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Issue File

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YEAR OF TOLERANCE

FNC Elections: The Fourth Democratic Experience in the Phase of Empowerment

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Collins Aerospace Tackles Military Comms Challenges

Saab Presents First Gripen E to Brazilian Air Force

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Editorial

The Sons of Zayed Make the Dream Come True

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The UAE had a glimpse of the future on September 25 when Hazza Al Mansoori, the first Emirati astronaut, was aboard the Soyuz MS 15 spacecraft on a journey to the International Space Station (ISS). Thus, a new page of the UAE history was written under the title "Eyal Zayed – Make Zayed's Dream Come True by Embracing Space." This historic achievement confirms that Emirati children, armed with knowledge and a strong will to challenge the impossible, are the country's true wealth. It is also a source of inspiration to the UAE's young people, raising the levels of their ambitions to match this sky-high achievement.

While this cultural, cognitive and human achievement is a source of pride for every Emirati and Arab, it is also of exceptional importance to the Armed Forces, because Al Mansoori is one of its distinguished members. He graduated from Khalifa bin Zayed Air College and has significant experience in the field of military aviation. He received advanced training courses within the Armed Forces, which has enhanced his expertise and capabilities. He has been chosen for this historic mission on account of his advanced, qualitative qualities and expertise, most of which he gained during his Armed Forces career, which played a major role in his excellence and high physical fitness. He has more than 14 years of experience in military flight and has been a trainer on the military aircraft F-16 and in 2016 he was qualified to be a pilot of single aerobatics.

Al Mansoori is the first Emirati astronaut, and the first Arab astronaut to visit ISS since its inception in 1998. The UAE has proved that its dreams to embrace space have come true. These dreams began with an idea during the meeting of the founding father Sheikh Zayed bin Sultan Al Nahyan, may God rest his soul, in the 1970's, with the NASA team responsible for the Apollo mission to the moon. This achievement is part of the UAE civilisational and human project, which seeks to contribute to the making of the world future.

His participation in this journey will include many important scientific experiments in different fields. It will document not only the UAE's participation in the development of the space industry but will also launch a new phase in which the UAE will put the Arab and Islamic world firmly on the map of the global space industry.

The UAE is consolidating its position as one of the world's key players in the aerospace industry. Al Mansoori's visit is part of the country's ambitious space exploration project, which seeks to send the first UAE probe (Hope Probe) to Mars in 2021, which will mark the Golden Jubilee of the country's founding. It also aims to bring about the first human landing on the Red Planet in the coming decades through the project (Mars 2117). This project includes a national programme for the preparation of UAE specialised scientific research cadres in the field of Mars exploration, in order to build the first human settlement on the Red Planet. The ambitious UAE space project puts it on the threshold of a new phase of development and progress and opens up many positive opportunities that will enhance its development process at all levels.

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National Security

Emirati Expertise at the Forefront at DSEI

The UAE recently took part in the 20th edition of the Defence and Security Equipment International (DSEI) exhibition at the ExCel Exhibition Centre in London. In fact, the UAE Pavilion got landslide attention from the public, media, VIPs and top military corporations that swarmed into the pavilion to take a look at the latest developments of the well-known Emirati companies on the show floor.

The UAE national dress worn by young female Emiratis at the UAE Pavilion commanded visitors' attention, admiration and appreciation as it reflected the country's modern and classical repertoires and highlighted national identity. However, the biggest surprise came from knowing that these young participants were career engineers and marketing and maintenance experts who demonstrated the UAE's success in developing and improving women's competence in defence industries and creating a highly qualified and professional generation. The Emirati participants expressed their excitement and sense of pride in taking part in this international event, saying "This appreciation will drive us to double efforts in our careers with various defence industries".

Leading companies such as Al Fattan Ship Industry, Aquila Aerospace, Exechon, Safe City, Al Hamra Group, Tawazun Industrial Park (TIP), Al Rumaithy Establishment, Halcon Systems, ADASI, Rabdan Academy, Nation Shield journal published by UAE Armed Forces, International Golden Group (IGG) and Tawazun Economic

Council's Economic Development Unit highlighted their services at the event. The pavilion also hosted representatives from Emirates Defense Companies' Council (EDCC), strategic partners, the UAE's Ministry of Defense and the GHQ of the UAE Armed Forces.

Showcasing Expertise

Matar Ali Al Romaithi, Chairman of the EDCC, which organises and manages the UAE Pavilion at key industry events, expressed the Council's interest in hosting Emirati corporations at such renowned military and security exhibitions in order to display their military industry capabilities at one of the largest platforms showcasing developed and creative projects in the field of maintenance, manufacturing, repair, overhaul, logistic services, communications, training and technological development.

He added that UAE defence industries have proved themselves in the international arena over the last few years, and have come to acquire a competitive edge to enter a more advanced stage, either in producing new types of weapons and equipment, or gaining access to fresh markets to showcase their high-quality and heavy-duty products. For this purpose, Tawazun Economic Council has always been keen to support these positive developments by offering highly creative and innovative visions/strategies to comply with the next stage requirements and the directives of the wise leadership to boost UAE's status in defence and security industries, and help maintain a national competitive economy based on knowledge, creativity and future technological applications.

Al Romaithi said: "We believe that for a national defence industry base to develop is a joint responsibility requiring all efforts to translate our wise leadership's aspirations in boosting UAE's competitiveness with advanced nations in the defence industry.

"On their part, a number of military sector commanders and officials of national defence and security companies took part in DSEI 2019 and affirmed that the UAE pavilion provided the necessary support for the UAE economic sector and would bring about many benefits to boost future development plans".

EDCC is based on a plan set collectively by Tawazun, Ministry of Defense and the UAE Armed Forces in order to serve as a form for intensive dialogue with top local and international defence industry corporations by offering streamlined and open channels to meet with top defence company officials and boost opportunities of partnership and UAE's external commercial projects/programmes through the UAE pavilion at various international events. There are currently 63 members, including EDIC, Mubadala and other private sector companies.

Safe City Group and AVET partnership signing ceremony

Delivering State-of-the-art Systems

Al Hamra Trading Group (HTG), which was established in Abu Dhabi in 1982, and has branches throughout the region, was present at the show. HTG is primarily focused on delivering defence and security systems, communications and services to the armed forces, law enforcement and civil defence forces, customs and Ministry of Interior (MoI).

Mohammed Ibrahim Al Mana'i, HTG's CEO pointed out that the company represented a large number of their client's U.S. and European companies, and that it was committed to participation at DSEI to showcase systems and services in areas of air security, vital facilities protection, harbour and ports monitor and training.

Specialised Entity

Another participant at DSEI was Tawazun Holding Company's Tawazun Industrial Park (TIP), a leading member of the Emirates Defense Companies' Council (EDCC), which hosts other members. TIP is a fully integrated industrialisation area to provide services of managing facilities and infrastructure for local and international defence and strategic industrialisation corporations. TIP is currently hosting a large number of local companies such as Burkan Munitions Systems, Caracal International, LLC., Nimr Automotive Company, EDIC Precision Industries,

Tawazun Industrial Park (TIP), is a leading member of the Emirates Defense Companies' Council

Bari Dynamics Company and Caracal International Company.

Mansour Ahmed Al Rumaithy, CEO, Al Rumaithy Establishment, part of Al Rumaithy Group, said that following UAE's dynamic development, the Group, which was established in 1972, continues to work hard and diligently to provide world-class technical and flight technologies inside the UAE and outside.

He pointed out that the Group strived over the last three decades to transform itself from a mere bunch of regional companies into a leading chain of unlimited services. The Group's technical department supplies commercial and military clients with top-notch systems and equipment in addition to local support.

Al Rumaithy noted that the Group was amongst the early companies registered by the Civil Aviation Authority as an entity specialised in civilian and military spare parts.

Mouthpiece of the UAE Armed Forces

Lieutenant-Colonel Yousef Juma'a Al Haddad, Editor-in-Chief, Nation Shield Journal, said the publication was the official mouthpiece of the UAE armed forces, with relentless commitment to participate in all renowned international exhibitions and events.

He pointed out that monthly Nation Shield Journal is focused on publishing the latest defence and academic materials in both English and Arabic and having it circulated by certified agents and proper military channels in addition to public subscription.

Lieutenant-Colonel Al Haddad noted that Nation Shield Journal, which was established in 1971, owed its name to His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE and Supreme Commander of the Armed Forces (May God protect him).

Pioneering Manufacturer

Fadel Al Kaaby, CEO, International Golden Group (IGG), said that the Group is one of the top suppliers of the armed forces, Ministry of Interior (MoI) and defence and security establishment in the UAE and displayed the latest products and services at the show.

He noted that more than 100 production lines were offered by IGG to the commanders and officials in the defence and security areas. IGG is planning to become a pioneering manufacturing company for the latest technological techniques and defence systems.

Latest Tech on Dispaly

On his part, Khalifa Al Tamimi, Project Manager at Halcon Systems, pointed out that this was the first time the company participated at DSEI within the UAE pavilion, and that the company was currently involved in utility preparation to develop and produce the latest technological defense systems. Last February, Halcon Systems signed an agreement with Tawazun Economic Council's Defence and Security Development Fund (DSDF), which is the official body charged with defence industry development throughout the UAE. DSDF will offer finance to Halcon Systems, which some reports said plans to develop and manufacture smart rockets' monitoring and guidance panels over the next three years. Al Tamimi noted that Abu Dhabi-based Yas Holding Group owns Halcon Systems.

UAE defence industries have proved themselves in the international arena over the last few years

Spotlight on UAS

While Abdul Rahman Al Hammadi, Program Manager at Abu Dhabi Autonomous Systems Investments (ADASI), said the company used DSEI to put on display a large number of services and autonomous systems solutions, starting with joint analysis of end-user needs, through the formalisation of their requirements, to equipment selection and procurement. Based in the UAE, but capable of acting across the SAMENA region, ADASI's scope includes the acquisition, development, test, operation, training and full-service support of autonomous systems for air, land and sea use. This includes modification and reconfiguration of unmanned systems, in particular identifying and integrating alternative payloads.

Fully-integrated Solutions

Exechon Enterprises L.L.C. is a Joint Venture between Lockheed Martin, Tecgrant AB (formerly Exechon AB), a Sweden-based technology company and Abu Dhabi-based Injaz National. The company displayed the "Parallel Kinematic Machine" (PKM) technology that could transform manufacturing processes, cope with work flow and offer patents to secure fully-integrated solutions that would enable the customers to benefit from the advanced industries and meet their requirements in future. The PKM technology provides machine rigidity with dynamic five axe- technology of the movable articulate arm-robot for easier, speedy and accurate assembly, and augment total performance of equipment. The XMini robot is the latest equipment developed by the company with a 30 micron precision, which is a force multiplier for current limited rigidity and speed space robots. Unlike the classical, traditional machines, light, carbon-made XMini can be set in any direction, even upside down, to get a five axe- machine.

Shipbuilding Solutions

Moreover, Mesfer Al Korbi, General Manager of Al Fattan Ship Industry, said the company, a leading shipbuilder providing numerous solutions in the military sector, presented their latest boat model at the show. The UAE-established and based company is located at Al Sadr Port in Al Taweelah and specialises in shipbuilding and repair. The technology-driven organisation manned by professionals has over 15 years of experience and is active in the building of metal ships, offshore and onshore services, manufacturing, fabrication, repairs, and maintenance of aluminium marine vessels and fiberglass boats. Some of its products include the 15m fast patrol boat, used by the coast guard for interdiction operations, and the 34m-patrol boat employed in support of homeland security and search and rescue. Al Fattan Ship Industry has also developed, as a private venture, a 16m-catamaran torpedo boat. Its facility occupies an area of more than 300,000sqm and it reportedly intends to develop a capability to handle ships of up to 100m in size.

Tawazun Economic Programme Achievements

Achievements of the new framework of Tawazun Economic Programme were highlighted a day before DSEI commenced. Under the theme "Enabling Innovation and Partnerships", key industry leaders alongside DCC members, including representatives from local and international companies, attended the meeting.

The DCC meeting, organised by the UAE defence and security industry enabler Tawazun Economic Council, examined the major milestones reached since the new framework was launched in February. In his opening remarks, Al Romaithi welcomed DCC members and partners, emphasising the importance of the defence and security industry, which has witnessed tremendous growth in the UAE and the region as a whole.

He said: "The UAE is at the forefront in terms of competitiveness and efficiency across the region, which has led to the establishment of a promising knowledge and innovation-based defence and security sector. It has also resulted in the establishment of strong and solid partnerships that will contribute to knowledge transfer and technology, further strengthening the UAE's commitment to economic diversification."

Since the launch of the new Tawazun Economic Programme framework, seven projects have been executed, while 10 other project concepts are currently underway. The new programme allows for the development of technology-driven solutions that extend beyond the defence and security industry to include, aerospace; infrastructure and transportation; education technology; sustainability; environment and climate change; and food and water security.

Abdulla Saif Al Awani, Executive Director of Economic Partnerships at Tawazun, detailed a proactive feature within the programme's framework, which is aimed at creating more value to Tawazun's industry partners.

The new feature, called Project Bank, matches technology with strategic priorities identifying gaps and improvement opportunities in the process. Through this feature, Tawazun identifies and develops a pool of project ideas aligned to key strategic UAE government objectives, allowing contractors to select project concepts from a cart of pre-approved concepts.

The DCC members applauded the new value-focused programme and the Project Bank, which offer greater flexibility to Tawazun's partners.

Ministry of Defence, UAE Armed Forces Discuss Bilateral Relations

A delegation from the Ministry of Defence and the General Command of the UAE Armed Forces, headed by Major General Pilot Mubarak Ali Al Neyadi, Head of the Executive Department of Policy and Cooperation at the Ministry of Defence, attended the show.

The delegation, accompanied by Mansour Abdullah Khalfan Belhoul, UAE Ambassador to the United Kingdom, visited the UAE pavilion. Seventeen Emirati defence companies participated in the exhibition, and the UAE pavilion was an important platform

for the national defence and security industries to showcase their latest defence and security products and independent systems.

Maj. Gen. Al Neyadi and the Emirati delegation toured the exhibition, which included the pavilions of several countries and the stands of regional and international defence companies.

Al Neyadi highlighted the exhibition's international importance and praised the participation of over 1,600 exhibitors and around 300 official delegations from 84 countries, as well as its level of organisation.

Al Neyadi met separately with Lt. General John Lorimer, Senior Defence Adviser for the Middle East at the British Ministry of Defence, and Mark Goldsack, Director of the British Defence and Security Organisation of the Ministry of International Trade. Their meetings, which were attended by senior officers from both sides, discussed the bilateral relations between the UAE and the UK, as well as ways of developing them in various areas and several issues of common interest.

Safe City Group and AVET Announce Partnership

UAE's Safe City Group announced a multi-million-dirham partnership with the UK-based company, AVET Technologies. The partnership, which was announced during DSEI, will enhance investigation processes, evidence gathering techniques and data interrogation technologies to support international police, security forces, court and judicial processes.

The signing ceremony took place at the UAE Pavilion. The technology and investment based manufacturing agreement entails dedicated purpose-built evidence recording solutions featuring innovative storage and data interrogation concepts that will significantly augment the role of law enforcement officers whilst conducting interviews.

Safe City Group will also soon launch the next generation of digital interview recorders. Focusing on vulnerable members of the community, the recorders will focus on law enforcement, judicial and education sectors within the UAE. The company is a UAE owned and based company that specialises in innovative public safety solutions for the Middle East.

Boosting Opportunities and Partnerships

The UAE companies' participation reflected their technical capabilities in various defence and security systems, and highlights the outstanding performance and high-calibre rehabilitation of UAE cadres as the participant companies showcased a large number of advanced technologies of modern systems, which were developed as per international standards in order to shed light on the advantages and features of UAE products.

The UAE defence companies participating highlighted the importance of taking part in such specialised exhibitions and meeting one-to-one with top commanders, officials, experts and decision-makers at DSEI, which hosts top defence and security corporations worldwide to display the most advanced defence systems, military equipment, troop supplies/accessories and defence equipment.

UAE Companies to Showcase Latest Developments at BIDEC

A host of UAE companies will make their presence felt at the upcoming Bahrain International Defence Exhibition & Conference (BIDEC) that will take place from 28-30 October in Manama, Bahrain. Under the patronage of His Majesty King Hamad bin Isa Al Khalifa, Clarion Events, organisers of DSEI London, will be hosting the second edition of BIDEC.

The event is fully supported by the Bahrain Defence Force, and presents a unique opportunity for exhibitors to showcase the latest technology, equipment and hardware across land, sea and air.

Emirates Defence Companies Council (EDCC) and Tawazun will be participating at the event, at the dedicated UAE Pavilion, among other Emirati companies. EDCC is the primary communication platform between industry players both local and international. The council aims to facilitate networking and partnerships and to promote UAE businesses abroad through the UAE Defence Pavilion. It also seeks to enable dialogue between the industry and various stakeholders and productive discussion on industry topics.

While Tawazun Economic Council (Tawazun) is a key enabler for the development of defence and security industries in the UAE. It targets new capability and technology development technologies in the defence and security industrial sector. Since its establishment, Tawazun has enabled creation of more than 90 companies across 11 sectors, including defence manufacturing.

DSEI's 20th Birthday Celebrated in Innovative Style

Celebrating its 20th anniversary, the 2019 DSEI gave its 35,000 plus visitors ever more to see and do when they passed through the doors of Excel, London. Showcasing exciting debuts and demos, September's DSEI featured 1,700 exhibitors across five zones and six new sector-focused hubs, with the event reflecting the new defence market and its growing number of developing indigenous industries.

In innovating, sharing knowledge, discovering and experiencing the latest capabilities, this year's DSEI Strategic Conferences featured industry leaders and senior speakers from the UK and overseas militaries addressing key topics from across the Aerospace, Land, Maritime, Rotorcraft and Medical domains, while debuting the free-to-attend Defence and Engineering Skills Conference to explore challenges faced by the defence sector.

Visiting Naval Vessels

Of the high-profile visits to Victoria Dock, the River Class Batch 2 offshore patrol vessel HMS Medway made its Docklands debut at DSEI 2019. Delivered to the Royal Navy in March, the River Class features a flexible and modular communications solution developed by Rohde & Schwarz to enable secure voice and data communications in the HF and VHF/UHF frequency bands.

Soveron displayed its R&S M3SR Series 4100 HF radios — innovative, versatile software-defined radios designed for use in permanently connected deployment in beyond-line-of-sight communications. Installed in racks within a ship's radio-room or at a shore station, they cover long-haul ship-to-ship or ship-to-shore communications and support frequency-hopping, while providing interoperability with tactical radios in HF-operating modes.

The M3SR Series 4400 VHF/UHF radios offer military customers line-of-sight communications with a flexible range of applications for NATO and proprietary electronic protection waveforms. They also support the military data transmission methods Link 11 and Link 22.

Other visiting ships included:

- HMS Argyll - British Navy Type 23 Frigate
- HMS Grimsby - British Navy Sandown-class minehunter
- HMS DASHER - Archer Class P2000 Patrol Vessel, UK
- HMS TRUMPETER - Archer Class P2000 Patrol Vessel, UK
- BNS POLLUX – Coastal Patrol Vessel, Belgium
- HNLMS ZEELAND - Oceangoing Patrol Vessel, Netherlands
- FS GARONNE – Loire Class Offshore Support and Assistance Vehicle, France

Dynamic Waterborne Demonstrations

This year, visiting warships were accompanied by popular and visual waterborne demonstrations taking place daily on the Victoria Dock. Spectators witnessed an integrated and coordinated display between BAE Systems, Dstl and L3Harris while, in support of NavyX, a demonstration of the Royal Navy's new Autonomy and Lethality Accelerator and the Maritime Mission Systems Enterprise Board highlighted

the integrated and coordinated use of unmanned surface vessels to enhance Royal Navy operations.

Elsewhere, the BAE Systems Pacific 24 RIB had been retrofitted for optional unmanned operation for service with the UK Royal Navy, integrated with L3Harris' ASView control system and BAE Systems' combat system. Dstl's MAST 13 was operated autonomously from an L3 Harris control station using the ASView and demonstrating how the use of autonomous vessels working alongside the command team and manned assets can identify, contain and neutralise a threat.

Waterborne demonstrations from DSEI 2019 exhibitors included:

• Survitec recovery mission showcased its 530GPM military inflatable boat and Maritime Infantry Ensemble with Atacama military dry-suit, low-profile XTP290 life preserver and the world's first floatable load carriage system, the Ascent.

• Barras' Neander-Shark Survitec 8m RIB, a highly specialist rescue and medical boat with specialised diesel engine.

• Ophardt-Maritim's fast and highly manoeuvrable OPH/1280/R interceptor patrol RIB.

• Cox Powertrain's Tornado 9.5m RIB with smokeless diesel engine and low noise levels, offering wide-ranging engine speeds with solid handling at the highest speed.

• Streit Group's high-performance interceptor, the Triton 850 RIB and its all-terrain Sand Tiger patrol boat.

• CPH Group's high-performance Nunya interceptor with specialist targeting and weaponry.

• Volvo demonstrated the versatility of its Marell RIB and high-performance Penta engines.

• Berthon showcased ease of mooring and launching from its Floating Dock, alongside the manoeuvrability of its Gemini Waverider 780 RIB and effectiveness of its shock absorbing Shoxs seating.

• Marine Inflatables demonstrated how its inflatable seagoing platform carries and delivers large loads close to the shoreline.

• Versadock provided the moorings for the boats constructed by TPA Pontoons.

Key Exhibitor Highlights

DSEI is unrivalled in connecting governments, national armed forces and industry thought-leaders with the global defence and security supply chain via a range of valuable opportunities for networking, platforms for business and access to relevant content or live-action demonstrations in the Aerospace, Land, Naval, Security and Joint domains. With more exhibitors, greater international presence, expert-led conferences and new features including hubs dedicated to Manufac-

turing and Space, DSEI 2019 remains the most comprehensive to date.

Team Tempest Italian Partnership

Following commitments at governmental and industrial level, Italy will join the UK's Tempest sixth-generation fighter development, a co-funded technology initiative launched by the RAF Rapid Capabilities Office. Tempest will ensure the UK maintains the technological competence necessary to retain military freedom of action, playing a lead role in future combat air system development by bringing together the UK's world leading industry and sovereign capabilities.

Hard Kill Defensive System

MBDA's weapon range is for land, naval and airborne guided weapon system requirements. In the domain of Survivability in Attack and Control of the Air, MBDA is developing concepts for a Hard Kill Defensive Aid System (HK-DAS) capable of tracking, targeting and intercepting incoming missiles in high threat environments.

MBDA is also utilising HJ-DAS in a small-form factor, scalable Ground Attack Micromissile capability to enhance the Tempest system in the Close Air Support (CAS) role for Persistence in Attack. Chris Allam, Managing Director of MBDA UK, said: "The partnership approach provided by Team Tempest will deliver a step change improvement in the time, complexity and cost of weapons system integration campaigns. Being involved in the development of novel interfaces, bay designs and integration processes will also be a key enabler to the spiral development of complementing effectors in the future. We are utilising our unique role in this collaboration to ensure that a future fighter is able to use existing weapons and planned weapons fully, whilst supporting a full range of system-design studies assessing the trade space between the future fighter platform and the weapons of the future."

DSEI 2019 also featured MBDA's contribution to the PYRAMID Open Mission System, exploiting technologies developed in the Ground Based Air Defence (GBAD) command and control (C2) domain to enhance the operational proficiency of Tempest in Air-to-Air engagements for Effectiveness in Control of the Air.

Protector Test-and-Evaluation Contract

GA-ASI announced signing a Direct Commercial Sale (DCS) contract with the UK Ministry of Defence (MoD) to complete the certification activities for the Protector RG Mk1 Remotely Piloted Aircraft (RPA) system for civil airspace. The DCS contract also funds additional Protector programme elements, including X-band SATCOM system verification, training material development and logistics planning.

"This completes another important milestone as we work towards the delivery of Protector to the Royal Air

Force (RAF)," said Linden Blue, CEO, GA-ASI. "We have completed more than 100 qualification test flights using our two company-owned SkyGuardian RPA."

Once delivered to the RAF in the early 2020s, MQ-9B SkyGuardian is the baseline RPA for the Protector RG Mk1. RAF operators will continue to support evaluation activity for Protector using the two SkyGuardian test aircraft and the Protector cockpit.

The GA-ASI-developed DAA system consists of a Due Regard air-to-air radar and processor, integrated with Traffic Alert and Collision Avoidance System (TCAS II) and Automatic Dependent Surveillance-Broadcast (ADS-B). The Protector RG Mk1 is being built for all-weather performance with lightning protection, damage tolerance and de-icing system.

Remote Weapon Station Launch

MSI-Defence Systems Ltd announced the launch of its MSI-DS TERRAHAWK Remote Weapon Station (RWS), a new addition to the MSI-DS product portfolio in the land weapon systems market. The MSI-DS TERRAHAWK RWS combines the proven reputation of the SEAHAWK family of gun systems for reliability and unmatched accuracy, with optimisations for vehicle integration, compact flexible fire-control and multiweapon modularity.

The DSEI TERRAHAWK was fitted with M2HB 12.7mm Heavy Machine Gun, suitable for integration into both legacy and new build vehicles, with the modular system designed for ease of integration into unmanned platforms for remote operation. Remote firing capabilities demonstrate the SEAHAWK's exceptional accuracy at extended ranges while the MSI-DS SEAHAWK Multi Weapon Station (MWS) has recently completed successful firing sea trials on the BAE Systems P950 Unmanned Surface Vessel (USV) demonstrator.

Modular Surveillance Solutions Launched

The UK-based Chess Dynamics showcased two new payload-agnostic, modular solutions for increased military flexibility and cost efficiency in land-based surveillance and target acquisition operations. The Modular Integrated Pod System (MIPS) is a self-contained, vehicle-mounted platform enabling quick changeover of surveillance and target acquisition payloads including radar, electro-optical tracking systems and counter-unmanned aerial systems (C-UAS).

Providing a squadron or company with the same capability of three or four separate systems or vehicles, this mission-configurable system provides 360˚ surveillance coverage, interoperable with supporting systems. Currently in operational service with a NATO member nation, operators use the MIPS 'clip-on, clip-off' system easily when changing payload, limiting the need for specialist equipment training and reduces downtime for maintenance.

Chess has also developed an ISO container-based surveillance-and-target solution compatible with multiple payloads and radar, electro-optical tracking or C-UAS capability. The ISO container is easily transported, enabling rapid payload deployment to provide a protective, habitable and environmentally-controlled space with an integrated interior control and display unit to monitor and track targets from inside when facing extreme environmental conditions.

In March, Chess announced its U.S. partner Liteye's contract with the U.S. Department of Defence (DoD) to meet threats at US borders and airports and protect critical internal infrastructure.

Coyote Nears First Export

Raytheon and the U.S. government are clearing Raytheon's Coyote unmanned aircraft system for international sales. The small, expendable, tube-launched Coyote is ground, air or ship deployed then flown individually or netted together in swarms, adaptable for surveillance, electronic warfare and strike missions. It operates for maximum one hour and is designed for interchangeable payloads.

Handling relatively large accelerations during launch, the Coyote improves surveillance imagery and enhances targeting capability, providing near real-time damage assessment and reduced threat to manned aircraft. Raytheon is finalising advanced Coyote variants to fly faster and further.

Warrior Capability Sustainment Programme

After 20 battlefield mission tests, Lockheed Martin's upgrade to the Warrior IFV will soon enter British Army service, with negotiations underway to update fleet of Warrior infantry fighting vehicles. In cooperation with the British Army's Armoured Trials and Development Unit, Warrior has tested its CTAI-developed 40mm cannon, driving more than 5,000 kilometres to pass battlefield mission assessments.

The Warrior Capability Sustainment Programme (WCSP) will extend the out-of-service date to beyond 2040 and include the Warrior Fightability & Lethality Improvement Programme, Warrior Enhanced Electronic Architecture and Warrior Modular Protection System.

Lockheed Martin UK has supplied 11 WCSP for Armoured Reliability Growth trials (RGT) and Development Unit trials: six FV520 Warrior IFV section vehicles, two FV521 Warrior IFV command, one FV522 Warrior repair, one FV523 Warrior recovery/repair and one FV524 Warrior artillery observation post vehicle.

Leonardo Laser Targetting

Leonardo announced sales of over 600 units of Type 163 Laser Target Designator (LTD) to 16 customers including Italy, the U.S., Australia, Canada, New Zealand, Belgium, Denmark, Finland, France, Latvia and the Netherlands.

The success of the product reinforces Leonardo's position as international leader in the high-energy military laser market, accounting for over 70 per cent of global sales for airborne platforms and around 60 per cent of total sales, including for ground-based applications.

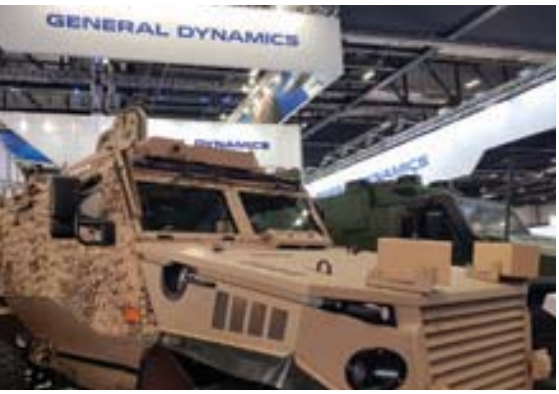
Joint Terminal Attack Controllers (JTACs), the troops responsible for directing close air support, use the Type 163 Ltd with around 550 units delivered to date, including to U.S. Special Operations Forces. The Type 163 has been battle-tested during Middle East operations where users have benefitted from immediate and accurate target identification capabilities.

Leonardo also announced a new research contract to develop counter-UAV (C-UAV) technologies for the RAF. Four baseline systems will be delivered by next March, then tested and developed to the RAF's requirements.

Autonomous Underwater Vehicles

Having participated in the inaugural DSEI Space Hub, Teledyne showcased various defence solutions and capabilities at DSEI 2019 covering surveillance, low-light and infrared imaging, missile defence and counter-measure systems, chemical and biological species detection for CBRN applications and undersea mine countermeasures.

Teledyne Marine has an indefinite



delivery/indefinite quantity contract from the U.S. Naval Undersea Warfare Centre to supply autonomous underwater vehicles and related monitoring and communications acoustic systems valued at US$5.4 million with a maximum US$22.2 million value until December 2024 with all options. Autonomous underwater vehicles (AUV) can carry out complex survey missions for commercial, scientific and defence applications.

Teledyne AUVs' modular architecture enables sensors to be easily integrated and battery packs exchanged in the field. In addition to powered, self-propelled AUVs, Teledyne provides a wide range of autonomous profiling floats, variable-buoyancy autonomous gliding vehicles, unmanned surface vehicles and inspection-class remotely operating vehicles (ROVs).

Multiple Launch Hydra System

Arnold Defence unveiled their new high-capacity rocket launcher, the Multiple Launch Hydra System (MLHS) installed on the Mercedes-Benz UNIMOG LTTV platform on Jankel's Stand at DSEI 2019.

This new version has 23 launcher tubes for 2.75in/70mm solid propellant laser-guided rockets, such as the BAE Systems Advanced Precision Kill Weapon System (APKWS), and is set to transform the surface defence world by delivering low-cost, high-capacity surgical strike capability.

The latest Fletcher MLHS includes the platform, the laser-guided rockets pod and a mounted or air-based laser designator integrated into a helicopter, an unmanned aerial vehicle or an aircraft.

Composite Rubber Track System

In the Canadian Pavilion, Soucy Defence exhibited the Composite Rubber Track (CRT) system on a one-off vehicle prototype — the Mortar or Armoured Battlegroup Warrior Support Vehicle supplied by Rheinmetall BAE Systems Land (RBSL) and currently in service with the British Army.

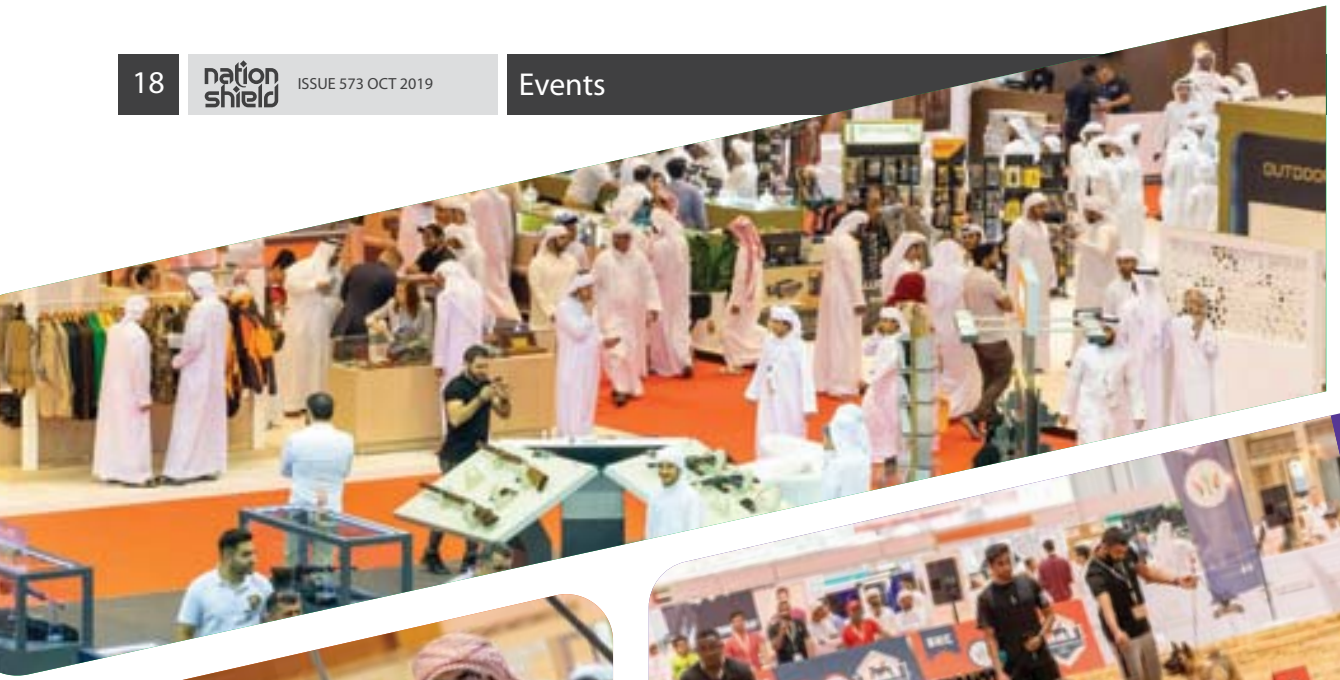
Soucy's CRT system consists of a continuously-cased rubber-band structure, reinforced with a range of composite materials and steel cord, weighing 50 per cent lighter than steel track.

Upgraded Unmanned Helicopter

The upgraded UVH EL was showcased at DSEI 2019. UAVOS has upgraded its unmanned UVH EL helicopter with an advanced airframe.

As an electric-powered UAV, it is equipped with a gimbal for day or night surveillance with increased carrying capacity, flying range and extended temperature range.

Powered by autopilot, take-off, landing and missions are all carried out automatically.



ADIHEX 2019 Concludes With Resounding Success

The event welcomed 115,000 visitors and recorded sales of over AED70 million

The 17th Edition of the Abu Dhabi International Hunting and Equestrian Exhibition (ADIHEX) held under the patronage of His Highness Sheikh Hamdan bin Zayed Al Nahyan, Ruler's Representative in Al Dhafra Region and Chairman of Emirates Falconers' Club, came to an end on August 31. Held at the Abu Dhabi National Exhibition Centre (ADNEC), the exhibition took place for five consecutive days under the slogan "Together to Consolidate Sustainable Hunting Initiatives."

The exhibition was visited by His Highness Sheikh Humaid bin Rashid Al Nuaimi, Supreme Council Member and Ruler of Ajman, His Highness Sheikh Ammar bin Humaid Al Nuaimi, the Crown Prince of Ajman, His Highness Sheikh Abdullah bin Rashid Al Mualla, Deputy Ruler of Umm Al Quwain, His Highness Sheikh Nahyan bin Mubarak Al Nahyan, Minister of Tolerance, His Excellency Dr. Thani bin Ahmed Al Zeyoudi, Minister of Climate Change and Environment, His Excellency Sheikh Sultan bin Tahnoon Al Nahyan, Member of the Executive Council-Abu Dhabi as well as other Sheikhs, excellencies and VIPs from the UAE and countries that represented diplomatic communities.

His Excellency Majid Al Mansouri, Secretary General of the Emirates Falconers' Club and Chairman of the Higher Organising Committee of the exhibition said, "This 17th edition had more than 650 companies and brands, 400 local and international exhibitors from 41 countries, and governmental and non-governmental entities from inside and outside the country, as well as local and international agencies

over an area of 45,000 squared metres. This exhibition has witnessed several media outlets and representatives that reached more than 600 individuals as well as international television and radio channels who covered the exhibition's various activities. The exhibition received 115,194 visitors and the sales of the exhibition amounted to more than AED70 million."

He added: "The Hunting Guns sector saw a significant rise in the number of pieces that were sold especially with the large participation of major companies, local authorities and organisations. This is especially the case as during the exhibition, UAE nationals who are over the age of 21 years, were allowed to own three pieces of weapons from the exhibition, and others from the rest of the world could also purchase weapons under the condition of providing a license and a No Objection Certificate (NOC) from their respective countries."

His Excellency expressed his satisfaction because of the success of the exhibition that has turned into a cultural heritage environmental international festival that is a multicultural forum all under one roof. This success is considered a benchmark for continuity, development and renewal in the upcoming editions.

"We have already started putting the basic plans and initial cornerstones of the 18th edition of the exhibition, in reference to the testimonials of exhibitors, participants and visitors, who expressed their happiness and praised the exhibition and its initiatives that gathered all categories of people of all ages," Al Mansouri added.

There were several interesting initiatives within the exhibition that were dispersed over 11 sectors, which were: veterinary products and services, hunting guns, media, outdoor leisure vehicles and equipment, hunting tourism and safari, arts and crafts, equestrian, falconry, fishing and marine sports, hunting and camping equipment and the promotion and preservation of cultural heritage. This is in addition to the arena that was dedicated to horse, camel, and dog shows.

Action-packed Shows

Falconry enthusiasts experienced the debut of the Falcons Auction, which witnessed the participation of dozens of local and international companies specialised in producing the best falcons in the world. The auction took place over the five days where there was bidding and a competitive spirit between falconers from the GCC to buy the best falcons. This was all with the aim of encouraging falcon farmers to produce the best falcons and to empower falconers to own superior falcons at the best prices.

The 25th edition of the Arabic Camels Auction was also tremendously successful. It was organised by the Advanced Scientific Group and was designed to attract a wide audience of camel lovers and focused specifically on camels that are used in racing. The camels did not exceed the age of two years and were affiliated to the strains of ancient authentic breeds that have the ability to compete in races and as a result there was strong participation of bidders from all over the world.

Additionally, this edition also provided an opportunity for fans and visitors to see more than 200 breeds of purebred dogs from more than 15 countries.

Peek into Japanese Heritage

The visitors at the exhibition were fascinated by the Japanese Pavilion that had a special participation this year with over 50 exhibitors and artists who presented performances and dances that reflect the art and heritage of the Japanese tradition. The shows were enjoyed by all the visitors, along with many other platforms that showcased Japanese products such as antiques, accessories and various traditional arts.

Workshops

The first day of the event witnessed a high-level workshop that tackled issues surrounding illegal trade in birds of prey that was held on the sidelines of the exhibition. It was held in the presence of His Excellency Dr. Thani bin Ahmed Al Zeyoudi, Minister of Climate Change and Environment, His Excellency Majid Ali Al Mansouri, Secretary General of the Emirates Falconers' Club and Chairman of the Higher Organising Committee of ADIHEX and Her Excellency Dr. Sheikha Salem Al Dhaheri, Secretary General of the Environment Agency Abu Dhabi, and a number of local and international officials.

The workshop reviewed the mechanisms of the process and efforts taken by local and international institutions in aiding the efforts of the International Association for Falconry and Emirates Falconers' Club to promote the elimination of illegal trade of birds of prey. It also showcased the decisions taken by the judiciary department that includes encouraging the reproduction of falcon families and using international scientific controls rather than depending on wild falcons. There were discussions and workshops with decision makers, researchers and specialists to find the right solutions to evade the illegal hunting of birds of prey.

GCC Participation

ADIHEX 2019 welcomed a huge participation from the GCC, especially from governmental entities. The Kingdom of Saudi Arabia had exhibitors from the Ministry of Interior and the General Department of Arms and Explosives that came to support the exhibition and join the UAE in exchanging expe-

riences. From Kuwait, the Ministry of Interior participated through the General Department for Weapons Investigations, in addition to various companies and agencies from heritage sports enthusiasts. This participation has reflected the depths of brotherly relations between the GCC countries and the UAE.

For instance, ARB 4x4 Accessories Emirates, part of Al Masaood Group and one of the leading market brands in four-wheel drive accessories and outdoor gear, took part in the exhibition.

ARB Emirates participated at ADIHEX for the 11th consecutive year and unveiled their latest products with the most recent innovative technology and also had a raffle draw on their stand, which gave visitors a chance to win ARB products such as portable compressors and digital and analogue gauges. Furthermore, the company offered a special discount of up to 25 per cent to visitors across their products range.

Robert Schwarz, Chief Operating Officer of Al Masaood Group, said: "ARB Emirates has consistently met the expectations and demands of outdoor enthusiasts throughout the UAE since 1990. Young Emiratis have emerged as a new generation of off-road aficionados and, as the leading national brand in the 4x4 cars customisation market, we provide a wide range of high-quality products and embrace the culture and heritage of the UAE as we welcome more and more customers every year."

He continued: "ARB Emirates' association with ADIHEX for the past decade has contributed to our progress and realisation of our goals. The 2019 edition welcomed a record number of attendees and presents an unrivalled platform to showcase the latest products to a truly special audience. We look forward to the future events with huge expectations and optimism."

Range of Activities

There were special activities for children that included practicing various games creatively and in a fun atmosphere. These focused on heritage and cultural activations that were also educational and entertaining for children. Moreover, it helped in initiating curiosity through the dedicated Knowledge Corner that specialised in inspiring the little ones.

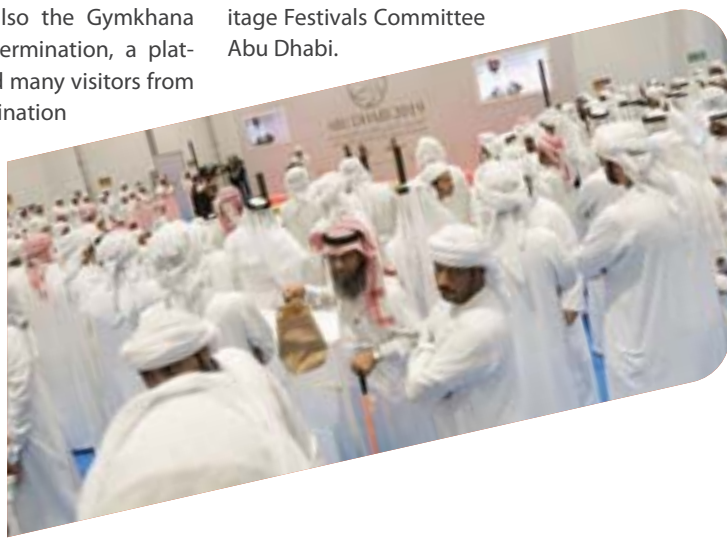
The exhibition also included entertaining activities on falconry and equestrian where children were encouraged to be creative in drawing on glass, face paint, as well as watch a puppet show that entertained kids with special performances. They also got the chance to ride real ponies that were presented by Dhabian Equestrian Club.

Another interesting activity was the Treasure Hunt that composed of educational questions focused on the concept of tolerance and love of nature. There was also the Gymkhana for People of Determination, a platform that attracted many visitors from people of determination who enjoyed the multiple displays.

Prizes and Awards

Promoting creativity and camaraderie, ADIHEX hosted several competitions, which offered prizes equivalent to more than one million dirhams. There were raffle draws for the visitors of the exhibition throughout the five days. The youngest exhibitor at the exhibition, Sultan Al Muhairbi, 13 years old, and the youngest female exhibitor, Gaya Al Ahbabi, were awarded during ADIHEX. This was a step to encourage the young generations and youth to be part of these national and international events to celebrate heritage and promote environmental conservation.

The Abu Dhabi International Hunting and Equestrian Exhibition is organised by Emirates Falconers' Club. The Environment Agency of Abu Dhabi, International Fund for Houbara Conservation and Abu Dhabi National Exhibition Centre were the Official Sponsors of the event. Nation Shield, the official journal of UAE Armed Forces was a media partner of the event. While Wahat Al Zaweya was the Sustainability Sponsor and Barary Ain Alfayda Development and Tiger Properties were the Hunting Tourism and Safari Sector Sponsors. Event supporters included the Department of Culture and Tourism and Cultural Programmes and Heritage Festivals Committee Abu Dhabi.



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CLARION EVENTS

Mohamed bin Zayed, U.S. Secretary of State Deliberate Regional Developments

His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, reaffirmed the UAE's support for the Kingdom of Saudi Arabia against all the menacing threats besetting its security and stability.

H.H. Sheikh Mohamed made the statements as he received U.S. Secretary of State Mike Pompeo at Qasr Al Shati', with the two sides deliberating the recent attacks on Saudi oil installations and their repercussions on regional and international security.

"The UAE categorically rejects any attempts to undermine the Kingdom's security and stability and regards any threat to the Kingdom as a threat to international peace and security," Sheikh Mohamed added.

He underscored the UAE's principled support for preserving peace and stability in the Gulf region and the Middle East in cooperation with other sisterly and friendly countries, primarily the United States of America.

The two sides doubled on the importance of maintaining channels of bilateral coordination and continuing to solidify the pillars of peace and stability in the region.

Mohammed Al Bowardi, U.S. Army Acting Secretary Discuss Bilateral Cooperation

Mohammed bin Ahmed Al Bowardi, Minister of State for Defence Affairs, received Ryan McCarthy, Acting Secretary of the U.S. Army, and his delegation currently visiting the UAE, at the headquarters of the Ministry of Defence in Abu Dhabi.

During the meeting, which was attended by Mattar Salem Al Dhaheri, Under-Secretary at the Ministry of Defence, Al Bowardi welcomed McCarthy, and both sides discussed the friendship and cooperation between the UAE and the U.S. and ways of reinforcing them. They also explored potential areas of coordination between their countries in the areas of defence and military affairs and exchanged their views on many regional and international issues of mutual concern. The meeting was attended by several senior officers from the ministry.

UAE Joins International Coalition for Maritime Security

The UAE recently announced it has joined the International Maritime Security Construct, an international alliance that aims to protect the safety of maritime navigation and international trade. Salem Mohammed Al Zaabi, Director of the International Security Cooperation Department at the Ministry of Foreign Affairs and International Cooperation, said that the UAE's accession to the alliance comes in support of regional and international efforts to deter threats to maritime navigation and global trade, and in order to secure the flow of energy supplies to the global economy and contribute to the maintenance of international peace and security.

The alliance protects the interests of its members and their merchant ships when passing through maritime corridors.

Hazza Al Mansoori Realises Sheikh Zayed's Dream

On September 25, Hazza Al Mansoori, former Emirati F-16 aircraft pilot, became the first UAE national in space. His journey marked an important milestone in the UAE's burgeoning space industry, led by the Mohammed Bin Rashid Space Centre (MBRSC).

Russian Soyuz MS-15 spacecraft, carrying Al Mansoori and two other astronauts, blasted off to the International Space Station (ISS) from Baikonur Cosmodrome in Kazakhstan, to participate in a scientific research space mission.

"The arrival of the UAE's first astronaut Hazza Al Mansoori in space is a message to all Arab youth that we can make progress and move forward. We can catch up with the others. Our next stop is Mars via the Hope probe, which is designed by our young people with competency," His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, tweeted.

"It has been more than two years ago, since my brother Sheikh Mohamed bin Zayed and I launched the UAE Astronaut Programme. Today, we celebrate the launch of the first Emirati astronaut on a historic mission to the International Space Station... an Emirati achievement that we are proud of and we dedicate to the Arab and Islamic nations," he added.

"I proudly watched as Hazza Al Mansoori lifted off into space. This event strengthens our confidence in our youth who will take our nation to new heights and reinforces our ambitions for the future. We pray for Hazza's success and his safe return home," His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, tweeted.

The UAE Astronaut Programme was launched in 2017 to train and prepare a team of Emiratis to be sent to space for various scientific missions. The Programme is the first in the Arab world aimed towards developing skilled and capable Emirati astronauts to embark on future space missions and serve as ambassadors for the UAE and the Arab world in space exploration.

During his eight-day stay aboard the ISS, Al Mansoori will study the impact of microgravity in 15 experiments that have been selected based on MBRSC's 'Science in Space' competition, which involves schools in the UAE in the process of preparing experiments for space. Students will also conduct the same experiments on earth to compare the results with those done in space.

Moreover, the reaction of the human body to space will be studied before and after the trip, the first time this kind of research will be done on an astronaut from the region. This is on top of the existing scientific missions assigned to Al Mansoori whilst on the ISS, using on-board laboratories.

Nation Shield wishes Al Mansoori success on this historic journey!

Germany Selects BAE Systems 57mm Guns

BAE Systems has been selected to provide the German federal police force, Bundespolizei, with three 57mm naval guns for its three new 86m Offshore Patrol Vessels (OPVs), built by Fassmer shipyard.

The gun systems, known as the Bofors 57 Mk3, will support the maritime arm of the Bundespolizei that monitors the country's North Sea and Baltic coastlines. The 57 Mk3 is a flexible gun system designed to react quickly for close-to-shore operations.

"The Bofors 57 Mk3 is a versatile naval gun with firepower and range that exceeds expectations when compared with similar, medium calibre naval gun systems. That's how our 57 millimetre system has earned its reputation as the deck gun of choice for ships operating in coastal environments," said Ulf Einefors, director of marketing and sales for BAE Systems' weapons business in Sweden. "This contract expands the number of European nations deploying the 57 Mk3 and reflects the growing interest we're seeing in the region, where we look forward to supporting new opportunities in the near future."

The 57 Mk3 naval gun is also in use with the allied navies and coast guards of eight nations, including Canada, Finland, Mexico, and Sweden, as well as the U.S., where it is known as the Mk110 naval gun.

This contract also includes accompanying fire control systems as well as systems integration support. The work is expected to begin immediately and will be performed at the BAE Systems facility in Karlskoga, Sweden. The first unit is scheduled for delivery in 2020.

General Dynamics Bags US$1.6 B Contract to Build More U.S. Navy ESBs

General Dynamics NASSCO, a subsidiary of General Dynamics, was recently awarded a contract by the U.S. Navy worth up to US$1.6 billion for the construction of the sixth and seventh ships of the Expeditionary Sea Base (ESB) programme, as well as an option for ESB 8.

Kevin Graney, president of General Dynamics NASSCO, said: "ESBs have proven to be affordable and flexible, and as the fleet has gained experience with the platform, we have worked with the Navy and Marines to develop even more capabilities and mission sets."

The contract, announced by the U.S. Department of Defense, provides US$1.08 billion as a fixed-price-incentive modification to a previous contract for the design and construction of the two ships, with an option for the third that, if exercised, would bring the total cumulative value to US$1.63 billion.

Named after famous names or places of historical significance to U.S. Marines, ESBs serve as a flexible platform and are a key element in the Navy's airborne mine countermeasures mission, with accommodations for up to 250 personnel and a large helicopter flight deck. The ship's configuration supports special warfare and Marine Corps task-organised units. Work on the two new ships of the ESB programme is scheduled to begin in the first quarter of 2020 and continue to the second quarter of 2023.

Leonardo and CAE USA Sign MoA

Leonardo and CAE USA have joined forces to collaborate in the U.S. to offer integrated solutions for helicopter training requirements for the government market. A Memorandum of Agreement (MoA) was signed recently between the companies that expands on the long-established relationship between Leonardo and CAE in helicopter training.

The MoA is focused on delivering tailored helicopter-and-training packages to U.S. government operators and Foreign Military Sales (FMS) customers. The companies will provide low risk and best value by offering a comprehensive and integrated training solution that includes aircraft, simulators and courseware. Working together to create a cohesive flight training package, Leonardo and CAE will be at the forefront of integrated, live, and virtual training developed for specific aircraft missions.

The integrated offerings from Leonardo and CAE could include advanced helicopters, simulators and training devices, courseware, training services, and training centres. Each arrangement will be specific to the customer and determined on a case-by-case basis.

William Hunt, CEO AgustaWestland Philadelphia Corporation, said: "Leonardo has a long history of collaborating with CAE for helicopter training. By creating integrated training systems for the U.S. government together, we are able to offer forward-looking, cost effective solutions that ensure mission success."

"We look forward to collaborating with Leonardo on training opportunities in the U.S. military market related to Leonardo's range of helicopter platforms," said Ray Duquette, President and General Manager, CAE USA.

AAR and WSU Tech Announce Education Partnership

AAR, a leading provider of aviation services to commercial airlines and governments worldwide, and WSU Tech recently announced their new aviation maintenance education and training partnership to further enhance instruction, as well as student job experiences and career prospects at AAR upon graduation.

AAR's EAGLE Career Pathway programme will expand the curriculum of WSU Tech's aviation maintenance technology programme to include job shadowing and mentoring, as well as academic support and monitoring. WSU Tech students who pursue the FAA-certified aircraft mechanic's certificate are eligible for up to US$15,000 in tuition reimbursements from AAR. The announcement was made at WSU Tech's main campus in the National Center for Aviation Training, located in Wichita, Kansas, U.S.

AAR's partnership with WSU Tech is one of the many ways the company is connecting students with education and real-world job experience to fill the gaps in aviation for middle skills that do not require a bachelor's degree. There is demand for 189,000 new mechanics in North America through 2037, according to a Boeing study. But aircraft maintenance technicians (AMTs) are already in short supply.

AAR is introducing the EAGLE Career Pathway at schools near its five U.S. aircraft repair stations. EAGLE demonstrates how students can earn portable, stackable skills leading to multiple career paths at AAR. The stackable skills will enable interested students to pursue the coveted position of FAA-certified airframe and powerplant (A&P) mechanic.

MBDA Brings MESKO into Global Missile Supply Chain

MBDA recently partnered with MESKO S.A. to bring the Polish firm into its global missile supply chain. Contracts from MBDA to MESKO S.A. were signed at the recently concluded MSPO 2019 in Kielce, Poland. The scope of work includes components within multiple missiles including the CAMM air defence missile family and the Brimstone strike missile.

Warren Devine, MBDA Head of Industrial Co-Operation Poland, said: "These contracts validate our assessment that MESKO can provide quality missile components to MBDA's exacting standards whilst enhancing our global competitiveness. MESKO will become a valuable part of MBDAs supply chain and a strong partner for deep cooperation."

Gabriel Nowina-Konopka, Vice CEO of Mesko S.A., added: "The agreement confirms our capabilities in manufacturing and delivering advanced missile systems. We are now included in the supply chain of components for one of the largest global manufacturers, and are working on expanding this partnership on other ambitious projects."

The contracts between MBDA and MESKO S.A., a PGZ company, follow on from the signing of a strategic co-operation agreement between MBDA and PGZ on missiles in February 2017. Since then, detailed assessments have been undertaken between both parties, which recognise the benefits of co-operation with each other. CAMM and Brimstone are also offered to Poland for the Narew and Tank Destroyer programmes. In addition to global supply chain opportunities, MBDA's co-operation with PGZ involves unprecedented depth of missile technology and know-how transfer to Polish industry.

U.S. Navy LCS to be equipped with iXblue Navigation System

iXblue Defense Systems has been chosen by OSI Maritime Systems for integration into its warship Integrated Bridge and Navigation System (IBNS), a Marine Equipment Directive Type Approved certified Integrated Navigation System, to equip Lockheed Martin Freedom-class Littoral Combat Ships (LCS) 27, 29 and 31.

Already equipping over 111 U.S. Coast Guard cutters, this installation marks the first time that iXblue Defense Systems' navigation technology has been chosen to equip a surface warship for the U.S. Navy. The company's Marins Inertial Navigation Systems, are manufactured at Federal Electronics' facility in Cranston, Rhode Island,U.S. Based on iXblue Fiber-Optic Gyroscope (FOG) technology, the Marins Series INS offer high performance levels and provide accurate position, heading, roll, pitch and speed information with low SWaP, in any environment, including GNSS denied.

Major navies and coast guards worldwide have selected the Marins Series, including the UK's Royal Navy for all their surface ships and submarines. Besides the Marins systems being delivered to the LCS programme, more than 390 other types of fibre-optic gyroscopes and INS's have been delivered by iXblue to U.S. customers, including U.S. Special Operations Command (SOCOM), NAVSEA, U.S. Coast Guard and NAVAIR.

Saab Showcases Production Giraffe 1X Radar

Saab exhibited a serial production standard Giraffe 1X, at the recently concluded DSEI exhibition for the first time. The radar provided a live demonstration of its capabilities by viewing the airspace from its position at the show. Visitors were also able to talk to Saab experts about its unique features and saw the high-quality situational awareness users can expect.

The Giraffe 1X is a compact, lightweight high-performing 3D radar perfect for the ground-based air defence role as well as for civil applications such as airports and site protection as well as naval applications for all types of vessels.

The radar also boasts simultaneous air surveillance, Counter Rocket, Artillery and Mortar (C-RAM) and Counter Unmanned Aerial System (C-UAS) capability with an Enhanced Low, Slow and Small capability against low observable targets as well as UAVs. As an example of this application at DSEI, the air picture generated by the Giraffe 1X was supplied to the nearby stand of Chess Dynamics in support of their counter-UAV system.

"We brought an operating Giraffe 1X to DSEI to showcase how the radar is the new benchmark in so many ways for the small radar segment. In another first, the Giraffe 1X at DSEI was installed on a Supacat Jackal vehicle, reflecting how the radar's small footprint and low mass mean it can quickly be deployed wherever the commander's need is greatest or when rapidity equates to survivability," says Torbjörn Wolffram, Marketing & Sales, Saab's business unit Radar Solutions. The Giraffe 1X can be networked or operated fully self-contained with C3 capabilities. It is designed for flexibility of integration, with the option for both mounted and dismounted applications.

Rohde & Schwarz Highlights SOVERON

At DSEI 2019 in London, Rohde & Schwarz demonstrated its proficiency as a systems partner and integrator who plans, develops and implements secure communications architectures and networks.

Digital sovereignty and technological independence are extremely crucial for government customers with security-critical applications. SOVERON gives government customers a secure, high-performance network architecture consisting of state-of-the-art, innovative hardware and software, cryptology and intelligent routing. It takes into account their security and national interests and enables them to achieve information superiority.

The SOVERON family works with the high data rate jam resistant SOVERON WAVE for tactical rugged use on the first mile. All members of the SOVERON WAVE offer mobile ad hoc network (MANET) functionality.

As key components of the SOVERON communications system architecture, SOVERON SDRs are available for tactical communications scenarios and for deployment on airborne platforms. The different types include SOVERON HR that covers the "first mile" with a secure and trustworthy handheld SDR suitable for dismounted applications; SOVERON VR that is optimised for vehicle-based communications and covers the complete VHF/UHF frequency range; and SOVERON CRYPTO, a state-of-the-art security management system for the SOVERON software defined radio family for managing security-critical elements in tactical radio and IP networks, among others.

Rabdan Academy:
Towards a More Resilient Nation

At the recently concluded DSEI 2019 in London, Rabdan Academy was a part of the UAE pavilion. The Academy is an Abu Dhabi-government owned university and training establishment that specialises in safety, security, defence, emergency preparedness and crisis management sectors in a cross-government setup.

By: Sakha Pramod

James Anthony Morse CB, Rear Admiral and Rabdan Academy President

On the sidelines of the show, James Anthony Morse CB, Rear Admiral and Rabdan Academy President, told Nation Shield: "I am here to tell people at the Exhibition what the Academy is doing in Abu Dhabi, because there isn't anything quite like our Academy elsewhere in the world. I have a great opportunity to tell senior defence and security officials about our vision and mission, and why it is important."

Morse explained: "For example, we have military personnel training alongside the police and other government entities. We are trying to assist prepare all those entities to work together and face the security and defence challenges of the future as a team. A cross-government response is an essential element of success and the importance of interagency cooperation is a key lesson from previous events."

His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces vision for Rabdan Academy is to lead the security & defence training & education effort in a cross-government setup. The Academy hosts several programmes such as Bachelor's degree in homeland security and Master's degrees in subjects such as Intelligence Analysis and Policing and Security Leadership. Most of the academic programmes are conducted in English.

"We offer top-quality courses; for example, the competition to get into our Master's of Intelligence Analysis is tough, as it is a world-class programme," he added.

The Academy also hosts several vocational short courses for government entities in the field of safety, security and defence. Morse said: "That's an area of business that has grown dramatically over the last few years. We are also working with several entities as an "agent to assist change", where they are looking to refine the way they view training and education, including certification and national recognition. The Academy is doing a lot of work with government entities to assist them in that process. Ultimately, we want to contribute to a well-educated, fully trained Emirati workforce with nationally recognised certification, with portable skills between different areas and entities including the private sector."

About 25 per cent of the Academy's faculty is Emirati and it also has an in-

Rabdan campus provides a technology rich environment

Each student at Rabdan Academy is assigned an advisor who will provide support and advice to students in all facets of their activities

Rabdan Academy has a library and information centre containing books, journals, reports and other media

ternational spread of instructors who bring a global perspective, drawing on best practices from around the world and tailored for the UAE.

Focus on Teamwork

The UAE government and federal entities or the Abu Dhabi government sponsor most of Rabdan Academy's students, along with some self-funding students.

"For instance, the Armed Forces and Abu Dhabi Police are big stakeholders. We also work with different ministries such as the Ministry of Defence, Ministry of Interior, and the Supreme Council for National Security, among others. It is a wide range of stakeholders and for me, that is important, as I want as many of those entities to work together as possible because ultimately it is that teamwork that is going to be successful," emphasised Morse. "We plan to hopefully attract more regional students and then expand into a more global approach in the due course."

> The Academy is doing a lot of work with government entities

At the Academy, you will find a policeman sitting next to a military officer and by the time they finish their degree or course they know each other and have a network of colleagues and friends. This assist in building strong relationships between all these organisations.

Morse passionately shared that the Academy is looking forward to training and educating young people and preparing them for challenges that are not yet known. "The world is changing so fast that by the time students finish a programme, the challenges they face will have evolved and so must the graduates' mind-set. That's part of the excitement and why we try to identify the changes and focus on enduring skills, such as critical thinking, leadership and analysis," he concluded.

Rabdan Academy is six-years-old, was formed by Royal decree and is steadily enlarging in the number of students choosing its academic programmes. It is also growing very fast in the vocational space. Its aim is to continue that path of growth and to offer more academic courses and programmes, achieve the highest possible standards and identify training and education needs of stakeholders in the future.

International Partnerships

Rabdan Academy has a number of key partnerships such as with the Virginia Commonwealth University in the U.S. The American university and Rabdan Academy have similar programmess and send exchange students to each other for a semester. "We are looking at partnerships with other academic institutions and are trying to build research co-operation," Morse highlighted.

Collins Aerospace Tackles Military Comms Challenges

URG-IV features the latest 4G Automatic Link Establishment technology

By: Sakha Pramod

Collins Aerospace Systems, a unit of United Technologies Corp., showcased the Universal Radio Group (URG)-IV, a new portable ground station for the first time at the recently concluded Defence & Security Equipment International (DSEI) expo in London. This wideband High Frequency (HF) communications system delivers reliable, high-speed data and clear digital voice beyond-line-of-sight (BLOS) communications without needing satellites.

The URG-IV is a modernised version of the company's URG-III HF communications system, which has provided customers reliable and quality communications for decades.

"URG-IV features the latest 4G Automatic Link Establishment (ALE) technology, which automatically determines the optimal bandwidth for transmission and links much faster than legacy HF equipment," Laurent Soyer, Business Development Manager, Mission Systems told Nation Shield, explaining the features of the station on the sidelines of the show. "This makes it more reliable and easier to use the HF communications platform. Beyond clear voice communications, the URG-IV's wideband HF capabilities also enable users to transmit images and use real-time chat functionality.

"You have now a proven, BLOS communications option in contested environments where SATCOM is expensive, challenged or denied. It is flexible, user friendly, cost-effective and backward compatible. It delivers a clear ground-based communications system in a rack mount or transportable configuration. Above all, it is powerful.

"Modernised HF is an integral component of a communication system's PACE (Primary, Alternate, Contingency, Emergency) plan and helps maintain situational awareness on the battlefield."

The URG-IV line of HF radio communications equipment offers the right communications systems for different missions. Whether you need a single radio to integrate into your existing system or you want to establish a new network of multiple radio systems dispersed geographically under remote control by multiple operators, Collins Aerospace has the answer.

The company's engineers work with clients to customise installations and net-

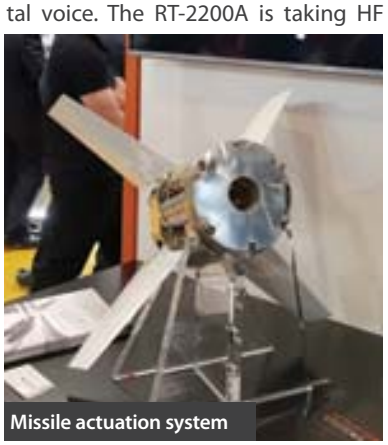
Herve Tilloy and Anthony O'Carroll at the DSEI 2019 Collins Aerospace stand

works to meet specific requirements such as remote control and split-site operability. This easy-to-use, modernised HF system provides wideband and legacy narrowband interoperability for BLOS analogue voice, digital voice and data communications. Modernised wideband HF (WBHF) provides a powerful alternative to expensive narrowband SATCOM in contested battlespaces.

The heart of the HF communications system is the new, software defined RT-2200A receiver-exciter and PA-2010 1 kW power amplifier and ancillaries housed together in a moveable package. "Combining the radio, power supplies and amplifiers provides beneficial redundancy and protection against failures, adding to the reliability of wideband HF communications," added Soyer.

Additionally, a full-colour LCD touchscreen provides intuitive local radio control and status interfacing, along with voice audio and keying connections.

Also, the RT-2200A's wideband channel (3-48 kHz) operation provides significant advantages over legacy HF, facilitating better establishment and link maintenance in poor propagation and operating environments than legacy narrowband HF can support. It supports text chat and low-rate digital voice. The RT-2200A is taking HF where it's never gone before, Soyer emphasised.


Missile actuation system

Missile actuation

At DSEI, Collins also presented its full portfolio of actuation systems. "Collins Aerospace Actuation systems is at the forefront in design, development, manufacturing and qualification of missile control and Thrust Vector Actuation (TVA) systems. Collins Aerospace has the latest developments in technology supplying a large portfolio of actuation systems for missiles. Our missile actuation business dates back over 40 years and provides solutions to customers for a range of actuation products including missile actuation," said Anthony O'Carroll, Chief Electronics Engineer Actuation Systems, Mechanical Systems at Collins Aerospace.

Collins Aerospace Actuation Systems has extensive experience in Control Actuation Sections (CAS) for precision guided missiles including programmers such as GLMRS and Standard Missile. Actuation Systems is able to provide the Control Actuation System (CAS) and TVA for a range of missile applications. For example, it has developed CAS for a wide variety of missile applications with packaging concepts ranging from discrete actuators to fully integrated missile CAS sections. Collins manufacturing processes cover both low and high production rates – from a few development units to several thousand systems per year.

"We are a leading supplier to precision weapons with capabilities in fin, wing and thrust vectoring control systems," O'Carroll said. "As a leading provider of control actuation plus micro-electromechanical systems (MEMS)-based and spinning-mass inertial sensors, Collins Aerospace offers precision guidance solutions to advanced missiles and munitions."

"Its targeting and guidance systems offer smart weapon solutions at low risk and an affordable cost. Collins Aerospace supports stability augmentation on a wide range of vehicles and platforms and provides terrain referenced navigation and predictive ground collision avoidance systems on more than 5,000 aircraft," O'Caroll added.

New order for M-Code capable GPS receiver

Collins Aerospace Systems has begun working with its first undisclosed customer on a 2020 delivery of the company's latest-generation Miniature PLGR Engine—M-Code (MPE-M) GPS receiver. The new MPE-M, announced this summer, is ideal for lightweight, ground-based applications such as radios, blue force trackers, targeting devices, vehicle LRUs and small unmanned aircraft. The MPE-M has the same Type-II small form factor as the MPE-S and is designed to be easily integrated into platforms that utilise the MPE-S today.

According to independent testing, the MPE-M is the lowest Size, Weight and Power (SWaP) small Type II form factor ground receiver available and incorporates Collins Aerospace's recently certified Common GPS Module (CGM).

MQ-9B SkyGuardian and SeaGuardian

GA-ASI's New Multi-Mission Aircraft Brings New Capabilities to RPA

General Atomics Aeronautical Systems, Inc's. (GA-ASI) MQ-9B SkyGuardian and the maritime variation, SeaGuardian, are all set to become one of the world's most advanced Remotely Piloted Aircraft (RPA). This development will take place when the first variant is delivered to the UK Royal Air Force (RAF) as the Protector RG Mk1 in the early 2020s. The demand for the MQ-9B is continuing to rise throughout the world, including in the Middle East and North Africa (MENA) region. The MQ-9B has flown more than 100 test flights to demonstrate the RPA's capabilities.

Recently, the Government of Belgium approved Belgian Defense to negotiate the acquisition of SkyGuardian in order to meet the nation's RPA requirements. Moreover, the aircraft is also being considered by the Australian Defence Force, who chose GA-ASI to supply an RPA system for Project Air 7003.

Proven Platform

The MQ-9B is a ground-up redesign of earlier variants. The redesign took place 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 will meet NATO STANAG-4671 airworthiness standards, and meet U.S. Federal Aviation Administration's (FAA) commercial airworthiness certification standards.

Jim Thomson, regional vice president of International Strategic Development for GA-ASI, was quoted saying: "The Detect and Avoid (DAA) system that GA-ASI has developed for the aircraft is made up of an air-to-air radar, Traffic Collision Avoidance System (TCAS), Automatic Dependent Surveillance-Broadcast (ADS-B), and the ability to blend that surveillance onboard 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 remain clear in coordination with air traffic control."

In order to comply with STANAG airworthiness requirements for airframe fatigue and integrity, the MQ-9B aircraft are constructed with certified composite materials using riveting and bonding processes that provide a service life of 40,000 flight hours, which is double the service life of the MQ-9A aircraft.

Furthermore, in August, GA-ASI gave a flight demonstration to RAF senior leadership and RAF Reaper operators, as well as to the U.S. Marine Corps and Royal Australian Air Force (RAAF), to showcase MQ-9B SkyGuardian's capabilities. The competences shown included the new Certifiable Ground Control Station (CGCS), automatic take-

off, landing and taxi over SATCOM, Portable Pre/Post-Flight Equipment (P3E) and the Mission Intelligence Center. Some other achievements for the MQ-9B include the successful lightning tests, and SATCOM Launch and Recovery using Expeditionary Command and Control (XC2).

Greater Endurance

The SeaGuardian in its basic configuration is equipped with a high-definition Electro-optical/Infrared (EO/IR) sensor and a 360-degree multi-mode maritime radar to support maritime patrol and surveillance missions.

Additionally, the MQ-9B's wings have been extended by four metres to a total length of 24m to accommodate additional fuel capacity, while providing greater lift and endurance. The wing extension adds two hardpoints for a total of nine that can accommodate a maximum external payload of 2,155 kilograms. It also boasts a maximum airspeed of 210 Knots True Airspeed (KTAS) and an endurance of more than 40 hours.

ISR and ASW Capabilities

The SeaGuardian can also provide the MENA region with state-of-the-art sensors that offer unparalleled ISR (Intelligence, Surveillance and Reconnaissance) capabilities for a wide range of operational and threat environments. The MQ-9B is capable of operating at Beyond Line of Sight (BLOS) ranges at altitudes over 40,000 feet and in inclement weather conditions and 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 further 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 offers a true Maritime Wide Area Search (MWAS) and identification and interdiction of maritime targets.

The company has also developed 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 onboard, and then relayed to the aircraft's GCS. The demonstration successfully paired sonobuoy receiver and data processing technology onboard the MQ-9A.

Some of the future developments that are being planned include adding to SeaGuardian's ability to carry and dispense sonobuoys and to transmit the acoustic data via BLOS SATCOM. This continuous growth process offers a cost-efficient capability to complement manned maritime patrol aircraft in the prosecution of submerged vessels.

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 in 2018. The flight originated from GA-ASI's Flight Test and Training Center in Grand Forks, North Dakota, U.S.

GA-ASI has delivered over 850 aircraft and more than 300 GCS worldwide. Every second about 70 of GA-ASI RPA are airborne worldwide. To date, the aircraft have accumulated close to six million flight hours.

GA-ASI's Certifiable Ground Control Station (CGCS) will be used to fly the MQ-9B

SeaGuardian is the maritime version of the MQ-9B SkyGuardian

Airbus Flexes its Technological Muscle

Recently, Airbus and Telespazio (Leonardo/Thales) have set up a partnership to market military telecommunications services using the future Syracuse IV satellites. This partnership will lead to the creation of one of France's leading private operators of military satellite telecommunications. It demonstrates the desire for cooperation by European industrial prime contractors Airbus, Thales and Leonardo, as well as the French State, in marketing Syracuse IV satellite capacity for the benefit of armed and security forces in Europe and around the world.

The French Defence Procurement Agency (DGA), Airbus, Thales Alenia Space and Telespazio have put together an innovative financing initiative, enabling any excess satellite capacity to be sold to third-party customers, thereby bringing down the total cost of ownership of the Syracuse IV system. These sales contracts, scheduled for a 10-year period, will enable allied countries or organisations to be offered flexible and reactive access to a strategic resource, thus strengthening France's international cooperation arrangements in the field of defence and security.

With this partnership, Airbus and Telespazio will be able to sell Syracuse IV satellite capacity and various value services such as anchor capacity (connection of satellite communications to the ground networks of third-party customers), end-to-end services with capacity and throughput guarantees, as well as engineering and maintenance services.

These services will be accessible over a broad area ranging from French Guiana to the Straits of Malacca and will be deployed for maritime, terrestrial and air uses. Allied forces will thus have access to communication capacity in X-band, military Ka-band and X/Ka dual-band mode, offering flexibility while benefiting from the highest levels of protection and hardening provided for in the NATO standards. Their units deployed in the field will be able to exchange video, voice and data via all-IP (Internet Protocol) communications at rates of up to several hundred Mbit/s.

"Airbus is capitalising on the unique experience of satellite services for the armed forces to enhance its range with a system equipped with the most advanced space and terrestrial telecommunication technologies," said Eric Souleres, Head of Communications, Intelligence & Security Engineering at Airbus Defence and Space.

"Building on its expertise in the field, Telespazio is proud to consolidate its role as a trusted operator of French military telecommunications satellites and contribute to an innovative operation, which will round out its world-class range of government capacity services," said Jean-Marc Gardin, CEO of Telespazio France and Deputy CEO of the Telespazio Group.

Syracuse IV is a telecommunication

system consisting of two military satellites, Syracuse 4A and 4B, plus ground stations to ensure communications in the operational areas and with mainland France. These two 3.5-tonne class, electric-propulsion geostationary satellites, are being built by an industrial group consisting of Thales Alenia Space and Airbus, with launch planned for 2022. They will be supplemented in around 2030 by a third satellite in order to meet growing needs, in particular the specific needs of air vehicles (aircraft, UAVs). These new-generation satellites will be the first to offer a completely flexible reconfiguration of the X – and Ka-band military payload as well as the means of protection and hardening against cyber, jamming, intercept and EMP-type threats.

Ultra-high-resolution Satellites for UK MOD

Airbus recently won a design study from the UK's Defence Science and Technology Laboratory (Dstl) to develop technologies for a cluster of ultra-high-resolution Synthetic Aperture Radar (SAR) satellites for the UK Ministry of Defence (MOD). The satellites will also have the ability to collect radio frequency (RF) signals.

Called "Oberon" the project will see Airbus develop the technologies that could lead to an in-orbit demonstration in 2022 and potentially an operational capability as early as 2025. The innovative techniques and technologies developed within the project will allow the ground to be seen in outstanding detail regardless of darkness, or of cloudy weather conditions.

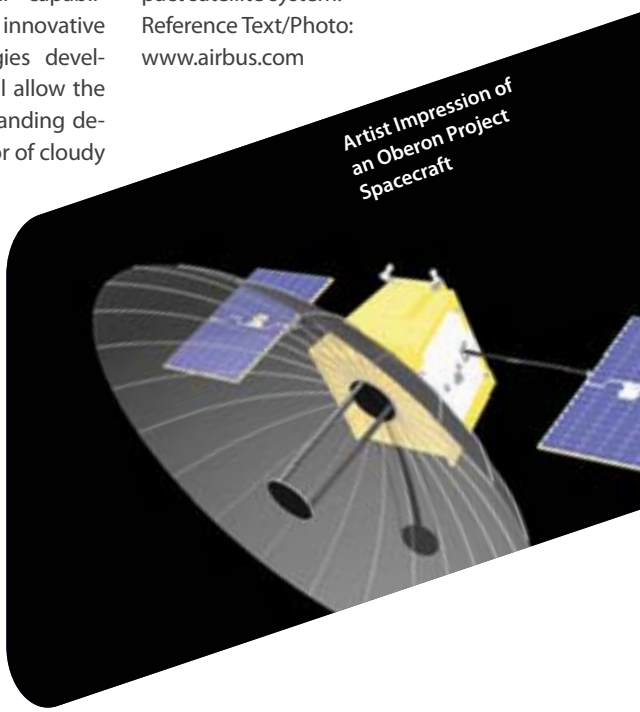
The company recently signed an agreement to sell military telecommunications and will also be developing technology for ultra-high-resolution satellites.

Syracuse IV is a telecom system consisting of two military satellites, Syracuse 4A and 4B, plus ground stations

Colin Paynter, Managing Director of Airbus Defence and Space UK said: "Project Oberon builds on Airbus' expertise in space radar technology developed over 40 years. I look forward to seeing this study leading to a new surveillance capability for the UK MOD, helping to protect our armed forces across the world."

Oberon follows the success of the SAR satellite, NovaSAR, designed and developed by Airbus and SSTL, which was launched in September 2018. Since NovaSAR was conceived, Dstl and Airbus have made significant leaps in technology, allowing the Oberon system to achieve high performance from a compact satellite system.

Reference Text/Photo: www.airbus.com



Saab Presents First Gripen E to Brazilian Air Force

Saab has delivered the first Gripen E aircraft to the Brazilian Air Force in Sweden. Designated as F-39 by the air force, the Gripen will move to Brazil next year after initial tests, and the complete aircraft assembly of 15 aircraft will begin under the Brazilian Gripen Programme, which includes a comprehensive transfer of technology programme to Brazil.

The ceremony held on September 10, was attended by Fernando Azevedo e Silva, Brazilian Minister for Defence; Lieutenant Brigadier Antonio Carlos Moretti Bermudez, Chief of the Brazilian Air Force; Nelson Antonio Tabajara de Oliveira, Ambassador of Brazil to Sweden; Lieutenant Brigadier Carlos Augusto Amaral Oliveira, Chief of Staff of the Brazilian Air Force; Peter Hultqvist, Swedish Minister for Defence; Major General Mats Helgesson, Commander of the Swedish Air Force; and representing Saab Håkan Buskhe, President and CEO; and Jonas Hjelm, Senior Vice President and head of Saab business area Aeronautics.

"I am proud to be part of building a long-term strategic partnership with Brazil and the Brazilian Air Force. With Gripen Brazil, will have one of the most advanced fighters in the world and the technology transfer programme will allow Brazil to develop, produce and maintain supersonic fighters," said Håkan Buskhe, President and CEO of Saab.

"Gripen will increase the operational capacity of the Brazilian Air Force and boosts a partnership that ensures the transfer of technology to Brazil, fosters research and industrial development in both countries," says Fernando Azevedo e Silva, Brazilian Minister for Defence.

"The F-39 is a significant technological leap in fighter aviation for the Brazilian Air Force and a great example of collaborative development based on the transfer of technology. The development of Gripen E is a definitive step towards the collaborative promotion of defence industry. The Brazilian Air Force now has a multi-mission platform for the fulfilment of its actions to control, defend and integrate the national territory. I am very happy to be part of this historical moment for fighter aviation in Brazil," says Lieutenant Brigadier Antonio Carlos Moretti Bermudez, Chief of the Brazilian Air Force.

Saab's partnership with Brazil for Gripen E started in 2014 with an order value of 39.3 BSEK. The Brazilian Gripen Programme included the development and production of 36 E/F for the Brazilian Air Force, including related systems,

support and equipment. With the programme, Saab is driving the development of the local aeronautical industry through its national partners and ToT programmes which will be delivered over approximately 10 years.

Gripen E/F Capabilities

Built on the success of earlier designs, Gripen E is a modern fighter equipped with all features of a multirole fighter. It is developed to counter and defeat the most advanced threats in a modern battlespace and offers upgradability to counter up with new challenges. Saab believes that the Gripen E/F will rapidly embrace new technology and tactics to be ahead of the game in the future.

One of the key features of the Gripen is the ability to attack or assess opposition at long ranges. It uses all available data in the battle cloud, whether coming from Gripen fighters or other air, land or sea-based units and fuses it locally on every platform but it is also fusing globally between fighters. Resulting in Gripens capability to see the unseen, thus reducing the likelihood of being detected on its passive sensors, or through active jamming. This means that weapons can be used either beyond the point at which opposing forces can respond or without them ever realising Gripen was there.

The fighter intelligence capability of Gripen works autonomously on several areas simultaneously and provides the pilot with suggestions ranging from anything between weapon selection and full manoeuvring of the fighter. It also displays the right tactical information, at the appropriate moment giving an optimised battlespace overview allowing Gripen pilot to be in control.

Equipped with a smart avionics architecture, old algorithms can be replaced by new ones without reducing the high availability of the aircraft. Gripens architecture allows rapid hardware and weaponry updates, with a high degree of alteration for each customer nation. According to Saab, Gripen is a smart fighter designed to be the smart fighter for generations to come, it will not only allow customers to keep at pace with evolution but also allow them to lead it. The Brazilian Gripen E/F aircraft are developed and produced with the participation of Brazilian technicians and engineers. This integration is part of the transfer of technology and aims to provide practical knowledge necessary for the execution of these same activities in Brazil. Development of the two-seat Gripen F is progressing with extensive activities at Gripen Design and Development Network in Gavião Peixoto, Brazil. Gripen F deliveries are expected to start in 2023.

Five nations currently operate Gripen: Sweden, South Africa, Czech Republic, Hungary and Thailand, and is soon to be joined by Brazil. The UK Empire Test Pilots' School (ETPS) uses Gripen as a platform for test pilot training.

Reference Text/Photo:
www.saabgroup.com

Delivery of Gripen E

F-39 is the Brazilian Air Force designation for Gripen

Nexter's VBCI and CAESAR Steal the Show

Nexter, a KNDS company was recently present at DSEI in London. As an architect and system integrator, the company displayed its expertise on the KNDS stand by proposing solutions, equipment, and ammunition that meet the needs of armed and security forces.

Nexter focused on two of its systems at the show. The first was a copy of the 8x8 VBCI armoured vehicle equipped with a 40mm CTA turret. The VBCI is a benchmark in the combat-proven 8×8 market, combining firepower, protection, and mobility. It has been engaged in several of the French military's overseas operations, in Afghanistan, Lebanon, Mali and the Central African Republic. It has proven its exceptional strategic mobility and reliability across all types of terrain, particularly in the Serval operation in Mali, where it covered more than 2,500 km between Dakar and Gao with no assistance.

The VBCI has covered more than a million kilometres, showing the merits of wheels compared with tracks, and has been projected by air and by sea in six countries since 2010. This version of the armoured vehicle in service in the French armée de Terre represents the best in wheeled combat vehicles. It benefits from increased protection, a powerful engine, and additional carrying capacity and exceptional firepower thanks to the new T40 CTA turret, firing 40mm cased telescoped ammunition. This gun has already made an impression over the French, Belgian (on EBRC-JAGUAR) and British (on Warrior and Ajax) armies.

The second point of focus was the CAESAR 8x8 self-propelled artillery system, which was displayed on the stand in mock-up format. It gave visitors an opportunity to discover a system whose 155mm gun is combat proven in the French armed forces. Highly modular, the CAESAR 8x8 can carry a wide range of equipment according to operational needs (secondary weapons, electronic countermeasures, smoke, fuel reserves, etc.). It also has an automatic shell reloading system, whose speed can be configured (semi-automatic to automatic). This advanced artillery system recently won

GRIFFON, Multi-Rated Armoured Vehicle

over the Danish ground forces, who ordered 19 CAESAR 8x8 (15 to be delivered in early 2020, 4 more in 2023).

SCORPION Programme Vehicles

Visitors were also able to discover the SCORPION programme vehicles – VBMR-GRIFFON, EBRC-JAGUAR, Lightweight VBMR-SERVAL and LECLERC XLR – whose models were displayed on the KNDS stand. The SCORPION programme goes well beyond the development and delivery of the GRIFFON, JAGUAR, SERVAL and LECLERC tanks. It includes the integration of drones and robots into the combat system, communication with the dismounted fighter and management of the multiplication of the sensors.

VBMR-GRIFFON: The GRIFFON, Multi-Rated Armoured Vehicle (VBMR), is capable of filling a wide spectrum of missions. Its goal is to allow users to achieve their mission in optimal conditions. Ten versions of the vehicle have been developed such as the Transport Troops, Command Post, Health, and Artillery Observation Vehicle, among others.

EBRC-JAGUAR: The JAGUAR, Armoured Reconnaissance and Combat Engine (EBRC) will replace the AMX10RC and ERC90. It is equipped with a threat detection system including an acoustic start tracking system, a laser-warning detector and a missile departure detector. The on-board simulation will allow the crew to train in regiment without external means.

Lightweight VBMR-SERVAL: SERVAL, Light Armoured Multi-Roles Vehicle (Light VBMR), meets the need for engagement of light units in the contact area, especially in the initial phases of an operation under various conditions. To ensure the missions assigned to it, the SERVAL will be available in three versions: Armoured Patrol Vehicle (VPB), Tactical Communication Node (NCT), and Surveillance, Acquisition, Intelligence, Recognition (SA2R).

LECLERC XLR: The LECLERC tank is a third generation heavy combat tank. Its architecture allows it to be revised and upgraded with the latest systems to adapt to the ever-changing battlefield threats. This renovation will increase the operational capacity of the tank, with the integration of the Vétronique and a secondary armament, as well as the new systems of command and communication of the army.

Success on Display

Nexter also presented some of the group's innovative solutions such as the FINDMP touch table, the FINDART fire support system, and the NERVA robots with their payloads, among other equipment.

Moreover, the company has a strong international presence, with numerous export successes, such as CAESAR 8x8 sold to Denmark, the CaMo programme with Belgium and the TITUS armoured vehicle acquired by the Czech Republic.

Reference Text/Photo:
www.nexter-group.fr

Long-standing Collaboration

The relationship between Nexter and BAE Systems was in the spotlight at the show and was part of the dynamic of Franco-British cooperation in the field of defence. The two companies are celebrating the 26th anniversary of their CTAI joint venture. This collaboration has led to the development and commercial success of the 40CTA gun and 40mm cased telescoped ammunition. To further illustrate this fruitful cooperation, at DSEI, CTAI was present on both the Nexter and BAE Systems stands.

JAGUAR, Armoured Reconnaissance and Combat Engine

Raytheon's Peregrine Missile Packs a Punch

Raytheon Company is developing a new medium-range, air-launched weapon called the Peregrine missile. It will reportedly be half the size and cost of today's air-to-air missiles yet deliver greater range and effect.

The missile will be developed to strengthen the capabilities of the current fighter aircraft. The new, smaller Peregrine missile will be faster and more manoeuvrable than legacy medium-range, air-to-air missiles, and will double the weapons loadout on a variety of fighter platforms. Its miniaturised guidance system can detect and track targets at any time of day and in any weather condition.

"Peregrine will allow U.S. and allied fighter pilots to carry more missiles into battle to maintain air dominance," said Dr. Thomas Bussing, Raytheon Advanced Missile Systems vice president. "With its advanced sensor, guidance and propulsion systems packed into a much smaller airframe, this new weapon represents a significant leap forward in air-to-air missile."

The Peregrine missile benefits from military off-the-shelf components and readily available materials to offer an affordable solution for countering current and emerging airborne threats.

Going the Distance

In today's threat environment, it's not good enough to be better; you have to overmatch adversarial forces – with clear and decisive advantages. Raytheon puts these capabilities in the hands of every warfighter, with a portfolio of integrated, precise and proven solutions.

The Peregrine missile is a small, fast, lightweight air-to-air weapon for use against drones, manned aircraft and cruise missiles. Through the use of additive manufacturing, it effectively doubles the number of missiles current fighter jets can carry, at a significantly lower cost than current weapons.

The missile is more manoeuvrable than legacy medium-range, air-to-air missiles and its relatively compact airframe weighs just over 150 pounds, is about 6 feet long, and offers greater flexibility and precision.

Peregrine can seek out and engage targets in spite of bad weather in the battlespace. Its sophisticated sensor, guidance and propulsion systems can detect and track moving or stationary targets at any time of day and in challenging weather conditions.

The system's compact airframe doubles the weapons loadout on current aircraft, allowing U.S. and allied fighter pilots to carry more missiles into battle to achieve air dominance. It can be easily integrated on today's fourth- and fifth-generation fighter jets and is compatible with current launch gear.

Raytheon's systems incorporate satellite navigation, laser guidance, high-definition radars, advanced seekers and other technologies. They allow customers to carry out discriminating strikes on bona fide targets and defend against incoming attacks with unprecedented effectiveness. These reliable, overmatch solutions give militaries a decisive edge on the battlefield. When near misses aren't acceptable, Raytheon's solutions are precisely on target.

Polaris Displays Versatile DAGOR

Polaris Defense and Polaris Britain Ltd., divisions of Polaris Industries Inc., exhibited its newest production vehicle, DAGOR, along with the well-established MRZR and MV850 vehicle platforms, at DSEI.

At the show, the company displayed a full line up of highly mobile, tactical air transportable vehicles. These vehicles are in service worldwide in more than 20 countries, which streamlines service and support and provides a high degree of interoperability and commonality among allied forces.

"Polaris Defense and Polaris Britain Ltd. brought game-changing resources in off-road mobility," said Doug Malikowski, Director, International Business, Polaris Defense. "At DSEI, DAGOR demonstrated how well Polaris understands ultra-light mobility needs for armed forces around the world."

Mission Effective

DAGOR was specifically designed for light infantry, expeditionary and special operations forces. It is easily transported by tactical air, carries enough payload to be mission effective and carries full payload (1,474 kg) in extreme off-road terrain. It meets those requirements in a robust and modular off-road vehicle platform that can be configured to carry up to nine soldiers with full kit. By traversing more concealed and unpredictable routes over terrain usually travelled on foot, the vehicle allows warfighters to move quickly to the objective with mission-critical equipment. DAGOR is supported with a COTS supply chain, anywhere in the world, making it easy to use and maintain, even when deployed.

The vehicle curb weight is less than 2,041 kg (4,500 lbs) to maximise tactical aircraft operational range. The width of DAGOR facilitates rapid loading into the CH-47 platform, without modification, and the weight allows it to be sling loaded under the UH-60 and NATO helicopters with similar lift capabilities. The vehicle has completed certification testing for CH-47 Internal Air Transport (IAT), air drop and UH-60 Sling Load. DAGOR is currently under contract with U.S. and allied Special Forces.

While the MRZR 2 and MRZR 4 are highly mobile off-road platforms that are internally transportable in a variety of U.S. and allied military aircraft. The vehicles can be configured in a number of ways to help expeditionary forces meet mission requirements for emerging threats, while being forward deployed. Some common tactical features of these off-road platforms include increased payload, standard winch, electronic power steering, aircraft tie-downs, fold down rollover protective structures (ROPS), large cargo boxes, IR light capability and blackout mode.

DAGOR is supported with a COTS supply chain

Polaris provides a wealth of engineering, production and sustainability resources. The company maintains a robust global network of dealers, distributors, and subsidiaries, providing full life-cycle support for these vehicles throughout the world. With a proven and well-established defence team, the company works closely with military customers to gain a thorough understanding of their off-road mobility needs.


AW149, tactical troop helicopter


Dragonfire laser gun

Leonardo Captivates DSEI With Latest Solutions

At the recently concluded DSEI 2019, Leonardo unveiled two new additions to its GUARDIAN range of Counter-Improvised Explosive Device (C-IED) products, offering improved survivability for ground forces. The New GUARDIAN HR and GUARDIAN HFE have been developed in response to the emerging techniques and technologies, which are starting to be employed by insurgent and terrorist groups. The two new variants are at a high technology readiness level and are available to order now for deliveries in 2020.

Leonardo's GUARDIAN family of systems protect ground troops from the widespread threat of remotely activated Improvised Explosive Devices (IEDs). These low-tech remotely controlled bombs represent a deadly threat to ground forces. In response, the GUARDIAN family uses advanced jamming technologies to block the signals used to detonate the devices. Designed and manufactured in the UK, the products have been battle-proven on operations in combat zones such as Northern Ireland, Iraq, Afghanistan and Syria, saving many lives.

Leading-edge Tech

The Leonardo stand at DSEI also highlighted leading-edge technologies and products across the land, sea, air, and cyber domains. These were centred on a full scale AW149, representing the company's latest/future generation tactical troop helicopter and Leonardo's ability to provide a full spectrum of capabilities, from sensors to support. It has an illustrative sensor suite, which comprises the Osprey radar, SAGE ESM (electronic support measures) and a MAIR missile warner.

In the Air Zone alongside its Team Tempest industry partners, Leonardo is continuing to support and show its commitment to the UK Government and its programme to develop a Next Generation Combat Air System capable of operating in the 2040-plus environment. The company is developing the Sensor and Communications Systems technology for Tempest under the Future Combat Air System Technology Initiative (FCAS TI). Moreover, within the air domain and present at the exhibition was the AW101 Multi-Role Helicopter on the Rotary Wing Static display.

Aditionally, the company showcased a wide range of products from its portfolio spanning cyber, electronics and manned/unmanned aircraft, highlighting the company's innovative technological solutions, which have been successfully exported around the world.

In the electronics domain, the company showcased its latest products in the land, maritime and airborne domains, aimed at boosting mission performance while ensuring maximum crew and

Miysis DIRCM for RAF Shadow platform

platform survivability. Highlights included the first appearances of a number of new land and maritime products at the show including a new low-maintenance thermal imaging camera. The Land Zone hosted Leonardo's Vehicle Mission System technologies.

A range of naval products was also on display including the Sentinel integrated communication system for naval vessels and now available for submarines, and the Kronos Grand Naval AESA radar. On the dock, on-board the Type 23 HMS Kent Leonardo had its AW159 (Wildcat) maritime helicopter and its AWHERO RWUAS stationed.

Away from the Leonardo stand, another major collaboration in the spotlight was the UK Dragonfire, a consortium led by MBDA, with Leonardo, Qinetiq and a number of other companies who have come together to develop a naval Laser Directed Energy Weapon (LDEW) capability demonstrator for the UK MoD. The Dragonfire model was displayed at the Royal Navy area.

Work in Progress for RAF Shadow ISTAR fleet

The UK Ministry of Defence announced at the show that it has contracted Leonardo and Thales, under a single source procurement, to deliver an integrated UK Defensive Aids System (DAS). The procurement will equip the RAF's fleet of eight Shadow R1 intelligence-gathering aircraft, providing an advanced DAS, which will protect the aircraft against latest-generation of Infra-Red (heat seeking) missiles.

Future RAF counter-drone capability programme will commence in early 2020

Designed, developed and manufactured in the UK, the system provides a sovereign capability, which will be able to evolve in anticipation of changing threats to air platforms.

A combined MOD/Leonardo/Thales team, under a Leonardo prime systems integration contract, will deliver the deal with the equipment being integrated onto the platform by Raytheon UK. Initial Operating Capability is targeted for early 2021.

Royal Air Force's Counter-Drone Research Programme

At the show, Leonardo also announced that it has been selected by the UK's Royal Air Force (RAF) to support the next stage of their research and development programme. The study will explore the current threat posed by hostile drones and how this is likely to evolve in future, as well as evaluating a range of technologies that could form a future RAF counter-drone capability. The programme is expected to last three years and will commence in early 2020.

Drone technology is evolving rapidly and is creating a challenge for organisations that need to secure themselves against the misuse of such aircraft. The RAF's research programme will inform how the Air Force will respond to current and future threats and keep pace with technology over time, examining how operators will be able to detect, track, identify and defeat rogue drones.

Reference Text/Photo:
www.leonardocompany.com

JLTV's Popularity Continues to Rise

Oshkosh Defense LLC, an Oshkosh Corporation company, showcased the Joint Light Tactical Vehicle (JLTV) at the recently concluded DSEI in London, where it received growing international interest.

"We were pleased to be at DSEI with our Joint Light Tactical Vehicle," said Mike Ivy, Senior Vice President and General Manager, International Programs at Oshkosh Defense. "We were even more pleased to share the international interest in the JLTV platform that continues to grow." To date, the United Kingdom, Lithuania, and Slovenia have publicly expressed interest in procuring the JLTV.

"Oshkosh is committed to delivering an extremely affordable, highly connected and protected solution to our valued U.S. allies," Ivy added. "In fact, we've successfully executed several of the most challenging demonstrations and trials just this year."

The JLTV not only met but exceeded the rigorous demands it faced, including many failure-free miles both on-road and off-road. "The U.S. Army and Marine Corps have plans to purchase 49,099 and 15,390 respectively, and now our allies know why. There is simply nothing quite like the JLTV," he concluded.

The Marine Corps Combat Development Command, Combat Development and Integration also recently announced that the JLTV programme has reached Initial Operational Capability (IOC), nearly a year ahead of schedule. To date, the U.S. government has ordered over 11,000 JLTVs and Oshkosh has delivered over 750 to the U.S. Army and Marine Corps.

Exceptional Capabilities

The JLTV provides U.S. and allied forces with a next generation, lightweight, all-terrain vehicle that is protected, mobile, transportable and connected.

The JLTV base vehicle right off the production line provides small arms and ballistics protection. With an add-on B

kit, the vehicle achieves MRAP levels of protection. Moreover, the JLTV features the latest in suspension technologies, using the Oshkosh TAK-4i intelligent independent suspension system to deliver extreme off-road mobility and speeds that are 70 per cent faster than today's gold standard, the M-ATV, while maintaining the same ride quality for occupants.

Weighing less than 6,350 kg (14,000 lbs) at curb weight, the vehicle is highly transportable while maintaining its protection and performance. It can be air transported internally by a C-130, C-5 and C-17, or externally by CH-47 and CH-53.

Furthermore, the JLTV is built with the capability to serve as a mobile command centre. The vehicle features a modular, scalable open architecture system to support rapidly evolving C4ISR suites.

JLTV Makes an Appearance at Modern Day Marine

Oshkosh Defense also recently displayed two JLTVs at the Modern Day Marine Expo 2019 in the U.S. A four-door General Purpose JLTV equipped with the Javelin Integration Kit (JIK), LW30 Remote Weapon Station (RWS), and, for the first time, a Black Hornet Vehicle Reconnaissance System (VRS) and a 2-door Utility JLTV outfitted for the first time with the Uvision Hero-120 Tactical System were showcased.

The FLIR Black Hornet Vehicle Reconnaissance System (VRS) equips JLTV with an immediate, organic, and self-contained surveillance and reconnaissance system. Adapted from the Black Hornet Personal Reconnaissance System (PRS), the VRS has extended this game-changing capability of the Black Hornet nano-UAV. The launch unit is mounted externally, and fully integrated within the vehicle to create a real time situational awareness (RSTA) airborne system for crews protected inside the vehicle.

The new Hero-120 variant features a modular warhead section that can accommodate different warhead solutions, ranging from 1.5 kg to 4.5 kg. The New Hero-120 also features corresponding deployable cruciform aft and mid-body wing assemblies, modifications to the external aerodynamic surfaces of the munition, and a re-positioned EO/IR assembly package including a laser for the proximity mode of the fuze, and two pitot tubes for safety

"As the military pivots its focus from counter-insurgency threats towards near-peer adversaries, so too must industry," said George Mansfield, Vice President and General Manager of Joint Programmes for Oshkosh Defense. "We designed the JLTV with the unpredictability of the future in mind, bringing the warfighter unprecedented lethality capabilities along with scalable levels of protection to meet virtually any mission need."

"We're incredibly pleased to hear that based on their own evaluation, the U.S. Marine Corps (USMC) is now planning to field 15,390 JLTVs, replacing all HMMWVs in the Corps' legacy fleet in a one-for-one swap," he added. "We will continue to work with both the U.S. Army and the USMC to align and deliver against key military modernisation priorities."

Mobilising Forces

Oshkosh Defense is a leading provider of tactical wheeled vehicles and life cycle sustainment services. For decades the company has been mobilising military and security forces around the globe by offering a full portfolio of heavy, medium, light and highly protected military vehicles to support customers' missions.

It was recently announced that the U.S. Army has awarded Oshkosh Defense along with Flyer Defense LLC a Task Assignment award under an existing Project Agreement with the National Advanced Mobility Consortium (NAMC) to develop the new Infantry Squad Vehicle (ISV). The ISV production contract award is expected to take place in the Spring of 2020. In total, the U.S. Army plans to procure 651 vehicles and associated hardware and services between fiscal years 2020 and 2024.

Additionally, Oshkosh offers advanced technologies and vehicle components such as TAK-4 independent suspension systems, TerraMax unmanned ground vehicle solutions, Command Zone integrated control and diagnostics system, and ProPulse diesel electric and on-board vehicle power solutions, to provide customers with a technical edge as they fulfil missions. Every Oshkosh vehicle is backed by a team of defence industry experts and complete range of sustainment and training services to optimise fleet readiness and performance.

Lockheed Martin's
Hypersonic Sector Expertise Wins New Army Contract

Hypersonic weapons provide a survivable and affordable capability to overcome distance in contested environments using high speed, altitude and manoeuvrability, while amplifying speed, range, flexibility and precision as the enduring attributes of airpower.

In this way, the U.S. Army has just awarded Lockheed Martin an estimated US$347 million contract as part of a multi-year hypersonic weapons programme focused on long-range precision strike missiles. It is named the Long-Range Hypersonic Weapon (LRHW) systems integration project.

Robust experience in high-speed flight has positioned Lockheed Martin as an industry leader in hypersonic technology, providing the most mature and cost-effective solutions for addressing increasing threats in the global security arena. Hence, in providing a research cornerstone for hypersonic defence systems, Lockheed Martin's hypersonic strike awards exceed over US$2.5 billion across the corporation.

As the prime contractor, the Lockheed Martin team will develop and integrate a land-based hypersonic strike prototype in partnership with the Army Hypersonic Project Office and the Army Rapid Capabilities and Critical Technologies Office. The team includes Dynetics Technical Solutions (DTS), Integration Innovation Inc. (i3), Verity Integrated Systems, Martinez & Turek and Penta Research.

Notional Hypersonic Strike Glide Vehicle

"Lockheed Martin is driving rapid technical development for these national priority programmes. There are natural synergies with our industry teammates," emphasises Eric Scherff of Lockheed Martin Space, Vice-President for Hypersonic Strike Programmes. "We believe our relationships offer the Army unmatched expertise to deliver this critical capability to the nation. Lockheed Martin is thus proud to partner with the Army in integrating the common hypersonic glide body and the land-based hypersonic strike weapon system prototype. We are committed to combining the best of what our companies have to offer to deliver on this national priority programme."

For over 30 years, Lockheed Martin has played a significant role in the research, development and demonstration of hypersonic technologies, with the corporation making significant investments in hypersonic strike capabilities and defence systems against emerging hypersonic threats. Hypersonic weapons are unique compared to other ballistic trajectory missiles because they fly at five times the speed of sound and operating at varying altitudes.

"Delivering hypersonics to a unit of action will provide a critical combat capability for the Army in support of the National Defence Strategy," confirmed LTG L. Neil Thurgood, Director of Hypersonics, Directed Energy, Space and Rapid Acquisition. "With a collaborative effort by our partners in industry and the Department of Defence, we will advance this strategic weapon system and fulfil a critical mission for our nation."

U.S. Army's DTS Partnership

In March 2019, the U.S. Army's Secretary and Chief of Staff commissioned the accelerated delivery of a prototype ground-launched hypersonic weapon with residual combat capability, aiming for Fiscal Year (FY) 2023. The Army Rapid Capabilities and Critical Technologies Office (RCCTO) has hence been able to select two prime contractors to build and integrate components of the LRHW prototype.

The Army has also awarded a US$352 million contract to DTS to produce the first commercially manufactured set of Common-Hypersonic Glide Body (C-HGB) systems. DTS has selected Lockheed Martin in order to support integration and prototyping of this new C-HGB, so seeking to provide military services which have commonality with air, land and sea platform requirements.

The Army LRHW prototype will leverage the C-HGB and introduce a new class of ultrafast and manoeuvrable long-range missiles possessing the ability to launch from ground mobile platforms. The LRHW system prototype will thus provide residual combat capability to soldiers by 2023.

> Hypersonic weapons are unique compared to other ballistic trajectory missiles

Undoubtably, hypersonic strike weapons capable of flying speeds in excess of Mach 5 are a key aspect of modernisation efforts towards improving long-range precision fire. The U.S. Army is thus seeking to fulfil this remit in the national security strategy of competing with and outpacing potential threats.

The Army RCCTO is responsible for delivering the prototype LRHW battery, consisting of four trucks with launchers, hypersonic missile rounds and a command-and-control system. The OTA awards have then supported the design, integration and production work behind a series of flight tests beginning next year and leading to fielding in FY2023.

Army-Navy Joint Cooperation

In developing the LRHW, the Army is working in close collaboration with the other services managed by a Joint Service Memorandum of Agreement on hypersonic design, development, testing and production.

Reference Text/Photo: www.army.mil
www.lockheedmartin.com

Otokar Brings Technology Transfer to the Fore

Otokar, a Koç Group company, exhibited its TULPAR armoured tracked vehicle and COBRA II wheeled armoured vehicle at DSEI. The company also provided information about its flexible business model, which includes transfer of technology and local manufacturing models. In addition to exhibiting its broad product range, Otokar displayed TULPAR with Mızrak-30 turret system. While COBRA II was showcased with the Keskin turret system in the Land Zone Static Display Area.

General Manager Serdar Görgüç emphasised that Otokar has the capabilities and the infrastructure to rapidly design and develop modular products in line with users' current and future needs.

He said: "In the last 10 years, we have allocated 8.5 per cent of our revenues for R&D activities. We continue to introduce innovative solutions in land systems by taking into account the current and future requirements of modern armies and security forces. Last May, we unveiled one of the best examples of this with our electric armoured vehicle Akrep IIe, which provides an excellent choice for reconnaissance and surveillance missions.

"Our combat-proven vehicles are actively used in different geographies, extreme climatic conditions and conflict zones. We analyse the different needs of our users for land systems and develop solutions that meet these requirements in the fastest manner thanks to our excellent engineering and R&D capabilities. We are ready to meet the different requirements of armed forces, not only by supplying products but also through transfer of technology and local production models. At the exhibition, we shared our experience and capabilities in this field with our customers."

Superior Mobility

Görgüç further highlighted that Otokar, as a supplier of NATO and the United Nations, brings its know-how and

TULPAR is designed as a multi-purpose vehicle with variants ranging from 28 to 45 tonnes

experience in modular land systems to tracked vehicles with TULPAR.

"TULPAR is designed to meet todays and future needs of modern armed forces. With its superior mobility and high level of protection, the vehicle can operate in a wide range of challenging terrains and climate conditions. TULPAR, which features a modular design, can be manufactured in a number of variants to meet user needs," he emphasised.

TULPAR is designed as a multi-purpose vehicle with variants ranging from 28 tonnes to 45 tonnes to satisfy future global requirements. Its future-oriented perspective of modularity is to increase operational flexibility by using common components and a common chassis over wide range of vehicle variants.

The vehicle comes in several variants that share common subsystems. The common platform can accommodate a medium tank; infantry fighting vehicle; armoured personnel carrier; reconnaissance vehicle; command and control vehicle; air defence; ambulance; repair and recovery vehicle; mortar vehicle and other vehicle variants. It is a multipurpose platform that boasts of high lethality, modularity and growth potential that can be tailored to meet operational requirements.

High Performance

COBRA II, manufactured by Otokar with the mission of designing and manufacturing globally competitive land systems products, stands out with its superior performance. The vehicle offers high level of protection and payload capacity and large internal volume. It also comes with the capacity to accommodate 10 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 amphibious capability, adapting effectively to different missions as needed.

COBRA II has been subjected to rigorous field tests in different parts of the world and has travelled thousands of miles. Moreover, the different variants of COBRA II are today operated in various combat operations throughout the Middle East and Africa proving the vehicle's proficiency in enhancing combat capability of the user.

The vehicle offers a wide range of weapons integration and mission equipment options and has been successfully used in border protection as well as for 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. It is already in service with the Turkish Armed and Security forces and has various export customers.

Combat Proven

As one of Turkey's largest private capital defence industry companies, Otokar provides modern armies with state-of-the-art tactical vehicles in different configurations through its product spectrum that covers the full range of armoured vehicles from four tonnes up to main battle tanks. Otokar military vehicles operate under extreme climate conditions in the world and their combat capabilities are proven in real situations in high risk areas.

Apart from being the main land systems supplier for Turkish Armed Forces, Otokar is a well-known brand in global markets. The company has delivered over 28,000 military vehicles to nearly 50 different users in around 30 countries. Today, Otokar's vehicles are deployed in various operations under UN and NATO flags.

Reference Text/Photo: www.otokar.com

BAE Systems Unveils

At the recently concluded DSEI, BAE Systems showcased advanced defence technology across land, sea, air and cyber domain.

In the Land sector, BAE Systems showcased a version of the BvS10 all-terrain support vehicle for the first time. The vehicle will significantly streamline information load and increase situational awareness for crews.

The versatile BvS10 is fitted with a Generic Vehicle Architecture (GVA) equivalent system to increase the vehicle's current operational capability and ensure critical upgrades quickly get to the battlefield. GVA is a NATO standard for operating systems in military vehicles employed by the UK Ministry of Defence and allied forces.

Standardising multiple user interfaces to create an integrated system-of-systems in the BvS10 will shorten crew training times, increase crew agility by making it easier to change duties and vehicles, and increase combat efficiency. The GVA's design architecture supports interoperability across vehicle fleets and allows for a rapid and cost-effective technology refresh, while greatly reducing system lifecycle cost.

This technology upgrade brings the vehicle up to the standard required by potential future users in European markets and demonstrates that the flexibility of the GVA's mission systems allows it to be tailored to meet specific customer requirements and create effective integration into the host vehicle. Fitted with several cameras, as well as monitors front and back, this BvS10 demonstrates extended situational awareness and increased communication capacity for the crew while they remain under cover in the protected armoured vehicle.

The vehicle on display at DSEI incorporated the convenience of GVA equivalency with the mobility and crew protection of the BvS10. It is a tough vehicle that can operate in the harshest environments and terrains from mountains and rocks to snow and swamps. It can withstand extreme temperatures and has an amphibious capability.

Tempest Partnership Announced

At DSEI, leading UK defence companies (BAE Systems, Leonardo UK, Rolls Royce and MBDA UK), together with key Italian industry players (Leonardo Italy, Elettronica, Avio Aero and MBDA Italy) announced their intent to partner on the Tempest programme by signing a Statement of Intent (SOI). This will see the parties work together to define an innovative concept and partnership model, which will include knowledge sharing, product definition and technology development for the joint development of future combat air systems.

The signing of the SOI follows a commitment by the UK and Italian govern-

BvS10 all-terrain support vehicle

Advanced Defence Solutions

ments to work closely together on Combat Air capabilities, including on systems such as Typhoon and F-35, as well as on Tempest, the UK-initiated next-generation combat air system. Both governments confirmed a common desire to maintain strong industrial bases in order to access key capabilities and secure prosperity for both nations. Italy and the UK have a long and successful history working together on international programmes such as Tornado, Typhoon and F-35.

Integration of USV with Royal Navy Warship

At the show, BAE Systems also demonstrated for the first time how Unmanned Surface Vessels (USVs) can be fully integrated with operational Royal Navy warships to extend their reach beyond the horizon and reduce sailors' exposure to danger.

An unmanned Pacific 24 Rigid Inflatable Boat (P24 RIB) integrated with the combat system of HMS Argyll, a Type 23 frigate, showcased a series of waterborne demonstrations in London's Docklands, as part of DSEI.

At 7.8 metres long, the P24 RIB has a speed of 38 knots and can operate for up to 45 hours at patrol speed or 100 nautical miles in pursuit mode, while being controlled remotely or operating autonomously. Its integration with an active warship has potential applications across a range of missions, including anti-piracy operations, border control, intelligence gathering, maritime security and force protection.

At the show, technologists from BAE Systems, in collaboration with the Royal Navy, Dstl and autonomous systems supplier L3Harris, demonstrated the potential to make naval missions faster, easier and safer by carrying out high-speed exercises that mimic real world scenarios that include force protection, threat intercept and chase missions.

A key part was to ensure a secure connection between the combat management and sensor system on board the warship and the off-board systems on the RIB.

The version of the autonomous P24 RIB on show at DSEI was modified for optional unmanned operation and fitted with additional sensors and effectors including a high-resolution optical and thermal camera and Long Range Acoustic Device (LRAD) system, capable of emitting warning messages at distance. It is equipped with automated navigational decision-making technologies allowing operators to focus on mission critical information from afar.

The demonstrations highlighted the collaborative effort of the industry working alongside Dstl partners in supporting the future of the Royal Navy, and the advancement of technology in providing non-lethal and lethal advantage to the military forces.

Milrem Robotics Introduces New Generation Multi-Purpose UGV

Milrem used this year's DSEI to introduce the fifth generation THeMIS UGV (Unmanned Ground Vehicles), as a new model designed to complement warfighters and enhance combat effectiveness. Milrem Robotics is the leading European manufacturer of unmanned ground vehicles (UGV) and developer of robotic warfare solutions.

Kuldar Väärsi, CEO of Milrem Robotics, assured the conference that, "In 2015 we exhibited the first THeMIS concept here at DSEI in London. Now, four years later, after extensive testing with industry partners and NATO forces in very demanding environments, we are proud to be back here and present a mature and robust product that will greatly enhance warfighting capabilities."

The fifth generation THeMIS incorporates all the knowledge garnered from tests held in the U.S., Europe and the Middle East, alongside deployment in Mali in the French-led Operation Barkhane. This generation's THeMIS follows NATO STANAG standards in the vehicle's architecture, safety, air transportability, power offload and other aspects.

Väärsi confirmed that, "Our engineers have taken into account the feedback from different armed forces and carried it into the design, creating a robust and reliable tool to support dismounted troops."

Multipurpose Security

The THeMIS is a multipurpose tracked vehicle that can be equipped with weapon systems, tethered drones, IED detection devices and other warfighting technology, carrying a payload of 1,200kg at 25 km/h while pulling other equipment with a force of 21,000N. It can be remotely operated via cameras or autonomous functions such as waypoint navigation and follow-me, for the vehicle's objective is to keep soldiers safe and increase their capabilities while lightening their load.

THeMIS has become the industry-standard UGV for various payload integration projects. A dozen different systems have already been integrated with partners like Kongsberg, FN Herstal, MBDA and ST Engineering, while live firing tests have been conducted with five different weapon systems, including an anti-tank missile launcher.

In addition, Milrem Robotics is working to enhance the vehicle with autonomous functions, including point-to-point navigation, obstacle detection and avoidance. Autonomous function development is focused on mobility alone, not on weapon systems deployment.

The Netherlands and Norway have already received their first THeMIS vehicles with an option to integrate them into additional warfighting equipment. As logistics platforms are intended to carry gear and supplies, the THeMIS UGV has recently passed air transportability tests to offer another option for deployment in operation areas.

The air transportability tests were conducted according to NATO standard STANAG 3542 and facilitated by the helicopter crew of the Estonian Police and Border Guard.

Two THeMIS UGVs were delivered to the Royal Netherlands Army

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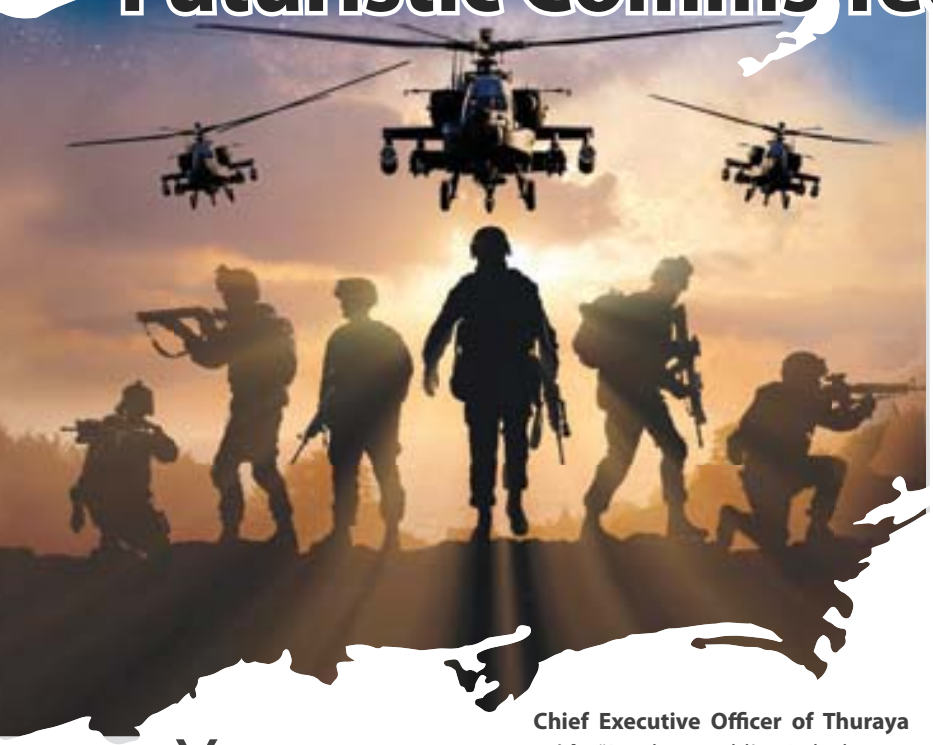
Yahsat and Thuraya Reveal Futuristic Comms Technology



Yahsat, one of the UAE's leading global satellite operators and Thuraya, its mobile satellite services subsidiary, showcased their latest military and government communication capabilities at the recently concluded DSEI in London. During the event, Yahsat Government Solutions and Thuraya introduced a number of end-to-end solutions for mission critical operations on land, sea and air platforms. The combined portfolio, powered by C, Ka, Ku and L-bands, complemented the cutting-edge developments showcased by the Emirati defence and security industry at the adjoining UAE National Pavilion.

Ali Al Hashemi, General Manager of Yahsat Government Solutions and-Chief Executive Officer of Thuraya said: "As the world's sixth largest satellite operator with an enhanced portfolio including fixed and mobile communication solutions, Yahsat and Thuraya were excited to be part of the defence and security dialogue at DSEI. We welcomed our partners at the event, and explored opportunities to enable comprehensive, future-focused systems for our government and commercial customers."

Multipurpose Satellite Solutions

Yahsat Government Solutions is one of the UAE government's preferred partners for satellite solutions, providing highly secure, diverse and integrated fixed and mobile communication solutions for the UAE Armed Forces, enabling Beyond Line of Sight (BLOS) Communications, Blue Force Tracking (BFT), Secure Communications on the Move and Military Grade Handheld Communications.

Yahsat and Thuraya bring more than 30 years of combined expertise in developing solutions for some of the most complex security requirements. Following Yahsat's acquisition of Thuraya in 2018, Thuraya's two satellites, which serve over 160 countries, joined Yahsat's network to expand the group's total fleet to five satellites. As a result, Yahsat's service portfolio is now poised to reach a wider breadth of markets in Europe, Africa, the Middle East, South America, Australia and Asia.

Yahsat provides multipurpose satellite solutions for broadband, broadcast and government communications use across the Middle East, Africa, Europe, and Central and South West Asia. The company is headquartered in Abu Dhabi, and wholly owned by Mubadala Investment Company. It is the first company in the Middle East and Africa to offer Ka-band services including YahClick, Yahsat Government Solutions, YahLink and Yahlive via its Al Yah 1 and Al Yah 2 satellites.

With the launch of Al Yah 3 satellite, Yahsat's commercial Ka-band coverage has extended to 20 additional markets, reaching 60 per cent of Africa's population and over 95 per cent of Brazil's population.

In September 2018, Yahsat and Hughes announced a new joint venture to provide satellite broadband services to the Middle East, Africa and Southwest Asia markets, followed by the announcement of a similar new joint venture with Hughes in Brazil dated May 2019.

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QinetiQ Uncovers Next-Gen Banshee

QinetiQ recently announced the launch of the next-generation Banshee, "Banshee NG", the target that replicates fast flying jets and missiles, enabling test and evaluation and live fire training exercises.

Banshee NG was built to enable NATO and allied militaries to train against simulated higher speed aerial threats, preparing for the evolution in those threats that are beginning to emerge. As a fifth member of the Banshee family of targets, joining the Banshee Whirlwind, Jet 40, Jet 80 and Jet 80+, customers opting for the Banshee NG will own a new generation of transonic aerial target that travels at a faster speed (>250 metres per second), soars to a higher altitude (up to 12,000 metres), offers increased manoeuvrability (up to 9G, from typically 3G), provides lower sea skimming capabilities (three metres) and is less detectable due to a low radar cross section (RCS).

This further evolution in threat representation technology is a key part of the company's strategy to lead and deliver world-class test and evaluation, training and mission rehearsal capabilities for governments around the world. Peter Longstaff, Managing Director of QinetiQ Target Systems said: "Banshee NG is the next-step up in the Banshee family, for the live fire, test and evaluation community looking to buy an affordable target that represents even faster and more manoeuvrable aerial threats. Adding Banshee NG to QinetiQ's Target Systems' portfolio enables us to deliver an even more comprehensive end-to-end threat representation offering to customers. As with all our targets, we can either provide Banshee NG as a product sale or deploy to a customer's site as part of a managed service for test or training purposes."

An added advantage of the Banshee NG is that it is operated using the infrastructure and accessories that QinetiQ's Target Systems business offers for its other Banshee targets. This includes being launched with ground-based pneumatic air-launchers, being equipped with a range of payloads such as radar augmentation, miss distance indication and sophisticated electronic warfare capability and being operated using the command and control systems currently on offer by QinetiQ.

Once launched, Banshee NG is operated with a proprietary QinetiQ guidance system and range-certified flight termination system that enables full control at all times. It can be recovered using a parachute. Since its inception almost 30 years ago, the Banshee UAV-T and its various weapon-specific augmentation devices have evolved with the requirements of its customers.

QinetiQ Target Systems is the world-leading provider of unmanned air, land and surface vehicle targets for live-fire training and weapon system test and evaluation. It designs and develops threat-representative targets and special mission platforms at manufacturing facilities in Ashford, UK, and Alberta, Canada, and supports these platforms with a field service capability honed for decades on military ranges worldwide.

MBDA'S SPEAR-EW to Act as a Force Multiplier

Recently, MBDA was awarded a contract to demonstrate SPEAR-EW, a new electronic warfare version of the SPEAR weapon system family on order for the UK's Royal Air Force (RAF). SPEAR-EW is being developed by MBDA in partnership with Leonardo to complete a range of Suppression of Enemy Air Defence (SEAD) missions, under a Technical Demonstration Programme (TDP) contract awarded by Defence Equipment & Support (DE&S). It will integrate a cutting-edge miniaturised EW payload from Leonardo, which will act as a stand-in jammer to increase the survivability of RAF aircraft and suppress enemy air defences, acting as a significant force multiplier.

UK's Defence Minister Anne-Marie Trevelyan said: "These state-of-the-art electronic jammers will confuse our adversaries and keep our pilots safer than ever in the air. Paired with the power of precision Brimstone and Meteor missiles, our world-class F-35 and Typhoon jets will continue to rule the skies in the years to come."

Mike Mew, MBDA UK Director of Sales and Business Development, said: "SPEAR-EW is a new capability that, alongside the existing SPEAR3 weapon, marks a fundamental change in the ability of friendly air forces to conduct their missions despite the presence of enemy air defences. Our vision for SPEAR is to create a swarm of networked weapons able to saturate and neutralise the most sophisticated air defences. Adding SPEAR-EW to the family demonstrates the principle of introducing complementary variants to the SPEAR family that will add significant capability and force multiplication without the need to repeat the platform integration."

The core of SPEAR-EW's payload is Leonardo's advanced, miniaturised Digital Radio Frequency Memory (DRFM) technology, which offers advanced and future-proof electronic jamming and deception available on the market today.

The new SPEAR-EW will complement the SPEAR network enabled miniature cruise missile, which is designed to precisely engage long range, mobile, fleeting and re-locatable targets in all weathers, day or night, in the presence of countermeasures, obscurants and camouflage, while ensuring a safe stand-off range between the aircraft and enemy air defences. Powered by a turbojet engine, the SPEAR missile offers over double the range, and a flexible operating envelope, when compared to a conventional glide weapon. It utilises this long endurance through its capacity to be launched at enhanced stand-off ranges and loiter while carrying out its jamming mission.

The compact size of the SPEAR family allows four weapons to be carried internally in each of the two internal weapons bay of the F-35, or three per station on the Eurofighter Typhoon. It will keep the same form and fit as the baseline SPEAR to enable a single integration pathway and launcher solution.

The SPEAR weapons system recently completed a set of ground trials and fit-checks of a loaded three-pack SPEAR launcher onto a Eurofighter Typhoon fighter aircraft. The work was undertaken by a joint engineering team from MBDA, BAE Systems, and the UK Ministry of Defence's Defence Equipment and Support (DE&S) and took place at BAE Systems' flight test site in Warton, Lancashire.

Supacat's Range of Vehicles a Big Draw

Supacat, the UK headquartered Special Forces vehicle developer, had a very successful participation at DSEI with its vehicle range attracting attention from trade visitors and delegations alike. The Special Forces vehicle HMT Extenda Mk2, Light Role Vehicle (LRV) and its technology demonstrator for hybrid and optionally manned operations were the highlights at the show.

HMT Extenda Variant Makes Debut

Supacat, showed the most advanced version of its world leading Special Forces vehicle, the HMT Extenda Mk2, for the first time at DSEI 2019. This latest variant offers a step change in capability and payload capacity with an enhanced suspension system enabling gross vehicle weight to increase to 12,000kg from 10,500kg and crew seating to six from four.

The Extenda is a variant of Supacat's successful HMT (High Mobility Transporter) platform, which is operated by Special Forces around the world.

Supacat undertook a rigorous and extensive programme of trials to verify and validate the performance of the system. Besides, the vehicle has successfully completed a 12,500km tour of Australia in order to confirm reliability and performance over long distances.

"The innovations to the HMT platform on the latest Extenda deliver increased capability and superior payload and performance. Our user feedback indicates that the vehicle has exceeded expectations, allowing them to do things they'd previously thought not possible," said Phil Applegarth, Head of Supacat.

The chassis is now STANAG compliant for recovery purposes and a 6.7 litre Cummins diesel engine comes as standard. The blast and ballistic protection option can now be integrated at the factory build stage.

In line with Supacat's modular design philosophy, the latest Extenda provides for a range of configuration options from the factory in addition to the flexibility to re-role the base platform throughout the lifetime of the vehicle with a variety of mission modules and protection levels to meet changing demands. HMT Extenda has the unique capability of being operated as a 4x4 or 6x6 wheel drive vehicle thanks to a

removable third axle.

Users Describe Light Role Vehicle as 'In a Class of Its Own'

Supacat's Light Role Vehicle (LRV) offers unrivalled performance in terrain access, range and operator comfort. Its low weight and packaging offers a genuine `Fly / Drive` tactical capability utilising current in-service aviation assets for rapid intervention operations, while maintaining excellent payload capacity.

The LRV is designed to deliver exceptional off road performance lowering user fatigue, reducing cognitive burden and enabling the operator to arrive at their objective "fit to fight."

LRV's upgraded version has a new engine and chassis to provide an optimised mix of bespoke and COTS components. This delivers an extended platform life with ease of supportability and standardisation across the LRV variants.

The Supacat LRV platform is highly modular and offers a range of configuration options to suit a variety of environmental conditions, threat levels and crew requirements. All variants use a common chassis and driveline with customers able to specify modular elements of the vehicle such as open or closed cabs, seating layout, load platform and weapon systems.

LRV has the unique feature of being convertible between 6x6 and 4x4, offering users the flexibility to reconfigure the vehicle to meet different operational requirements within hours by the addition or removal of a third axle module.

"The feedback from our current specialist customer base has been extremely positive and users describe the vehicles as `in a class of its own`," said Ben Gaffney, Head of New Programmes, Supacat.

LRV is ITAR free and can be supported via Supacat's existing globally available spares network. It has been developed with a common user interface to the Supacat HMT `Jackal` to maximise inter-operability and minimise training.

`Optionally Manned Hybrid` Demonstrator Unveiled

Supacat's technology demonstrator for hybrid and optionally manned operations is developed to keep pace with battlefield logistical requirements on extreme terrain and unpredictable routes.

The technology demonstrator has been developed in collaboration with the University of Exeter as part of an Innovate UK-supported Knowledge Transfer Partnership (KTP).

"Electric hybrid propulsion and autonomous technologies are two important innovations that will enhance the capabilities of users of our in-service high mobility platforms. We have focussed our efforts on designing open system architectures, allowing extensive use of commercial off the shelf (COTS) components, which we see as key to a successful and sustainable military solution in a rapidly evolving technology sector," said Steve Austen, Engineering Director of Supacat parent, SC Group. "It is in Supacat's DNA to tailor its platforms and solutions to each customer's requirements. Our approach uses a common electric drivetrain, each of which can be customised through different powering options depending on mission, range, payload and operating environment.

The 'optionally manned' demonstrator utilises a terrain detection and response system for enhanced mobility and optimised endurance. The object categorisation and response system used for obstacle clearance or avoidance during technical off road driving, can be tailored to the capabilities of the vehicle, driver or a remote operator. The path planning and motion behaviour system uses simultaneous localisation and mapping (SLAM) for the navigation of lead and follow on vehicles.

The technology demonstrator uses the All-Terrain Mobility Platform (ATMP), as its base vehicle, as ATMP is a mature battle proven and relatively simple product, enabling the development programme to focus on the new technologies and capabilities and subsequently allowing rapid development.

Reference Text/Photo:
www. scgroup-global.com

Closed Cab LRV

Patria Demonstrates Latest Tech

Patria showcased the Patria 6x6 vehicle, Patria Nemo mortar system and several products related to intelligence, surveillance and command and control systems at DSEI.

Patria 6X6 is a successor to the Pasi Armoured Personnel Carrier and will complement the vehicle fleets of customers of the legendary Patria AMV 8X8. The 6X6 is a multipurpose transport vehicle. Its chassis structure is based on the same components as the AMV, but with one less axle. The vehicle is driven by all three axles and steered from the front two, or all three, depending on its equipage. Optional equipage can be added to bring the 6X6 closer to the AMV. For example, various ballistic and mine protection levels, weapon systems, self-protection systems and other interior equipment are available.

Patria Nemo, a turreted, remote-controlled 120 mm mortar system, is an indirect fire support system, but due to its direct fire capability, it can also be used for self-defence. It can also fire Multiple Rounds Simultaneous Impact (MRSI) fire missions where up to five grenades are hitting the target simultaneously. The light and compact turret is easily installable on light, tracked chassis or wheeled armoured vehicles in the 6x6/8x8 class.

Patria's CANDL is a compact data link for air-to-air and air-to-ground applications requiring high reliability, low probability of detection and interception, dynamic networking with several members and long communication ranges. CANDL is a useful data link for Unmanned Aerial Systems (UAS), Manned-Unmanned Teaming (MUMT) operations, Intra-Flight Data Links (IFDL) and Live Virtual Constructive training (LVC) systems.

While **ARIS** is a remote operable Electronic Intelligence (ELINT) system used to intercept, identify, record and analyse radar signals. With ARIS you can master strategic ELINT in today's complex signal environment, get spectrum awareness and make fast and accurate updates to ELINT databases.

ARIS-E is a new Electronic Support Measures (ESM) product building on ARIS. It provides automatic identification, real-time geolocation and tracking of radars on the battlefield. ARIS and ARIS-E together deliver comprehensive tools for strategic and tactical ELINT/ESM for various needs.

The company also highlighted the **MUSCL** passive radar system, which is a covert and easily deployable air surveillance system, using signals from existing radio and TV broadcast networks for target detection and tracking.

Furthermore, it put the spotlight on

Patria AMV to be Tested in Japan

Patria's armoured modular vehicle AMVXP has been chosen to a one-year field testing in Japan after a competitive bidding. The Japanese Ministry of Defence will buy two vehicles from Patria for the tests. Two other companies have been selected to deliver their vehicles to the tests. The final selection is to be expected after the trials.

"This is good news as it is a sign of the high quality and appreciation of Patria vehicles. In case Patria vehicles will be selected to Japan, we are ready for technology transfer project and to set up an assembly line there," says Petri Jokinen, VP, Sales and Marketing of Patria's Land business unit.

TADS, a Tactical Debriefing System that provides instant debriefing of military missions and training exercises from single sortie to large joint forces campaigns involving all branches and LVC (live, virtual, constructive training) scenarios. TADS visualise order of battle, weapon and sensor usage in detail as well as electronic warfare activities giving practical and precise feedback to improve the performance of pilots and operators.

Patria is an international provider of defence, security and aviation life cycle support services, pilot training and technology solutions. The company provides its aerospace and military customers with equipment availability, continuous performance development as well as selected intelligence, surveillance and management system products and services. Its mission is to give its customers confidence in all conditions, and the company's vision is to be the leading partner for critical operations.

Senop Presents Advanced Situational Awareness

Senop, a part of the Patria Group, displayed its latest innovations for increased mobility, performance and situational awareness at the show.

Senop is a forerunner in situational awareness by providing advanced sensor solutions and system platforms. Traditionally OEM's have manufactured standalone-based sensors with limited capability of information sharing. The company takes it to the next level by providing a network of different kinds of sensors. The devices and systems that are part of the said network can share versatile information with each other by using either wireless or wired network. The network can consist of different kinds of sensors like NVGs, intelligent weapon sights, observation, and surveillance systems, and UAVs equipped with hyperspectral cameras.

For example, the Senop OSCU, a new passive outdoor surveillance system, can share classified pattern recognition information via images and live video stream to a command post or other sensors that are part of the network. The information can be autonomically pre-analysed by the sensor.

The advanced information and situational awareness sharing are supported in all Senop products like NVGs, intelligent weapon sights, observation, and target acquisition systems. The sensor devices can also be connected to different C2 systems.

In addition to traditional elements, the future battlefield will include factors that make it multi-dimensional, rapidly changing and unpredictable, and as a result of this, more technical.

Textron Systems to Participate in Next-Gen Squad Weapons Prototype Programme

Textron Systems, a business of Textron Inc., has been chosen by the U.S. Army's Project Manager Soldier Weapons as one of three organisations to deliver Next Generation Squad Weapons (NGSW) based on the company's high-performance cased telescoped (CT) technology. Under this award, Textron Systems will deliver 43 6.8mm CT NGSW-Automatic Rifles and 53 NGSW-Rifles, as well as 845,000 rounds of CT ammunition during a 27-month period of performance.

NGSW consist of the NGSW-Automatic Rifle (NGSW-AR) and the NGSW-Rifle. The NGSW-AR is the planned replacement for the M249 Squad Automatic Weapon in Brigade Combat Teams. It will combine the firepower and effective range of a machine gun with the precision and ergonomics of a rifle, yielding capability improvements in accuracy, range, and lethality. The weapon will be lightweight, fire lightweight ammunition and have reduced acoustic and flash signature. Soldiers will employ the NGSW-AR against close-, mid- and extended-range targets in all terrains and conditions.

To support the NGSW prototype programme, Textron Systems leads an excellent team that offers decades of trusted small arms experience and includes Heckler & Koch as well as Olin Winchester. Heckler & Koch provides renowned small arms design, research and development, and manufacturing capabilities, while Olin Winchester brings renowned small calibre ammunition production capabilities.

"We have assembled a team that understands and can deliver on the rigorous requirements for this U.S. Army programme with mature and capable technology, reliable programme execution and dedicated user support," says Wayne Prender, Textron Systems' Senior Vice President, Applied Technologies and Advanced Programmes.

Textron Systems has successfully demonstrated its high capability and low-risk 6.8mm CT system that provides significant performance enhancements over current Army systems. The design features improved accuracy and greater muzzle velocity for increased performance, as well as weight savings of both weapon and ammunition over current Army systems. It also incorporates advanced suppressor technology to reduce the firing signature and improve controllability.

Under earlier development programmes, Textron Systems successfully scaled its lightweight CT technology into numerous calibres and configurations, demonstrating its technical maturity as well as scalability for future growth to support U.S. close combat forces against current and future adversaries. The next generation of CT weapons and ammunition systems delivers improved manoeuvrability and performance at 40 per cent less weight than current systems. The next generation CT weapons and ammunition continue to provide weight-saving benefits but substantially increase lethality, providing warfighters improved performance without compromising manoeuvrability.

Vulcano Precision Guided Munition is Ready for Fielding

Diehl Defence and Leonardo have developed and qualified the precision-guided munition family Vulcano 127mm and 155mm, under the umbrella of the Italian and German governments. Vulcano is a family of unguided (BER) and guided (GLR) ammunition for the 76mm, 127mm naval guns and 155mm land artillery systems The STANAG-conforming joint qualification controlled by the Italian and German authorities has been successfully completed. The qualification performed is compatible with all Joint Ballistic MoU gun systems, such as the land-based platforms PzH 2000 and FH-70 as well as 127mm/5inch naval platforms.

The Vulcano ammunition is designed to achieve extended ranges of 70 km for Vulcano 155 and 80 km for Vulcano 127 in conjunction with unique accuracy against stationary and moving targets.

Vulcano 127mm ammunition is conceived to give the 127/54 C and the 127/64 LW Naval Guns the capability to meet any present and future requirement for Precision Naval Fire Support and Long Range engagement of Surface Targets. Vulcano 127mm BER maintains the anti-air role as well. The rounds capitalise on new and emerging technology based upon a fin stabilised airframe with canard control for terminal guidance.

While the Vulcano 155mm projectile is a sub-calibre, fin stabilised airframe, compatible with the use of standard modular charges, with no need of additional propulsion; it is loaded with Insensitive Explosive and Patented tungsten rings; the mechanical interfaces are the same as in standard 155mm ammunition.

The multi-role, insensitive high-explosive (IHE) warhead with pre-fragmented tungsten splinters is most effective against soft targets, vehicles, semi-armoured vehicles, infrastructures and all typical infantry command posts.

The ammunition family reaches the highest target accuracy through the unique combination of satellite-based navigation with laser- or infrared-sensors for terminal homing. This makes the Vulcano family one of the most accurate artillery ammunitions for land and naval applications worldwide.

The Vulcano ammunition configuration for naval guns can be automatically loaded without any mechanical modification to the loading system. It is fully compatible with in-service five-inch and 155mm guns with additional functionality including programmable initialisation for fuse and guidance system, mission planner and technical fire control for trajectory computations, gun fire angles, selection of ammunition type and firing sequences.

Vulcano programming kits enable artillery platforms to fire the ammunition in an easy way. The kits allow either fully integrated or standalone operations. The embedded fire command computation programme, NABK-18+, has been officially released.

The latest adaptations of Vulcano are compatible with the majority of in-service artillery systems including 127/64 LW and 127/54C naval guns, the Advanced Gun System (AGS) currently on board the U.S. Navy's Zumwalt class of destroyers, and the more than 250 Mk 45 naval guns delivered to fleets worldwide. For land platforms, Vulcano can be fired from all variants of M777 and M109 howitzers and the majority of weapons for allied militaries around the world.

Integrating Vulcano into these weapons offers a number of possibilities such as the gun system's maximum rate of fire does not change with the integration of Vulcano. It provides all-weather precision attack capability (<5 m CEP) to fully defeat targets with a high lethality pre-fragmented warhead. Vulcano effectively addresses land and surface attack on land and at sea. It can be equipped with optional Semi-Active Laser seeker and perform in-flight retargeting to address moving targets.

HiDRON Sets New Records in Canadian Aviation

UAVOS recently conducted a successful record-setting stratospheric flight, as part of a joint project between the company and Stratodynamics. The stratospheric glider named HiDRON was released from a Canadian Space Agency (CSA) scientific gondola at an altitude of 111,434 feet and performed a four-hour controlled flight and landed at Iroquois Falls Airport about 80 km from the Timmins, Ontario launch site. The flight once again confirmed HiDRON's capability to perform high-altitude missions and beyond visual line of sight (BVLOS) operations and set a new operational best for the flight in a challenging stratospheric environment. The night flight was also supported by the French Space Agency (CNES) and was part of the 2019 Strato-Science Balloon campaign.

The record setting flight achieved many firsts in Canadian Aviation such as it was the highest altitude flight of a UAV or Remotely Piloted Aerial Systems (RPAS). Also, it was the first UAV above 29,000 feet in Class A airspace.

The HiDRON release from the CSA gondola was another first for the companies, as previous launches have been carried out by weather balloons and added new layers of complexity. Prior to the launch, the Stratodynamics and UAVOS teams advanced aspects of the HiDRON including the transponder, stratospheric flight controls, data links, and safety protocols. The HiDRON features UAVOS' autopilot AP 10.3 Micro.

The mission plan was to release the HiDRON from the gondola sometime between an altitude of 30 km altitude and the target ceiling altitude of 121,000 feet. Once released, the HiDRON would follow a pre-set flight plan and land at Iroquois Falls Airport. This meant the team was onsite at the Timmins airport until the gondola's lift-off from the CSA Balloon Base.

As the gondola rose to its float altitude, the HiDRON was released at around 12:30 am on September 1 at an altitude of 111,400 feet. The HiDRON performed well in difficult headwinds and -60-degree C stratospheric conditions with its AMON detector recording single pixel data in a near-moonless night sky.

The record setting flight is the culmination of 12 months of international collaboration and planning with colleagues in Canada, Belarus and Slovakia and was the second of two flights commissioned to test AMON Airglow detector from Stratodynamics' client, the Institute of Experimental Physics at the Slovak Academy of Science. The Slovakian team was searching for a cost-effective method for the AMON detector to have a clear view upwards unencumbered by a weather balloon blocking the view. The AMON detector is planned to participate in EUSO-SPB2 mission that will fly on a long duration NASA balloon in 2022.

Aliaksei Stratsilatau, CEO, UAVOS said: "HiDRON is a real solution that advances the important research around climate change and other atmospheric chemistry problems. The HiDRON provides solutions for tough problems that affect all of humankind, which is why it is such a necessary platform for researchers."

Boeing Starts Assembling Japan's KC-46A Tanker

The Boeing KC-46 team recently began assembling Japan's first next-generation tanker, loading an 82.4-foot (25 metres) long wing spar in the company's 767 production facility.

"This is an exciting development for the programme, and we look forward to building and delivering these multi-role tankers to the Japan Air Self-Defense Force (JASDF)," said Jamie Burgess, Boeing vice president and KC-46 programme manager. "From the enhanced flight deck to the modernised boom, this tanker will provide unmatched capabilities for Japan."

Boeing was awarded a Foreign Military Sale contract for one KC-46A aircraft and logistics services in December 2017. The U.S. Air Force exercised an option for Japan's second aircraft in December 2018.

"We're proud to support the JASDF with a production line that emphasises quality, efficiency and safety," added Bruce Dickinson, Boeing 747/767 vice president and general manager.

Boeing is assembling KC-46A aircraft for both the U.S. Air Force and Japan on its 767-production line in Everett, Washington, U.S. Following initial assembly, workers install the tanker's military unique systems at the site's Modification Centre. The jets are then flight tested at Boeing Field prior to delivery.

The company began developing the KC-46A for the U.S. Air Force in 2011 and delivered the first tanker in January 2019. The first four multi-role KC-46 tankers were delivered in January to McConnell Air Force Base in Wichita, Kansas. Boeing is currently on contract for 52 of an expected 179 tankers for the Air Force. Japan is the programme's first international customer. Deliveries to the JASDF will begin in 2021.

The KC-46 will be a force multiplier in the U.S.-Japanese defence alliance, certified to refuel all U.S. Air Force, U.S. Navy and JASDF aircraft safely and efficiently. Built to carry passengers, cargo and patients, it will be easier to maintain than previous tankers, improving reliability and lowering life-cycle costs. It is a derivative of the commercial 767-2C, a proven airframe in service as an airliner and freighter. Boeing has delivered more than 1,150 767s worldwide.

KC-46 can detect, avoid, defeat and survive threats using multiple layers of protection, which will enable it to operate safely in medium-threat environments.

During extensive flight testing, six KC-46 completed more than 3,800 flight hours and offloaded more than four million pounds of fuel to A-10, B-52, C-17, KC-10, KC-135, KC-46, F-15E, F-16 and F/A-18 aircraft. It has been rigorously tested throughout all aspects of the refuelling envelope and in all conditions, including day, night and covert.

HENSOLDT Launches New SETAS Situational Awareness System

HENSOLDT, a leading sensor solution provider, launched its newly developed SETAS electro-optical situational awareness system for armoured vehicles, among other cutting-edge technologies at the recently held Defence & Security Equipment International (DSEI) in London. The company's solutions at display included a new variant of SharpEye naval radar series and other products.

Newly Developed SETAS

The newly developed SETAS electro-optical situational awareness system for armoured vehicles provides one of the best situational awareness be it in air, sea, or land. The SETAS Integrated Camera Models encompasses two very powerful sensors, high-resolution visual cameras, and two uncooled thermal imager module (UCM).

The new system has an unrivalled visual sensor capability to recognise pedestrians at a 300-metre distance and can be further enhanced by integrating acoustic sniper detection sensors, laser warner system and a hemispherical camera to cover the area directly above the vehicle. The SETAS situational awareness system comes with a head-mounted Human Machine Interface (HMI) display that boasts of providing the crew member inside the vehicle a "see-through" experience, similar to observing when "heads up".

SETAS intelligent software algorithms are programmed to automatically alert the crew if any potentially threatening movement is detected 360° around the vehicle. The SETAS, according to HENSOLDT, is flexible and can easily be fitted as a stand-alone system. However, for the greater advantage, it is ideal to connect it to the vehicle's network or Battle Management System, which allows the display of external data to each crew member individually. The company also informed that SETAS will be available from 2020.

Aside from SETAS, HENSOLDT displayed a broad range of sensor solutions for the Air, Sea, Land and Security domains. For the land domain there were several advanced optronic systems such as laser rangefinders and designators, missile protection systems for tanks and a number of rifle scopes. The Electro-Optical Targeting System EOTS II, displayed at the event, offers a choice of different day vision zoom cameras while the driver sight system SPECTUS II features a low light level TV camera (LLLTV) with unprecedented image quality. Meanwhile, the vast capabilities of active and passive radar sensors were shown by the TRML-4D air defence radar and the Twinvis passive radar.

New SharpEye Mk 5 Navigation Radar

The new variant of HENSOLDT's successful SharpEye naval radar series -the Mk 5 radar, is the first open array 80W SharpEye navigation radar especially aimed at the smaller military vessels that require full capability with limited space availability.

According to Russell Gould, Managing Director of Kelvin Hughes, a HENSOLDT subsidiary, SharpEye provides the user with the most capable radar that allows exceptional performance against small targets in the clutter with minimal user adjustment. "Kelvin Hughes SharpEye radars have been fitted to more than 30 leading naval and Coast Guard services worldwide, and the Mk 5 makes this technology available to a wider range of naval and Coast Guard vessels," he said.

SharpEye is a state-of-the-art coherent, Pulse-Doppler X-Band radar for navigation and situational awareness. It utilises Gallium Nitride (GaN) power transistor technology for superior detection performance of small targets in heavy clutter, thus improving mission success and survivability of military and Coast Guard vessels.

Solutions for ISR

HENSOLDT also presented solutions for airborne ISR including ARGOS-II HD multi-sensor system, the lightweight observation camera GOSHAWK-II and the PrecISR multifunction radar. The company presented the Airborne Missile Protection Suite AMPS for Aircraft and the modular Kalaetron radar warning system. Also on display was HENSOLDT's Mode 5-capable IFF portfolio together with avionics equipment such as crash recorders and tactical data links. The new generation airborne observation system, LEO-III HD was also displayed, in addition to the Sferion advanced pilot assistance system, which protects helicopters in restricted visibility conditions and prevents the most significant causes of non-hostile losses.

For missions and surveillance on the sea, HENSOLDT presented TRS-4D naval radar system, multi-sensor optronic masts for submarines and the optoelectronic laser detection system COLDS NG. Its security solutions were focusing on radar and optronic sensors feeding the CxEye command & control system and the VADR UAV captured drone.

HENSOLDT Expands in the UK

HENSOLDT further established its presence in the UK by rebranding its subsidiary Kelvin Hughes Ltd. as HENSOLDT UK. Commenting on this HENSOLDT CEO, Thomas Müller said, "We are expanding our activities in the UK and will bring together our existing portfolio with Kelvin Hughes' offerings. In this way, we are creating comprehensive system solutions which will boost our UK business significantly."

While Russel underlined the seven-decade long partnership between the two companies and said, "Bringing together our products under one brand name will increase our visibility in the market and will open up additional business opportunities."

Kelvin Hughes, with approximately 200 employees, designs, produces and markets radar sensors mainly for maritime and security applications.

Embraer Delivers First KC-390 to Brazilian Air Force

Embraer recently delivered the first multi-mission airlift KC-390 to the Brazilian Air Force (FAB) at a ceremony held at Anápolis Air Base, in the mid-western state of Goiás. This will start preparations for the aircraft's entry into service by FAB's First Troop Transport Group (1st GTT). The company has been conducting theoretical and practical training with the Air Force teams to start operations.

The KC-390 was developed as a joint project between the Brazilian Air Force and Embraer to set new standards for efficiency and productivity in its class, while presenting the lowest life-cycle cost in the market. The programme represents a significant advance in terms of technology and innovation for the Brazilian aeronautics industry and an operational improvement for FAB's transport aviation. In 2014, FAB signed a firm order for 28 units of the KC-390 aircraft and initial logistical support. The aircraft are produced at the Gavião Peixoto factory, in São Paulo state.

The KC-390 was granted the Type Certificate by the Brazilian civil aviation authority ANAC (Agência Nacional de Aviação Civil) in 2018, when it achieved Initial Operational Capability (IOC), which ensures that the necessary conditions have been met for the aircraft to start operations.

"The entry into service of the KC-390 by FAB represents an important milestone for the programme and will increase the growing international interest for this aircraft, consolidating the path to new sales," said Jackson Schneider, President and CEO of Embraer Defense & Security. "We are confident that the KC-390, in addition to successfully fulfilling the missions required by our Air Force, will have a positive economic impact on job creation and new investments in Brazil, as well as high value-added exports."

In order to maximise the operational availability of the KC-390 fleet in the fulfilment of the respective missions, FAB and Embraer Services & Support signed a comprehensive five-year services and support contract. Under the agreement, Embraer's portfolio of solutions TechCare will be responsible for logistical and engineering support, maintenance control, component repair, support staff for the aircraft entry into service, materials supply and an additional package that includes structural analysis, maintenance bulletin development, and aircraft painting, among other services.

The KC-390, which was recently ordered by the Portuguese Government, can carry out various missions including humanitarian support, medical evacuation, search and rescue, forest fire fighting and cargo and troop transport and launch capabilities, as well as aerial refuelling.

Equipped with two International Aero Engines V2500 turbofan engines, the latest avionics, a rear ramp, and an advanced cargo handling system, the KC-390 is capable of carrying up to 26 metric tons of cargo at a maximum speed of 470 knots (870 km/h), with ability to operate in austere environments, including unpaved or damaged runways.

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Mbombe 4x4 Certified One of the

Paramount Group, the global technology and aerospace business, has announced that the Mbombe 4x4, the latest in its advanced Armoured Personnel Carrier (APC) family of vehicles, has received final certification for the independently verified blast tests, which exceeded the criteria for NATO STANAG 4569 – one of the highest levels of protection that can be achieved in its class.

Both the launch of Paramount Group's Mbombe 4 and its first customer, the United Arab Emirates, were announced at the 2019 International Defence Exhibition and Conference (IDEX) in Abu Dhabi.

This follows the exceptional performance of the Mbombe 4x4, which features unique flat-floor mine protection technologies pioneered by Paramount Group, during a series of explosives tests designed and executed by Landward Sciences, a programme of the Council for Scientific and Industrial Research (CSIR), South Africa's leading and independent scientific research body.

The blast tests are performed in accordance with the highest international specifications, namely, STANAG 4569, a NATO standardisation agreement that institutes benchmarks for occupant protections in vehicles such as the Mbombe 4x4, in this case including three 10 kg TNT explosions under the wheels and the hull, and one 50kg side blast test, carried out at a 5 meter distance to imitate an Improvised Explosive Device (IED). The applique armour packages can provide higher levels of ballistic protection (up to level 4) and mine protection as required by the customer.

The Mbombe 4 was designed and developed specifically for local manufacturing in customer countries, in response to the increasing requirement from governments for the development of their own defence industrial capabilities.

The vehicle has successfully completed a series of summer trials with several armed forces around the world. Featuring next-generation design, advanced technologies and highest levels of protection, the result of decades of real-world battlefield and asymmetrical warfare experience, the Mbombe 4x4 is ready to serve customers.

Though the Mbombe 4 is equipped for full mission capability and maximum versatility, it has a singular mission – soldier survivability. Protecting the lives of combat personnel is the utmost priority; as also reflected throughout the company's entire portfolio.

As part of the blast testing programme, the integrity of the Mbombe 4 was subjected to both intense experimentations and post-test evaluations that took several months to complete, with final inspections of the Mbombe 4 yielding impressive results. The inspections confirmed no evidence of hull ruptures, or injurious internally formed secondary fragments (e.g. secondary shrapnel) nor loose equipment in the occupant compartment, and that anthropomorphic test devic-

Best Protected Armoured Vehicles

es (ATDs) and the seats in which they were placed remained in position and uncompromised.

Each of these tests is intended to validate explosives resistance and occupant protection capacities for logistics and light-armoured vehicles by pushing unmodified units to their functional limits, using expertly controlled trials and post-test evaluations.

Key features of Mbombe 4 also include an unique, rear-door ramp design, which has been proven in combat on 6x6 and 8x8 IFVs. The ease of access provided by the rear-door ensures the rapid deployment of the crew while the vehicle is static or on the move.

Drawing on the exceptional heritage of the Mbombe 8x8, now in production following its launch in 2016, and the Mbombe 6x6, which has entered service, the Mbombe 4x4 completes the highly advanced Mbombe family of combat vehicles.

The Mbombe family enables Paramount Group to provide customers with a comprehensive family of 4x4, 6x6 and 8x8 IFVs, which share over 70 per cent of common components to reduce through life costs and ensures efficient training and logistics. This gives the end-user of all three vehicles significant savings in the areas of maintenance and logistical support.

The vehicle is being fully industrialised to allow for manufacture in customer countries using Paramount's proven portable manufacturing model.

The Mbombe 4 shares a 'conventional' or 'in-line' automotive driveline configuration, positioning the powerpack at the front of the vehicle and along its centre line. This configuration results in far greater efficiency in terms of the transfer of power from the powerpack to the wheels.

The Mbombe 4 performs with a burst speed of 140km/hr, an 800km operating range and an independent suspension system designed to optimally meet the increasing demand for outstanding protection yet adaptability in conventional and asymmetrical warfare alike. The vehicle is fully operational in winter conditions of -20 Celsius to desert conditions of +55 Celsius.

The 16 tonnes Mbombe 4 provides a payload of nearly three tonnes, encapsulating weapon systems, ammunition, crew and supplies. The Mbombe 4 has been designed to accommodate a wide range of payloads and turrets. The onboard mission computer and interface system is able to integrate with both Western and Eastern-made weapon systems. The vehicle is further fitted with the latest generation navigational, crew comfort and security systems, with examples including a driver-assist camera system, winterisation kit, vehicle location and tracking systems, a NATO standard tow-hitch, radios and intercoms systems and a Central Tyre Inflation System (CTIS).

Paramount Group's Unique Flat-Floor Design Meets Stringent NATO Standards for the Protection of Personnel in Armoured Vehicles.

Mbombe 4 blast test

AJAX Transitions into Service With the British Army

DSEI 2019 has seen General Dynamics Land Systems–UK take the opportunity to demonstrate the capabilities of the AJAX Family of Vehicles. AJAX is a £4.5 billion programme delivering 589 vehicles in six variants to the British Army ahead of the planned Initial Operating Capability (IOC) in 2020, with the first six ARES vehicles having been delivered to the British Army in February of this year.

The British Army has installed desktop training equipment and full-motion driver training simulators at the Armour Centre in Bovington and at Ministry of Defence Lyneham to support advanced training of British Army soldiers for the AJAX Family of Vehicles. Meanwhile, eight production and seven prototype vehicles are continuing live fire, cold-weather and Equipment Support-specific trials — such as ATLAS successfully recovering a 60-tonne Challenger Main Battle Tank — with ongoing vehicle reliability trials running more than 10,000 kilometres to date.

Carew Wilks, vice president and general manager of General Dynamics Land Systems–UK confirms that, "The transition of AJAX into service with the British Army is a significant milestone for the Programme. The provision of highly intuitive training assets, alongside vehicle deliveries, will allow the British Army to get to grips with this world-leading capability and enable them to use this fully digital Family of Vehicles. Through its advanced open and secure Electronic Architecture, AJAX will remain at the forefront of technology and survivability, ensuring it will be the vehicle of choice for British Army soldiers on operations."

Introducing the EAGLE 6×6

Fitted as a Troop Carrier variant at DSEI 2019, GDLS-UK also showcased its EAGLE 6×6 at this year´s DSEI — a contender for the UK's Multirole Vehicle–protected (MRV-P) Group 2 programme and a highly-adaptable Fox-

hound 4×4 vehicle.

Developed from the EAGLE / DURO family of vehicles that are currently in-service with the British, German, Danish and Swiss Armies, the EAGLE features a unique suspension and driveline, offering superior tactical mobility and reliability with the highest protection in its class. Proven on operations worldwide, the EAGLE is available in 4×4 and 6×6 configurations for Troop Carrier, Ambulance, Recovery, Command, Reconnaissance and Logistics roles, while providing logistic commonality across its variants to offer lower maintenance and lifecycle costs.

Wilks confirms that "The EAGLE 6×6 is an outstanding tactical wheeled vehicle ideally suited to troop transport and the rapid, safe carriage of injured personnel. EAGLE is highly-survivable with the mobility performance characteristics the British Army needs on operations worldwide. We have a highly-skilled team at Merthyr Tydfil that stands ready to undertake the assembly, integration and test of these vehicles. The British Army can be assured it is getting the right platform for its requirements."

Foxhound 4×4 at DSEI

Foxhound is the protected mobility vehicle of choice for British Army light infantry and specialist troops on international operations, where it has delivered high levels of operationally-proven protection, reliability and adaptability, alongside extremely significant levels of availability.

Since 2012, the British Army has deployed 400 Foxhound vehicles worldwide, in Afghanistan and Iraq, offering exceptional mobility, ride and blast protection, while the latest variant of the British Army Foxhound fleet enables the vehicle to undertake a Public Order role. Designed and built in the UK, Foxhound integrates highly survivable V-shaped hull technology and a dismountable crew pod designed for roles integrating the existing Foxhound Troop Carrier, a Weapons Mount Installation Kit (WMIK)-style Reconnaissance variant, a flat-bed Utility load carrier and a Command-and-Control (C2) variant.

With their specialist knowledge in complex, scalable electronic architectures, General Dynamics Land Systems and General Dynamics European Land Systems have a long, global history in delivering tracked and wheeled military vehicles. Alongside the AJAX family of vehicles, these innovative companies have delivered the Abrams main battle tank, the LAV (Light Armoured Vehicle), Piranha and Stryker Family of Vehicles and the Cougar Mine Resistant Ambush–Protected (MRAP).

The 400 new Foxhound vehicles are not the end of the story, for in receiving the Cougar-based Mastiff, Ridgeback and Wolfhound fleet to meet Urgent Operational Requirements, the British Army has met its Protected Mobility requirements. Moreover, General Dynamics Land Systems–UK is to provide a best-in-class fully-digital AJAX Family of AFVs for the British Army and has invested significantly in Centres of Excellence at Oakdale and Merthyr Tydfil in South Wales, the latter facility especially designed for a highly-trained production team assembled to meet future requirements, including the ability to handle Main Battle Tanks.

The Oakdale facility is an engineering hub with more than 300 highly skilled engineers across the software, electrical and mechanical divisions, thus well-placed to design, deliver and ensure the Through-Life Capability of the AFVs of today and tomorrow. Oakdale also features a high-tech Systems Integration Laboratory and a range of test facilities to support the development and sustainability of AFVs.

Reference Text/Photo:
www.gdls.com

EAGLE is available in 4×4 and 6×6 configurations

FNC Elections: The Fourth Democratic Experience

FNC is a Fortress of "Shura" and one of the Constitutional Pillars of UAE since Establishment of the Union

The elections of the Federal National Council (FNC), which will be held in early October 2019, constitute a new stage in the implementation of the empowerment programme, launched by His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE. This election is of exceptional importance this time as it represents a new start for the process of the UAE women's political participation. In this issue, Nation Shield sheds light on the features of this national electoral occasion, dimensions and political connotations.

On December 2, 2005, in celebration of the 34th anniversary of the declaration of the UAE, His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE, launched the Empowerment Programme, including many ambitious development goals in various fields and sectors. One of these goals pertains to the empowerment of citizens and enhancement of their political participation through the activation of the FNC's role.

In his speech, His Highness stressed that "the next phase of our march, and the changes and reforms taking place in the region, require more activation of the role of the FNC, and are empowering it to be a supportive authority that guides and supports the executive authority. We will endeavour to make the Council more capable and

in the Phase of Empowerment

effective, and more committed to the nation's issues and the concerns of citizens, through which the values of genuine participation and the Shura approach are firmly established. We have decided to gradually activate the role of FNC through the election of half its members from the councils of each emirate, and the appointment of the other half, thereby embarking on a journey that culminates in more participation and interaction from the people of the country."

This ambitious programme aims to achieve several requirements as follows:

• Respond to the requirements of the new phase referred to by His Highness the President of the UAE in his speech on "consolidating the principles of the rule of law, values of accountability, transparency and equal opportunities, which in turn required the reconstruction, reorganisation and rehabilitation of existing government systems, in terms of their structure and functions. It also required directing efforts to support, develop and motivate institutions, structures, activities and promising cadres, in order to create conditions conducive to a conscious start towards the horizons of the 21st century."

• Support the political, religious, cultural, media, educational and civil society organisations to assume their responsibilities in instilling the values of work within the society, changing the negative view regarding professional and manual work, and emphasising the concept of work as a responsibility, and as a human, cultural and religious value.

• Evaluate and learn from the past 34-years of experience and re-arrange our priorities, so that we can move forward in the process of progress and prosperity with better awareness, confidence and empowerment.

• Promote the principle that "man is the goal and object of development, as well as its instrument and means" through empowerment. Hence, the objective is to work towards the ad-

vancement of our human resources, development of scientific capabilities, technical skills and technological expertise. This is realised by providing and developing an educational structure that responds to the needs of comprehensive development in its various economic, social and demographic aspects.

FNC in Constitution

The FNC represents the fourth federal authority in the ranking of the five federal authorities provided for in the Constitution, namely: The Federal Supreme Council, the President and Vice-President of the Union, the Cabinet of the UAE, the FNC and the Federal Judiciary. The Council has 40 members, distributed according to the Constitution as follows: 8 seats for the Emirate of Abu Dhabi, 8 seats for the Emirate of Dubai, 6 seats for the Emirate of Sharjah, 6 seats for the Emirate of Ras Al Khaimah, and 4 seats for each of the Emirates of Ajman, Fujairah and Umm Al Quwain. The FNC exercises two basic functions, namely: legislative function, which means the power of the Council to discuss and approve or reject constitutional amendments and draft laws, and Supervisory function, which means the right of the Council to control politically the executive authority through specific control tools, namely: discussing general issues, and providing recommendations on them, as well as the settlement of citizens' complaints against federal government bodies.

Historical Development of the Process of "Shura" in UAE

The late Sheikh Zayed bin Sultan Al Nahyan, may God rest his soul, inaugurated the first session of the FNC on February 12, 1972, marking the completion of the constitutional pillar of the Union, establishing the fourth authority among the five powers stipulated in the Constitution of the UAE. In addition, the establishment of the Council was an embodiment of the founding leader's ambition to build a modern state that possesses the elements of modernity and development.

Despite the recency of parliamentary experience in the country at the time of its foundation, there are factors that contributed to the success of the Council in the performance of its tasks and fulfilment of its constitutional competencies. The most important of these factors was the reliance on a long historical heritage of the values and principles of the Shura (i.e. consultation). Foreign travellers who visited Abu Dhabi in the first quarter of the 19th century indicated that the sheikhs of Al Nahyan adopted the Shura system and did not

The first session of the FNC on February 12, 1972, marked the completion of the constitutional pillar of the Union

conclude an order before consultation with the elderly. This meant that they were proceeding on the way to modernity and progress in the light of the authentic Bedouin values. The Shura approach provided them with a legacy of wisdom.

This great foundational school in political participation and consultative approach produced for the UAE society the FNC at the beginning of the foundation phase of the UAE. This was in conjunction with the start of the progress journey of the UAE and the launch of the State of the Union. This correlation explains the strength and continuity of the federal construction of the UAE.

National Controls for the Practice of Shura

If these convictions and principles prevailed in the founding phase, then the empowerment phase, under the leadership of His Highness Sheikh Khalifa bin Zayed Al Nahyan, is based on the principles, values and approach of Sheikh Zayed, who endorsed the principle of the specificity of the UAE experience in the domain of Shura.

He said, "We will give everything its due consideration and do not want to be in a hurry in order to avoid failure. We must first achieve the requisites of parliamentary life, and we do not want to jump or take quick steps to attain what we aspire to." Here lie the roots of the principle of political progression, which is one of the most important dynamics of work in the Empowerment Phase.

The founding leader, may God rest his soul, always stressed that the talk about democracy should be in stages, from one stage to a higher one and so on. His strategic vision stemmed from his ability to anticipate the future and awareness of his developments based on the experiences of the past, as well as a genuine inherited wisdom.

Development of the Shura Process in the Empowerment Phase

If the establishment phase of the state has witnessed the establishment of the Council and the consolidation of the Shura approach, the empowerment phase represented a turning point in the process of parliamentary development in the state. We may call it the second establishment of the FNC, because of the qualitative shifts in the process of parliamentary work, through the launch of the "Empowerment" Programme in 2005.

In his speech on the occasion of the 34th anniversary of the Union, His Highness Sheikh Khalifa bin Zayed Al Nahyan, President of the UAE, launched a roadmap for all fields and aspects of development, especially the political development and empowerment. In anticipation of the requirements of the future, he said, "One of our most important purposes for the coming stage is to create the necessary conditions for the preparation of a more participatory citizen and a greater contribution. The experience of the FNC should move to a more representative stage and clearer effectiveness in addressing the issues of the country and the concerns of citizens, through which the values participation and Shura approach may be consolidated. The Council exercises its role as a legislative authority in support of all the transformations witnessed by society through representatives who are loyal to the homeland, committed to its goals and interests, and supportive of its political system."

Women Empowerment in FNC

Up to the announcement of the Empowerment Programme in 2005, women in the UAE had not been granted the right to political participation, and thus had not been members of the FNC since its establishment. Hence, the political empowerment of women was one of the mainstays of the Empowerment Programme that covered various developmental sectors and areas in the UAE. Women were empowered politically by granting them the right to vote and to stand for election to the Council. Women

participated in the first elections of FNC in December 2006. This participation was a major qualitative transformation that had a clear impact both in terms of enhancing the role and status of Emirati women and improving the image of the UAE, Gulf and Arab women internationally. The fact that Emirati women gained their political rights only 34 years after the founding of the UAE is a record achievement by virtue of the fact that most countries, including developed countries, have witnessed decades of struggle for women's political rights.

Conclusion

The process of empowerment, which encompassed various sectors of the country, gave the development process a renewed impetus and provided it with new sources that are in line with the ambitious development goals that were included in the UAE Vision 2021 and the UAE Centennial 2071. The empowerment of the FNC was an important guarantee that the political development of the country will keep pace economic, social, cultural and other development areas. The process of empowering the FNC ensured the maturing and success of the UAE parliamentary experience through a deliberate step-by-step approach that represents one of the peculiarities of the UAE model and its sources at the same time.

Political participation, especially for Emirati women, is a powerful catalyst for the new generations to contribute strongly to work and production and take responsibility for national action in various development sectors. It also ensured that the UAE model was fortified against sedition and conspiratorial plans that exploit any gaps that could be implemented to wage the fourth-generation wars to destabilise security and social stability and dismantle the strong bonds underlying societies.

Although the UAE society is characterised by qualities and characteristics that keep it away from many of the problems and dilemmas suffered by other Arab societies due to external interference, the fact that the evil forces are lurking in wait for everyone makes it necessary to fortify all societies against any plans. Thus, the democratic festivity witnessed by the UAE through the fourth electoral experience is a very important step in the field of empowerment. Perhaps this step is achieved through a framework that bears the hallmarks of the UAE and its cultural and civilisational characteristics through a gradual approach that represents an added value for this achievement.

Women form 50 per cent of the Parliament members, which is one of the highest representation of women in parliament in the world. These are indicators of global competitiveness of the UAE in terms of gender balance indicators and the achievement of the goals of the UAE Vision 2021, thus becoming one of the first countries to achieve the goals of the 2030 UN Agenda for Sustainable Development.

National Security:
Cooperative and Tech Savvy Efforts Across the Middle East

In approaching the end of this decade, there has been renewed optimism for a safer and more harmonious future across the Middle East and the GCC in particular. Nations are seeking to collaborate on cross-border transport links, large-scale renewable energy projects, smart city initiatives and heightened joint-security strategies.

Indeed, existing and emerging threats have both shown themselves ready to cause disruption and chaos at a moment's notice. From increasingly sophisticated cybercrime to older practices of smuggling drugs and weapons, ME nations are now conscious that their national security faces unceasing attacks both from terrorists and organised crime.

The capacity to act decisively and pre-emptively is now essential and pursued by every major ME nation, with individual countries aiming to improve the security of their vital infrastructure and build new technologically-advanced capabilities. In making these changes while expanding and improving existing military, police and other security-related equipment or assets, the GCC is forging ahead with new regional and individual national security programmes, so boosting its combined defence budget to a record US$100 billion by the next decade.

Spending across the homeland and commercial security market is also set to rise in the Middle East. Estimated to be over US$12.2 billion in early 2018, it is now predicted to double over four years to hit US$25.3 billion in 2022, representing a massive 33 per cent CAGR.

Key Regional Threats

The metastasis of terrorism has put the world on alarm, trying to map out future targets and breeding sites for insurgency cells. From New Zealand to Sri Lanka, recent attacks on public spaces are establishing a changed operational environment, but national security forces are adapting to cope with this threat through deterrence and social media monitoring on one hand, and lawful interception and surveillance on the other; not only for crime prevention but crisis management and negotiations.

Abu Dhabi has developed an AI empowered 'Safe City' Centre to enhance and maintain its reputation

No less alarming are the rising tensions in the Arabian Gulf and the hostilities against commercial assets, which are driving up defence procurements and increasing personnel numbers for regional and allied forces stationed close to the field of operations. With more than 70 per cent of GCC trade carried out by seaborne conveyance, it is vital that sea route security is reinforced.

Lastly, traditional issues such as drug trafficking, illegal smuggling, human trafficking and IEDs call for innovation. There have been notable improvements in security controls for national entry-and-exit points at airports, seaports and border crossings.

Terrorism: Despite a trend of declining terrorism attacks and fatalities worldwide, many of the world's deadliest groups still operate throughout the Middle East with continued activity from Islamic State and Al-Qaeda.

Cybercrime: Cybercrime is one of the most serious and penetrating threats facing the Middle East today. From low-level but high-volume fraud incidents to cyber-attacks that could cripple critical infrastructure, hackers remain a leading threat to national security.

Cybercrime is one of the most serious and penetrating threats facing the Middle East today

One of the largest oil companies, Saudi Aramco, suffered the worst hack the world had ever seen three years ago. Meanwhile, cyber-attacks against other ME countries are increasing, with 12 per cent more attacks reported in the first three months of 2019 compared to the same period last year.

Cross Border Smuggling: Moving narcotics, illegal arms and other contraband from one country to another by land, air or sea presents challenges to regional and international security in combatting the financing and equipping of the world's most dangerous criminal and terrorist organisations. Recent estimates suggest that drugs alone may account for up to 40% of funding for extremist groups.

UAV (Drone) Based Attacks: From military-grade assault drones to commercially-available UAVs adapted for combat, Unmanned Aerial Vehicles are becoming a more visible threat across widening contexts.

As UAV technology floods the Middle Eastern market, more and more unidentified drones are causing shutdowns and security concerns at airports and other critical infrastructure. While the technology develops and the capabilities of even basic UAV models improve, better countermeasures need to be implemented to stop deadly attacks.

3D-Printed Firearms: While expensive and limited in their ammunition capacity, 3D-printed guns present a

serious security threat in being created without a serial number, rendering them untraceable. They are also plastic, making them easier to transport past traditional security designed to detect metal.

Technologies Transforming Security Solutions

With the rising security risks of terrorism and cybercrime, the global emergency response market is predicted to rise almost threefold from US$50.4 billion in 2012 to US$131.6 billion in 2019. Many GCC member states continue to invest heavily in homeland security, surveillance and defence technologies and solutions, giving us the opportunity here to outline the key security solutions and technologies that are turning the technological tide.

Robots are used by troops to defeat IEDs

Advanced Infrastructure Security

The fundamental elements of national infrastructure are likely targets for criminal and terrorist actors, particularly points of ingress/egress such as ports and airports. This constant and pervasive threat is representative of the rapid growth of the global Critical Infrastructure Protection market, expected to reach US$135.48 billion by 2025.

In turn, US$100 billion is currently being invested across the Middle East on airport-related upgrade projects, with the industry seeing a raft of new and emerging security technologies being installed in the most prominent ME airports. Biometrics, drones, AI-enabled security and surveillance measures are making airports and similarly important infrastructure more resistant to attack and therefore more capable of stopping the flow of unauthorised persons and illegal shipments.

With over 89 million passengers served annually, Dubai International is one of the world's busiest airports. It has been steadily upgrading and enhancing its security systems by implementing the latest technological advances in biometrics, automation and

A fully integrated, real time data visualisation centre

the IoT (Internet of Things).

Last year, Dubai opened the Airport Operations Control Centre (AOCC), which provides staff with real-time data feeds from every part of the airport while tapping into over 90 applications and collating data managed by 120 staff across 12 video screen walls and 96 workstations. The AOCC has been built to be a fully resilient and integrated nerve centre for the airport, dramatically improving its response capabilities in any emergency and allowing for greater vigilance across every daily operation.

The security processing of passengers and cargo has also been completely overhauled at Dubai International. With smart gates and other biometric-empowered security features, the airport can now capture passengers' biometric footprint which they can utilise throughout their journey in a swift, seamless and unobtrusive manner.

Comprehensive Cybersecurity Solutions

The UAE has been a prominent target for cybercrime for many years, routinely placing it in the top 5 spots of the annual global rankings. Hackers and cybercriminals can attack from anywhere in the world, requiring private and public sectors to partner in providing comprehensive cybersecurity setups for all critical infrastructure related to national security.

National Security Middle East

The 6th edition of the National Security Middle East Summit will be held for the first time in Manama, Bahrain on 15th-16th October 2019, co-located with the Crisis Management and Emergency Response Summit to create a large venue where every aspect of the national security ecosystem will be discussed by senior officers and regional thought leaders. This event is a must for industry leaders who can meet directly with experts from homeland security, police, coastguards, border guards, airports and ports, industrial security and armed forces across the land, air and sea domains in order to discuss how to enhance regional capabilities and provide a superior counter to the predominant security threats in the region.

In 2015, Kaspersky reported that 2 million Emirati citizens had been targeted by hackers, with 20 per cent believing that their data had been compromised. Prompted into action, in 2016 the UAE Government pledged a doubling of its cybersecurity spending to US$10 billion, while drawing up a national cybersecurity strategy for the development of a raft of new and developing security measures.

The UAE is fast becoming a global leader in digital innovation, safety and security, seeking out global partners to share and shape international best practice. There is great need for such development as, in July and August 2019, Bahrain's National Security Agency and the Ministry of Interior came under sustained cyber-based assault, alongside parallel attacks launched at several of the country's critical infrastructure services providers.

While the exact nature and origin of the Bahraini attacks have not been revealed, their sophistication suggests a state-level or state-sponsored attacker. Conventional wisdom points to a demonstration of capability, designed to send a message not only to Bahrain but also to its regional allies and the

NATO officers checking for IEDs on the ground

U.S., who maintain a strong presence in the country.

Advanced Training Techniques

While technology gives security professionals an edge in preparing viable long-term strategies, access to tech needs to be paired with the necessary training of personnel who are to use it effectively. The advanced training of border patrollers, customs officials, police officers and other security professionals can also improve their observational skills and tactical capabilities, maximising their effectiveness in the long-term fight against malicious actors.

With an already impressive track record of providing effective security without hampering trade flows, the UAE is investing even more heavily in the training and equipping of security forces as part of its unified national customs strategy. Between January and September last year, Dubai Customs reported 922 successfully prevented smuggling attempts, of which 38.5 per cent were related to narcotics, while customs officers routinely undergo training programmes set to international best practices in understanding body language, drug and contraband identification and the ever-evolving tactics of criminal elements.

Artificial Intelligence-based Security

Even the most well-trained and diligent security officer cannot hope to spot and respond to every threat within their remit; hence, keeping up with their adversaries requires security institutions to join the raw data-processing power and analytical abilities of AI with the instincts and intuition of their human officers. This powerful combination of tools is revolutionising the manner in which Middle East institutions design, plan and execute security strategies.

The UAE is investing even more heavily in the training and equipping of security forces as part of its unified national strategy

Abu Dhabi has developed an AI empowered 'Safe City' Centre to enhance and maintain its reputation as one of the world's safest cities. Here 14 interconnected technical systems gather, collate and analyse data gathered from across the city to provide Abu Dhabi Police with a constantly updating picture of traffic flows, incidents, security issues and other vital situational data in the event of emergencies.

AI is also at the heart of the Oyoon Project, another key UAE security ini-

tiative whose large-scale technology implementation plan involves fitting thousands of cameras with facial recognition software and microphones to enable police to track and analyse movements of individuals of interest instantly, utilising real-time data on developing criminal situations. Oyoon is a prime example of the UAE's determination to leverage technology to its fullest potential in the fight against crime and national security threats, aligning with further plans to integrate AI surveillance systems and even robotic police officers.

International Combined Security

As no single nation has the reach or resources to combat modern cyber threats fully and continually, ME governments are having increasing success in pooling their resources with regional partners and international allies. By forging strategic partnerships based on shared responsibility and intelligence, the surveillance and security levels of any targeted area can be dramatically boosted.

> As UAV technology floods the Middle Eastern market, more and more unidentified drones are causing shutdowns and security concerns

Based in Bahrain, Combined Task Force 150 is a coalition naval task force made up of 25 participating nations, which has proven instrumental in combatting piracy off the coast of Somalia and smuggling interdiction operations. From December 2018 to February 2019, CTF-150 was responsible for seizing more than 22,000 kilos of narcotics within just three months across its 3.2 million square kilometre area of operations across the Gulf of Oman, Red Sea and Indian Ocean.

Countering Tomorrow's Threats Today

Although budgets were cut over 2014-2015, the Middle East continues to increase its spending and procurement for increasingly modern security and defence-based solutions. Given the variety of severe threats arrayed against the region, this trend is unlikely to slow any time soon. The Middle East has already shown its willingness to invest heavily and collaborate openly to protect itself comprehensively from both new and existing threat types, presenting excellent opportunities to develop greater security capabilities across the region.

Reference Text/Photos:
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www.defenceiq.com
www.nato.int

Combined Task Force 150 is a coalition naval task force made up of 25 participating nations

ARCHER Mobile Howitzer

"Powerful Precision, Versatile Mobility"

BAE Systems unveiled its ARCHER Mobile Howitzer at DSEI 2019, a new model highly adaptable to diverse terrains and battlefield conditions with the flexibility to meet a wide range of mission requirements. ARCHER's combination of precision, mobility and intense rate of fire makes it a key tactical asset in fast-moving combat situations.

ARCHER's modular design enables integration into different truck chassis for existing vehicle fleets. This makes it a cost-effective solution offering critical battlefield capabilities.

First delivered to the Swedish Armed Forces in 2013, the original ARCHER was mounted on a Volvo A30 6X6 articulated hauler. However, the ARCHER system displayed at DSEI 2019 was mounted on a Rheinmetall RMMV HX2

8x8 truck, entailing its commonality with systems already in service with the British Army.

"This new international version of the ARCHER can be easily integrated onto different chassis, allowing the customer to specify the vehicle best suited to their needs," said Ulf Einefors, Director of Marketing, and Sales at BAE Weapon Systems in Sweden. "We're pleased to demonstrate the versatility that ARCHER could add to any allied military force."

Next Generation Artillery System

The modern battlefield is characterised by a multitude of threats and challenges; hence, combat units must be able to work together effectively to improve survivability. As one of the world's most advanced artillery systems with high mobility and precision, ARCHER represents the next generation of wheeled artillery systems built to keep up with fast-moving ground forces.

Based on proven subsystems with an extensive ammunition portfolio, ARCHER combines powerful and flexible fire support with high levels of autonomous operation under protection. It is a fully automated, self-propelled 155 mm, 52-calibre howitzer developed for the fragmented battlefield, where loading, laying and firing is handled from inside the armoured cabin, offering full protection for the crew at all times.

The long-range, self-propelled ARCHER also offers the safety of an armoured cabin. From the time the operators receive a call for fire, the three-person crew needs less than 20 seconds to stop the vehicle, position for action and fire the first round.

Less than 20 seconds after the mission is accomplished, ARCHER is on the move again, making it the ultimate shoot-and-scoot artillery system. With a road-speed of up to 45mph or 70km/h with a manoeuvre range of 1,000 km per day, the ARCHER system has thus been developed specifically for mobility in the most difficult terrain.

Operators control the entire gun system from the safety of ARCHER's armoured cabin which offers four workspaces, even though the system requires only one person for operations. A standard ARCHER team would consist of the gun commander, gun operator, and driver, while aircraft such as the C17 and A400M "Atlas" can transport the system in its entirety.

Next-gen Training Simulation

BAE is ensuring that operators can improve their skills by using realistic training simulators as a safe and cost-efficient way to teach the crew ARCHER operating procedures.

The advanced digital classroom-training simulator guarantees that the crew are fully trained in all aspects of operation, including a simulator built into the gun system enabling on-the-job training for different combat scenarios.

Protection

The crew cabin is protected against nuclear, biological and chemical (NBC) threats, artillery fragmentation, mine attack and blast overpressure, while also being separated from gun and ammunition meaning that they never have to leave the cabin during combat, which further enhances survivability.

The system also features a Remotely Controlled Weapon Station (RCWS) mounted on top of the crew compartment, with Optional Advanced Multispectral Camouflage System enhancing protection. Its firing range is is very precise, in excess of 50 km with a rate of fire of up to nine rounds/minute and fully automated magazines carrying 21 shells and modular charges.

Powerful C3 Integration

ARCHER can operate autonomously in tandem with today's command and control systems, while on-board ballistics calculation enables autonomous operation. With automated ammunition management capability and automated electronic fuse setting (NATO standard), ARCHER also features open architecture interfaces for Battlefield Management System.

Fully digitised fire missions then minimise the risk of human errors and reduce response time. Meanwhile, precision navigation is provided by easy integration of radios for voice and data communication and GPS-supported INS.

Fire for Effect

ARCHER has an efficient tracking capability and an intensive rate of fire, engaging stationary and moving ground or sea targets with high precision. It carries 21 complete rounds, which can all be fired in 2.5 minutes from fully automated magazines alongside an autoloader and on-board ballistic calculation.

The ARCHER artillery system's ammu-

Excalibur

nition resupply system is supported by an Ammunition Resupply Vehicle (ARV) designed to provide a complete reload of the howitzer within minutes. The modified standard ISO container carries up to 100 rounds and can be mounted on any container-carrying vehicle, then reloaded in 5 minutes with a support vehicle carrying crew supplies.

The magazines handle all types of 155 mm artillery ammo, including advanced sensor-fused and precision-guided munitions. Rounds can be fired at distances up to 40km with conventional 155mm ammunition and to 60 km with precision-guided munitions, including the Excalibur.

M982 Excalibur: Fully qualified in multiple systems, including the M777, M109 series, M198, the Archer and PzH2000, Excalibur munition is compatible with every howitzer so far tested for it. The Excalibur is also compatible with the AS90, K9 and G6 howitzers, while plans are underway to integrate it with other mobile artillery systems.

With more than 1,400 rounds fired in combat to date, the Excalibur artillery projectile is the revolutionary, extended-range, precision munition for U.S. and international artillery forces. Thus, in reducing the logistical burden for artillery forces, the Excalibur projectile is a true precision weapon, impacting at a radial miss distance of less than two metres from the target.

Unlike "near precision" guidance systems, the Excalibur weapon provides accurate first-round effects at all ranges in all-weather conditions. This weapon system also extends the reach of .39-caliber artillery to 40 km and of .52-caliber artillery to more than 50 km. The Excalibur projectile's exceptional level of precision hence enables a dramatic reduction in the time, cost and logistical burden associated with other artillery munitions. On average, other projectiles have been shown to take at least 10 conventional munitions to accomplish what one Excalibur weapon can do.

Coupled with its ability to be integrated on multiple gun systems, the Excalibur projectile's precision is of great benefit to the U.S. and its coalition partners. It provides overmatch capabilities against stationary and moving land targets in a variety of combat environments. Sweden, Canada, Australia and the Netherlands have chosen the Excalibur precision-guided projectile to address vital security interests and several other international partners are finalising procurement plans.

Successfully tested in 2018 and now deployed to U.S. forces, Raytheon has developed the Excalibur Shaped Trajectory (EST) variant enabling soldiers to eliminate targets in hard-to-reach

ARCHER combines powerful and flexible fire support with high levels of autonomous operation

locations by selecting the projectile's terminal or final phase attack angle. The Excalibur N5 munition has been developed as a laser-guided 5-inch variant of the projectile, which incorporates a digital semi-active seeker to hit moving targets and engage targets without accurate location information. Named the Excalibur S, it also reduces the risk associated with GPS jamming.

Finally, the Excalibur N5 is a sea-based projectile expected to more than double the maximum range of conventional 5-inch munitions with the same accuracy as the land-based version. The Excalibur precision-guided projectile has been co-developed by Raytheon Company and BAE Systems Bofors.

155 mm BONUS: This BAE Systems-built Archer artillery guns can successfully detect and combat heavily armoured vehicles within 35 kilometres. Compatible with the majority of existing artillery guns, BONUS is handled just like a conventional shell.

The munition also features a base-bleed design, increasing its range to a maximum of 35 kilometres when fired from a NATO L52 gun. When launched from any 155-millimeter artillery system, the BONUS carrier shell separates to deploy two sensor-fused munitions searching for targets within a given footprint.

Each of the two expelled munitions seeks and neutralises its own target independently, and by carrying two smart munitions within the BONUS shell its mission success per round is greater than with traditional ammunition. Sweden has used this smart munition since 2003 which is developed and produced in cooperation by BAE Systems in Sweden and Nexter in France, and used by Finland, France, Norway and Sweden.

Depending on customer requirements, the ARCHER charge magazine can be adapted for either conventional bags or modular systems, with fire capabilities including direct fire and Multiple Rounds Simultaneous Impact (MRSI). Precision targeting is achieved using highly integrated components in the gun computer system, such as ballistic calculation, while firing and operation of the gun computer can be handled automatically or manually, providing ultimate flexibility.

The combination of precision, mobility, and intense rate of fire makes ARCHER a key tactical asset – especially in fast-moving combat situations

Reference Text/ Photo

www.raytheon.com

www.baesystems.com

Technical Specification

Width: 3.0 m
Height: 3.4 m
Length: 13.1 m
Weight: 33,000 kg
Fuel: Diesel tank 400 litres
Calibre: 155 mm
Barrel length: 52 calibre
Crew members: 3
Ballistic protection: Fragment, Bullet, AT mine
MRSI: Up to 6 rounds
Direct fire: Day and night capability

ARCHER system is one of the world's most advanced artillery systems with high mobility and precision