the US response to a formidable new Japanese industrial threat. As chief executive officer of a unique firm called Microelectronics and Computer Technology Corp. (MCC), Inman will head a research operation jointly funded by ten top American computer companies. At stake: the 42% US share of the $92 billion world computer market.
>
> The idea for MCC was born when 15 big US computer manufacturers met at a Florida country club a year ago at the invitation of Control Data's chairman, William Norris. Several months earlier, Japan's government and its computer industry had announced that they were joining forces in the Fifth-Generation Project. Its aim: to develop a new super-computer by 1990 that works ten times faster than the best models on US drawing boards and breaks new ground in simulating human intelligence. Reminding his competitors of Japan's rapid inroads into the semiconductor market, Norris convinced them that unless they began to work together, American computers could go the way of compact cars and television sets. The first shareholders

in the new cooperative, founded in August, include such industry heavy-weights as Control Data, Digital Equipment, Honeywell, National Semiconductor and Sperry Corp.

With start-up funding of $50 million, MCC will concentrate on four areas: advance computer architecture, software technology, integrated-circuit packaging, and computer-aided design and manufacturing systems. MCC will not market products: that will be up to its individual member companies. One of Inman's toughest tasks, therefore, will be to maintain the delicate balance between cooperative research and the competing market aims of MCC's shareholders. Says he: 'The ability of the partners to believe they are going to share equally and fairly is critical.' But not quite as critical to this venture as their shared belief that working together is the way to beat Japan, Inc."

It should be determined whether this type of joint endeavor has applicability to Israel.

RECOMMENDATION #77 - TECHNION SHOULD CONSIDER DEVELOPING A UNIVERSITY COMPUTATION CENTER.

The City of Haifa might develop with Technion and Haifa University, a University Computation Center as was done in the Research Triangle Park of North Carolina.

It is reported: "During the last quarter of a century the positive cooperation of the three Triangle Universities -- Duke University, North Carolina State University, and the University of North Carolina at Chapel Hill -- has produced in succession the effective launching and functioning of: the Research Triangle Foundation, the Research Triangle Park, the Research Triangle Institute, the Triangle Universities Computation Center and the Triangle Universities Center for Advanced Studies, Inc."

The North Carolina Triangle Universities Computation Center (TUCC) was organized in 1965 as a not-for-profit corporation with a Board of Directors consisting of three members from each university appointed by each president or chancellor.

The purpose of TUCC is to provide and support the computing needs of its founding universities and the North Carolina Educational Computing Service which extends these services to some fifty other institutions of higher education in North Carolina. TUCC also serves the Research Triangle Institute and other research organizations located in the Research Triangle Park.

The Triangle Universities Computation Center is one of the largest educational information tele-processing centers of its kind in the world. The heart of its computing system is an Amdahl 470 V/8, IBM System/370 Models 165 and 165-2 and its two Hewlett

Packard 2000 minicomputers are linked to the three Triangle universities' campuses by microwave or highspeed transmission lines and to the other insititutions by various telephone services.

The latest expression of the outstanding cooperation of these three universities is the creation of the Triangle Universities Center for Advanced Studies, Inc. (TUCASI) in 1975. TUCASI is the owner of a 120 acre campus in the center of the Research Triangle Park. The National Humanities Center, a major institute of advance study itself accommodating over forty scholars in residence, is the first of what is expected to become over time a number of advance studies activities on the TUCASI acreage. TUCASI is governed by a Board of Trustees representing the three universities, the University of North Carolina General Administration, the Research Triangle Foundation and the public.

RECOMMENDATION #78 - THERE IS A NEED TO DEVELOP A CENTER OF BIO-TECHNOLOGY.

I propose that there be instituted in the Haifa High Technology Park a center of Bio-Tech. New biological technologies, including gene-splicing are moving ahead rapidly.

In a recent editorial, it was pointed out that "Bio-tech breakthroughs will have profound social and economic impacts. But at present America has no center for the commercial application of genetic technology and bio-medical research comparable to Boston's Route 128 cluster for computers for California's Silicon Valley for solid-state physics. More than any other city, New York has the ingredients needed to fuel growth of the bio-tech industry. With its worldrenowned medical institutions, libraries and consulting and research organizations, the city already possesses a strong bio-medical research infrastructure. More than 14 percent of the nation's medical personnel work here, and we have more than 150 hospitals, including 22 comprehensive medical centers."

With 20 percent of American venture capital controlled by New York State firms, New York has the money to fund long-term investments in this field. Profits and jobs will be created not only in a research center of this type, but there will be created a spin-off of industries such as laboratory materials and computer software.

The ingredients for bio-technology research apply to the development of a bio-tech center in Haifa.

RECOMMENDATION #79 - THERE IS NEED TO DEVELOP A ROBOTICS INSTITUTE.

The mechatronic revolution underway in the USA and Japan should be carefully studied by Israeli manufacturers. Haifa

is the place of the establishment of a center for a Robotics Institute. "Mechatronics" is an English word of Japanese manufacture. Linking mechanics with electronics, it described the application of advance technologies and the use of computers, microprocessors and integrated circuits to achieve greater efficiency in the design, production and operation of machinery. Thus, mechatronics also means automation -- but automation without fear.

In a report dated November 27th, from Tokyo, Japan, it was pointed out "Japan's MITI (Ministry of International Trade and Industry) wants smarter Japanese robots. They will fund a government/industry collaborative venture to develop high intelligence robots. The program will cost Y17 billion for the seven year project. The first task will be to form a research in the first year. Five specific study areas include, (1) creation of high sensitivity sensors for 'seeing' and 'touching', (2) production of very small, high efficiency processors, (3) the reduction of robot weight and (4) the development of a new kind of robot arm."

Certainly Israel can play an important role in the development of sophisticated robots.

The State of Michigan has recently opened a Center for Robotics and Integrated Manufacturing (CRIM).

"The Center for Robotics and Integrated Manufacturing (CRIM) of the University of Michigan was established in late 1981 as one component of a combined State-industry-university effort to revitalize and diversify the manufacturing base of the nation in general and the State of Michigan in particular.

CRIM, based in the U-M College of Engineering, was formed by consolidating the College's existing activities in robotics, computer engineering, manufacturing engineering, and information systems. Under CRIM, the relevant research, instructional activities, and laboratory facilities of 40 faculty members from six departments are coordinated. The six core departments participating in CRIM are: Electrical and Computer Engineering, Mechanical Engineering and Applied Mechanics, Industrial and Operations Engineering, Material and Metallurgical Engineering, Aerospace Engineering, and Naval Architecture and Marine Engineering."

RECOMMENDATION #80 - THERE IS NEED TO EXPAND THE RESEARCH IN GENETIC ENGINEERING.

There are a number of companies in Israel that are conducting genetic research. This is an important field that needs to be expanded. American companies should be interested in doing R&D in this field in Israel.

The "Jerusalem Post" recently reported:

"Jerusalem's newest science-based industry opened its doors this month at the Talpiot Industrial centre.

The International Genetic Sciences Partnership Company, with an initial capitalization of approximately $5 million, will devote its first three or four years to research. The target 'product' is the development of a practical process for the introduction of selected genes into cells derived from animal and plant sources.

Plans also call for production of commercial products such as glyco-proteins, livestock vaccines and hormones.

International Genetic Sciences Partnership was established by two American firms -- First Mississippi Corp. and International Genetic Sciences, Inc.

The new Jerusalem firm's researchers will be guided by a team of local and foreign geneticists, including Prof. Avraham Loyter of the Hebrew University and Prof. Demetrios Papahadjopoulos of the University of California. Former President Ephraim Katzir has been named senior advisor to the company."

RECOMMENDATION #81 - CONSIDERATION SHOULD BE GIVEN TO THE DEVELOPMENT OF A BATTELLE-TYPE ORGANIZATION IN ISRAEL.

I have had discussions with representatives of Battelle Memorial Institute concerning their setting up an office in Israel. Battelle pioneered the concept of contract research, and much of its work is sponsored by industrial companies, government agencies, and associations. Its scientific activities extend from fundamental studies for new knowledge to applied programs directed toward new products and processes. In addition to sponsored research performed for industry and government, Battelle maintains its own internal research and development and educational programs.

Battelle, with headquarters in Columbus, Ohio, has four major research centers in the US and Europe. Additionally, it has four sites for specialized research, as well as offices and correspondents in various cities in the United States, Europe, Africa, Latin America, the Middle East, Australia, and the Far East.

It would be an important addition to the Haifa High Technology Park if there was located in the park an office of Battelle Memorial Institute. This would provide a needed service to both Israeli and foreign companies in conducting research on a contract basis.

RECOMMENDATION #82 - THERE IS NEED TO DEVELOP A TECHNOLOGY EXCHANGE COMPANY.

There is a considerable amount of interest on the part of Israeli manufacturers in acquiring American technology. By doing so, they can oftentimes save the two to three years required in the development of the technology on their own. Similarily, many American companies want to locate and license technology developed in Israel.

There is a need for private companies to find technology in the United States and in Israel as well as bringing about an exchange through licensing. A private vehicle is needed to bring about technology transfers.

RECOMMENDATION #83 - THERE IS NEED TO EXPAND THE TEACHING OF COMPUTER TECHNOLOGY.

"Newsweek" (October 18, 1982) presented some ideas that could be useful in the design of the Haifa High Technology Park.

> "A smart work force is America's best resource -- and education is the best guarantee to workers that they will always be qualified for a job. A great deal of attention is now being paid to the minimal requirements being demanded of US students in mathematics and science, two crucial disciplines for a high-tech future. But the education problem is broader than that.
>
> As a first step, Congress should pass what has come to be known as the 'Apple bill.' Steven Jobs, chairman of Apple Computer, wants to donate a computer to every accredited school in the nation -- some 103,000 machines at a cost to Apple of $40 million.
>
> The Computer Equipment Contribution Act of 1982, as originally drafted, would have changed the US tax code for one year to permit Apple and other computer companies to recover most of the cost of such donations. A watered-down version of the bill has passed the House. Jobs points out that children, who pick up computer skills much more quickly than adults, could get a head start on 'computer literacy' that would help enormously as they enter a work world that is increasingly dependent on computers.
>
> This type of program might have applicability to Israel. In additon, Israel should consider something like the nascent 'advanced technology institute' in Colorado. The institute, still in the planning stages, will collect equipment from industry and money from the state, then sprinkle them on the university system to ensure state-of-the-art training for engineers and other applied scientists."

Industry cooperation with the education system in USA is critical -- especially because of the severe shortage of qualified teachers; higher pay in the private sector has lured the best and brightest out of the nation's schools. And it is coming. Ten major US corporations have banded together to fund an engineering college-faculty-shortage project, and many companies -- included Exxon and Allied Corp. -- are pumping money directly into the salaries of junior faculty members. The upgrading of technical training in the educational system has sociological as well as industrial significance; some experts warn that without it, the military will do most technical training.

Israel should consider a venture of this type.

RECOMMENDATION #84 - THERE IS NEED TO DEVELOP A SOLAR ENERGY CENTER.

Israel has been in the forefront of the development of solar energy. Here are many moves being made in the United States and other parts of the world to expand solar energy systems. It is recommended that a Solar Energy Center be established for necessary research and development of new forms of solar energy equipment which will have substanital export potential.

RECOMMENDATION #85 - THERE IS NEED TO DEVELOP A FIBER-OPTICS CENTER.

Toshiba Corporation of Japan advertises that one tiny Toshiba fiber-optic thread less than 4/1000ths of an inch thick, can handle as much as 10,000 ordinary telephone lines. Toshiba fiber-optic communications systems now play vital roles in power-generating and oil-refining industries. They are also helping highway and subway systems move more efficiently and safely.

In a recent article in the "New York Times" it was pointed out:

> "In short, fiber-optics offers a compact, cheaper, faster, more reliable means of telecommunications and an alternative to metal wiring in items ranging from computers and photocopiers to sensing devices used by medical exports probing for disease. Fiber-optics also offers careers in what can be roughly divided into two areas -- manufacture and development of fiber-optics systems, and their applications.
>
> 'For every inventor there are hundreds more who develop and refine the invention, making it better, cheaper to produce and easier to use,' said Dr. Henry Kressel, staff vice president of solid-state research at RCA Laboratories' David Sarnoff Research Center in Princeton, N.J. 'Every component of a fiber-optics system needs to be improved; and the industry needs people to do the improving,' Dr. Kressel said.

'The nuts-and-bolts development still needs to be done,' said Dr. David A. Duke, vice president and general manager of the tele-communications group of Corning Glass. 'The next generation of fiber-optics is waiting to be born.' Dr. Duke singled out the need for high-performance lasers for 'systems people who can design tele-communications networks using fiber-optics and for craftsmen who can handle the new technology, from installation to repair.'

Mr. Kressler the market-research company president had a shopping list of improvements and 'improvers': optical and electrical engineers to develop lasers 'the size of pinheads' to operate at the right wavelengths; chemists and materials experts to make the fibers purer, since impurities contribute to energy loss by bouncing the light pulses off the fiber walls and dissipating the signal; chemical engineers and mechanical engineers who will manipulate plastics and production methods so the fibers can be coated with a thinner protective layer than currently used, further reducing the width of the fiber cables."

Israel has been in the forefront of fiber-optics development. There are many opportunities for the development of lasers that can be effected through a Fiber-Optics center in Haifa.

RECOMMENDATION #86 - CONSIDERATION SHOULD BE GIVEN TO THE FURTHER EXPLORATION OF OIL IN ISRAEL.

"Israel Business" October 1982, commented:

"After an interval of more than 25 years, prospectors once again struck oil in Israel. A producing well, the first since the discovery of small fields at Heletz and Kokhav in the mid 1950's, has been brought in near Arad.

Evidence available to the general public until now suggests this also is not a revolutionary discovery. Production of the new well has been estimated on the order of a hundred barrels per day, the equivalent of something like 5,000 tons a year -- a mere drop in the bucket compared to the seven million tons Israel now consumes annually. One forecast places the well's total projected output, over its expected five year span of production, at the equivalent of one day's national consumption.

Nevertheless, the find is significant. First of all, tests do indicate the presence of a larger subterranean reservoir, justifying perhaps as many as ten additional wells in the immediate area. Those holes certainly will be sunk in the near future, and experts have also suggested the advisability of a return to some of the drillings abandoned as dry holes in the same area in the past. Such additional exploration

is expected to save the country on the order of $10 or $15 m. a year, of the foreign currency that has to be spent on fuel imports, between now and the late 1980's. While small, in comparison with Israel's overall payments deficit, these are not sums to be taken lightly.

Oil industry experts, however, have been quoted as saying that the importance of the present development goes far beyond the value of oil to be recovered from one specific well or field. They see in this the vindication of their theories, which insisted that there is petroleum in Israel, and that it could be found -- the number of dry holes drilled over the last three decades notwithstanding.

One might even find symbolic value in the new well's name: in Hebrew, 'Tzuk Tamrur' means the rock, which is a roadsign. Is the limited success in this instance to be interpreted as an indication of better things to come?

And so the search will continue with renewed vigor. Private investors, from Israel and from abroad, backed by substantial government support, are now intensifying their prospecting activities in different parts of the country. One American group, organized as the King David Oil Prospectors, Inc., may spend as much as $1.2 m. on new exploration in the course of this year alone."

Hopefully this type of increased exploration will find much needed oil in Israel. A break in this area would go a long way towards Israel reaching financial independence. More US companies must be attracted to drill for oil in Israel.

Isramco, Inc., on May 6, 1983, filed a registration statement with the Securities Exchange Commission in Washington, DC, indicating a price to the public of Isramco shares in the amount of $5,100,000.

Isramco was organized in November 1982 in order to participate in an oil and gas exploration and drilling project in Israel.

RECOMMENDATION #87 - THERE IS NEED TO DESIGN AND IMPLEMENT A US-ISRAEL INVESTMENT COMPANY IN THE STYLE OF AFRICA-ISRAEL INVESTMENTS LTD.

The "Israel Economist" pointed out:

"Few companies can claim to have contributed so much to the building of Israel as Africa-Israel Investments Ltd. Established by a group of South African investors, the company is a subsidiary of Bank Leumi. Aside from their diverse construction activities, the company's financial strength

is augmented by ownership of Migdal, one of the country's largest insurance concerns and the health, holiday and tourism complex at Tiberias Hot Springs.

Africa-Israel has been involved in projects ranging from the construction of entire residential suburbs which include commercial and community facilities, to industrial parks, shopping centers and tourist developments.

The company's slogan, 'The people who built Savyon,' recalls Africa-Israel's most prestigious achievement. In the sixties the company transformed a piece of semi-arid land on the outskirts of Tel Aviv into a suburb containing some of Israel's most coveted villas. Africa-Israel's success in Savyon typifies the company's high standard of vision and workmanship.

In Savyon, as in most of their projects, Africa-Israel oversaw the project from its inception through the planning and construction stages, and continuing through to the actual selling of the homes. The company continues to maintain many properties, like the Savyon Country Club, of which they retained ownership. The company's shares are quoted on the Tel Aviv Stock Exchange.

Another well known project that was the work of Africa-Israel is the Kiryat Weizmann Industrial Park just outside of Rehovot. Concentrated there is a cluster of science based industries, operating in futuristic and high technology fields such as computers and electronics.

The Tiberias Hot Springs is another ongoing tourist project of Africa-Israel. The four star Ganei Hamat Hotel is located on the shores of Lake Tiberias close to the mineral hot springs, famous for their medicinal qualities. The company has developed the entire tourist complex which includes a health resort (a spa since Roman times), and present and planned recreational facilities which make the Tiberias Hot Springs an attractive holiday spot for the young. Facilities include private beaches, tennis courts and a discotheque.

Following on its success in Savyon, the company is constructing or has already created, a number of neighborhoods on the same lines that have made Savyon a legend of luxury and affluence. These projects include Rimon, Givat Savyon (both close to Savyon itself), and in north Tel Aviv, close to Ramat Aviv, the new suburb of Savyonai Aviv."

We need to think through how we can design a company to be known as US-Israel to operate in a manner similar to Africa-Israel Investments Ltd. We need to conduct the necessary R&D to determine the types of projects US-Israel Investments can develop and implement.

RECOMMENDATION #88 - WE URGE THAT THE ZOA EXPAND ITS WORK INTO THE AREA OF INDUSTRIAL DEVELOPMENT OF ISRAEL.

I believe that the time has come to add a new dimension to Zionism -- namely, ensuring the economic viability of Israel through expansion of the private business sector of Israel. ZOA has worked effectively in many areas in the past. To continue their work for Israel, it would appear to be appropriate for ZOA to call on its membership to open factories in Israel -- to conduct R&D in Israel -- buy products from Israel.

I am having encouraging discussions with a branch of ZOA calling for a movement in this direction. Insuring the economic viability of Israel must be placed high on the future priority list of ZOA nationally and through their chapters. We would be pleased to offer our assistance.

RECOMMENDATION #89 - WE NEED TO OPEN BRANCHES OF CEG-I IN CERTAIN US COMMUNITIES.

Considerably more grass roots work must be done throughout the USA to expand business relationships between Israeli and American businessmen. We plan to open branches of CEG-I using the skills, talents and resources of local businessmen in selected communities. We believe there is the interest and the capability to "go local" -- which we intend to do.

We urge the US readers of this plan to contact us in Milwaukee if they would like to develop a local branch of CEG-I.

RECOMMENDATION #90 - THERE IS NEED TO HAVE ISRAELI BUSINESS SCHOOL STUDENTS CONDUCT BUSINESS RESEARCH.

There is a limited amount of information available from Israel in US business quarters. Graduate students, with a business orientation, could conduct R&D in such areas as:

1) How successful have US companies been in Israel in terms of return on investment -- results of R&D by US companies in Israel, etc.? Success stories will help sell other investors and R&D in Israel.

2) How competitive are Israel's incentive programs to attract foreign investors?

3) How effective are the lead programs sent on to the US?

4) How effective are the non-profit organizations set up to assist in expanding business relationships between Israeli and US companies?

5) What were the results of applications of US companies to open factories in Israel during the past three years? What numbers were approved? -- what companies withdrew? -- why? what companies were turned down by the Government of Israel? why?

6) How can some of the recommendations contained in this plan be implemented? -- by whom?

RECOMMENDATION #91 - THERE IS NEED TO EXPAND THE ROLE OF THE ISRAEL-US CHAMBER OF COMMERCE IN ISRAEL.

The various chapters of Israel-US Chamber of Commerce in Israel and the US play an important role in expanding business relationships between the US and Israel.

As we look to 1990, the question must be answered, "How can the Chamber expand its programs to increase business relationships between US and Israeli business executives?" One way is for the Chamber to serve as the conduit to assist missions of Federations, UJA, etc., to meet their counterparts in business. I believe we will find many non-profit organizations moving into the area of setting up missions of corporate executives to Israel for expansion of business relationships. The Chamber has the facilities and the active membership to make this program succeed.

In addition, the Chamber in Israel might well renew its referral structure of business leads to the USA to determine if this is the most effective way of serving Israeli exporters. I would hope that the Chamber could implement some of the recommendations contained in this plan.

RECOMMENDATION #92 - WE NEED TO ENCOURAGE MORE ISRAELI COMPANIES TO SELL A PORTION OF THEIR COMMON STOCK ON THE OVER-THE-COUNTER MARKETS IN THE USA.

Ten Israeli companies have come to Wall Street to sell shares in their companies. This program has increased the expansion opportunities of their companies as fresh capital is brought into Israel.

While the Dow-Jones industrial average rose only 47 percent between August 2, 1982 and August 1, 1983, nine Israeli securities, most of them newcomers to the US investment scene, outperformed it by appreciating at an average of 97.9 percent.

Israeli securities are not exactly a novelty for American investors. Indeed, Israeli firms have received a warm reception in the US since the first Israel-based company came to raise

capital on Wall Street nearly a quarter of a century ago. In 1959, American Israeli Paper Mills was listed on the American Stock Exchange; since then, eight other companies from the Jewish state have been accepted for trading on the American Stock Exchange and over-the-counter. No other foreign country except Canada has so many of its companies traded in the US securities market.

Today most of the Israeli firms that are traded publicly in the US are heavily oriented toward science-based industry. They produce sophisticated equipment in such fields as electronics, medical instrumention and computers. All of them compete on world markets.

The key to their success is research and development, capitalizing on Israel's greatest natural resource: the brainpower of its people. Today Israel is regarded around the world as a "hi-tech country," and the companies traded in the US securities market have done well enough to have made significant contributions to closing Israel's foreign trade gap. Thus, while Israel's total exports rose sevenfold between 1970 and 1980, exports of electrical and electronic equipment increased 22.5 times.

Three of these securities -- American Israeli Paper Mills, Etz Lavud and Laser Industries -- are traded on the American Stock Exchange. Shares of the other six - AMPAL Electronics Industries, Elscint, InterPharm Laboratories, Scitex Corporation and Teva Pharmaceuticals -- are quoted over the counter. A hypothetical investment of $1,000 in each of these stocks on Aug. 2, 1982 -- at the beginning of Wall Street's rapid climb -- would have appreciated dramatically in the following eight months. (See accompanying chart.)

Thus, the original $9,000 investment -- $1,000 in each Israeli stock -- would have been worth $17,520 on August 1, 1983 -- an increase of 97.9 percent.

Company	Exchange	2 Aug.82 Price	1 Aug.83 Price	Share Splits	Change in %	Original $1000
American Israeli Paper Mills	ASE	6 3/8	7 5/8		+ 20	$1200
AMPAL	ASE	1 5/8	4 7/8		+200	2998
Electronics Corp Of Israel	OTC	11 1/4	16 5/8		+ 48	1480
Elron Electronics Industries	OTC	15 1/2	14 1/2	(3/2)=29 1/4	+ 40	1400
Elscint	OTC	13 1/8	18 1/4	(2)=51 1/2	+178	2780
Etz Lavud	ASE	12	27		+124	2240
InterPharm Labs	OTC	3 3/8	6 3/4		+100	2000
Laser Industries	ASE	7 1/4	18 5/8		+157	2570
Scitex Corp	OTC	15 1/4	25 3/4	(3/2)=38 1/4	+153	2533
Teva Pharmaceutical	OTC	9 1/4	5 1/2		- 41	594

Source: Bank Leumi

Much of the credit for these success stories on Wall Street goes to Fred Adler & Company. He has had the foresight and the necessary judgment to take these companies public in the US at the right time. Fred Adler can be an important figure in bringing more Israeli companies to Wall Street in the future.

RECOMMENDATION #93 - WE NEED TO ESTABLISH A MUTUAL FUND IN THE US TO SELL ISRAELI STOCKS.

Private entrepreneurs need to establish a mutual fund made up of high technology Israeli stocks sold in the USA and Israel. As a result of the successes of many Israeli companies in the US market, there is a considerable interest in America in the stock of these companies. I propose that a $25 million mutual fund be created to market Israeli securities in the US -- particularly in the high technology field.

This fund can be used as an alternative to the cashing in of Israeli bonds. Many holders of Israeli bonds would prefer to have an equity position after holding Israeli bonds to maturity.

We need to find an investment banking firm to underwrite this type of fund. We have a detailed proposal available to interested parties.

RECOMMENDATION #94 - CONSIDERATION SHOULD BE GIVEN TO THE DEVELOPMENT OF AN ISRAELI TECHNICAL ASSISTANCE PROGRAM FOR SMALLER COMPANIES.

A review should be made of several US plans to assist smaller companies in their R&D programs to determine applicability to small Israeli companies.

Pennsylvania was a pioneer in acknowledging the importance of technology transfer when it created the Pennsylvania Technical Assistance Program (PennTAP) in 1965. The program linked the state's small business community to existing academic resources. Now the state has begun to carry its role as business problem-solver one step further.

Later this year, a new state-supported program called the Ben Franklin Partnership will get under way with $1 million of state funds, to be matched by an equal amount of private money. Pennsylvania's idea is to further leverage university resources, which are already bringing technical assistance to small businesses, to assist entrepreneurs in product commercialization and applied research.

RECOMMENDATION #95 - THERE IS NEED TO EXPAND THE INTEREST OF AMERICAN COMPANIES TO MAKE LOANS TO ISRAELI COMPANIES.

Many Israeli scientists and engineers will be looking to set up companies to develop and market hi-tech products. They will need capital -- short term and long term. They will look to financing from private venture companies as the banks are not providing start up funds.

Recently, 11 prominent Israeli industrialists, some of whom are on the CEG-I Israel Board, started a company called Danot Investments to finance primarily Israeli science-based industry. This was an important step forward for emerging companies. Danot has financed companies that deal with (1) limb implants, (2) switching mechanisms, (3) computers to provide graphic images, etc.

More Danots will be needed to finance Israeli entrepreneurs. We have venture capital companies in the US that should become interested in financing emerging Israeli companies. Funds of this type are particularly valuable in trying to attract Israelis who are residing in the USA to return to Israel to develop hi-tech companies.

RECOMMENDATION #96 - CONSIDERATION SHOULD BE GIVEN TO ESTABLISHING AN INTERNATIONAL LOTTERY EMANATING FROM ISRAEL.

Thought should be given to setting up a lottery to provide university scholarships in Israel. Israel has the machinery through its local lottery programs. This could be expanded to sell lottery tickets worldwide with case awards -- free trips to Israel, a second home in Israel, etc.

The Greza Frankfort, a German credited lottery, advertises tickets for $350 each. They offer 500,000 tickets with 241,588 DM to the winners. There are two top awards of 3,000,000 DM.

By setting up an international lottery in Israel to be sold worldwide, substantial funds could be made available for scholarships. This will help fill the need to provide additional Israeli engineers in the years ahead.

RECOMMENDATION #97 - THERE IS A NEED TO SET UP A PRIVATE VEHICLE TO ASSIST ISRAELI FIRMS TO ACQUIRE US COMPANIES WHO WILL EXPAND INTO ISRAEL.

There are a number of Israeli companies that would benefit by owning a US company that has developed product lines and marketing capability. Uzia Galil, Chairman of Elron, has pointed out that Israelis, by buying these companies, might well expand their product lines and marketing facilities.

All too often, Israeli companies look for joint ventures with US companies and are unsuccessful. By buying over 51 percent of the stock of certain US companies, they can expand their operations into Israel and use their marketing capability to sell the Israeli-made products in EEC countries and the US.

We need to have a privately funded vehicle that will provide the brokerage service to find the US companies and offer them to appropriate Israeli companies.

RECOMMENDATION #98 - WE NEED TO DEVELOP AN ISRAELI COMPETITION FOR ADVANCE TECHNOLOGY.

With Israel's industrial thrust being in the area of high technology, we should consider designing a competition for advance technology. We in the USA can join with Israelis in the setting up of the program by providing US awards via advanced training in US institutions.

RECOMMENDATION #99 - WE NEED TO MARKET A PERIODICAL IN THE US TO BE KNOWN AS "BUSINESS ISRAEL."

There is a limited amount of business information flowing from Israel to the business community in the US. As a result,

the miracle of Israel's industry and high technology is not sufficiently portrayed to US business influentials. We need to design an ongoing information program to the US business influentials to provide information which will suggest to them, "We better look at Israel as a place to invest or do some of our R&D."

There is a large market in the US for a sophisticated, non-puffery magazine that speaks in businessmen's terms. This should be developed on a private, for-profit basis.

RECOMMENDATION #100 - THERE IS NEED TO PUBLISH A MAGAZINE IN ISRAEL TO PROVIDE INFORMATION CONCERNING THE US MARKET -- CAPITAL OPPORTUNITIES IN THE USA -- COMING CONFERENCES AND TRADE SHOWS -- CHANGES IN THE US IMPORT LAWS, ETC.

I have found that many Israeli manufacturers are flying in the dark in relation to the US market. We can provide a valuable service by publishing a monthly magazine for the Israeli manufacturers, "Business USA."

The information would be obtained in the USA. Ads would be obtained from US companies. The magazine would be published in Israel and marketed in Israel.

RECOMMENDATION #101 - THERE NEEDS TO BE AN INCREASED NUMBER OF MERGERS OF SMALL ISRAELI COMPANIES.

There are too many small companies in Israel attempting to compete in the American market for the sale of their products. They would be better equipped to market their products if they were part of a larger conglomerate organization.

It appears that there are legal and labor problems in Israel that adversely affect the consummation of mergers. It is proposed that steps be taken to ease the way for mergers so that an increased number of smaller companies will become a part of larger companies. This will also enable many more companies to go public and to have an expanded basis for investments.

RECOMMENDATION #102 - THERE IS NEED TO EXPAND ISRAEL'S FREE PORT ZONES.

In a recent article in the "Journal of Commerce," it was pointed out that Israel has two free port zones -- one in Haifa and the other at Eilat. The writer of this article concluded that both are "only now coming to life, although founded 10 years

ago." It was suggested, "These areas offer considerable exemptions from custom duties, indirect, direct, property and income taxes -- plus a hefty government grant for constructing the plant and even for its equipment, and free developing of the area, such as roads, water, etc. The main drawback was that all these benefits were accompanied by plenty of red tape -- although this problem is gradually being licked."

Consideration should be given to the expansion of the Haifa and Eilat free port zones. The "Journal of Commerce" pointed out; "The 'awakening' of these free zones after so many years is due to several factors. The first is the fact that companies can maintain a low profile, in an area which is rife with disturbances, not only in the Middle East, but especially in certain parts of Africa."

"The second reason is the 'peace process,' initiated by Egyptian President Sadat two years ago, which has switched the impression that Israel was prone for future turbulence to the feeling that a settlement would eventually be reached between Israel and its neighbors. Thus, many African countries are eyeing Israel as a place where their raw materials can be shipped, manufactured and sent on to Europe."

RECOMMENDATION #103 - THERE IS NEED TO DESIGN NEW ATTRACTIONS TO EXPAND TOURISM FROM AMERICA TO ISRAEL.

Tourism can play a major role in making Israel financially independent in 1990. Israel offers excellent facilities for visitors, whether they be Jewish or Christian. It has been reported:

> "A total of nearly one million visitors from around the world traveled to Israel in 1982. Translated into dollar terms, these visitors represented $1 billion in income for Israel, making tourism one of Israel's more important sources of foreign currency.
>
> The 'added value' for tourism is 85 percent, meaning that the tourist industry earned a net income in foreign currency of about $850 million, thereby outranking all other major export industries in this respect.
>
> To further illustrate tourism's economic impact, recent figures combining tourism and El Al Israel Airlines revenues, indicate that in 1981, tourism accounted for one-fifth of Israel's exports of services, and constituted 11 percent of the country's total exports (goods plus services.)
>
> Last year, Israel's tourism industry experienced one of its roughest periods. From 1980, when the number of tourists visiting Israel peaked at 1.17 million, the figure dropped to 1.07 million in 1981; and to 996,000 in 1982 -- a 12 percent decrease from the previous year.

Three main factors are held reponsible for the decline: the worldwide recession, the Lebanese war and its aftermath, and the interruption in El Al Service.

Tourism officials predict a return to the upward trend in 1983, with the reorganized El Al back in business, an aggressive marketing campaign by the Israel Government and private tourism sectors, and improvement in the international economy.

In addition to the vital financial benefits, another important plus of tourism -- on which no dollar figure can be placed -- is that visitors usually leave the country with a 'more balanced view' than they might have had, relying on the media back home."

We need to design new tourist attractions. Many potential visitors to Israel have taken the tours -- gotten up at 5:30 to get on the bus to take in the history, culture and religious experiences of Israel. They want now to come to Israel to follow the sun -- to relax -- to enjoy. Others want to participate in sports -- attend cultural events -- go to school, etc.

Here are some suggestions that might well lead to expanded tourism:

1) Cultural Programs -- Israel has a wealth of talent in various cultural fields. Programs should be developed which will bring those interested in cultural events to Israel for one month to three months. The following ideas should be explored:

   a) Music Festivals -- A series of concerts should be developed so that Americans can spend a month in Israel attending concerts in Jerusalem, Tel Aviv, etc.

   b) Music Center -- The developemnt of a music training center, similar to Interlachen in Michigan. Students from all over the world would come to Israel for a course of study in music.

   c) Dance Center -- A school of dance in Israel should be established.

   d) Drama Festivals -- Many Americans attend the Shakespeare Festival in Canada. A similar program should be considered for Israel.

   e) Drama School -- A Julliard type of school should be established in Israel.

   f) Aspen Type Institute -- A center similar to Aspen Institute should be created in Israel.

2) Sports & Health Facilities

a) Tennis schools similar to the John Gardner Schools in the United States -- This requires employing top professional talent, both from within Israel and outside of Israel to provide the training needed. Programs similar to those provided by US tennis camps would be made available to youth wanting to spend a summer in Israel. Tennis tournaments for various age groups would be set up within Israel.

b) Golf -- A whole range of golf tournaments, instruction, etc., similar to that provided for tennis would be arranged for in Israel.

c) Health Spas -- Health spas similar to La Costa, would be created in Israel.

d) Art -- An international art exhibit would be staged twice a year in Israel.

e) Film -- An international film competition would be staged annually in Israel.

f) Photography -- An international photographic show would be staged in Israel bi-annually.

g) Campgrounds -- A number of campgrounds similar to the KOA Campgrounds in the United States could be established throughout Israel. The cost of hotels in the major cities in Israel has become very high. Many people would like to travel throughout Israel with their families and stay on campgrounds.

h) Hostels -- There is need for a number of youth hostels to be built in Israel to make it possible for more young people to spend their summer in Israel.

RECOMMENDATION #104 - ESTABLISHMENT OF A MUSEUM OF SCIENCE AND INDUSTRY IN TEL AVIV.

There are large numbers of visitors who come to Israel who would be interested in viewing the high technology products being manufactured in Israel, and which will be manufactured in the future. I recommend that consideration by given to development of a Museum of Science and Industry to be built in Israel. France has announced that in 1985 the government will open a Museum of Science and Industry in Paris. There will be 340,000 square feet of exhibition hall, libraries and laboratories, plus a planetarium.

A museum of this type in Israel will help initiate and promote Israeli high technology. This will have the final effect of increasing exports of high technology products.

WHAT CAN YOU DO TO HELP BRING THIS PLAN INTO REALITY IN 1990?

This plan calls for a massive effort on the part of Americans and Israelis interested in the goal of financial independence for Israel in 1990. We solicit your support. We urge you to write us and give us your ideas and recommendations.

If you are an American business executive, we would urge you to contact us at (414) 961-1000 to discuss ways in which you can do business with your counterparts in Israel. If you are active in Federations, UJA, Bonds, etc., we urge you to let us know how you think you can be helpful in bringing these organizations into the area of economic development for Israel -- through the private sector.

If you are an Israeli, there are numerous ways in which you can be helpful to us. We need marketing information; we need to know the names of companies that are seeking new technology or have technology to offer for licensing in the US; we need to know about companies that are seeking financial assistance -- particularly where they are in the high technology field.

Let's make this a cooperative effort, using the considerable amount of unused potential that is available both in the United States and Israel.

Contact me by calling: Elmer Winter
(414) 961-1000

Or write to me at: 5301 North Ironwood Road
Milwaukee, Wisconsin 53217
USA

In Israel contact: Shraga Tzur
22 Bar Ilan Street
Tel Aviv, ISRAEL
(03) 226612

Thank you for your support.

APPENDIX A: GOVERNMENT-OWNED COMPANIES
(Subject to Update)

Mining and quarrying:

Dead Sea Bromine Company Ltd.	Chemical production
Negev Ceramic Material Ltd.	Quarrying of ceramic materials
Negev Phosphates Ltd.	Mining & production of phosphates
Dead Sea Works Ltd.	Extraction of potash and other minerals from the Dead Sea

Manufacturing:

Elta Electronics Industries Ltd.	Development and production of electronic systems
Haifa Chemicals Ltd.	Production of potassium nitrate and phosphatic acid
Chemicals and Phosphates Ltd.	Production of fertilizers and basic chemicals
Arad Chemicals Industries Ltd.	Production of phosphatic and other basic chemicals
Electrical and Mechanical Services Ltd.	Assembly and production of pumping equipment, electrical control systems, etc.
TAMI (I.M.I.) Institute for Research Development	Research and development
Bromine Compounds Ltd.	Basic chemicals

Construction:

Mekorot Construction and Development Ltd.	Civilian construction, earthwork and dwelling

Transport and storage:

Mifalei Tovala Ltd.	Land transport
Oil Products Pipeline Ltd.	Oil transport
TESHET-Tourist Enterprises and Aviation Service	Tourist and aviation service

JEWISH AGENCY COMPANIES
(Subject to Update)

The Jewish Agency has at least a 50% interest in the following:

Manufacturing:

Yakhin Hakal Ltd.	Citrus growing canning, processing of fruits and vegetables
Yitsur Upituah	Farm contractor, vegetable dehydration and canning
Luchot Hagalil Ltd.	Manufacture of fibreboards
Mifalei Batim Tromim (M.B.T.) Ltd.	Prefabricated housing, building from concrete elements precast in its own plants

Manufacturing (continued):

Mabat Furniture Ltd.	Manufacture and sale of bedroom and kitchen furniture, wood-panelling, furnishing of absorption centers

Construction:

Diyur Laoleh Ltd.	Home building
Rassco, Ltd.	Housing, building, property, management

Services, miscellaneous:

Binyanei Hauma Ltd.	Jerusalem convention center and concert hall
Israel Land Development Ltd.	Developer of real estate and resort hotels
Real Estate Participation in Israel Ltd.	Management of residential and commercial properties

GOVERNMENT-OWNED COMPANIES
(Subject to Update)

The Government of Israel has more than half of the voting rights in the following companies:

Mining, quarrying, oil:

The Israel National Oil Company Ltd.	Oil exploration
The Oil Exploration (Investment) Ltd.	Oil exploration
Lapidoth - Israel Oil Prospectors Corp. Ltd.	Oil exploration
Naphta Israel Petroleum Corporation Ltd.	Oil exploration and gas wells
Chemicalim Leisrael Ltd.	Holding company for government organi-chemical companies

Manufacturing:

Haifa Refineries Ltd.	Petroleum refining and import-export of lubricants
Israel Shipyards Ltd.	Ship building and repair
Israel Desalination Engineering (Zarchin Process) Ltd.	Desalination research and equipment
Ashot Ashkelon Industry Ltd.	Motors and motor vehicles
Pituach, Diamonds Research and Development Company Ltd.	Research - rough diamonds

Construction:

Jerusalem Economic Corporation Ltd.	Industrial area development
Industrial Building Corp. Ltd.	Construction of industrial premises for sale and rental

Construction (continued):	
K.B.A. Townbuilders Group Ltd.	Urban development and construction
Housing and Development for Israel Ltd.	Construction of homes and commerical and communal centers
Water:	
Tahal Consulting Engineers Ltd.	Engineering planning and consultation in Israel and overseas
Transport and storage:	
El-Al Israel Airlines	International passenger and cargo aviation services
Ayalon Highway Co. Ltd.	Planning, implementation and administration of Ayalon expressway and initiation of other transportation projects in Greater Tel Aviv
Petroleum Services Ltd.	Oil storage
Tourism:	
Tourist Industry Development Corporation Ltd.	Loans and other economic aid for tourist enterprises
Insurance:	
The Israel Foreign Trade Risk Insurance Corp. Ltd.	Foreign trade risk insurance
Miscellaneous:	
Israel Oceanographic and Limnological Research Ltd.	Oceanography and limnological research

APPENDIX B: US COMPANIES DOING BUSINESS IN ISRAEL OR HAVING FACILITIES IN ISRAEL

Electronics, Computers & Instrumentation

Amer. Electronics Lab., Inc.
Astronautics Corp. of America
AVX Corporation
Babcock Electronics Corp.
Bell Telephone Lab., Inc.
Celesco Transducer Prod., Inc.
Computer Consoles, Inc.
Control Data Corporation
Designatronics, Inc.
Deutsch Electromechanical Ind.
Digital Equipment Corp.
Electro Materials Corp. of Amer.
Fibronics International, Inc.
General Dynamics Corp.
Gen. Telephone & Elec. Corp.
Gerber Scientific Inst. Co.
Grumman Corp.
HCC Industries Ltd.
High Voltage Engineering Corp.
Hughes Aircraft Co.
Information Magnetics Corp.
Intel Corporation
International Bus. Machine IBM
International Telecommunication & Teleprocessing, Inc.
Kulicke & Soffa Industries, Inc.
M/A-Com, Inc.
Mennen-Greatbatch Electronics, Inc.
Mennen Medical, Inc.
Modgraph, Inc.
Mica Corporation
Motorola, Inc.
Microwave Associates
National Semiconductor Corp.
Pentacom, Inc.
Phasecom Corporation
Raychem Corporation
Systems Engineering Lab., Inc.
Veeco Lambda Corporation
Vishay Intertechnology, Inc.
Wideband Data Corporation
Zenith Radio Corporation

Metals

American Can Company
American Heliothermal Corp.
Austin Instruments, Inc.
Chromalloy Amer. Corp.
Dixie Steel & Supply Co., Inc.
Felt Products Manufacturing
Fischer & Porter Co.
Walter Kidde & Company
LSB Industries, Inc.
Phibro Corporation
Rapid-American Corp.
Refac Technology Dev. Corp.
Roe International, Inc.
Ryerson Steel
Sciaky Bros., Inc.
Sealed Unit Parts Co., Inc.
Slant/Fin Corporation
TRW, Inc.
Welbilt Electronic Die Corp.
Worcestor Controls Corporation

Chemicals, Oil, Fine Chemicals, Pharmaceuticals & Cosmetics

Baxter Laboratories, Inc.
Bel-Art Corporation
Bio Technology General Corp.
Colgate-Palmolive Co.
Damon Corporation
Dexter Chemical Corporation
Economics Laboratory, Inc.
Energy Exploration Ltd.
Estech, Inc.
First Mississippi Corp.
Forest City Enterprises, Inc.
Gelman Sciences, Inc.
General Refractories Co.
Globe Union, Inc.
Griffin Corporation
Griffith Laboratories
ICC Industries, Inc.
International Genetic Sciences Ltd.
KEM Manufacturing Company
MacDermid, Inc.

Chemicals, etc.

Miles Laboratories, Inc.
Monsanto Company
Mundi-International Ltd.
Overseas Public Utilities & Gas
Pennwalt Corporation
Phillip Bros. Chemicals
Revlon, Inc.
Sigma Aldrich Corporation
Three H. Corporation
Witco Chemical Corporation

Finance & Insurance

Brink's, Inc.
Commercial Credit Corp.
Dun & Bradstreet, Inc.
First Pennsylvania Corp.
Frank B. Hall
Manufacturers Life Insurance Co.
Mortgage Guaranty Insurance Corp.

Textiles

Brawer Bros. Silk Co., Inc.
Glenoit Mills, Inc.
I.M.I. Associates, Inc.
Rospatch Corporation
United Merchants & Manufacturers, Inc.

Tourism, Transportation & Entertainment

Avis, Inc.
Canadian Pacific
CBS Records (Division of Columbia Broadcasting System)
Hertz Corporation
Hilton Hotels Corporation
Hyatt International Corp.
ITT Sheraton Corp. of America
Ramada Inns, Inc.
Sonesta International Hotels Corp.

Paper

Hudson Pulp & Paper Corp.
International Paper Company
Tri-Wall Containers, Inc.
Union Camp Corporation

Miscellaneous

Butler
Coca Cola Bottling Co.
The A. Epstein Companies, Inc.
Hasbro Industries, Inc.
Manpower, Inc.
Joseph E. Seagram & Sons, Inc.
United Artists
Zale Corporation

APPENDIX C: INDUSTRIAL R&D PROJECTS IN ISRAEL SUPPORTED THROUGH FOREIGN INVESTMENT

Project	Israeli Company
Jojoba Wax	Negev Jojoba
Artificial Kidney Control	Elmar
Plastic Arteries	Elmar
Automatic Taring	Popper Engineering
Fuel Saving System	Electra
Solar Drying of Fruit	Electra
Hydromechanic Transmission	Timetz
Personal Defense	Ispra
Protection for Safes	Pan Universe
Solar Heating	Electra
Digital Storage System	Tel-Data
Computer Control System	Cycon
Automatic Instrument for Field-of-vision	Shorashim
Welding Robot	Elco
Computer System for Complex Calculation	Exatek
Infra-Red Detectors	Galai Labs
Medical Laser	Rotem
Cancer Detection System	Abic
Modulator for TV	Phasecom
Computer Peripherals	Tek-Dyn
High-Powered Laser	MLI
Safe Controls	Kanaf Electronics
Opaque Materials for Tomography	Concat
Beta Lactams	Teva
Guayule Rubber	Sophisticated Products
Miniaturized Artificial Kidney	Ramot Plastics
Genetic Engineering on Plant Cells	Genetic Sciences
Hollow Fibers	Sophisticated Products
Pheromones	Sophisticated Products
Magnetohydrodynamics	Solmex
Multipurpose Robot	International Robots
Computer for Harsh Conditions	Rada
Storage Systems	Efrat
Stable Isotopes	Omega P.
Control System (CNC)	Elex
Metal Working Robot	Hal Robotics
Cell	Ampal
Robotics	Granot
Robot for Fruit Picking	Industrial Robots
Irrigation Accessories	Sophisticated Products
Controlled Hothouse	Granot
Interferons	Inter-Yeda
Bacterial Diagnostic System	Hy Labs

Project	Israeli Company
Digital Storage by P.C.M.	Telbit
Automatic Transmission	IDC
Biotechnology for Marine Animal Development	Oceanographic Inst.
Solar Energy for Steam	Luz
Industrial Robot	Sharnoa
Automatic System for Fruit Sorting	Eshet Ayalon
Waste Treatment etc.	Migal
Teaching System for Computer Languages	Lantek
CAD for Integrated Circuits	Softal
Solar-generated electrical power for homes	Solar Power Labs

The total foreign investment in these projects is about $34,000,000 during 1982-83.

The Israeli government offers matching loans to the Israeli companies to augment the foreign investment, through the Office of the Chief Scientist of the Ministry of Industry and Trade.

The projects noted above represent a good cross-section of Israeli technological expertise. Note that virtually the projects fall into one of 5 categories:

Computers and Electronics
Sophisticated Mechanical Devices
Medical and Biological Systems
Energy Sources
Agrotechnology

APPENDIX D:

THE 1983 INFORMATION INDUSTRY SWEEPSTAKES

A FORBES Special Advertising Supplement

Company Name (Company Class)*	DP Revenues 1982	DP Rank 1981	DP Revenues 1981	Growth Rate 82/81	Growth Rank 1982
1 IBM (1)	31467.6	1	25111.0	25.3	37
2 DEC (2)	4019.0	2	3586.6	12.1	67
3 Burroughs (1)	3809.5	4	2934.0	29.8	30
4 Control Data (6)	3301.1	3	3120.4	5.8	81
5 NCR (1)	2915.3	5	2838.0	2.7	87
6 Sperry (1)	2800.5	6	2781.0	.7	92
7 Hewlett-Packard (2)	2268.0	7	1875.0	21.0	44
8 Honeywell (1)	1685.0	8	1774.0	-5.0	98
9 Wang (3)	1321.5	9	1008.5	31.0	28
10 Storage Technology (7)	1030.0	10	890.9	15.6	57
11 Xerox (6)	975.0	11	872.0	11.8	68
12 General Electric (9)	850.0	14	735.0	15.6	56
13 TRW (9)	825.0	12	855.0	-3.5	96
14 Data General (2)	803.8	13	764.3	5.2	83
15 Texas Instruments (2)	746.7	15	640.0	16.7	54
16 Tandy (3)	725.0	19	460.0	57.6	10
17 ADP (9)	704.0	17	613.0	14.8	59
18 Computer Sciences (9)	683.4	16	624.7	9.4	74
19 Apple (3)	663.8	22	400.7	65.7	9
20 Electronic Data Systems (9)	555.6	18	480.6	15.6	58
21 Datapoint (7)	514.0	20	453.0	13.5	61
22 Motorola (8)	484.9	45	180.0	169.4	4
23 McDonnell Douglas (9)	476.0	26	346.5	37.4	21
24 Amdahl (1)	462.2	21	442.8	4.4	84
25 Prime (2)	435.8	24	364.8	19.5	49
26 Commodore (3)	420.0	46	176.0	138.6	6
27 National Semi (1)	387.1	28	320.0	21.0	43
28 Teletype (6)	377.6	23	368.4	2.5	88
29 Mohawk (7)	355.5	29	314.0	13.2	62
30 MAI (2)	354.2	25	349.1	1.5	90
31 Harris (7)	344.9	30	313.0	10.2	72
32 Tektronix (7)	336.2	31	308.9	8.8	76
33 Raytheon (7)	336.0	35	260.0	29.2	31
34 Tandem (2)	330.9	38	242.5	36.5	24
35 Triumph-Adler (6)	326.7	27	320.0	2.1	89
36 C. Itoh (6)	326.4	43	213.0	53.2	12
37 Computervision (5)	325.2	33	270.7	20.1	47
38 Gould-SEL (2)	325.0	32	280.0	16.1	55
39 Warner (3)	310.0	69	115.0	169.6	3
40 Racal (11)	300.0	39	240.0	25.0	40
41 Dataproducts (6)	297.6	34	270.0	10.2	71
42 Tymshare (9)	297.0	37	246.8	20.3	46
43 Perkin-Elmer (2)	267.4	40	226.6	18.0	52
44 ITT (6)	265.0	36	250.0	6.0	80
45 Boeing (9)	263.7	44	205.5	28.3	34
46 Northern Telecom (2)	237.4	41	222.0	6.9	78
47 3M (11)	223.1	42	220.0	1.4	91
48 Paradyne (7)	207.3	59	135.4	53.1	13
49 Philips (4)	203.0	57	140.0	45.0	16
50 Allied (2)	195.0	50	160.0	21.9	42
51 Telex (7)	194.7	56	142.7	36.4	25
52 Lanier (4)	194.2	49	161.0	20.6	45
53 M/A COM (8)	190.0	47	171.0	11.1	69
54 Nixdorf (2)	186.2	51	59.3	16.9	53
55 Sanders Associates (7)	181.2	48	166.2	9.0	75
56 Tandon (6)	177.1	89	70.4	151.4	5
57 Schlumberger (5)	175.0	53	148.0	18.2	50
58 Informatics (9)	170.2	52	150.3	13.2	63
59 Shared Medical (9)	165.8	61	131.6	26.0	36
60 Ampex (7)	163.0	54	147.0	10.9	70
61 CPT (4)	158.6	63	123.8	28.1	35
62 Intergraph (5)	155.6	77	91.1	70.9	8
63 General Instrument (9)	152.2	60	135.0	12.7	65
64 Sun (9)	152.0	64	121.8	24.8	41
65 United Telecom (9)	148.7	58	137.4	8.2	77
66 Planning Research (9)	146.8	65	117.2	25.3	38
67 Dysan (11)	142.8	70	104.2	37.0	23
68 Cray (1)	141.1	73	101.6	38.9	20
69 Wyly (9)	140.5	55	146.8	-4.3	97
70 Martin Marietta (9)	124.0	75	99.2	25.0	39
71 Quotron Systems (9)	120.9	78	88.1	37.2	22
72 Reynolds & Reynolds (2)	119.7	68	115.4	3.7	85
73 NBI (4)	119.5	85	76.7	55.9	11
74 Recognition Equipment (7)	119.5	62	131.5	-9.1	99
75 Bradford National (9)	115.4	71	102.0	13.2	64
76 Centronics (6)	112.7	66	115.9	-2.8	95
77 Dun & Bradstreet (9)	110.0	74	100.0	10.0	73
78 Gerber (5)	107.2	72	101.9	5.2	82
79 American Express (9)	106.0	82	81.0	30.9	29
80 Commerce Clearing House (9)	104.5	76	92.0	13.6	60
81 National Data (9)	102.7	86	71.9	42.8	18
82 MSA (9)	101.2	88	70.6	43.4	17
83 Zenith (3)	100.0	87	71.0	40.8	16
84 Televideo (6)	98.5	98	34.7	184.0	2
85 Convergent (6)	96.5	100	13.1	636.1	1
86 Modular Computer (2)	92.8	79	87.2	6.4	79
87 Verbatim (11)	91.9	90	68.6	34.1	27
88 General Automation (2)	89.6	67	115.6	-22.5	100
89 Triad (2)	89.2	84	79.1	12.7	66
90 Lear Siegler (6)	88.0	80	85.0	3.5	86
91 Floating Point (7)	86.6	95	57.9	49.6	14
92 Interactive Data (9)	81.7	81	81.1	.6	55
93 Printronix (6)	77.4	93	60.2	28.7	33
94 Comshare (9)	77.4	83	79.4	-2.5	56
95 Systems Industries (7)	75.4	91	62.9	19.9	48
96 Nashua Corp. (6)	74.8	94	58.0	29.0	32
97 Decision Data Computer (7)	74.3	97	50.1	48.3	19
98 Anacomp Inc. (9)	73.9	96	54.6	35.4	24
99 McGraw-Hill (9)	72.0	92	61.0	18.0	52
100 Cipher Data Products (6)	70.1	99	33.2	111.2	1
SUMMARY:	78244.1		65244.0	19.9	

*Company Classifications

1 Mainframes
2 Minicomputers
3 Microcomputers
4 Word Processing/Office Automation
5 CAD/CAM
6 OEM Hardware
7 End User Peripherals
8 Data Communications
9 Software and Services
10 Maintenance
11 Other (primarily media)

APPENDIX E: PROSPECTS FOR JOINT RESEARCH IN ISRAEL

1980

GLOSSARY

Sales 1980: Includes all sales and other operating revenues.
Sales percent change from 1979: Change in sales from 1979, restated, to 1980.
Sales percent annual change: Average annual change in sales, as restated, over the last five years.*
Profits 1980: Net income before extraordinary items or discontinued operations.
Profits percent annual change: Average annual change in net income before extraordinary items or discontinued operations, as restated, over the last five years.*
R&D expenses 1980: Dollars spent on company-sponsored research and development for the year, as reported to the Securities & Exchange Commission on Form 10-K. Excludes any expenditures for R&D performed under contract to others, such as U.S. government agencies.
R&D percent change from 1979: Change in R&D expenses from 1979, restated, to 1980.
R&D percent of sales: R&D expenditures as percent of sales and other operating revenues.
R&D percent of profits: R&D expenditures as percent of net income before extraordinary items and discontinued operations.
R&D dollars per employee: R&D expenditures divided by the reported number of company employees.
Employment percent average annual change: Annual change in number of employees, using restated figures, over five years.*
Data are for calendar 1980 except for those companies reporting on a fiscal year other than calendar basis, in which case the annual data are for the most recent fiscal year reported as of May 30. Companies included in the survey are limited to those reporting 1980 sales of $35 million or more and R&D expenses amounting to at least $1 million or at least 1% of sales. With the exception of companies in telecommunications with significant manufacturing or research efforts, no regulated utilities or transportation companies are included in the survey.

*All rates of change are calculated using a log linear least squares method. A rate is indicated NA if the rate for the first or last year is negative or if the rates for two or more years in the series are negative.

Data: Standard & Poor's Compustat Services Inc.
NA = Not available

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYM'T
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
AEROSPACE											
Bangor Punta	759	-3.4	13.8	32	28.7	10.8	-10.0	1.4	33.9	908	NA
Boeing	9426	15.9	22.7	601	56.5	767.5	46.1	8.1	127.8	7041	10.0
Cessna Aircraft	1000	6.5	17.6	28	11.9	47.9	3.0	4.8	170.4	2658	6.0
Fairchild Industries	906	29.1	36.5	55	87.9	10.3	4.0	1.1	18.9	552	NA
Gates Learjet	351	16.3	24.0	13	9.9	9.8	-27.1	2.8	73.9	1784	17.5
General Dynamics	4743	16.8	16.8	195	20.6	118.2	19.4	2.5	60.6	1400	5.4
Grumman	1729	17.8	5.8	31	5.3	27.6	50.0	1.6	89.9	984	-0.1
Lockheed	5396	33.0	9.3	28	-9.5	87.0	1.2	1.6	315.2	1166	5.8
McDonnell Douglas	6066	14.9	13.6	145	14.4	199.0	2.6	3.3	137.6	2411	7.6
Northrop	1655	4.6	10.2	86	30.4	93.0	26.2	5.6	108.0	3079	5.9
Rockcor	53	33.5	24.7	2	34.5	1.3	24.5	2.5	58.7	1192	12.0
Sierracin	61	36.3	29.3	3	40.9	1.4	1.7	2.4	42.5	1060	NA
Thiokol	623	16.8	21.6	31	23.7	11.4	29.0	1.8	37.2	1091	NA
United Technologies	12324	36.1	24.2	393	27.1	660.3	21.1	5.4	167.9	3298	9.4
INDUSTRY COMPOSITE	45092	21.9	17.7	1642	28.7	2045.5	25.1	4.5	124.6	3026	7.5
APPLIANCES											
Dynamics Corp. of America	145	11.4	6.9	12	8.1	1.2	21.7	0.8	9.3	535	-1.0
Hoover	830	10.1	7.9	30	37.4	7.7	7.9	0.9	25.7	385	-3.0
Magic Chef	636	55.3	26.4	5	73.5	6.0	111.7	0.9	116.9	872	NA
Reece	46	-0.5	6.8	2	-2.8	3.0	43.2	6.5	134.1	2619	-0.1
Rival Mfg.	87	5.9	-8.1	7	-22.3	1.0	4.5	1.1	13.5	539	-3.5
Ronson	143	9.3	2.8	-6	NA	1.6	0.1	1.1	-27.7	560	-10.6
Singer	2787	7.3	7.1	38	-12.3	45.8	8.5	1.6	120.2	645	NA
Sunbeam	1406	6.3	10.8	49	15.6	20.9	17.1	1.5	42.7	727	2.6
Whirlpool	2243	-0.8	10.6	102	8.0	33.5	0.3	1.5	32.9	1450	0.5
Zenith Radio	1186	10.3	5.8	26	-3.5	47.8	41.4	4.0	181.1	1898	1.3
INDUSTRY COMPOSITE	9511	7.9	8.8	267	7.4	168.4	17.9	1.8	63.1	921	-0.*
AUTOMOTIVE: Cars, trucks											
American Motors	2553	-20.0	6.2	-198	NA	66.7	11.5	2.6	-33.8	2850	NA
CCI	258	9.8	20.3	10	43.7	1.6	122.1	0.6	16.8	498	NA
Chrysler	9225	-23.1	1.0	-1710	NA	278.4	-22.3	3.0	-16.3	3087	NA
Ford Motor	37086	-14.8	10.6	-1543	NA	1675.0	-2.6	4.5	-108.5	3925	1.5
General Motors	57729	-12.9	10.7	-763	NA	2224.5	14.1	3.9	-291.7	3982	2.5
International Harvester	6312	-24.8	6.8	-370	NA	255.4	17.2	4.0	-69.1	2889	-0.4
INDUSTRY COMPOSITE	113161	-15.3	9.8	-4573	NA	4501.6	4.5	4.0	-98.4	3264	2.2

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYMT
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
AUTOMOTIVE: Parts, equipment											
Bendix	3838	13.4	9.1	187	18.0	79.2	26.5	2.1	42.4	1009	-1.2
Champion Parts Rebuilders	80	-1.8	23.2	2	33.3	0.9	-5.5	1.1	46.2	413	9.1
Cummins Engine	1667	-5.9	17.8	-11	NA	42.6	3.9	2.6	-387.7	2008	3.7
Dana	2524	-8.6	19.3	96	12.9	32.3	1.9	1.3	33.7	866	NA
Donaldson	234	4.2	16.9	8	7.6	5.0	4.7	2.1	60.2	1529	7.2
Eaton	3176	-5.5	17.7	116	19.3	74.3	10.0	2.3	64.2	1476	5.0
Fruehauf	2082	-15.1	13.3	32	9.9	18.5	4.0	0.9	57.4	635	4.9
Hayes-Albion	184	-27.4	6.7	-3	NA	2.5	-7.4	1.4	-86.8	877	-3.7
Raybestos-Manhattan	274	-6.9	7.1	-6	NA	5.1	-18.0	1.9	-81.6	1082	-3.6
Sealed Power	258	-7.7	13.7	12	11.6	4.0	20.9	1.6	34.4	873	3.5
Sheller-Globe	451	-21.8	4.6	2	-38.0	5.0	-3.3	1.1	245.1	480	NA
Smith (A.O.)	894	-17.1	9.4	-2	NA	19.2	6.3	2.8	-1127.0	1958	-0.4
Standard Products	214	-1.2	14.2	-3	NA	2.4	16.3	1.1	-85.4	604	3.9
Superior Industries International	50	-44.0	15.6	-5	NA	1.4	377.1	2.7	-26.4	1309	-2.9
INDUSTRY COMPOSITE	1572[illegible]	-5.1	20.3	425	8.3	292.5	10.7	1.9	68.9	1127	9.9
BUILDING MATERIALS											
Ameron	292	2.9	8.0	13	10.9	1.5	15.1	0.5	11.7	428	-1.8
Bird & Son	313	-1.3	9.5	0	-82.4	2.3	11.7	0.7	1690.4	695	-1.2
De Soto	338	3.4	5.0	11	19.0	15.3	13.6	4.5	135.5	3921	-10.2
GAF	677	-1.0	11.7	10	-14.2	8.6	17.9	1.3	83.6	1328	NA
Guardsman Chemicals	55	7.6	13.6	1	-7.4	2.1	-3.8	3.8	322.7	3037	0.0
Ideal Basic Industries	459	5.4	12.1	53	17.2	2.1	20.8	0.5	3.9	492	1.9
Insilco	642	9.6	14.3	31	15.4	4.1	130.9	0.6	13.6	446	4.5
Intercraft Industries	116	11.4	18.2	4	6.4	1.1	-6.2	1.0	28.2	478	NA
Interpace	352	5.8	14.9	15	12.3	2.0	10.9	0.6	13.3	322	-9.2
Johns-Manville	2267	-0.4	16.6	81	19.3	30.5	-1.9	1.3	37.8	984	6.2
Lilly Industrial Coatings	90	10.0	18.2	4	31.3	1.5	12.1	1.7	40.3	1817	4.2
Masco	766	5.5	20.0	77	17.6	10.9	7.4	1.4	14.1	1211	9.0
Moore (Benjamin)	191	8.7	11.2	10	16.4	2.7	17.3	1.4	27.5	1753	NA
Owens-Corning Fiberglas	2285	1.8	22.7	54	8.1	39.5	18.0	1.7	72.7	1646	9.3
Pratt & Lambert	105	7.9	8.1	3	10.9	1.5	8.0	1.5	48.6	1225	-0.5
Reliance Universal	189	-0.3	14.4	5	31.0	1.0	9.4	0.5	21.5	586	2.2
Sherwin-Williams	1264	5.6	7.0	25	20.8	8.9	24.7	0.7	35.6	527	-4.6
Sikes	39	24.9	17.9	3	99.2	0.5	-29.9	1.3	17.2	739	NA
U.S. Gypsum	1474	-3.3	13.7	94	32.7	13.0	34.7	0.9	13.8	692	0.7
Valspar	137	13.0	18.8	4	27.8	3.6	33.9	2.7	90.2	2737	8.4
Walter (Jim)	1967	1.8	11.2	75	4.2	6.9	17.3	0.4	9.2	297	0.6
INDUSTRY COMPOSITE	14017	2.2	17.8	573	16.4	159.8	14.4	1.1	27.9	939	5.3
CHEMICALS											
Air Products & Chemicals	1421	15.5	14.9	116	14.5	30.2	25.9	2.1	26.1	1197	14.7
Akzona	1054	4.1	9.7	5	9.5	28.2	11.9	2.7	578.0	1772	-0.1
Allied Corp.	5519	27.4	21.4	289	18.2	105.0	49.1	1.9	36.3	2269	8.2
American Cyanamid	3454	8.4	12.7	159	3.2	141.8	14.3	4.1	89.1	3328	NA
Betz Laboratories	213	18.0	16.1	23	21.5	6.0	16.3	2.8	25.5	2840	NA
Celanese	3348	6.4	12.5	122	19.7	94.0	2.2	2.8	77.1	2866	-1.2
Church & Dwight	105	7.0	3.7	8	18.2	2.9	4.2	2.8	39.2	5138	-0.7
Crompton & Knowles	242	0.9	15.4	8	23.2	4.7	16.5	1.9	61.3	1680	3.6
Detrex Chemical Industries	76	1.0	13.4	4	30.2	0.9	17.5	1.2	23.0	1579	2.6
Dexter	535	17.1	21.1	26	19.1	16.1	18.6	3.0	62.6	2981	5.2
Diamond Shamrock	3143	33.4	20.0	201	8.5	50.0	19.4	1.6	24.8	3948	3.0
Dow Chemical	10626	14.8	16.9	805	5.9	314.0	16.7	3.0	39.0	5528	1.4
Du Pont	13652	8.6	13.8	716	23.4	484.0	16.6	3.5	67.6	3561	0.2
Essex Chemical	152	19.4	26.2	6	17.5	2.7	24.5	1.8	48.9	2828	NA
Ethyl	1741	5.0	13.3	90	10.2	34.0	17.1	2.0	37.9	2165	-1.0
Ferro	696	17.5	16.3	29	16.5	2.3	2.2	0.3	8.0	244	4.3
Fuller (H.B.)	297	14.5	17.3	10	18.7	5.4	13.2	1.8	55.1	1574	5.9
Grace (W.R.)	6101	15.2	12.6	284	20.8	45.0	6.1	0.7	15.9	491	9.4
Great Lakes Chemical	127	3.4	24.9	19	24.6	4.1	21.6	3.2	21.4	3682	19.2
Hercules	2485	6.0	12.5	114	26.8	53.5	14.5	2.2	46.9	2332	-0.1
Hunt (Philip A.) Chemical	106	2.8	15.7	4	-5.3	6.0	12.5	5.7	149.0	5486	NA
Intl. Minerals & Chemical	1790	18.4	6.2	146	-2.1	8.9	34.8	0.5	6.1	840	0.8
Koppers	1929	5.5	13.3	55	1.2	16.4	19.9	0.9	29.8	780	4.9
Lawter International	81	19.6	17.6	12	15.3	1.2	8.1	1.5	10.0	3750	9.7

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYM'T
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
Liquid Air of North America	408	10.6	11.1	29	8.6	2.2	42.5	0.5	7.4	535	7.7
Loctite	199	23.4	24.0	26	39.5	5.0	27.4	2.5	19.4	1937	14.2
Lubrizol	902	24.4	16.9	112	19.9	27.7	22.5	3.1	24.9	6678	3.1
MacDermid	57	15.9	14.9	5	24.8	2.6	34.3	4.5	48.2	4904	NA
Monsanto	6574	6.2	12.7	149	-10.3	204.4	26.7	3.1	137.4	3306	1.0
Morton-Norwich Products	847	15.7	10.4	48	33.6	21.8	13.7	2.6	45.7	1981	-2.1
Nalco Chemical	617	6.5	15.3	72	16.3	27.7	28.5	4.5	38.4	6287	3.9
Olin	1853	4.2	8.2	34	-8.4	30.9	18.4	1.7	91.1	1471	-2.2
Pennwalt	1189	10.1	10.9	43	8.1	25.6	8.2	2.2	59.1	2006	-2.0
Petrolite	254	35.8	16.8	25	16.0	6.4	13.9	2.5	25.6	3353	NA
Products Research & Chemical	48	15.0	19.0	4	27.6	1.6	28.8	3.4	43.8	2680	NA
Reichhold Chemicals	885	1.2	16.0	16	-2.5	6.3	-1.6	0.7	39.4	1138	4.6
Rohm & Haas	1725	8.5	14.6	94	26.6	66.9	24.2	3.9	71.3	5060	-0.7
SCM	1892	7.9	8.5	54	14.1	34.2	42.5	1.8	63.5	1248	1.3
Stauffer Chemical	1695	11.1	12.0	137	6.7	44.4	20.0	2.6	32.5	3321	0.8
Stepan Chemical	158	8.6	12.6	5	4.2	5.0	17.1	3.2	92.3	6097	4.4
Sun Chemical	514	9.3	15.7	31	30.5	10.6	15.2	2.1	33.7	1738	NA
Union Carbide	9994	8.9	12.3	673	10.7	166.0	3.1	1.7	24.7	1430	1.5
Witco Chemical	1176	21.6	18.0	41	24.2	14.6	25.9	1.2	35.7	2116	NA
INDUSTRY COMPOSITE	89877	11.7	15.1	4847	11.4	2161.1	17.4	2.4	44.6	2478	3.6
CONGLOMERATES											
Avco	2150	11.3	12.2	117	38.9	17.1	5.1	0.8	14.6	632	NA
Chromalloy American	1518	-1.2	15.2	44	17.3	6.1	34.8	0.4	13.7	282	NA
Colt Industries	2166	1.2	15.1	98	13.4	25.1	21.0	1.2	25.7	803	2.4
Emhart	1803	14.6	30.4	67	19.3	38.7	4.3	2.1	57.8	1154	18.8
ITT	18530	7.4	12.3	894	8.4	504.7	15.7	2.7	56.4	1577	NA
Kidde	2539	11.2	18.8	87	16.6	25.2	34.0	1.0	28.8	475	NA
LTV	8010	0.2	15.4	128	76.7	41.0	13.6	0.5	32.1	645	NA
Lear Siegler	1423	7.2	19.2	66	29.8	15.4	10.8	1.1	23.4	640	8.7
Litton Industries	4242	3.9	5.2	291	69.2	76.0	10.4	1.8	26.1	1007	-5.1
Martin Marietta	2619	27.1	19.9	188	28.8	9.5	23.4	0.4	5.1	274	10.2
Rockwell International	6907	11.8	9.5	280	19.9	101.1	-2.7	1.5	36.1	934	-2.2
Signal	4285	1.0	16.3	152	34.5	139.4	10.6	3.3	91.5	2771	NA
TRW	4984	9.3	14.6	212	15.0	66.9	13.6	1.3	31.6	711	3.0
Teledyne	2926	8.2	11.4	344	30.6	37.5	9.7	1.3	10.9	785	NA
Textron	3377	9.1	9.6	169	11.0	92.5	-1.7	2.7	54.6	1516	-1.0
Union	196	7.2	12.7	5	12.3	1.1	9.0	0.6	21.6	288	NA
INDUSTRY COMPOSITE	67675	7.2	19.9	3143	32.3	1197.3	11.6	1.8	38.1	1141	NA
CONTAINERS											
American Can	4812	6.6	12.2	86	3.5	41.0	5.7	0.9	47.8	804	2.5
Ball	699	25.9	13.3	24	14.3	7.0	6.8	1.0	28.7	637	NA
Continental Group	5120	13.5	10.1	225	15.3	41.0	-4.2	0.8	18.2	704	-0.4
Maryland Cup	579	17.9	16.7	26	18.5	1.0	0 0	0.2	3.8	95	6.9
Owens-Illinois	3906	11.5	11.3	149	10.6	26.9	18.0	0.7	18.0	457	-2.4
INDUSTRY COMPOSITE	15115	11.3	11.4	510	11.3	116.9	4.4	0.8	22.9	617	6.0
DRUGS											
Abbott Laboratories	2038	18.6	16.6	214	25.0	97.6	13.7	4.8	45.5	3143	5.1
American Home Products	3799	11.7	11.1	446	12.3	101.6	12.8	2.7	22.8	2040	1.5
American Hospital Supply	2340	14.7	15.1	122	17.0	38.9	11.5	1.7	31.8	1239	4.5
American Sterilizer	207	20.9	8.1	10	16.7	6.0	24.1	2.9	60.8	1696	-0.8
Baxter Travenol Laboratories	1374	15.4	19.7	128	23.4	57.2	21.8	4.2	44.6	1775	6.1
Becton, Dickinson	942	16.3	14.9	65	12.9	39.2	17.7	4.2	60.5	1901	5.7
Bristol-Myers	3158	14.7	11.0	271	13.4	128.6	24.9	4.1	47.5	3674	NA
Chattem	72	15.6	16.0	3	18.9	1.2	5.7	1.7	39.0	1869	NA
Cooper Laboratories	173	5.0	15.3	21	66.1	6.4	-23.6	3.7	30.6	1869	NA
ICN Pharmaceuticals	63	-18.9	-5.2	1	NA	1.1	-26.9	1.7	127.6	1087	NA
Johnson & Johnson	4837	14.9	17.4	401	17.7	232.8	20.8	4.8	58.1	3133	7.0
Lilly (Eli)	2559	13.7	16.5	342	14.8	200.7	13.0	7.8	58.7	7142	4 1
Mallinckrodt	442	12.6	15.3	36	14.7	15.5	19.6	3.5	43.0	3225	4.5
Marion Laboratories	116	17.9	14.7	8	-5.9	10.3	25.0	8.9	122.7	5800	NA
Merck	2734	14.7	14.5	415	13.0	233.9	24.4	8.6	56.3	7402	4 0
Pfizer	3029	10.3	12.8	255	13.0	159.9	16.1	5.3	62.8	3881	0.7

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYM'T
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
Richardson-Vicks	1212	11.1	13.1	84	12.3	51.6	14.2	4.3	61.3	3439	0.3
Robins (A.H.)	432	11.9	12.1	25	3.4	27.0	31.7	6.3	106.1	4827	NA
Rorer Group	312	16.6	15.5	32	12.7	11.0	39.9	3.5	34.1	2449	NA
Schering-Plough	1740	21.4	17.2	239	11.8	90.0	20.3	5.2	37.6	3285	12.3
Searle (G.D.)	1082	20.4	14.3	94	6.5	71.3	19.7	6.6	75.5	3915	NA
Smithkline	1772	22.7	26.5	308	44.6	135.8	31.6	7.7	44.1	6408	9.1
Squibb	1676	15.4	13.1	123	4.8	77.3	12.7	4.6	62.8	2861	3.5
Sterling Drug	1701	13.4	10.7	123	9.6	58.1	18.8	3.4	47.1	2238	-0.7
Syntex	580	23.1	18.9	75	13.9	54.4	29.3	9.4	72.4	5977	9.5
Upjohn	1761	16.7	14.4	170	22.1	147.3	13.9	8.4	86.5	6700	4.7
Warner-Lambert	3479	8.1	10.3	193	0.5	102.9	10.0	3.0	53.4	1838	NA
INDUSTRY COMPOSITE	43629	14.4	14.7	4206	15.0	2157.5	18.5	4.9	51.3	3466	4.9
ELECTRICAL											
Acme Electric	50	15.2	14.6	3	25.2	2.9	12.2	5.9	104.0	2780	6.0
Ametek	400	1.9	13.5	22	12.6	8.1	3.8	2.0	37.4	1209	5.7
AMP	1155	14.0	23.6	131	35.8	104.0	15.6	9.0	79.2	5576	8.5
Baldor Electric	146	4.6	22.4	9	32.0	3.1	29.2	2.1	32.9	1240	13.3
Champion Spark Plug	800	-0.8	13.2	37	-1.1	10.7	27.4	1.3	29.0	713	4.1
Duro-Test	61	6.7	6.0	4	6.1	1.3	10.6	2.1	29.1	722	-1.3
Echlin Mfg.	301	-0.9	11.1	9	4.7	2.2	24.1	0.7	25.3	418	1.4
Electronics Corp. of America	43	17.0	7.8	6	40.1	1.8	8.6	4.1	30.5	1502	4.6
Emerson Electric	3067	12.6	17.4	238	17.8	68.0	25.9	2.2	28.6	1264	7.5
Franklin Electric	156	10.8	12.9	2	-4.4	2.5	14.8	1.6	109.4	710	5.9
General Electric	24959	11.1	12.2	1514	16.4	760.0	18.8	3.0	50.2	1891	1.5
Gould	2200	5.0	22.4	72	15.1	86.2	14.1	3.9	118.9	2445	8.7
Instrument Systems	151	4.3	12.1	1	NA	2.2	144.4	1.5	313.8	733	NA
Kearney-National	61	-0.5	8.5	3	10.3	1.1	-11.6	1.8	38.4	1339	NA
Lightolier	97	12.2	9.9	3	18.9	2.8	37.0	2.9	107.3	1246	7.2
Lincoln Electric	456	5.8	9.7	32	3.4	7.5	10.3	1.6	23.4	2851	NA
McGraw-Edison	2264	70.1	35.4	50	10.6	27.4	101.5	1.2	54.4	783	30.2
R T E	207	5.3	22.4	2	1.6	1.6	-11.3	0.8	77.6	638	14.7
Square D	999	20.9	16.6	83	18.0	19.3	23.0	1.9	23.2	875	6.7
Thomas Industries	227	-2.4	18.0	11	29.4	2.8	15.7	1.2	26.2	772	4.2
Warner Elec. Brake & Clutch	152	9.9	17.2	10	23.6	3.9	22.1	2.6	37.8	1378	4.6
Westinghouse Electric	8514	14.4	8.4	403	14.8	186.0	14.8	2.2	46.2	1278	-1.7
Woodhead (Daniel)	44	3.6	17.4	3	13.4	1.0	12.4	2.4	36.3	1538	9.4
Wooward Governor	134	10.2	13.5	10	15.6	5.1	21.0	3.8	52.6	2177	3.8
INDUSTRY COMPOSITE	46645	13.0	17.3	2658	18.9	1311.6	19.0	2.8	49.3	1703	6.6
ELECTRONICS											
AEL	59	-1.8	15.3	0	NA	0.9	5.2	1.6	-527.7	669	6.4
AVX	141	54.2	39.6	8	56.8	3.3	17.3	2.3	40.5	775	24.8
Adams Russell	36	27.2	20.8	3	46.6	0.7	54.7	2.0	26.8	985	7.7
Altec	41	-5.3	7.6	0	NA	0.6	-22.4	1.5	-177.5	682	NA
American District Telegraph	375	15.6	12.5	20	7.0	6.1	17.2	1.6	30.2	686	1.8
Analog Devices	136	35.3	35.3	9	49.7	9.1	54.0	6.7	96.6	3348	26.1
Analogic	67	37.8	40.1	6	67.7	6.0	42.2	8.9	99.0	4358	NA
Andrew	89	24.4	17.3	7	19.0	4.7	5.4	5.2	65.5	2711	11.2
Avantek	58	46.3	37.4	7	58.4	4.4	35.0	7.5	62.4	3291	29.3
Aydin	103	60.4	20.4	7	41.7	1.6	52.6	1.6	22.2	1014	10.5
Bunker Ramo	468	9.7	10.2	27	39.5	8.2	26.9	1.8	30.2	874	0.7
Burndy	254	10.4	16.4	24	24.1	9.3	-5.0	3.7	38.3	2050	4.3
CTS	188	0.0	8.4	10	1.6	3.4	4.9	1.8	33.2	485	3.5
California Microwave	38	-4.9	29.1	0	-7.2	1.4	-2.3	3.6	879.1	2001	14.4
Cherry Electrical Products	88	26.3	31.1	7	44.3	1.1	51.0	1.2	14.2	482	NA
Conrac	147	7.0	14.7	5	19.5	1.9	9.2	1.3	41.5	771	-1.6
Cordis	109	17.3	24.1	3	97.1	13.4	28.6	12.3	477.5	5598	3.7
Dynascan	51	-8.7	-5.1	2	-28.2	2.2	31.7	4.3	114.4	3962	-4.3
EECO	43	22.2	19.5	2	18.0	2.6	-2.5	6.0	110.1	3397	9.0
EG&G	613	16.6	24.8	26	25.8	10.4	11.8	1.7	39.5	612	NA
Edo	97	9.5	12.3	3	18.6	3.1	26.9	3.1	120.0	1596	3.4
Electro Audio Dynamics	78	14.8	14.8	-1	NA	1.1	-10.1	1.4	-203.6	629	NA
Esquire Radio & Electronics	52	38.9	11.0	2	4.4	0.5	6.1	0.9	26.3	1324	16.7
GK Technologies	1190	4.3	34.3	70	33.0	13.9	13.0	1.2	19.8	604	NA
General Datacomm Industries	54	29.5	34.4	4	87.3	4.4	35.2	8.3	100.3	4360	25.5
Gulton Industries	156	8.6	13.6	7	28.3	2.6	1.6	1.7	39.7	730	1.2
Harris	1301	21.0	21.8	80	30.4	57.0	20.5	4.4	71.5	2365	NA
Hazeltine	134	8.5	10.0	5	21.8	6.3	39.6	4.7	130.4	2234	5.4

COMPANY	SALES			PROFITS		R&D EXPENSE				EMPLOYMENT	
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	[illegible]
High Voltage Engineering	88	11.7	16.0	4	30.1	2.4	31.2	2.7	57.5	1260	[illegible]
Intermedics	105	35.4	111.5	11	113.4	4.8	24.0	4.6	45.1	3070	53.3
Johnson (E.F.)	43	-2.7	-12.7	2	-0.6	2.9	12.5	6.8	160.5	2511	[illegible]
King Radio	97	-1.7	19.3	7	50.7	8.6	20.5	8.9	122.8	3032	[illegible]
Loral	153	17.2	23.3	12	32.7	4.8	42.7	3.1	38.5	1542	11.9
Lynch Communication System	40	-21.6	21.2	-3	NA	3.8	7.5	9.7	-147.8	4340	7.4
M/A-Com	322	42.0	32.0	25	53.1	6.7	35.5	2.1	26.9	1068	16.6
Magnetic Controls	56	39.7	28.4	4	58.8	3.8	55.3	6.9	106.0	2677	16.4
Medtronic	270	20.7	21.5	39	29.1	19.1	7.2	7.1	49.3	4255	10.7
Methode Electronics	44	13.3	15.1	1	17.1	0.6	17.5	1.4	61.3	555	7.9
Molex	122	23.9	35.3	15	44.6	6.3	29.8	5.1	42.1	2978	25.1
Monolithic Memories	77	109.5	32.6	10	85.8	4.0	90.2	5.2	41.6	1552	NA
North American Philips	2658	10.4	12.8	74	16.6	38.2	9.3	1.4	51.2	879	6.0
Nuclear Data	41	22.7	21.0	2	12.4	0.8	10.7	1.8	44.8	NA	NA
Oak Industries	386	37.1	27.1	20	79.2	9.3	29.3	2.4	46.2	812	9.7
Paradyne	76	83.2	57.9	8	132.8	6.3	114.4	8.4	76.9	3922	51.8
Pittway	308	10.5	18.8	24	10.8	2.6	31.7	0.9	11.1	562	12.0
Plantronics	98	13.2	26.6	8	20.3	8.1	5.4	8.3	101.6	4115	18.3
Quotron Systems	64	34.6	29.3	9	115.3	4.4	28.3	6.9	49.1	6338	12.2
RCA	8011	7.5	11.1	315	21.4	196.9	13.6	2.5	62.4	1480	3.3
Raychem	462	36.8	25.7	36	99.1	31.9	45.0	6.9	87.4	4064	NA
Raytheon	5002	14.9	14.9	282	27.7	129.6	13.3	2.6	45.9	1664	8.1
Regency Electronics	58	11.6	6.9	5	-0.3	2.4	40.3	4.1	46.1	1898	9.3
Sanders Associates	281	71.3	11.6	19	32.6	11.6	130.4	4.1	62.7	1789	5.5
Scientific-Atlanta	192	48.0	29.6	13	44.7	8.6	39.2	4.5	67.4	2143	NA
Sealectro	45	27.3	23.4	3	70.6	0.8	26.5	1.8	27.9	529	9.3
Sierra Research	48	21.4	24.4	2	26.2	1.0	51.6	2.1	50.0	1029	19.2
Siliconix	66	21.7	25.5	3	22.1	7.1	18.5	10.7	260.7	3279	13.8
Siltec	57	31.1	56.5	3	64.0	2.0	95.4	3.6	59.5	2421	NA
Stewart-Warner	336	-8.1	7.9	19	7.1	9.4	0.1	2.8	50.6	1239	-1.3
TIE/Communications	60	75.6	44.9	3	94.3	1.5	15.4	2.5	44.4	3750	NA
Thermo Electron	175	36.9	27.8	7	48.3	2.7	-6.4	1.5	37.3	1039	NA
Thomas & Betts	254	12.2	18.9	33	20.1	11.9	14.3	4.7	36.7	3975	7.5
Tracor	295	21.3	23.4	13	34.1	7.4	20.1	2.5	55.7	984	13.0
Unitrode	104	26.9	31.4	10	45.4	3.1	73.6	3.0	30.1	1564	13.4
Varian Associates	621	25.9	17.3	21	21.5	40.3	47.7	6.5	190.4	2879	9.5
Varo	94	21.7	10.2	7	6.0	1.8	-39.7	2.0	28.0	918	5.4
Veeco Instruments	105	21.2	29.9	11	45.6	4.2	21.7	4.0	38.9	1848	NA
Vernitron	125	36.4	23.7	7	30.6	1.9	56.7	1.5	25.8	NA	NA
Watkins-Johnson	133	4.0	14.1	7	1.8	8.4	6.2	6.3	118.5	3102	5.2
Western Gear	191	8.0	16.5	11	22.3	3.3	23.2	1.7	31.0	1043	-1.4
INDUSTRY COMPOSITE	**27929**	**13.9**	**16.1**	**1446**	**26.8**	**805.6**	**19.7**	**2.9**	**55.7**	**1584**	**6.5**
FOOD & BEVERAGE											
AZL Resources	132	39.8	8.9	2	NA	1.3	39.1	1.0	58.6	1085	NA
Altair	51	8.5	37.7	1	16.4	0.7	21.9	1.4	52.6	1620	NA
American Maize-Products	414	16.5	12.9	11	-5.1	1.6	38.0	0.4	14.5	492	-0.2
Amstar	1285	21.6	-4.3	31	-10.4	3.4	-5.5	0.3	10.9	421	2.2
Anderson, Clayton	1703	14.3	5.6	53	8.1	5.0	15.9	0.3	9.6	292	NA
Borden	4596	6.6	7.0	148	8.7	18.9	4.4	0.4	12.8	492	-1.4
CPC International	4120	11.4	9.3	197	12.8	35.7	5.3	0.9	18.1	881	-1.1
Campbell Soup	2561	13.9	9.7	135	9.3	22.3	18.6	0.9	16.6	587	NA
Carnation	3236	14.5	9.3	155	11.4	11.9	13.3	0.4	7.7	531	NA
Castle & Cooke	1734	11.4	19.2	32	-4.6	3.0	50.0	0.2	9.3	79	NA
Central Soya	1744	4.3	6.9	35	11.4	7.0	6.1	0.4	20.1	668	1.7
Charles River Breeding	35	17.0	18.7	4	20.1	0.6	9.8	1.6	14.8	686	4.7
Chatham	51	8.5	36.9	1	43.2	0.7	21.9	1.4	77.5	1620	NA
Consolidated Foods	5343	13.2	17.1	128	18.7	16.3	26.9	0.3	12.8	184	4.3
Coors (Adolph)	888	19.9	10.2	65	-1.1	14.3	26.8	1.6	21.9	1477	NA
Dart & Kraft	9412	6.7	10.7	383	13.6	55.0	44.0	0.6	14.4	688	0.7
DEKALB AgResearch	545	15.7	14.1	44	6.2	20.0	17.1	3.7	46.0	4355	NA
Esmark	2925	13.0	13.1	59	-3.1	11.1	-5.9	0.4	18.7	364	NA
Foremost-McKesson	3662	13.0	11.4	58	17.3	2.0	-6.7	0.1	3.4	113	1.6
General Foods	5960	8.9	10.4	256	15.4	79.1	12.5	1.3	30.9	1493	2.0
General Mills	4170	11.4	13.8	170	14.9	44.4	19.0	1.1	26.1	672	NA
Heinz (H.J.)	2925	18.4	13.1	143	16.4	13.8	14.5	0.5	9.6	285	NA
Hershey Foods	1335	15.0	19.8	62	8.4	4.5	26.2	0.3	7.3	362	11.5
Holly Sugar	201	22.0	-6.1	6	NA	1.5	3.1	0.7	25.3	497	NA

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYMT
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
Hormel (Geo. A.)	1322	-6.5	6.8	33	21.4	2.3	-11.0	0.2	7.1	287	NA
International Multifoods	1012	16.6	4.9	26	10.9	2.1	18.0	0.2	8.1	243	2.8
Kellogg	2151	16.5	9.9	185	10.2	10.1	17.4	0.5	5.5	475	1.8
McCormick	548	19.9	16.2	15	9.3	2.6	37.7	0.5	17.8	446	5.0
Nabisco	2569	8.8	6.2	128	12.2	13.2	18.3	0.5	10.3	356	-5.5
Norton Simon	3013	9.3	13.9	125	9.8	8.6	11.1	0.3	6.9	194	NA
Pillsbury	3032	40.0	16.5	105	18.8	19.4	12.1	0.6	18.5	235	NA
Pioneer Hi-Bred International	406	23.9	21.5	57	14.3	12.5	23.8	3.1	21.8	5960	6.1
Quaker Oats	2405	22.3	11.1	96	22.7	23.0	16.8	1.0	23.9	732	NA
Ralston Purina	4886	6.2	9.5	163	7.8	25.0	1.6	0.5	15.3	358	NA
Schlitz (Joseph) Brewing	897	0.3	-1.4	27	-10.4	1.7	0.0	0.2	6.3	279	NA
Shaklee	411	30.9	29.2	12	31.7	5.0	52.8	1.2	41.8	4203	13.4
Staley (A.E.) Mfg.	1656	26.3	18.9	74	0.1	7.0	32.1	0.4	9.5	1614	2.5
Standard Brands	3018	15.5	11.5	104	9.1	10.5	20.7	0.3	10.1	434	3.3
Universal Foods	379	12.0	13.8	11	6.8	3.7	15.6	1.0	34.8	1014	6.7
INDUSTRY COMPOSITE	**86732**	**12.3**	**14.8**	**3337**	**14.3**	**520.6**	**16.4**	**0.6**	**15.6**	**530**	**NA**
FUEL											
Agway	2659	29.7	14.2	34	12.5	2.3	7.1	0.1	6.7	225	NA
Ashland Oil	8118	25.4	16.6	205	23.1	14.2	24.8	0.2	6.9	576	-0.5
Atlantic Richfield	23744	44.8	24.5	1651	33.1	138.3	61.2	0.6	8.4	2590	NA
Conoco	18326	44.5	18.9	1026	24.4	55.3	52.5	0.3	5.4	1333	-1.5
Exxon	103143	29.8	17.5	5650	17.9	489.0	28.3	0.5	8.7	2763	6.4
Farmland Industries	4745	22.9	11.8	21	NA	3.2	2.1	0.1	15.1	320	NA
Kerr-McGee	3478	29.6	12.8	182	6.5	8.8	46.7	0.3	4.8	780	0.8
Marathon Oil	8180	22.4	22.9	379	20.9	16.8	15.9	0.2	4.4	1102	4.4
Mobil	59510	32.0	21.5	2813	32.2	143.0	24.3	0.2	5.1	672	1.9
Occidental Petroleum	12476	30.6	18.4	711	26.6	63.5	36.6	0.5	8.9	1828	1.2
Phillips Petroleum	13377	40.8	20.2	1070	27.2	84.3	19.8	0.6	7.9	2601	1.8
Shell Oil	19830	37.4	18.3	1542	21.4	155.0	15.7	0.8	10.1	4235	2.9
Standard Oil (Calif.)	40479	35.2	18.0	2401	25.1	132.5	23.7	0.3	5.5	3295	0.7
Standard Oil (Ind.)	26133	40.4	20.0	1915	18.7	108.3	16.0	0.4	5.7	1921	3.8
Standard Oil (Ohio)	11023	39.3	36.1	1811	80.6	24.5	35.6	0.2	1.4	1068	2.3
Sun Co	12945	21.4	23.9	723	23.2	36.0	2.9	0.3	5.0	738	NA
Tosco	2387	24.2	18.3	46	70.9	6.2	121.5	0.3	13.6	2045	9.6
Union Oil Co. of California	9984	31.9	16.3	647	22.6	25.3	18.2	0.3	3.9	1406	1.9
INDUSTRY COMPOSITE	**380536**	**33.2**	**22.7**	**22828**	**27.2**	**1506.5**	**27.3**	**0.4**	**6.6**	**1774**	**6.7**
INFORMATION PROCESSING: Computers											
Amdahl	394	23.2	37.6	15	-0.1	62.5	49.2	15.8	410.4	15534	NA
Apple Computer	117	144.7	NA	12	NA	7.3	102.2	6.2	62.3	7774	NA
Burroughs	2857	2.6	12.1	82	-5.1	193.8	14.4	6.8	236.4	3382	2.8
Computer Automation	81	27.8	30.2	5	28.1	7.6	9.1	9.4	165.3	5683	32.1
Control Data	2766	23.0	18.3	148	34.1	182.8	22.4	6.6	123.7	3733	10.1
Cray Research	61	42.2	197.0	11	126.8	8.8	47.7	14.5	80.9	11591	71.8
Data General	654	28.9	41.0	55	33.0	65.6	29.7	10.0	120.0	4568	31.0
Digital Equipment	2368	31.3	34.8	250	38.5	186.4	34.8	7.9	74.6	3389	22.6
Electronic Associates	44	12.9	10.3	2	54.4	1.1	29.1	2.5	61.7	1260	-1.8
Floating Point Systems	42	43.4	120.5	4	67.0	4.6	16.0	10.9	108.6	5648	NA
General Automation	126	8.8	17.6	-15	NA	8.5	6.1	6.7	-56.2	4141	NA
Hewlett-Packard	3099	31.3	26.4	269	27.3	272.0	33.3	8.8	101.1	4772	14.9
Honeywell	4925	17.0	17.3	281	30.3	295.4	25.9	6.0	105.2	3039	8.3
Intl. Business Machines	26213	14.7	12.6	3562	11.2	1520.0	11.8	5.8	42.7	4454	NA
Management Assistance	304	14.9	26.4	14	21.2	10.7	61.1	3.5	76.2	2039	NA
Modular Computer Systems	81	12.9	19.2	4	-0.7	6.8	23.6	8.4	179.6	4619	9.8
NCR	3322	10.6	10.9	255	41.3	201.0	17.5	6.1	78.9	2956	1.7
Prime Computer	268	75.0	88.1	31	132.0	20.4	69.0	7.6	65.3	5084	73.8
Sperry	5427	13.4	12.7	313	20.5	336.5	20.3	6.2	107.5	3638	NA
Tandem Computers	109	94.7	247.4	11	284.5	8.8	88.8	8.1	82.2	6335	NA
INDUSTRY COMPOSITE	**53258**	**16.4**	**15.1**	**5307**	**15.2**	**3400.6**	**19.0**	**6.4**	**64.1**	**3979**	**9.5**
INFORMATION PROCESSING: Office equipment											
AM International	910	20.6	9.4	4	-1.0	20.6	29.0	2.3	519.7	1017	-0.4
Barry Wright	124	25.9	22.1	10	39.9	2.3	51.4	1.8	22.5	1113	12.6
CPT	59	75.4	49.4	6	55.5	2.0	74.6	3.4	32.3	2815	37.9
Diebold	347	13.7	14.2	21	28.7	3.8	13.1	1.1	18.0	648	3.5

COMPANY	SALES			PROFITS		R&D EXPENSE					EMPLOYMT
	1980 millions of dollars	Percent change from 1979	Percent annual change (1976-80)	1980 millions of dollars	Percent annual change (1976-80)	1980 millions of dollars	Percent change from 1979	Percent of sales	Percent of profits	Dollars per employee	Percent annual change (1976-80)
Hormel (Geo. A.)	1322	-6.5	6.8	33	21.4	2.3	-11.0	0.2	7.1	287	NA
International Multifoods	1012	16.6	4.9	26	10.9	2.1	18.0	0.2	8.1	243	2.8
Kellogg	2151	16.5	9.9	185	10.2	10.1	17.4	0.5	5.5	475	1.8
McCormick	548	19.9	16.2	15	9.3	2.6	37.7	0.5	17.8	446	5.0
Nabisco	2569	8.8	6.2	128	12.2	13.2	18.3	0.5	10.3	356	-5.5
Norton Simon	3013	9.3	13.9	125	9.8	8.6	11.1	0.3	6.9	194	NA
Pillsbury	3032	40.0	16.5	105	18.8	19.4	12.1	0.6	18.5	235	NA
Pioneer Hi-Bred International	406	23.9	21.5	57	14.3	12.5	23.8	3.1	21.8	5960	6.1
Quaker Oats	2405	22.3	11.1	96	22.7	23.0	16.8	1.0	23.9	732	NA
Ralston Purina	4886	6.2	9.5	163	7.8	25.0	1.6	0.5	15.3	358	NA
Schlitz (Joseph) Brewing	897	0.3	-1.4	27	-10.4	1.7	0.0	0.2	6.3	279	NA
Shaklee	411	30.9	29.2	12	31.7	5.0	52.8	1.2	41.8	4203	13.4
Staley (A.E.) Mfg.	1656	26.3	18.9	74	0.1	7.0	32.1	0.4	9.5	1614	2.5
Standard Brands	3018	15.5	11.5	104	9.1	10.5	20.7	0.3	10.1	434	3.3
Universal Foods	379	12.0	13.8	11	6.8	3.7	15.6	1.0	34.8	1014	6.7
INDUSTRY COMPOSITE	**86732**	**12.3**	**14.8**	**3337**	**14.3**	**520.6**	**16.4**	**0.6**	**15.6**	**530**	**NA**
FUEL											
Agway	2659	29.7	14.2	34	12.5	2.3	7.1	0.1	6.7	225	NA
Ashland Oil	8118	25.4	16.6	205	23.1	14.2	24.8	0.2	6.9	576	-0.5
Atlantic Richfield	23744	44.8	24.5	1651	33.1	138.3	61.2	0.6	8.4	2590	NA
Conoco	18326	44.5	18.9	1026	24.4	55.3	52.5	0.3	5.4	1333	-1.5
Exxon	103143	29.8	17.5	5650	17.9	489.0	28.3	0.5	8.7	2763	6.4
Farmland Industries	4745	22.9	11.8	21	NA	3.2	2.1	0.1	15.1	320	NA
Kerr-McGee	3478	29.6	12.8	182	6.5	8.8	46.7	0.3	4.8	780	0.8
Marathon Oil	8180	22.4	22.9	379	20.9	16.8	15.9	0.2	4.4	1102	4.4
Mobil	59510	32.0	21.5	2813	32.2	143.0	24.3	0.2	5.1	672	1.9
Occidental Petroleum	12476	30.6	18.4	711	26.6	63.5	36.6	0.5	8.9	1828	1.2
Phillips Petroleum	13377	40.8	20.2	1070	27.2	84.3	19.8	0.6	7.9	2601	1.8
Shell Oil	19830	37.4	18.3	1542	21.4	155.0	15.7	0.8	10.1	4235	2.9
Standard Oil (Calif.)	40479	35.2	18.0	2401	25.1	132.5	23.7	0.3	5.5	3295	0.7
Standard Oil (Ind.)	26133	40.4	20.0	1915	18.7	108.3	16.0	0.4	5.7	1921	3.8
Standard Oil (Ohio)	11023	39.3	36.1	1811	80.6	24.5	35.6	0.2	1.4	1068	2.3
Sun Co	12945	21.4	23.9	723	23.2	36.0	2.9	0.3	5.0	738	NA
Tosco	2387	24.2	18.3	46	70.9	6.2	121.5	0.3	13.6	2045	9.6
Union Oil Co. of California	9984	31.9	16.3	647	22.6	25.3	18.2	0.3	3.9	1406	1.9
INDUSTRY COMPOSITE	**380536**	**33.2**	**22.7**	**22828**	**27.2**	**1506.5**	**27.3**	**0.4**	**6.6**	**1774**	**8.7**
INFORMATION PROCESSING: Computers											
Amdahl	394	23.2	37.6	15	-0.1	62.5	49.2	15.8	410.4	15534	NA
Apple Computer	117	144.7	NA	12	NA	7.3	102.2	6.2	62.3	7774	NA
Burroughs	2857	2.6	12.1	82	-5.1	193.8	14.4	6.8	236.4	3382	2.8
Computer Automation	81	27.8	30.2	5	28.1	7.6	9.1	9.4	165.3	5683	32.1
Control Data	2766	23.0	18.3	148	34.1	182.8	22.4	6.6	123.7	3733	10.1
Cray Research	61	42.2	197.0	11	126.8	8.8	47.7	14.5	80.9	11591	71.8
Data General	654	28.9	41.0	55	33.0	65.6	29.7	10.0	120.0	4568	31.0
Digital Equipment	2368	31.3	34.8	250	38.5	186.4	34.8	7.9	74.6	3389	22.6
Electronic Associates	44	12.9	10.3	2	54.4	1.1	29.1	2.5	61.7	1260	-1.8
Floating Point Systems	42	43.4	120.5	4	67.0	4.6	16.0	10.9	108.6	5648	NA
General Automation	126	8.8	17.6	-15	NA	8.5	6.1	6.7	-56.2	4141	NA
Hewlett-Packard	3099	31.3	26.4	269	27.3	272.0	33.3	8.8	101.1	4772	14.9
Honeywell	4925	17.0	17.3	281	30.3	295.4	25.9	6.0	105.2	3039	8.3
Intl. Business Machines	26213	14.7	12.6	3562	11.2	1520.0	11.8	5.8	42.7	4454	NA
Management Assistance	304	14.9	26.4	14	21.2	10.7	61.1	3.5	76.2	2039	NA
Modular Computer Systems	81	12.9	19.2	4	-0.7	6.8	23.6	8.4	179.6	4619	9.8
NCR	3322	10.6	10.9	255	41.3	201.0	17.5	6.1	78.9	2956	1.7
Prime Computer	268	75.0	88.1	31	132.0	20.4	69.0	7.6	65.3	5084	73.8
Sperry	5427	13.4	12.7	313	20.5	336.5	20.3	6.2	107.5	3638	NA
Tandem Computers	109	94.7	247.4	11	284.5	8.8	88.8	8.1	82.2	6335	NA
INDUSTRY COMPOSITE	**53258**	**16.4**	**15.1**	**5307**	**15.2**	**3400.6**	**19.0**	**6.4**	**64.1**	**3979**	**9.6**
INFORMATION PROCESSING: Office equipment											
AM International	910	20.6	9.4	4	-1.0	20.6	29.0	2.3	519.7	1017	-0.4
Barry Wright	124	25.9	22.1	10	39.9	2.3	51.4	1.8	22.5	1113	12.6
CPT	59	75.4	49.4	6	55.5	2.0	74.6	3.4	32.3	2815	37.9
Diebold	347	13.7	14.2	21	28.7	3.8	13.1	1.1	18.0	648	3.5

APPENDIX F: R&D PROJECTS FINANCED BY THE CHIEF SCIENTIST OF ISRAEL

Project	Description	Israeli Firm	Foreign Participant
THF	Development of Thymus Hormone as anti-cancer adjunct	Miles-Yeda	German and US firms invented $2,000,000
Interferon	Development of wide-spectrum pharmaceutical with anti-viral and anti-cancer properties	Interyeda	Italian and British firms invested $500,000
Jojoba	Growing and utilization of Jojoba plant for industrial and medicinal uses	Negev Jojoba Co.	American group invested $400,000
Shrimps	Genetic improvement of prawns for mass production from larvae	Aquaprotec	American group invested $400,000 and large American firm is negotiating for joint project
Algae	Production of glycerol and carotene from salt water algae	Koor Foods	European chemical company is participating
Pheromones	Development of sex attractants as a means of insect control	Dexter Chemicals	Joint project with multinational chemical company
Genetic Engineering	Development of bacterial and yeast strains for pharmaceutical and chemical products	Biotechnology General	Joint venture with U.S. company
Heart Monitor	Development of protable computerized miniature cardiac monitors for ambulatory and hospitalized patients and for feotal heartbeat	C O M	British company invested $2,500,000
Automotive Transmission	Development of computerized flywheel transmission for energy saving in both conventional and electric vehicles	I D C	Large US firm invested $1,500,000
Steam from Solar Energy	Commercial steam supply from concentrating solar collectors	I H P	$1,000,000 invested by US group
High powered laser	Development of 8-10KW laser for metal working industries	Laser Industries	American company set up joint venture and is negotiating $3,000,000 investment.

Project	Description	Israeli Firm	Foreign Participant
Talk Doubler	Telephone line system for doubling capacity	E C I	Joint project with large US firm
Materials Handling	Novel system for handling particulate products based on low energy vibration	Popper Engineering	Joint project with large US Firm
Controls for Artificial Kidney	Development of electronic control system for kidney machines	Elbit	US group invested $500,00(
Solar Heating of Swimming Pools	Solar collectors and control systems for swimming pools	Electra	US group invested $500,00(
Fingerprint Identification	Security system for factories based on instant fingerprint identification	El-De	Joint projects with large European company
Aluminum Recovery	Non-electrolytic production of aluminum from local materials	Ramot	Joint project with large US firm

In addition there are projects with the support of a World Bank loan totalling $5,000,000 over a five year period:

Project	Israeli Company
Solar Ponds	Solmat
Tomographic Scanner	Elscint
Rural Telephone Exchange	Tadiran
Industrial Infrastructure in Negev	Applied R&D Institute at Ben Gurion University