

ISRAEL HIGH-TECH REPORT

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JOSEPH MORGENSTERN, EDITOR

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From the Editor

Space & Missile Achievements Also More Export Dollars

Two recent notices in the world press, which have been officially denied here, are focussing international attention on Israel's growing sophistication in the development of advanced satellite and missile systems. One item, published in England about the imminent launching of the Ofek II satellite, has been denied by Israel Aircraft Industries. Israel's first satellite, Ofek I, was launched on September 19, 1988, and orbited the earth every 90 minutes. A rocket launcher developed by Rafael, Israel's Armament Development Authority, lofted the 156 kilogram unit into space where it was expected to remain for about a month. It remained in orbit for six months, earning the country a noted place in the very limited ranks of satellite launching nations. Until Ofek I, the list included only the USA, USSR, Japan, Great Britain, China and France. Despite the denial, few doubt that Ofek II will be launched in the not-too-distant future. As Israel's satellite program advances numerous commercial and technological opportunities will open up. Among other functions, satellites serve as relay stations for global telephone and television transmissions, covert intelligence gathering, remote sensing of the earth and environment, meteorological analysis, and as platforms for orbital telescopes. Another item, reported by TASS, the Soviet news agency, and also denied, concerned an Israeli ballistic missile launching, which the Soviet Ministry of Defense had tracked for a distance of 1,300 kilometers in the Mediterranean Sea. The U.S.S.R. has been increasingly sensitive to ballistic missile launchings since 1988, when the Iraqi regime demonstrated a SCUD missile capacity that could strike into Russian territory. The USA also acknowledged

tracking the Israeli missile. Considering the sharp curtailment in Defense spending that has taken place in Israel over the last two years, the satellite and missile stories highlight a changing pattern. Although there appeared to be a threat to the country's defense capability when the cutbacks occurred, Chief of Staff Dan Shomron accepted them, advocating a policy of streamlining for the sake of efficiency. Shomron also strongly pushed for increasing integration of high technology in defense weaponry. The application of high technology in defense products is simultaneously having a major impact on the defense industry's export capabilities. Rafael, for example, is undertaking a \$140 million export contract with the USA for supplying sophisticated weapons systems. Israel Aircraft Industries has obtained a US defense contract worth \$40 million for developing prototypes of drones for the US armed forces. The drones, or Remotely Piloted Vehicles, utilize numerous home-grown technologies such as optics and infrared sensing which give the RPV its unique qualities. If the drone program is approved by the US Dept. of Defense the next order may be as high as \$700 million. Earnings in export dollars from defense sales also encourage a trend for seeking non-defense applications and additional markets abroad. In the case of drones, for example,

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industrial surveillance and geological surveying are two of many commercial applications that can be exploited.

Recent Developments

Joint Ventures, Contracts, Corporate News and New Products:

Small Profit for IAI:

Moshe Keret, Managing Director of Israel Aircraft Industries (IAI), called for an efficiency campaign to increase profits. He was responding to the relatively scanty profits. The unaudited net profit was \$2 million sales turnover of over half a billion dollars.

Order for Servo from General Dynamics:

Servo Hydraulics Lod (SHL), a subsidiary of Israel Aircraft Industries (IAI), has signed a contract with General Dynamics to manufacturer flight control activators for 200 F-16...

New Testament Scanned:

The Computech software house in Maale Adumim has completed a project, received through the Vatican's representatives in Cyprus, for the Vatican's publication institute. The two-week project involved using an optic reader to scan the new Testament so that it could be electronically typeset. The scanner photographed each page, translated it into computer language and stored it in the computer's memory. The software then processes the computer characters into ASCII characters while retaining the form of the original page. The computer does all this without intervention by a human operator. Benny Erez, Managing Director of Computech, says that the software is not dependent on language or on the direction in which the text is written. A graphic wordprocessor developed by the company enables processing of the ASCII file with all typefaces, including texts with vowel symbols.

Exports Up:

In the first seven months of 1989 electronics exports totalled \$1.028 billion, an 11.6% increase over the same period last year. While exports of defense products remained stable, there was a 25% increase in non-military exports during the first seven months of the year. Mordechai Avior, director of the Metals and

Electronics division of the Ministry of Industry and Trade, notes that the importance of non-military electronics exports has grown significantly over the last few years and is expected to reach 60% of all electronics exports. Growing demand for products developed in Israel is particularly apparent.

Opal Closes Deal in Japan:

Opal, a subsidiary of Nes Ziona based Optrotech, announce that they have reached an exclusive agreement with Innotech of Tokyo for marketing their products in Japan. Opal manufactures automatic control systems for the semi-conductor industry, using advanced electro-optic technology. Opal managers believe that the agreement will open the doors to the Japanese market for the Israeli systems.

Record Revenues at Rada:

Financial results for the first half of 1989 have been published by Rada Electronic Industries. Revenues totaled \$10.4 million, up 37% from the same period in 1988. Net after tax profits rose 38% to \$680,000. According to President Haim Nissenson, the growth in sales and profits was due mainly to the industrial division, consisting of Rada (Israel) and Tasco Electronic Services, a majority-owned subsidiary, located in Anaheim, California. During the first half of 1989, Rada's major development efforts were devoted to an avionic computer for the F-16. In June, Rada and Tasco obtained purchase orders in the amount of \$7.6 million from General Dynamics and the Israeli Ministry of Defense for avionic computers for the F-16 aircraft, which will be sold to the Israeli Air Force.

Chips for Digital:

Digital has taken the wraps off its "Center for VLSI Development" in Jerusalem; three years after its establishment. This project is an extension of the engineering and development division of Digital International, centered in Hudson, Massachusetts. The division has similar projects in the U.S., but the only foreign projects it has set up are in Israel and Japan. The company has invested \$10 million till now in the Jerusalem plant, all self-financed. General Manager Avraham Menachem states that the communications

component and the control component. The first two chips to be developed at the plant, are now intended for all models of all Digital computers. The plant now employs 50 workers. Most of the employees are computer engineers, electronics engineers, software engineers and assemblers of integrated circuits.

Defense Industry Exports Up:

In the past two years, the major defense industries have increased exports. In 1988, defense industries sold products and services abroad totalling \$1.4 billion. Signed contracts totalled \$3.3 billion in 1988. Projects sales for 1989 are \$1.6 billion. Contracts to be signed in 1989 amount to \$1.5 billion. According to a senior defense official, the orders backlog the defense industries work for a period of two and a half years. Export to the U.S. amounts to \$500 million. Indirect purchase contracts signed between the Ministry of Defense and American companies have been on the increase.

Portable Medical Monitor:

A new instrument which analyzes metabolic processes has been introduced to the market recently. Manufactured by Frantz Tech Ltd., the Israeli subsidiary of Frantz Medical Development of the U.S.A.

Hepatitis B Vaccine Moves From Weizmann Institute to Biotechnology General

Clinical testing of an approved Hepatitis B vaccine is expected to begin within a few months. The relatively inexpensive product is a spinoff of the Institute's basic research into the molecular biology of viruses, and it also helps lower the incidents of liver cancer.

A Hepatitis B vaccine more closely resembling the liver virus and of greater potency than currently available inoculations, has been invented by a researcher at the Weizmann Institute and is now under development for human use at Biotechnology General (Israel) Ltd. (BTG), Nes Ziona, Israel. The product is of particular promise for populations in Africa and Asia, where an estimated 150 million people have contracted the viral disease

and where individuals who survive its acute inflammatory stage may later develop primary hepatocellular carcinoma.

This liver malignancy, which is clearly linked to hepatitis B infection, while rare in the West, is the world's second or third most common form of cancer. Individuals protected against the virus are extremely unlikely to contract that usually fatal hepatocarcinoma. Following advanced development and production scale-up at Bio Technology General (Israel) Ltd., a genetic engineering firm neighboring the Weizmann Institute's Rehovot campus, clinical testing of the vaccine by the company is expected to begin within months.

According to vaccine-inventor Dr. Yosef Shaul (Dept. of Virology), the new product is a spinoff of his basic studies of the hepatitis B virus. In one aspect of this work, Dr. Shaul introduced a genetic fragment of the hepatitis carriers. Realizing that this particle as derived from blood natural particle. Only the major, least immunogenic material remains. The new vaccine, which is produced under much milder conditions, contains the intact particle and elicits a 20 to 100 times stronger immune system response in laboratory animals. More-over, blood processing is expensive, resulting in a vaccine with a price tag of roughly \$100-120 for the required series of three injections. This expense is a major problem with regard to mass inoculation of residents of the epidemic areas where hepatitis B is rampant.

Israeli Companies on Wall Street

Elron Electronics Industries: Consolidated revenues for the three and six month period were \$38.7 million and \$75.3 million, respectively, as compared with \$38.1 million and \$81.6 million in the same periods last year. Consolidated revenues represent primarily revenues of Elbit Computers Ltd., the Company's 57.1% subsidiary, and do not include sales of affiliates whose results are shown only on equity

Israel High Tech Shares Traded In The United States
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Company	Revs. (In mil.)	Net Income (In Thou.)	Share Price	Change
BIOTECH GENERAL c Biological products for health care	6,475	d6,805	n.a.	—
BTGCC:OTC				
ELBIT COMPUTERS d Defense electronics	75,041	5,705	8.875	n.c.
ELBTF:OTC				
ECI TELECOM d Telecommunications	25,297	2,291	11.250	+2.500
ECILF:OTC				
ELRON ELECTRONICS d Invests in high-tech	72,488	d0,497	6.375	+1.125
ELRNF:OTC				
ELSCINT d Medical imaging	71,000	d0,500	1.500	+0.375
ELT:NYSE				
FIBRONICS d Fiberoptics	22,224	939,000	6.500	+0.125
FBFX:OTC				
INTERPHARM LAB c Biological products for health care	18,092	505,000	3.250	n.c.
PLLF:OTC				
LASER INDUSTRIES Surgical lasers	n.a.	n.a.	3.250	+0.625
LAS:ASE				
OPTRITECH d Electro-optical systems	34,820	1,982	7.500	-0.500
OPTKF:OTC				
SCITEX d Computer graphics	107,170	13,164	11.625	+2.500
SCDF:OTC				
IIS INTELL c Computer peripherals	17,099	3,549	4.500	-0.500
ISLF:OTC				
ARYT OPTRONICS c Optical lenses	11,400	277,000	1.625	+0.125
ARYTE:OTC				

Price quotations are from the 15th of the month and the change relates to the corresponding quotation a month ago.
Selected earnings summaries for calendar quarter indicated.

a Q1-1989

b Q2-1989

c Q1-Q4-1988

d Q1+Q2-1989

basis. Aggregate revenues of all Elron subsidiaries and affiliates for the three and six month periods were approximately \$103 million and \$203 million, respectively.

Net income for the quarter under review was \$195,000 or \$0.02 per share, as compared with a net loss of \$926,000 or a loss of \$0.09 per share, in the parallel quarter of 1988. For the six months ended June 30, 1989, the company incurred a net loss of \$497,000 or a loss of \$0.04 per share, as compared with a loss of \$1.7 million, or a loss of \$0.15 per share, in the same period last year. The contribution of the publicly traded subsidiary and affiliated companies to Elron's profitability during the first six months of 1989 amounted to \$4.38 million; of which \$3.26 million were derived from Elbit, \$835 thousand from Optrotech Ltd. (42%), and \$289 thousand from Fibronics International Inc. (30%) Elron's expenses which amounted to \$4.88 million, include research and development expenses of the company's "projects in incubation", current losses in new ventures, general and administrative and finance expenses.

ECI Telecom Ltd. Announces Record Second Quarter and First Half Result:

Mair Laiser, President and Chief Executive Officer of ECI Telecom Ltd., (NASDAQ:ECILF), today announced results of operations for the second quarter and six months ended June 30, 1989:

Revenues for the second quarter increased 56% to \$12,978,000, compared with \$8,336,000 for the comparable period in 1988. Gross profits rose 69% from \$3,620,000 to \$6,106,000. Net income for the second quarter rose 126% to \$1,253,000 or \$.22 per share, compared with \$555,000 or \$.10 per share in the corresponding period last year. Weighted average number of shares for purpose of calculating earning per share was 5,041,125 in the 1988 period and 5,626,341 in the 1989 period.

Revenues for the 6 month period ended June 30, 1989 were \$25,297,000, up 60% from first half 1988 revenues of \$15,802,000. Gross profits rose 63% from \$6,810,000 to \$11,109,000. Net income for the current six months rose 118% to \$2,291,000, or \$.41 per share, compared with \$1,051,000, or \$.20 per share in the first half of 1988. Weighted average number of shares for purposes of calculating earnings per share was 5,041,125 in

the 1988 period and 5,584,740 in the 1989 period.

As previously reported, during the second quarter the company moved all of its Israeli-based activities to a newly-acquired facility in Petah Tikva, just outside of Tel Aviv. Despite the emphasis and attention devoted by the move, sales in the second quarter exceeded those of the first quarter of 1989 by 5%. Moreover the company absorbed the entire cost of the move during the quarter. Sales recorded in the second quarter are the highest in the company's history.

Bio-Technology General Corp. Announces Agreement Regarding Debt Restructuring:

Bio-Technology General Corp. (OTC) announced that it has reached an agreement with Elliott Associates, L.P., Grace Brothers, Ltd. and Wechsler and Krumholz, Inc., which own an aggregate of approximately 49.8% of the company's outstanding Notes and approximately 23.6% of the outstanding debentures, regarding their participation in the Company's proposed debt exchange offer. Under the terms of the agreement with Elliott, Grace and Wechsler, the company will offer to exchange (i) \$250 principal amount of its Series A 7.5% Senior Secured Convertible Notes due January 15, 1995 and 200 shares of Common Stock for each \$1,000 principal amount of its 5% Convertible Senior Subordinated Notes due April 15, 1997 and (ii) \$250 principal amount of its Series B 11% Senior Secured Convertible Notes due October 15, 1998 and 200 shares of common stock for each \$1,000 principal amount of its 11% Convertible Senior Subordinated Debentures due March 1, 2006. The conversion price of the new debt securities to be issued in the

ISRAEL HIGH-TECH REPORT INDEX*

66.81 UP 8.1%

*ISRAEL HIGH-TECH REPORT INDEX is a weighted index made up of the shares of 10 leading high-tech companies. Base: 100 as of 9/30/84

exchange offer will be \$1.75 per share. In addition, the company will be able to pay interest on the new debt securities in cash or common stock, and the company intends to pay interest in shares of common stock until its board of directors has determined that the company's financial condition has materially improved. The new debt securities will be secured by substantially all the assets of the company, while the existing outstanding debt securities are unsecured.

Consummation of the exchange offer is conditioned upon, among other things, at least 95% of the outstanding principal amount of each of the Notes and Debentures being exchanged, and the Noteholders consenting to certain amendments to the indenture under which the Notes were issued.

The company anticipates that it will commence the exchange offer in the next few weeks.

"Implementation of the debt exchange will substantially improve Bio-Technology General Corp.'s overall financial structure and should enhance the company's ability to attract new equity investments in the future. The exchange will also significantly reduce the Company's cash outlays connected with its debt interest obligations," stated Sim Fass, Bio-Technology General Corp.'s president.

Fibronics Announces Profitable Second Quarter and Strong First Half Operating Results:

Fibronics International Inc. (NASDAQ/NMS:FBRX)

For the three months ended June 30, 1989, revenues were \$11,102,000, as compared with revenues of \$10,419,000 for the same period in 1988. The net income for this period was \$230,000 or \$0.04 per share, as compared with net income of \$353,000 or \$0.06 per share for the equivalent period in 1988.

For the six months ended June 30, 1989, revenues were \$22,224,000, as compared with revenues of \$19,255,000 for the same period in 1988 (a 15 percent increase). The net income for six months was \$939,000 or \$0.15 per share, as compared with a net loss of \$526,000 or \$0.09 per share for the equivalent period in 1988. The second quarter results reflect increased spending to implement product and sales strategies. The increased strength of the U.S. Dollar against the British Pound and the German Mark also unfavourably impacted earnings. The company's

force of direct sales representatives has been increased by 56 percent in 1989, and sales leadership has been strengthened by addition of a Vice President-Sales and a Manager of Distributor Sales in North American Operations, and a National Sales Manager in Germany.

Elbit Announces Second Quarter Results Elbit Board Declares Dividend of 5 Cents Per Share:

Elbit Computers Ltd. (NASDAQ:ELBTF)

Israel-based manufacturer of computer-based systems and products for military and commercial applications and a subsidiary of Eilon Electronics Industries Ltd. (NASDAQ:ELRNF), today announced its unaudited financial results for the second fiscal quarter and six-month period ended June 30, 1989.

Revenues for the quarter ended June 30, 1989 were \$38,493,000, as compared with revenues of \$38,020,000 for the parallel quarter last year. Net income for the quarter was \$2,938,000, or \$0.21 per share, similar to \$2,928,000 or \$0.21 per share, for the corresponding quarter in 1988.

On a year-to date basis, sales in the six months ended June 30, 1989 totalled \$75,041,000, with net income of \$5,705,000, yielding earnings per share of \$0.41. These figures compare with revenues in the six months ended June 30, 1988 of \$81,272,000, and net income of \$5,468,000, or \$0.39 per share. Net profit margin in the six-month period under review was 7.6%, up from 6.7% in the corresponding period last year.

During the quarter under review the company signed a multi-million dollar contract with General Dynamics Corporation to supply mission computers for F-16 aircraft ordered by the Israel Air Force.

The company also announced in this quarter that its innovative electrical turret drive and stabilization system has been installed in the "Merkava Mark 3", the recently unveiled main battle tank of the Israel Defense Forces. This new system constitutes a major breakthrough in the application of advanced technologies to the heavy turrets of main battle tanks. The company's board of directors declared a second quarter dividend of 5 cents per ordinary share, payable on September 25, 1989 to shareholders of record at the close of business on September 2, 1989.

The company is examining several

possible strategic moves aimed at utilizing accumulated cash reserves as a leverage to enhance its growth. In this context, the company has recently announced that it is currently negotiating with Tadiran Ltd. regarding the acquisition from Tadiran of its 50% interest in El-Op Electro Optic Industries Ltd. ("El-Op"). El-Op is an Israeli defense electronics company primarily engaged in the field of electro-optics. El-Op's annual revenues in 1988 were in the range of \$110 million. There can be no assurance that acquisition agreement executed. Another strategic move which is still undergoing examination is the possible exchange of shares with the Company's parent company, Elron Electronic Industries Ltd., which may lead to a diversification into the civilian sector.

Optrotech Announces Second Quarter Results:

Optrotech Ltd. (NASDAQ/NMS:OPTKF) announced unaudited consolidated revenues and earnings for the quarter ending June 30, 1989.

Revenues for the three months ended June 30, 1989 were \$17,506,363 as compared with revenues of \$15,193,385 for the three months ended June 30, 1988. Net after-tax profits for the three month period ending June 30, 1989 were \$1,052,872 or \$0.20 per share, as compared with \$585,109 or \$0.11 per share for the same period in 1988, an increase of 80%.

For the six months ended June 30, 1989, Optrotech's unaudited revenues were \$34,820,166 compared with the revenues of 329,190,786 for the same period in 1988. Net income after tax for the six months ended June 30, 1989, was \$1,982,314 or \$0.28 per share, compared with net income after tax of \$1,130,316 or \$0.22 per share for the same period last year, and increase of 85%.

The company is completing these days the successful beta sits testing of a new system in its Image line at one of the major computer manufacturing plants in the United States. The new system is utilizing an innovative patented laser plotting technology which will set new performance standards in the industry. The company believes the system offers an outstanding price/ performance ratio which will strengthen Optrotech's market position and maintain its leadership in the Printed circuit Board (POB) industry.

Group Boosts Stake in Fibronics INTL to 7.8 PC:

A group of French investors raised its stake in Fibronics International Inc. to 7.5 PC of the common shares outstanding, according to an sec filing.

The stock was bought for investment purposes only, the filing said. The group said it holds 485,600 Fibronics common shares, including 66,100 shares bought from August 1 to August 11 for *6.50 to *7.375 per share.

American Companies Seek Israel's Technical Expertise in Product Development

BIRD's Associate Director, Ira Grinberg, on his return from a four week tour of eleven states reported that he met with representatives of more than 60 U.S. companies. The tour resulted in increasing expressions of interest for joint ventures under the auspices of BIRD. About 35 of Grinberg's meetings were with companies that have not yet attempted joint development of products with Israeli companies. "Most of these companies," he said, "seem to be very much aware of Israel's technical expertise in their particular areas of product development. The U.S. companies clearly see the need to

ISRAEL HIGH-TECH REPORT

NEWS AND INVESTMENT OPPORTUNITIES

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maintain a flow of new products into their pipelines in order to sustain their record of aggressive growth... Time after time, product development and possible manufacturing in Israel, coupled with U.S. marketing, is seen as a formula for success - particularly if BIRD acts as a coinvestor." BIRD, the Binational Industrial Research and Development Foundation cost-shares 50-50 with each company in U.S./ Israeli teams that seek to develop and commercialize new technological products. Over 220 projects have been initiated under this program already, leading to sales of over \$700 million.

Institutes of Higher Learning

Developments From the Institutes that Bear Watching:

Hebrew U. Operating First DNA Fingerprinting Lab in Israel

A laboratory for positive identification of people, animals or plants, according to analysis of their DNA patterns is now operating at the Hebrew University Faculty of Agriculture in Rehovot. The lab is the first of its kind in Israel. DNA fingerprinting, as the method is known, was developed in England and has been used in recent years in Europe and the U.S. Israeli researchers have improved existing techniques for plants and animals, through developing a new DNA probe with superior characteristics. No two beings have identical DNA fingerprints. Consequently, there are many uses for the DNA probe in the breeding of cattle, fowl, sheep and plants. DNA is the cellular compound responsible for transmission of hereditary characteristics and the building of proteins. Through DNA fingerprinting researchers can help determine paternity, investigate crimes involving rape and murder, and diagnose hereditary diseases. DNA patterns are increasingly accepted in British, U.S. and European courts for positive identification in criminal cases. Until now, only labs in the

U.S. and England have been carrying out the rather expensive DNA fingerprinting analysis on blood or tissue samples. The Hebrew U. researchers are developing new methodologies for use in animal and plant breeding. Work is also underway to establish commercial services for individual identification and paternity tests in humans and animals.

Koch Prize Award

The prestigious Robert Koch Prize for fundamental medical research will be given to Prof. Irun Cohen of the Weizmann Institute of Science and Prof. Alex J. van der Eb of Leiden University, at the University of Bonn on November 6, 1989. The Prize, which is awarded annually by the Robert Koch Foundation of West Germany honors the scientists for their work on autoimmunity. The two recipients have done pioneering studies on peripheral tolerance, demonstrating that autoreactive lymphocytes are part of the normal immune repertoire. They have also conducted original studies in animal models using autoreactive T-cell clones. As a result they have increased understanding of the natural and therapeutic control of autoimmune diseases.

Appointment

Prof. Ruth Arnon, Vice Pres. of the Weizmann Institute of Sciences has been elected Secretary-General of the International Union of Immunological Societies (IUIS), the largest and most influential scientific organization in the field of immunology.

Genetically-Engineered Mice at Weizmann Aid Study of Inherited Disorders, Allergic Diseases and Cancer

The Weizmann Institute's new Transgenic Mouse Research Laboratory has produced genetically tailored mice that will assist in important biomedical studies in Rehovot. The research should provide new insights into major genetic disorders, allergic diseases and cancer. The state-of-the-art laboratory produces, with the aid of genetic engineering, model strains of laboratory animals which exhibit disease patterns resembling those found in humans.