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Editorial

KhalifaSat: Zayed's Sons Make The Dream Come True

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Since its inception in the early 1970's by the founding father Sheikh Zayed bin Sultan Al Nahyan, may God rest his soul in peace, the key feature of the UAE is that it doesn't know the impossible. Its aspirations have no ceiling or limits. It always has the strong will to succeed and look forward to the future as long as it works for it. This philosophy of action has become an approach followed by all, leadership and people, so the UAE is now an icon of success and a source of inspiration for countries that seek to achieve development and progress.

The highly successful launch of the satellite KhalifaSat on October 29 to the outer space from Tanegashima Space Centre in Japan aboard the rocket H-IIA is a new qualitative achievement by which the UAE inaugurates the era of full space industry. It clearly highlights that Sheikh Zayed's dream of embracing space is achieved today by "Zayed's children," armed with modern science and knowledge. They assert day after day that they can move the UAE into the ranks of developed countries.

The UAE space project began with an idea that was born during Sheikh Zayed's meeting in the 1970's with the NASA team responsible for the Apollo trip to the moon. The idea then turned into a legitimate ambition to enter the space age. This ambition was then translated into action to establish a national space sector, beginning with the establishment of Thuraya Telecom in April 1997, Yahsat (Al Yah Satellite Communications Company) 10 years later in 2007, and the announcement by His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE, on July 16, 2014, of the establishment of the UAE Space Agency, which is responsible for the space sector.

The launch of KhalifaSat into space is a civilised quantum leap for the UAE in particular, and all Arabs in general. It does not only translate the cultural, scientific, and technological development of the UAE, but it also sends a message of hope and optimism to Arab peoples that Arabs can contribute to human civilisation if they master science and sound planning, and own a good outlook for the future, just as the UAE did. It managed to break the stereotype of the Arab and Islamic countries as "rigid" states that do not move in favour of a new image based on participation in the creation of human civilisation and encouragement of innovation and creativity, such as space manufacturing, aerospace and other fields that require a modern intellectual, cognitive and technical infrastructure.

The Emirates Space Project includes ambitious programmes to prepare national cadres with expertise in space science, and continuous plans to develop the education system in the country to meet the requirements of this vital sector. With the launch of KhalifaSat, the UAE has entered into the age of full space industrialisation and continues to work day and night to send the first Emirati probe, the Hope Probe, to Mars in 2021, which coincides with the UAE golden jubilee of its foundation.

The launch of KhalifaSat coincides with the Year of Zayed in which the UAE celebrates the 100th anniversary of the birth of Sheikh Zayed. This is in fact the best celebration and appreciation of the founding leader, because it affirms that his legacy in work, construction, ambition and sacrifice for the homeland, constitute the value system with which Zayed's sons arm themselves to face challenges and cross into the future.

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ADIHEX: A Unique Window Into UAE's Rich Cultural Past


The exhibition brought together more than 650 companies

The Abu Dhabi International Hunting and Equestrian Exhibition (ADIHEX) is the Middle East's most popular and reputed exhibition that promotes UAE culture and traditions. Ever since ADIHEX was launched in 2003, it has remained the only dedicated consumer and trade event in the Middle East for weaponry, equestrian, outdoor and marine sports, safaris, arts and antiques, and preservation of culture and heritage.

Visitors to this year's event which ran from September 25 to 29 at the Abu Dhabi National Exhibition Center (ADNEC) had the opportunity to purchase the latest camping, hunting, equestrian and weaponry equipment. The designated heritage centre acquainted them with the rich traditions of Abu Dhabi and the UAE. ADIHEX also featured camel and equestrian activities, saluki beauty contests, art competitions and traditional hunting activities.

The five-day exhibition that celebrated the legacy of UAE's founding father, the late Sheikh Zayed bin Sultan Al Nahyan, was held under the patronage of His Highness Sheikh Hamdan bin Zayed Al Nahyan, Ruler's Representative in Al Dhafra Region in the Emirate of Abu Dhabi and Chairman of the Emirates Falconers Club. This year's exhibition had 'The Year of Zayed' as the overarching theme and focused on the protection of the environment, falconry, sustainable hunting, and equestrianism.

The exhibition brought together more than 650 companies and commercial firms from more than 40 countries, including 170 local exhibitors, 164 international exhibitors and 61 new exhibitors. It covered a total area of more than 40,000 square metres.

The event was organised by the Emirates Falconers' Club and Informa Middle East, and supported by the Environment Agency - Abu Dhabi (EAD), International Fund for Houbara Conservation (IFHC), the Department of Culture and Tourism (DCT) and The Cultural Programs and Heritage Festivals Committee, in addition to many local, regional and international media partners.

The main sponsor of ADIHEX 2018 was HH Sheikh Mansoor bin Zayed Al Nahyan's Global Arabian Flat Racing Festival, while the Gold sponsors were Etisalat, The National and Arabian Tents, Silver sponsors Wahat Al Zaweya, the Dhabian Equestrian Club, Smart Design LLC and Tiger Properties, and the Bronze sponsors AlMoe and National Geographic.

The expo attracted extensive participation of local and international companies in related fields such as tourism, safaris, marine sports, outdoor leisure and vehicle equipment, in addition to arts, crafts and entertainment for children.

HE Majid Ali Al Mansouri, Chairman of the Higher Organising Committee of ADIHEX and Secretary General of the

HH Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces visited ADIHEX

Emirates Falconers' Club, said: "The exhibition gives us the opportunity to showcase the most important initiatives and activities that highlights Sheikh Zayed's personality and his love to promote and spread heritage sports."

High Profile Visitors

HH Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, during his visit to the exhibition, said: "The event provides a key insight into the deeply rooted legacy left by our ancestors." His Highness underlined the importance of preserving Emirati heritage and doubling efforts to maximise young generations' awareness of their traditions and legacy, lauding the role played by various institutions participating in ADIHEX to enrich the local scene with informative and knowledge-sharing activities.

Sheikh Mohamed was accompanied by Dr. Ahmed Mubarak Al Mazrouei, Secretary-General of the Abu Dhabi Executive Council, Major General Faris Khalaf Al Mazrouei, Chairman of the Festivals, Cultural and Heritage Programmes Committee, and Majid Al-Mansouri, Chairman of the exhibition's Supreme Organising Committee.

His Highness Sheikh Hamad bin Mohammed Al Sharqi, Member of the Supreme Council and Ruler of the emirate of Fujairah visited the booth of Tasleeh, which displayed the latest firearms and tactical items offered by the company.

The exhibition was also graced with the presence of HH Lt. General Sheikh Saif bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Interior.

Also, the UAE ambassador to Bahrain, Sheikh Sultan bin Hamdan bin Zayed Al Nahyan took a tour of the various pavilions and acquainted himself with some

HH Lt. General Sheikh Saif bin Zayed Al Nahyan was briefed about the latest developments and modern technologies used in hunting and equestrianism

Sheikh Nahyan bin Mubarak Al Nahyan, Minister of Tolerance, toured the exhibition and visited its various pavilions and sections

of the participating companies and their role in holding heritage events.

This year's exhibition was turned into a global destination with many competitions in cultural and recreational activities, and art exhibitions organised by the International Fund for the Houbara Conservation (IFHC).

The Year of Zayed, the "First Falconer"

ADIHEX 2018 coincided with the 'Year of Zayed' marking the 100th birth anniversary of the late Sheikh Zayed and highlighted his efforts and activities as the first falconer, who was instrumental in the promotion and development of hunting and equestrian sport, and and was one of the most important leaders in the field of protecting the environment.

Inspired by the Year of Zayed, the Environment Agency – Abu Dhabi (EAD) took visitors on a journey through the environmental legacy of UAE's Founding Father, giving them a close look at Protected Areas, Endangered Species, Regulations, the Sheikh Zayed Falcon Release Programme and the Abu Dhabi Falcon Hospital.

The interactive Protected Areas zone focussed on how the late Sheikh Zayed established Al Wathba Wetland Reserve as a protected area in 1998 after he arranged the successful breeding of the flamingo for the first time on that site. Today, Al Wathba is the only site in the Arabian Peninsula where flamingos continue to breed regularly. It is an internationally recognised sustainable tourism destination and is one of the 19 protected areas under the Sheikh Zayed Protected Areas Network.

The Endangered Species zone highlighted the efforts of Sheikh Zayed to protect endangered birds and animals through a wide variety of programmes such as a captive-breeding programme for Arabian Oryx. Today, the numbers of Arabian Oryx in the UAE have increased to over 10,000, of which 5,000 are in the emirate of Abu Dhabi. As a result, the International Union for the Conservation of Nature (IUCN) has changed the status of the Arabian Oryx from "Endangered" to "Vulnerable" in 2011.

In the Regulations zone, visitors were told about Sheikh Zayed's efforts in 1966 to protect the environment and biodiversity through the issuance of environmental regulations and laws and the adoption of procedures, controls, and standards for many environmental issues, including the regulation of hunting.

The Sheikh Zayed Falcon Release Programme zone gave details about one of the most successful wildlife release programmes in the world, which he set up in 1995. Since then, 1,857 falcons have been returned to the wild.

In the Abu Dhabi Falcon Hospital zone, visitors learned about how the late Sheikh Zayed established, in the early 1980s, a small falcon hospital outside of Abu Dhabi. They also had the

Mohammed bin Ahmed Al Bowardi, Minister of State for Defence Affairs, visited heritage and national identity protection dedicated pavilions

This year's exhibition was turned into a global destination with many competitions in cultural and recreational activities

opportunity to adopt cats and dogs on-site from the Hospital's Abu Dhabi Animal Shelter. Today, the Abu Dhabi Falcon Hospital, managed by EAD, has become the world's largest falcon hospital in the world and an award-winning sustainable tourism destination.

Finally, the Inspired Citizens zone highlighted Sheikh Zayed's role in inspiring a new generation of young Emirati environmentalists who are carrying his environmental legacy forward.

The highlight of the stand was a holographic theatre-style experience in the form of a captivating story summarising the late Sheikh Zayed's environmental legacy.

The exhibition had the largest collection of rare photos of the Sheikh Zayed many of which were taken from falconry hunting trips. These pictures, taken with the lens of the photographer Mohamed Al Khaldi, were exhibited for the first time.

Hamdan bin Mohammed Heritage Center

The Hamdan bin Mohammed Heritage Center (HHC) had a unique pavilion featuring smart technology showcasing its various championships.

The pavilion carried the theme 'Year of Zayed', and was designed to reflect the wisdom of the UAE's Founding Father aimed at connecting his legacy to the younger generation. With a click of a button, using smart gadgets, the pavilion presented pictures and short films about Sheikh Zayed highlighting his role in nation building.

The HHC pavilion also highlighted its various championships and activities, including heritage sports such as Falconry, Saktoun rifle championship, diving, desert trekking, camping, hunting, and equestrian, and other traditional outdoor activities.

Fun Events: Competitions, Live Performances and Heritage Activities

One of the major draws at the expo was the Saluki beauty contest. Saluki is a well-regarded breed of dog in the Middle East since ancient times and is said to be quicker than the greyhound over longer distances. Saluki has been popular for racing as well as hunting in the region. The exhibition also featured live performances such as beauty shows and live shows for horses, K9 dogs, birds, and falcons. ADIHEX 2018 also boastd heritage workshops and many other activities including marine sports in addition to arts and crafts.

Camel Auction and Hunting Activities

For animal enthusiasts and owners, the 16th edition of ADIHEX witnessed a camel auction, as well as an online auction. Also, there were numerous hunting segments including archery shooting range, shooting simulator, paintball, target shooting range and airsoft shooting.

Photo credit: Faisal Al Qaisi

www. adihex.com

'KhalifaSat' Successfully

On October 29, the Mohammed bin Rashid Space Centre (MBRSC) announced the successful launch of KhalifaSat into space from the Tanegashima Space Centre in Japan onboard the H-IIA rocket. KhalifaSat is the first Emirati satellite to be 100 per cent developed at the facilities of MBRSC in the UAE by Emirati engineers. This marks a new milestone that adds to the UAE's achievements and a new phase in the development of the national space sector.

KhalifaSat entered into a low earth orbit at an altitude of approximately 613 kilometres at 9:33 AM, 85 minutes after its launch. The first signal was successfully received at the ground station at MBRSC.

KhalifaSat is two metres high and weighs only 330 kg. Its speed is estimated at 7km/s, which enables it to orbit the Earth almost 14 and a half cycles daily. It has bagged five patents and developed seven space innovations that have given the satellite an enhanced digital camera; fast image download and high-speed communication capabilities from its position anywhere above the world; an automatic satellite control system with increased storage capacity; a satellite positioning technique that allows it to simultaneously capture multiple 3D images; as well as advanced target positioning for capturing high quality images with pinpoint accuracy and high speed.

A Proud Moment

HH Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Chairman of Dubai Executive Council and MBRSC Chairman, followed the first contact made by the satellite with the ground station at the Centre.

Sheikh Hamdan congratulated President His Highness Sheikh Khalifa bin Zayed Al Nahyan, His Highness Sheikh Mohammed bin Rashid Al Maktoum, the Vice President, Prime Minister and Ruler of Dubai, His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, and the entire nation on this achievement. The Crown Prince of Dubai said that this accomplishment is another milestone in securing a bright future for the nation. He noted the UAE has all the assets required to achieve excellence in advanced sciences.

Sheikh Hamdan said: "Today, we celebrate a significant national achievement. This project has been 100 per cent developed by Emiratis. The UAE is a key partner in the global efforts to make the world a happier and better place through scientific advanc-

Launches into Outer Space

es. We thank the team that launched KhalifaSat and encourage them to work harder to bring more achievements to this great nation."

The launch of KhalifaSat was attended by Dr. Ahmad bin Abdullah Humaid Belhoul Al Falasi, Cabinet Member, Minister of State for Higher Education and Advanced Skills and Chairman of the Board of Directors of the UAE Space Agency; Hamad Obaid Al Mansoori, Chairman of MBRSC; Khalid Al Ameri, UAE Ambassador to Japan; Yousuf Hamad Al Shaibani, Director-General of MBRSC; Dr. Mohammed Nasser Al Ahbabi, Director-General of the UAE Space Agency, and Salem Humaid Al Marri, Assistant Director-General for Scientific and Technical Affairs at MBRSC.

Supporting Global Efforts

KhalifaSat is the third satellite to be developed by MBRSC after DubaiSat-1 and DubaiSat-2. What distinguishes it from the first two satellites is that it is the first satellite to be fully developed by a team of highly qualified Emirati engineers.

The satellite is one of the most technologically advanced remote-sensing earth observation satellites.

The images provided by the satellite will be used in urban planning and management, ensuring the effective optimisation of land use and realistic infrastructure proposals. The images will also be used to develop detailed maps of targeted areas and monitor major engineering and construction projects.

It will also monitor environmental changes locally and internationally to support global efforts to preserve the environment. The satellite is also expected to provide detailed imagery of the ice caps at the North and South Poles, helping to detect the effects of global warming.

The hexagonally designed satellite is powered by four deployable solar panels attached to the sides of the satellite bus. There are two decks within the structure, as well as an upper sun shield made of a carbon fibre reinforced polymer (CFRP) that protects the sensitive camera system from temperature fluctuations and radiation.

The MBRSC ground station in Dubai supports KhalifaSat and its functions from Earth. The ground system includes three main subsystems: Antenna and Radio Frequency (RF) subsystem, Mission Control Station (MCS), and Image Receiving and Processing Station (IRPS). The main function of the Antenna & RF subsystem is to transmit imaging orders, give commands to the satellite, receive information and download images through the X-band feed.

'Leaders Conference:
Human Resources and Technology, Critical for Security

The high profile two day annual meet of the UAE Ministry of Defence titled 'Leaders Conference: War in the 21st Century' held in Abu Dhabi recently underscored the need for excellence in human resources and technology to meet vital security challenges.

Mohammed bin Ahmad Al Bowardi, Minister of State for Defence Affairs inaugurated the annual conference. The sessions on the first day took place at the headquarters of the Emirates Centre for Strategic Studies and Research, ECSSR, while the sessions of the second day were held at the Rabdan Academy in Abu Dhabi.

The inauguration of the conference was attended by Hussain bin Ibrahim Al Hammadi, Minister of Education, Omar bin Sultan Al Olama, Minister of State for Artificial Intelligence, General Hamad Mohammed Thani Al Rumaithi, Chief of Staff of the Armed Forces, Lieutenant General Saif Abdullah Al Shaa'far, Under-Secretary of the Ministry of Interior and more than 700 leaders, experts, specialists and civil and military scholars from the UAE and abroad.

Al Bowardi said in his address, "Following in the footsteps of the Founder, the late Sheikh Zayed bin Sultan Al Nahyan, the wise leadership in the UAE works today to establish the culture of innovation in the community, and hopes to unleash the creative energies of the future generations in the different fields of life including scientific, technological and administrative."

He added, "This has become an essential part of the national strategy related to managing the human resources, as the leadership believes that this is the correct method of transforming the future's challenges to opportunities. It is also the ideal method to achieve the national strategic goals and targets represented in protecting the country's

War in the 21st Century'

existence in the long-term, to secure its security and stability and to continue the journey of advancement and prosperity by utilising its own capacity."

Technology to Shape Future Wars

During the first session, held under the theme, "Defending Countries in Future Wars" Michael D. Griffin, United States, Under-Secretary of Defense for Research and Engineering, affirmed that his country realises that the wars in future cannot be won except through technological excellence.

He said that the American cooperation with the UAE is considered comprehensive, old and diverse, and includes many defence and military activities, including determining the form of the wars of the future. He thanked the UAE for hosting this important conference, which addresses an extremely important axis, which is "National Defence in an Era of Technological Innovation."

Curbs Needed on AI

In the second session, Omar bin Sultan Al Olama, Minister of State for Artificial Intelligence, spoke about the effect of Artificial Intelligence (AI) on defence and national security. He said there was an international arms race of a new kind revolving around AI and added that technological innovation in defence could result in applications of a civilian nature.

He pointed out that technological innovation will face challenges, the most important of which is the morality related to AI applications and the possibility of terrorists obtaining advanced technologies.

He added that to face the challenges of technological innovation, it requires unified international legislation to regulate the use of AI, strengthen cooperation between the public and private sectors, and place mechanisms to deactivate the AI systems in case they are wrongfully used.

General Sir Richard Barrons, from the United Kingdom, said in his scientific paper which addressed the topic of "innovations courses", that the forms of war continue to change. "As we have seen in the previous decades, we can see some countries using firm force with a smaller amount of restraint as part of the hybrid methods for confrontation and struggle, adding that the technology which is produced for commercial purposes has a great influence on defence and security, particularly data, and the power of processing, communication and social media."

UAE to Present its Latest

More than 30 most prominent UAE companies specialising in defence and security-related products and services, including armoured vehicles, aerospace, ammunition, naval vessels, telecommunications, maintenance and repair operations, cybersecurity, logistical support, and technical development are making a strong presence at two high profile international exhibitions in Saudi Arabia and Bahrain.

The participation of Emirati firms at Saudi National Security & Risk Prevention (SNSR) Expo as well as Bahrain International Air Show (BIAS) is expected to enhance the security cooperation of the UAE with Saudi Arabia and Bahrain. UAE's participation in the SNSR Expo from 4 to 6 November and BIAS from 14 to 16 November enables the UAE exhibitors to proudly present the state-of-the-art 'Made in UAE' national security solutions to leading stakeholders from the region. The extensive UAE Pavilion is sponsored by Tawazun Economic Council and organised by the Emirates Defense Companies Council (EDCC).

This huge participation underscores the ever-expanding collaboration between the UAE and Saudi Arabia in national security matters. The companies that will be promoting their products and technologies at the UAE pavilion at these two events are ADASI, ADSB, Advanced Pyrotechnics, EDIC NIMR, EDIC Caracal, EDIC Barij Dynamics, EDIC Barij Munitions, Calidus, Al Asber Auto Industries LLC, Al Hamra Group, Al Marakeb, Rabdan Academy, Tasleeh, Siham Al Khaleej Technology, Hader Security & Communications Systems LLC, Nation Shield, International Golden Group, Emirates Defense Companies Council , Al Fattan Ship Industry, Etimad Holding, Atlas Group (Atlas Dynamics), Atlas Group (Sky Stream), Premier Composite Technologies, Remah International Group, Yahsat, Abu Dhabi Aviation, Royal Jet, Maximus, EDIC GAL, AMMROC, Earth, ETIC, and Abu Dhabi Airports.

Shaping the Future of National Security

In response to major geopolitical shifts in the Middle East, SNSR Expo is launched as the platform that coordinates the Kingdom's internal and external policies relating to national security, enabling it to respond effectively to rapidly changing domestic, regional, and international environments.

Held under the patronage of H.R.H. Prince Abdulaziz bin Saud bin Nayef Bin Abdulaziz Al Saud, Minister of Interior of Saudi Arabia and in partnership with the Saudi Ministry of Interior, the SNSR Expo is a one-of-a-kind innovative platform facilitating business matchmaking between industry leaders and the Saudi government, of-

Technology at SNSR and BIAS

fering its participants an unparalleled platform that is customer driven and value oriented.

In the light of Vision 2030, the security industry is identified as a foundational pillar in delivering a solid socio-economic strategic progressing Saudi Arabia. The SNSR Expo aims to create a highly profitable business environment for state-of-the-art security products and service providers.

SNSR Expo will explore the future of five key topics through dedicated pavilions and value content forums: Border Security, Counter Terror, Smart & Safe Cities, Hajj Safety & Security, and Cyber Security.

Scintillating Flying Displays

The BIAS will enthral and entertain thousands of visitors offering them the opportunity to experience one of the best flying displays in the Middle East at the unique location at Sakhir Airbase.

The fifth biennial BIAS looks set to be the biggest and most successful

The fifth biennial BIAS looks set to be the biggest and most successful

yet. Held under the patronage of His Majesty King Hamed bin Isa Al Khalifa, King of the Kingdom of Bahrain and under the close supervision of HH Shaikh Abdullah bin Hamad Al-Khalifa, Chairman of the BIAS Supreme Organising Committee, BIAS occupies a strategic position on the global aerospace calendar, bringing some of the world's leading and most influential organisations to the Sakhir Airbase. Although one of the Middle East's youngest shows, in just eight years BIAS has seen major expansion making it the fastest-growing show in the region. This edition, exhibitor numbers are up by 70 per cent compared with the previous show, the Exhibition Hall has doubled in size, 11 out of the world's top 15 aerospace companies are exhibiting, and more than 100 aircraft are flying or on static display.

Fuelling this is Bahrain's growing status as a transportation hub along with BIAS's commitment to creating innovative show features and a world-class commercial environment.

Amanda Stainer, Commercial Director for Farnborough International, co-organisers of the Bahrain International Airshow, says: "Since the first event in 2010, the show has seen a 75 per cent increase in visitor numbers."

BIAS again unites aerospace and airport infrastructure with a conference entitled "Into the Future: Challenges and Opportunities for Gulf Region Airports and Airlines", inviting industry leaders and experts to share experience and expertise. Space is a major focus for BIAS 2018, attracting a number of space research centres and organisations including the UAE Space Agency, ISRO (Indian Space Research Organisation), Roscosmos and Information Satellite Systems. Also Bahrain Space Team will be presenting their latest work on nanosatellite technology at the expo.

Embraer's signing brings chalet participation at the show to almost 100 per cent and includes Airbus Group, BAE Systems, Bell Helicopters, DRDO, L3, Leonardo, Lockheed Martin, Otokar, Texel Air and Rolls-Royce. Other highlights are national pavilions from UAE, India, UK, U.S., Saudi Arabia, and Russia.

Prominent UAE companies are making a strong presence at SNSR and BIAS

Unveiling Future EW and Cyber Warfare Technologies

By: Sakha Pramod
Photo: Mahmoud Al Shurafa
Ismael Alblooshi

EW GCC 2018 saw the biennial electronic warfare conference morphing from a conference-led event to an EW technology exhibition. The event was held from October 8 to 10 in Abu Dhabi. Reflecting the changes emerging in the Middle East, the event focussed on insights into the essential EW technology required to operate effectively across the 21st century electronic battlefield. More emphasis was placed on future EW & cyber technologies and their capability in the electronic spectrum. Current, new and groundbreaking technologies and their component parts were on show with live demonstrations.

The EW GCC created an effective stage where the very best international EW technology suppliers were able to build strong and sustainable business connections with leading local defence companies tasked with realising regional military and security objectives.

The event revolved around two core elements: EW Capability Exhibition and Advanced Learning Workshops. The EW Capability Exhibition showcased the latest technologies from an international line up of high-end technology solution providers. Advanced Learning Workshops, a new segment which drew particular interest from participants, were practical and interactive events of one-hour duration that allowed EW practitioners to fully understand emerging technologies and processes.

Market Insights, High Profile Participants

Companies looking to enter new markets need reliable market intelligence to create a sound market entry strategy. EW GCC 2018 provided market insights including a quality roadmap that highlighted the competition, past procurement trends, and organisational charts of seniority and responsibility. High profile delegations matched to the product or service showcased at the expo was another highlight. The expo facilitated one-on-one meetings for participants with their target audience. More than 600 military and industry officials from over 30 countries participated in the three-day expo.

Exhibitor Highlights

Nation Shield met participants at the event and discussed their latest offerings in the field of EW. Here we bring to our readers the highlights of EW GCC 2018.

Saab Presents High Quality EW Products

Defence major Saab boasts an EW portfolio comprising Signal Intelligence systems, covering both COMINT and ESM/ELINT for government agencies, intelligence organisations and armed forces, for land, airborne and naval domains, as well as complete self-protection suites for land, sea, and airborne platforms.

"Product experts from most of our specialist areas within electronic warfare participated in EW GCC, for networking and a large number of valuable meetings with our customers and partners," said Killian Swift, deputy

Head of Saab's Market Area Middle East and Africa.

"That way, you could actually say that we more or less brought our entire electronic warfare portfolio to the EW GCC."

"We had a large number of participants at our two advance learning workshops, which also generated many new contacts, "continued Killian Swift.

Cobus Van Der Merwe, Head of Product Area Command and Control, Saab in South Africa, held a workshop on 'Future Enabled Awareness - The Command and Control Perspective', while Dr. Alban Fereizi, Sales Manager, Saab in Germany, held a workshop on 'What is the Benefit of Big Data Applications in EW Scenarios?´

"EW GCC is an important event for Saab since we are a supplier of both self-protection and SIGINT systems to several countries in the region. The UAE is a key customer country for Saab where we are growing our presence by establishing development and production in Abu Dhabi," concluded Swift.

Cutting-edge Technology

BAE Systems featured their EW solutions, focusing on the platform capability of the Typhoon and Hawk.

Andy Wardman, EW Advisor, BAE Systems said: "For Typhoon and Hawk in particular, when the company provides EW capabilities on the aircraft, it also tries to help customers develop EW Operational Support capability.

"So, either we will assist and make data on behalf of a customer to load to the aircraft, as a service to the military, or we can help teach and train, along with our partners, Leonardo and MASS Consultants, on how customers and/or their local industry can make data themselves. We are very flexible in that."

Currently, BAE Systems is supporting all the nations that have Typhoon such as Italy, Germany, Spain, UK, Austria, Saudi Arabia, Oman, and Kuwait.

He added that BAE Systems has a large footprint in the U.S. and also provides components for various aircraft and EW components that are used on fighters such as F35, F22 and F16.

COMINT Shelter and Communication Jamming Shelters

Hensoldt subsidiary GEW Technologies from South Africa presented models of COMINT Shelter and Communication Jamming shelters as delivered to armed forces in the region.

Gerhard Schwebius, Sales Director Electronic Warfare and Avionics, Middle East, Hensoldt, said: "The Compact Multirole Direction Finding and Monitoring System MRD7 was presented and the modern user interface available was shown to the end users.

"The GEW MRD7 is a compact all-in-one signals intelligence solution designed specifically for applications where durability, size, weight and rugged construction are of vital importance, without compromising performance."

"With simultaneous direction finding and wideband monitoring functionality integrated in a military ruggedised solution, the MRD7 is an ideal solution for use in a variety of challenging environments. With the man-pack antenna configuration, the MRD7 is operated on the move by dismounted EW teams to support intelligence gathering and clandestine reconnaissance missions. "

He said the MRD7's full band compact mobile antenna is ideal for vehicle installations ranging from small commercial vehicles to armoured personnel carriers. The mobile antenna is also

used in the transportable role, when mounted with the MRD7 on a lightweight and durable quad-pod and typically deployed at field deployed command posts to provide tactical awareness and early warning information to battlefield commanders.

Qinetiq's High Power Communication Intelligence Systems

Qinetiq, a British multinational defence technology company headquartered in Hampshire, exhibited a range of different products at the show, the first and foremost of which was ASX, a communications intelligence system. Its range gives a high probability of intercept in dense signals environments and enables the rapid extraction of intelligence from data with advanced filtering techniques.

Tim Allen, Regional Director - MENA, QinetiQ said: "The ASX product range has been devised to be fitted onto aircraft, both manned and unmanned, of different sizes. It combines detect, intercept and locate functions across a broad frequency range. There was a considerable amount of interest at the show in this highly relevant capability."

QinetiQ has worked with a range of customers to develop airborne Signal Intelligence (SIGINT) systems that deliver the intelligence they need in critical operational scenarios.

The second product demonstrated was the BRACER satellite Command and Control radio system. It's a low size and weight (450g) capability that has been designed for rapid deployment, operational flexibility and movement in all domains, ease of use, and is focused on enhancing the speed of the decision making cycle.

"Enabled by the Iridium satellite network, this compact Push-to-Talk communication system has military grade encryption. It was recently launched at SOFEX and has been designed with Special Forces, aircrews, and the like in mind - those who have a need to carry a handset with them that has global coverage with the highest possible levels of security," Allen said.

Other solutions displayed included the OBSIDIAN radar that has been designed specifically for counter-drone operations, providing a 180° azimuth by 85° elevation staring array radar solution, capable of detecting and identifying the micro-doppler signature of smaller drones. Also TOTEM, which detects those electromagnetic attacks against fixed infrastructure that are designed to deny or disrupt service - threats that typically don't have fingerprints or easy traceability.

Allen concluded: "A number of the systems on display are already in service with customers in UK, Europe and Africa. This was a very productive exhibition for QinetiQ, and we were particularly pleased with the number and quality of the delegates from the Middle East, with a good number of constructive meetings and new leads."

ESM Intelligent Solutions from Harris

A leading technology innovator, solving customers' toughest mission-critical challenges, Harris Corporation has

been providing solutions that connect, inform, and protect, for over 120 years. Its Electronic Support Measure (ESM) systems help commanders create a comprehensive operational picture of allied and adversary disposition alike allowing informed tactical decision making, while its Electronic intelligence (ELINT) solution helps military strategists develop insights into how to manage operations in contested areas and other militarily important locations.

Justin Ghalayini, International Business Development, Surveillance Solutions and Electronic Warfare, Harris said: "Our ESM and ELINT solutions are for land, sea and air platforms. They provide passive radar detection solutions to give an overall situation awareness picture of all the radar activity going on at that moment. The systems intercept, analyse, locate, evaluate and report radar signals as well as capture the information in a library database for further analysis and situational awareness."

He said these systems can be installed on small and large ships as fixed locations on land. Systems used for coastal surveillance are networked stations which can be operated remotely. Some other systems under their portfolio include mobile air-traffic control radars that are used to precision guide aircrafts to land at established airports as well as remote areas.

Currently, these solutions have been deployed by some Middle Eastern, Asian and NATO countries, and Australia.

Sensors to Detect, Disable, Defeat

Chemring Technology Solutions Ltd, a wholly owned subsidiary of Chemring Group PLC, whose products are relied upon by the best equipped armed forces in the world, including some NATO members, showcased its high quality sensors designed to detect, disable and defeat.

Simon Bugge, Regional Director, Chemring Technology Solutions Ltd said, "The centrepiece of the EW GCC event was our Resolve system. The Resolve system has been designed to satisfy a range of EW mission profiles in hostile environments. Rapid end-user reconfiguration allows the same equipment to be redeployed to meet needs as they arise. A Resolve system consists of one or more intercept and direction finding nodes that can operate both as standalone and as a networked baseline."

State-of-the-art Solutions to Protect Aircraft

Indra is one of the world's top technology and consulting companies and a technology partner for the key operations of its customers' businesses worldwide. Indra presented cutting-edge value-added solutions for security and defence apart from other sectors and operates in more than 128 countries.

Alex Moya, General Manager, Indra said: "Indra provides solutions to detect, analyse, classify and identify radar and communication signals, and also countermeasure them, in the most critical platforms; Fighters, Transport aircrafts, Submarines, Attack helicopters.

"At EW GCC 2018, Indra showed its full wide band digital receivers, and its InShield DIRCM system, which is a state-of-the-art solution developed by Indra to protect aircraft from infrared guided surface-to-land and surface-to-air missiles. InShield has passed in-flight tests during the NATO Trial EMBOW XVI exercise, one of the most demanding and prestigious in the world. InShield uses a modern Open-Architecture based on Jamming Laser Turrets, one Central Processor, and a High Power Multispectral Laser, which allows it to protect the platform against multiple simultaneous threats."

Full-Spectrum Battle-Simulation Training Systems

At the show, Battlespace Simulations Inc. displayed Modern Air Combat Environment (MACE), its full spectrum combat simulation. The technology can be used to provide computer generated/semi-automated forces (CGF/SAF) and threat generation for distributed simulation environments, Joint Terminal Attack Controller (JTAC) training capability, Electronic Warfare (EW) simulation capability, mission rehearsal, and man-in-the-loop combat aircraft simulation.

Gary DeYoung, President & CEO, Battlespace Simulations Inc. said: "We have customers that use MACE for air-to-air, close-air-support, unmanned aerial vehicles, electronic warfare, and joint fires training where soldiers are taught how to conduct a wide range of military operations. We have simulators all around the world, including a large simulator complex in the UAE. We also have extensive market share in the U.S., and with our NATO allies as well, in the joint fires market. Plus, all electronic warfare officers in the US train using our software. We also have two EW houses in the UK, and one in Australia."

Latest EW Sensor System from Teledyne

Teledyne's Phobos Threat Warner/RESM is a compact, affordable, end-to-end integrated EW sensor system comprising: antennas, RF processing, digital processing, and operator interface.

Peter Forrest, Head of Business Development, Teledyne Defence & Space told Nation Shield said: "We have named the system Phobos after the second moon of Mars. The system is designed for use primarily in the land and naval environment, with several different configurations available, from M1 to M10. It can handle known and unknown emitters that will give you rapid threat alert of the signal that you are intercepting. It comes with full 2-18GHz frequency coverage and 360-azimuth coverage in a very small and lightweight unit. It comes with a simple to use handheld PDA MMI display and full ESM MMI running on a ruggedised laptop."

A key feature of Phobos-R is that there are no external RF cables and no positional alignment requirements during set-up, making it easy to deploy and operate on a wide variety of small platforms of all types, including those not thought previously feasible for such protection on the grounds of size, weight, power or cost. Teledyne is planning to promote the product in the Middle East soon.

EW GCC will return to the region in 2020.

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CAE Awarded $200M USAF Deal

CAE recently announced that CAE USA has been awarded a United States Air Force (USAF) contract to provide comprehensive C-130H aircrew training services.

The eight-year contract, awarded as a three-month transition effective October 1, with a one-year base period and seven additional option periods, is valued at a total of more than US$200 million.

The formal training unit for USAF, Marine Corps, and Coast Guard C-130H training is based at Little Rock Air Force Base (AFB) in Arkansas. Training under the C-130H Aircrew Training System (ATS) programme is also provided at Dobbins Air Reserve Base (ARB), Georgia; McChord AFB, Washington; Minneapolis Air National Guard Base (ANGB), Minnesota; and Cannon AFB, New Mexico. Each year, more than 11,000 crewmembers from the USAF, other U.S. military services, and over 30 other countries are trained under the C-130H ATS programme.


C-130H Aircrew Training System

CAE USA will be the C-130H ATS prime contractor responsible for providing classroom and simulator instruction, training device modifications and upgrades, systems engineering support, programme management and contractor logistics support. It will also manage the C-130H Training Systems Support Center (TSSC) located at Little Rock AFB. Currently, there are 11 C-130H full-mission simulators and more than 50 additional aircrew training devices used as part of the C-130H ATS programme.


There are more than 450 U.S. Army Chinooks worldwide

Boeing Bags $160M for Chinook Support

Boeing announced that it will continue its support for the U.S. Army's inventory of H-47 Chinook rotor blades with a new $160 million contract award.

The five-year performance-based logistics agreement extends work that began in 2012 and calls for the continued management of stock availability and the overhauling of all Chinook blades for the U.S. Army.

Boeing is responsible for rotor blade maintenance, repair and overhaul, as well as developing innovative ways to save blades that would typically be removed from service. There are more than 450 U.S. Army Chinooks worldwide.

"The Chinook has proved itself to be critical to the U.S. Army's wide range of missions, and supply availability is critical to the Chinook's operational readiness," said Kathleen Jolivette , director of U.S. Army Services for Boeing Global Services. "With our demonstrated performance and expertise, we look forward to partnering with our customers on reducing ownership costs and extending blade life for mission success."

GA-ASI's Second MQ-9B Sky-Guardian Completes First Flight

On September 26, General Atomics Aeronautical Systems, Inc. (GA-ASI) completed the first flight of its second MQ-9B SkyGuardian Remotely Piloted Aircraft (RPA) (YBC02) aircraft. The flight of the company-owned aircraft was conducted at Laguna Army Airfield in Yuma Proving Grounds, U.S.

The second MQ-9B SkyGuardian gives the GA-ASI programme team another aircraft to perform important development testing and demonstrations. New capabilities that weren't available when the first prototype was completed in 2016, such as lightning protection, an upgraded avionics and software suite, and a de-icing system, have been included as part of MQ-9B's roadmap to become the first RPA to be certified to fly in civil airspace.

The upcoming test schedule for YBC02 includes further flight envelope expansion testing, testing of the Certified Redundant Control Module, flight controller updates, and testing of the Certifiable Ground Control Station (C-GCS).

The first MQ-9B SkyGuardian aircraft has completed more than 75 flights and 400 flight test hours. Last year the aircraft set an endurance record for Predator series aircraft when it flew for more than 48 consecutive hours.

In December 2017, it was used to demonstrate Automatic Takeoff and Landing Capability using SATCOM only. Then in July 2018, it completed a trans-Atlantic flight that took off from Grand Forks, North Dakota, U.S., landing at Royal Air Force (RAF) Fairford in Gloucestershire, UK. The flight covered 3,760 nautical mile flight in just over 24 hours. The RAF is acquiring MQ-9B SkyGuardian as part of its PROTECTOR RG Mk1 programme.

MQ-9B SkyGuardian

Robonic Delivers KONTIO to Leonardo

Robonic Ltd Oy, subsidiary of Safran Electronics & Defense, recently delivered a third-generation KONTIO pneumatic launcher to Leonardo.

Designed to launch tactical unmanned air systems (UAS) and target drones, this high-pressure pneumatic launcher is capable of catapulting several types of aerial target drones. This Robonic' success broadens its customer base and further proves its position as a leading supplier of pneumatic zero-point launchers.

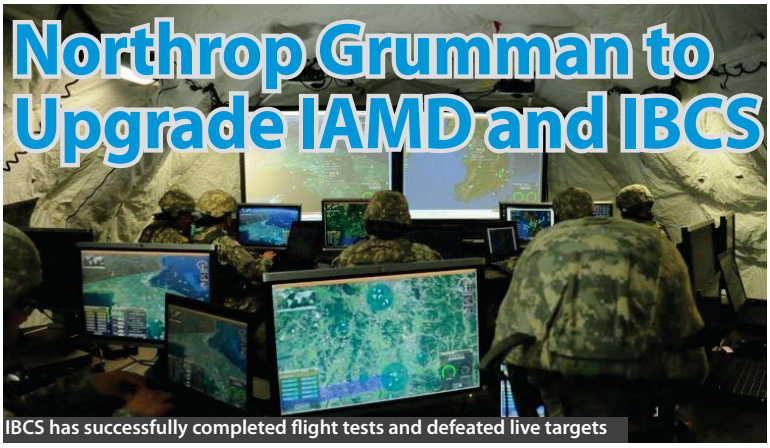
The KONTIO launcher is a highly transportable universal launcher with a large mass and speed envelope, which makes it suitable for several types of targets or tactical unmanned aerial vehicle. It is designed to launch air vehicles of up to 140 kg with a 70 m/s exit velocity or alternatively 500 kg at 37 m/s.

Kontio pneumatic launcher

"Delivery of our KONTIO launcher to Leonardo and Italy is a major milestone to develop our market and the advanced solutions to meet the demands of the target drone market," said Juha Moisio, Managing Director of Robonic. "We are extremely proud of this delivery to Leonardo. This is a culmination of years of cooperation. We look forward to further strengthening our relationship with Leonardo."

With its launchers delivered worldwide, Robonic has more than three decades of operational experience in supporting the evolving requirements of the global UAS industry and UAS end-users.

Northrop Grumman to Upgrade IAMD and IBCS



IBCS has successfully completed flight tests and defeated live targets

The U.S. Army has awarded Northrop Grumman Corporation a $289 million contract to continue system design and development toward fielding of the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS).

Under the contract, Northrop Grumman will upgrade IBCS engagement operations centres and integrated fire control network relays to enhance performance, reliability and maintainability. The company will also develop and deliver IBCS software version 4.5 that integrates Patriot system updates and incorporates updates for evolving threats. Among other contract deliverables, the company will provide logistics, training and support for tests, including a flight test planned for late 2019.

Recent joint warfighting exercises and soldier checkout events under dynamic, stressing threat conditions have already confirmed IBCS' ability to: integrate radars and weapons over a vast area and efficiently and effectively maintain voice and data connectivity; consistently deliver integrated air pictures and target information with accuracy and contribute to a Link 16 network with Navy, Air Force, Marine Corps and Army participants.

IBCS has also successfully completed flight tests and defeated live targets, having conducted an intercept on its inaugural flight test and a more difficult "engage-on-remote" on its second flight test.

During its third flight test, IBCS simultaneously intercepted two threat types with two interceptor types, demonstrating command-and-control for sensors and weapons not designed to work with each other. Two more successful flight tests were conducted with Sidewinder and Longbow Hellfire missiles to support the Indirect Fire Protection Capability, validating missile integration within a few short months.

Sentar Wins $12.1B Contract

Sentar, Inc. recently announced the award of a potential nine-year, $12.1 billion multiple award indefinite-delivery, indefinite-quantity (ID/IQ) contract from the U.S. Army for Information Technology Enterprise Solutions-3 services, known as ITES-3S. Sentar is a women-owned small business specialising in advanced cybersecurity and intelligence services and technology. Like its predecessor the ITES-2S, ITES-3S will be managed by the Army's Computer Hardware, Enterprise Software and Solutions (CHESS) programme and is expected to be the Army's primary source of IT-related services worldwide. The contract ceiling value is $25 billion.

ITES-3S will provide services to enable a broad range of enterprise-level support services for Information Technology integration and service management activities to the Army, other DoD agencies, and all other Federal agencies. The contract scope includes services and solutions essential to support the Army's enterprise services, encompassing nearly all areas of enterprise IT, including cybersecurity, information systems security, information assurance, and a multitude of business planning, IT administration, and training services.

"Sentar is excited to be recognised as a leading small business that can provide the innovation and agility required in today's cybersecurity-intensive IT environment," said Bridget Abashian, CEO and president of Sentar.

The ITES-3S IDIQ award is expected to offer various task-order types, including firm-fixed-price, cost-type, and time-and-materials. Work locations and funding will be determined with each order, with an estimated completion date of September 23, 2027.

H225M Achieves 100,000 Flight Hour Milestone


H225M ©_Anthony Pecchi

The H225M, with 88 aircraft currently in service in six countries, recently surpassed the 100,000 flight hour milestone, following its first delivery to the French Air Force in 2006. It deployed the aircraft in Lebanon, where the H225M, also known as the Caracal, successfully evacuated around 300 people.

Since then the 11-metric-tonne H225M has proven its reliability and durability in combat conditions and crisis areas such as Afghanistan, Chad, the Ivory Coast, the Central African Republic, and Mali, while also supporting NATO-led operations in Libya.

Michel Macia, Head of Super Puma programme at Airbus Helicopters said: "Its state-of-the art avionics and world renowned four axis autopilot, its exceptional range and payload capacities, combined with a large cabin designed to carry 28 troops and powerful air-to-ground and air-to-surface armament and electronic warfare system, allow the H225M operators to carry out the most demanding missions."

Operating both from ships and from land, even in icing conditions, the helicopter has an all-weather capability supported by night vision goggle compatibility. Its 1,296 km range can be extended with air-to-air refuelling capabilities, allowing for flight times of up to 10 hours.

France, Brazil, Mexico, Malaysia, Indonesia, and Thailand rely upon the H225M, a member of the Super Puma family, as a force multiplier. The Royal Thai Air Force has recently opted for a follow-on order of four aircraft for combat search and rescue and troop transport missions.

BAE Systems to Develop Next-Gen Technologies for US DoD

The U.S. Department of Defense (DoD) has chosen BAE Systems to compete for future research and development (R&D) task orders awarded under a nine-year, indefinite delivery/indefinite quantity (IDIQ) contract. The contract provides fast, flexible, low-cost solutions across technical disciplines to meet the current and future technology needs of the U.S. military.

"This large-scale contract provides us with a tremendous opportunity to reach across BAE Systems and leverage our own internal research and development investments to help the DoD solve its most difficult mission challenges," said Al Whitmore, president of BAE Systems' Intelligence & Security sector. "We are excited to help the government leverage innovations in artificial intelligence, machine learning, and directed energy technologies to enhance the security and effectiveness of our warfighters across physical and digital domains."

BAE Systems is one of 15 companies selected by the Defense Technical Information Center to compete for future R&D and support task orders expected to exceed $15 million.

These task orders will be awarded by the Air Force Installation Contract Agency/KD Offutt AFB, Nebraska, and will support the DoD Information Analysis Center Program Management Office. The ceiling value for all future work awarded under the IDIQ is $28 billion.

Raising the Bar in Marksmanship

Marathon Targets enables soldiers to become pre-combat veterans by rapidly developing skills in combat marksmanship. Robotic targets allow for the creation of tactical live fire scenarios capable of simulating realistic combat environments. Compared to this, traditional fixed, pop-up, or rail mounted target systems lack the realism of human like behaviours, and often only present a front facing profile that tracks sideways. Marathon Targets' robotic system helps soldiers to develop realistic marksmanship skills required to engage moving targets. In an exclusive interview, Stuart Norman, Director of International Sales MENA & Asia, Marathon Targets LLC, Abu Dhabi, shares with *Nation Shield* the many advantages of the robotic system that is being favoured by many countries.

Robotic targets are a major enabler to the USMC 'Table 7' moving target marksmanship practice

By: Sakha Pramod

How will robotic targets enhance combat skills?

The robots benefit a wide range of skills from marksmanship through to leadership training. Marathon receives much feedback as to the innovative ways our military and law enforcement clients are employing robots in different types of training and it is often in ways, which were not envisaged during the robots early stages of development as a marksmanship target.

Prior to their widespread adoption of robotic targets in 2017, the U.S. Marine Corps (USMC) carried out extensive testing for 2 years. The USMC Warfighting Laboratory at the Weapons Battalion based at Quantico, Virginia, assessed that Marines of all skill/experience levels (Recruit to Veteran) demonstrated a 104 per cent improvement in marksmanship after a single day of training with robotic targets. The robotic targets are now a major enabler to the USMC new 'Table 7' moving target marksmanship practice, which all Marines must shoot and qualify annually.

What advantages do robotic targets provide military instructors?

Robotic Targets provide military instructors with a very powerful tool to train and assess trainees across a broad spectrum of skill sets. The robotic targets can replicate basic through to advanced movement patterns and replicate tactical scenarios allowing the instructor to escalate or deescalate the training required to teach, reinforce or assess trainees' abilities to achieve their training outcomes. The robotic targets differentiate and record non-lethal and lethal impacts to the torso mannequin providing the instructor with assessable data on the trainees' accuracy.

The robotic targets can be used in live fire tactical 'scenarios' where they appear to be enacting a role similar to a role player or human Opposing Force (OpFor).

How many countries have employed robotic targets as part of military or security training?

Marathon robotic targets are employed in the UAE, U.S., Canada and Australia with both military and law enforcement users. In the UAE, we have exclusively partnered with the local firm International Golden Group.

How does Marathon Targets' system help soldiers compared to traditional systems?

Robotic targets address a fundamental gap in marksmanship training. Tra-

Robotic targets can be used in live fire tactical 'scenarios'

ditional two dimensional (2D) fixed or 'pop up' targets including those moving laterally on rails do not accurately reflect the changes in orientation and speed of a human enemy on the battlefield. Forward facing two dimensional targets commonly represent an enemy target 'crabbing' sideways when moving laterally, which is something soldiers are unlikely to ever see in reality. Generations of soldiers have trained on marksmanship systems, which lack realism necessary to refine marksmanship skills for combat. Robotic targets allow soldiers to be trained in marksmanship and manoeuvre warfare to a level described as 'pre-combat veterans'.

What is the 'Dynamic Warfighting" scenario you are trying to create?

Dynamic Warfighting refers to the robotic targets' ability to manoeuvre in real time in the live fire training environment. Traditionally, in live fire training, tactical commanders and soldiers practice their tactics and formations against fixed enemy targets or static 'pop up' targets. Once contact with the 'enemy' occurs, the human soldiers will manoeuvre to defeat the enemy. The limitation with traditional static targets is they are expected to remain and die in place. This is not the reality of warfare where the enemy is often an agile and elusive combatant. Traditional targets do not counter-manoeuvre against friendly forces. Robotic targets allow tactical commanders and soldiers to exercise their ability to respond to the dynamically changing battlefield.

What is the role of "Robotic Opposing Force" in your training?

Robots can emulate the movement, formations and tactics of an enemy soldier or enemy force for training in the live fire environment. Traditionally, human Opposing Force is used in training with laser based simulation or in reality based training employing man marking ammunition. Marathon robotic targets replace the human Opposing Force and allow soldiers to exercise in the live fire environment against a dynamic target which can manoeuvre in real time in response to friendly force movements or tactics. Employment of a Robotic Opposing Force (ROPFOR) in live fire activities further enhances the training and the training outcomes.

Can your robotic system operate in the existing shooting ranges?

Yes. Robotic targets are deployable and can be employed on existing ranges without modification to the range environment.

Is your system widely used by USMC?

Marathon Targets are employed across the United States Marine Corps' major live fire training ranges and are used in a wide range of applications including moving marksmanship practices, field and urban operations exercises. The robotic targets can be employed as standalone targets for marksmanship or as a Robotic Opposing Force.

You have also started trials of custom-built delivery robots. Can you elaborate?

Marathon has conducted several trials for 'Last Mile' delivery services in Australia with Domino Pizza and also the Australia Post.

Lockheed Martin's LM-100J Freighter Takes Flight

Last month, Lockheed Martin introduced Pallas Aviation as the first LM-100J commercial freighter operator. The LM-100J is a production variant of the proven C-130J Super Hercules, which is the military airlifter of choice for 18 nations around the world.

Pallas Aviation will provide management services and operational control of two LM-100J aircraft requiring heavy-lift/oversized cargo capability into and out of unconventional airports and remote locations for a specific set of clients in multiple industries. Pallas will operate its LM-100Js out of Fort Worth Alliance Airport, Texas.

In conjunction with this announcement, an LM-100J aircraft was also on static display at the Alliance Air Show in Fort Worth that took place on October 13 and 14.

"In choosing the LM-100J, we have access to one of the newest cargo freighters that happens to have one of the most proven pedigrees in aviation: the C-130J Super Hercules. The LM-100J offers an outstanding performance record, reliability, experience, and unmatched capabilities," said Emory Ellis, Pallas Aviation president. "There are other cargo aircraft in the market, but there's one LM-100J, and that's the airplane we need to do our job."

Lockheed Martin introduced the LM-100J freighter in 2014 as an updated version of the L-100 legacy Hercules commercial variant. The company delivered more than 100 L-100s to private and government operators from 1964-1992. The LM-100J offers a civil-certified option for operators that build on the proven performance of the military C-130J variants, which have flown almost two million hours in support of a multitude of mission requirements.

"Over the past few years, we've had the honour to partner with the Pallas team in building the LM-100J and are excited to see this joint vision be a reality that we can share with the aviation industry," said George Shultz, vice president and general manager, Air Mobility & Maritime Missions, Lockheed Martin. "We can't wait for Pallas to show the world the versatility and capability that is found only in an LM-100J."

Two LM-100Js are currently flying in support of FAA type certificate update testing. The C-130J was fully FAA certified when it was first developed and the LM-100J requires an update of this certificate.

Ideal Airlift Solution

Lockheed Martin officials submitted a Program Notification Letter with the Federal Aviation Administration on January 21, 2014, for a type design update for the Lockheed Martin Model L-382J airplane, a variant of the proven

C-130J Super Hercules to be marketed as the civil-certified LM-100J.

The first production LM-100J had its first flight on May 25, 2017, while the second production had its first flight on October 11, 2017. Both aircraft are currently supporting FAA testing, which is on track to complete in 2018.

Five LM-100Js are on contract to an undisclosed customer. Pallas Aviation will operate two of these LM-100Js. It includes all of the proven aspects of the C-130J, including its outstanding operational performance, affordability, flexibility, active production line, robust supply chain, and worldwide sustainment providers.

The airlifter is an efficient and ideal airlift solution for delivering bulk and oversize cargo particularly to austere locations worldwide. It incorporates technological developments and improvements over the existing L-100s at a competitive price that results from years of C-130J operational experience. The result of this experience and advancement translates to an aircraft that will deliver reliable service in a flexible airframe for decades to come.

Emory Ellis, Pallas Aviation president

As it is based on the operational C-130J, the civil variant LM-100J can operate from short, unprepared airfields without ground support equipment. Furthermore, it requires minimal material handling equipment and enables rapid onload and offload at truck-bed height. The growth provisions built into the LM-100J will enable it to support a variety of future missions that include Oil spill clean-up, oil exploration logistics operations, mining logistics operations, aerial firefighting and delivery, medevac/air ambulance, humanitarian relief operations, VIP transport and aerial spray.

The LM-100J has an integrated global logistics network, a worldwide support system and insights from known operational and support costs.

In addition, Lockheed Martin's Hercules Training Centre (HTC) will be opening this year and will be a single source for all C-130J military and commercial training needs. In addition to courses, the HTC will have a re-configurable, Level D simulator. The HTC is located in Marietta, Georgia, just steps from the Super Hercules production line.

The LM-100J provides unmatched flexibility for the most challenging logistics requirements such as oversize, ramp-loaded or palletized cargo (463L pallets), true multi-role capability with roll-on/roll-off sensors and equipment, short field/soft (unimproved) field, and all weather/night missions. The LM-100J is in the "stretched' configuration, providing a 55-foot-long cargo floor. The military components of the C-130J are removed for this civil variant.

LM-100J is an efficient solution for delivering bulk and oversize cargo

Oshkosh's New MTV Makes Stunning Debut at AUSA

The FMTV A2 fleet will feature 16 models, performing a wide range of duties

AUSA 2018 saw Oshkosh Defence debut its A2 model addition to its Family of Medium Tactical Vehicles (FMTV), while displaying other examples of its multiple Joint Light Tactical Vehicles (JLTV). The vehicles were on display at the Walter E. Washington Convention Centre that held the 2018 AUSA Conference from October 8th - 10th in Washington D.C.

Oshkosh was awarded the FMTV A2 contract in February 2018 in response to the U.S. Army's competitive request for proposal (RFP). The army was looking for an upgraded platform with improved payload, underbody protection, ride quality, mobility, engine power, electronics, diagnostics, and safety enhancements.

"We are honoured that the U.S. Army selected Oshkosh as the winner of the FMTV A2 production contract earlier this year," declared an emphatic John Bryant, President of Oshkosh Defence and Executive Vice President of Oshkosh Corporation.

"Oshkosh Defence is proud to debut the FMTV A2 at AUSA 2018. We took a great truck and made it even better with greater force protection, improved payload, a smoother ride, and better mobility."

The FMTV A2 fleet will feature 16 models, performing a wide range of duties from supporting combat missions to relief efforts and including logistics and supply operations.

New JLTV Family Members

"Oshkosh has an exciting few months coming up with the JLTV programme," Vice President Bryant continued. "First, we expect a Full Rate Production (FRP) decision in early FY19, when we will substantially ramp up our JLTV production. Following the FRP decision, the U.S. Army and the U.S. Marine Corps will begin fielding JLTVs."

It is worth noting that, to date, Oshkosh has manufactured over 2,000 JLTVs, delivering over 1,600 of its family vehicle to its key U.S. client.

In addition to the FMTV A2, three fully integrated JLTVs were also showcased on the AUSA show floor. The first JLTV on display was outfitted with the Kongsberg Common Remotely Operated Weapon Station (CROWS) featur-

ing the Javelin Integration Kit (JIK) and .50 Calibre Machine Gun.

Oshkosh also showcased a second JLTV in the Kongsberg booth, one integrating the Kongsberg PROTECTOR II Remote Weapon System (RWS) with a XM914 Lightweight 30mm Cannon, the JIK and a 7.62 coax machine gun. The third Oshkosh JLTV was included in the IMI Systems booth and featured the Iron Fist Active Protection System (APS).

Ambitious JLTV Programme

What is unique to the new JLTV is that its powerful drivetrain and advanced suspension system can now manoeuvre soldiers over steep inclines while its fully integrated C4ISR system will keep them fully connected. Capabilities such as the C4 mechanical, electrical and user interface have been factored into vehicle designs to reduce integration time and optimise overall system performance.

The new JLTV fleet is wired for current and future C4ISR systems on the production line, which means that it is mission-ready on delivery with its integrated network allowing the vehicle systems to operate independently or as part of a common operational picture. In addition, it is now easier to reconfigure vehicle systems in the field and introduce mission expansion packages to meet the demands of the evolving battlefield.

> The JLTV comes with Oshkosh's Core1080 crew protection system

Protection: In providing small arms and ballistics protection, the JLTV base vehicle is right off the production line. Moreover, the add-on B kit will enable the new JLTV models to achieve levels of protection equivalent to the base M-ATV.

Mobile: The new JLTV models combine the latest in suspension technologies as the Oshkosh TAK-4i intelligent independent suspension system delivers off-road speeds that are 70 per cent faster than today's gold standard, the M-ATV. The TAK-4i features 20 inches (508 mm) of usable wheel travel for improved off-road mobility, while its adaptable suspension can be raised or lowered with interior controls to meet transportability requirements and the high-performance brake solution provides exceptional stopping and grade-holding capability.

Proven: Oshkosh has worked closely with government customers to complete reliability qualification testing, in which it accumulated over 100,000 miles to exceed evaluation requirements.

Unique Protection System

The JLTV comes with Oshkosh's Core1080 crew protection system, which has been proven on multiple vehicle platforms and credited for saving thousands of troops' lives over the past decade.

In fact, Core1080 crew protection is not just a layer of armour or a seat, but a comprehensive design and testing approach proven to increase survivability while giving troops the confidence to complete their missions outside the wire. Its capabilities include off-road mobility and power to escape high-threat situations, alongside advanced hull designs built to optimise survivability against a full range of blast and ballistic threats.

The Core1080 also comes with blast-protected seats, restraints and stowage to minimise crew impact during adverse events.

Its integrated system is designed to absorb and deflect blast energy, employing automatic fire suppression systems and ensuring plug-and-play integration of situational awareness systems.

Reference Text/Photo:
www.oshkoshdefense.com

The new JLTV models will achieve levels of protection equivalent to the base M-ATV

The Tiger to Get a New Set of Claws

Airbus Helicopters has been commissioned to conduct de-risking studies to provide the Tiger multi-role attack helicopter with next-generation battlefield capabilities in a mission organised by OCCAR (Organisation Conjointe de Coopération en matière d'Armement / Organisation for Joint Armament Co-operation) on behalf of the French, German, and Spanish Armament agencies.

With Thales and MBDA also taking part in the studies, the main objective will be to prepare the development and retrofit phases of the Tiger's new avionics, mission, and weapon systems. "We are proud to be preparing the future of the Tiger as it represents a major programme for the European Defense cooperation initiative," said Bruno Even, CEO of Airbus Helicopters. "The de-risking studies will ensure that France, Germany, and Spain will be able to decide on implementing the additional operational capabilities for their Tiger helicopters." Having accumulated over 110,000 flight hours to date, 178 Tigers have now been delivered to France, Germany, Spain, and Australia. As a highly versatile, stealthy, and manoeuvrable attack helicopter first deployed by the French Army in Afghanistan in 2009, the Tiger continues to demonstrate its essential role in theatres of operation across the world. The Tiger HAD is designed to perform day or night armed reconnaissance, air, or ground escort, air-to-air combat, ground fire support, destruction, and anti-tank warfare in adverse conditions. Historically, the Tiger has proven capabilities in operational deployments in Afghanistan, the Central African Republic, Libya, and Mali.

Superior Cockpit Capabilities

Thanks to its tandem-seat glass cockpit layout, the pilot in forward position and the aft-seated gunner can both manage the weapon systems and primary flight controls, switching roles if necessary. Each crewmember's pair of multifunction LCD displays is then used to display sensor data and information on internal systems while enabling them to interact with the aircraft's systems.

The Tiger's flying pilot is provided with an additional display system on the helmet-mounted display (HMD), presenting flight, and fire data with digitally enhanced optics. The HMD also enables the gunner to control the on-board weapon systems and interact with the helicopter's view-targeting data.

Twin Turboshaft Engine Power

The great agility of the Tiger HAD is centred upon a 13-metre, four-bladed hinge-less main rotor, while its signifi-

cant level of power can be attributed to two enhanced MTR 390 turboshaft engines. Its EUROGRID battlefield management and digital map display systems, integrated radio and satellite communications and data transfer links complement an IFF transponder/interrogator and a high-authority 4-axis digital automatic flight control system.

The Tiger HAD's gyro-stabilised roof-mounted sight features a TV camera, thermal imager, laser rangefinder, laser designator and laser spot tracker capable of simultaneously following up to four targets. With combat external fuel tanks for longer mission flight times and digital communications for the modern digitised battlefield, the HAD benefits from an extended flight domain in which Spike and Hellfire anti-tank missiles can be fired, while its Block 2 helicopter variants may also be "navalised" to allow operations from ships and in maritime environments.

Significant Enhanced Survivability

It is the combination of flight agility with a flat and narrow silhouette, low radar infrared signature and passive weapon system that ensures the Tiger HAD will enjoy dramatically low levels of vulnerability on the battlefield. The helicopter's system architecture has designed-in redundancies and segregation entailing that its high levels of survivability are further enhanced by ballistic protection, high crashworthiness and self-sealing tanks.

> Tiger represents a major programme for the European Defense cooperation initiative

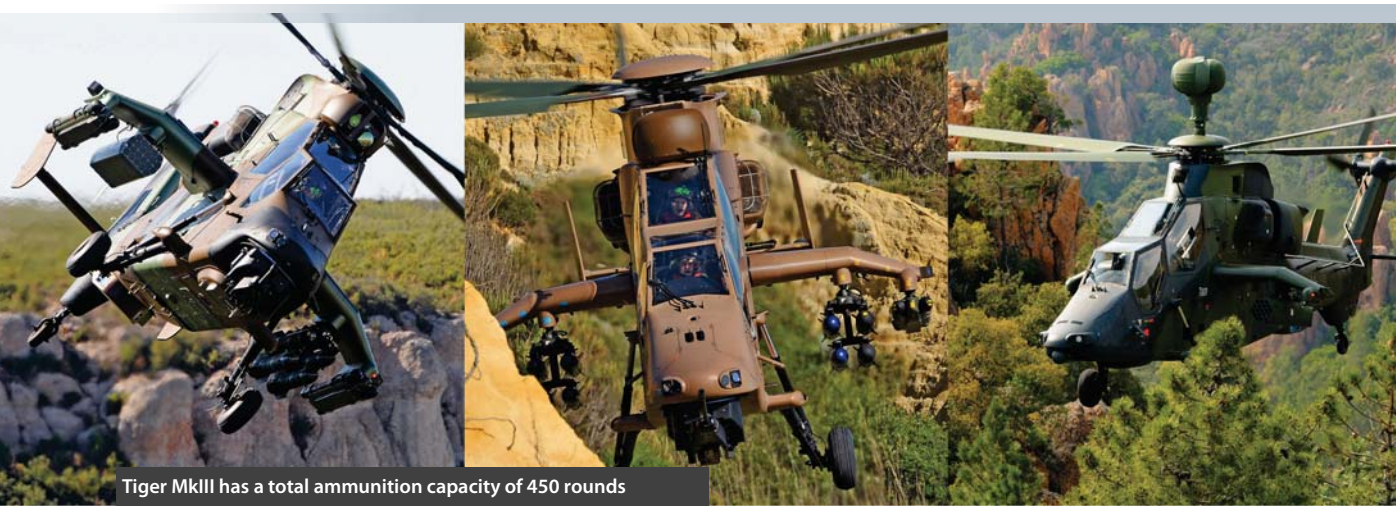
Supreme Armament Management

The Tiger HAD's turreted gun is built for ground-attack missions as one of the most accurate and lethal weapons of its type thanks to a hyper-efficient fire control system. The turret gun is linked to both roof and helmet-mounted sights, enabling swift, user-friendly target acquisition at a total ammunition capacity of 450 rounds and a firing rate of 750 rounds per minute.

The Tiger HAD's design enables 68 mm or 70 mm unguided rockets to be exchanged in place for other weapon types without changing the helicopter's fixed parts. While capacity is up to 68 for the 68 mm rockets and 52 for the 70 mm rockets, growth potential also exists for armament with laser-guided rockets.

Supplementary to the Tiger HAD's Hellfire laser-guided missiles, the helicopter can also integrate Spike ER electro-optical or fibre optics-guided air-to-ground missiles, with both capable of 8,000 metre range in self-designation mode. Finally, the Tiger HAD will retain a powerful air-to-air combat capability thanks to four "fire and forget" Mistral air-to-air missiles and integration of the Nexter 30M781 30 mm turreted gun, while a total of four Mistral missiles can be accommodated on outer launchers at a range of up to 6,000 metres.

Reference Text/Photo:
www.airbus.com



Tiger MkIII has a total ammunition capacity of 450 rounds

Otokar to Display Armoured Vehicles at IDEX

Otokar, the leading manufacturer of land vehicles for the defence industry in Turkey, has confirmed its participation at IDEX 2019, Abu Dhabi, UAE. Otokar has been manufacturing tactical wheeled and tracked armoured vehicles for defence industry.

Within its wide product range Otokar will be displaying its various armoured vehicles with superior mobility as well as ballistic and mine protection along with turret systems.

Otokar had recently debuted its Tulpar Light Tank for the first time at Eurosatory 2018. During Eurosatory Otokar General Manager, Serdar Görgüç, said, "Being Turkey's internationally recognised land platform manufacturer and operating in more than 30 countries in the world, we highly enjoy our extensive new vehicle development capabilities made possible by both our know-how and experience. We are more than happy to carry our experience in designing and developing armoured vehicles, and particularly main battle tanks onto the new vehicles."

"Considering the continuously changing combat conditions and threats, light tanks, effectively serving as reconnaissance and fire support vehicles in modern armies are playing a more important role in combat. By getting inspired from different requirements of our clients in different parts of the world, we combine our experience with our engineering and R&D capabilities, and debuted newly developed Tulpar Light Tank in Paris. We believe that light tanks will be more apparent in the inventories in the upcoming years."

New Tulpar Light Tank Targets Global Market

Görgüç stated that Otokar manufactured various armoured vehicles and turret systems in different types and versions ranging from 4x4, 6x6, 8x8 wheeled armoured vehicles to tracked armoured vehicles, "New Tulpar Light Tank is targeting several markets. Otokar is known in the global markets as a company that designed, developed and qualified Turkey's main battle tank and our most important reference in new purchases is our armoured vehicles used in more than 30 countries in five continents. We are in talks with the countries that need and demand the light tank in particular."

"We are happy to see that today Otokar stands apart in the defence industry, not only with its land platforms but also global know-how, engineering, R&D and technology transfer capabilities. Last year our subsidiary and Joint Venture Company Al Jasoor signed a significant 8x8 armoured vehicle contract for UAE Rabdan. Our aim is to be able to respond to the needs and expectations of different users in the best possible way through similar collaborations" he added.

Otokar Tulpar Light Tank stands out with its mobility, fire power and protection. The vehicle is integrated with CMI Cockerill's 3105 turret with autoloader, which is capable of firing all kinds of 105 mm NATO ammunition and the Falarick Gun Launched Anti-Tank Guided Missile (GLATGM) with its high pressure 105 mm tank gun. The Fire Control

System (FCS) with fully stabilised day/night (thermal imaging) sights and coincidence firing logic provides high first-round hit probability against static or moving targets and Hunter-Killer Capability provides single and multiple target engagements. CMI Cockerill 3105 turret has a two-man crew.

Tulpar Light Tank offers effective solution for missions requiring high fire and destructive power. Thanks to its superior mobility, Tulpar Light Tank can operate in diverse terrains where the Main Battle Tanks cannot serve due to their weight and size; like bridge capacities or in built up areas.

Tulpar is designed as a multi-purpose vehicle platform in regards to users' needs of diverse missions. The vehicle offers an ideal platform for the light tank. Tested in the toughest climate conditions and the most challenging terrains, Tulpar features a modular armour technology that can be configured and scaled according to threats as well as the best mine protection in its class. It can be integrated with active protection systems and has the capacity to accommodate 3 crew (Commander, gunner and driver) plus 2 personnel. Its outstanding Integrated Logistic Support System provides low lifecycle support costs.

COBRA II: High Protection and Payload Capacity

COBRA II, manufactured by Otokar with the mission of designing and manufacturing globally competitive land systems products, stands out with its superior performance. Built on the COBRA platform, COBRA II offers high level of protection and payload capacity and large internal volume. In addition to superior mobility, COBRA II also comes with the capacity to accommodate 9 personnel including the driver and commander, offering high protection against ballistic, mine and IED threats.

Delivering high performance in the toughest terrain and climate conditions, COBRA II is optionally available with an amphibious version, adapting perfectly to different missions as needed. Preferred especially for offering a wide range of weapons integration and mission equipment options, COBRA II is successfully used in border protection as well as internal security and peacekeeping missions. The modular structure of COBRA II also makes it possible to be used as a personnel carrier, weapons platform, ground surveillance radar, CBRN reconnaissance vehicle, command control vehicle and ambulance.

ARMA 6x6 Makes a Mark with Superior Mobility, Mine Protection

Otokar's multi-wheeled modular armoured vehicle with high tactical and technical features, ARMA 6x6 offers superior mobility, high mine and ballistic protection, as well as medium and high-calibre weapon system integration options. ARMA also comes with an optional amphibious version for peacekeeping and humanitarian aid operations in the most demanding terrain and climate conditions. ARMA 6x6 stands out especially with its high battle payload and large internal volume. ARMA can be equipped with different weapons and turret according to the needs. The ARMA family can be used for different missions as an armoured personnel carrier, armoured combat vehicle, command control, CBRN reconnaissance vehicle while different weapon systems can be integrated into the vehicle.

Cobra Stands Out for Its High Mobility

Otokar's COBRA armoured vehicle, currently used in more than 15 countries worldwide, stands out with its high mobility and survivability. Providing superior mine and ballistic protection with its monocoque body, COBRA continues to be one of the world's most recognised armoured vehicle in its class. Thanks to its modular structure, COBRA can be adapted to different vehicle configurations to serve as a personnel carrier, weapons platform, CBRN reconnaissance, ground surveillance radar, surveillance, ambulance or command post depending on the mission. COBRA is also available with an amphibious version.

KAYA II, the Favoured Mine-resistant Personnel Carrier

KAYA II was produced with Otokar's experience and know-how in mine protected vehicles. Designed as a mine-resistant personnel carrier, KAYA II provides superior protection against both mines and kinetic-energy ammunition with a chassis that adapts to the terrain with a suspension system with torsion bars. Offering unparalleled mobility in all kinds of terrain and climate conditions, the 4x4 tactical wheeled armoured vehicles KAYA II features a monocoque body. KAYA II has a capacity of carrying ten people including commander and driver.

Reference Text/Photo:
www.otokar.com

COBRA II is optionally available with an amphibious version

'Black Night' For Fighting in the Dark

Recently, BAE Systems unveiled 'Black Night', the first fully-upgraded Challenger 2 Main Battle Tank, which is a working example of the firm's vision for the proposed upgrade of the British Army's Challenger 2 Main Battle Tank.

The company is leading a major strategic partnership of world-leading defence firms, Team Challenger 2, to bid for the tank's Life Extension Project (LEP). It consists of BAE Systems Land (UK), General Dynamics Land Systems-UK, Leonardo, Safran Electronics & Defence, Moog, QinetiQ and General Dynamics Mission Systems-Canada.

The Challenger 2 tank, built by BAE Systems in the 1990s, served in Bosnia, Kosovo and Iraq. The LEP is a UK MOD contract to remove obsolescence from Challenger 2 and extend its out-of-service date by 10 years to 2035. As well as removing obsolescence, there will be the opportunity to make further capability enhancements.

Black Night

The upgraded tank, which is being called 'Black Night' thanks to its enhanced night-fighting ability, would bring for the first time to Challenger 2, two independent night vision systems, allowing the gunner to focus on one target while the commander identifies other targets simultaneously.

According to the company, this is just one of a host of other proposed upgrades including laser and missile-based protection systems, thermal imaging technology and regenerative power sourcing.

Black Night has different technologies and capabilities that are being offered by BAE Systems to the Ministry of Defence as part of Challenger 2's LEP. These include Active Protection System, Laser Warning System, Regenerative braking, Thermal Imaging Technology, and Accelerated fightability.

The new equipment controlling tank's weaponry is faster, meaning the crew can identify an enemy, target and engage more quickly.

Simon Jackson, Campaign leader for Team Challenger 2 at BAE Systems said: "The UK is home to some of the world's finest engineering companies, who have pushed the boundaries of combat vehicle design with Black Night. We are providing the bulk of this upgrade from home soil; however, we have chosen the best defence companies from around the world to collaborate with, including names from Canada, France and Germany, who bring unique skills and proven

Challenger 2 is the Main Battle Tank in service with the British Army and the Royal Army of Oman

technology. The British Army has our commitment that we will deliver the most capable upgrade possible, and the best value for money."

Robust Mobility

Challenger 2 is the Main Battle Tank in service not only with the British Army, but also with the Royal Army of Oman. It is a heavily armoured, highly mobile Main Battle Tank, designed for use in the direct fire zone. Its primary role is to destroy or neutralise armour. However, it has the ability to engage both hard and soft targets and can operate across a spectrum of high intensity conflict, counter insurgency and peace keeping roles.

The vehicle is equipped with an L30 120mm rifled tank gun, firing both long rod penetrator and High Explosive Squash Head (HESH) ammunition natures. Secondary armaments are provided with a 7.62mm co-axial chain gun and a 7.62mm pintle mounted General Purpose Machine Gun.

Optical and thermal imager sights are provided for both the commander and gunner, including an independent 360-degree panoramic sight for the commander. The sighting systems, turret and gun are fully stabilised enabling rapid target engagement when static and on the move.

The vehicle is equipped with an L30 120mm rifled tank gun

Mobility is provided through a 12-cylinder, 1,200hp Perkins CV12 diesel engine with a David Brown TN54 gearbox, providing six forward and two reverse gears. A double pin track with Hydrogas suspension and a Hydraulic Track Tensioner provide platform stability covering flat road surfaces through to rough cross-country terrain.

Key Upgrades

One of the partners on Team Challenger 2, Leonardo, is bringing its electro-optic technology to the tank upgrade programme. As well as being proven on other military platforms such as the Royal Navy's Queen Elizabeth aircraft carrier and Royal Air Force's Chinook fleet, this technology has also been chosen by broadcasters to capture some of the most difficult night shots possible for television.

Sighting systems are a vital element of a Main Battle Tank's lethality, where fractions of a second in reaction time can make the difference between mission success and failure. The system can detect vehicles at 50km and personnel at 30km.

Jackson added: "This sight delivers a night-and-day hunter-killer capability with a long-range threat detection and identification system. For Leonardo, which produces the sight from its UK facility in Basildon, this contract would support a large number of jobs in this high technology sector."

Reference Text/Photo:
www.baesystems.com

Boeing Bags
T-X Trainer and MH-139 Contracts

Recently, the US Air Force awarded Boeing with two key contracts. The company was selected for the T-X pilot training programme that is valued up to $9.2 billion and was also given a contract to replace the Air Force's UH-1N 'Huey' with the MH-139, in collaboration with Leonardo. Boeing's expertise spans a broad range of products in defence and the company has leveraged this holistic knowledge to work closely with the U.S. Air Force on these projects and deliver integrated systems.

Building U.S. Air Force's Next Trainer

The U.S. Air Force chose Boeing for the development of a new advanced pilot training system that will help train fighter and bomber pilots for generations to come. Boeing is the designated prime contractor for the Advanced Pilot Training Program. Saab is a risk-sharing partner with Boeing in the development of the T-X aircraft. The service currently plans to buy 351 jets with full operational capability by 2034. The original service cost estimate was $19.7 billion, according to the announcement.

Boeing's trainer aircraft will replace the Air Force's aging T-38 trainers that have been in the U.S. military's portfolio since the 1960s. The multi-billion-dollar contract comes as the Air Force moves to modernise its fleet of bombers, fighters, tankers as well as nuclear intercontinental ballistic missiles.

Successful Collaboration

"The announcement is the culmination of years of unwavering focus by the Boeing and Saab team," said Leanne Caret, President and CEO, Boeing Defense, Space & Security. "It is a direct result of our joint investment in developing a system centred on the unique requirements of the U.S. Air Force. We expect T-X to be a franchise programme for much of this century."

"This selection allows our two companies to deliver on a commitment we jointly made nearly five years ago," said

MH-139 will be used to protect America's intercontinental ballistic missile bases

T-X pilot training programme is valued up to $9.2 billion

Håkan Buskhe, President and CEO of Saab. "It is a major accomplishment for our partnership with Boeing and our joint team, and I look forward to delivering the first trainer aircraft to the U.S. Air Force."

The initial $813 million contract to Boeing covers the engineering and manufacturing development (EMD) of the first five aircraft and seven simulators.

Boeing offered the only all-new system purpose-built for the U.S. Air Force training mission, with aircraft, ground-based training and support designed together from the start. Proven in manufacturing and flight test, the new, flexible design meets all requirements and can evolve as technologies, missions and training needs change. Boeing is now clear to begin placing orders with its suppliers, including Saab.

MH-139 to Replace UH-1N Huey

Boeing also announced that it will provide its MH-139 helicopter and related support to the U.S. Air Force to replace the more than 40-year-old UH-1N "Huey" helicopters used to protect America's intercontinental ballistic missile bases. The programme awarded is valued at $2.4 billion for up to 84

helicopters, training devices and associated support equipment.

"We're grateful for the Air Force's confidence in our MH-139 team," said David Koopersmith, vice president and general manager, Boeing Vertical Lift. "The MH-139 exceeds mission requirements, it's also ideal for VIP transport, and it offers the Air Force up to $1 billion in acquisition and lifecycle cost savings."

The contract also includes operations, maintenance, training systems and support equipment for the MH-139 aircraft.

"We're proud to provide the U.S. Air Force with solutions across the entire services ecosystem," said Ed Dolanski, president of U.S. Government Services, Boeing Global Services. "With the AW139 platform's more than two million flight hours and established supply chain, we look forward to applying our expertise to drive cost savings while supporting mission readiness."

The MH-139 derives from the Leonardo AW139, which is used by more than 270 governments, militaries and companies worldwide. Leonardo will assemble the helicopters at its northeast Philadelphia plant, with Boeing integrating military-specific components at its facility in Ridley Township, Pennsylvania. Over 900 AW139s are already in service, with 260 assembled and delivered from Philadelphia.

> The MH-139 derives from the Leonardo AW139

Alessandro Profumo, Chief Executive Officer, Leonardo said "We are extremely proud of this outstanding result. Major customers continue to rely on Leonardo to meet the most stringent requirements like the critical mission of protecting missile bases and transporting government personnel and special forces. This selection is also testament to Leonardo as a strong, reliable partner and long-established contributor to the U.S. industry."

The MH-139 leverages the Leonardo AW139 baseline – a modern, non-developmental, multi-mission helicopter that is in service worldwide and has already demonstrated its capabilities in protecting critical infrastructures and transporting military and government representatives in various nations.

Gian Piero Cutillo, MD Leonardo Helicopters, said: "The announcement is a strong recognition of the world-class quality and competitiveness of our product to meet the most demanding needs of leading customers."

The MH-139 is the right-sized aircraft for the mission, exceeds the Air Force's speed, payload, range, armament and survivability requirements for protecting ICBM bases, and is perfect for VIP transport. The type features modern design and the best level of affordability with a savings of $1 billion in acquisition and lifecycle costs over the life of the fleet.

William Hunt, CEO, AgustaWestland Philadelphia Corporation, said "We are happy that the U.S. Air Force has selected our team to deliver a new fleet of Philadelphia-built MH-139s. Our Air Force deserves the best tools; this is the right helicopter for their mission. The more than $125M investment made by Leonardo in the Philadelphia facility demonstrates that we are fully prepared to execute in support of this contract. We look forward to working with Boeing on this programme and we're committed to deliver according to expectations of the prime contractor, the U.S. Government and taxpayers."

Reference Text/Photo
www.boeing.com
www.saabgroup.com
www.leonardocompany.com

Over 900 AW139s are already in service

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COGES AFRICA

Elettronica Celebrates 40 Years of Excellence

Established in 1978, Elettronica GmbH, a German Defence Company, headed by Marcello Mariucci as Managing Director, is celebrating its 40th anniversary this year. The company was formed as a a local logistic and maintenance facility, and one of its first defence awards was the contract with the German MoD for the provision of Electronic Warfare Countermeasures to be installed on board of the F104 Starfighter. Over the years, the firm has been growing within Europe thanks to its participation in international defence programmes such as Eurofighter and NH90. During the last decade, Elettronica GmbH (ELT) has successfully entered the new market segment of Homeland Security and Electronic Warfare (EW) Simulation, acquiring new capabilities and skills, enlarging its customer portfolio in Germany and abroad, evolving from a logistics company to an engineering and systems integration entity, able to cope with the most demanding requirements of the aerospace and defence market.

The company can be regarded as an EW centre of excellence for German MoD and a leading firm in supplying Police Forces with its fully equipped vehicles for surveillance and intelligence. As part of the European Defence industry, the company has felt the responsibility to provide its contribution to the debate on the current strategic issues involving the Common European Defence Policy and the opportunities that could derive for EW and Homeland Security Industries.

Leading the Way

An event was held to celebrate the anniversary and gathered representatives from German and Italian military institutions and industries as well as politicians, hosting outstanding personalities as speakers, such as Axel Binder, Commander of the German Strategic Reconnaissance Command, Rear. Adm. (UH) Giuseppe Abbamonte, Director of the General Directorate for Telecommunications, IT and Advanced Technologies (TELEDIFE) – Italian Ministry of Defence, MP Marcus Faber, Member of Parliament and of the Defence Committee of the Bundestag, and Volker Paltzo, CEO of Eurofighter Jagdflugzeug GmbH.

"This anniversary represents the opportunity to underline the importance of the company that opened the EW gateway to Europe, pursuing an innovation-oriented business concept, with solid Italian roots, but looking to the future with a strong German footprint. At the same time, the leading idea aimed at implementing a deeper collaboration between industries able to foster the cooperation and integration of the European Defence Industry, which could represent the base for the creation of an effective European Defence strategy among the Member States," said Enzo Benigni, President and CEO of Elettronica Group, in his welcome address.

Elettronica's German footprint was stressed by the words of Maj. Gen. Axel Binder, in his welcome address: "Elettronica has proven to be a reliable and valuable partner for the Federal Armed Forces and Strategic Reconnaissance Command."

The celebration was also the stage for an intense debate, on how to pursue a common industrial and institutional strategic approach towards a

European Defence Strategy. The round table had a specific focus on the relevance of a closer cooperation within the Defence and Security sector.

Volker Paltzo, Eurofighter CEO, offered his industrial point of view, affirming: "Elettronica is a reliable supplier within the Eurofighter programme. Surely in the future, EW will be one of the main areas for the upgrade of Eurofighter capabilities. Eurofighter will be the central pillar of European air defence and a stepping-stone into the Future Combat Air Systems."

The real opportunities created by European industry integration were underlined by the Country Manager of Elt GmbH Marcello Mariucci who said, "Our company and the European projects such as Eurofighter and NH90 that involve our systems and capabilities are the concrete proof of the virtuous cycle generated by the collaboration. We really hope to go ahead in that direction. Elt GmbH is ready for this challenge!"

Reference Text/Photo

www.elettronica.com

Modular UAV Solution

Elettronica Group recently attended the ***Electronic Warfare GCC conference*** in Abu Dhabi. The event brought together EW technology suppliers from across the globe in order to build strong connections with leading local defence companies, tasked with meeting regional military and security objectives. At the event, representatives from the company held a workshop aimed at exploring the threat posed by drones, analysing the full operational cycle of the Innovative Counter Drone Systems, to be effective in future scenarios.

The firm also highlighted its industry-leading products such as ADRIAN (Anti-Drone Interception Acquisition and Neutralization), a complete innovative capability for the protection of critical infrastructures, public areas, during public events and civil airspace from hostile mini and micro drone threats.

Claudio Dainelli, Industrial Operation & Customer Services, Head of Training Simulation System, Elettronica, explained that drone attacks are a huge problem all over the world, particularly for areas such as airport, palaces, stadiums etc.

He told Nation Shield: "Currently ADRIAN offers multi spectral detection suite, while drone neutralisation offers jamming capabilities with the possibility to integrate a gun, Laser and EMP for an hard-kill reaction. The system also provides Intelligence and Forensic functions, in order to collect information on a specific drone and to develop highly effective countermeasures.

"In the operational application after the detection of the target, there is tracking and then the identification through the Threat Library. After that the right counter measure is activated according to the authorised TTP. ADRIAN offers also the Planning function for the optimal sensors and effectors siting to guarantee the best probability of detection and neutralisation."

The system is based on multispectral sensors (Radar, EO/IR, acoustic and radio link interceptor) data fusion for the best detection and identification and on a reactive and adaptive jammer to interrupt the remote-control link of the platform without interfering with the communications that insist in the same area. ADRIAN offers also the possibility to jam the navigation aids signals, used by drones in autonomous flight mode to follow the programmed route through waypoints.

ADRIAN is integrated with an Enhanced EW Training Simulator System able to replicate a Counter Drone Scenario to train operator and Analyst in how to conduct a complete Drone Kill Chain. The Company is currently delivering the system to the Italian Air and Land Forces.

Elettronica team at EW GCC 2018

Radar Innovation with HENSOLDT's PrecISR

HENSOLDT, the world's leading independent sensor house, now has the product to provide armed forces and border protection authorities with unprecedented situational awareness and extremely short reaction times: the innovative airborne multi-mission surveillance radar PrecISR.

Multi-Mission Surveillance

As a software-defined Multi-Channel X-Band-Radar, the PrecISR can translate the latest innovations in active array and digital receiver technology into a scalable high-performance sensor. This multi-mission radar can be installed aboard helicopters, unmanned aerial vehicles (UAV) and fixed-wing special mission aircraft.

The PrecISR family of airborne multi-mission surveillance radars recognises that in a complex world with unpredictable and constantly changing threats, superior information is the key to staying ahead in threat mitigation. With its high performance and compact design, the PrecISR sensor is precisely the solution required to provide decision-makers with outstanding surveillance capability.

Adaptable AESA Sensor

PrecISR has been designed to detect conventional and asymmetric threats on the ground, at sea and in the air during all-weather conditions to ensure safety and security for every type of airborne surveillance mission.

This 24/7 state-of-the-art sensor has a gallium nitride Active Electronically Scanned Array (AESA) antenna and two-dimensional e-scan capability combining with large bandwidth multi-channel radar core electronics and integrated radar signal processing to provide unprecedented precision in target detection. The modular design of the PrecISR antenna permits scaled antenna sizes to fit different platforms making it the sensor of choice for surveillance of large sea and coastal areas against piracy, trafficking or illicit intrusion.

Surveillance Capabilities

The PrecISR increases the surveillance capabilities and mission efficiency for any special mission aircraft. Thanks to its software-defined radar modes and electronic beam steering, PrecISR can fulfil multiple tasks near simultaneously, entailing that it is capable of detecting, tracking and classifying thousands of objects and thus literally find the 'needle in a haystack'.

The PrecISR is designed ITAR free, its radar modes are software-defined to provide striking performance by collecting large amounts of data, so increasing the surveillance capabilities and mission efficiency of any special mission aircraft. This data is used to detect and to classify the relevant threats faster, with the added efficiency greatly reducing the work-load of both the aircraft crew and users on the ground.

PrecISR is thus the sensor of choice for monitoring large sea and coastal areas to combat piracy, illicit trafficking or intrusion. This multi-mission radar can also support illegal fishing, oil dumbing, terrorism and smuggling amongst other mission areas.

Compact, Perfect Fit

The innovative and compact PrecISR design enables fully flexible, easy installation without penetrating the airframe of board helicopters, UAVs and fixed-wing special mission aircraft. The system can be mounted underneath the fuselage bottom as an optional extra, while multiple fixed arrays may also be installed. Compact design enables all of the power-consuming parts to be located outside of the airframe. It is this simplified airborne platform integration that makes the PrecISR significantly more efficient and use-friendly than other radars.

Reference Text/Photo
www.hensoldt.net

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Carl-Gustaf to Get Game Changing Munition

Saab, in collaboration with Raytheon, has received a contract from the U.S. Army to demonstrate a guided munition for the Carl-Gustaf system, with three all-up-round test firings against threat-representative targets.

In 2017, Saab announced its partnership with Raytheon to develop new weapons for infantry forces. The new munition meets a U.S. Special Operations Command requirement and is designed to increase the capability of the combat proven, shoulder-launched, multi-role weapon system Carl-Gustaf built by Saab. The new munition is guided, which will provide for increased precision against moving targets.

"Collaborating with Raytheon, utilising their technical and product excellence in combination with our innovative technology solutions, will enhance the world-leading Carl-Gustaf and AT4 weapon systems with additional capabilities that will further increase the operational benefit for the end user," said Görgen Johansson, senior vice president and head of Saab business area Dynamics.

"Paired with the Carl-Gustaf weapon system, this new guided munition will give U.S. and coalition dismounted forces additional overmatch capabilities against enemy threats on the battlefield," says Kim Ernzen, Raytheon Land Warfare Systems vice president. "The munition is intended to enable ground troops to engage multiple targets precisely at distances up to 2,000 metres, including moving targets."

The munition's advanced warhead is designed to penetrate light armour, bunkers and concrete structures while decreasing collateral damage. With increased range, the new munition will offer greater protection for ground troops by enabling them to fire at targets from inside structures or buildings.

Multi-purpose Capability

The Carl-Gustaf system is a multi-role, man-portable shoulder-fired weapon. The system is suitable for a wide range of missions. It is light and ruggedised and its multi-purpose capability provides freedom of action for the commander in all environments.

Görgen Johansson

Furthermore, the system offers the soldier various types of ammunition, ranging from armour penetration and anti-personnel, to ammunition for built-up areas as well as special features like smoke and illumination.

The M3 version of the launcher features significant weight reduction and improvements for urban operations. It allows the infantryman to defeat armoured vehicles with add-on armour protection, destroy landing craft and bunkers, blast breach holes through brick and concrete walls, knock out concealed troops, deploy a smoke screen, and even turn night into day.

Also, recently, Saab made the first delivery of its new HEAT 655 CS 84-mm ammunition, giving, for the first time, Carl-Gustaf system users the ability to fire from inside confined spaces.

The new guided munition will provide increased precision against moving targets

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Nexter Captivates Vietnam With its Defence Solutions

The 105 LG1 makes the ideal fire support weapon for troops engaged under all climatic conditions

Nexter, a KNDS Group company, which is a European leader in land defence, recently took part in the third Homeland Security Expo (HSE) that took place between October 3 and 4, in Vietnam. The company is the main partner of the French Army, providing 100 per cent of its combat gear and most of its artillery systems.

Rugged Artillery Systems

Fighter protection is now a priority and in this regard, the support of land forces by precise artillery fire and barrage is crucial. Nexter is among the leading manufacturers in the world in the field of artillery, relying on a technological mastery of the weapon/ammunition pair that allows accurate shots up to almost 40 kms, and a unique feedback from French gunners who use its systems in many theatres.

The CAESAR 155mm self-propelled gun is a symbol of the group's know-how. Mobile, rugged and precise thanks to its digitisation including the FINDART gun control and management system, the CAESAR has already been chosen by five armies.

Multi-purpose, mobility, ease of implementation, sustained firing capability and survivability are the key features of the CAESAR arms system (compliant with the JB MoU 155mm/52 calibre standard). It meets the operational requirements, whatever the conflict level, theatre of operation or nature of the forces involved, thanks to its tactical mobility and manoeuvrability (6x6 truck chassis).

Plus, Nexter's 105LG1, a light towed artillery system demonstrates the company' ability to meet the requirements of the seven ground forces that have chosen it.

Lightness, ruggedness and ease of handling are its major operational assets. In operation, the 105 LG1 has proven its reliability, mobility, manoeuvrability and firepower. Today, it makes the ideal fire support weapon for troops engaged under all climatic conditions, including on the most difficult terrain. It can fire all compatible ammunition available within NATO, such as US M1 or the extended range HE ER G3 from Nexter Munitions (more than 17km). The company also offers an optional system for the artillery environment (ballistic computer and inertial positioning and laying system) which is simple and adapted to flexible use of the equipment. The 105 LG1 can be integrated in all Fire Control Sys-


NERVA©Nexter Robotics

tems (all types of C3I system, etc.)
Alongside the models of the CAESAR 6x6 and 8x8 and 105LG1, the 155m LU211 - LU 107 munitions and three FINDART stations were exhibited on Nexter's stand, at HSE.

Mission Preparation System

The company also showcased its digital battlefield management solutions with FINDMP, a fully interactive, tactile tactical mission preparation system. It is composed of a Digital Sand Box (DSB) and Tactical Analysis Systems (TAS) and allows collaborative work to ease and speed up the tactical decision making process for training, mission preparation and conduct of operation. FINDMP can be used in command posts, command vehicles and when dismounted during a military operation.
The system displays the terrain in 2D and 3D and facilitates terrain analysis. It also allows to determine key points (a hill offering good fire cover of a sensitive zone, a bridge that allows logistical supplies or a retreat, a single point of passage which must be held, etc.). Three new smart features have been added recently: the incorporation of a constructive simulation software into the Digital Sand Box, connection of the Digital Sand Box to a Battle Management System in order to transfer the order of battle to the BMS (save time and avoid errors) and to keep the pace of manoeuvre, and the Immersive Building Reconstruction Tool (ORBI) developed by Nexter Training, which helps Special Armed Forces or Special Security Forces to better prepare their intervention.
ORBI contains a software tool to virtually reconstruct, in few minutes and in 3D, the inner part of a building or a room from 2D information as photos, drawings. It then displays this 3D view through virtual reality googles and allows the operator to move inside.


FINDMP, is a fully interactive, tactile tactical mission preparation system

Range of Robotic Systems

Nexter also showcased the NERVA robot, enabling a number of missions thanks to its wide range of payloads (manipulator arm, fire detection, 3D scans); and a respiratory mask offering increased protection against nuclear, bacteriological and chemical risks.
Nexter Robotics cost-effective NERVA family range of robotic systems, includes a large set of platforms, control stations and compatible "Missions Kits". The platforms all offer a high level of robustness and ease of use; four-wheel and six-wheel versions that have semi-autonomous capabilities and increase operational efficiency in a range of missions that can be addressed with one single robotic system (Day/night Reconnaissance, CBRN reconnaissance, Counter-IED, Security and Protection, Civil Security).
They can be operated from a large set of control stations (PC, Tablets and Smartphones). All these are compatible with all types of platform. One single control station can supervise up to three robotic platforms. One single robot can be dynamically and sequentially operated by several control stations.

Reference Text/Photo
www.nexter-group.fr

SeaGuardian: Persistent Maritime ISR for MENA Region

SeaGuardian is the maritime version of the MQ-9B SkyGuardian from General Atomics Aeronautical Systems, Inc. (GA-ASI), and is set to become one of the most advanced Remotely Piloted Aircraft (RPA) when the first variant is delivered to the UK Royal Air Force (RAF) as the PROTECTOR RG Mk1 in the early 2020s.

"PROTECTOR will be a step change for us in terms of capability," said RAF Group Captain Lyndon Jones. "The new aircraft will offer greater range and endurance, and will be certified to fly in UK airspace."

As the UK awaits its first delivery, demand from other parts of the world, including the Middle East and North Africa (MENA) region, continues to build, a company statement highlighted.

Global Impact

On July 11, MQ-9B became the first Medium-altitude, Long-endurance (MALE) RPA system to complete a trans-Atlantic flight when it landed at the Royal Air Force (RAF) Fairford in Gloucestershire, UK. The flight originated from GA-ASI's Flight Test and Training Centre in Grand Forks, North Dakota, U.S.

In addition to the UK and the U.S., countries such as Italy and France have GA-ASI MQ-9A systems in their inventory, and a prominent Middle East country operates the Predator RPA. Spain and the Netherlands have MQ-9 systems on order. Discussions are also on-going with several other countries.

Multi-mission Aircraft

The MQ-9B leverages the mature system architecture of the legacy MQ-9A and its more than two million flight hours, while incorporating enhancements that support mission capability, global industrial expertise, and its goal of achieving unfettered access to national and international airspace.

As a truly multi-mission aircraft, nine external hardpoints on MQ-9B offer unmatched configurability to meet diverse mission requirements. In the basic Intelligence, Surveillance, and Reconnaissance (ISR) configuration, the standard SeaGuardian is equipped with a high-definition Electro-optical/Infrared (EO/IR) sensor and a high-performance 360-degree multi-mode maritime radar to support maritime patrol and surveillance missions.

In contrast to MQ-9A, MQ-9B's wings have been extended by four metres to a total length of 24m to accommodate additional fuel capacity, while also providing greater lift and endurance. The wing extension adds two hardpoints for a total of nine that can accommodate a maximum external payload of

MQ-9B SkyGuardian completed the first-ever trans-Atlantic flight of a MALE RPA when it landed at RAF Fairford on July 11

GA-ASI's Detect and Avoid (DAA) system is made up of an Air-to-Air Radar, TCAS II, ADS-B IN/OUT, and a Conflict Prediction and Display System

2,155 kilogrammes.

The SeaGuardian boasts a range of 6,000-plus nautical miles and an endurance of more than 40 hours. "GA-ASI flew an MQ-9B for 48.2 hours on 2,721 kg of fuel in May 2017," said Jim Thomson, regional vice president of International Strategic Development for GA-ASI. "Providing greater endurance at lower operating cost, SeaGuardian is ideally suited to complement manned maritime patrol aircraft in performing wide area maritime surveillance."

Persistent Maritime ISR

In addition to exceptional endurance, SeaGuardian can provide the MENA region with state-of-the-art sensors that offer ISR capabilities for a wide range of operational and threat environments. Capable of operating at Beyond Line of Sight (BLOS) ranges at altitudes over 40,000 feet and in inclement weather conditions, the MQ-9B can also provide EO/IR Full Motion Video (FMV), Synthetic Aperture Radar (SAR) imagery, and Ground Moving Target Indicator (GMTI) data about potential threats to military commanders in real-time from stand-off ranges without harm to the aircrew.

The platform can also be equipped with a multi-mode maritime search radar, an Inverse Synthetic Aperture Radar (ISAR) capability, and an Automatic Identification System (AIS) detection capability that provides a true Maritime Wide Area Search (MWAS) and allows for the identification and interdiction of maritime targets.

These maritime capabilities, long in use by the U.S. in the MENA region, are critical to confront the maritime threats, before they reach population centres. A more robust ISR capability would also allow MENA counties to conduct persistent patrolling around the Bab el-Mandeb.

SATCOM Auto Takeoff and Landing Capability (ATLC) is part of the SeaGuardian package, designed to help minimise the aircraft's launch and recovery footprint, and reduce manning and equipment requirements at a Forward Operating Base (FOB). This capability allows aircrew on a Main Operating Base (MOB) to land, taxi and launch


In October 2017, GA-ASI demonstrated remote detection and tracking of submerged contacts

the aircraft from a separate FOB, requiring only a small team equipped with a ruggedised laptop at the FOB.

Both SeaGuardian and the MQ-9B SkyGuardian are capable of all-weather day/night operations. The cold weather engine start capability allows ground operations down to -41 degree C. It also has an Electro-expulsive Deicing system (EEDS) for wing leading edges, anti-ice heated engine inlet, heated pitot tube and static ports, and lightning protection.

Revamped Version

MQ-9B is a ground-up redesign of earlier variants. This was done in order to earn certification to fly in non-segregated airspace and integrate seamlessly with manned aircraft. GA-ASI expects MQ-9B to achieve certification in the early 2020s, when the aircraft initially will meet NATO STANAG-4671 airworthiness standards, and subsequently will meet commercial airworthiness certification standards in cooperation with the U.S. Federal Aviation Administration (FAA).

"The Detect and Avoid (DAA) system that GA-ASI has developed for the aircraft is made up of a radar, Traffic Collision Avoidance System [TCAS], Automatic Dependent Surveillance-Broadcast [ADS-B], and the ability to blend that surveillance on-board in support of alerting and manoeuvring guidance to the pilot in the Ground Control Station (GCS). It enables the RPA to detect other platforms and safely remain well clear in coordination with air traffic control," said Thomson.

A number of technologies and design attributes have been incorporated into the production of MQ-9B to meet certification standards. To comply with STANAG airworthiness requirements for airframe fatigue and integrity, all MQ-9B aircraft are constructed with certified composite materials using riveting and bonding processes that yield a service life of 40,000 flight hours – double the service life of the MQ-9A aircraft.

For MQ-9B to be able to "file and fly," it needs to be controlled by a GCS that's also certified. That effort has brought with it a number of key features designed to enhance safety and situational awareness for the remote pilot, including the Launch and Recovery Element (LRE), Mission Control Element (MCE), dual control Pilot/Sensor Operator (PSO) stations, full automation or manual "pilot-in-the-loop" operations, and design standards to meet the FAA's DO-178/DO-254 airborne systems and equipment certification.

ASW Feature

GA-ASI is also developing an Anti-submarine Warfare (ASW) capability. In October 2017, GA-ASI demonstrated remote detection and tracking of submerged contacts using an MQ-9A RPA. The MQ-9A used sonobuoys to gather acoustic data and track underwater targets. The data was transmitted to the MQ-9A, processed on-board, and then relayed to the aircraft's GCS. The demonstration successfully paired sonobuoy receiver and data processing technology on board the MQ-9A.

Future developments are planned that include SeaGuardian's ability to carry and dispense sonobuoys and to transmit the acoustic data via BLOS SATCOM. This continuing development offers yet another cost-efficient capability to complement manned maritime patrol aircraft in the prosecution of submerged vessels.

Achieving Milestones

GA-ASI has delivered over 850 aircraft, more than 300 GCS, and its aircraft operate worldwide. To date, GA-ASI aircraft have accumulated over five million flight hours, with 90 per cent of these flight hours achieved during deployed operations.

Developed to fly in civil airspace, SeaGuardian provides persistent situational awareness across vast maritime domains. It does this without putting aircrew at risk and more cost effectively than manned aircraft alternatives. Interoperable with NATO, its multi-mission capability makes it a valued asset in a variety of scenarios – from environmental protection and maritime domain awareness to search and rescue and military surveillance.

Reference Text/Photo:
www.ga-asi.com

MX-GCS:
L3's Versatile Sighting System

L3 WESCAM recently demonstrated its all-digital MX-GCS sighting system in four different configurations for short-range air defence at the 2018 AUSA Annual Meeting and Exposition, which took place from October 8 to 10, at the Walter E. Washington Convention Center in Washington, D.C.

The demonstrations featured a diverse range of mounting applications and advanced sensor capabilities in support of today's critical ground-to- ground and ground-to-air land requirements.

L3's MX-GCS is an above-armour sighting system that weighs up to 75 per cent less than traditional glass periscope systems and performs with lower power consumption than other fielded solutions.


L3's MX-GCS is an above-armour sighting system

"Today's land missions require sighting solutions that are versatile and flexible and offer exceptional clear, long-range sighting capabilities," said Matthew Richi, president of L3's Tactical Mission Systems sector, which includes L3 WESCAM. "We are excited to show how the MX-GCS works across various customer land-based platforms, and we remain focused on developing innovative technologies that give our servicemen and women a distinct advantage in the field."

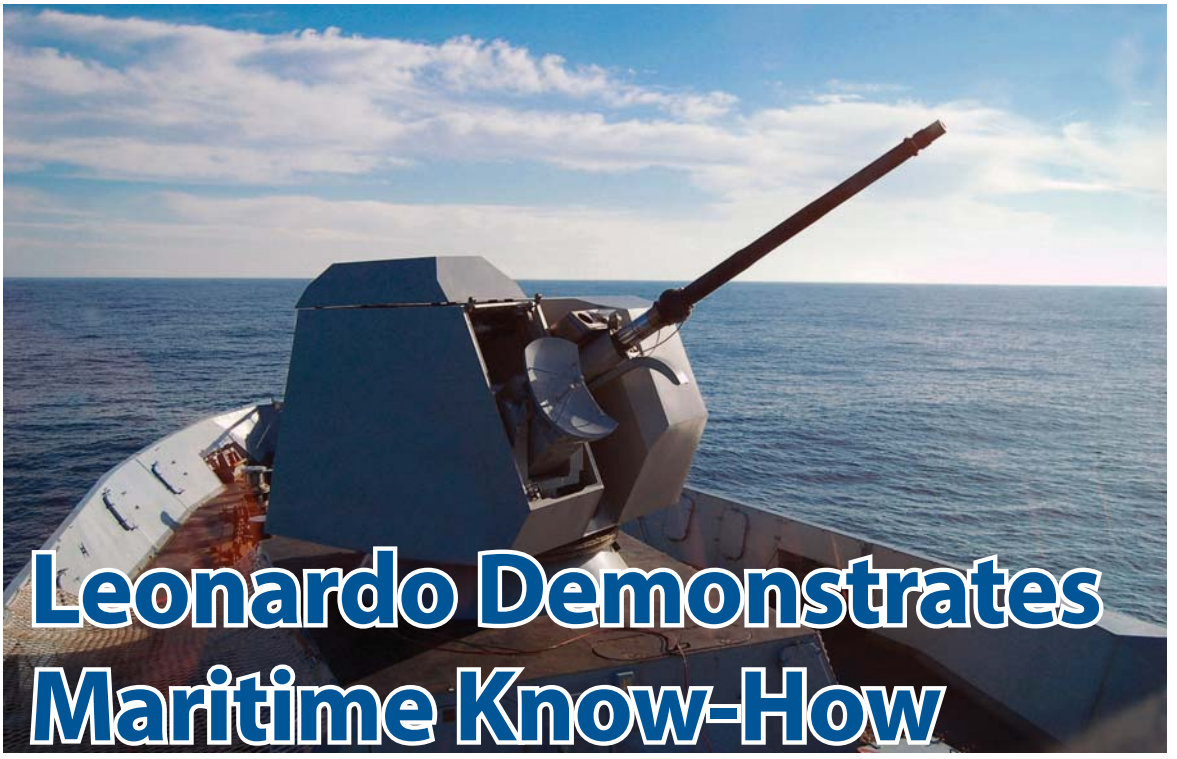
L3's MX-GCS sighting system was featured on four key customer platforms, demonstrating its flexible and adaptable capabilities. These included the Reconfigurable Integrated-weapons Platform (RIwP) in a U.S. Army IM-SHORAD configuration; Mobile Protected Firepower (MPF) vehicle; Gunsight and Commander's Independent Viewer (CIV) option for 3000-series turret; and 50mm gun turret in support of a Cooperative Research and Development Agreement (CRADA) with the U.S. Army Research, Development and Engineering Command (ARDEC).

As a Gunner Sight, the MX-GCS can identify threats beyond the range of the vehicle's weapon system, allowing for standoff distance engagements at maximum effective ranges.

While as a Commander Sight, it provides vehicle commanders the ability to scan for, identify and track targets (Hunter) independent of the gunner system, hand-off identified threats between target acquisition systems (Killer) or fire weapons autonomously from the commander position.

MX-GCS reduces detection time by providing real-time image enhancement of all sensors, high-performance haze penetration, improved feature recognition and Identification, and Image blending that combines day and infrared night images into a single image stream, affording the operator the benefits of both.

L3 WESCAM is a leading global company in the design and manufacture of stabilised, multi-spectral imaging systems. The firm is an agile innovator and leading provider of global ISR, communications and networked systems, and electronic systems for military, homeland security and commercial aviation customers. It develops advanced defence technologies and commercial solutions in pilot training, aviation security, night vision and EO/IR, weapons, maritime systems and space.



Leonardo Demonstrates Maritime Know-How

Leonardo, the Italy-based high-technology aerospace and defence company, is currently finalising some relevant maritime contracts in several countries: from Africa to Oceania, and is also pursuing important tenders in Europe, South America and the Middle East, while also partnering with Fincantieri.

To better face the new challenges in the international market and offer joint solutions in an increasingly competitive and demanding sector, Leonardo and Fincantieri have revamped their partnership through the Orizzonte Sistemi Navali (OSN) Joint Venture with shares of 51 per cent and 49 per cent respectively, as part of the preferred partnership launched in October 2014. With this agreement, the two parties will enhance all the high-tech skills and expertise developed at a national level; Leonardo will be the preferred partner for the Combat Management System and the equipment and combat systems of the ship.

Leveraging on proprietary technologies, Leonardo partners with its customers to provide total maritime domain awareness by delivering a comprehensive offer of systems and products based on an innovative product portfolio ranging from turn-key combat management systems for surveillance and security to naval guns, ammunition, sensors and underwater systems for all classes of military vessels, both manned and unmanned.

Furthermore, the company's portfolio is rapidly expanding bringing to market advanced naval training and maintenance solutions, and satellite systems and services for Earth observation and geo-location, which are essential for marine environmental monitoring and maritime security.

Best in class Naval Products

At the Euronaval exhibition in Paris, Leonardo displayed its unique naval products, sensors and systems; along with its range of helicopters; newly enhanced air to ship integration capabilities and innovative developments for training and through-life support services, in line with Leonardo's Industrial Plan. The company has enhanced its customer support, logistic services and training order intake target from 20 per cent to 25 per cent in the next five years. One of the first achievements in this sector that was awarded was the NATO Science and Technology Organization's (STO) Scientific Achievement Award for Leonardo's contributions to the development of a new promising approach to Modelling & Simulation and Training. This new approach relies on a paradigm called Modelling & Simulation as a Service (MSaaS), internationally recog-

nised as the new frontier for modelling and simulation systems.

In this context Leonardo, in close co-operation with the NATO Modelling & Simulation Centre of Excellence (CoE) in Rome, defined OCEAN (Open Cloud Environment Application): a new prototype platform to deliver Modelling & Simulation and Training through the Cloud on highly complex military systems also using virtual and immersive reality.

The solution, developed at Leonardo's Genoa Centre of Excellence, will allow the customers to move from distributed extremely rigid training systems to centralised cloud-based systems, which will provide on-demand services and be reconfigurable according to customer needs. The 'student station' will no longer need to be a specific physical system, installed in a particular place, but a "mobile" terminal from which the student can remotely connect to services.

AW101 MK4 Merlin's1st Flight

Long-lasting Legacy

Leonardo is celebrating its 70th anniversary this year. Founded in 1948 under the name of Finmeccanica and the same age as the Italian Constitution, the company was simultaneously witness to and protagonist of the birth of a new chapter in the history of Italy, restoring a new perspective to the impressive skills displayed by many industrial companies in the post-war era and accompanying them towards an international expansion. A company statement says that it has been a long and complex path, often characterised by difficult choices and changes of course, but one which has been able to maintain and build upon the fundamental assets on which the Company has built its success: the skills of its people and technological innovation, which have catapulted it amongst the top 10 global players in aerospace, defence and security.

"Leonardo's first 70 years represent a true history of innovation. By recognising our heritage, we're able to inspire our future" said Giovanni De Gennaro, Chairman of Leonardo. "Therefore, "mission accomplished", but it is also the beginning of another story, in which our Company aims to continue to be the leading figure: in the design and realisation of innovative solutions for the security of people, the environment and infrastructure; in collaborations for the development of the territory and its industrial activities, in the dissemination of a scientific and technological culture at the base of the industry of the future. In short: we want to continue to create value for all our stakeholders."

'TITAN' Robotic Antitank and HMG System

The Titan unmanned ground vehicle by robotic warfare systems developer Milrem Robotics with the Protector remote weapon station by Kongsberg Defence and Aerospace was exhibited at this year's AUSA trade show in Washington DC.

Titan is a first-of-its-kind modular, hybrid, large, unmanned ground vehicle that provides support for small military dismounted operations. Developed by QinetiQ North America (QNA) and Milrem Robotics, Titan features a multi-mission, reconfigurable platform that increases unit effectiveness while increasing soldier safety.

Developed with Proven Technology

Titan consists of QNA's combat-proven robotic systems and controller and Milrem's THeMIS mobility platform and modular mission payload. The vehicle platform features a pair of diesel-electric hybrid tracked drive modules providing all-terrain long-range endurance with run-silent capability.

Load Carrying Capabilities Ensuring Mission Success

Titan's load carrying capabilities provides force multiplication and greater mobility. These capabilities insure off-route manoeuvrability resulting in a safer and successful mission.

Titan's open architecture platform supports a wide range of operations. Milrem's THeMIS mobility platform includes two track modules linked by a mission specific payload frame that supports both infantry and combat engineer requirements. The vehicle can be operated in both unmanned and manned modes depending on the mission. Titan also interfaces with third party payloads for CBRNe, route clearance and integration autonomy packages.

Unlike existing UGVs, Titan offers a highly modular platform that allows for a variety of structures to be mounted and integrated to support complex missions such as rescue, transport and reconnaissance. The flexibility and versatile nature of the system not only increases efficiency, it also significantly reduces life cycle costs and soldier workload.

The system on display was equipped with a 50.cal and a Javelin missile launcher providing excellent combina-


Titan's load carrying capabilities provides force multiplication and greater mobility


Milrem's tracked UGV has proven itself to be an ideal platform for various weapon systems integration

tion of heavy machinegun and antitank capabilities to warfighters. Just a month before AUSA exhibition the system was showcased in a live fire demonstration conducted near Kongsberg's headquarters in Norway. Further testing and demonstrations, including Javelin firing are planned for the near-future.

"Milrem's tracked UGV has proven itself to be an ideal platform for various weapon systems integration," said Kuldar Vaarsi, CEO of Milrem Robotics. The UGV has previously passed live fire tests with FN Herstal's deFNder Medium RWS, ST Kinetics ADDER and Aselsan's SARP. An anti-tank system with MBDA's IMPACT (Integrated MMP Precision Attack Combat Turret) system is also in development, thus the Titan/THeMIS is one of the most sought after platform by weapon systems developers.

"Equipping unmanned and robotic platforms with weapon systems enhances the safety of warfighters and keeps them from harm's way. These systems will always have a human operator controlling the weapon thus eliminating the concern about "killer robots"", added Vaarsi.

'Protector' Weapon Stations: Suitable for Any Mission, Land or Sea

Kongsberg has an extensive range of products in the Protector family of remote weapon stations, from the man-portable Super Lite to the Medium Calibre Turret Protector MCT-30. With more than 18 000 systems sold to 18 nations, Kongsberg is a world-leading provider of Remote Weapon Systems.

The Protector Remote Weapon Station is a platform-mounted system for remote operation of light, medium and heavy machine guns. The Protector family of Remote Weapon Stations are systems suitable for any missions whether on land or at sea, on mobile or static platforms for remote operation of payloads ranging from small calibre weapons to medium calibre automatic cannons. The system is modular, and all of the different variants of the Protector RWS share the same baseline technology.

The Protector Remote Weapon Station (RWS) is a proven product based on millions of hours of operational experience in combat zones combined with a close cooperation with defence forces worldwide. The Protector has an unprecedented Operational Readiness Rate of 99 per cent.

The Protector RWS is built for operation in extreme environmental conditions with capabilities that allow soldiers to operate from a protected position using stabilised precision optics and laser to observe, detect and engage targets with increased accuracy and reduced collateral damage.

The fully stabilised system provides unmatched observation and engagement capabilities where the gunner is enabled to keep his sights on target, independent of the ballistic solution for the weapon in use.

With approximately 15,000 systems already in service across the US DoD, Kongsberg's Crows weapon station-family is uniquely positioned to support UGV weaponisation, either as an applique solution or in a ground-up design.

Eskild Aas, Director Digital Vehicle Solutions at Kongsberg said: "Many of the control capabilities already being delivered to the U.S. (for Crows) support a relatively straight forward and low-risk UGV integration for our weapon stations." He went on to say: "We are obviously quite excited to continue our work with Milrem Robotics and believe further demonstrations of this system will help the user-community understand what is possible for a robotic platform."

Reference Text/Photo:
www.milrem.com

Belrex Protected Vehicles Launched

A new family of Protected Vehicles, comprising ten variants based on Paramount's Marauder, was launched recently at the biennial Africa Aerospace and Defence 2018 exhibition. Paramount also unveiled its new Surveillance and Intelligence Network, or SAINTS.

The Singapore Technologies (ST) Engineering's Land Systems arm and Paramount Group, South Africa's global aerospace and defence company, together will market the family of Belrex Protected Vehicles globally.

The ten variants leverage ST Engineering's strong and proven expertise in the design and development of armoured mobility platforms. In November 2016, the Singapore Army commissioned the Belrex Protected Combat Support Vehicle.

Tung Yui Fai, President of Defence Business at ST Engineering's Land Systems arm said, "We believe the Belrex Protected Vehicle, with its variants, will be a key asset to armed forces and paramilitary, offering protected mobility transport for combat and non-combat operational requirements."

Ivor Ichikowitz, Group Chairman of Paramount Group said, "Singapore is one of the most sophisticated defence procurement markets. It is with great pride that we have partnered with ST Engineering, a global leader in defence technologies."

Classified as MRAP (Mine-Resistant Ambush Protected) class, the four-wheeled armoured vehicle provides motorised infantry combat support and combat service support forces with improved firepower, protection and situational awareness to enhance their survivability. It is highly flexible, and can be configured to carry combat loads for a variety of combat support and logistical functions. The ten variants include security, engineer, reconnaissance, logistics,

fuel, mortar, medical, signal, maintenance and mortar ammunition carrier. The base platform comes in three basic crew compartment sizes – four, eight and ten.

In addition to a remote machine gun and a smoke grenade launcher, the vehicle also has provisions for a suite of C4 systems, enabling co-operative engagement with other land combat platforms as part of a networked force. The vehicle can be deployed in peacekeeping roles in conflict areas and other para military roles.

New Surveillance Network

Paramount Group, meanwhile, also announced the launch of its new scalable and modular Surveillance and Intelligence Network, or SAINTS. The pro-

gramme provides customers with affordable surveillance and intelligence capabilities to discover and assess potential security threats in any environment, setting a new industry standard for situational awareness in the field.

Paramount Advanced Technologies CEO, Ralph Mills said, "In today's environment of uncertain asymmetrical challenges, superior information and intelligence is vital to ensure safety and mission success. Many governments face serious challenges to their sovereignty, for example, which can vary dramatically in nature and scope. Almost every state has cause to improve, to modernise its ability to monitor potential and emerging threats. The more, and more quickly that security forces can detect and recognise danger, the greater their opportunity to act decisively to defuse or overcome it".

SAINTS provides customers with latest technologies, covering both military and paramilitary situations, enhancing network effectiveness by way of its reliance on both commercial and military telecommunications systems. End-users can find precisely the right capabilities to address their unique situations at hand. The programme is fully networked and allows for the deployment of additional sensors as part of its system architecture; thus, SAINTS can begin with a one-man portable system, however, it is scalable and can incorporate additional platforms and sensors, providing both affordability and flexibility.

Paramount Group developed the network in-house, using extensive engineering, intelligence, and operational experience in step with a mission to leverage the technological boons of the Fourth Industrial Revolution. The PAT Engineering team acted as Lead System Integrator, bringing together multiple products as part of the solution in consultation with intelligence specialists.

SAINTS allows customers to choose among a large variety of sensors, weapons, and other mission equipment options

SAINTS covers both military and paramilitary situations

The company drew on its experience with Paramount's Flexible Light Armaments System (FLASH) for helicopters soon to be adapted to fixed wing aircraft, which takes a similar approach as SAINTS, allowing customers to choose among a large variety of sensors, weapons, and other mission equipment options. SAINTS was created with a special understanding of budgetary constraints commonly facing public entities.

Mills added: "Responsible sovereign powers and peacekeeping forces need to maintain security, and therefore for nearly 25 years, we have designed world-beating technologies that both protect personnel and enable them to better fulfil their objectives. The fact that the SAINTS system is both modular and scalable, with the added ability to reuse legacy communication equipment and sensors, allows customers to find the right fit for both capability and price".

Paramount Group has assisted more than 30 nations and has an extensive global manufacturing base. It is a leader in defence and security innovation and is a trusted partner to sovereign governments across the globe. Paramount Group has been responsible for the development and production of a broad range of highly advanced armoured and mine protected vehicles that are in operation around the world. The family of APC and combat vehicles which has been developed from clean-sheet design is at the vanguard of armoured vehicle technologies. These vehicles have been designed and developed to meet the increasing demand for multi-role, high mobility, and mine hardened platforms, providing a solution to the ever-changing demands of the global battlefield.

Reference Text/Photo:
www.paramountgroup.com

Thales Employs ISR Digital Transformation

ECLIPSE jams radio signals across a wide range of frequencies without interfering with the radio communication systems used by friendly forces

Thales is a global company with headquarters in France and has a long-standing relationship with the Armed forces across the GCC. With a presence in the region since 1978, the UAE has evolved into a key player in Thales' target markets on a global scale. The Group's vision in the GCC is to bring security, safety and growth; whilst evolving state sovereignty, providing sustainable economic development, and fostering provincial talent.

Thales Group, a long-term partner of the UAE, has developed its local presence in the country through numerous joint ventures and partnerships. This has allowed Thales to expand its local footprint, to be able to adapt and meet customer needs and, crucially, to develop talents through the means of high-level professional and academic training programmes.

Thales' strategy encompasses strategic topics with the aim of promoting local expansion in emerging countries. This is of paramount importance as it allows the Group to attain its ambitious objectives.

The firm works relentlessly in ensuring the best solutions are adapted to the countries requirements. It has various unique protection solutions designed specifically for the local market in terms of countermeasures.

Jean-Michel Eustache, Thales's Operational Marketing Manager, Electronic Warfare Intelligence, Surveillance and Reconnaissance said: "Our solutions are customised for the customer's requirements and needs, and provide multiple sources of data such as EW, imagery, surveillance radar, open source, and human intelligence. The system and sensor net disseminate these data to an exploitation Centre updating and upgrading the national reference database. Specific libraries extracted from this database are key tools with which the system can automatically check intercepted activities, react to facing threats, for example a fighter or a ship. When the system intercepts a signal, it can compare it to the library and react to protect assets."

He explained that Thales is inserting the last digital technology inside its solutions. For example, the Big Data technology allows a sensor or system to ingest and compile a huge quantity of accurate data. Facing the evolution of the complex environment and the higher quality of the sensor itself, the quantity of data exposes the human analysis capacity. The Artificial Intelligence inside the sensor, by using the Machine Learning approach, extracts in real time the real target of interest and concentrates the operator to its mission and not to the sensor control.

Digitalisation is also the ability to compare a situation with a previous historisation. So then, you focus your attention only to the anomaly or target of interest.

"So, thanks to the Digitalisation, Big Data and Artificial Intelligence, we are able to control all activities in an area

Fabrice LE CLEZIO at Thales stand at EW GCC 2018

ECLIPSE is a compact device ideally suited for integration on board any type of light or armoured vehicle

of interest to manage the situation assessment," he added.

Countering Threats in Real Time

At the show, the company highlighted ECLIPSE, a new-generation jammer that prevents improvised explosive devices (RCIED) from being detonated by remote control. The moment an IED is detected, ECLIPSE jams radio signals across a wide range of frequencies without interfering with the radio communication systems used by friendly forces. Now fully qualified for use in hostile environments, ECLIPSE is a compact device ideally suited for integration on board any type of light or armoured vehicle. A modular, open architecture makes it possible to expand the defensive capabilities by adding new functions to the system as threats evolve.

Fabrice LE CLEZIO, Thales Electronic Warfare Product Line Manager, said: "For example, a terrorist may trigger a radio controlled improvised explosive device in order to strike conventional land forces. Its objective is to trigger its remote control while a vehicle comes. As the incoming vehicle is equipped with the ECLIPSE system, it is going to jam radio signals. This will prevent the IED to be triggered.

"As Thales is a key military radio-communication provider, such technology is very well known. This provides a real advantage to ECLIPSE for not interfering with your friendly communications while jamming the area. There is an increasing global interest in this system, as it enables the protection of your forces."

ECLIPSE can be integrated inside the vehicle or outside the vehicle. The equipment can be integrated on tanks, and various types of vehicles. High expertise has been acquired by Thales in terms of vehicle's integration by realising EMC simulations in order to optimise antennas' location.

It's also very easy to operate for the land forces. Its mission programming tool configures ECLIPSE in order to adapt to the threats by using various modes such as active, reactive or hybrid modes. This solution can also be used for counter UAV.

Investing in the Future by

Innovative National Initiatives to Reinforce the Role of Youth in the Empowerment Phase

Young people in the UAE constitute the essence of strategic planning and the wise leadership's vision in the empowerment phase. The various strategies of sustainable development are based on young people, who are assigned vital roles to prepare them for future leadership. Having an insightful strategic vision for its centennial in 2071, the UAE needs the efforts and energies of its young people for building the future. In this issue, Nation Shield sheds light on the plans and vision of the empowerment of the UAE youth.

Empowering the Emirati Youth

The wise leadership, led by His Highness Sheikh Khalifa bin Zayed Al Nahyan, the President of the UAE and the Supreme Commander of the Armed Forces, is looking forward to young people as the engine leading the development movement and taking responsibility for leadership in the future. Therefore, it spares no effort to prepare and equip them with the knowledge and skills that enable them to face the various challenges and build a bright future. Young people are the mainstays not only of the present, but also the makers of the future. The investment in building a creative and innovative youth is a key priority in the UAE's vision of development. This is reflected in reality through many strategies and policies to empower young people and improve their abilities and skills continuously.

Persistent Approach

Investment in empowering young people to participate in various national workplaces has been a constant Emirati approach since the foundation of the UAE in the 1970s to this day. The late Sheikh Zayed bin Sultan Al Nahyan, may his soul rest in peace, had very early on realised that the preservation and enhancement of the UAE's achievements are the responsibility of the young men and women of the country. He always encouraged young people to constantly arm themselves with knowledge and ethics, so as to serve the nation, learn about the past and the difficult circumstances and hardships experienced by their parents and grandparents, and

look forward to the future. He was keen to provide young people with the skills to deal with modern state-of-the-art technologies and instil in them the values of belonging and adherence to national identity.

Focus on Empowerment

In the footsteps of the late Sheikh Zayed, His Highness Sheikh Khalifa, believes that youth are the foundation of development and progress in any society. Therefore, young people constitute the essence of the empowerment phase launched by His Highness in 2005. Hence, the government initiatives reflect the keenness of the wise leadership to nurture a generation full of national values, virtue, responsibility, tolerance, altruism and respect, to be able to participate in decision-making and to assume leadership positions in the country. Initiatives have also been launched to empower Emirati youth to participate in the political arena, to choose their representatives under the umbrella of the Federal National Council and to assume their responsibilities in discussing laws that support their aspirations towards the future.

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai has on many occasions expressed his country's belief in the youth and takes pride in their abilities. "Our nation has been built by the arms of youth and we will continue to build its future relying on their skills and abilities," he said.

Sheikh Mohammed has adopted a number of initiatives and programmes that include the establishment of youth councils in coordination with local governments and the launch of an integrated guide to the values of UAE youth. "Through all our programmes, policies and services, we aspire to inspire, delight and build real opportu-

nities for all young people in the UAE," he said.

Empowering young people is the foundation of all initiatives launched by the UAE in its journey to the future, culminating in the appointment of the Minister of State for Youth Affairs in the Government of His Highness Sheikh Mohammed.

UAE Youth Global Initiative: A Quantum Leap to Activate the Role of Youth in Service of the Homeland

In August 2018, His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, launched the UAE Youth Global Initiative, which is being implemented by the Federal Youth Foundation to promote the UAE's values, culture, tolerance, co-existence, human development and youth empowerment, as well as bridging the human, scientific and knowledge gaps between the youth of the UAE and the world.

The UAE Youth Global Initiative aims to achieve several objectives, including:

* Activate the role of young people globally in achieving leadership and enhancing the reputation and prestige of the UAE.
* Support the participation of the UAE youth in various international events, tasks and official missions abroad.
* Introduce the UAE experience and strategy in empowering its youth.
* Empower UAE youth to contribute to the development of "Emirates Vision".
* Equip UAE youth with skills and potentials and instil the highest values in them to represent the UAE globally and to introduce the UAE identity, values and culture.

* Empowerment of Young People in Political and Government Work

The UAE's leadership has provided opportunities to empower young people

at various levels, both legislative and executive, to strengthen their spirit of leadership. The Government of the Future, formed in February 2016, has included eight new ministers, five of whom are women. The average age of the new ministers is 38, including Shamma bint Suhail Faris Al Mazrui, Minister of State for Youth Affairs, who took office at the age of 22 to become the youngest minister in the world.

The new cabinet reshuffle in October 2017 included a group of young leaders in line with the vision of Sheikh Mohammed. It is remarkable that in this cabinet unprecedented ministries have been created at the world level, such as the Ministry of Artificial Intelligence. This has not been witnessed by any government in the world, with a participation rate of 28 per cent. At the same time, young people play an active role in many national institutions, such as the Federal National Council.

Mohamed Bin Zayed Majlis For Future Generations: A Pivotal Role in Empowering Young People

As part of its vision for future development, the UAE pays special attention to the preparation of young leaders in various national workplaces and will provide programmes that contribute to enhancing their capabilities so that they will be able to participate effectively in the process of development and assume leadership responsibility in the future.

The Mohamed Bin Zayed Majlis for Future Generations aims to achieve a set of objectives, the most impor-

tant of which are:

- Acquire 21st century skills.
- Build the future generations.
- Prepare young people to keep up with the UAE's future ambitions.

The UAE's Strategic Investment in Building Young Leaders

The UAE is keen to prepare young people to be the leaders of the future. It is working to provide an appropriate environment that motivates them to create, innovate and excel. It unleashes their energies and invests their potential and capabilities in promoting comprehensive progress. There are many programmes and initiatives aimed at raising the leadership capacities of young people and qualifying them to take responsibility in various national workplaces, most notably: The UAE Government Leadership Program, which was established in 2008 and includes four categories: strategic leadership, executive leadership, future leadership and creative leadership.

Strategies for Empowerment of Youth in Different Fields

At the federal and local levels, the Government of the UAE is making concentrated efforts to empower the UAE youth in various aspects, notably:

1. National Youth Agenda: This was launched by Sheikh Mohammed, in October 2016. It reflects the exceptional interest the UAE attaches to its youth. The most important feature of the National Youth Agenda is that it was formulated on the basis of proposals made by young people representing different sectors of society and the government during the recent youth retreat under the leadership of Sheikh Mohammed and saw the participation of many young ministers and leaders in the country.

> UAE is keen to prepare young people to be the leaders of the future

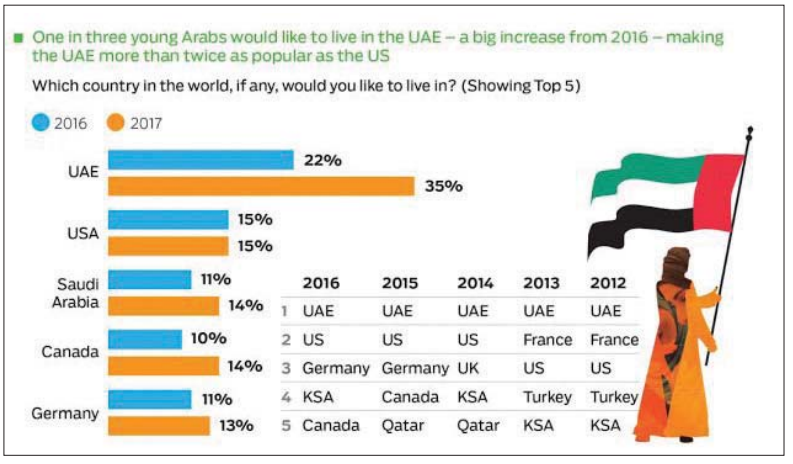
2. The National Strategy for Youth Empowerment, prepared by the Ministry of Culture and Knowledge Development in cooperation with the General Authority for Sport in order to realise the vision of the UAE 2021. The strategy sets out the State's full commitment to youth welfare, the identification of priorities and trends, and the areas of work that embody this commitment. It seeks to bridge the gap between the reality of youth and the requirements of achieving or implementing the State's strategy in various fields, aligning youth initiatives with the vision of the UAE 2021.

3. The Emirates Youth Council: In 2016, the Cabinet approved the establishment of the Emirates Youth Council, which represents youth aspirations. The Council seeks to develop a strategy for young people in line with the future directions of the state through the 100-day plan. The Council will also prepare studies on the role of youth in community development by opening all channels to listen to the views of young people and the challenges they face, in order to provide the necessary solutions and activate their positive participation in various sectors of the State.

4- The Ministerial Councils for Youth: The members of the ministerial councils for youth are chosen from the young employees in a specific ministry, in order to support the senior leadership in the ministry by discussing the challenges facing work and coming up with the best recommendations.

5. Institutional Boards: The Institutional Councils act as representative arms for youth in all private and public institutions in the UAE.

6. World Youth Councils: These aim to enhance the participation of Emirati scholarship students through the establishment of a representative platform for them under the supervision and management of UAE embassies and the Emirates Youth Council. These councils will provide young Emiratis with the opportunity to transfer best practices in all fields abroad to the UAE, to be implemented under the auspices of the Emirates Youth Council and the concerned authorities.



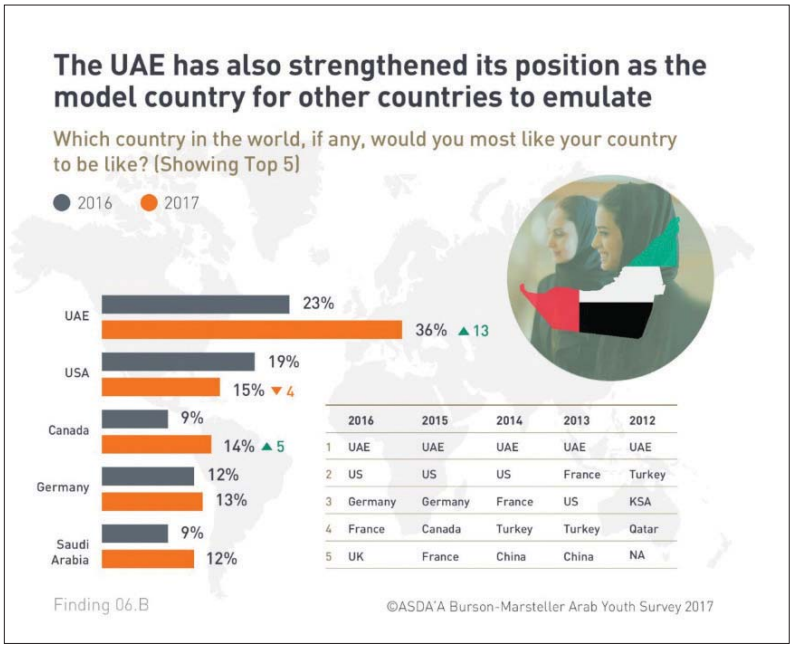
7. The Federal Youth Foundation: This was approved by the government in 2018. It coordinates with the local youth councils to develop an annual agenda for youth activities in the country and ensure that the objectives, plans, strategies and activities of these councils are consistent with the general plans of the state in the field of youth.

8 - Innovative Efforts to Empower the Youth of the Country: In addition to the previous institutional frameworks aimed at activating the role of young people in various national workplaces, the UAE government at the federal and local levels is exerting vigorous efforts to empower UAE youth in various aspects. The most prominent are:

* Provide educational opportunities for young people.
* Provide support for entrepreneurship.
* Support young people to build stable families.

UAE is the Favourite Model for Arab Youth

The UAE remains an inspiring model for the Arab youth, representing a successful development experience aimed at achieving the happiness and general satisfaction of all those living on its territory. The UAE's position as the preferred country for the Arab youth for the seventh time in a row clearly shows that the country is a source of hope and optimism among the Arab youth at a time of fanaticism, extremism and the economic problems of many countries in the region.



Conclusion

The UAE has been successful in empowering young people, supporting them, and promoting the spirit of leadership in every young man and woman. This spirit encourages all the UAE youth to insist that the country remains the first in all fields. The empowerment of youth and building national human resources will therefore be the mainstay of achieving the UAE 2071 centennial. The young people of the UAE have proved that they have the ability to take responsibility and contribute to building the nation.

MACE
Unmatched Battlespace Simulation

Modern Air Combat Environment (MACE) is a physics-based, full spectrum Computer Generated /Semi-Automated Forces (CGF/SAF) application with a large and user-extensible order of battle, capable of many-on-many simulation yet having very high fidelity at the engagement level. MACE supports the Distributed Interactive Simulation (DIS) architecture including simulation management, entity state, fire, detonate and emissions Protocol Data Units (PDU). MACE is ideally suited for both standalone scenario creation/mission rehearsal and distributed mission simulation.

MACE is a Combat Air Forces – Distributed Mission Operations (CAF-DMO) certified CGF/SAF with over 600 licenses in production. It is currently used by the USAF A-10 programme, the 160th Special Operations Aviation Regiment (SOAR), the Distributed Mission Operations Centre (DMOC), the Distributed Training Operations Centre (DTOC), the Distributed Training Centre (DTC), AFSOC's Mission Readiness Operations Centre (MROC) as well as over 70 fielded and fully accredited Joint Fires training devices including the Advanced Air National Guard JTAC Training System (AAJTS), Joint Terminal Control Training and Rehearsal System (JTC TRS), the JTAC/TACP Operational Simulation Suite (J/TOSS), AFSOC JTAC Simulator, the US Navy's Combined Arms Virtual Environment (CAVE), and the UAE's Combined Unit Training System (CUTS). This past year Air Forces Special Operations Command (AFSOC) announced it is going to integrate MACE in all of its major simulators to include the AC-130, MC-130, CV-22 and UAVs.

Versatile Capability To Simulate Highly Contested Battlespaces

MACE can simulate highly contested battlespaces including full Integrated Air Defence Systems (IADS) comprising Early Warning, Acquisition, Height Finding and Target Tracking radar. In fact, MACE can also simulate advanced, 5th -generation Active Electronically Scanned Array (AESA) and Passive Electronically Scanned Array (PESA) radar over Distributed Interactive Simulation (DIS). Each sensor is modelled down to the pulse level to include the dynamic generation of high-fidelity emitter audio. MACE simulates air-to-air and surface-to-air missile fly-outs and air-to-ground weapons and ballistics. Instructors can make real-time, dynamic inputs into the scenario by adding or moving threats, including both surface-to-air missile (SAM) systems and aircraft equipped with airborne radar and air-to-air missiles.

Superior Geographic Information System Core

MACE is built upon a mature Geographic Information System (GIS) core. BSI has built a worldwide tile server and road vector database derived from the OpenStreetMap project. This means that your battlespace is the entire world and you have the GIS data you need to create scenarios appropriate for both training and mission rehearsal.

Modern, object-oriented and multi-threaded MACE takes advantage of today's multi-core processors. MACE is multi-threaded to provide extremely fast line-of-sight and aerodynamic calculations – essential for real-time, many-on-many simulation.

Full Spectrum Battlespace Simulation

Most competing CGF/SAF programs were either purpose-built by one of the branches of the armed services or, for commercial competition, were purpose built for a particular weapons system trainer. MACE is different because it was designed from the ground-up as a full-spectrum CGF/SAF. It is a general purpose combat simulator that excels in the areas of Joint Fires and IADS simulation, specifically because of a full-spectrum, holistic approach to simulating the battlespace.

Live-Virtual-Constructive Simulation

MACE is available with an integrated Test and Training Enabling Architecture (TENA) interface for interoperability with instrumented ranges. MACE's Virtual SA-8 Simulator provides person-in-the-loop virtualisation of constructive MACE-generated SAM threats. In addition, any MACE platform (aircraft, lifeforms, vehicles) can be either constructive or virtual; simply make a joystick/gamepad input to take virtual control of a constructive entity.

MACE Classroom Setup

Navy JTAC Simulation

> MACE is multi-threaded to provide extremely fast line-of-sight and aerodynamic calculations

Unique Ability To Realistically Simulate IADS

During mission simulation, the EW, HF, ACQ and TT radar sites in MACE are linked together to form an Integrated Air Defence System (IADS). The IADS can be imported from FalconView (4.0 or newer) or created in MACE -- you can even import a real electronic order of battle (EOB) in PCI format. The ability to realistically simulate an IADS is a clear differentiator between MACE and simulations which rely on scripting or simplistic rules to trigger radar activity. In MACE, a complex algorithm is executed for each sensor in the battlespace. Does the sensor have line-of-sight to the target? Is the target obscured by stand-off jamming? Has the sensor 'burned through' the jamming, if present? MACE answers each of these

questions, and more, for every single sensor in the battlespace, many times per second.

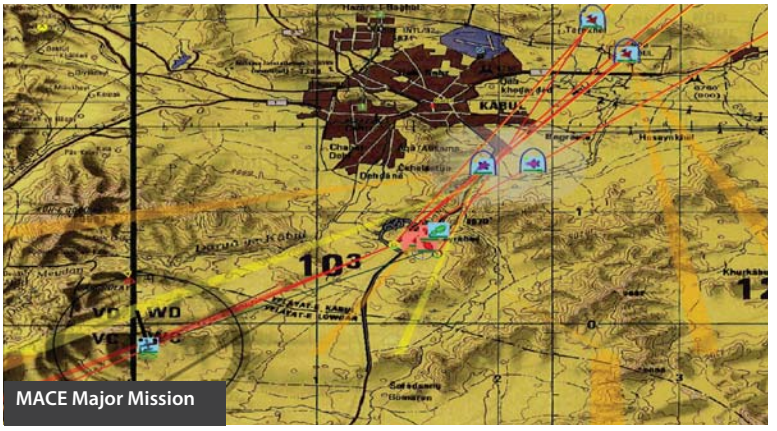
MACE also includes a very high-fidelity 'object model' for every sensor in the battlespace, sufficient for MACE to run the dynamic two-way Radar Range equation with pulse-level fidelity.

Dynamically Generated Threat Radar Signals

MACE provides the user with a toolset for defining an emitter's beam, scan and pulse patterns; each emitter supports multiple modes, and beam, scan and pulse patterns can vary by mode. This pulse level fidelity enables the generation of emitter audio from the pulses as they're processed by the receiver. Both crystal video and super-heterodyne receivers are modelled within MACE. All the threat radar signals presented visually and aurally in MACE are actually being generated dynamically from the threat system's parameters.

Energy-Based Aerodynamic Models

MACE uses an energy-based aerodynamic model for aircraft flight. Specific Excess Power (Ps) is the primary driver for describing an aircraft's flight performance. At positive values of Ps an aircraft is free to turn, climb or accelerate, when Ps is negative an aircraft is forced to decelerate or dive or a combination of both. Ps is also useful to depict an aircraft's speed-altitude envelope; if Ps has reached zero, the aircraft can neither climb nor accelerate, and thus the aircraft has reached either its ceiling or maximum level velocity. When an aircraft manoeuvres, it retrieves the specific excess power of the aircraft at its current altitude, Mach number, and g-loading. It then initiates a climb angle, turn angle, and rate of acceleration based on its specific excess power data-tables. An energy based aerodynamic model is a good balance between reasonably-close aircraft performance and limited CPU usage when trying to simulate large numbers of constructive forces.



MACE Major Mission

Flyable Flight Models

MACE includes 6-DOF models for all rotary-wing aircraft, 6-DOF hydrodynamic models for all surface and sub-surface platforms, and 5-DOF physics-based flyable flight models for fast moving fighter-type and slower moving attack-type aircraft. These models are not intended to provide flight training, but rather to construct a flight model that is "sufficiently realistic" for simulating aircraft response to person-in-the-loop flight control inputs. In MACE, you can quickly transfer an entity from constructive (computer) control to virtual (person-in-the-loop) control, and back again.

Missile Flyouts and Ballistic Flyouts

MACE uses a physics-based aerodynamic model and limited guidance model for missile fly-outs. Missile aerodynamics is derived from weapon thrust, drag, and weight. Weapon thrust is calculated by the motor's mass flow rate and specific impulse. Drag is calculated by the missile's drag reference area, coefficient of drag (subsonic and supersonic), speed, and atmospheric conditions at the flight altitude. Missile weight is reduced as propellant is burned. The missile flight profile is based on a four stage approach that includes a free fall time, booster stage, sustained stage, and glide stage. MACE also uses a physics-based aerodynamic model for ballistic fly-outs.

Full Spectrum Battlespace Simulation

Ask yourself – can your CGF/SAF gen-

MACE EW Equipment

C-130H Challenge

SAM Launch

UAV Soldiers Firing

erate lifeforms that pathfind around obstacles? That are aware of each other and avoid collisions? That can enter/exit other vehicles? Does it have 9-Line, 5-Line and Call for Fire interfaces? Can this same CGF/SAF simulate an entire IADS? Can it simulate AESA/PESA radar down to the pulse level? Does it have fixed-wing, rotary-wing and hydrodynamic models? Only MACE has all that.

Fully Integrated Avionics And Combat Equipment

Since MACE is purposefully designed as a data-driven application, the end user can add or edit their own threat data, even down to the pulse level for generating emitter audio. MACE has a wide variety of Sensors and displays to suit the customers' needs.

MACE uses an energy-based aerodynamic model for aircraft flight

MACE-EW For Electronic Warfare Training And Simulation

Because of its capability to generate high-fidelity radar signals and the library of EW displays included, MACE-EW is also widely used as a stand-alone or networkable Electronic Warfare training simulation. Both MACE and MACE-EW have the same signal generation capability; MACE-EW is differentiated by the inclusion of 2 separate panoramic receivers, a direction finding (DF) display, a simulated ALE-50 Towed Decoy and a simulated USQ-113 communications jammer.

Integration With Image Generation Software

MACE uses Distributed Interactive Simulation (DIS) standard appearance bits and articulated parts to provide your Image Generation (IG) software with very detailed descriptions for rendering entities in your 3D Battlespace. MACE includes a vast library of entities including civilian and military aircraft, surface-to-air threats, vehicles, targetable buildings and humans. MACE has been extensively tested with MetaVR's Virtual Reality Scene Generator (VRSG).

ATGMs: The Nemesis of Modern Tanks

In being designed to destroy heavily armoured military vehicles, today's Anti-Tank Guided Missiles (ATGMs) require a solid anti-armour system for successful combat, one including anti-tank units as its basic element.

A long-ranged and stunningly accurate ATGM equipped with a warhead capable of penetrating all but the best composite armour will thus strike fear in the heart of every tank crew. Indeed according to a recent study conducted by "Defence Procurement Analysts", the Anti-Tank Guided Missiles market is set to grow to $14bn by 2028.


ATGM 'Shershen-DM' on Streit Group Spartan APC

Historical Anti-Aircraft Beginnings

ATGMs date back to World War II where, in being assailed by superior forces, Germany was desperate for an anti-aircraft weapon. They developed the X-4 air-to-air missile as the first of its class and then a secondary ATGM design concept, which, owing to problems, never entered service.

Nonetheless, the idea lived on and France soon developed the SS.10 missile, entering service in 1955 and followed by the first ATGMs ranging up to 2000 metres. However, these missiles were steered via attached wires, meaning that they had to remain within the operator's line-of-sight.

The second generation arrived in the 1970's with superior warheads and now requiring operators only to keep the sights on the target. The ubiquitous helicopter-carried Hellfire was one of the first of this class.

ATGM Performance Today

The most recent generation of ATGMs are "fire-and-forget" weapons, entailing that the operator need only lock the missile's laser, infrared or radar sensors on the target for the missile to hone-in on the target, although this makes it more vulnerable to countermeasures. These missiles now give infantry soldiers the capability to defeat light and medium-armour tanks from long range, even if main battle tanks (MBTs) are still quite resistant to them.

Epitomised by the U.S. Javelin, ATGMs have evolved to become more compact and easier to carry with each using a lightweight and very effective High-Explosive Anti-Tank (HEAT) warhead. Here, a small "spike" protrudes from the tip, allowing its shaped explosive charge to detonate before reaching the target, so enabling the warhead to form a superheated jet of molten metal capable of slashing through all but the strongest armour.


A U.S. Army soldier fires a Javelin missile during a live-fire exercise

HEAT warheads were once believed to make tank armour useless against all but small arms fire, although the Soviet T-64 main battle tank shifted this paradigm by introducing composite armour. Originally pioneered in the United States, the T-64 was the first widespread tank to use armour consisting of a steel layer, a hard plastic layer, and another layer of steel.

The HEAT warheads would first penetrate the steel layer but then shatter the plastic and lose so much energy that the second steel layer would stop it. Now, aside from vehicle and aircraft-mounted missile systems, the size of anti-tank guided missiles vary from shoulder-launched weapons transportable by a single soldier to larger tripod-mounted weapons requiring a squad to transport and fire.

Global ATGM Usage

ATGMs were initially adopted in Eu-


The Kornet anti-tank missile

rope, but China, South Korea and India in the Asia-Pacific and the North American region have now followed, reflecting growing military expenditure. As of 2017, they were used by more than 130 countries, while the ground-based man-portable ATGM is now expected to lead the market in the coming five years.

The leading companies developing ATGMs include Lockheed Martin Corporation, Raytheon Company, Saab Group, MBDA, KBP Instrument Design Bureau, General Dynamics Corporation, Roketsan A.S., Denel SOC Ltd and BAE Systems. The following is a guide to the ATGMs currently available in the market-place.

Javelin Weapon System

Javelin is one of the most versatile and lethal one-man-portable, anti-tank, guided munition and surveillance weapon systems, produced by the Javelin joint venture between Raytheon Company and Lockheed Martin. A premier light infantry surveillance and anti-armour weapon system, Javelin is easy-to-use offering enhanced situational awareness and demonstrated lethality against a wide array of targets (armoured vehicles, bunkers, and caves). Javelin is combat proven at a 94 per cent reliability rate and can be deployed from multiple platforms for use in all-weather, day-or-night operations. In being scheduled for inventory until 2050, the Javelin programme now demonstrates remote launchers for ground vehicles.

High Precision PARS 3 LR

PARS 3 LR is a high precision fire-and-forget weapon system for the engagement of mobile and stationary targets, including buildings, bunkers and other high-value targets. Its fire-and-forget capability enables the platform system to leave its position immediately after firing the missile ensuring that platform and crew are exposed to the enemy's reconnaissance and counter-action for a minimal amount of time.

With the precision and effectiveness of the missile ensured over the entire firing range, the PARS 3 LR is the main armament for the German Army's Tiger helicopter. The German Army is indeed due to receive what is currently the most high-performance fire-and-forget guided missile system for precision strikes against high-value stationary and moving targets.

The fire-and-forget system allows the helicopter to quit its position immediately after firing a missile, thereby limiting to the absolute minimum its exposure to the threat of retaliation. Salvo firing then permits the engagement of various targets at the same time while the technical lay-out design of the PARS 3 LR enables unambiguous target identification, target designation and highly precise effects against a large target spectrum.

The PARS 3 LR system simultaneously assures maximum protection for both helicopter and crew. With manufacture of the PARS 3 LR for the German Army being carried out by PARSYS, a joint venture between MBDA Germa-


The precision and effectiveness of the PARS 3 missile is ensured over the entire firing range

ny and Diehl BGT Defence, the weapon is already generating significant interest in the export market.

Man-in-the-Loop Milan ER

The combat-proven Milan weapon system has been selected by over 40 international customers for land combat forces specifically involved in sustained and demanding close combat operations.

Milan ER combines precision and versatility to address static or moving modern battlefield threats, including the most heavily armed tanks, fortifications and infrastructures.

It is suitable for both urban and open terrain thanks to Man-in-the-Loop (MITL) operation for avoidance of collateral damage and friendly fire, while complying with ever-complex rules of engagement.

Hornet Replaces Kornet

The Shershen ("Hornet") is the Belarussian variant of the Ukrainian Skif, although the Skif and the Shershen have slightly different applications. The Shershen can defeat tanks and fortifications at ranges comparable to the Russian Kornet, utilising a tandem configuration where two 130 mm missiles are installed side-by-side on a single pivoting mount.

The Shershen-D is suited for light vehicles and armoured personnel carriers, and even offshore and riverine vessels, while the Shershen-Q is deployed by a vehicle similar to the Kornet-D. The Shershen "complex" is hence composed of a collapsible tripod, a box-shaped control system, a launcher rail, launch tube and a command launch unit combining TV guidance and modular thermal sights.

In Belarus, the Shershen is armed with two types of missile - the RK-2S with a tandem HEAT warhead and the RK-20F fragmentation round for defeating soft-skinned vehicles. The RK-2S' penetration is sufficient to disable current-generation main battle tanks at a maximum range of 5000 metres against stationary targets and 5500 metres against mobile ones.

Milan ER training at La Courtine in France

> The combat-proven Milan weapon system has been selected by over 40 international customers for land combat forces

In contrast, Shershen's 152 mm P-2B missile stretches to an impressive 7500 metres with a 1100 mm penetration against rolled homogenous steel and explosive reactive armour. Like the Skif, the Shershen is fired manually, but by using a portable control panel in a specially designed suitcase, the operator can remotely launch and direct the Shershen from distances up to 100 metres away via a cable locking the control panel to the launcher.

The RK-2S has an added stealth feature for its in-flight elevation above the line of sight, enabling the missile to rise ten metres above the Shershen's laser beam to avoid terrain obstacles and detection. For instance, if aimed at a tank the missile descends as it nears the target and strikes at the space between the turret and the hull.

Belarus has completed development work on the Shershen-M system, a new vehicle-mounted ATGM using Ukrainian RK-2 and RK-3 variants and featuring a quadruple launcher for four different Luch ATGM variants launched simultaneously (the RK-2, RK-2V, B-2M and the RK-3). The anti-tank system also includes a telescopic mast with a dual-axis combined observation and missile guidance package (the 1K118P).

The Kornet "Spriggan"

The Kornet-E ATGM was codenamed Spriggan by NATO after the small Scottish rock goblin with the ability to

inflate itself to giant size. It is a vehicle-mounted or portable system designed to engage tanks fitted with explosive reactive armour, lightly armoured vehicles, fortifications, hovering helicopters, while pinpointing surface targets all-weather day or night, and performing in electronic and optical countermeasures environments.

Weighing 30 kilograms and easily managed by two people, the Kornet system enables one person to detect a target, aim and fire a missile, then tracking and defeating the target. The missiles can be dropped on the ground and without special storage conditions, entailing that the Kornet is deployed within one minute to penetrate more than a metre of steel or reactive armour on all main battle tanks including the M1A2 Abrams, AMX-56 Leclerc, Challenger 2 and Merkava Mk3.

The Kornet's all-weather anti-jamming laser guidance and infrared sight makes the launch difficult to spot, hitting targets at a range of 3 kilometres at night and 5 kilometres in daylight. Moreover, the Kornet-E launcher is folded into a compact travelling position, with its thermal sight placed in a pack device, while the modular-designed launcher can be bracketed on to a wide range of wheeled and tracked vehicles.

Lethal MMP

MBDA's production of its 5th-gen MMP medium-range ATGM is for delivery to the French Armed Forces where, next year, it will replace the French Milan and Javelin missiles. In allowing engagement of a broad target set, it utilises rapid into-action times, Lock-on-Before-Launch and Fire-and-Forget modes, alongside Lock-after-Launch and Man-in-the-Loop engagements for collaterally sensitive scenarios.

MMP offers 4,000+ metre range and precision to defeat the target beyond counter fire ranges. It is being integrated onto multiple vehicles and turrets to provide an ideal solution for modern armies, as demonstrated in the LAND 400 and LAND 4108 Australian defence programmes.

Its dual mode seeker, uncooled infrared and visible colour channels engage wide-ranging targets. Low thermal contrast and a fibre-optic data link then make it possible to maintain "man-in-the-loop" engagement of 3rd-party-designated targets outside the sight of the launch platform.

The missile's multi-purpose anti-tank, anti-personnel and anti-structure package can defeat targets ranging from heavy tanks with reactive armour to entrenched infantry. MMP has validated all performance requirements through 20 test firings and ground tests, involving deployment in extreme environment and temperature conditions, firing in confined spaces, shooting under infra-red and colour TV guidance at extreme long-range targets (4,100 metres) and warhead versatility against varied targets.

NLAW is a top-attack, fire-and-forget single-soldier missile

NLAW – The Next-Gen Killer

NLAW is a top-attack, fire-and-forget single-soldier missile developed by Saab AB and manufactured by Thales in Belfast. This Next-Generation Light Anti-Tank Weapon (NLAW) is now shoulder-launched, with its Overfly Top Attack and anti-tank missile system ensuring that it is the tried-and-


MMP firing training at Canjuers military camp-France

tested tank killer for light forces operating dismounted in all environments. NLAW attacks tanks from above combining the simplicity of light anti-armour weapons with the advantages of heavy, crew-operated guided missile systems. A single soldier can therefore destroy a heavily protected modern Main Battle Tank with only one shot at a range of 20-800 metres.

The NLAW has Selectable Overfly Top Attack (OTA) against armoured targets and Direct Attack (DA) against non-armoured targets, such as enemy troops inside buildings. What is more, PLOS (Predicted Line of Sight) guidance and OTA deliver easy handling, accuracy and high kill probability.

Multi-Mission BILL 2

The BILL 2 is an overfly, top-attack anti-tank missile system combating both moving and static targets up to 2200 metres. Its wire-guided missile is immune to jamming and attacks the weakest part of the target from above, while requiring no lock-on or cooling down time before launch to ensure very short reaction times.

Light and man-portable, the BILL 2 can also be vehicle configured with a high mission capability for all terrains, defeating anything from MBTs to lightly armoured combat vehicles and secondary targets. Currently used by four nations, the missile is operated by a two-man crew in ground action, but to increase target flexibility it can be launched in three modes to defeat anything from MBTs to lightly armoured combat vehicles and secondary targets across any terrain.

The basic mode employs OTA where two interactive, dynamically compensated, vertically striking shaped charges attack the MBT from above, striking down through the turret roof to avoid the heavily protected frontal arc. Here, the fuze system consists of both a dual-sensor proximity fuze and an impact fuze.

BILL 2 gives soldiers the ability to detect, recognise and identify before engaging the target. Hence, its multi-mission capability can be employed anywhere against any aggressors with a storage shelf life exceeding 15 years and requiring no maintenance.

Future Trends

Future trends of development would be configuring multi mode sensors for ATGMs. Recent advances in tank innovation may be making the ATGMs less effective but the ATGM is a too effective weapon to be simply made useless by this new advancement. Whether the future ATGMs have a higher speed or deploy countermeasures, it is almost certain that they will adapt and remain the terror of the tank.

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BILL 2 can also be vehicle configured with a high mission capability for all terrain

British Warrior Becomes More Lethal

As the most widely deployed vehicles in the British army, the family of Warrior vehicles include infantry fighting vehicles, repair & recovery vehicles and command & observation posts. A highly successful armoured fighting vehicle whose enhanced armour is being continuously updated, the British Army Warrior now has battlegroup thermal imagery fitted to increase its night-fighting capability and 40 CTAS cannon to provide superior firepower.

Having performed over 80 Urgent Operational Requirement (UOR) modifications in recent campaigns, Warrior can deal with changing operating conditions and threats, with the speed and performance to accompany Challenger 2 main battle tanks over the most difficult terrain, boasting firepower, and armour sufficient to support infantry in assault.

The Warrior family entered service in 1988 with seven variants of armoured vehicles proving highly successful in armoured infantry battlegroups during the Gulf War and conflicts in Bosnia, Kosovo and Iraq. In providing excellent infantry mobility, lethality and survivability, the Warriors have enabled key elements from the Royal Artillery and Royal Electrical and Mechanical Engineers to operate effectively within the battlegroup.

The Warrior command and section vehicles currently with the British Army are fitted with a turret-mounted 30mm Rarden cannon striking light armoured vehicles at a range of 1500m, alongside an 8x magnification image-intensifying night sight and eight 94mm light anti-armour HEAT rockets.

Variants include an artillery observation post vehicle (OPV), command post vehicle (CPV) and a REME recovery and repair vehicle, all equipped with a 7.62mm chain gun and Rarden cannon boasting anti-helicopter capability.

Capability Sustainment Programme

In October 2011, the UK MoD awarded

the development contract to Lockheed Martin UK with a production option. Lockheed leads a team including Ultra Electronics; the Defence Support Group; SCISYS (Electronic architecture); Rheinmetall Defence; Curtiss Wright (supplying the turret-drive servo system for the Warrior); Thales UK (optics and Battlegroup Thermal Imaging system); Moog; Meggitt; CTA International (supplying the 40 mm CTA gun); Westwire; TKE, MTL and Caterpillar UK (powerpack support).

The British Army's Warrior Capability Sustainment Programme (WCSP) offers major upgrades to the armoured fighting vehicle (AFV), including a turret developed by Lockheed Martin UK (LMUK) in Ampthill together with cross-platform improvements. A fully stabilised 40mm CT40 cannon enables significantly greater firepower and fire-on-the-move capability, alongside an enhanced sighting system for raised situational awareness.

The new turret features a modular protection system allowing greater threat protection and quick change of armour. An upgraded environmental control system and decluttered, reorganised, and increased crew space supplies much greater comfort, with the 380 Warriors (five variants) included in the WCSP, so extending vehicle life up to the 2040s.

Superior 40-CTAS Firepower

The next generation weapon of choice for medium-calibre systems within Armoured Fighting Vehicles (AFV) and Infantry Fighting Vehicles, the 40 CTAS cannon provides firepower superior to any other Medium Calibre equivalents. The suite of associated ammunition is designed to ensure increased impact against armoured vehicles such as Main Battle Tanks, while defeating reinforce concrete, buildings and soft targets.

The 40 CTAS can incorporate unlimited ammunition natures within the same handling system giving end user capability to engage threats quickly across the modern battlefield spectrum, including those within urban environments through selection of the most pertinent nature of ammunition.

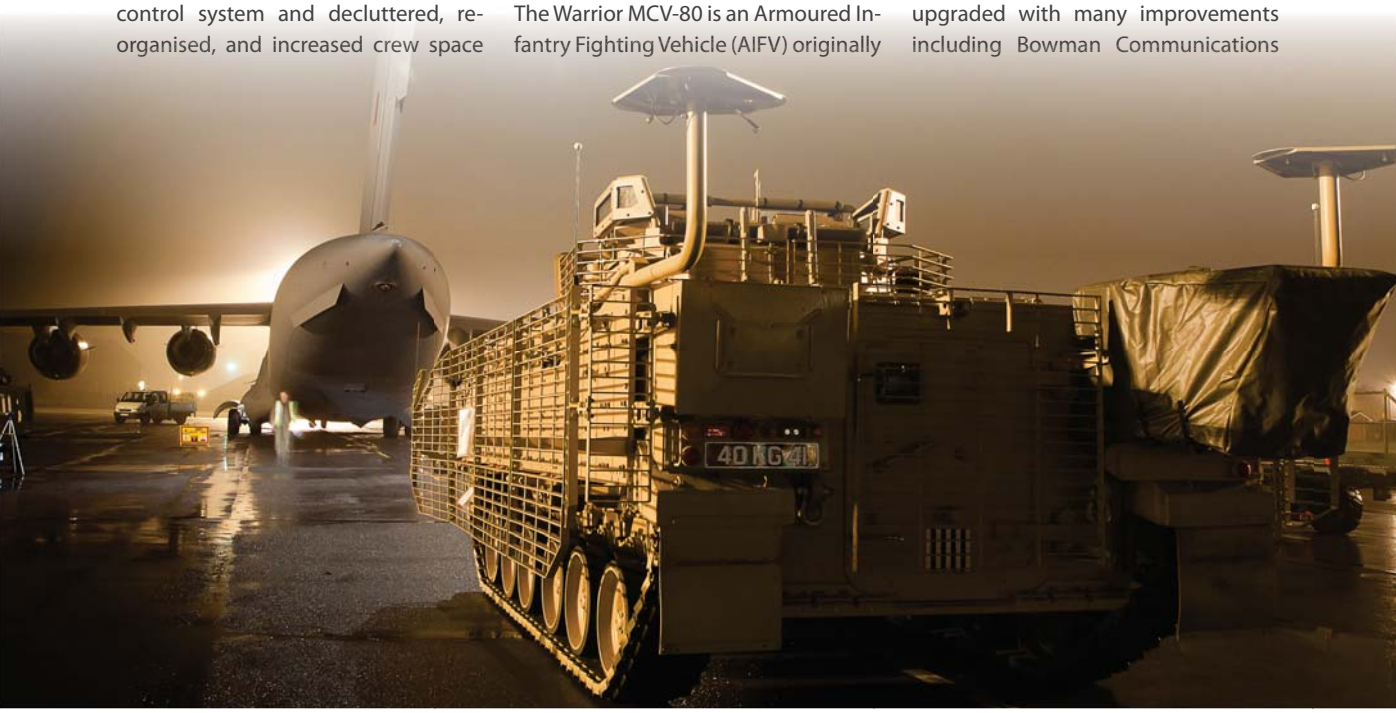
Lockheed Martin confirmed that the upgraded warrior would enter trials in the coming year.

British Development

The Warrior MCV-80 is an Armoured Infantry Fighting Vehicle (AIFV) originally designed in 1977 by British company GKN Sankey to replace the tracked armoured personnel carrier FV432 in British Army service since the 1960s. By 1980, three prototypes of the MCV-80 were running and in 1984, the British Ministry of Defence announced that 10 prototypes had been built.

Highly successful demonstrations in the Middle East in 1983-84 led to the development of a Warrior Desert Fighting Vehicle configuration with 25 mm, 30 mm or 90 mm cannon and a 10-man crew. The first 290 vehicles' production were completed by 1986, of which 170 were section vehicles with two-man 30 mm RARDEN turrets and the remaining 120 comprising of specialised variants. The first production Warrior was officially handed over to the British Army in May 1987.

The first Warrior battalion to feature in the British Army was fully operational in mid-1988, while the second and third batches have totalled 763 vehicles to bring the total British Army order to 1,053 vehicles which would be sufficient to equip 13 armoured infantry battalions. The Warrior has been upgraded with many improvements including Bowman Communications



British Army's Warrior Capability Sustainment Program will involve upgrading 643 of its Warriors

System and Thales Battle Group Thermal Imaging (BGTI) night sights, with future upgrades including a digital fire control system and improved power pack.

The British Army's Warrior Capability Sustainment Program (WCSP) will involve upgrading 643 of its Warriors with the Warrior Modular Protection System (WMPS) and Warrior Enhanced Electronic Architecture (WEEA) in order to extend service life to 2025. Within that group, 449 vehicles will also be fitted with a new turret and weapon system under the Warrior Fightability Lethality Improvement Program (WFLIP), while the remainder will be designated Armoured Battlefield Support Vehicles (ABSV), lacking turrets but carrying out field repair and recovery roles using winch and crane attachments.

Designed for Protection

The Warrior MCV-80's all-welded aluminum hull provides protection against small arms and shell splinters. The driver sits at the front with the two-man steel turret in the centre with the troop compartment at the rear, while troops enter via a single power-operated door in the back hull with a vision block.

The Warrior carries eight infantry with one soldier commanding the vehicle and dismounting with the infantry, while the remaining seven sit belted in separate seats. The troop compartment's double roof hatches feature two day-rotating periscopes for infantry use.

Optimal Warrior Mobility

The MCV-80 is powered by a Perkins Engines CV-8 TCA V-8 diesel developing 550 hp at 2,300 rpm, coupled to a Perkins Engines Company X-300-4B fully automatic transmission with torque converter and lock-up clutch, plus 4 forward and 2 reverse gears. The torsion bar suspension rests on six rubber-tyred aluminum roadwheels on either side, with the drive sprocket at the front, idler at the rear and three track-return rollers.

The Warrior's maximum road speed is 75 km/h with a 660 km maximum cruising range. It can negotiate 60 per cent gradients, 40 per cent side slopes and natural or engineered trenches to 2,500 mm and climbs a 0.75 m vertical obstacle and 1.3 m fording depth without preparation.

Technical Specification

Max Speed: 75 KMH
Crew: 3+7
Length: 6.34M
Width: 3.0M
Height: 2.78M

Enhanced MCV-80 Accessories

Standard Warrior equipment has a full range of passive night vision equipment, with a stowage box including an NBC (nuclear (N), biological (B) and chemical (C)) system on either side of the rear troop doors mounted in the side hull to the left rear of the driver.

In the AIFV, Bowman radios now replace Clansman for enhanced communications, command and control, while IR night vision sights have been replaced with Thales Optronics Battle Group Thermal Imaging (BGTI) sights to upgrade night fighting capabilities with 8x magnification.

Current Warrior Variants:

- FV511 Infantry Command Vehicle: 84 units produced.

- FV512 Mechanised Combat Repair Vehicle: 105 units produced, operated by REME detachments in Armoured Infantry battalions, the FV512 is equipped with a 6.5 tonne crane plus power tools and can tow a trailer carrying two Warrior power packs or one Challenger power pack.

- FV513 Mechanised Recovery Vehicle: 39 produced and operated by REME detachments in Armoured Infantry battalions, equipped with a 20 tonne winch and 6.5 tonne crane plus power tools; like the FV512, it is able to tow a trailer carrying two Warrior power packs or one Challenger power pack.

- FV 514 Mechanised Artillery Observation Vehicle: 52 produced, operated by the Royal Artillery as an Artillery Observation Post Vehicle (OPV) and fitted with mast-mounted Man-packable Surveillance and Target Acquisition Radar (MSTAR) and Position and Azimuth Determining System (PADS), with Image Intensifying and Infra Red equipment. Solely armed with the 7.62 mm machine gun, the 30 mm Rarden cannon has been replaced with a dummy weapon to allow space for the targeting and surveillance equipment while still keeping largely the same outward appearance of a standard Warrior to avoid becoming a priority target.

Warrior IFV is the first to be armed with the French-UK 40-mm auto cannon firing caseless rounds

Standard Warrior equipment has a full range of passive night vision equipment

- FV 515 Battery Command Vehicle: 19 produced, operated by the Royal Artillery.

- Warrior with MILAN: A conversion originally developed for Operation Desert Storm with multiple kits supplied to convert existing vehicles for this role, the European anti-tank missile MILAN ATGW (Anti Tank Guided Missile) launcher is essentially pintle-mounted on the right side of the turret roof, with racks provided internally for additional missiles. The UK MoD ordered another batch of Warriors in 1991 to carry the MILAN ATGW system in place of the FV432s which lack the cross-country mobility for Warrior vehicles and Challenger 1/2 MBTs.

- Desert Warrior: Kuwait purchased 254 of the export version in 1993 adapted for operations in hostile desert conditions, fitted with the Delco turret used on the LAV-25 wheeled IFV and mounting a stabilised M242 Bushmaster 25 mm chain gun with coaxial 7.62 mm chain gun and 2 x Hughes TOW ATGM launchers (one mounted on each side).

Warrior is currently in service with the British Army, while the Desert Warrior is serving with the Kuwait Land Forces.

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