ISRAEL HIGH-TECH REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES

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TERRORISM, AVIATION SECURITY and TECHNOLOGY

In the United States,terrorism and programs aimed at increasing security at airports, are destined to take a back seat to two other higher priority programs.One is the fight against AIDS.And the other is the battle against drug traffickers and drug abuse. The Bush Administration is likely to increase the level of public attention and government spending in these two important areas. However, in the Middle East and especially in Israel, terrorism has been, is and apparently will continue into the foreseeable future to be a target area for efforts aimed at its prevention and eradication. this should not come as a major surprise.AIDS while a cause of concern to the individual and public authorities has not surfaced in Israel in sufficiently large numbers to warrant major concern. However since 1985 in the Middle East there were 52 terrorist attacks. For Israel hijackings and attacks on its civil aviatioon are more than 20 years old. They have resulted in a loss of live and have created a deep awareness of the problems of terrorism. In 1968 an El Al flight was hijacked to Algeria. Two years later a SwissAir flight on its way to Israel was destroyed in mid-air..The well known Entebbe Rescue was in response to an El Al plane hijacking. These experiences translated themselves into the development of one of the most effective aviation security programs in the world. Israel willing to share the experience it had gained hosted an International Seminar on Aviation Security in early February. A desire to learn from Israel's experience and expertise in the field of aviation security and dealing with terrorism attracted nealy a 100 participants from 30 countries Participants included heads of airport and airline security,civil aviation authorities army and police representatives,government agencies and producers of anti-terrorist equipment .

What we saw and heard at the Seminar convinced us that little is being done throughout the world to protect travellers who have become the victims of terror.which rarely is aimed at them.it is quite clear that cursory checks of luggage are insuffien to thwart terrorists have become sophisticated at avoiding conventional detection at airport security points. The recent crash of the Pan Am jet with the loss of many lives was attributed to explosives smuggled onto the plane in a radio cassette and detonated by a highly sensitive barometric device.Some of the material preented at the conference represents a new level of achievement in dealing with terrorism.At the same time we learned tha there are no foolproof systems which currently can be relied on to defeat every attempts to breach airport security.In the final analysis human alertness and rthe carrying out of procedures are the key elements in effective securiyt programs.

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DEFENSE AND MILITARY APPLICATIONS OF ISRAEL'S LASER TECHNOLOGY

Laser research and development resulting in useful medical and defense applications have a history of nearly three decades.This is true on the university level as well as in industry. is by The large number of international seminars and meetings held in Israel dealing with lasers are proof of the high level of technological achievement.IHTR has covered this area mostly from the medical side Here Laser Industries is a company whose carbon dioxide surgical laser systems represent an important medical first. In the past year we have begun to cover the uses of the lasers in defense of Israel. One of the best studies to be published in Israel on this subject recently appeared in the IDF Journal and was penned by the highly qualified Dr.M. Rosenblum. The material forms the basis of most of the information which we present here.

Weapons design, according to Dr.Rosenblum, is moving from range and power,towards fire control and targeting accuracy. Currently developed weapons have a much greater potential for accuracy than in the past. Their high cost, however, limits the number of expensive, unproven weapons systems that armies can maintain in stock in their arsenals. This in turn increases the importance of first-round hits;and since first-round hits are almost a certainty, the speed with which a combatant can identify an enemy target becomes critically important. Acceleration of the development of electro-optics technology, which has improved the efficiency of major weapon systems has moved ahead in parallel. Thermal imaging,in which targets are located by the heat waves they generate,and lasers are the two major technologies used in electro-optical weapon systems.

The best known and most visible laser application for military use in Israel is the laser rangefinder. These systems can be extremely complicated,combining lasers, cameras, detectors,and other technologies. Yet the basic principle behind the laser rangefinder is relatively simple.A well collimated, or narrow-divergence, short pulse is bounced off a target,and the reflection is detected by a receiver mounted on the rangefinder. The time elapsed between sending the pulse and the arrival of the reflection indicates the distance to the target.The briefness of the pulse allows for highly accurate target range determination.

A typical example of a rangefinder produced in Israel is EL-OP's MT-18. It is a hand-held light in weight device for the infantry. The Mini-laser Rangefinder, is a vehicle-mounted laser integrated into the periscopes of tank fire control systems;and the very light-weight laser rangefinder,a system specially designed for airborne applications, capable of following moving targets by emitting quick series of pulses.

The majority of rangefinders use solid state lasers which emit energy at a wavelength of 1.06 microns,which is in the infrared region of the electromagnetic radiation spectrum. Not visible to the human eye,1.06 micron radiation can still be dangerous in some situations. Two technological approaches are used to solve the eye-safety problem.In one method,a gas cell inserted into the beam shifts the wavelength to an eye-safe 1.54 microns.The other method uses carbon dioxide gas lasers operating at 10.6 microns,which although technically more complex,is safer and offers better atmospheric penetration under typical battle conditions,as well as future compatibility advantages with thermal imaging equipment,whose wavelength they share. Target designation represents a somewhat more sophisticated use of lasers in the battlefield On the ground or in the air,the laser beam is aimed at designated targets.

Codified laser pulses,with each target having its own recognizable series of pulses,bounce back from the target head of "intelligent" missiles or "smart" bombs.

Beam riding is another way of using lasers to guide missiles to their target A gunner aims the laser directly at the launched missile, which generally has a rear infra-red sensor.The missile is then guided to the target via the gradual movement

of the laser beam. One such system is Mapats manufactured by the Israel Military Industries(IMI). It is a portable anti-tank weapon system consisting of a infrared laser beam-riding missile and a mobile launcher. The Mapats missile has a range of 1.8 miles and carries a warhead capable of penetrating a 3.2 inches of hard steel armor. Israel Aircraft Industries produces the Guillotine Laser Guided Glide Bomb which has a range of up to 12 miles at an altitude of 40,000 ft.
Intensive laser R&D programs are being carried out at academic institutions and government-funded research centers.
One area of R&D is the use of lasers for remote sensing of aerosols and gases. This approach makes it possible to collect all kinds of information about a particular area from a distance.Examples of this are measurement of wind velocity or the concentration of hazardous gases.
Lasers made of semiconductor materials,such as those used in microelectronics,are important as light sources for optical communication systems.In addition to the small size of such systems,the intensity of the light they create can be controlled by the electric current passing through the semiconductive material.These reliable lasers operate either in the 0.8 or 1.3 micron wavelength region.
One military application is in systems where short range,of up to a couple of miles,wireless communication, using portable, lightweight, low cost equipment is required.The laser beam serves as a carrier wave for the transmission of audio,video,and other signals.Laser Communicator,first produced in the early seventies,incorporated a diode laser into standard military binoculars, used to align the line of sight between two stations. This device allows both visual observation and secure voice communication from point to point,in either or both directions,at a range of up to 6 miles The usefulness of the laser in military and defense applications can be expected to obtain budgetary allocations in keeping with its importance as an integral part of Israel's defense system.

IMPROVED FERTILIZATION METHODS FOR RICE

Methods for better biological fertilization developed at the Hebrew University's Faculty of Agriculture are likely to increase rice yields in the Far East. The methods involve improving the fertilization of rice fields with nitrogen which is fixed by a small water fern,the azolla.
The research was conducted by a team of scientists from the Faculty of Agriculture in Rehovot,headed by Prof. Elisha Tel-Or,together with a team headed by Prof. Kykassiruya of the University of Peradeniya in Sri-Lanka and a team headed by Prof Shmuel Malkin of the Weizmann Institute of Science in Rehovot.
Over a period of three years,the rate of nitrogen release by various strains of the azola plant that are common to the Far East. These strains were brought to Israel by Prof.Kulasooriya, who spent a few months as visiting professor at the Department of Agriculture Botany of the Faculty of Agriculture.
Rice paddies fertilized by azolla currently cover some 12 million acres in various countries of the Far East. The azolla,a floating water fern,has the ability to utilize nitrogen from the air to create nitrogenous fertilizer material, which makes increased yields possible without the necessity to use expensive chemical fertilizers.
During their research on the azolla,the scientists measures various environmental factors,such as temperature,solar radiation and water quality,on the rate of nitrogen released by the azolla.With this knowledge,they were able to come up with a series of recommendations as to how farmers in the Far East can help create conditions which would enhance nitrogen fertilizer production by the azolla.

LOWER TAXES FOR HIGH TECH EMPLOYEES:

In a meeting between Finance Minister Shimon Peres and Moshe Cohen, President of the Association of High-Tech Industries in Israel,the two agreed that the government would investigate ways of supporting hi-tech industries and would consider lowering the tax buren on employers and employees in the sector.

Israel High Tech Shares Traded in the United States

Selected earnings summaries for the quarter ended September 30, 1988. Price quotations are from the 15th of the month and the change relates to the corresponding quotation a month ago.

Company	Revs (in mil.)	Net Income (in thou.)	Share Price	Change
BIO-TECH GENERAL				
Biological products for health care	0.865	(2,128.8)	3.000	+1/2
BTGC: OTC				
ELBIT COMPUTERS				
Defense electronics	35.271	8,140	5 .875	+ 5/8
ELBTF: OTC				
ECI TELECOM				
Telecommunications	9.710	650	6.000	+11/8
ECILF: OTC				
ELRON ELECTRONICS				
Invests in high-tech	36,460	(2,773.0)	3.625	+ 1/8
ELRNF: OTC				
ELSCINT				
Medical imaging	38.065	(3,850)	1.375	+ 3/8
ELT: NYSE				
FIBRONICS				
Fiberoptics	10,512	723	4.750	+ 7/8
FBRX: OTC				
INTERPHARM LAB.				
Biological products for health care	4.475.7	104.4	3.000	+ 1/4
IPLLF: OTC				
LASER INDUSTRIES				
Medical surgical lasers	4.923	(3,254)	3.875	+ 5/8
LAS: ASE				
OPTROTECH				
Electro-optical syetems	15,563.5	891	5.000	+ 1/8
OPTKF: OTC				
SCITEX				
Computer graphics	47,756	3,872	8.750	+11/4
SCIXF: OTC				
IIS				
Computer peripherals	3,551	814	5.250	+ 1/2
IISLFL: OTC				
ARYT OPTRONICS				
Optical lenses	2.775.0	(108.0)	1.625	unch.
ARYTF: OTC				

NEW FORMAT FOR STATISTICS

With this issue we are changing the format out of the statistical financial data relating to the dozen Israel High-Tech Shares Traded in the USA. We are comfortable with the assumption that the sales performance and net profit or loss are two key indicators of a company's recent performance. The data presented is for the quarter ended September 30, 1988. With only two exceptions all of the companies appearing in the table are traded over-the-counter. In keeping with financial reportage regulations they announce their performance nearly 45 days after the ending of the quarter. Complementing this data IHTR publishes monthly items of special interest regarding developments within these companies. News of contracts, personnel changes, technological developments, mergers and acquisitions and information from announcements and personal contacts with management are presented. IHTR'S editor in 1984 published a book titled Israeli Companies on Wall Street. The Israeli companies who have raised capital by selling their shares in the United States number more than two dozen. Yet many of them do not fall into the category of science-based or high-tech oriented. As a result they are not covered in IHTR.

When we feel that there is a major change of direction in the business development within any of these companies we publish a special report Typically are the reports on ECI Telecom in the IHTR February 1989 issue or that on Scitex, the previous month. We are aware that IHTR is considered internationally as the most important and reliable publication in this field. This is the result of our untiring efforts to provide news and information based on personal contacts with corporate managers, scientists, researchers and government people. The newsworthiness of the material is rooted in personal coverage. Because of the many years of on-the-spot personal involvement in this field the interpretation of the news has an added dimension.This is what sets us apart from others in the field. Being leaders in our field leaves us with the continuous challenge of maintaining our leadership position.

ROBOTS IN FRENCH SCIENCE MUSEUM

Eshed Robotics Ltd. of Tel Aviv,a world leader in educational indusrial robotics systems has recently installed four of its scorbot robots at the French National Museum.The Eshed robots which the visiting public can operate ,demonstrate industrial robotic operations.

KOOR SELS SHARES IN TEVA

Koor's 25% interest in Teva Pharmaceuticals,valued at $40 million,has been acquired by a consortium consisting of Bank Hapoalim,Bank Leumi and Salomon Levin, Elstein Ltd.,the investment group that originally founded Teva in 1901.

MARKETING ACCORD FOR IIS:

IIS Intelligent Information Systems.Ltd,of Haifa,manufacturers of IBM compatible peripheral and communications equipment,has signed a $3 milion marketing agreement with Dana Marketing of the U.S.

OPTROTECH ANNOUNCES MAJOR CONTRACT WITH HEWLETT-PACKARD:

Optrotech Ltd.(NASDAQ/NMS:OPTKF)has announced the completion of a corporate purchase agreement with Hewlett-Packard. Under this agreement HP expects to purchase CAM(computer-aided manufacturing)computer systems and/or photoplotters from Optrotech's Image product line for all of HP's printed circuit manufacturing facilities in the U.S.,Scotland,and Germany.Several orders have already

ISRAEL HIGH-TECH REPORT INDEX*

49.24 + 17.1 %

*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

been placed under this agreement;with more expected to follow.
This contract with HP represents the strongest cpmmitment from a major corpration to Optrotech's CIM (computer integrated manufacturing) product concept to-date.HP has previously purchaded several Optrotech Image CAD/CAM and Vision 206 systems for inspectionof PCB's wich are installed worldwide.Under this new contract,HP will be acquired the major elements of Optrotech's Image product line resulting in a fully integrated and automated tooling design and dissemination system in each of their facilities.
Optrotech Ltd.,founded in 1981,was the first company to supply automated optical inspection equipment for the printed circuit board industry based on advanced vision and artificial intelligence technoligies.

RESHEF WINS $15m M.O.D.ORDER
Reshef Defense Technologies Ind., manufacturer of electronic fuses for military applications,has been awarded a $15 milion contract by Israel's Ministry of Defense.
Minister of Defense Yitzhak Rabin announced the contract award at the recent inaugural ceremonies of the new Reshef plant in Sderot, a development town.

MILKING CHINESE COWS:
Material presented at a locally held international seminar relating to the computerization of the milking process is being adopted for use on farms in China. Israel is known for its expertise in agriculture. Israeli farmers hold a number of records in maximizing milk yields.

HUNGARIAN COWS MAY BE MILKED AS WELL:
The Special Agricultural Equipment company of Kibbutz Afikim,is in advanced stages of negotiations with the Hungarian Ministry of Agriculture, in respect of the sale of four computerized milking units to that country.
The fully-automatic hi-tech equipment,valued at $4 million,can be mounted on already operational machines. The Hungarians first became interested in the project during a visit to Kibbutz Afikim where they were able to compare per cow output in Israel (10000 liters)to that in Hungary (5000 liters) and the U.S.S.R (2000 liters).Kibbutz Afikim is forming an international marketing organization,which includes representatives from Israel, Belgium, England, France and Holland,for the sale of milking equipment worldwide.

NIGHT VISION FOR U.S. ARMED FORCES
A subsidiary of Israel Aircraft Industries has been awarded a contract by the U.S. Marines and the U.S. Navy to develop night vision systems. The cost of the multi-year project is estimated at $64 milion.It's planned for the manufacturing to be transfered to the U.S.

ISRAELI CAD FOR IBM MAINFRAMES
At IBM-Germany's request,Robocad Ltd.- is adapting its three-dimensional CAD software for use on IBM 6150 and 5080 graphic workstations. The package simulates complex industrial robot installations permitting clients to preview expensive systems before committing themselves to investment. It is already used by BMW and Ford;Volkswagen, Opel and Peugot are collaborating with Robocard on other projects.In Israel, the softwear is used by several academic institutions.

PLANE PRODUCTION MAY BE HALTED
Plane production may be halted:
The Israeli Aircraft Industries' (IAI) board of directors will convene at the end of the month to decide the future of the Astra executive eight - seater aircraft priced at $6 million. Unlike the Westwind,which at one point held 23% of the world market for executive aircraft. Only twenty Astras have been sold in the six years since the project's inception.

HIGH-TECH DIAMOND PLANT LAUNCHED,

The first state-of-art hi-tech polishing plant in the gem diamond branch. was launched at the turn of the year. The Leviov Diamonds International Ltd plant has been termed by leaders of the diamond

trade from Israel as "a breakthrough in computerized diamond production The plant is located at the new Industrial Park in Barkam. Developed by one of Israel's largest diamond cutting companies,the new plant applies automation to the processing of difficult raw materials,"makeables"

This makes their production in Israel cost effective and competive by reducing the cost of labor and of roughs through the high yield of its computerized production.

BIDS ON U.S. DRONES:
Mazlat Ltd. is tending a bid on a U.S.Defense Department contract for short range ,up to 120 miles, RPVs-pilotless drones. Lockheed Boeing, Northrop Aircraft,General Dynamics,IBM and other American firms are competing for this order Initially contracts will be awarded to only two firms in order to standardize all U.S. Defense Forces unmanned aircraft by 1991.In the next stage,one of firms will be selected to manufacture a line of RPV's.

ALDO-TEK MEDICAL KITS TO U.S.AND CANADA
Medical kits developed and manufactured by Aldo-Tek and International Diagnostic Laboratories of Jerusalem, are being marketed in the U.S. and Canada under a distribution agreement recently signed with the U.S. based Isolab. located in Akron,Ohio.
The products to be marketed have been approved by U.S. Department of Health authorities,and consist of two kits for use in detection of viral diseases and two for the diagnosis of risk factors in heart disease. Distribution will be handled by a Aldo-Tex/IDL subsidiary set up for that purpose.The agreement is expected to total several hundreds of thousands of dollars.

AUTOMATIC LANDING SYSTEN FOR RPV's

El-Op Electro-Optics Industries has developed a new system for RPVs which controls the aircraft from the time of take-off until landing.The system replaces the external remote-control pilot who operates the RPV with the aid of a T.V.-like sighting device and guides it via an internal computer.The new system is said to avoid the element of human error. El-Op hopes to market the product where skilled manpower is limited and/or and in those countries where the infrastructure for the use of RPVs already exists.

SPERM ANTIBODY KIT
The presence in the body of conception-preventing sperm antibodies can now be quickly and positively identified thanks to a medical detection kit developed by the Department of Immunology at the Haifa Technion Medical School.Sperm antibodies are blamed for 50% of all cases of "inexplicable" infertility among married couples. Treatment for the condition,which involves a temporary weakening of the body's immunization system as a whole,is only warranted when the presence of such antibodies has been positively identified.An agreement for the further development,manufacture and marketing of the test-kit has been signed with the U.S.based UMS are the inital investors in the kit's development.The kit itself will be manufactured in Israel. The product

Bill first be packaged for hospital and medical laboratory use. A test kit for use in doctor's offices is in the planning stage.

BETTER DATA PROCESSING AND IMAGE PROCESSING RESULT FROM PRIZE-WINNING WEIZMANN INSTITUTE RESEARCH

More reliable communications software packages and more detailed microscopic images should result from research carried out by two Weizmann Institute computer science students,who recently were awarded prizes for their work.
The novel data processing techniques developed by Ziv Soferman can dramatically increase the resolution of microscopic images as recorded through a video camera. Despite the availability extremely-high-resolution electron microscopes,the less advanced optical variety is often required for studying live cells,among other purposes.Soferman's approaches can be used to obtain accurate three-dimensional reconstructions of cells or to locate automatically biologically-significnt structures in blurred,"noisy" images.
Although Shmuel Safra's work is theoretical,it has practical applications in certain areas,in particular in the development of reliable communications systems.

LASER SURGERY:
Scientific research has yet to come up with a suitable vehicle to carry the infrared laser beam into the body.A solution to this problem would have major implecations for heart patients.The vehicle must be able to carry long wavelength,,CO2 infrared beam.It should be flexible enough to zigzag its way through the body to the target area,It should not disintegrate when exposed to the laser beam,and should not be toxic to the body tissue.Few materials exist that can carry an infrared beam,and most of the known ones are limited in that they are fragile,inflexible or toxic.
Prof.Nathan Croitoru of the Faculty of Engineering,Department of Electron Devices,Has concentrated on the one material known to carry the beam well.He used plastic tubing that provides flexibility and nontoxicity.He coated the inner wall with thin layers of insulator-metal. The process of coating the wall with insulator-metal layers developed by the research team was patented in Israel.

RAMOT,the University Authority for Applied Research and IndustrialDevelopment,Ltd.,is currently marketing th fiber.Prof.Croitoru speaks about miniaturizing of the diameter of the fiber as the next development step.

SOURCE OF A "GREENHOUSE EFFECT" GAS DISCOVERED BY WEIZMANN SCIENTISTS:

One of the major,previously-unknown causes of the "greenhouse effect",which threatens to alter the world's climate,is polluted groundwater,according to a recent study conducted by Prof.Mordeckai Magaritz,Daniel Ronen and Ehud Almon of the Weizmann Institute's Isotope Research Department.The greenhouse effect,which results from excess trappng of solar heat by the earth's atmosphere due to changes in its gaseous composition,leads to a general rise in global temperatures.For many years scientists noted a dramatic build-up of one of these gases in the atmosphere,nitrous oxide,but were unable to explain its source.
Then,while conducting a study of the effect of sewage irrigation on groundwater in Israel and acid rain in the Netherlands,Magaritz and his team accidentally discovered a major source of atmospheric mitrous oxide.

ECI LIVES UP TO EXPECTATIONS

As we went to press Mair Laiser announced that for the year ECI sales totalled $38.4 million and profits reached a recovery high of $2.77 million.This was in line with IHTR's analysis in our February issue.