

# ISRAEL HIGH-TECH & INVESTMENT REPORT

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## High-TechBlooms

Israel became a high-tech hothouse because she had to. True, she enjoys favorable conditions for the growth of high-tech industries; chief among them, well-educated, inventive, enterprising people. Relative to the size of her population, Israel has more engineers, and sees more scientific articles published, than any other country in the world (Israel has 135 engineers per 10,000 people; the US has 85). However, the stimulus for the industry's growth has been national survival, both military and economic.

As a small country in a hostile neighborhood, Israel must strive to maintain a qualitative military edge over her potential enemies. Experience in a series of wars has taught Israel that she needs to develop that edge independently as far as she can. In large part, Israel's high-tech industries are a spin-off from that process.

Israel fought the 1967 Six Day War largely with French weaponry. When President de Gaulle imposed an arms embargo after that war, Israel turned to the United States, and to herself. The commercial consequences can be seen today. Blades Technology, for example, a company originally set up to manufacture engine parts for the Israel Air Force's

Mirage aircraft, now has annual sales of \$90 million, and joint ventures with Pratt & Whitney and Rolls Royce.

In the 1973 Yom Kippur War, Israel was surprised by the technological capabilities of her enemies, and also experienced difficulty in obtaining vital mate-

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The History of High-Tech

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ther.

riel from her foreign suppliers, spurring efforts for technological supremacy and self-sufficiency. The Kfir jet fighter, based on the French mirage, was one of the first large-scale projects in this effort.

The effort for military self-sufficiency reached its limits in the 1980s, when Israel tried to develop the Lavi jet fighter. The cost proved beyond her and the project was abandoned, but this meant that, in the mid-eighties, hundreds of engineers with experience at the cutting edge of aerodynamics, avionics, computers and electronics were released onto the market. The Lavi project's demise has been described as one of the greatest ever boosts to Israeli high-tech industry.

Since the Lavi, Israeli defense industries have focused more on components, electronics, avionics and other systems that are installed on American or other platforms. Israel has arranged many reciprocal procurement agreements with leading aerospace and military manufacturers, which help sustain high-tech industries. The development of these auxiliary systems has also given Israeli high-tech industries an edge in civilian spin-offs in security, electronics, computers, software and the burgeoning Internet sectors.

The military imperative has not disappeared. Even in the era of the peace process, Israel must keep up her guard. In response to the Iraqi Scuds that hit Tel Aviv in the 1991 Gulf War Israel began development of the Arrow anti-missile missile. The Arrow program began as part of the US SDI (Star Wars) program, requiring considerable advances in electronics, computers and ballistics. The Arrow will soon be ready for operational deployment. In general, the search for

better systems in the areas of weapons, intelligence gathering, and command and control, goes on apace.

In the 1990s, Israel became only the eighth country in the world to develop and launch satellites, beginning with the Amos civilian communications satellite, followed by the Ofek military satellites and the Eros civilian photo-reconnaissance satellite. Israel now partners with NASA, the ESA and the Russian space program, building component and complete satellites for scientific and civilian uses.

In 2002, two of Israel's six largest industrial companies by turnover were high-tech companies: Israel Aircraft Industries (IAI), Intel Electronics, as well as pharmaceutical company Teva (Nasdaq: TEVA; TASE:TEVA). The largest exporters in terms of sales included high-tech companies Teva, IAI, Intel Electronics,

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In part, the economic necessity derives from the military one. Israel's defense budget is inadequate for her to maintain her military advantage. One solution is export. Israel is both a highly successful defense and civilian high-tech exporter.

However, the global defense market is shrinking. Civilian applications of the skills in software, communications, imaging, process control, derived from military industries, have therefore become increasingly important. For example, the need for better night-vision equipment led to local engineers becoming trained in the field of image processing, and to the establishment of two trailblazing Israeli high-tech companies: Scitex (Nasdaq: SCIX; TASE:SCIX), and Elscint. Because Israel is such a small market, export is essential for civilian products too, providing a further incentive to maintain technological excellence, particularly in certain niche markets - network security, for example, where Check Point (Nasdaq: CHKP) is a world leader; Mercury Interactive Corporation (Nasdaq: MERQ) is a leader in enterprise testing and performance management solutions; and Amdocs (NYSE: DOX) is a leader in customer relations management, billing and order management solutions.

In the 1990s, pharmaceuticals and medical devices became a rising high-tech sector. Teva has become a leading global generic drug maker, followed by Taro Pharmaceutical Industries (Nasdaq: TARO) and Agis Industries (TASE:AGIS). Medical device company Given Imaging (Nasdaq: GIVN) and biopharmaceutical companies such as Savient Pharmaceuticals (Nasdaq:SVNT) are becoming

prominent players, listed on Nasdaq and European bourses.

The wave of immigration from the countries of the former Soviet Union in the 1990s provided an influx of skilled scientists and engineers. The government's technology incubator program was largely a response to the need to provide these newcomers with employment, and harness their talents to the needs of industry. The immigrants helped fuel Israel's phenomenal growth rate between 1991 and 1994, and helped man the high-tech boom after 1998. In the late 1990s, Israeli high-tech began suffering from a shortage of skilled manpower. The government and industry have been expanding educational and vocational programs to meet the demand. The high-tech slump since late 2000 has slowed demand for trained personnel, but not ended the shortage altogether.

Israel has few natural resources. The aspiration of her population for a Western standard of living can only be satisfied through integration into the global market. Israel's transition from a State-dominated, centralized, protectionist economy to a free market means that traditional industries such as textiles are disappearing, losing out to low-cost overseas competition. How far and how fast this transition should go is a matter of debate, but there is no doubt that high-tech, where Israel enjoys a relative advantage, will be a mainstay of Israel's economic future. As Israel's economy restructures from traditional industries for the local market to export-oriented high-tech, high-tech exports as a percentage of total exports has been steadily increasing, rising from 45% in 1995 to 57% in 2000.

Exports of electronics communications

components, electronic components, medical equipment and software and IT products soared to over \$13 billion in 2000. Although the onset of the high-tech crisis in late 2000 caused a sharp contraction in exports and production, electronics, communications, monitoring and control equipment, and avionics are still key exports. Pharmaceuticals and medical devices and equipment are also becoming increasingly important. High-tech is still the key growth engine for the Israeli economy and a mark of its integration into the global economy.

An important aspect of Israel's integration into the world economy has been increasing inward investment, particularly in the high-tech industry. Companies like Cisco Systems, Motorola, Intel, IBM, Nortel, Microsoft, Mitsubishi, Deutsche Telekom, aviation and space companies, to mention just a few, have recognized that Israel is a fount of high-tech innovation they cannot afford to ignore. They have set up subsidiaries and research centers here, invested in Israeli companies, technology incubators, and venture capital funds, or found Israeli strategic partners.

Annual foreign investment in Israel grew from \$400 million in 1992, to peak at \$5.0 billion in 2000. Foreign investment subsequently contracted, due to the high-tech crisis, the global economic slowdown and political tensions in the Middle East, but is still substantial. Foreign venture capital investment grew apace, rising from \$587 million in 1998, peaking at \$3.1 billion in 2000, before falling to \$982 million in 2002, still higher than the level of five years previously. Investment by Israeli venture capital funds followed the same pattern: peaking at \$1.27 billion in 2000, but totaling

only \$481 million in 2002, including \$62 million in foreign companies. (Sources: MoneyTree and IVC). The Bank of Israel reported that total foreign investment in Israel amounted to \$2.6 billion in 2002, including \$1.2 billion in direct foreign investment.

With 3,000 start-ups, the Global Competitiveness Report 2000 ranked Israel second behind the US in the number of start-ups and first relative to population. The weight of start-ups of GDP was 3% in 2000, compared with 0.4% in 1997. The comparable figures for the US was 0.3% and 0.1%, respectively. Israel was highly ranked in terms of the number of engineers and education, but poorly in terms of physical infrastructure, a situation the government is trying to remedy.

Israel was ranked second in civilian R&D expenditure as a percentage of GDP, rising from 2.7% in 1994 to 4.2% in 1999. Total R&D expenditure in 2000 was \$4.2 billion and NIS 23.9 billion in 2001. State expenditure on civilian R&D has been rising faster than GDP through the 1990s, mostly being invested in high-tech, but also agriculture, manufacturing and biotechnology.

In any discussion of the future of Israeli high-tech, the following points tend to emerge:

The limiting factor on the sector's growth is a shortage of engineers and managers. Although training programs at universities, colleges and government and industry sponsored retraining courses have been expanding, plus attempts to expand the labor pool by tapping haredi (ultra-orthodox) and other communities, demand continues to outstrip supply, even in the wake of the cutbacks due

to the high-tech crisis since mid-2000. Demand to allow the entry of foreign skilled engineers and programmers for the high-tech sector have abated, the issue may re-emerge when the industry recovers and if the Israeli labor pool remains insufficient.

The industry needs to consolidate through company mergers.

The government's role needs to be reviewed. Many argue that government support for civilian R&D is not sufficiently discriminating, resulting in financial and human resources becoming too thinly spread.

Tax reform to ease mergers and acquisitions, better reward employees, and encourage foreign investment. Although progress has been made on these issues, stumbling blocks remain.

Biotechnology and medical devices are seen as coming fields. While Israel is well placed to exploit it, with outstanding life sciences and medical research institutions, this will mean a departure from the military-industrial symbiosis which has done so much to sustain high-tech development up to now. Nevertheless, Israel has a number of outstanding and growing start-ups and companies in these fields, including many new listings on Nasdaq and European exchanges. Israel is ranked third in the world in biotechnology start-ups.

In 2000 there were 160 biotechnology and 400 medical device companies in Israel, compared with 25 in 1988, employing 4,000 people and generating \$800 million in turnover. 20 companies are publicly traded, half in the US and half in Europe. Investment in biotechnol-

ogy has been growing steadily, reaching totaled \$1.7 billion in 2000, including about \$200 million in venture capital.

So how successful has the Israeli life-sciences industry been? Check out the stats: There are currently about 700 active life-sciences companies in Israel; 56 percent of them (396) of them were founded in the last decade.

A quarter of them, 173, were founded only five years ago. Of the rest, 306 were founded before 2001, with the oldest, Teva Pharmaceuticals, founded in 1901 (amazing but true). Out of the 700, 401 (56%) are in the medical devices business.

There are 15 life sciences venture capital funds operating in Israel.

In 2000, exports of high-tech products accounted for 55% of all exports, up from 23% in 1991. Exports of electronics communications components, electronic components, medical equipment and software and IT products peaked at over \$13 billion, before the onset of the high-tech crisis in late 2000 caused a sharp contraction in exports and production.

National expenditure on civilian R&D amounted to NIS 23.9 billion (over \$5 billion) in 2001, 4.2% of GDP. Spending on civilian R&D has remained stable despite the recession since 2000, although the focus on research has been shifting from Internet and software to new fields such as biotechnology, nanotechnology. Chemical and chemical products, electronic components, communications components, supervision, monitoring, and medical equipment accounted for 87% of industrial R&D expenditure in 2001.

Israel issues the largest number of companies in the US after the US itself and Canada. According to the Bank of Israel, investment by foreign residents totaled \$9.4 billion in 2000, up from \$3 billion in 1995. Israeli companies raised \$4.2 billion overseas in 2000, mostly on Nasdaq, but also including \$800 million raised on European exchanges. The 2000 figure is 13 times the amount raised only five years earlier, in 1995, reflecting the immense growth by Israeli high tech and its emergence as a global player. Foreign investment and the raising of capital by Israeli companies overseas has since fallen to a fraction of the 2000 figure.

**Avent buys electronic components business**

PHOENIX — Electronic components maker Avnet Inc. said that it bought the electronic components distribution business of Israel-based CRG Electronics Ltd.

Financial terms of the deal, which has already received regulatory approval, were not disclosed.

Founded in 1989, CRG provides engineers, marketing, sales and inventory logistics to over 300 customers in the networking, telecommunications, defense and industrial segments.

For the calendar year 2011, the electronic components business generated about \$23 million in revenue, Avnet said.

Avnet said the acquisition would strengthen its position in the Israel's high-tech market by adding complementary product lines and a strong technical team. Avnet said it expects the deal to immedi-

ately boost its profits.

Finisar to acquire optical amplification company RED-C Optical Networks for \$23.7 million

Fiber optic subsystems and components provider Finisar has acquired optical amplification company RED-C Optical Networks for \$23.7 million in cash.

logo.gifRED-C had \$3.2 million of cash and no debt. Finisar will also pay stockholders and certain employees up to an additional \$20 million subject to the achievement of financial performance targets.

The acquisition will broaden Finisar's product lines primarily for telecom applications by adding key amplification technologies, including Erbium Doped Fiber Amplification (EDFA), Raman amplification and dynamic Hybrid amplification.

"RED-C has been an innovator in optical amplification, which we view as an increasingly critical technology as networks get faster and more complex," said Eitan Gertel, Finisar's CEO. "As we have further penetrated the line card market with our differentiated WSS technology, we see this acquisition as a tremendous opportunity to further innovate for our customers and advance our vertical integration strategy."

RED-C was founded in 2000 by Yossi Boker, President & CEO and Dr. Uri Ghera, CTO. It was previously a business unit within Elop Electro-Optics Industries, merged later with Elbit Systems (NASDAQ: ESLT).

The company has over 140 employees, all of whom are located in Israel. Following the acquisition, the RED-C business

will operate as a subsidiary of Finisar, with principal operations continuing at its current facility in Israel.

Finisar is a global technology leader of fiber optic subsystems and components that enable high-speed voice, video and data communications for networking, storage, wireless, and cable TV applications.

Finisar is headquartered in Sunnyvale, California, USA with R&D, manufacturing sites, and sales offices worldwide. The company (NASDAQ:FNSR) has a market cap of \$1.17 billion.

Intel Capital to expand Israel investments

Intel Capital is planning to expand its operations, with an emphasis on Israel. The investment arm of Intel Corporation (Nasdaq: INTC) has been operating in Israel for 15 years, and has been involved in some of the country's top high-tech companies. As part of the process, and future plans, the fund added two Israeli investment managers, Yair Shoham and Merav Weinryb, who will work with Uri Arazi, Intel Capital's investment manager in Israel.

Intel Capital Western Europe and Israel managing director Marcos Battisti says that the increase in activity is driven by the need to adjust activity to the number of opportunities that the fund finds in Israel. "The facts are that we need to invest more here, and make a greater effort. We see the opportunities, and we think that we should increase our bet here," he said.

Intel Capital, which began operations in 1991, has invested in more than 60 Israeli companies in a range of fields, out of the 1,200 companies it has invested in

to date.

Shoham and Weinryb are veteran venture capitalists. Until recently, Shoham was a partner at Genesis Partners and Weinryb was a principle at Pitango Venture Capital.

Despite unflattering figures about the scale of operations by Israeli venture capital, outside the country, these are boom times for investment in high tech. While veteran Israeli firms are struggling to raise new funds and continue operations on the scale that they have been used to, the vacuum in Israeli capital is being seen as a great opportunity by foreign funds, especially funds seeking strategic exposure to Israeli start-up activity.

To achieve impressive returns on investment, it is necessary to reach the right companies. Intel Capital has had a number of successful investments in Israel, including Anobit, AeroScout Ltd., and Mellanox Technologies Ltd. (Nasdaq:MLNX; TASE:MLNX), but no real bonanza that would give a 30-fold or higher return on the money and nine-digit amounts.

Given this reality, Shoham says, "We're ready to write big and small checks, and we'll do what it takes to win the good deals in Israel."

Intel Capital's intention, through these "good deals", is to show a willingness to invest larger amounts than in the past, and to take a much more aggressive approach with companies it is interested in. "We realize that we've missed a lot of opportunities here," says Battisti. "We were more aggressive elsewhere in the world in recent years, and we want to be the same here too."

This approach will be expressed by leading all the investments that Intel Capital will participate in, and by faster investment procedures.

Intel Capital invests in a range of fields, with an emphasis on financial returns, regardless of a connection with Intel Corporation. Intel Capital says that it intends to seek out investments in Internet applications, such as social networks, and in vehicles and energy, in addition to its previous investments in Israel in computing and communications infrastructures, mobile devices, and consumer digital products.

### Intel eyes Israeli investments

Although Intel is in the bad books of Israel for shifting some of its fab work to Ireland, it seems that Chipzilla has not given up on investing in the promised land.

Intel Capital told Reuters that it wants to invest in some more Israeli start-ups.

Intel has invested in more than 60 companies in Israel since 1996 including Anobit, Passave, and Gteko, which was bought by Microsoft and Mellanox which went public on Nasdaq.

Marcos Battisti, managing director of Intel Capital for Western Europe and Israel, said investment returns in Israeli start-ups have been in the double digits the last five years.

However he thinks that Intel could have made a lot more dosh in the Land of Milk and Honey.

Part of Chipzilla's problem is that it doesn't have enough staff on the ground to seek out decent investments and find the good deals.

Battisti said that Intel Capital has added two venture capital veterans having realized that it missed some big opportunities.

Chipzilla wanted to invest in perceptual computing, which it thinks is the next generation user interface, communications, gaming, cloud, mobile ecosystem and consumer internet outfits.

As Mellanox rides high, CEO Eyal Waldman talks about the growth potential, his no-nonsense management style, and his abiding fear.

Recently the Tel Aviv Stock Exchange went wild. The cause of the drama was Mellanox Technologies Ltd. (Nasdaq:MLNX; TASE:MLNX), the provider of enterprise communications solution from Yokne'am. The previous evening, Mellanox, which is listed in Tel Aviv and New York, published record results, astonishing the market. Its share price shot up 43% on Wall Street, 48% in Tel Aviv, and its market cap jumped to NIS 15 billion. Overnight, Mellanox became the sixth largest company by market cap on the Tel Aviv Stock Exchange, worth more than some of Israel's foremost banks and industrial concerns, and it was being crowned the company of the decade in high tech.

One might have thought that Eyal Waldman, the company's founder, chairman and CEO, who was at its California office at the time, would be able to let go of some of the sense of fear that has accompanied him like a shadow ever



since he founded Mellanox in 1999, and free up time in his diary for a few whoops of joy.

Not him, it turns out. "I'm afraid all the time. You can't rest on your laurels," Waldman explained. "There are expectations all the time. You are under constant pressure to continue to execute."

For years, you were the entrepreneur with the strange technology swimming against the tide and trying to prove that your way was right. Are you now vindicated?

"I'm always having to justify myself. Even now. Many people have said to me in the past few days, 'You've done it'. But we still haven't done anything; we are half-way there, perhaps even at the start. You don't feel that you have done something. As far as I am concerned, we are still a small company."

The Boeing Company has validated the integration of a new helmet system for pilots of the F-15 Silent Eagle aircraft, designed partly by Israel's Elbit Systems, allowing the pilots to aim weapons and sensors at their targets, by looking at them.

Developed by Vision Systems International, a joint venture between Elbit and Rockwell Collins, the Joint Helmet Mounted Cueing System II/h (JHMCS II/h) is also a cost cutting measure for potential buyers, due to the helmet's processing systems which eliminate the need for mounted equipment on the aircraft.

Greg Hardy, who runs the JHMCS II/h program at Boeing, said "Integrating this enhanced system onto the Silent Eagle took less than three months between

'go-ahead' and first flight." Hardy added that during recent test flights "Both pilots who flew with the JHMCS II/h system immediately noticed that the helmet was more balanced and the smaller, lighter interface cable was less restrictive."

Boeing is marketing the F-15 Silent Eagle as a more affordable alternative to the F-22 and F-35 fighter jets.

"Technology advancements are reshaping the military helmet-mounted display market," said Phil King of VSI. "The rapid validation of the maturity and effectiveness of several such technologies in this demonstration program has shown that we can meet and exceed the performance baselines established by the extremely successful legacy JHMCS design while also providing new capabilities and reducing cost to the customer."

Apple Inc., Yahoo! Inc., Google Inc., LinkedIn and Cisco Systems.

The new Israeli venture capital fund is one of three new funds being raised by Sequoia. The others will focus on the US and China and the total of the three funds will be \$975 million.

The firm has always raised separate funds for Israel and has \$580 million in its previous four Israeli funds. The last two Sequoia Israel funds have each been \$200 million in size, while its first fund was just \$30 million in size, and its second fund was \$150 million. Investments have included Provigent, acquired by Broadcom, Attenti Holdings acquired by 3M, Snaptu acquired by Facebook, Storwize acquired by IBM, BitBand acquired by Motorola, and Amobee acquired by SingTel.

Qualcomm acquires DesignArt for \$120-140m

The Raanana based company develops solutions for mobile 3G, 4G and high-speed wireless backhaul infrastructure.

Chipmaker Qualcomm Inc. (Nasdaq: QCOM) announced that it is acquiring Israeli start up DesignArt Networks, which develops components for wireless communications infrastructures. The announcement came after lengthy negotiations. The official announcement probably did not include the amount of the acquisition, which is not significant for Qualcomm, but it is believed to be about \$120-140 million including milestone payments that DesignArt will be required to meet. Qualcomm, the world's largest supplier of chips for 3G mobile technologies, has a market cap of about \$105 billion.

DesignArt was founded in 2006 by CEO Oz Barak, CTO Assaf Touboul and Avishay Mor. Since then the company has raised \$30 million from Carmel Ventures, Magma Venture Partners and Motorola Ventures. The company also received a loan from the Plenus Venture Lending Fund. Headquartered in Raanana, DesignArt focuses on data-centric mobile radio access network (RAN) with highly integrated system-on-chip (SoC) platforms and trial-ready embedded SW solutions for the mobile 3G, 4G and high-speed wireless backhaul infrastructure. This area is problematic because a major portion of content needs on mobile phones is based on video and multimedia.

Qualcomm has an R&D center in Haifa with 250 employees, managed by Eyal Bar-David, and this will not be Qualcomm's first acquisition in Israel. In 2010, Qualcomm acquired mobile web compa-

ny iSkoot for \$50-100 million. This latest acquisition will probably become part of the Qualcomm Atheros Division, based on the acquisition of Atheros for \$3.1 billion in 2011. Atheros mainly supplies Qualcomm with non-cellular communications solutions such as local networks, and end-user computer and communications products. The acquisition of DesignArt will enable Qualcomm-Atheros to enter a new area, more based on infrastructures in which it is currently almost not active.

Israeli innovation could make water drinkable in Africa

In a world where freshwater resources are becoming increasingly scarce, Israel—a country that is two-thirds arid—has become a leader in developing the necessary technology for making salt water potable.

The Israeli desalination company, IDE Technologies, which has been in operation for more than 40 years, has made many advances in desalination technology, installing over 400 desalination plants in 40 countries including the Caribbean Islands and United States. IDE Technologies has also won major contracts with Cyprus, India and Australia, and last year with China.

Since 2011, the Israeli-built desalination plant in Tianjin is China's largest and most environmentally friendly desalination plant to date, running on some of the waste heat produced by a nearby power plant, producing fresh water and salt.

However, desalination plants for the most part are extremely costly for less-developed nations, as they use enormous amounts of electricity and are location-sensitive. But thanks to a recent Israeli

discovery, the desalination system may become much more affordable in areas like Africa and the Middle East.

Researchers from the Zuckerberg Institute for Water Research at Ben Gurion University of the Negev and central Arava R&D, have found a way to utilize solar energy at a fraction of the cost which can be custom-engineered for the desalination process, according to the Israel Ministry of Foreign Affairs (MFA).

The new innovation uses solar energy panels to power the pumps of a desalination unit that generates clean water for crops. More importantly, the technology utilizes unique nanofiltration membranes that enable farmers to decide which minerals should be retained from the water to feed various types of crops, a method which requires much less energy. The new system is currently being tested in the Arava Valley of Israel, south of the Dead Sea, where the basin is very dry. The results thus far show that farmers can use up to 25 percent less water and fertilizer than what has usually been needed in that area.

According to Andrea Ghermandi of the Zuckerberg Institute for Water Research at Ben-Gurion University and one of the system's creators, the current environment is forcing agricultural systems to become more economical. Ghermandi told the MFA that "the growing global demand for food and competition for resources among economic sectors compel future agricultural systems to be more efficient in the use of natural resources such as land and water."

Another important researcher in the discovery, Ben Gurion University's Rami Messalem explained that the "break-

through here was to make the system more economical and we've done this using nanofiltration cleverly. Our system is compatible with electricity but is based on the premise that it can be used in poor countries, in places where you don't have an electricity source—as a stand-alone system."

The MFA website indicated that the new desalination system was made possible thanks to funding from Swiss philanthropist Samuel Josefo

Israel's log-range UAV is ready for action

The Air Force's most advanced UAV, which can reach Iran, is back in the air after seven months.

The Israel Air Force's most advanced unmanned aerial vehicle (UAV), the Heron TP, known as the Eitan, is back in the air after being grounded for over seven months. The extraordinary decision to ground all Eitan UAVs was taken after one crashed in late January during a test fight of its payload.

The Eitan is a long-range UAV, capable of reaching Iran, but it did not get far on that January test flight. A rolling breakdown caused a wing to break, resulting in a crash from high altitude, which shattered the UAV in an orchard on the Coastal Plain.

The Air Force and Israel Aerospace Industries Ltd. (IAI) (TASE: ARSP.B1) struggled to understand the cause of the crash to one of the Air Forces' operational workhorses. For years, the Air Force has been expanding its UAV fleet and missions, which now carry out a quarter of all missions - a proportion that is likely

to grow.

Examination of the remains found that a wing spar broke under a load for which it was not designed to bear, during the test flight. The crash of the UAV, a state-of-the-art machine in global aviation, was a blow to morale and the pocket, as each Eitan is estimated to cost \$5 million.

According to foreign media reports, the Air Force used the Eitan to attack convoys in the Sudan carrying weapons from Iran to terrorist organizations in Gaza. The Eitan's latest intelligence gathering capabilities in difficult conditions, its ability to closely monitor a target, its state-of-the-art observation systems, and ability to stay aloft for over 35 hours while using satellite communications systems, make it relevant under any scenario of a possible Israeli strike on Iran.

Meanwhile, the Air Force is making sure to have the Eitan ready for such a war, and is keeping a low profile about its operational capabilities.

The Eitan's status in the Air Force and its role in building the Air Force's long arm, meant that there was no cutting of corners investigation into the January crash. The Air Force insisted on finding out what went wrong, step by step, mainly to avoid the risk of similar crashes of costly UAVs and disrupting training and operational programs. Such breakdowns should not happen when the Air Force is required to be on high alert to fulfill paramount strategic missions.

The Eitan crashed just one month after a top-secret US UAV, the RQ-170 Sentinel, crashed on a CIA intelligence gathering mission of Iran's nuclear facilities.

The RQ-170, whose development was top secret, is used by the US military to track el Qaida terrorists in Afghanistan, and has been nicknamed the Beast of Kandahar.

Two days after Iran announced the crash of the RQ-170, Revolutionary Guards put it on display. The Americans knew that the Iranians would not waste time, and would use reverse engineering to crack one of US Army's most innovative systems.

With this in mind, IAI engineers returned to the drawing boards used to design the Heron a decade earlier to find the cause of the Eitan's crash. During this time, the Eitans sat in Palmachim Air Force Base hangars, and their operators used simulators to keep up the skills.

The Air Force and IAI crash investigation team concluded that a cause of the crash was a childhood illness of the technologies and complex materials used in the Eitan. After the cause of the crash was found, the Eitans were strengthened, but not in a way that would require structural change.

A defense source involved in the program told "Globes", "We succeeded in obtaining absolute certainty that the fault has been fixed. After we located the problem, we understood that the extreme flight conditions of the test flights exposed the Eitan to load dangers that were liable to end in the way that the January test flight ended. Today, the chance of this happening verges on absolute zero."

Israeli firm awarded Gates Foundation grant for 'next-generation' toilet

An Israeli-invented toilet that needs no water and leaves no waste caught the interest of the Bill & Melinda Gates Foundation, which announced in June that it was awarding parent company Paulee CleanTec a \$110,000 grant. The foundation's goal is "to create next-generation sanitation technology to help make sanitation services truly safe and sustainable for the poor."

"We are one of only very, very few Israeli companies that have received any grants from this foundation," noted Oded Halperin, CEO and one of the company's original investors.

The toilet is based on the same principle as a high-tech pooper-scooper invented by Hebrew University professor and biotech innovator Oded Shoseyov. The device gathers droppings and turns them into odorless, sterile powder within seconds after the dog-walker pushes a button to release an activation capsule from the cartridge inside the unit. The resulting powder is a fertile composting material.

The Paulee CleanTec toilet will go a step further.

"For the solid waste, which also can include toilet paper, we are mixing it with our chemical formula for not more than 30 seconds, and it will turn immediately into odorless, sterile fertilizer," Halperin said. "The fertilizer will be automatically dropped into a removable canister, where it can be collected from time to time and then be used for field and/or home crops."

The liquid waste will be sterilized separately in another reservoir, and then pumped up to flush the toilet, all powered by heat energy created from the solid-

waste process and stored in a battery. According to the still-secret drawings of the patent-pending device, the internally created heat would even power a light inside the stall.

"Just to back up the energy source, we will also use a small solar panel on the roof," said Halperin. "There's no need for any sewerage or electricity infrastructures or connections. No need for water to flush. No special maintenance — the chemicals can be put in its dispenser once a month, and the cost of one use is only a few cents."

These features are a good fit for the Bill & Melinda Gates Foundation's "Reinvent the Toilet Challenge," which aims to improve on the limitations of the 18th-century toilet still in use today, for 2.6 billion people lacking access to sanitation.

According to the foundation, reinventing the toilet for use in developing countries could save millions of lives and help end poverty. About 80 percent of human waste goes into rivers and streams untreated, and 1.1 billion people don't use a toilet.

The winning solution must be hygienic and sustainable, with an operational cost of no more than five cents per user per day. It may not discharge pollutants and must generate energy and recover salt, water and other nutrients. It may not rely on water to flush waste or a septic system to process and store waste.

The one-year Gates grant is first-phase funding. If the foundation likes what it sees, Paulee CleanTec will then submit a second proposal for a \$1 million or \$1.5 million grant to complete development and build a prototype.

Microsoft inaugurates Israeli innovation center

Microsoft has invested millions of dollars in the Microsoft Technology Center in Ra'anana.

Microsoft Corporation (Nasdaq: MSFT) has completed the establishment of its Israeli innovation center, one of 31 Microsoft Technology Centers worldwide. Microsoft invested millions of dollars in the Microsoft Technology Center Israel, based at Microsoft Israel Ltd.'s premises in Ra'anana.

The Microsoft Technology Centers serve mainly for the building and sale of IT infrastructure products. The centers function as places where company representatives spend several days in developing customized solutions with Microsoft staff.

"The Israeli center is the same as every other center, which offers all the added value services that we provide," said Microsoft Technology Center director Lew Wagman. He added, "Microsoft is now undergoing major changes in the products and solutions it is bringing to market, and Israel is a place where customers seek to adopt new technologies to solve complex problems. The Technology Center will help these customers solve them."

Wagman added that the center's customers will see Microsoft's new services, such as Windows 8, tablets, and cloud systems. The Technology Center works with large organizations and technology partners. "Customers coming here need to know that the solution they want to

install will work according to their specifications."

Israel Brain Technologies Announces \$1 Million B.R.A.I.N. Prize for Innovation in Neurotechnology inspired by Peres's Vision for Brain Research and Technology

Israeli President Shimon Peres said that as the world becomes increasingly global, humanity must harness the power of the brain to change reality as we know it.

"The brain is more important now than ever before," Peres said, adding that he foresees monumental changes taking place very soon, and that Israel is well positioned to serve as a center for brain research and technology.



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