

ISRAEL HIGH-TECH REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

JOSEPH MORGENSTERN, EDITOR

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EDITORIAL

REPORTING ON SENSITIVE SCIENTIFIC DEVELOPMENTS

Israel's scientific standing and its technological developments are the pillars of the country's strength today. Scientists, engineers and technicians are involved in all areas of research and development which are vitally important to Israel, as well as to the world outside its borders.

Basic research at the institutes of higher learning is being applied to some of the major problems afflicting mankind. A drug being developed at the Weizmann Institute holds out the promise of being an effective agent in the fight against Acquired Immune Deficiency Syndrome (AIDS).

Israeli researchers have been enlisted in the Strategic Defense Initiative (SDI), aimed at protecting the Western world from ballistic attacks. One of Israel's contributions is a development aimed at establishing a protective shield against short range ballistic missiles.

A double-edged sword which can be used for healing or defense is found in Israeli developments in the field of basic and applied laser technology. Israel has pioneered in the research, development and manufacture of carbon dioxide medical lasers. These are now being used in hospitals and clinics throughout the world. Were it not for the natural conservatism of the surgical community in switching from the traditional scalpel to that of the laser, it is likely the number of Israeli-produced carbon dioxide surgical lasers would be much higher than the 1,500 units now in use worldwide.

The application of other types of lasers and for military purposes has become widespread and is clearly one of the growth areas. The linkage of lasers, optics and infrared technology, when put together, result in products which are revolutionizing military doctrine. This is also true in the fields of domestic surveillance and security applications. These systems have made it possible to see at night as clearly as in the daytime and they represent the leading edge of these technologies. Their use will become more widespread as their price tags go down.

At the Weizmann Institute, the scientific preoccupation with the basis of life, such as the study of proteins on the theoretical level, has spawned important developments in the field of biotechnology. One company, basing itself on this research, has spent nearly \$25 million on intensive research and development of healthcare products for major therapeutic market segments, including cardiovascular drugs, anti-infectives, endocrinology products and wound healing/anti-inflammatory agents. Last year, the company earned \$3.6 million worldwide from agreements with pharmaceutical and chemical companies itself.

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Circulation Offices: Israel Publications Inc. 47 Syron Place, Scarsdale, N.Y. 10583, USA.
Attention: Mr. Robert M. Bruckenthal.
Editorial Offices: Asia House, 4 Weizman Street, Tel Aviv 64239, Israel.
Tel:- 972-3-430817. Tlx: 3351: FISGR IL. Fax:- 972-3-255816.

The Israel High-Tech Report dedicates itself to reporting on as broad a spectrum as possible of Israel's developments in science and technology. Often, we are faced with the problem of understanding and reporting on developments which are shrouded in secrecy. This is very much the case when trying to obtain insights into products, systems and technologies related to the defense sector. Yet, to an extent, it is also true in non-defense and non-military developments. Israeli business people, even those involved in high-tech, are generally tight-lipped. Our sources are aware that we are pledged to maintain confidentiality. We have access to and excellent contacts in the scientific community, as well as among government officials, many on the ministerial level. Getting insight into military and defense laser applications is a time consuming process. But, eventually, the information is made available to us. In non-military areas, the reticence in discussing the products, business plans and strategies is being overcome.

As Israel moves along the road of commercialization of its scientific developments, we find that many scientists are highly reserved when discussing their work. It is either because their scientific findings have not yet been published or they have not received patent acknowledgment.

More accessible, from the point of view of reportage, are the public science-based industrial companies. By nature, though they are public companies, they are more forthcoming and maintain close contact with us. The relative ease of access to scientific and technology developments is also true of entrepreneur-led young companies. The emerging growth companies are generally ready for a limited degree of public exposure. They tend to be more ready to discuss their work and to look for publicity that could attract investors and businessmen. Some of these companies will grow into large, vital, exporting units and, in the next few years, are expected to make an entry into the international marketplace.

Material relating to defense activities, and that which may be considered sensitive to the security of the country, we must submit to the censor. This procedure has not hindered or delayed a timely and accurate presentation of our material.

We shall continue and expand our reporting on Israel's technological developments and achievements -- with a view to pinpointing those developments which offer business opportunities, whether in the form of licensing, technology transfer, direct investment, joint ventures, representation or direct trade. As Israel enters its fifth decade, this task should keep us very busy.

NEW PRODUCTS

A NEW CHEMICAL FOR THE MICROELECTRONICS INDUSTRY

MacDermid Israel Ltd. recently introduced 1024MB, a specialty electronic chemical for applications in the printed circuit board industry. The company is working on the development of a new family of positive photoresists.

*

AN IMPROVED DIGITAL HEARING AID

A hearing aid, described by the Israel-U.S. Binational Industrial Research and Development Foundation as being remarkable, was developed in Israel and is now being evaluated by a major United States company. The hearing aid is based on sophisticated digital signalling processing techniques whereby the voice is amplified while background noise is rejected.

Developed by DSP, the hearing aid employs two highly sensitive microphones which can be turned by the user towards the person whom he wishes to hear.

*

U.S. AND ISRAEL TO CO-PRODUCE POPEYE

According to the Near East Report, the United States Martin Marietta and Rafael, Israel's Armament Development

Authority, have signed an agreement to coproduce the Popeye air-to-surface missile. The Popeye was developed by Rafael and is currently being evaluated by the United States Air Force for use by the Strategic Air Command. If approved, the U.S. Air Force will spend more than \$8 million to purchase 12 Popeye systems.

Rafael has been developing and supplying high technology weapons systems for more than 30 years. It has a staff of several thousand engineers, scientists and other skilled personnel and is Israel's largest R&D organization for weapons systems.

*

VISIONICS INTRODUCES NEW INFRARED DETECTOR

Visonic Ltd. (INTR-7/87) has begun marketing a new infrared detector consisting of only one component instead of the usual two. It does not require a reflector or light source facing the detector.

Visonic is a rapidly growing firm, and is Israel's outstanding producer of safety products. Its electronics surveillance systems are gaining widespread acceptance in Israel and the company points to a growing number of export clients.

DRUG FOR TREATING AIDS

American Home Products (NYSE: AHP), a major drugs and medical products corporation, has acquired an exclusive license to develop and market AS101, "an experimental drug which holds promise for treating AIDS", according to the Wall Street Journal.

The drug was discovered by scientists at Bar Ilan University. Co-discoverer Michael Albeck, Bar Ilan University president, has revealed that the drug is currently under development by the American and National Institute of Allergy and Infectious Diseases. This agency is a leader in carrying out a greater part of the American government's program for AIDS-related clinical studies.

WEIZMANN INSTITUTE CONFERENCE

The 6th International Leadership Conference of the Weizmann Institute is being held in Rehovot from May 15-19. The conference will bring together friends of the Institute from all parts of the world. During the course of the conference, popular science lectures will be delivered by some of the best known names from the Institute including nuclear physicist Prof. Haim Harari, cell biologist Prof. Michael Feldman, artificial intelligence mathematician Prof. David Harel, Chairman of Yeda, Prof. David Mirelman and many other prominent scientists.

RPV SALES TO EXCEED \$100 MILLION IN 1988

Mazlat Ltd., the joint venture company combining technologies developed by Israel Aircraft Industries and Tadiran Ltd., could record drone sales that will exceed \$100 million in 1988. Last year, the company recorded sales of \$30 million. Mazlat has a substantial backlog of various types of drones which have been ordered by the Israel Defense Forces and other armies.

The Israeli Remotely Piloted Vehicles (RPV's) were reportedly used on the S.S. Iowa battleship during its tour of duty in the Persian Gulf.

ISRAELI GEOTHERMAL POWER PLANT DEDICATED IN SOUTH AMERICA

A 600 kw turbine built in Israel is part of a geothermal power plant recently dedicated in Argentina. The turbine is manufactured by Ormat Turbines Ltd. and generates electricity by using the heat of low pressure steam escaping from the ground.

Over the past two decades, the company had succeeded in introducing only small Ormat turbines to Argentina; so the dedication of the power plant marks a breakthrough.

FOREIGN INVESTMENT STABLE

Foreign investment in Israeli industry in 1988 is running at a rate similar to last year, when \$40 million was injected into local industries.

ISRAEL HIGH-TECH SHARES TRADED IN THE USA

	P-E Ratio	Price as of 4/15/88	Change since 3/15/88		Earnings per share	
					1986/7	1987/8
8888 OTC BIO-TECH GENERAL Biological products for health care	d	4 1/2	-2 1/8	12 Mo Sep	d 0.77	d 1.00
8288 OTC ELBIT COMPUTERS Defense electronics	8	4 3/4	+ 1/8	9 Mo Dec	0.80	0.51
8288 OTC ECI TELECOM LTD. Telecommunication Systems	d	2 7/8	- 1/4	12 Mo Dec	d 1.59	0.17
8288 OTC ELRON ELECTRONICS Company investing in high technology		3 1/2	- 3/8	9 Mo Dec	---	d 1.11
8288 NYSE ELSCINT Full range medical imaging	d	1 3/8	- 1/8	9 Mo Dec	3.10	1.23
8288 OTC FIBRONICS INT'L Fiberoptic communications	d	3 7/8	- 1/4	12 Mo Dec	d 0.34	d 0.46
8288 OTC INTERPHARM LAB. Biological products for health care	d	3	n.c.	9 Mo Sep	0.38	d 0.34
8288 ASX LASER INDUSTRIES Surgical laser systems	19	5 3/4	-2 3/8	9 Mo Dec	0.71	0.53
8288 OTC OPTROTECH Electro-optical systems for PCB	7	5 3/4	+ 1/4	12 Mo Dec	0.13	0.55
8288 OTC SCITEX Computer graphics	d	4 1/4	- 1/2	12 Mo Dec	d 3.08	d 0.42
8288 OTC I.I.S. Computer peripheral equipment	6	3 3/4	+ 1/4	9 Mo Sep	0.48	0.56
8288 OTC S.P.I SUSPENSION - PARTS INDUSTRIES Military components	7	1 3/8	n.c.	12 Mo Dec	0.33	0.03

d = deficit

LASER INDUSTRIES SALES AND EARNINGS

A strong 19% gain in net sales of \$9.8 million was reported by Laser Industries Ltd. (LAS:ASE) in the third quarter ending December 1987. Net income was down to \$425,000 or \$0.09 per share. The drop in net was partially due to the phasing out of production of the argon ophthalmic laser and was responsible for the \$0.11 loss per share.

Throughout most of 1987, the company's profitability has been affected by the weak U.S. dollar versus the Israeli shekel and European currencies.

The market for the company's surgical lasers continues to expand, and if the improvement of the U.S. dollar continues as seen in the first quarter of 1988, and Israel's inflation remains in the low teens, profitability could return to normal levels.

I.I.S. SALES AND PROFITS AT NEW HIGHS

I.I.S. Intelligent Information Systems (NASDAQ: IISLF) seems to be on its way to having another good year. The Haifa-based manufacturer of computer peripheral and communications equipment for use with medium and large IBM and IBM-compatible mainframe computer systems recorded \$13.5 million in sales for the year ending 1987, and a net income of \$2.9 million.

An increment of 25 percent in sales would bring these figures for 1988 to the order of nearly \$17 million and net earnings per share of over \$0.90. More than 25 percent of I.I.S.'s total sales were those made in the United States and the United Kingdom. I.I.S. has an extremely strong sales base in Israel.

\$5 MILLION CAPITAL INJECTION AT INTERPHARM

InterPharm Laboratories Ltd. (NASDAQ: IPLLF), received \$5 million by way of private placement. The investment was made by its parent company J.V.A. Joint Venture Associated N.V. InterPharm is part of the Ares-Sereno

group of companies with annual sales of about \$ 230 million.

Our expectations are that InterPharm will announce 1987 sales in excess of \$6 million. The company continues to expand its production and sales of native beta interferon.

InterPharm became a public company in May 1981 when it raised \$6.5 million. In addition, its R&D was financed by an early-in-its-history special R&D agreement with Israel Bio-Engineering Projects, a New York limited partnership, which provided \$10 million.

ISTEC MOVES ALONG

Istec-Industries & Technologies Ltd. (NASDAQ: ISTUF-ISTEF-ISTWF), the last Israeli company to float an issue on the U.S. capital market prior to the October 19 crash, reported sales and license fee income of \$1.1 million for 1987 and a loss of \$3.1 million.

Istec manages six high-tech projects, some of which are still at the R&D stage. With money in the corporate coffers from its IPO, Istec's CEO, Shalom Shpilman, can be expected to invest some of these proceeds in an operating business which would provide some immediate cash flow.

Istec is marketing laboratory diagnostic kits for sexually transmitted diseases, industrial refrigeration systems employing waste heat, digital signals and tropical fish.

	4/15/88	3/15/88
DJIA	2005.64	2050.07
S&P 500	259.75	266.37
NYSE INDUSTRIALS	179.12	182.05
ASE MARKET VALUE	298.94	296.94
NASDAQ INDUSTR'LS	383.43	389.21
ISRAEL HIGH-TECH REPORT INDEX*	38.81	43.00

*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

**BIO-TECHNOLOGY GENERAL
INAUGURATES KIRYAT WEIZMANN
HEADQUARTERS**

The new research and development and production headquarters of Bio-Technology General Corporation (OTC:BTGC) were inaugurated at Kiryat Weizmann, adjoining the Weizmann Institute on April 18. The inauguration took place in the presence of Mr Gad Ya'acobi, Minister of Economy and Planning, Sim Fass, BTGC's president, Uzia Galil, one of the founders, Dan Tolkowsky and United States Ambassador to Israel, Mr. Thomas Pickering.

BTGC reported that in 1987 the company had an income of \$3.6 million. The loss of \$4.5 million for the year included interest expenses of nearly \$2 million, or \$0.36 per share, of a total of \$1.00 per share loss.

Board members Richard Axel, Higgins Professor of Biochemistry and Pathology and Paul Marks, chairman of the Scientific Advisory Board told Israel High-Tech Report that the company expects comments from the FDA later this summer on its request for approval of hSOD.

**NEW ANTIBIOTIC FIGHTS PERIODONTAL
DISEASE**

Antibiotic TA, a new antibiotic discovered and tested by a team of microbiologists at Tel Aviv University, has been shown to have potential effectiveness in treatment of periodontal disease.

Produced from a strain of myxobacteria known as Myxococcus Xanthus, Antibiotic TA -- unlike other antibiotics -- binds tightly to a variety of tissues and retains its activity while in the bound form. It is this adhesive quality that makes it attractive in the treatment of periodontal disease. Early testing showed marked improvement in indices of gingivitis, plaque and bleeding. Antibiotic TA has been patented in the U.S., the U.K., Canada, Switzerland and other countries. Further research is being carried out to determine its usefulness in treatment of burns, surgical implants, and bladder and eye infections.

**INTERNATIONAL TECHNOLOGIES
(LASERS) LTD: A COMPANY REPORT**
International Technologies (Lasers) Ltd. (ITL) specializes in a line of targetting products and systems based on the latest technological achievements in the fields of lasers and optics for use at night. These systems have been battle-tested by the Israel Defense Forces. The company's present day challenge lies in international penetration of the markets for institutional security products as well as consumer products. ITL's products are big budget items but its systems offer special capabilities and advantages, particularly in anti-terror applications.

Whether ITL can expand its market depends on its ability to transfer some of the unique experience of Israel's crack defense and anti-terror units to other potential users.

In 1988, ITL's sales are expected to be in the order of \$2.5 million and, for the first time in the history of the company, some profits will be realized. If projections are reached, sales should top the \$10 million mark by 1990.

We believe that ITL, a technology driven emerging growth company, has products that reflect a unique basket of advanced technology applications.

BACKGROUND

ITL is owned by Clal, Israel's largest investment company. It was founded in 1982 by Yossi Vardi and Yoram Almogi. These two created a partnership with Clal Industries and Ampal-American Israel Corporation. In 1984, Ampal withdrew from the partnership. ITL continued to develop its product line and, by 1985, was generating sales of \$500,000 (and losses of \$1 million). At that point the firm had a staff of 22 including skilled engineers and technicians.

A major turning point in the history of the company occurred when Clal took over ITL's obligations from its founders. Ayraham Sorek, who had served as Clal's representative at ITL, assumed the top management

duties. Mr. Sorek, a Technion trained engineer, was general manager of Motorola before moving to Elscint in 1983. At Elscint he was in charge of development of the international magnetic resonance program. It was Sorek's contention that ITL should be headed by a professional versed in production.

Products

Products are divided into four major areas: projectors, laser aiming lights, laser light sources and laser augmented video cameras.

Set Beam

"Set Beam" is a searchlight with 6 M candle power, so compact it can be held in the hand: it is less than four inches across and weighs only 6 lbs. Used for recognition and identification, its light beam is shaped by the company's specially developed optical system which reduces stray light, the major impediment to clear identification. Flexibility of application enhances its usefulness. It can be hand carried, mounted on a car, boat, light airplane, helicopter or even on a fence. It can be connected to a 12 volt standard battery or to 110V or 220V mains. Its main components are a remote control unit, searchlight, power supply unit and an infrared filter.

Set Beam's effectiveness derives from its 150 watt lamp, which provides half a kilowatt light source, centered with optical lenses. Its efficiency is due to the use of a Senor Arc Lamp.

Currently, Set Beam is selling at the rate of 100 units per year. Applications for this product are expanding from its original use -- an anti-terror accessory for use in places which are not accessible by automobile. The Set Beam has a zoom feature allowing the beam to open up at a 1-10 ratio. It illuminates individuals at great distances, making the enemy a pinpointable target. It also causes them to lose their equilibrium. It can be used independently or mounted on weapons. Customers requiring this type of highly defined illumination are prepared to pay \$4,500.

The Set Beam and the Super Beam searchlight systems are sold in Israel and overseas. The Israel Defense Forces are a valued client. The overseas sales are now expanding from the narrow market of anti-terror units.

S-8

The S-8, mounted below the weapon's handgrip, is capable of illuminating either a stationary or moving target at distances of more than 300 ft. It emits a light "halo" which differentiates between friend or foe. Once an enemy target has been determined, a bore-sighted light spot appears on the target, assuring that the first shot will score an accurate hit.

The system's main feature is its "ease-of-aim", which is enhanced by a high density light which shows the exact spot where the bullet will hit. The unit sells for about \$850 with accessories that include an infrared filter, rechargeable battery, a charger and adaptors. The adaptors allow the unit to be attached to nearly all weapons currently in use worldwide. The market for this

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product is several hundred units per year.

The laser aiming light system can be incorporated under the rifle or other weapon and is bore-sighted with the rifle. It is used with goggles, which provide the element of night vision. The laser light which creates the point on the target determines where to shoot. This light cannot be seen with the naked eye. The lasers employed are of the semi-conductor type and are battery operated. The units are said to provide better shooting ability at night time than is possible in daylight.

Sniper's Spot Light

An infrared system useful at great distances, which results in shooting accuracy when aiming through dark windows or at close range in dark or darkened rooms. The spotlight is alignable with the night vision scope and illuminates the field of view with covert infrared light. ITL's system is being sold to clients such as the U.S. Navy and the U.S. Army by the American Litton Industries.

Fire Control Night Sight

This system is claimed to be unique. Weapon mountable and measuring the exact distance to the target, it provides calculations for the needed ballistic compensation required from the weapon. The short aiming process allows excellent hitting results even over long ranges.

Nitecam - Laser Augmented Video Camera

ITL produces a laser augmented video camera, capable of recording images in total darkness.

The Nitecam Camera incorporates a safe, invisible infrared laser with a light intensifier, resulting in the ability to filter clear pictures at 300 ft in total darkness and 900 ft in semi-darkness. The technology allows, at the extreme, to record pictures on a dark night and at a distance of 75 ft through a window into a dark room. The unit weighs 22

lbs and is capable of operating on a battery for up to three hours.

Financing

Funds for development, production and marketing are currently generated internally. Clal is providing the financing in an innovative way which allows for ITL to progress more rapidly than it would under conventional terms of financing.

Manufacturing

In July, ITL is moving out of its present modest premises in the Ramat Hachayal industry section in suburban Tel Aviv. It will be the first tenant in the brand new Rishon-le-Zion Science-Based Industries Park.

Marketing

ITL carries out its own marketing functions. Management feels that the many special advantages provided by its systems can be best explained by the developers and users. Buyers are reassured by the fact that Israel's Defense Forces and its anti-terrorist units are using ITL's products and systems and attest to the reliability of the company's products.

Summary

If ITL wins its bid to participate in a big American tender, then the upside projection of a \$10 million turnover would appear to be easily attainable. Even without it, a normal development of the market for its product should allow the company to double its existing sales by 1990.

ISRAELI HIGH-TECH SECTOR

INCREASES SALES TO IBM

We understand that IBM has increased, by more than 40% in 1987, its purchase of high-tech products from such companies as Fibronics, Orbot and Optrotech. Most of the products are destined for IBM Europe, with a small portion going to the United States division and some to Japan. Elisra, a member of the Koor Industries Group, has begun to supply power sources and Intel Israel will be supplying microprocessors.