

## Hellenic Air Force procurement and upgrade programs

### Greece equips itself with the RAFALE in the continuity of a partnership with DASSAULT AVIATION of more than 45 years

On 24 March 2022, Eric Trappier, Chairman and CEO of Dassault Aviation, and Vice-Admiral Aristidis Alexopoulos, Director General of Armaments and Investments of the Greek Ministry of Defence, signed in Athens, in the presence of Mrs. Florence Parly, French Minister of the Armed Forces, and Mr. Nikolaos Panagiotopoulos, Greek Minister of National Defence, a contract for the acquisition of six additional new Rafale aircraft.

This new contract, which follows Greece's acquisition of 18 Rafale in January 2021, will increase to 24 the number of Rafale operated by the Hellenic Air Force.

Following the arrival at Tanagra Air Base of the first six Rafale of the Hellenic Air Force on 19 January 2022, the 18 Rafale relating to the first contract will be fully deployed in Greece by the summer 2023. The six additional Rafale will then be delivered to the Hellenic Air Force shortly, thereafter, starting from the summer 2024.

As a European country and NATO member, Greece is a major strategic ally of France. Dassault Aviation is honored by the Greek government's decision to proceed with this new Rafale order, which extends nearly fifty years of uninterrupted partnership.

This additional order reflects the Greek government's great satisfaction with the Rafale's operational qualities, as well as its determination to strengthen the combat capabilities of the Hellenic Air Force in order to guarantee the country's sovereignty and ensure the security of its population in an increasingly unstable geopolitical context.

"This new contract demonstrates the Greek government's confidence in the Rafale, which is already actively contributing to guaranteeing Greece's sovereignty and operational independence. Once again, I am honored by the Hellenic Air Force's renewed trust in Dassault Aviation, reflecting nearly half a century of unwavering partnership. I would also like to assure the Greek authorities of our full commitment to fully meet their expectations," said Eric Trappier after the signing ceremony. Estimated budget is in the area of 1.092.300.000 €

On 25 January 2021, in the premises of the Greek Ministry of National Defence, Theodoros Lagios, General Director of Armament and Investments of the Greek MOD, and Eric Trappier, Chairman and CEO of Dassault Aviation, signed a contract, worth of 1,9 million euro for the acquisition of 18 Rafale aircraft for the Hellenic Air Force, as well as a contract worth of 400.000 million euro for the logistical support of the fleet. This signing ceremony was held in Athens in the presence of Mrs. Florence



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Parly, Minister of the Armed Forces of France, and Mr. Nikolaos Panagiotopoulos, Minister of National Defense of Greece.

As a European country and member of NATO, Greece is a major strategic partner of France. Dassault Aviation is honored by the Greek government's decision, that extends an uninterrupted partnership for 45 years. The order for 18 Rafale includes 12 Rafale recently in service with the French Air Force and 6 new Rafale produced at Dassault Aviation plants. To meet the urgent need of the Greek authorities, the deliveries of aircraft will begin in the summer of 2021 and will be spread over two years. The logistic support contract will support the Hellenic Air Force Rafale's air activity over four and a half years, maintaining the availability of equipment and systems at the highest level. The arrival of the Rafale in Greece highlights the quality of the strategic relationship between Greece and France and the continuation of more than forty-five years of solid partnership with Dassault Aviation and its industrial partners Thales and Safran. As with the Mirage F1 in 1974, the Mirage 2000 in 1985 and finally the Mirage 2000-5 in 2000, the Rafale is an opportunity to launch new cooperation's with the Greek aerospace industry.

"Greece is a leading European partner, a major member of NATO and a special partner of France, with which Dassault Aviation has stood steadfastly by its side for more than 45 years. The continuity of our presence in Greece, even in the most difficult times, is a token of the quality of this relationship. That is why I am proud and happy to sign today this contract, which symbolizes the extension of the commitment of Dassault Aviation towards Greece since 1974. I would like to thank the Greek authorities for their renewed confidence in us. I assure them of our total mobilization to achieve the objectives that are defined", said Eric Trappier, Chairman and CEO of Dassault Aviation.

The Dassault Rafale is a French, twin-engine, canard delta wing, multirole fighter aircraft that covers the full range of operational missions. It can cover multiple roles simultaneously (omnirole), allowing different missions to be carried out during the same flight. The Rafale has 14 External hardpoints and can carry up to 9.5 tons of external loads. It can carry a large number of weapons, including the long-range Meteor air-to-air missile, MICA EM and IR missiles, the SCALP EG cruise missile and the Exocet AM39 Block 2 Mod 2 air-to-surface missile, as well as precision weapons such as the GBU 12/16/24 and AASM, while carrying a

30 mm gun. The aircraft are based at 114 Combat Wing at Tanagra and belong to 332 Squadron with the call sign «Hawk».

### Upgrade of the Hellenic Air Force F-16s to F-16V Viper



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On 19 September 2022, the first two F-16 type fighters upgraded to the "Viper" standard in collaboration with Lockheed Martin and the Hellenic Aerospace Industry (EAB) were delivered to the Hellenic Air Force. At the Greek Aerospace Industries (EAB) facility in Tanagra, the delivery of the first two aircraft, upgraded from the F-16 Block 52+ Fighting Falcon model to the F-16V Block 70/72 configuration was carried out with an official ceremony. The ceremony was attended by Minister of Defense Nikos Panagiotopoulos, Deputy Minister of Defense Nikos Hardalias, Chief of the Hellenic National Defense General Staff Konstantinos Floros.

The first of 84 Greek Lockheed Martin F-16 fighters to be upgraded to the F-16V Viper standard took to the skies for the first time on 17 January 2021 arriving in Texas and at the Lockheed Martin Aero facility. The upgrade to the Viper version is a collaboration between the Hellenic Defense Industry (EAB) and Lockheed Martin. In Texas, all the necessary ground and flight tests will be performed, including simulation in special cabins, to determine that the aircraft meets all the necessary specifications.

The F-16V had been upgraded at the Tanagra facility of Hellenic Aerospace Industry (HAI), which is to carry out the modifications to the fleet in a program that was approved by the U.S. government



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# 50 YEARS OF CONTINUOUS PARTNERSHIP

Following the Mirage F1 in 1974, the Mirage 2000 in 1985 and the Mirage 2000-5 in 2000, the Rafale provides the Hellenic Air Force with the latest-generation fighter, enabling the Hellenic Republic, a leading European partner and a major member of NATO, to reinforce the protection of the country, to ensure its geopolitical stance in full sovereignty and to serenely address its strategic ambitions for the future.

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in October 2017. The value is estimated to reach around \$1.5 billion across 8 years, but it is only a part of the \$10 billion F-16 programs spanning 35 years of procurement and sustainment successes.

The first airframe, carrying the serial number 005, was originally delivered in 2009 as an F-16C Block 52+ with Pratt & Whitney F100-PW-229 engine as part of the Peace Xenia IV sale. Greece acquired a total of 90 Block 52/52+ aircraft and the survivors are the subject of the upgrade. The Hellenic Air Force (HAF) also received 80 Block 30/50 aircraft powered by the General Electric F110, but they are not part of the F-16V program.

After modernization, the aircraft is now an F-16V in Block 72 configuration, the "2" denoting its P&W powerplant. The key element of the modernization is the installation of the Northrop Grumman APG-83 Scalable Agile Beam Radar (SABR), a sensor with an active electronically scanned array (AESA).

The cockpit has a new center pedestal display and is compatible with the Joint Helmet-Mounted Cueing System (JHMCS) II. Other improvements include a new mission computer, an automatic ground collision avoidance system, enhanced electronic warfare capabilities, Link 16 datalink, and an advanced identification friend or foe interrogator system. The next three F-16Vs are also expected to

go to the U.S. to join the test fleet. A successful conclusion of the certification process will result in approval by Lockheed Martin for HAI to proceed with the remainder of the upgrade program which is expected to be completed by June 2027.

#### [Project background](#)

In 2018, Hellenic Government signed a \$1.5 billion contract to upgrade 84 F-16 fighter aircraft of the Hellenic Air Force to F-16V standard, with the relevant manufacturer company Lockheed Martin contract to be about \$1 billion. Main subcontractor will be the Hellenic Aerospace Industry getting more than 70% of the total amount of \$279 million subcontracting job, while the remaining 30% is directed to the Hellenic defense industry.

Lockheed Martin secured a \$996.8 million foreign military sales (FMS) contract for upgrading 84 Hellenic Air Force F-16 jets to the V-configuration, the US Department of Defense said on December 21, 2018. Lockheed Martin expects to complete the task by Jun 30, 2027. Lockheed Martin official said that the first two years will be spent on engineering for the prototype and the registration of the systems. The installation on the Greek fighter jets will take place during the third year of the program, and the Hellenic Air Force pilots will be trained in the fourth year. L3 Technologies will upgrade the F-16 fighter plane training system of Greek Air Force F-16 in



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a \$28 million contract. improving Aircrew Training Devices for conversion of Hellenic Air Force F-16s to the new F-16V configuration. The new variant includes add-ons which include electronically scanned array radar, a new mission computer and electronic warfare suite, automated ground collision avoidance system, and various cockpit improvements.

On 17 October 2017, the State Department has made a determination approving a possible Foreign Military Sale to the Government of Greece for an upgrade of F-16 aircraft to an F-16 Block V configuration. The estimated cost is \$2.404 billion. The Defense Security Cooperation Agency delivered the required certification notifying Congress of this possible sale on October 16, 2017. The Government of Greece has requested a possible purchase of an upgrade of its existing F-16 fleet to an F-16 Block V configuration which includes up to one hundred twenty-five (125) APG-83 Active Electronically Scanned Array (AESA) Radars (includes two (2) spares); one hundred twenty-three (123) Modular Mission Computers (MMCs); one hundred twenty-three (123) LINK-16 Multifunctional Information Distribution System Joint Tactical Radio Systems (MIDS-JTRS) with TACAN and EHSI; one hundred twenty-three (123) LN260 Embedded Global Navigation Systems (EGI)/Inertial Navigation Systems (INS); and one hundred twenty-three (123) Improved Programmable Display Generators (iPDGs).

Also included in the proposed sale are up to one hundred twenty-three (123) APX-126 Advanced Identification Friend or Foe (AIFF) Combined Interrogator Transponders (CIT); one (1) Joint Mission Planning System (JMPS); one (1) F-16V Simulator; upgrade to two (2) existing simulators; one (1) Avionics Level Test Station; Secure Communications, cryptographic equipment and navigation equipment; upgrade and integration of the Advanced Self-Protection Integrated Suite (ASPIS) I to ASPIS II on twenty-six (26) F-16s; Ground Support System, systems integration and test; spares and repair parts, support and test equipment; personnel training and training equipment; publications and technical documentation; U.S. Government and contractor engineering, logistical, and technical support services; and other related elements of logistics and program support. The total estimated program cost is \$2.404 billion.

Greece currently employs a mix of 154 F-16s in Block 30, Block 50, Block 52+, and Block 52+ Advanced configurations. Therefore, Greece will have no difficulty absorbing the upgrade of these aircraft from an operation and support standpoint.



### MBDA to arm Hellenic Air Force's new Rafale fighter jets



© Hellenic Air Force

The new aircrafts' weapons will benefit from the strong commonality with those from the Mirage 2000s and Mirage 2000-5s currently in service in the Hellenic Air Force. Like these, the Rafales will be armed with SCALP cruise missiles, AM39 Exocet anti-ship missiles and MICA multi-mission air-to-air missiles. Additionally, MBDA will also supply Meteor beyond visual range air-to-air missiles.

Eric Béranger, CEO of MBDA, said: "The signing of this agreement turns a new page in our relationship with Greece, which we have had for more than half a century. The country was the very first customer of the Exocet missile in 1968, showing great confidence in it and in our predecessor companies. This confidence has been renewed over the years and is being renewed again today. It is our duty to do everything we can in order to continue delivering on this confidence into tomorrow."

MBDA is the only European group capable of designing and producing missiles and missile systems that correspond to the full range of current and future operational needs of the three-armed forces (land, sea and air).



### Follow -on Support for F100-PW-229 engine maintenance

On 12 January 2022, the State Department has made a determination approving a possible Foreign Military Sale to the Government of Greece of Follow-on Support for F100-PW-229 Engine Maintenance and related equipment for an estimated cost of \$233 million. The Defense Security Cooperation Agency delivered the required certification notifying Congress of this possible sale today.

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The Government of Greece has requested to buy parts and services to support follow-on depot level maintenance and sustainment of F100-PW-229 engines to include spare, repair parts, and accessories; repair and return services; publications and technical documentation; U.S. Government and contractor engineering, technical, and logistical services; and other related elements of logistical and program support. The overall total estimated value is \$233 million.

This proposed sale will support the foreign policy and national security objectives of the United States by helping to improve the security of a NATO ally, which is an important partner for political stability and economic progress in Europe.

The proposed sale will improve Greece's capability to meet current and future threats by providing greater depth of repair capability for engines on their F-16 Block 52+/52+ Advanced aircraft, sustaining their weapon system, and improving aircraft capability rates. Greece has demonstrated a continued commitment to modernizing its military and will have no difficulty absorbing this additional sustainment support into its armed forces.

© Lockheed Martin F-35s being built at the Lockheed Martin Factory in Fort Worth, Tx., in April 2012.

The proposed sale of these services will not alter the basic military balance in the region. There are no principal contractors for this proposed sale. There are no known offset agreements proposed in connection with this potential sale. Implementation of this proposed sale will not require the assignment of any additional U.S. Government or contractor representatives outside the United States.

#### Greece to buy F-35

In 20 July 2022, Greek Defence Minister Panagiotopoulos visited the United States and during a meeting with the director of the Pentagon's F-35 joint program office he stated that Greece has expressed its strong willingness to join Lockheed Martin's F-35 co-production program and has sent a letter of request to buy 20 F-35 with an eye on delivery after 2028. He had also a tour at Lockheed's F-35 production line. Joining Lockheed's co-production program alongside the U.S. and eight other countries would also require Greece to stake its own equities in manufacturing the advanced fighter jets. Panagiotopoulos said that joining the program reflects the commitment of Greece and the U.S. to intensify cooperation "in the domain of defense procurement.



F-35s being built at the Lockheed Martin Factory in Fort Worth, Tx., in April 2012. (Lockheed Martin)



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Greek Prime Minister Mitsotakis has also said in the past "If the country's current fiscal state allows it, we will seriously consider purchasing F-35 fighter jets, because they are the most readily available and advanced in the market."

### International Flight Training Center of the Hellenic Air Force in Kalamata

On the 13-14 September 2021, was contacted a Program Manager Review meeting (PMR-1) at the Hellenic Air Force 120 Wing premises between GDDIA and HAIFGS officers and representatives International Defense Cooperation Directorate of the Israel Ministry of Defense and the Israeli company ELBIT.

The aim of the meeting was to access the work progress of the establishment of International Flight Training Center of the Hellenic Air Force in Kalamata.

On April 18, 2021, Elbit Systems Ltd. announced, further to the Company's announcement of January 5, 2021, that it was awarded a contract valued at approximately \$1.65 billion (approximately €1.375 billion) for the establishment and operation of the International Flight Training Center of the Hellenic Air Force, as part of an agreement between the Israeli Ministry of Defense and the Hellenic Ministry of National Defense.

The contract will be performed over a period of approximately 20 years and will include price indexation. Under the contract, Elbit Systems will supply new M-346 training aircraft and will maintain the entire training fleet, comprised of dozens of M-346 and T-6 training aircraft for a period of approximately 20 years.

In addition, the Company will provide its latest advanced Embedded Virtual Avionics (EVA) onboard the training aircraft, deliver networked flight simulators and an array of Ground-Based Training Stations (GBTS) as well as a command-and-control system to enable efficient management of the flight training operation.

The establishment of a modern flight school has become a priority to the Greek MOD to provide high-standard training for future pilots for Hellenic Air Force's Rafale and F-35 fighters. Under the modernization program, the HAF 120 Air Training Wing based in Kalamata, Peloponnese, will retire some of the T-2E Buckeyes adding 10 new Leonardo M-346, advanced jet trainers. Elbit Systems will deliver those aircraft and provide kits to upgrade and operate the wing's T-6 aircraft. CV

© Leonardo M-346





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## DEFEA 2023 SHOW DAILY

# Aeronautics will supply the Greek Ministry of Defense with dozens of advanced Orbiter 3 tactical unmanned aerial vehicle systems

**The agreement is part of the significant G2G contract between the Israeli and Greek Ministries of Defense for the procurement of Rafael's Spike missiles**

On 17 April 2023, Aeronautics Ltd. - a world leader in designing, developing and manufacturing Unmanned Aerial Systems (UAS) for global defense and HLS markets – announced a contract to supply dozens of its Orbiter 3 systems to the Greek Ministry of Defense. The agreement is part of the large contract between the Israeli and Greek Ministry of Defense, worth approximately 370 million euros, for the procurement of Rafael's Spike missiles.

As part of the contract, Rafael will provide an advanced solution enabling significant operational advantage to the modern battlefield; While the Orbiter 3 systems detect, recognize and identify (DRI) the target, the Spike missiles, launched from the air, sea, or land can rapidly close the sensor-to-shooter loop, using the "Fire Weaver" C4I system.

© Aeronautics



The rapid Sensor to Shooter process implementing advanced technologies, enables mission success.

The Orbiter 3 is a small tactical unmanned aerial system and considered to be one of the leading systems in its class worldwide providing superior performance for both defense and HLS applications. Highlights of the Orbiter 3 operational performance includes advanced ISTAR capabilities, runway-independent, long endurance, the capability of carrying various types of payloads, advanced image processing, a small logistical footprint, navigation including in a GPS-denied environment and the ability to withstand harsh weather conditions.

Dan Slasky, CEO of Aeronautics Group: "We are proud to be a part of this significant cooperation with Rafael in the G2G agreement with the Greek MOD. This collaboration demonstrates the technological synergy, and the close business integration between the two companies. We also thank the Israeli Ministry of Defense, which has invested significant efforts to facilitate the agreement, and to the Greek Ministry of Defense for expressing its confidence in the Aeronautics' solution."

Established in 1997, Aeronautics is a world leader in designing, developing and manufacturing Unmanned Aerial Systems (UAS) for the global defense & HLS markets. Backed by continuous research and development and with proven excellent performance and operability, Aeronautics' broad product portfolio includes the expertise of its subsidiaries and offers solutions for a wide range of Intelligence, Surveillance and Reconnaissance (ISR) missions that lead the segment with cutting-edge systems for the modern battlefield.

Having been acquired by Rafael Advanced Defense Systems and Stolero Aeron Ltd., Aeronautics utilizes the technological synergy between the two companies – Rafael's advanced air, land, and naval defense capabilities and Aeronautics' proven technologies in the Unmanned Aerial Systems and solutions - to strengthen its position as a leading unmanned and autonomous solutions integrator.



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## RAFAEL's SPYDER Now Offering Counter TBM Capabilities

Rafael has recently announced that its world-renowned, combat-proven SPYDER air defense system is now enhanced with a sophisticated Counter-TBM (tactical ballistic missiles) capability.

The introduction of this feature is the product of RAFAEL's Counter-TBM SPYDER program, which involved researching and analyzing the lessons learned from recent and ongoing armed conflicts involving extensive use of tactical ballistic missiles. The program has brought about a practical upgrade to the SPYDER system which is equipped for implementation. In response to urgent operational requests from several existing customers throughout the world, the program will extend the capabilities of the SPYDER's effectors as well as the implementation of various Counter-TBM derivatives across the system.

Executive Vice President and General Manager Air & Missile Defense Systems Division Brig. Gen. (Res.) Pinhas Yungman: "RAFAEL is a world-leading expert in the field of missile defense, as evidenced by our top-notch products, such as DAVID'S SLING and IRON DOME. We are proud to announce that our international sales leader – SPYDER – has been reinforced with a tactical ballistic missile defense capability. This extremely important Counter-TBM feature will be offered as an option in the SPYDER's toolbox. Under the SPYDER's tailor-made solution paradigm this capability will be offered as a cost-effective option to our valuable customers with respective urgent operational needs."

The SPYDER Air Defense System is the only Israeli-made air defense system that has been incorporated into the aerial defense array of NATO. SPYDER is a quick reaction, low-level surface-to-air missile system designed to counter attacks by aircraft, helicopters, UAVs, and precision-guided munitions. The system provides effective protection of valuable assets and first-class defense for forces located in the combat area. SPYDER's open architecture allows external components to be easily integrated and flexibly combined, affording different configurations with various ranges and capabilities based on customer needs and priorities. Its autonomous capabilities can detect threats while on the move and enables a 360° launch within seconds of the target being declared hostile, in all-weather, multi-launch, and net-centric capabilities. All the SPYDER systems have multiple target engagement capabilities for handling saturation attacks.

SPYDER systems incorporate the most advanced air-to-air-missiles with proven performance: Rafael's PYTHON-5 dual waveband IIR missile, I-DERBY active radar BVR, and the I-DERBY ER long-range missile, each of which can be used for air-to-air missions. The SPYDER-SR and SPYDER-ER variants provide 360° slant launching missile systems that provide quick reaction, lock-on-before-launch (LOBL), and lock-on-after launch (LOAL) capabilities while extending the range of defense to up to a 40 km radius. The SPYDER-MR and SPYDER-LR offer medium & long-range target interception through vertical launch while pushing the defense envelope up to an 80 km radius. The most recent variant, SPYDER All-in-One, incorporates an integrated radar, Toplite EO/IR sensor, and launcher onto a single platform to address a defense force's individualized, operational needs.

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### DEFEA 2023 SHOW DAILY

#### Edge to show advanced tech and defence solutions at DEFEA

The group will showcase its diverse product portfolio, with a clear focus on autonomous systems and smart weapons, highlighting Edge's technologically advanced defence solutions and products to the European market, and for new commercial and security partnerships.

Mansour AlMulla, Managing Director and CEO of Edge, said: "Greece and the wider Eastern European region are crucial focus markets for Edge, covering the government, military and civilian domains. DEFEA offers us a unique opportunity to showcase our advanced capabilities across air, land and sea domains. We look forward to building on valuable partnerships, and forging new ones, while promoting our portfolio of complementary products to the region's major players." Five of Edge's portfolio companies will display a wide range of advanced solutions and products covering the

domains of autonomous air and land systems, naval systems, precision-guided munitions, and small arms. In the domain of autonomous air systems, Edge will showcase the HUNTER SP (Soldier Portable) unmanned aerial vehicle (UAV), the tube-launched HUNTER 2-S swarming UAV system, and the REACH-S unmanned combat aerial vehicle (UCAV). The Shadow 25 loitering munition will also be displayed, along with the GARMOOSHA rotary-wing UAV. Land systems and solutions will be represented by NIMR's LRSOV, a special operations vehicle. Edge's advanced naval capabilities will include the ADSB 160 ITP (Inshore Tactical Engagement Platform), 120 FIP (Fast Inshore Platform), 510 OPV (Offshore Patrol Vessel), and the Sea Trooper, the ideal landing-craft vessel. In the domain of precision-guided munitions, Edge will showcase its multi-range DESERT STING air-to-surface precision-guided munition, as well as the Rash 1-M, Rash 2-H, and Rash 2-M precision-guided munition systems. For small arms and ammunition, Edge will display its CARACAL F pistols, CMP 9 submachine guns, the CAR 816 assault rifle, and the CSR 338 sniper rifle, as well as a full range of small calibre ammunition.



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## The F100: Trusted, Established, Agile

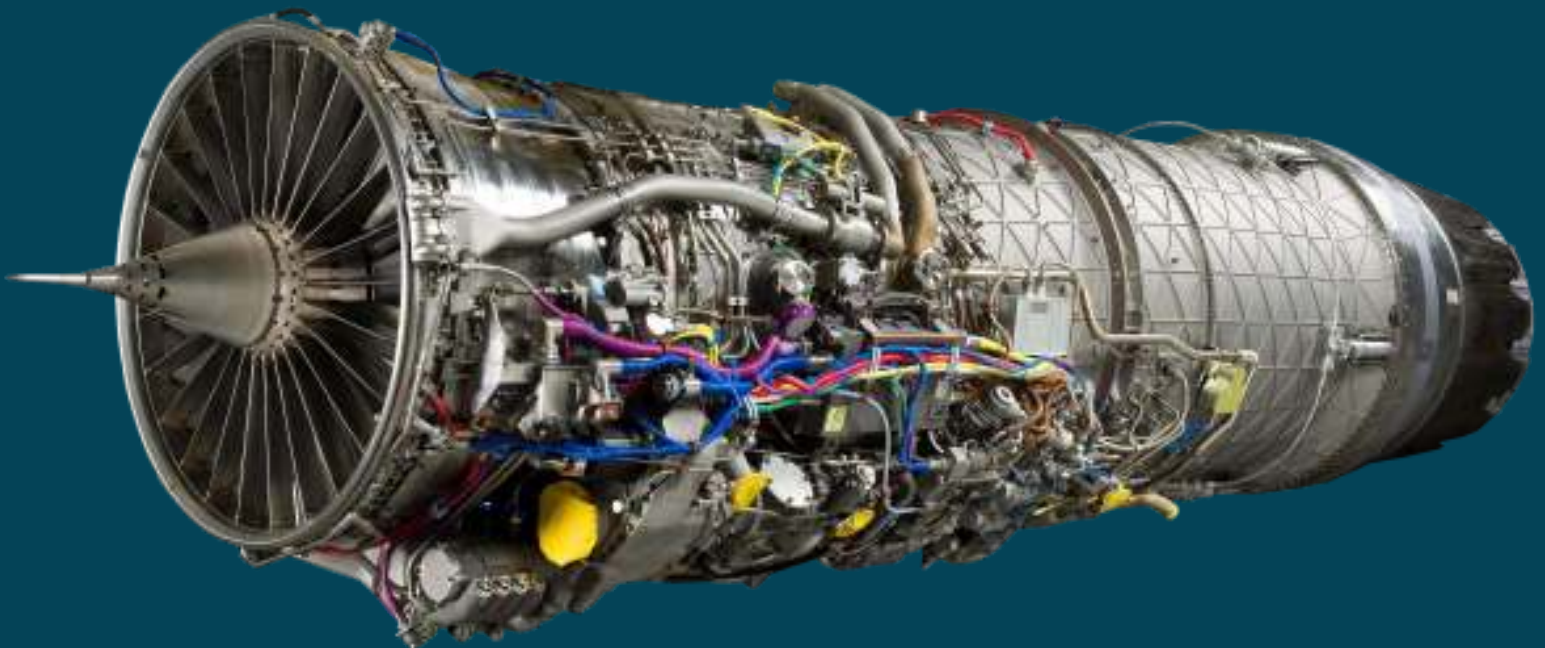
### The F100 at a glance

With more than 30 million flight hours flown by 24 allies air forces, the F100 delivers superior capability with industry-leading dependability, reliability and performance to the global fleet of F-15s and F-16s. The F100 is currently in production, and Pratt & Whitney is committed to supporting the F100 fleet for decades to come, including in the F-15EX and new F-16s.

- **Reliable:** The F100 is an industry leader in fighter engine reliability for the United States Air Force.
- **Technological Edge:** The F100 is the only field-proven 4th generation engine offering 5th generation technology.
- **Excellent Value:** The F100's low cost per flight hour provides excellent value to our customers.
- **Ease of Maintenance:** The F100 incorporates fully modular architecture, allowing 97% of maintenance tasks to be performed at the base level. F100 also has a world-class network of in-country field service representatives.
- **Experience Matters:** The F100 has achieved 30+ million flight hours.

### F100 Safety, Reliability & Performance

- The F100 engine is the global leader in its category, surpassing today the historic 30 million engine flight hour milestone – nearly three times as many hours as other 4th generation fighter engines.
- Both F100 engine models, the F100-PW-220 and the F100-PW-229, continue to sustain world-class levels in safety and reliability.
- The F100-PW-229 is the safest fighter engine in single-engine applications.
  - o Based on a 0.00 cumulative Class A mishap rate for the -229 on USAF F-16s.
- 2022 is the 50th anniversary of the F100 engine powering the F-15's first flight, and more than 3,500 F100s continue to deliver reliable performance to 24 customers around the world.
- The F100 significantly reduces the propulsion risk in a new program because of its mature and unmatched record of safety and reliability.
- The ability to rely on proven, reliable propulsion systems like the F100 allow us to deliver the propulsion systems our customers and partners need in less time and for a fraction of the cost of developing a new engine.
- The F100 engine is so reliable and trusted, it also powers more than half of the global fleet of single-engine F-16s.





### DEFEA 2023 SHOW DAILY

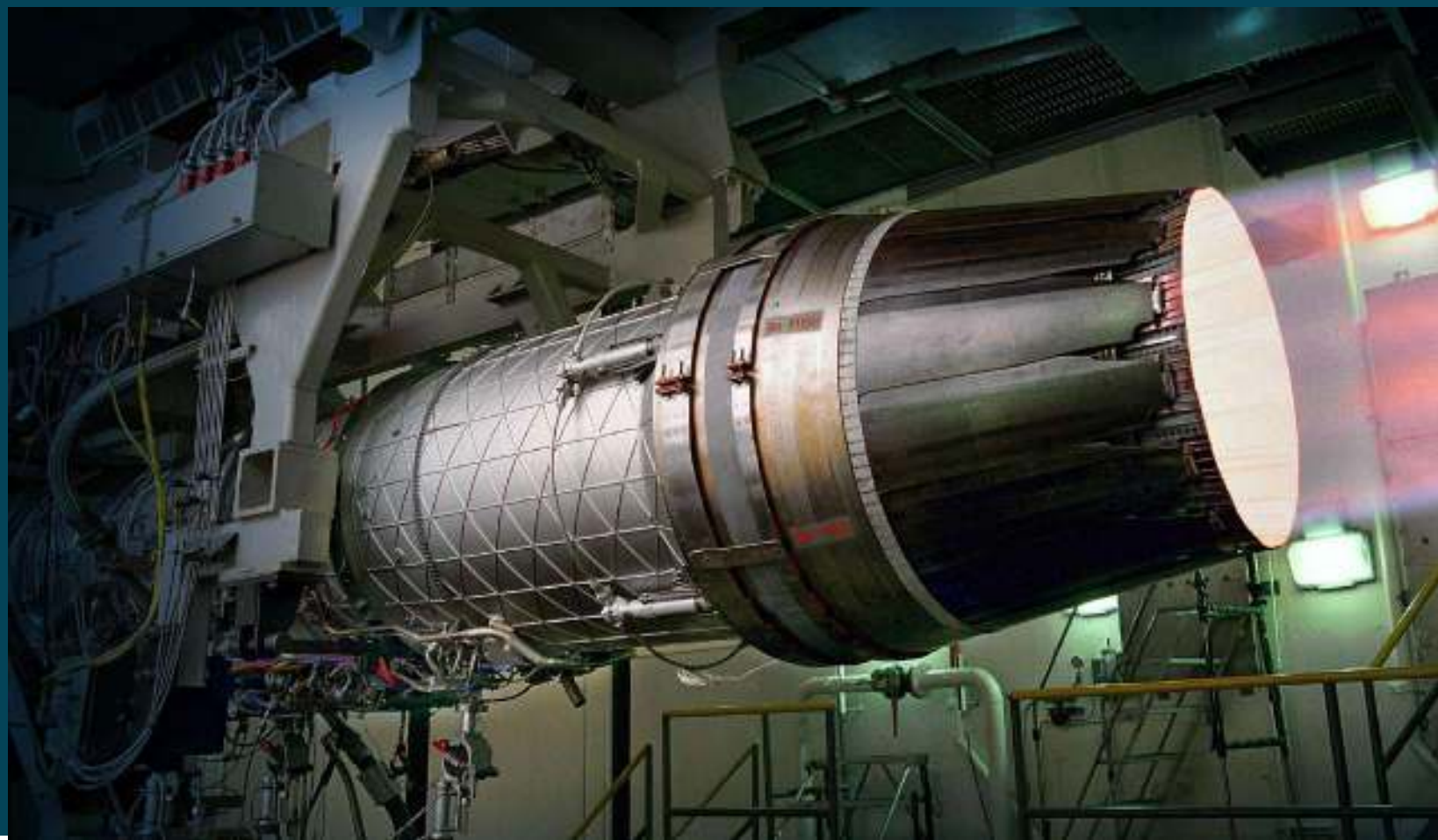
#### F100 pedigree & performance

- 50-Years of production, 30+ million flight hours, all current operational USAF F-15's, half the USAF F-16 fleet.
- The F100 engine was the first in its class to utilize a full-authority digital electronic engine control that transformed pilot throttle control; and the first to offer 6,000 total accumulated cycles (TAC), which afforded a significant improvement in reliability.
- P&W is the only engine manufacturer in the Western world that has operational 5th generation engines and P&W has incorporated these advanced technologies into the F100 product (e.g., Thermal coatings, turbine cooling, PHM prognostics, and engine health management) to ensure continuous improvement and performance of the global F100 fleet.
- The F100 family of engines offers a wide scale of thrust options ranging from 18,000 to 29,000 pounds. This scale reflects both augmented and non-augmented configurations.
- P&W supports its worldwide F100 fleet through Maintenance and Fleet Management Programs

and an unparalleled network of in-country field service representatives acting through dedicated Logistics program offices.

#### Industry Leader & Future Opportunities

- P&W has demonstrated successful integration of F100 products into UAVs and other unique applications.
- The F100 design (core flow) is uniquely suited for, and readily adaptable to support advanced airframe and weapon system requirements in power thermal management and mechanical power extraction.
- The F100 engine has been chosen to power new platforms like the Hermeus Darkhorse vehicle. The F100 significantly reduces the propulsion risk in a new program because of its mature and unmatched record of safety and reliability.
- P&W is uniquely qualified to integrate the F100 onto the Hermeus Darkhorse because P&W is the industry leader in the low-risk integration of its advanced propulsion systems onto military applications. For example: the C-17, KC-46, and KC-390.
- P&W boasts unique experience in high-Mach airframe applications such as the SR-71 with the P&W J58 engines and more recent propulsion systems like a rotating detonation engine that is coupled with our expertise in agile, digital development.
- The F100's design approach of modularity enables streamlined adaptation for integration into advanced applications such as Hermeus.



## DEFEA 2023 SHOW DAILY

## Israel Ministry of Defense and IAI successfully launched the "Ofek 13" satellite which has begun to orbit into space

The IMoD Space and Satellite Administration in the Directorate of Defense Research & Development (DDR&D), the Israel Defense Forces (IDF), and Israel Aerospace Industries (IAI) successfully launched the "Ofek 13" satellite into space Mar on 29 March 2023 at 02:10 IST . The launch took place at a test site in central Israel using a "Shavit" launcher.

The satellite successfully entered orbit, has begun transmitting data, and completed an initial series of inspections in accordance with original launch plans. IMoD and IAI engineers will continue pre-planned inspections before it begins full operational activity in the near future.

The "Ofek 13" satellite was developed based on the experience of the defense establishment and IAI in the production of earlier satellites in the "Ofek" series, which have been launched since 1988.

The IMoD's Space and Satellite Administration has led the development and production of the satellite and its launcher. The development process also includes the IDF's 9900 Intelligence Unit and the Israeli Air Force.

IAI is the prime contractor for the development of the satellite, launcher, and ground station monitoring system. The System Missiles and Space Group led by the Space division operates the project alongside with ELTA, an IAI subsidiary, and the MLM division. The launch engines were developed by Rafael Advanced Systems and Tomer, a government-owned company.

Once the satellite is deemed fully operational, the Ministry of Defense will deliver it to the IDF's 9900 Intelligence Unit for operational use. Defense Minister Yoav Galant, who was present during the launch stated: "The successful launch of the satellite is yet another important example of the Israeli defense establishment's groundbreaking innovation. Israel has already proved its diverse space capabilities many times and is one of very few countries to possess such capabilities - capabilities that we continue to develop and strengthen.

Our proud accomplishment today is first and foremost thanks to our engineers' creativity, talent and consistency in addition to the hard work of outstanding professionals that took part in this operation. We will continue to prove that even the sky isn't the limit for the Israeli defense establishment and that we continue to enhance its capabilities in every dimension in the face of various challenge

About two weeks after the satellite's successful launch into space, the DDR&D's Space Administration engineering teams, Israel Aerospace Industries, and the IDF's 9900 unit activated the "Ofek 13" satellite's synthetic-aperture radar (SAR) for the first-time last night. The first satellite images received at the IAI control station were of excellent quality.

Since the satellite launch on March 29th, the IAI and IMoD teams conducted a planned series of tests during which they gradually activated all of the systems and subsystems that comprise the satellite including the SAR payload. The tests were successfully activated. The engineering teams will continue the rigorous testing process to prepare the satellite for operational use in accordance with the pre-planned protocol. The "Ofek 13" satellite is a SAR observation satellite with advanced capabilities. In the coming weeks, following the completion of the In Orbit Tests led by IAI, the DDR&D and the IDF, the Israel Ministry of Defense will deliver the satellite to the IDF's 9900 Intelligence Unit for operational use.

© IAI



## Egyptian Air Force: First Rafale export user to reach 10,000 flight hours

In the presence of senior Egyptian authorities and Dassault Aviation representatives, a ceremony to celebrate the Rafale's 10,000 flight hours was held last week on the operational air base where the Egyptian Air Force's Rafale "Wild Wolves" squadron is stationed.

After an initial order in 2015, that made Egypt the Rafale's first export customer, followed by a second in 2021, the Rafale has now reached a new milestone thanks to the Egyptian Air Force: the first 10,000 flight hours operated by a user other than the French air forces.

This important milestone confirms the Rafale's technological and operational excellence and attests to the quality of the training of Egyptian

crews received in France. It also demonstrates the effectiveness of the systems and personnel put in place by Dassault Aviation to support the implementation of the aircraft in Egypt. Lastly, it illustrates the great skill of the Egyptian Air Force, which has carried out the transformation of its pilots and mechanics to the Rafale with ease and fluidity.

"Egypt has chosen the Rafale, recognizing its unique 'game-changer' character, to ensure its role in full sovereignty as a key player in the regional and international arena, in a demanding geopolitical context.

This celebration around the 10,000 flight hours of the Rafale salutes the great mastery of the Egyptian Air Force, the excellence of the Rafale, and honors Dassault Aviation, which has maintained strong relations with Egypt based on trust and commitment for nearly 50 years", said Eric Trappier, Chairman and CEO of Dassault Aviation.

With over 10,000 military and civil aircraft (including 2,500 Falcons) delivered in more than 90 countries over the last century, Dassault Aviation has built up expertise recognized worldwide in the design, development, sale and support of all types of aircraft, ranging from the Rafale fighter to the high-end Falcon family of business jets, military drones and space systems. In 2021, Dassault Aviation reported revenues of €7.2 billion. The company has 12,400 employees.

© Dassault Aviation



## DEFEA 2023 SHOW DAILY



Finally, the newly designed NIMROD 300 Remote Weapon Station designed by Valhalla in collaboration with Rheinmetall and EODH as a low-cost and high-performance solution for the upgrade of Infantry Fighting Vehicles is presented at the stand. This particular RWS carries a 30x173mm automatic cannon (Oerlicon KCE or ATK MK44) a 7.62mm coaxial machine gun and the ability of adapting a single or double A/T launcher of fire and forget missiles or a Loitering Ammunition launch unit to deal with all kinds of targets at long distances. Rheinmetall's state-of-the-art day/night sights as well as the remote control unit with the appropriate software and multiple interface options of different subsystems ensure high flexibility and ease of design adaptation to any operational requirement. This particular RWS is included in the offered upgrade package of 4K7FA APC to the

LEONIDAS 300 standard which also includes the replacement of the power-pack assembly, electrical and electronic circuits as well as the upgrade of the level of protection to Level 5 according to STANAG 4569.

With over 18 years of track record, EODH has resorted to its own state-of-the-art manufacturing facility, consistently pursuing its dedicated investment and growth plans. As a result, EODH has become an important global partner in the development, design and manufacturing of all types of protection systems in the defense market, with activities in Greece, Europe and the Middle East. By providing innovative and tailored made solutions for today's specific needs EODH became one of the preferred partners of **KMW** in the **LEO 2A7** and **Boxer 8x8** production as well in other modern AFV. Its key role results on the design, manufacturing and integration of their protection solutions.

## DEFEA 2023 SHOW DAILY

**EODH at DEFEA 2023**

The Greek company EODH S.A., based in Lakkoma, Chalkidiki participates in the International Exhibition of Defense Material DEFEA, (HALL 3 – STAND D4) which presents the latest developments in the field of protection of Heavy MBTs, Armored Fighting Vehicles and Light Armored Vehicles.

EODH presents for first time the heavy version of the advanced protection system "**ASPIS Modular NG - MBT**" (ASPIS - Advanced Shielding Platform Integrated System), installed on a Hellenic Army Leopard 2A4 MBT, designed as a complete hybrid solution that combines passive and active protection elements in the front arch to cope with modern threats such as tandem double warhead ATGMs and the new generation of long-rod APFSDS kinetic energy rounds. The design is such that it allows responding to multiple hits, while after attacking the armor modules can be replaced in field conditions by the crew. The solution proposed by EODH can be applied as an upgrade of existing MBTs or integrated into new designs and meets the new challenge posed by attack Drones, Loitering Ammunitions, and the new ATGM missiles in the Fire & Forget parabolic trajectory that attack the MBT at the top of the turret.

It uses stand-alone millimeter-wave radar sensors, distributed on the roof of the tower that, when activated, detect incoming threats approaching the roof from high elevation angles, and at the appropriate time trigger directed explosion charges. In addition, EODH presents the new Anti-Tank version of the High Mobility Armored Vehicle 4x4 "**Hoplite**" which incorporates many innovations and provides an excellent balance between the mobility and the protection. Aiming to cover National and International requirements in high mobility multi-role armored vehicles, EODH developed a new generation vehicle with its own resources, with modular design and high performance, suitable to cover a wide range of Military and internal security missions. The EODH design team, using tested sub-systems by specialized companies of known prestige, designed a vehicle of high operational value, which stands out for a plethora of innovations and at the same time integrates top level of protection for its class. The main goal of the new design is to create a basic platform with a maximum gross weight of 12 tons with a payload of 2 tons, easily adaptable to different roles, with main features Strategic and Tactical mobility, the great reliability and operational readiness with the least possible Logistics, high survival and capability conducting business under any circumstances.

EODH ©



## DEFEA 2023 SHOW DAILY

## Leonardo and Armaereo awarded a contract on the upgrade of the Italian Air Force's C-27J fleet



Leonardo and Armaereo, the Italian Defence Ministry's Air Force Armament and Airworthiness Directorate, on 7 March 2023 have signed a contract which represents an important step in the Italian Air Force's C-27J Spartan fleet upgrade.

The contract includes: the development, integration qualification and certification of a new avionics configuration for the C-27J, the upgrading of a number of general systems on the aircraft, the self-protection system and the flight simulator. It also includes the delivery of the relevant first aircraft in this configuration, potentially followed by the retrofitting of the remaining 11 aircraft.

Under this contract, the Air Force's C-27J will receive a significant upgrade of its avionics suite through the integration of new features such as the Mission Computer, the Flight Management System, Head Up and Head Down displays, radio and satellite communication systems, self-protection system and other upgrades improving the aircraft's flexibility and operational effectiveness. The training system will also be updated on the basis of the new systems introduced on-board, aligning both training devices (flight simulators) and courseware (teaching materials) along with relevant technical publications.

Dario Marfè, Senior Vice President Commercial and Customer Services of Leonardo, Aircraft Division, said: "The latest evolution of the C-27J further

improves the Spartan's efficacy and operational capability. We're proud to announce that the Italian Air Force has chosen the new avionics configuration of the C-27J, which will provide even better performance and efficiency. With its versatility and mission flexibility, the C-27J offers an even broader range of capabilities to support the operators in facing new challenges."

The Spartan embodies the very essence of national security, proving itself as an ideal asset for defence force operations and it also provides a vital contribution to civil protection tasks, as an aircraft capable of reaching the population even in the country's most remote and challenging areas.

Before the Italian Air Force, the air force of Australia already signed an agreement to upgrade its fleet. Very recently Romania and US operators of Spartan, US SOCOM and US Coast Guard, chosen for the avionics upgrade of their C-27J aircraft fleets.

The retrofit possibilities have been specifically studied as part of the development of the C-27J program, with the aim of allowing operators to constantly benefit from the improvements made to the aircraft.

A multitude of kits and easy to install and transportable roll-on/roll-off mission systems allow the C-27J to be rapidly transformed into the configuration required for the relevant mission. As a 'tactical airlifter', the aircraft's versatility extends from airlifts of troops and cargo to airdrops of paratroopers and materials, from medical battlefield evacuation to VIP transportation, from humanitarian assistance and natural disaster response to firefighting. The C-27J can be configured in the Maritime Patrol (MPA), Anti-Submarine Warfare (ASW) and Command-Control-Communications, Intelligence, Surveillance and Reconnaissance (C3ISR) versions.

The C-27J can be fitted with Active Electronically Scanned Array (AESA) search radar, electro-optical/infrared systems and other specific sensors essential for Intelligence, Surveillance, Reconnaissance (ISR), Maritime Patrol (MPA), Anti-Submarine Warfare (ASW) and Signals Intelligence (SIGINT) missions, support to Special Operation Forces and ground troops. The aircraft's sensors can be managed via a palletised and rapidly removable mission system that analyses data collected and transmits it to the crew in real time. The fire fighter configuration with roll-on/roll-off second generation Modular Airborne Fire Fighting System (MAFFS II) by United Aeronautical Corporation, world leader in advanced aerial application systems, enhances the C-27J's multi-mission capabilities.

## DEFEA 2023 SHOW DAILY

## Two more AW139s supporting the Australian Defence Force (ADF)

The helicopters will supplement a fleet of three AW139s currently supporting a range of activities including pilot and aircrew officer training, utility support to ADF exercises and emergency response and disaster relief missions.

With over 60 aircraft selected by multiple operators in Australia, the AW139 is chosen for its suitability across a wide range of roles including Helicopter Emergency Medical Service (HEMS), Search and Rescue (SAR), law enforcement, offshore and defence.

The AW139 has proven to be extremely successful platforms with military forces worldwide. It has developed an enviable reputation for its performance in Search and Rescue, Medical Evacuation (MEDEVAC), special operations, homeland security, slow mover intercept, advanced training, utility and transport.

Leonardo announced the expansion of its fleet of AW139 intermediate twin engine helicopters in Australia with an order for two aircraft by the leading helicopter operator Toll Helicopters (Toll). The helicopters will supplement a fleet of three AW139s currently supporting a range of activities including pilot and aircrew officer training, utility support to ADF exercises and emergency response and disaster relief missions. They will be delivered

from Leonardo's Vergiate final assembly line facility in Italy in the second half of 2023 and bring Toll's fleet of AW139's to a total of 12.

The AW139 has been sold by Leonardo in several State Government of the country to carry out a range of law enforcement, patrol and surveillance, maritime search and rescue missions and policing operations. This helicopter is ideal for law enforcement, EMS and parapublic missions thanks to its capability, reliability and safety. A fleet of over 60 units performs all of these missions today in Australia in addition to energy support and transport.

With more than 1,130 units in service with over 280 customers in around 90 nations and over 3.6 million flight hours logged to date since its certification in 2004, the AW139 has also proven extremely successful among military operators worldwide for a wide range of roles including SAR, MEDEVAC, special operations, homeland security, slow mover intercept, advanced training, utility and transport. The AW139 delivers outstanding capabilities, technology and safety to meet stringent requirements from operators for tasks in harsh conditions to maximize effectiveness. The type features state-of-the-art avionics with advanced navigation and collision avoidance systems to enhance situational awareness and reduce pilots' workload, unmatched speed, power margins and overall performance, the widest cabin in its category featuring high modularity for rapid reconfiguration, a unique 60+ min run-dry capable main gear box for enhanced reliability and safety and up to 1000 certified kits.

Toll Helicopters, headquartered in Brisbane, is an experienced provider of specialised mission-critical helicopter services and training for Government, Defence and the civil sector, specialized in helicopter emergency medical services, search and rescue operations, airborne law enforcement, training and logistics support. Toll is a Leonardo Authorised Training Centre with the only OEM-approved AW139 Full Flight Simulator in the Oceania region.

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## Diehl Defence GBAD Systems - successfully combat proven

Air defence systems are used to protect populations, important buildings, objects as well as ground troops against attacks from the air. Particularly ground-based air defence is capable of providing continuous area protection over the long term. The current global security situation favours defence systems that offer protection against a variety of hostile attacks, such as attacks from manned aircraft, unmanned aerial systems and helicopters at different ranges. Therefore, Diehl Defence has continuously developed its "Layered Air Defence" approach, based on the IRIS-T product family, to encounter different threats and threat scenarios from very-short range to long-range as well as for the defence against hypersonic missiles and has thus become a leading supplier of state-of-the-art defence systems covering different ranges.

The system IRIS-T SLM (surface launched medium range) provides highly effective protection against enemy aircraft, helicopters, missiles and drones and consists of the components missile launcher, multifunctional radar and TOC (tactical operations center). The modular system, which is currently in operation in an area of conflict, offers 360° protection of areas as well as high value targets such as cities, power plants, offshore platforms and other critical infrastructure, covering very short up to medium ranges (40 km distance and 20 km altitude). Several targets can be engaged simultaneously. This means, that one IRIS-T SLM system can protect the population and infrastructure of a large city through its protective shield against airborne threats. IRIS-T is characterized by high mobility as well as its all-terrain and all-weather capability. It is equipped with the surface-to-air guided missile IRIS-T SL, which was specifically developed for the ground-to-air application according to the requirements of the German Bundeswehr. Due to the high level of automation, the air defence system can be operated with a very low number of staff. The training times for new users for the safe handling of IRIS-T SLM amount to 6 to 8 weeks. A comprehensive Integrated Logistic Support concept is an integral part of Diehl Defence's customer service.



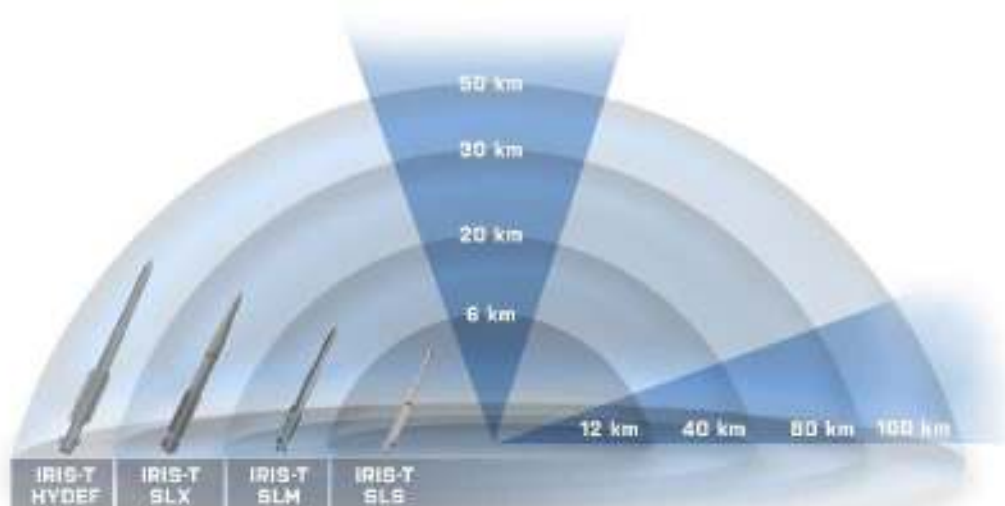
© Diehl Defence

So far, Diehl Defence delivered IRIS-T SLM to several customers, of which one has introduced the air defence system into its armed forces for immediate operations against an aggressive invasion force. Operational data have proven that IRIS-T SLM performed to full customer satisfaction under combat conditions.

Diehl Defence also offers as part of its layered air defence approach the IRIS-T SLS air defence system for short-range (radius of 12 km). The consistent use of open interfaces enables flexible integration of highly mobile IRIS-T SLS units into the IRIS-T SLM architecture. System variants for long-range (IRIS-T SLX, radius of 80 km) and for the defence against hypersonic threats (IRIS-T HYDEF, radius of 100 km) are currently under development in order to complete the IRIS-T GBAD product family.



## DEFEA 2023 SHOW DAILY



For decades, Diehl Defence has maintained a cooperation with Hellenic Defence Systems (HDS). Most prominent is HDS's contribution to the IRIS-T air-to-air missile program. Every single IRIS-T missile in service around the world contains a warhead produced by HDS. In December 2022, Diehl Defence and HDS decided to intensify their relationship:

Both companies signed a cooperation agreement in order to extend the long lasting cooperation to the ground-based air defence systems IRIS-T SLS and SLM. Together with the ongoing discussion for a future GBAD system for the Hellenic Armed Forces, even more collaboration opportunities might emerge.

## EMMIS- certified low voltage transformers

EMMIS has been manufacturing low voltage transformers since 1974, having established a significant tradition in Greece and internationally.

With continuous investments in Research & Development and advanced Engineering Equipment, EMMIS is today one of the few companies worldwide with production of **certified low voltage transformers**. At the same time, EMMIS MARINE manufactures specially designed transformers that fulfill the requirements of the marine industry.

Based on stringent international standards, Quality Control is carried out at all stages of the production process, from the receipt of raw materials to the completed products, one by one.

Also, through **exclusive strategic partnerships with leading manufacturers from Central Europe**, the product portfolio has been expanded, providing integrated systems and high value-added solutions in the sectors of electrical power supply, control and power quality.

Due to the accumulated experience and know-how, in conjunction with the flexibility in production, there is the possibility for **customized and highly challenging productions**, even of single items.

EMMIS MARINE has focused in recent years on investments to upgrade the quality of its products to meet the **specific needs of defense applications even more closely**, including the minimization of energy losses, contributing to the reduction of the energy footprint.



## ITALIAN INDUSTRY SIGNS CONTRACT FOR NEXT DEVELOPMENT PHASE OF 6TH GENERATION AIR SYSTEM

Italian industry signs contract for next development phase of 6th generation air system

- activities that will underpin Italy's participation in the Global Combat Air Program (GCAP) are now underway
- These will help define the innovative technologies that will deliver a generational leap forward in national defence capabilities
- The project will generate a positive return for Italy's national industrial ecosystem, drawing on SMEs, start-ups, universities and the world of research

The team of Italian companies that will participate in the development of the new Global Combat Air Program (GCAP) have signed a contract to support the Italian Ministry of Defense in the program's new concept & assessment phase and related demonstration activities. The team, which comprises Leonardo - as a strategic partner - and Italy's leading companies in their respective domains: Elettronica, Avio Aero and MBDA Italia, will progress technology development in support of the GCAP "system of systems" concept, based on sixth-generation combat air platforms operating in multi-domain scenarios.

Industry will collaborate with universities, research centres, SMEs and start-ups, allowing for the exchange of knowledge and growth of skills at a national level, all in close partnership with the Italian Ministry of Defence. The Ministry will be responsible for defining operational needs and directing technological development, drawing on industry support.

Alessandro Profumo, Chief Executive Officer at Leonardo said: "This new phase is a crucial step in the process of identifying and making available the innovative technologies that will ensure our defence capabilities make the necessary generational, technological and operational leap forward, allowing our national enterprise to reach the highest level of excellence and strategic autonomy. As part of the

GCAP program, Italian companies will play a fundamental role in the future of the defence industry at a national and international level. This will take place in a framework of growth that strengthens the operational capacity of our Armed Forces while at the same time generating positive returns including technological, economic and social progress for the entire national ecosystem".

Enzo Benigni, Chairman and CEO of Elettronica said: "With the launch of this new phase of the GCAP program, we are developing a plan for technology and industry that will move Italy's technology sector from the Typhoon era, the last major European combat air development program, into a new era of combat air underpinned by sixth-generation capabilities. The wider geopolitical context underlines how vital it is to achieve the right level of readiness, interoperability and availability of technologies. By doing so, we will be prepared to manage any crises that may affect us. Italian industry's significant role in the GCAP program will secure a national, European and international legacy, helping to cement the concepts of strategic autonomy and technological sovereignty. Elettronica is ready to contribute and recognises that the objectives that the GCAP program aims to achieve are also its own".

Riccardo Procacci, CEO of Avio Aero said: "Today's challenging geopolitical context requires technological solutions that focus on operational excellence and the ability to adapt to future scenarios. The GCAP program is responding to this need and will support the requirements of the Armed Forces while guaranteeing strategic autonomy. Avio Aero, as a European company in the propulsion sector and a long-term partner of the Armed Forces, is bringing its capabilities and recognised technological excellence to the program as well as continuing to invest in the development of innovative technologies with the support and involvement of its network of collaborations with universities, research centers and SMEs".

Lorenzo Mariani, Executive Group Director Sales and Business Development at MBDA Group and CEO of MBDA Italia, said: "By participating in the GCAP program and this second phase of our contract, MBDA Italia and our partners at research centres and SMEs will deploy our collective ability to manage the effectors and related technologies required for the system of systems. These technologies will form the basis of complex systems for national air defence. The ability to counter the most challenging threats will be a key element of the performance of a sixth generation combat air system".

In support of the GCAP program, Italy has already earmarked 6 billion Euros for investment in research



and development that will allow for the launch of technology development projects in areas of strategic interest. These will allow Italy's national industry to participate in the future development phases of the system-of-systems.

The development of a national collaborative work environment, a digital infrastructure underpinned by advanced security, will enable information, services and activities to be shared securely, supporting the subsequent implementation phases via a secure and classified virtual environment. The activation of projects which will deliver technological growth in areas of strategic interest will allow Italy's national industry to play a substantial role in the development of the system of systems. This activity will be vital in achieving an appropriate level of national sovereignty.

This initiative is also laying the groundwork for further international collaboration in the development of technologies relating to sixth-generation combat air platforms by enhancing Italy's national industrial competitiveness, its strategic autonomy and the academic and professional skills of current and future generations. In support of this goal, companies have already begun to invest in research, to activate collaborations with universities and to support technology incubators in the innovation sector by promoting the most promising ones nationally and internationally.

Italian activities related to GCAP, the Global Combat Air Program, officially started in December 2021, with initial funding allocated by the Ministry of Defence. The Ministry launched the "Typhoon-to-GCAP" technological evolution and transition phase with the support of industry, setting in motion a process of strategic modernization for the nation's operating resources.

Italy's national ambition is to develop, through the GCAP program, a truly innovative model of collaboration between Defence and industry, which could then represent a blueprint for future projects. Taking a system-level approach, the technologies involved range from aeronautics to electronics, from cyberspace to the integrated management of propulsion and power.

All of these will be able to leverage technologies such as artificial intelligence, big data analysis, quantum computing, digital twinning and integration between platforms both crewed and uncrewed.

The R&D activities of the Ministry of Defence and industry therefore include the study of requirements and solutions necessary to define the overall system, the creation of a technology development plan for a demonstrator that can support the roadmap and technology development & de-risking.

## Safe ejection for aircrew

Martin-Baker is the world's longest established and most experienced developer of ejection seats with approximately 17,000 seats in-service today, fitted to 70 aircraft types, flying with 117 operators across 83 countries. Backed by 78 years of continuous development, Martin-Baker has saved the lives of 7,691 aircrew worldwide.

Our range of crashworthy seats incorporate energy attenuation systems for both rotary and fixed wing aircraft. The crew and mission seats can be fitted in most maritime patrol and reconnaissance aircraft with 20,000 seats delivered to date.

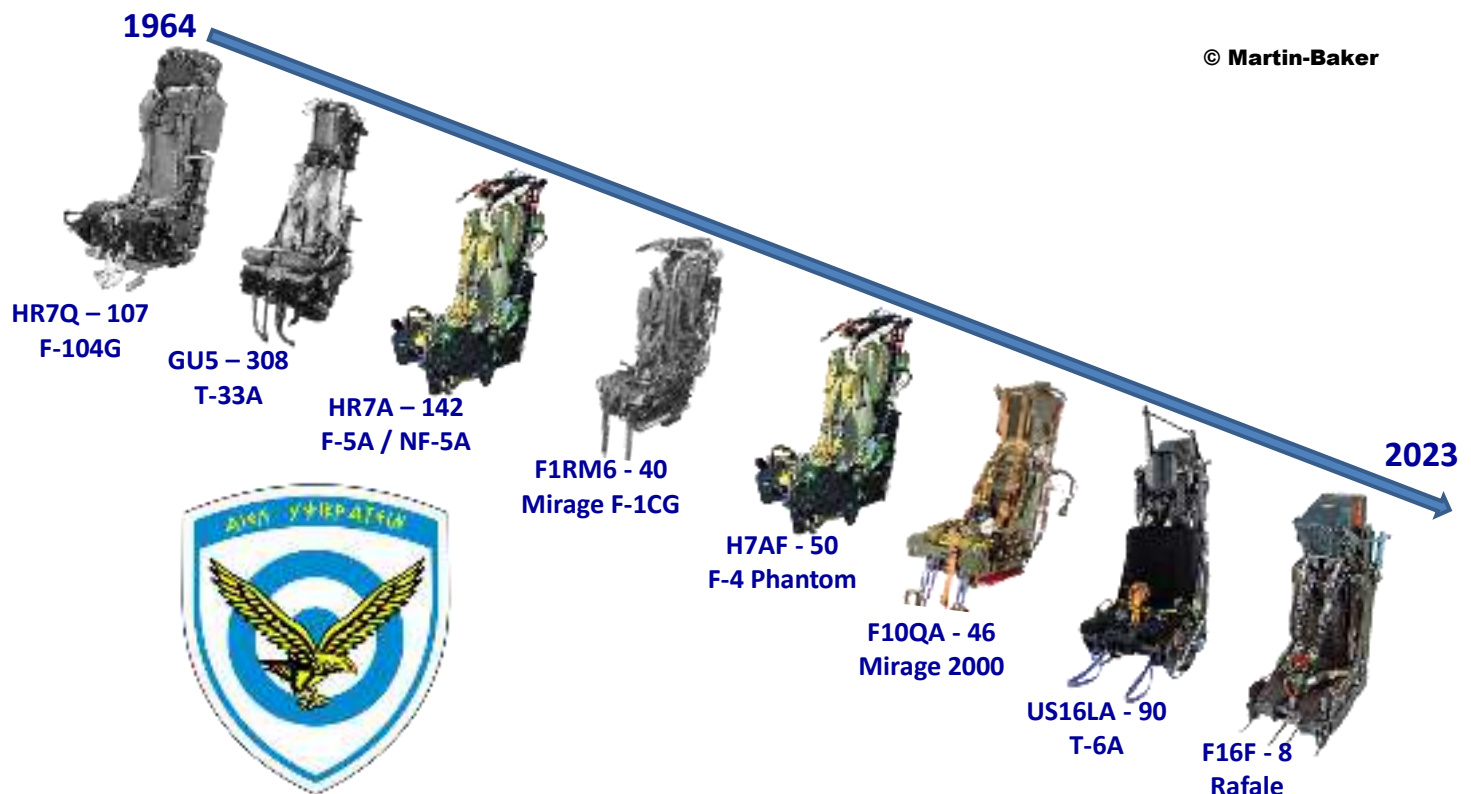
The Hellenic Air Force (HAF) has been an important operator of Martin-Baker ejection seats which began in 1964 with the GU-5 for the Lockheed T-33A now includes the F16F fitted to the Dassault Rafale that is now entering HAF service.

Martin-Baker has been proud to have saved the lives of 91 HAF aircrew over the past 59 years. Some 833 ejection seats have equipped 582 HAF aircraft using 8 different ejection seat types.

The very first HAF ejection took place from a Lockheed F-104G Starfighter on 05 July 1971 with the last ejection taking place from a Dassault Mirage 2000-5 on 29 May 2017.

In the future Leonardo M-346 lead-in fighter trainers and Lockheed Martin F-35 fighter aircraft will enter HAF service fitted with IT16D and US16E Seats respectively.

Additionally, Martin-Baker is qualifying its newest 5<sup>th</sup> Generation ejection seat, the US18E, for the end of 2023 for retrofit into F-16 aircraft. The US18E introduces the latest technology to enable safe ejection for aircrew wearing Helmet Mounted Displays (HMD) while simultaneously expanded the aircrew boarding range while reducing aircraft life cycle costs. The US18E remains an option for the HAF to consider including within the F-16 Mid-Life Upgrade (MLU) across the existing fleet of 116 F-16C and 39 F-16D Block 52 aircraft.



Martin-Baker is pleased to be exhibiting at DEFEA for the very first time. Visit us in Hall 4 at Booth D18 to discuss our latest ejection and crashworthy seats.

## DEFEA 2023 SHOW DAILY



© US18E ejection test at MBA test facility

## Martin-Baker has never been in the Lockheed Martin F-16 until now

The US18E ejection seat is a derivative of the US16E that is fitted to all variants of the Lockheed Martin F-35 5<sup>th</sup> Generation fighter aircraft. With more than 1100 seats delivered, the US16E has already saved the lives of 7 F-35 aircrew across the US and UK.

Competitively selected in 2020, introduction of the 5<sup>th</sup> Gen Seat into the F-16 introduces the following improvements over the legacy seat that it replaces:

- **Safe ejection** for aircrew wearing a Helmet Mounted Display (HMD) across the speed range;
- **Expanded** boarding mass range that becomes Gender neutral;
- **Modular** seat design that saves maintenance by reducing the need for canopy removals.
- While new seats are destined for the F-16 Block 70/72 production line in Greenville, South Carolina, Seat retrofit to earlier F-16 Blocks is still possible as

While new seats are destined for the F-16 Block 70/72 production line in Greenville, South Carolina, Seat retrofit to earlier F-16 Blocks is still possible as operators seek to upgrade their aircraft to extend their service life and operational mission effectiveness.

The Hellenic Air Force (HAF) currently operates both F-16C Block 52 and F-16D Block 52 aircraft and could consider the US18E ejection seat as part of the Mid Life Upgrade (MLU) program. This would allow the HAF to safely operate the latest Elbit Joint Helmet Mounted Cueing System (JHMCS) II HMD across a wider escape envelope and a wider aircrew population.

Should the F-16 Block 30 aircraft be included within the HAF retrofit numbers, there is reduction of 9,000 scheduled and unscheduled canopy removals estimated over 20 years, across the F-16 fleet. This equates to a reduction of 175,000 maintenance man-hours over the same period.

As aircraft availability is one of the key factors for generating airpower and lowering life cycle cost, the reduced number of canopy removals could increase the availability of each HAF F-16 aircraft by an estimated 14 days per year on the flight line!

## Bundeswehr orders upgrade of 143 Puma infantry fighting vehicles

On 19 April 2023, Germany's Federal Office for Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) has awarded Projekt System & Management GmbH (PSM), a joint venture of Krauss-Maffei Wegmann (KMW) and Rheinmetall, an order to retrofit a further 143 Puma infantry fighting vehicles. In doing so, the German government is exercising two options

contained in the contract for retrofitting original Puma infantry fighting vehicles to the new S1 design status. This contract was signed in June 2021. The order volume is in the region of €770 million. By 2029, the key capabilities of firepower and command and control of all 143 Puma systems will be brought up to date.



## DEFEA 2023 SHOW DAILY

## Elbit Systems Marks 20 Years of Operating the Elementary Trainer Aircraft Fleet of the Israeli Air Force with 95% Availability Rate

Elbit Systems Ltd is marking 20 years of operating the sixteen GROB G-120-AI aircraft fleet of the Israeli Air Force (IAF) that was established by Elbit Systems in 2002 as a multi-year Private Finance Initiative (PFI) program under which the Company procures, operates and maintains the fleet, providing the IAF with training flight hours. Since the start of operations, high customer satisfaction level has earned Elbit Systems with follow-on contracts to continue delivering this service to the IAF for two consecutive 10-year periods. During the 20-year period of its operation, the GROB G-120-AI fleet delivered 140,000 training sorties and 85,000 flight hours while maintaining availability rate of 94.7%.

Elbit Systems' expertise on delivering, operating and maintaining aircraft fleets resulted in continuous expansion of the Company's activity in this area. The Israeli Ministry Of Defense contracted Elbit Systems for handling two additional training fleets for the IAF – the Texan T-6 basic trainer fleet and the M-346 advanced jet trainer fleet; the Israeli Ministry of Public Security also contracted the

Company for the delivery, operation and maintenance of Israel's Air Tractor aerial firefighting fleet. In 2016 Affinity, an Elbit Systems JV, was contracted to procure, operate and maintain the Phenom 100, Beechcraft T-6 and GROB G-120TP fleets of the UK MFTS for the Royal Air Force. In 2020 the Company secured an approximately \$1.7 billion contract from the Hellenic Ministry of National Defense, under a G2G contract, for the establishment and operation of the Hellenic International Flight Training Center with fleets of T-6 and M-346. These bring the total number of aircraft operated by Elbit Systems to over 170.

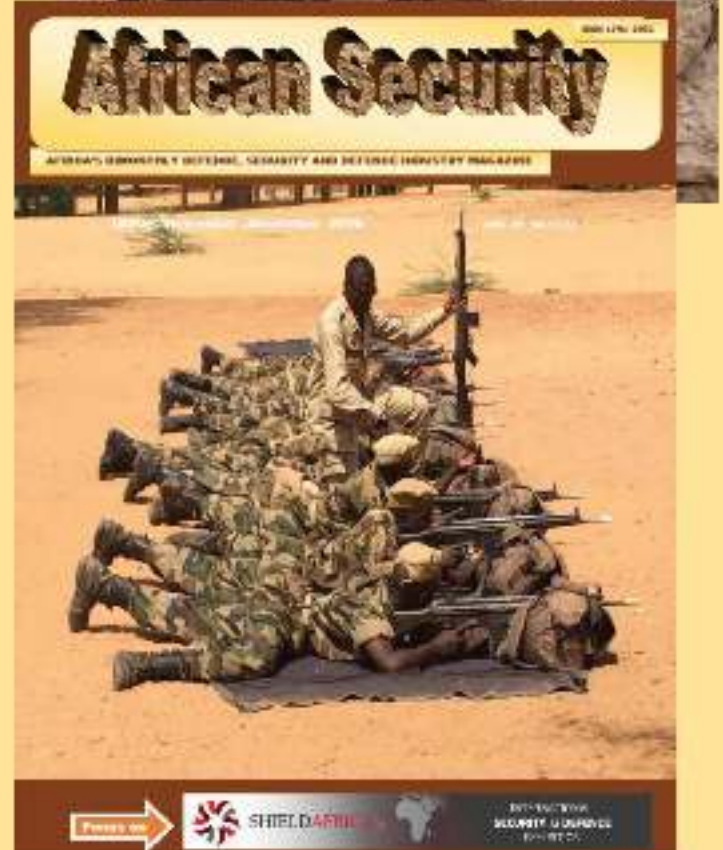
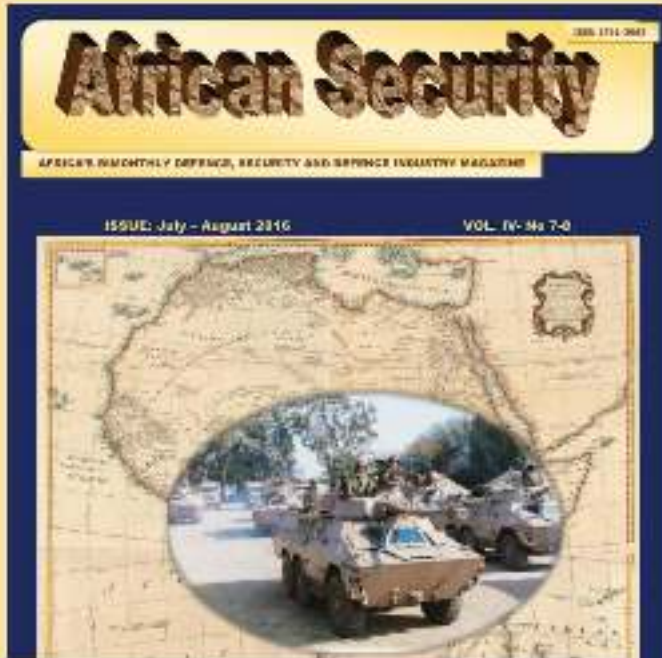
In November 2022, during the latest edition of NIDV's Exhibition Defense & Security (NEDS) Elbit Systems and Fokker Services Group signed an agreement to provide advanced, proven military flight training capabilities. Under the cooperation scheme Fokker Services Group will add its considerable MRO expertise and capacity to Elbit Systems' comprehensive portfolio of advanced flight training solutions that can be optimized to meet domestic requirements. "We are proud of the excellent performance indicators we have been able to achieve," said Adi Raviv, Elbit Systems VP for Flight Academies and Services, explaining that "delivering such a top service rate, with an emphasis on safety and availability, takes highly professional technical teams, well organized logistics and rigorous management."

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# African Security

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## DEFEA 2023 SHOW DAILY

## Israel Aerospace Industries presents its BlueWhale large Autonomous Underwater Vehicle (AUV)

Israel Aerospace Industries (IAI) is extending its maritime capabilities and presenting its BlueWhale Large Autonomous Underwater Vehicle for the first time. This has successfully undergone thousands of autonomous operation hours, including intelligence-gathering for both maritime and coastal targets, acoustic intelligence, and identifying the presence of naval mines. The autonomous submarine can perform a significant portion of the operations of a manned submarine, for periods of several weeks, at minimal cost and maintenance, without the need for operators on board.

Like manned submarines, BlueWhale performs covert intelligence-gathering above the sea surface, can detect submarines, underwater targets and gather acoustic intelligence, and also search for and detect naval mines on the seabed.

BlueWhale is equipped with a telescopic mast, like the periscope of a manned submarine, several meters high, on which are mounted radar and electro-optical systems for detecting sea and coastal targets. By using a satellite communications antenna on the mast, the gathered data can be transferred in real-time to command posts, anywhere in the world, at sea or on land. Submarine detection and acoustic intelligence-gathering data is enabled using a sonar, several tens of meters long, towed by the BlueWhale, and by flank array sonar with receiver arrays attached to both sides of the platform. In parallel, mine detection is performed using a dedicated synthetic aperture sonar, attached to the sides of the vessel. The BlueWhale has a sensor suite to help ensure its safe transit underwater or near the surface. In recent years, a number of international patents have been registered regarding development of the system.

**IAI VP and ELTA's CEO , Yoav Tourgeman:** "BlueWhale joins the family of land, sea, and space-based unmanned platforms, developed by IAI, and represents a force-multiplier for submarine fleets. Based on its advanced engineering capabilities IAI's Elta Group has for the first time in the world managed to bring to maturity the development and production of an autonomous underwater system able to perform a wide range of tasks. BlueWhale is a significant member of IAI's family of maritime products, which include solutions for use in Economic Exclusion Zones, tools for managing autonomous vessels, and their integration in monitoring the maritime arena."

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## DEFEA 2023 SHOW DAILY

## EDA-initiated multinational fleet of tanker transport now deployable worldwide

The multinational fleet of Airbus A330 tanker and transport aircraft, which was developed with support from the European Defence Agency (EDA), has been cleared for operations worldwide. First proposed at a NATO summit in 2012, the initiative for a Multinational Multi Role Tanker Transport Fleet (MMF) was established by EDA along with the Organisation for Joint Armament Cooperation and the NATO Support and Procurement Agency.

Now with six participating countries, the fleet performs air-to-air refueling of fighter jets, can carry out medical evacuations and also transport cargo and passengers. MMF reached Initial Operational Capability on March 23 in a ceremony attended by EDA Chief Executive Jiří Šedivý and NATO Secretary General Jens Stoltenberg, as well as the ministers and senior officials of the Netherlands, Luxembourg, Belgium, Norway, Germany, Czechia and the European Commission.

EDA's role in getting the project off the ground was crucial, by bringing together contributing Member States, motivating countries to join and negotiating the aircraft acquisition options.

To initiate MMF, EDA set up a project team to work on the harmonisation of requirements towards a future tanker capability. It helped craft the legal framework to establish the programme and smooth the way for the organisational and industrial partners that were to join.

The Netherlands, where the NATO-owned aircraft are registered, serves as the fleet's base. Aircraft are also stationed in Cologne, Germany. The Netherlands and Luxembourg launched the programme in July 2016. Germany and Norway joined in 2017. Belgium followed in early 2018 and Czechia joined the MMF programme in October 2019. Seven aircraft from the fleet are in service. Two more are expected to join in 2024, with the tenth aircraft scheduled for delivery at the end of 2026.

At present, the fleet has already provided six million liters – or about twice the volume of an olympic-size swimming pool - of fuel to NATO allies. MMF aircraft were the first tankers to deploy over Poland in support of NATO air policing following Russia's invasion of Ukraine. In total, the fleet has flown more than 500 missions, as well as supported the evacuation of civilians from Afghanistan and deployed for exercises with NATO partners such as Australia. Later this year, MMF aircraft will fly to the Middle East to support operations against ISIS.

EDA supports all EU Member States in improving their defence capabilities through European cooperation. Acting as an enabler and facilitator for Ministries of Defence willing to engage in collaborative capability projects, the Agency has become the hub for European defence cooperation with expertise and networks spanning the whole spectrum of defence capabilities. Member States use EDA as an intergovernmental expert platform where their collaborative projects are supported, facilitated, and implemented.



## DEFEA 2023 SHOW DAILY

## CopterPIX multi-rotor UAV solutions



**CopterPIX**, world leader in the development and manufacturing of autonomous, multi-rotor UAV solutions, **CopterPIX** is IDF's **exclusive provider of drones up to 25kg MTOW till 2026.**

**CopterPIX** has a strong track record in providing high-performing and reliable multi-rotor drones for a variety of applications including military and commercial use. Our Drones performed complex missions in fully operational and challenging conditions.

**CopterPIX** drones deliver AT LEAST 30% longer flight-time / carry heavier payload than ANY

commercial platform - thanks to CPX (our open framework platform), can easily integrate 3rd-party hardware and software. All made possible by a world-class team together with high-end proprietary technology.

**CopterPIX** multi-rotor drones range from 150gr MTOW to 50kg MTOW, include the following:

The **ERE 95** family, with world-leading heavy lifters (electric or hybrid operation systems), include the **ERE-95 Mini-Series** of drones for long-range inspection missions (100min flight time w/dual day/thermal camera); the **ERE-95 Series** hexarotor, fully redundant multi-purpose drones that carry payloads up to 20kg and **ERE-95 Hybrid** series offering a hybrid generator kit (mid-air stop/start for low-noise missions) enabling **5.5hours** of flight time w/dual day/thermal camera (9kg payload=1hour).

**CopterPIX** develops the world's 1<sup>st</sup> **Hybrid Parallel drone** which carries 25Kg for 50Km, 100Kg for 100Km (Q4/2023 commercial sales begins).

The revolutionary **APS300** Autonomous Patrolling System, using unregulated micro-drones with small mobile docking nests provides 24/7 patrolling capabilities for sites with perimeters up to 5km.

**CopterPIX** is a well-positioned leader in the UAV industry with a strong focus on developing cutting-edge technology and providing customized solutions for its clients.

## TYPHOON fire extinguishing systems

- With respect for human life.
- The environment
- And the economy.

Robotic firefighting is now a fact, with the use of spray (SPRAY).

- The systems are based on two axes
- Minimum operation time
  - Immediate fire suppression.

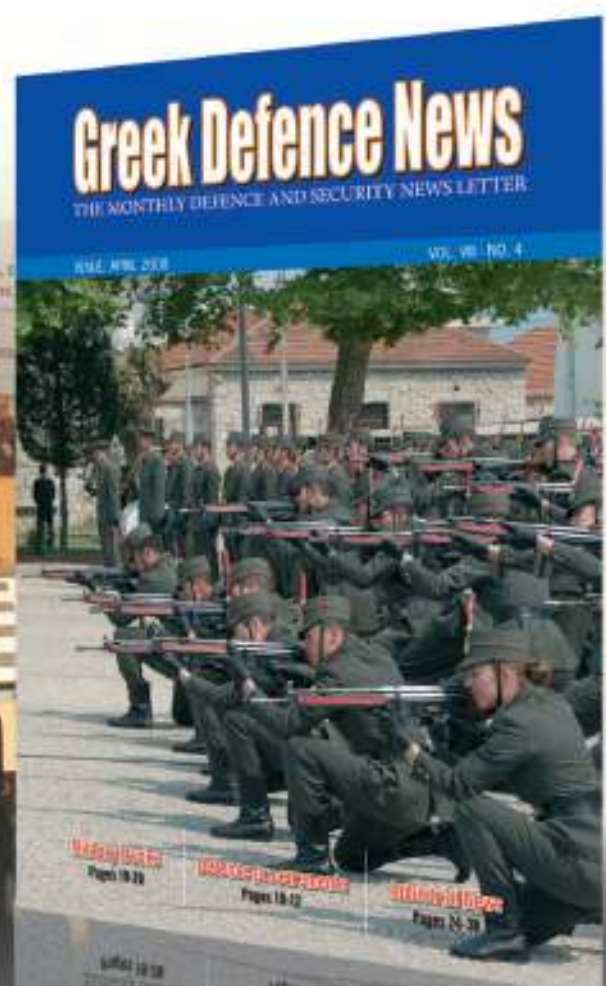
And at the same time evacuation of smoke from indoor spaces  
Extinguishing by intervening in two ways at the same time, cutting off the flame and reducing the heat.



- Possibility of throwing water from 100 to 5000 lt of water depending on the model and the type of fire it is called upon to deal with.
- Possibility of extending the shot with a flexible hose.
- Automatic firing range
- Automatic spray recommendation
- Remote control



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is appropriately designed to equip future combat vehicles and existing MBTs that need to be upgraded.

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