SAHA EXPO
25-28 OCTOBER 2022
ISTANBUL TURKIYE

DAY
3
THURSDAY
27 October 2022

MİR USV & SANCAR AUSV AT SAHA EXPO 2022

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TAWAZUN: "SAHA EXPO has been a **Very Informative & Rewarding Experience for Us.**"

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Exclusive Message on SAHA EXPO 2022 from Prof. Hasan MANDAL

Unmanned Surface Vehicles (USV) are one of the highlights at the SAHA EXPO 2022 International Defense & Aerospace Exhibition, organized by SAHA İstanbul at the İstanbul Expo Center between October 25-28, 2022, under the auspices of the Turkish Presidency and with the participation and support of the Ministry of Foreign Affairs, Ministry of Interior, Ministry of National Defense, Ministry of Industry and Technology, Ministry of Trade, and Defense Industry Agency. In this context, the modular MIR USV, developed in cooperation with ASELSAN and SEFİNE SHIPYARD, and the SANCAR AUSV, developed by HAVELSAN and YONCA-ONUK for the Anti-Submarine Warfare (ASW) role, will be exhibited at the booths and foyer areas of the companies.

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THIS EXHIBITION IS ORGANIZED WITH THE AUDIT OF TOBB (THE UNION OF CHAMBERS AND COMMODITY EXCHANGES OF TURKEY) IN ACCORDANCE WITH THE LAW NO 5174.

We are participating in the "SAHA EXPO Defense, Aerospace Industry Fair", held for the third time this year. The participants will be TÜBİTAK BİLGEM, TÜBİTAK MAM, TÜBİTAK SAGE, TÜBİTAK ULAKBİM and TÜBİTAK UZAY.

SAHA EXPO gains importance in terms of showing Türkiye's progress in the industry and technology journey, domestic and national production target, especially in the last 20 years. At the same time, this organization creates important awareness and impact in the sector. In terms of sustainability, it is critical to increase the competence of human resources in the defense industry.

For this purpose, the MBA Executive Development Program that was organized in cooperation with SAHA İstanbul and TÜBİTAK TÜSSİDE is very valuable for us. I was very happy to attend the graduation ceremony of this program within the scope of SAHA EXPO. I would like to thank SAHA ISTANBUL once again for starting such an initiative by identifying the need and accepting TÜBİTAK as a stakeholder in the solution.

Today, we face different problems than in the past. We will face challenges such as extreme events based on climate change, epidemics and, accordingly, more difficulties in food supply security and the emergence of more epidemics in the coming years. Because the problems we are facing currently are much more complex, variable and dynamic, old solution methods and traditional knowledge production approaches will not be sufficient. Therefore, there is a need for an innovative model based on co-development and co-learning. As TÜBİTAK, we act with this perspective and you can see understand it by looking at our stand.

The field of defense is so important that the national sovereignty of countries is threatened even from space. As our Minister of Industry and Technology Mr. Mustafa VARANK stated, it is unthinkable that Türkiye lags behind in the space race and does not invest in this field. At this point, you can examine the models of satellites developed by our UZAY Institute. İMECE, which will be Türkiye's first domestic and national earth observation satellite with sub-meter resolution, and TÜRKSAT-6A, which will be Türkiye's first domestic and national communication satellite, will be launched in 2023. We will also send a Turkish citizen to the ISS. Therefore, 2023 will be a year for Türkiye to be assertive in space.

At the same time, we are signing important cooperation agreements within the scope of SAHA EXPO.

We will do much better work by sharing experience and knowledge in the fields of space and defense.

We are happy with the feedback we are getting from visitors regarding the high-tech products that we have developed.

We welcome everyone to the TÜBİTAK stand.

Prof. Hasan MANDAL
The President of The Scientific and Technological Research Council of Türkiye (TÜBİTAK)

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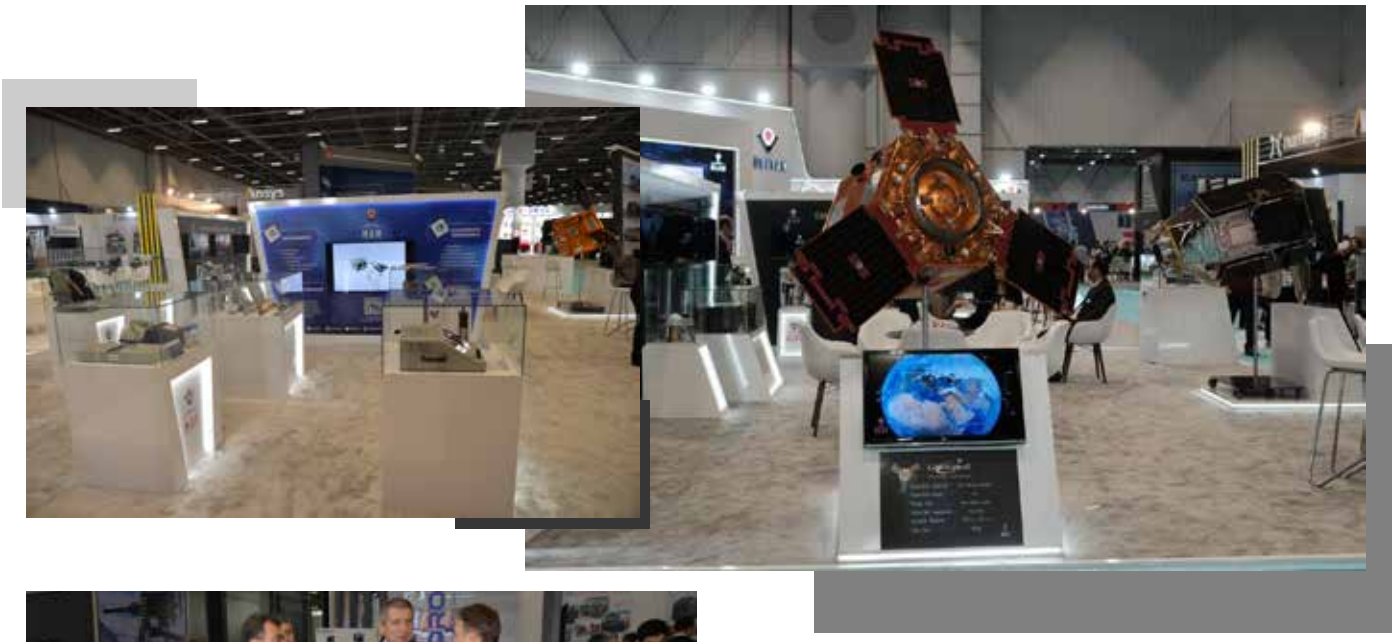

TÜBİTAK at SAHA EXPO **with High-Tech Products**

TÜBİTAK is exhibiting its capabilities in munition and military systems needed by the Turkish defense and aerospace industry at SAHA Expo.

The "MÜREN Integrated Combat Management System," which was developed by TÜBİTAK Informatics and Information Security Research Center (BİLGEM) under the "PREVEZE Class Submarines Combat Management System Modernization Project," was exhibited at SAHA EXPO, where TÜBİTAK participated with five institutes. "OZAN," the easy-to-use lightest foldable metal detector with a weight of 1.5 kilograms, which can work for 8 hours with 8 AA batteries, and the Integrated Processing Unit Project carried out under the National Combat Aircraft (MMU/TF-X) Program are also exhibited at the fair. The Fiber Optic Based Acoustic Sensor (FOTAS), which can ensure the security of the military, public, private facilities, border security, oil, natural gas, and water pipelines, and can perform real-time detection up to 50 kilometers, is also among the products on display.

With the MÜREN-PREVEZE Combat Management System (CMS) Project, TÜBİTAK BİLGEM developed a National Submarine CMS, including analog and digital sonar signal processing, target motion analysis (TMA), system track management, and finally, the fire control system, which provides the whole chain that a modern submarine combat management system should have. Integration of the systems into TCG Preveze was completed in just 9 months after the acceptance of the Land Based Test System, thanks to BİLGEM's 20 years of experience in this field and the capabilities it has acquired through past projects on the way to developing the MÜREN-PREVEZE CMS. In this context, more than 20 sensors and navigation systems, both existing and newly developed, have been successfully integrated into the submarine Within the scope of the project, command control systems, fire control systems, sonar signal processing algorithms, and software are developed by TÜBİTAK BİLGEM, while operator consoles, electronic and weapon cabinets, submarine information distribution system, sonar front electronic units are developed by other Turkish defense industry companies.

TÜBİTAK BİLGEM delivered the Integrated Processor Unit Prototype developed for the National Combat Aircraft (MMU/TF-X) at the end of August 2022 as part of the Integrated Processor Unit Project. The Integrated Processor Unit (IPU) and Avionic Interface Unit (DCU) prototypes delivered to TUSAŞ will perform the Aircraft

Management System and Mission Management System functions of the MMU, which is planned to be rolled out on March 18, 2023. 1 IPU and 4 DCUs will be used in the MMU Development and Test Aircraft - 0 (GTU-0), which will roll out from the hangar and start its engines. This computer system, which will manage the aircraft systems by taking the pilot's commands, provides information to the pilots via the Wide Area Display and allows giving commands on the touchscreen. Several new technologies, such as the new multi-core version of the National Real-Time Operating System, Deterministic Network Technology, Avionic Digital Video Bus, and High-Speed Multi-Core Processors, are used on this prototype chassis. IPU is a very important national technology for MMU/TF-X, and TÜBİTAK BİLGEM will deliver more advanced versions in the future.

TÜBİTAK Marmara Research Center (MAM) displays its products, such as Chemical Warfare Agents Detection System for Drinking Water, Chemical Warfare Agents Detection Device, Fuel Cell Charging System, Carbon Dioxide Calipatron, Polymer-Bonded Explosives to the exhibitors.

Scientific and Technological Research Council of Turkey (TÜBİTAK) Defense Industries Research and Development Institute (SAGE), one of the most important design offices and R&D centers in the Turkish defense industry, also participates at the fair with its capabilities in ammunition technologies. The high precision and low-cost "KUZGUN" modular munition family and fire-and-forget air-to-surface free-fall smart bomb "KAYI" designed for UCAVs are also at SAHA EXPO. "BOZOK" guided bombs and GÖKÇE and KGK-SİHA-82 guidance kits, developed by SAGE, are also exhibited at the fair.

PARDUS 21, AHTAPOT Integrated Cyber Security System, Liderahenk Central Management System, and ENGEREK Identity Management System, developed by the National Academic Network and Information Center (ULAKBİM), are also on display.

TÜBİTAK Space Technologies Research Institute is exhibiting RASAT (Türkiye's first domestic and national earth observation satellite), GÖKTÜRK-II, İMECE (the first domestic and national earth observation satellite with a sub-meter resolution), and TÜRKSAT-6A, which will be the first domestic and national communication satellite.

TÜBİTAK also signed various cooperation agreements with the Turkish Space Agency (TUA), SAHA İstanbul, and several companies within the scope of SAHA EXPO 2022 in the first two days of the fair.

Cooperation Agreement Between TÜBİTAK SAGE & TİTRA **DELI Tactical Loitering Munition System Debuted**

A Cooperation Agreement between TÜBİTAK SAGE and TİTRA on the development of the DELI Tactical Loitering Munition System (Kamikaze Drone) was signed on the second day of SAHA EXPO 2022 International Defence and Aerospace Exhibition with the participation of TÜBİTAK SAGE Director Gürcan OKUMUŞ and TİTRA CEO Dr. Davut YILMAZ.

Following the signing ceremony, at TİTRA booth SAHA EXPO Daily has created an opportunity to get first-hand information from TÜBİTAK SAGE Director Gürcan OKUMUŞ and TİTRA CEO Dr. Davut YILMAZ on both DELI Tactical Loitering Munition System and the new warhead developed specifically for it by TÜBİTAK SAGE.

Davut YILMAZ, CEO of TİTRA, underlined that the most important output of the project is a cost-effective product, and added: "TİTRA and TÜBTAK SAGE together decided to call the product DELI. It is an abbreviation for Cost-Effective Hand-Launched UAV. As a result, achieving cost efficiency is our top priority. Being as effective as possible when it reaches the target is our second priority. This will be achieved by TÜBİTAK SAGE. Ease of use is our third priority. It is designed to be both hand-launched and catapult-launched. We do not intend to launch this system from UAVs or any other platforms. We preferred to design it so that it could be carried by a single soldier, deployed quickly, and launched from any catapult system. Consequently, our concept will be quite different."

TÜBİTAK SAGE Director Gürcan OKUMUŞ noted that the advancements for small platforms and kamikaze drones have recently accelerated, and they are now widely used around the world. "The platform needs to be well stabilized. In addition, the effectiveness of the warhead also becomes crucial. We need to conduct an effective analysis specific to that platform and then ensure the proper effectiveness and airburst fragmentation on the target point. We want to significantly boost the warhead's effectiveness, even if it is small. We meticulously do the analysis to obtain such effectiveness. In this sense, excellent work is being done here. We have developed a design that is compatible with the platform, and I anticipate that we will soon start conducting live tests."

The multi-role DELI Tactical Loitering Munition System (Kamikaze Drone) to be developed with the Cooperation Agreement will have swarm capability and physical features suitable for use by a soldier. It will be fitted with a warhead developed by TÜBİTAK SAGE that is effective against both infantry and certain types of targets.

DELI Tactical Loitering Munitions stands out with its 85 km operational range and 75 min endurance compared to its rivals. DELI has a maximum take-off weight of 13 kg. The warhead is located just under the wings (wing-body junction point) of the platform and weighs almost 3.1 kg. The platform can also reach a maximum speed of 180 km/h. The cruise speed is 80 km/hr. DELI's operational altitude specified in its brochure is between 150-500 m. It can also reach an altitude of up to 3,500 meters.

Cooperation Protocol Between TÜBİTAK SAGE and ASARTECH on the **Nationalization of Radio Frequency (RF) and Microwave Ceramic Filters used in Radars**

The protocol aims to eliminate the foreign dependency of our country in this field by manufacturing Radio Frequency (RF) and Microwave Ceramic Filters, which are all imported from abroad, with national means in Türkiye. Radio Frequency (RF) and Microwave Ceramic Filters are included in the Priority Product List of the Tech-Driven Industry Initiative of the Ministry of Industry and Technology. These filters are used in high quantities in defense and communication applications, especially in radar systems.

Very High-Pressure Composite Tubes to be Developed Nationally

TÜBİTAK SAGE and SİMA Alüminyum signed a cooperation protocol during SAHA EXPO. The parties will conduct studies to develop and domestically produce very high-pressure composite tubes used in weapon and missile systems, using their know-how in their fields of expertise.

TÜBİTAK BİLGEM and TÜBİTAK SAGE **Signed Cooperation Protocol with TUA for CubeSat Technologies**

A cooperation protocol was signed between the Scientific and Technological Research Council of Türkiye (TÜBİTAK) and the Turkish Space Agency (TUA) at SAHA EXPO with the participation of Industry and Technology Minister Mustafa VARANK. The protocol was signed by the President of TÜBİTAK, Prof. Hasan Mandal, and Chairman of The Board & President of TUA, Serdar Hüseyin YILDIRIM.

Minister VARANK: "If we want to be a fully independent country, investing in space is not an alternative but a necessity."

Speaking at the ceremony, Minister VARANK said, "With the agreement signed today, we started a strategic cooperation between TUA, which is responsible for Turkey's national space program, and TÜBİTAK's institutes SAGE and BİLGEM. Cube satellites have now gained much more importance in space studies. Previously, TÜBİTAK National Metrology Institute (TÜBİTAK UME) had signed an agreement on atomic clocks to be used in Regional Positioning Systems that Türkiye plans to develop. We want to send those atomic clocks with cube satellites to test their use in space. With the agreement we signed today, we will implement both the development of propulsion systems to be used in cube satellites and the development of their software, especially for navigation systems, with TÜBİTAK SAGE and TÜBİTAK BİLGEM."

The cooperation between the TÜBİTAK Informatics and Information Security Research Center (TÜBİTAK BİLGEM) and TUA aims to carry out studies on software, data security, and artificial intelligence to be used in cube satellite technologies. The cooperation will contribute to Türkiye's future steps and achievements in space exploration.

TUA cooperates with TÜBİTAK Defense Industries Research and Development Institute (TÜBİTAK SAGE) on aerospace technologies within the framework of the National Space Program by using the infrastructure and expertise of the parties. Under the protocol, the parties will conduct studies to create advanced technology products with a high-added value in Türkiye for space exploration systems.

"The Overall Performance of 2nd AMFD in Kayseri on **A400M Maintenance is Fantastic**"

On the occasion of the SAHA EXPO 2022 International Defence & Aerospace Exhibition, SAHA EXPO Daily created an opportunity to have an exclusive interview with Airbus Defence and Space (ADS) Vice President & Head of Sales Southern Europe and Israel Bruno LAMARQUE and Chief Representative Airbus Turkey Simon WARD at the Airbus booth to get first-hand information on major activities carried out by Airbus Defence and Space during the first 9 months of 2022 and on the current status ofA330 MRTT and A400M Programs as well as the twin engine version of A400M for which ADS still trying to get launch customer. We also took the opportunity to ask them about the current activities of Airbus in Turkish market regarding the on-going modernization/ procurement programs as well as on the level of cooperation with 2nd Air Maintenance Factory Directorate (AMFD) for the A400Ms.

SAHA EXPO Daily: Could you give us an overview of 2022's first 9 months from Airbus Defence & Space (ADS)'s point of view? Could you provide a capsule summary of your major activities carried out during the first 9 months of 2022?

Bruno LAMARQUE: The first 9 months were pretty good. We clearly see dynamic growth in the defence market and also in the space market. So we are expecting this years results to be good for our defence and space activities. If I have to highlight some topics I would say we have a very good prospect for A330 MRTT which is the world leader so there is a very good momentum for this aircraft. Also the C295 in the various configuration of this product. This was indeed also a very good year. We were able to get both TÜRKSAT 5A and 5B Satellites in operation

with a smooth transition with our customer TÜRKSAT.

SAHA EXPO Daily: Can we say that as in the case with civil aviation there is also that kind of recovery in military aviation in terms of Airbus business operations?

Bruno LAMARQUE: In civil aviation terms there has been a very fast recovery in particular within Turkish carriers. And in fact they have exceeded 2019 passenger traffic already. Turkiye is leading the world in the recovery of civil aviation. On defence products due to the war between Russia and Ukraine has made governments realize that they have made over the past years a lot of budget cuts in defence. And now governments are trying to catch up and increasing their defence expenditure to somehow try to recover from the past years. Now Russia has reopened a new era where we see defence expenditure increasing particularly within Europe.

SAHA EXPO Daily: Does Airbus (ADS) have any plan to utilize the 2nd Air Maintenance Factory Directorate (AMFD)'s A400M retrofit capabilities to meet the global A400M users' requirements? Can you elaborate on the performance of the 2nd AMFD in A400M overhaul services?

Bruno LAMARQUE: Yes, we have a very solid cooperative business and industrial relationship with the 2nd AMFD in Kayseri, they have developed very good capabilities. We plan to use these capabilities together with the second factory to support new customer countries for example Uzbekistan and Kzakhstan. I would personally like to extend my sincere thanks and appreciation to the team 2nd AMFD.

SAHA EXPO Daily: Can you elaborate on the performance of 2nd AMFD in terms of A400M and overall program services?

Bruno LAMARQUE: They are the benchmark maintenance facility in the world for A400M.

SAHA EXPO Daily: I visited 2nd AMFD last year and they made really good investment and they are planning to make further investment at that time they told me that they have discussions with Airbus further training to get more deepen workshare on the program.

Simon WARD: The overall performance of 2nd AMFD in Kayseri on A400M maintenance is fantastic. 85% availability of the A400M Aircraft is the benchmark for maintenance facilities in the A400M Program. Significant investment in Kayseri to get that point and get beyond has required a very supportive partnership now we are working together to generate an export market for Turkey's maintenance capability. It is the customers who control where the aircraft are maintained so it is necessary to work together with Kayseri to market that capability around the world. We are committed to doing hat.

Bruno LAMARQUE: We are talking about A400M maintenance for export market but we are also talking about using the capabilities of Kayseri for the MRTT Program in Turkey. Should Turkey purchase MRTT then Kayseri will have a significant workshare in this program as well.

SAHA EXPO Daily: Within the scope of A400M Line Maintenance Activities, Airbus subsidiary Airbus Defense and Space Turkey (ADSTR) has been providing maintenance and material management support to the TurAF's 12th Air Transport Main Base under the Global Support Service 2 Agreement. Can you elaborate on the current status of activities being performed under this agreement?

Simon WARD: Global Support Services (GSS) 2 contract comes to an end next year and then we have to evaluate with SSB and the 2nd AMFD maintenance base what support they require from Airbus. What they have been doing is gradually reducing the support they get from Airbus as they become more autonomous So, I would expect that trend will continue. The goal of Turkish Airforce is to become independent, and maintain their aircraft fleet to the high standards they are achieving today.

SAHA EXPO Daily: Few days ago I saw a Tweet on A200M medium transport aircraft, twin engine version of A400M transport aircraft. If it is possible can you elaborate on this program?

Bruno LAMARQUE: A200M will never be named again A200M, it is a very old brand name and is changed. We are still trying to get customers for twin engine version and for the moment we couldn't get a launch customer, however now we are discussing with European countries under a European program to have several countries join together and jointly become launch customers. Similar to the A400M approach but not exactly because this will be under the European Union (EU) defence fund program.

SAHA EXPO Daily: The veteran 9 KC-135R Stratotanker Tanker Aircraft in the inventory of the Turkish Air Force (TurAF) are expected to be replaced with the New Generation Tanker Aircraft and the A330 MRTT was one of two candidates being evaluated. According to the information I have received, within the scope of the project, which will be carried out under the coordination of ASFAT (Military Factory and Shipyard Management Inc.) within the Turkish Ministry of National Defence (MoND), a total of 7 A330 MRTT Aircraft are expected to be delivered to the TurAF, to replace the 7 KC-135R Stratotankers in the inventory on a one-to-one basis. Can you elaborate on the current status of A330 MRTT discussions with Turkey?

Bruno LAMARQUE: Unfortunately, not. We are still hoping. We submitted a proposal, we had discussions but for the moment there is no progress made and we are waiting. We believe this aircraft is the perfect aircraft for the Turkish Air force. However, we are waiting for MOD to come back to us so we can continue the discussion which started one year ago.

SAHA EXPO Daily: Can you elaborate on your short and long-term objectives, vision in Turkey?

Bruno LAMARQUE: It is quite easy. The most obvious one is the MRTT.

SAHA EXPO Daily: Do you expect any further order for A400M from Turkish Airforce?

Bruno LAMARQUE: There is no discussion right now. We believe Turkey soon will need more. But we don't know when and how many.

SAHA EXPO Daily: What can you tell us about ADS' participation at SAHA EXPO 2022? Did the first day made your expectations?

Simon WARD: We had many discussions with SAHA and they persuaded us that they really wanted to see us here. The organization is fantastic. For me the size of the Show and the amount of the high-level VIP is a pleasant surprise. It is much bigger than the previous years. So certainly we will be back.

SAHA EXPO Daily: Mr. LAMARQUE and Mr. WARD, thank you for sparing your time for our readers.

"SAHA EXPO has been *a Very Informative & Rewarding Experience* for Us"

SAHA EXPO Daily caught up with CEO of Tawazun Economic Council, Tareq Abdul Raheem AL-HOSANI during SAHA EXPO 2022 to discuss the UAE approach to industrial development in defense. We also took the opportunity to ask him how he thought UAE–Türkiye relations in the defense field. As of 2021 summer Turkish-Emirati relations have been witnessing a new round of normalization following an almost decade-long implementation of divergent policies in the region.

SAHA EXPO Daily: Could you take us for a brief walk through the history of Tawazun Economic Council (formerly UAE Offset Group) as an entity focused on defense and specialized manufacturing? How was it established and what has it accomplished to date?

H.E. Tareq AL-HOSANI: Actually, everything began in 1992, and Tawazun celebrated its 30th anniversary this year! The UAE Offsets Group was founded by the government in 1992 with the intention of diversifying the oil-dependent economy of the UAE and with an ongoing mission to expand the industrial sector. The Group worked to build and manage industrial relationships for the benefit of the UAE's sovereignty as well as wider economic effect and prosperity.

After a very successful period of development, the UAE Offsets Group was renamed the Tawazun Economic Council and began to further develop its strategic defense manufacturing capabilities. Tawazun became the originator and facilitator of global and local partnerships, stimulating and building supply chains, supporting local SMEs, and creating a globally integrated defense and security industry.

It has been a successful journey of 30 years, and one that has made a significant contribution to the UAE's economic growth and progress. Tawazun has ultimately enabled the creation of more than 111 companies and investment vehicles across 12 industry sectors. We are proud of Tawazun's capacity for creativity and innovation as well as its ongoing mission to expand the industrial sector, now primarily focused on the defense and security industry.

SAHA EXPO Daily: How would you best describe Tawazun today in terms of its assets and capabilities, and its experience and legacy? How would you position Tawazun in today's global defense market and where do you envision Tawazun to be 10 years from now?

H.E. Tareq AL-HOSANI: The Tawazun Legacy, 30 years of creativity and development, speaks for itself. From the beginning Tawazun has worked on the development of the defense industry amongst others. And over that time, our role has significantly grown and expanded along with our responsibilities.

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is thriving and is expected to continue expanding globally, regionally and locally. In the UAE we have more than 40 products and over 70 companies operating in defense manufacturing to offer various and diverse products and services.

Many of these companies maintain strategic relationships and partnerships with local and international companies. Their products are of high quality and they enjoy a competitive edge, against products in the global markets. We are very proud of our achievements and look forward to continuing by the grace of God.

SAHA EXPO Daily: What can you tell us about the approach of Tawazun to Türkiye, and how would you assess the current relations between the UAE and Türkiye in the defense field? In May 2022 during a meeting held at the SSB Headquarters and attended by Prof. İsmail DEMİR, and you (Tawazun Economic Council CEO Tareq Abdul Raheem AL-HOSANI) two memorandums of understandings (MoUs) were signed between Türkiye and the United Arab Emirates (UAE) for the development of defense industry relations between the two countries. Can you elaborate on the coverage and importance on these two MoUs?

H.E. Tareq AL-HOSANI: The UAE has enjoyed decades long relationship and significant trade ties with Türkiye and this is only getting stronger. There is a level of partnership that we envisage in our relationship, and that is reflected in the MOUs that we signed in May. The further development of defense industry relations can only be beneficial for both partners.

SAHA EXPO Daily: What other areas of collaboration do you foresee with Turkish defense companies in the near term? Do you have any plan to expand your industrial and technological cooperation with Turkish defense firms to other areas of defense and also to space?

H.E. Tareq AL-HOSANI: The thing about buying products or developing capabilities in the defense arena, is that you need to continually look to the future. No matter who you are, it is not about the product of yesterday ... it is about the product of tomorrow. We need to ensure that we are continually assessing and looking at the future, the plans and directions that different industries are going in. And that's why it is important to have government to government understanding, so that we can open up a little bit on our future thinking, our different industries directions and to ensure we align with them.

SAHA EXPO Daily: Can you tell us about Tawazun's presence at SAHA EXPO 2022, and what would be your message to the visitors/ participants? What is your opinion of the SAHA EXPO 2022 Exhibition?

H.E. Tareq AL-HOSANI: SAHA EXPO has been a very informative and rewarding experience for us. We have enjoyed our time here, developed strong relationships, discussed opportunities for a greater cooperation in the defense sector and appreciated the hospitality shown us. I look forward to seeing you at SAHA EXPO again.

SAHA EXPO Daily: Thank you for sparing your time for our readers

MIR USV

MIR USV & SANCAR AUSV at SAHA EXPO 2022

Unmanned Surface Vehicles (USV) are one of the highlights at the SAHA EXPO 2022 International Defense & Aerospace Exhibition, organized by SAHA İstanbul at the İstanbul Expo Center between October 25-28, 2022, under the auspices of the Turkish Presidency and with the participation and support of the Ministry of Foreign Affairs, Ministry of Interior, Ministry of National Defense, Ministry of Industry and Technology, Ministry of Trade, and Defense Industry Agency. In this context, the modular MİR USV, developed in cooperation with ASELSAN and SEFİNE SHIPYARD, and the SANCAR AUSV, developed by HAVELSAN and YONCA-ONUK for the Anti-Submarine Warfare (ASW) role, will be exhibited at the booths and foyer areas of the companies.

MİR USV and MARLIN AUSV

In 2021, two new Unmanned Surface Vehicles with aluminum hulls started to be developed with the cooperation of ASELSAN and SEFİNE Shipyard for the security of the Blue Homeland in autonomous reconnaissance - surveillance, Anti-Surface Warfare (ASuW), Anti-Submarine Warfare (ASW), and protection of base/port/critical facilities and high-value surface platforms. With the ceremony held at SEFİNE Shipyard on July 7, 2021, the block assembly activities of the Autonomous and Swarm Capable Armed Unmanned Anti-Surface Warfare (ASuW) Vehicle MARLIN, which was known as RD09 at that time, started, and the first steel cutting of the Autonomous and Swarm Capable Unmanned Anti-Submarine Warfare (ASW) Vehicle MİR, known as NB57, was carried out. SEFİNE Shipyard unveiled its A/USV solutions for the first time during the DIMDEX 2022 Fair in March 2022 in Doha, Qatar. The SEFİNE Shipyard representative, whom we had the opportunity to meet during the fair, emphasized that the first boat was already at the Sea Acceptance Tests (SAT) stage.

MARLIN AUSV, which can be used for the protection of critical bases and ports and perform reconnaissance, surveillance, and patrol missions, and MİR USV, which can detect submarines with its onboard sonar and engage submarines with light torpedoes and ASW rockets, have been designed and manufactured to operate and communicate with UAV/UCAVs and autonomous underwater vehicles (AUV). It is stated that these new-generation approaches can alleviate the operational burdens of the navy, thereby reducing operating costs to reasonable levels. Both vessels will be able to support long-term intelligence-reconnaissance-surveillance operations and provide effective support in missions requiring firepower of manned surface and underwater platforms. In terms of autonomous navigation capability, both vessels will be able to navigate safely on their own by processing the images of their surroundings using onboard obstacle avoidance systems, navigation radar, and electro-optical cameras.

Both MİR USV and MARLIN AUSV can move to the operation area on their own from the port or can be transported by cargo planes, military ships, or by road and transferred to their mission location. In this context, for example, MİR USV or MARLIN AUSV can be one of the mission modules to be carried on TCG Derya DIMDEG, which can carry mission modules. Apart from TCG Derya, MİR USV and MARLIN AUSV can be carried on BAYRAKTAR Class LST, TCG Anadolu LHD, and

SANCAR AUSV

other ships providing logistic support, as well as surface vessels with helicopter pads can carry them in special containers and deploy them in the operation area. Both MİR USV and MARLIN AUSV can perform autonomously or with Remote Control together with other naval units and successfully conduct missions with Combat Management Systems (CMS) in an integrated manner.

A SEFİNE Shipyard representative, whom we had the opportunity to meet during the DIMDEX 2022 Exhibition, said: "We are building two Unmanned Surface Vehicle prototypes with aluminum hulls as Concept Development Prototypes, with the partial support of the Defense Industry Agency (SSB) and some with our own internal R&D funds. One of them is the Anti-Surface Warfare (ASuW, RD09) model, and the other is the Anti-Submarine Warfare (ASW, NB57) model. Our first boat will be ready to enter service with our Navy at the end of this year, within its contractual term. Our second boat will have demonstrated its first operational capabilities by the end of this year. In June 2023, it will be delivered to our Naval Forces. So we will deliver the prototypes with a difference of 6 months."

MİR USV was first-time displayed at SAHA EXPO 2022

Designed for anti-surface warfare, the RD09 MARLIN can transform from monohull to trimaran form with outrigger hulls (floats) attached to both sides of the hull and on which weapons can be placed. Thus, the payload capacity can be increased, allowing different weapons and systems to be used. The RD09 Autonomous and Swarm Capable Armed Unmanned Anti-Surface Warfare Vehicle, which has two counter-rotating propellers driven by two diesel engines, has a length of 14.75m, a width of 3.85m, a draft of 0.85m, and weighs between 21 to 26 tons depending on the payload and floats according to the product brochure. MARLIN/RD09, which is stated to be able to conduct missions in sea state 4 and navigate in sea state 5, has a cruising speed of 10 knots and a maximum speed of 36+ knots. MARLIN/RD09 is stated to have a cruising range of 700nm and can stay at sea for 7 days. On the product brochure of the scale model exhibited at the DIMDEX 2022 Fair, it was written that the total length is 15m, the maximum speed is 32+ knots, the cruising range is 400nm, and it can operate in sea state 5. MARLIN got its name from a species of swordfish known to sailors as the 'ship-sinker' (because it can seriously damage a boat with its pointed nose).

The MİR/NB57 Autonomous and Swarm Capable Unmanned Anti-Submarine Warfare (ASW) Vehicle will be fitted with both ARAS-2023 Diver Detection Sonar, ORKUN-2053 Dipping Sonar, and Sonobuoy Launchers, and it will be ready for delivery by the end of 2022. ARMELSAN product ORKUN-2053 Dipping Sonar will be used in the towed configuration on the NB57/MİR ASW USV built by SEFİNE Shipyard. Just as the ASW Helicopter must hover while

performing sonar operations, the USV will dip the sonar at a fixed point and begin to listen if the presence of a submarine threat is suspected. If nothing is detected, it will collect the sonar and move to another location. Like the MARLIN AUSV, the NB57/MİR will also be able to carry different anti-surface/submarine warfare weapons and systems and undertake critical anti-surface and anti-submarine missions.

In June 2022, the approximately 15m long MİR USV was spotted at sea for the first time and operated together with the 7m long ALBATROS-S USVs as part of the Heterogeneous USV Swarm. Although MİR has an aluminum hull and superstructure, part of the mast is made of composite materials to allow RF signals to pass through and not create a blind sector for communication systems. The total weight of MİR İDA is stated as 21 tons, and it is underlined that it can carry a payload of 1/3 of its total weight. Thanks to its high fuel capacity, MİR USV can stay at sea for an extended time (cruising range can be up to 800 nautical miles) and has flexible mission parameters. It can communicate with manned or unmanned platforms and cooperate with the allied command center.

Designed to operate in open seas, MİR USV is the first Unmanned Surface Vehicle produced for the Turkish Naval Forces for anti-submarine warfare purposes, and it can be used in many different types of naval warfare such as anti-surface warfare (ASuW), anti-submarine warfare (ASW), electronic warfare (EW), mine warfare, and asymmetric warfare. Designed for alternative weapon configurations that can provide high firepower, MİR USV is equipped with high-tech sensors such as navigational radar, ASELSAN SEA EYE KIRLANGIÇ Electro-optical reconnaissance & surveillance system, ASELSAN KARETTA Anti-Jamming GNSS (with anti-jamming and anti-spoofing features), ASELSAN ANS-510D Inertial Navigation System (INS), RF Communication, 4G/LTE Communication Unit (communication capability via GSM networks over 4G LTE), ASELSAN Ku-Band Satellite Communication System (SATCOM also has L-Band – Narrowband Satellite Communication System, it can transmit real-time video and images via SATCOM), Dipping Sonar (DS), Obstacle Avoidance Sonar, Single Beam Echosounder, Diver Detection Sonar and Automatic Identification System (AIS). The self-protection of the MİR USV is provided by the ASELSAN product 12.7mm STAMP-2L Remote Controlled Weapon System. MİR USV will be able to operate within the borders of Blue Homeland without any communication interruption, thanks to its indigenous designed unique communication system that can function in the electronic jamming environment.

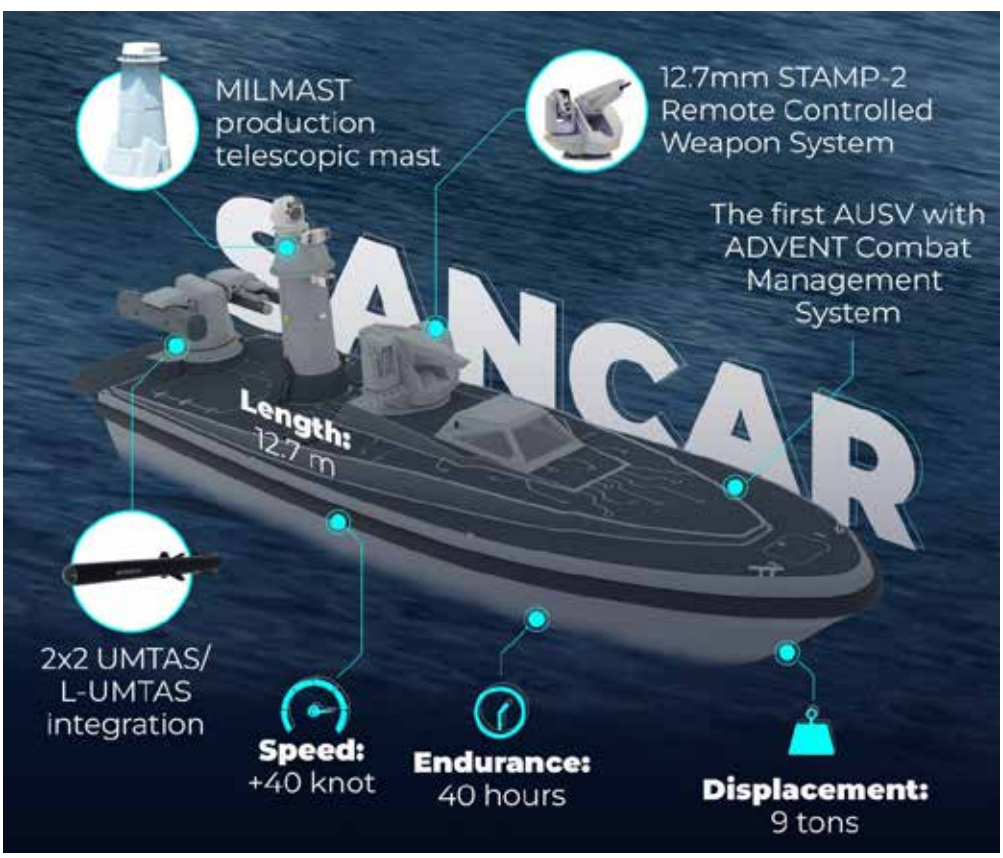
The approximately 15m long MARLIN/NB57 AUSV was first spotted in September. On September 15, 2022, President of Defense Industry Agency Prof. İsmail DEMİR announced on his official social media account that MARLIN AUSV is the first Unmanned

Surface Vehicle with Electronic Warfare capability in the world (ASELSAN ARES-2NC R-ES System and ASELSAN AREAS-2NC Compact R-EA System). The SEFINE Shipyard representative, whom I had the opportunity to meet with during the ADEX 2022 Exhibition held in Baku, the capital city of Azerbaijan, on September 6-8, 2022, explained that MARLIN AUSV was tested with ASELSAN product Electronic Warfare Systems before the Exhibition and pointed out that MARLIN will participate in NATO Exercises held in Portugal in September.

Developed locally and nationally in cooperation with ASELSAN and SEFİNE Shipyard, MARLIN AUSV participated in the REPMUS (September 12-22) and Dynamic Messenger (September 25-30, 2022) Exercises, respectively, in Portugal. MARLIN successfully represented our country, demonstrating its capabilities in the REPMUS '22 NATO Exercise, which was held on the Troia Peninsula in Portugal with the participation of approximately 1,500 civilian and military personnel from 16 NATO Member countries, including Türkiye. Around 40 Autonomous Underwater Vehicles (AUV), 18 Unmanned Surface Vehicles (USV), about 45 Unmanned Aerial Vehicles (UAV), 16 ships, and one submarine participated in the exercise. MARLIN AUSV was the only platform that sailed out to sea on a day when no one could go out due to harsh weather conditions. During the scenario, which required finding enemy submarines, MARLIN AUSV was the only unmanned surface vehicle that succeeded in finding targets that simulate enemy submarines thanks to its onboard sonobuoy processor. While performing its task, MARLIN also demonstrated that it can jointly operate with manned Navy elements on an international event. MARLIN, which can undertake important roles such as Electronic Warfare, Anti-Submarine Warfare, and Amphibious Warfare, will thus be the first unmanned surface vehicle to represent our country in NATO Exercises of this size.

The MARLIN AUSV is planned to be used in naval warfare operations for defensive and offensive purposes, on the coast or in the open sea. Able to perform critical missions even in the toughest sea states thanks to its unique hull design, MARLIN can carry different payloads such as guided missiles, light torpedoes, 12.7 mm machine guns, electronic attack, electronic support, sonobuoy that extends the sonar range, and towed array sonar systems in line with operational needs.

Designed to meet the high speed, stability, and maneuverability requirements, MARLIN is equipped with ASELSAN's remote-controlled weapon station, electro-optical reconnaissance & surveillance system, radar, anti-jamming GNSS, electronic warfare, and national software systems. MARLIN is also considered to herald a new era in naval warfare. In this context, the surface-to-surface, and surface-to-land versions of the KUZGUN-KY (Solid Propellant) missile developed by TÜBİTAK SAGE can also be fired from MARLIN. In this context, a strategic cooperation agreement for indigenous munition systems was signed between TÜBİTAK SAGE and SEFİNE Shipyard in June 2022. The emblem on the MARLIN AUSV, which participated in the NATO Exercises, also included 2 KUZGUN-KY launchers, each with 4 cells, placed on the floats attached to both sides of the hull. KUZGUN-KY, which can reach a speed of Mach 1.5 and reach a range of 40 km, can be used in the fire-and-forget mode on AUSV. KUZGUN-KY, a member of the KUZGUN Guided Modular Munitions Family, will use a dual-mode seeker (will feature both Semi-Active Laser Seeker and IIR Seeker). However, there will also be a version of the KUZGUN-KY with a Millimeter Wave (MMW) Radar Seeker. KUZGUN-KY missile is expected to undergo tests by the first quarter of 2023 and provide significant firepower at sea.



SANCAR AUSV Continues Tests

In October 2021, YONCA-ONUK and HAVELSAN decided to cooperate and started to work on the development of a Level 3 Autonomous AUSV. In line with the requirements of the Turkish Naval Forces Command, the development and testing process of the SANCAR Armed Unmanned Surface Vehicle continues under the contract signed on April 8, 2022, between the Defense Industry Agency (SSB) and HAVELSAN - YONCA-ONUK. The SANCAR AUSV was launched at the YONCA-

ONUK Shipyard on June 2, 2022, with the participation of the President of Defense Industry Agency Prof. İsmail DEMİR, and the first sea tests were completed in September 2022. In this context, the AUSV's software and remote-control mode tests have been conducted to a large extent, and autonomy tests are currently underway. Following the completion of the tests, SANCAR AUSV is planned to be delivered in 2023.

Within the project's scope, HAVELSAN provides platform autonomy, mission system software, ground control stations, mini-GVDS (Ship Data Distribution System), Satellite Communication System and anti-jamming GNSS. YONCA-ONUK is responsible for the production of the hull of the AUSV and the integration of the payloads. Developed to perform reconnaissance, surveillance, anti-surface warfare, and mine countermeasure missions, SANCAR AUSV will minimize the risk with unmanned use in dangerous missions for human life and enable multiple tasks to be carried out more cost-effectively with its payloads. SANCAR AUSV was first unveiled to the world with the scale model exhibited during the African Aerospace and Defence Expo (AAD 2022) held at Waterkloof Air Base in Pretoria, South Africa, between September 21-25, 2022, with the participation of around 450 companies from 30 countries.

Although SANCAR AUSV is represented as a prototype, it is actually built on a proven platform. SANCAR is based on 8 MRTP-12 Fast Patrol Crafts hulls delivered to the Turkish Navy by YONCA-ONUK. In this sense, SANCAR, a proven design, can be used autonomously over ADVENT CMS. Therefore, it will be possible to perform joint missions by being controlled by other surface platforms equipped with network-centered ADVENT CMS. SANCAR AUSV features a derivative of ADVENT CMS named "ADVENT ROTA", which is adapted for Unmanned Surface Vehicles and contains artificial intelligence (AI) elements. SANCAR can perform missions in the open seas by providing uninterrupted communication infrastructure, thanks to the combined use of RF/GSM/SAT systems.

SANCAR can be used in two different modes, Remote Control and "Autonomous." It can be remotely controlled or used in Autonomous mode both via the Mobile Ground Station and other surface platforms with ADVENT. In remote control mode, if more than one vessel is needed to be controlled simultaneously, each SANCAR requires an operator, while in Autonomous mode, any number of SANCAR USVs can be assigned via both ground stations and ADVENT, depending on the bandwidth limitation. SANCAR AUSV can reach over 40 knots (80km) in Remote Control Mode. In line with the capabilities of ADVENT/ROTA CMS, swarm operations are also being studied. In this context, HAVELSAN plans to bring swarm capability to SANCAR by combining its know-how from the studies on BAHA and BARKAN UAV/UGV with the capabilities of the ADVENT/ROTA Combat Management System. HAVELSAN continues to work carefully on scenarios and concept studies for SANCAR's deployment to the operational area. On the other hand, emergency scenarios are also being studied for the possibility of SANCAR being captured by hostile forces in the operation area or in case of a malfunction in the boat.

YONCA-ONUK has designed SANCAR according to end-user requirements. However, larger platforms may be built in the future in line with new requirements, such as longer endurance, better seaworthiness, or to operate in higher sea states. Therefore, the SANCAR platform can grow and gain new features according to the Turkish Navy's future requirements. For the marketing of SANCAR AUSV to other friendly countries, it can be reconfigured according to customer specifications. HAVELSAN and YONCA-ONUK offer SANCAR as a package together with ADVENT/ROTA CMS. The payload can be changed for additional functions requested by potential customers. ADVENT/ROTA CMS can be reconfigured to perform different missions depending on the payload.

The SANCAR AUSV platform, which uses autonomous technologies such as data fusion and artificial intelligence, also has a modular structure. SANCAR AUSV is equipped with a 12.7 mm STAMP-2 Stabilized Weapon System, 2x2 UMTAS/L-UMTAS Missile and Launcher, and MİLMAST product Telescopic Mast (Navigation radar, E/O camera, anti-collision systems). With a cruising range of over 740 kilometers, SANCAR AUSV has a length of 12.73 meters, a width of 3.3 meters, and a displacement of 9 tons.

NARVAL 1006
Autonomous Underwater Glider
Unveiled at SAHA EXPO 2022

NARVAL 1006 Autonomous Underwater Glider, developed by SONITUS Engineering to collect scientific data from Blue Homeland, will be exhibited for the first time at SAHA EXPO 2022. NARVAL 1006, an Autonomous Underwater Vehicle (AUV) with a variable buoyancy propulsion system instead of traditional propellers or thrusters, is equipped with hydrofoils (underwater fins) that allow it to glide forward while descending into the water. NARVAL 1006 Underwater Glider, which can move by gliding in the water thanks to its hydrofoils, will be able to operate continuously for 6 months.

Technical Specifications of the Autonomous Underwater Glider **NARVAL 1006**

Navigation	GPS, Pressure Sensor, Altimeter, Gyro
Diving Depth	1,000 m+
Weight	60 kg - 75 kg
Cruising Speed	0,50 m/s
Total Length	2,7 m
Hull Diameter	240 mm
Wingspan	1 m

LIVE

SAHA EXPO 2022 Panel 5

27 Oct Thuesday 11:30-12:30

The future of Unmanned Naval Systems and Turkey's potential

Moderator
Tolga ÖZBEK
Journalist Editor

Panelists
Cenk Cumhur KIYKIM
Head of Department Naval Platforms - Turkish Defence Industry Agency

Samet BİLEN
Planning Manager Yonca-Onuk Shipyard

Mustafa L. CİVELEK
Manager - Strategic & unmanned Systems - SEFINE Shipyard

Murat MELÜL
TEAM LEADER HAVELSAN

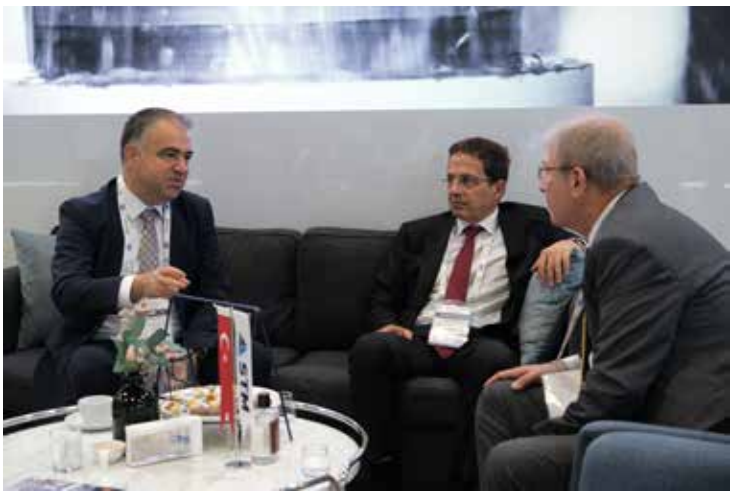
Ahmet AKYOL
Deputy General Manager - ASELSAN

ROKETSAN and STM Debuts New Game-Changing System **ALPAGUT**

The unveiling ceremony of the Smart Loitering Munition System ALPAGUT was held at SAHA EXPO. Türkiye's rocket and missile center, ROKETSAN, and Türkiye's leading company in tactical mini-UAVs, STM, started joint development of "ALPAGUT" to provide a new and effective solution. Before the ceremony, ROKETSAN and STM signed the "Cooperation Protocol on Developing Loitering Munitions Project" with the participation of President Defense Industry Agency Prof. İsmail DEMİR, Chairman of the Board of ROKETSAN Prof. Faruk YİĞİT, ROKETSAN General Manager Murat İKİNCİ and STM General Manager Özgür GÜLERYÜZ.

ALPAGUT, which can operate day and night, is effective against mobile or fixed/stationary land and naval targets, radars and communication systems, light armored vehicles, critical facilities, infantry, and opportunity targets. ALPAGUT, which will have an operational radius of 60 kilometers, can stay in the air (endurance) for more than 60 minutes. ALPAGUT can carry different types of warheads and can be used single or in a swarm.

After the system is fired or launched, it will detect, track, and evaluate targets by hovering in the air for a certain period of time and will destroy the target by diving into it autonomously with user approval from the ground. ALPAGUT can detect and identify targets without being noticed with its dual-mode seeker. The system, which is not affected by the GPS jamming systems, can be directed to the target with the precision guidance propulsion system. In addition to all these features, the system also offers significant advantages to its users with its fire-and-forget capability



STM Invites **Suppliers and Companies Seeking to Become Suppliers** to "STEP" Supply Ecosystem Platform

Özgür GÜLERYÜZ, General Manager of STM, made evaluations for the SAHA EXPO Daily #3 on the second day of the exhibition regarding the activities for the business ecosystem and suppliers, their objectives, the local content rate in the programs they carry out, and the innovations they will put forward for the expansion of the eco-system in the coming period: "As STM, our priority in all of our activities is to grow together with the ecosystem, get stronger through collaborations, export our solutions developed with our domestic companies, and support the expansion and export readiness of them. In this regard, we have collaborated with nearly 300 system providers and more than 400 construction material manufacturers and suppliers in the military naval platform construction and modernization projects we have carried out in Türkiye and abroad to date. For instance, in the Logistics Support Ship project, which we designed and delivered to the Pakistan Navy, and in the export of KARGU, Türkiye's first mini attack UAV, to two different continents, we have indirectly facilitated the export of more than 50 of our companies. We also exported the domestic systems of our companies in the modernization of Pakistan's AGOSTA90B Class, Türkiye's first submarine modernization export, for which we were the main contractor. We continue to develop innovative systems in accordance with national goals with more than 1,000 suppliers and business partners, and we aim to grow together by sharing our expertise and capabilities with our business ecosystem."

"Contribution from 194 Domestic Companies to TCG UFUK"

Stating that they place significant attention to the development of the domestic ecosystem, GÜLERYÜZ added the following: "We have achieved many successes with the domestic ecosystem at home. We are working on various indigenization initiatives ranging from military naval platforms to tactical mini-UAV systems. We have succeeded to increase the local content rate of the MLGEM project, which is a source of national pride, to 70 percent. Similarly, we will deliver MİLGEM-5 (TCG ISTANBUL), which will be Türkiye's first national frigate, next year with at least 75 percent localization rate. This year, we completed our Test and Training Ship TCG UFUK (A-591), under the direction of STM, the main contractor, with the contribution of 194 domestic companies. In the New Type Submarine Project (YTDP), which will be Türkiye's most advanced naval submarine, we produced the bow section "Section50", which contains the submarine torpedo tubes, which only a few countries in the world can produce, for the first time in Türkiye at Gürdesan by providing engineering services. Thanks to our integration capabilities and experience in cyber security, we have collaborated with the domestic cyber security ecosystem for turnkey, integrated cyber security solutions. We also cooperate with development agencies to support the ecosystem. We expand the fields in which we can advance with our domestic producers with each passing day.

"Local Content Rate to Accelerate with STEP"

GÜLERYÜZ mentioned that they have put the STEP platform into practice, which would accelerate the indigenization process in critical systems, and continued his speech as follows: "This year, we introduced our Supply Ecosystem Platform, or "STM STEP." With STEP, which will quicken the process of indigenization in critical systems, we will continue to grow with our suppliers and achieve high value-added products. STM STEP will work in integration with EYDEP, a program of the Presidency of Defense Industries. All EYDEP member suppliers will be able to join STEP directly. With STEP, which will speed up the indigenization process in critical systems, our suppliers will also achieve export growth. I invite our organizations and suppliers seeking to become our suppliers to join STM STEP. I wish them to become our partner in our competition with the world's largest corporations by exporting the national experience we have developed domestically to friendly and allied countries."

"**Leonardo Has Already Demonstrated** that it is a Reliable Partner and **a Significant Inward Investor in Turkey**"

SAHA EXPO Daily caught up Sinan ŞENOL, Leonardo Turkey Chairman & General Manager, during the second day of SAHA EXPO 2022, to discuss Leonardo's presence in Turkey. We also took the opportunity to ask him the most important defense programs that carried out by Leonardo so far in Turkey.

SAHA EXPO Daily: Could you please inform us about Leonardo's Presence in Turkey?

Sinan ŞENOL: Leonardo, aerospace and security international company headquartered in Italy with main industrial presences also in the UK, US and Poland, has been present in the country for over 30 years with its own Representative Office and also a local company (formerly Selex ES Turkey, today Leonardo Türkiye) in Ankara. Leonardo's history in Turkey dates back decades further, taking into account the work done by various companies that belong to what was then known as the Finmeccanica Group, but much more as AgustaWestland, Selex SI, Alenia Aermacchi, OTO Melara, Telespazio and so on. In these years, Leonardo participated in major civilian and military projects, such as T-129 ATAK Helicopter, MELTEM-III Maritime Patrol Aircraft, GÖKTÜRK-I High Resolution Earth Observation Satellite, SMART Air Traffic Management and Control System, Vessel Safety Traffic Management System, Marti Program with AB412 Helicopter fleet for Turkish Coast Guard, etc.

A local company was established in 1988 (now Leonardo Turkey Havacılık Savunma ve Güvenlik Sistemleri A.Ş. - Leonardo Turkey Aerospace Defense and Security Systems Inc.), while a manufacturing facility was open in 1992, covering 4,500 sq meters with around 100 employees. As of January 2022, I was appointed as General Manager of Leonardo Türkiye Representative Office.

SAHA EXPO Daily: Could you please provide some key facts and organizational structure of the company Leonardo Türkiye for our readers?

Sinan ŞENOL: We, as Leonardo Turkey, perform project management, design, development, production, test, integration, and logistics support activities on Defense and Aerospace sectors, in line with several international quality standards including highly demanding aviation standards as well, such as EN 9100:2018, EASA Part 21 Subpart G Production Organization Approval (POA), NATO E-3A Source of Repair Certificate etc. Main business areas include communication systems, products and peripherals for Land, Naval & Air platforms, integrated communication systems for Naval platforms, internal and external lighting systems (NVIS) for Air and Land platforms and control panels for Air and Land platforms.

Along with our indigenous product portfolio and capabilities, by having an access to the entire Leonardo's product portfolio and technical support, we are offering customized, cost effective and reliable solutions to Turkish Customers and all shareholders.

SAHA EXPO Daily: How would you summarize Leonardo's involvement in Turkey over the last three decades? Can you list the most important defense

programs that carried out by Leonardo so far in Turkey?

Sinan ŞENOL: Leonardo has been collaborating for a long time with the Turkish industry, guaranteeing the support to grow of Turkey in the aerospace and defense sectors through the share of know-how in collaboration programs. Know-how, both for national programs and for export programs, proving to be a reliable partner for the institutions and the industry of the country. Among these, major collaborative programs include T-129 ATAK Helicopter, MELTEM-III Maritime Utility and Patrol Aircraft, GÖKTÜRK-1 Satellite Program, defense and security electronics for air and naval platforms, Vessel Traffic Management System (VTMS), SMART Air Traffic Control (ATC) System and other helicopter fleet for TLF, TCG, Gendarmerie. We believe that Leonardo has demonstrated to be a reliable partner and a significant inward investor in Turkey, and now is looking to build on this long-standing collaboration and take-on new opportunities.

SAHA EXPO Daily: Lastly, would you like to say anything about Leonardo Türkiye's participation at SAHA EXPO 2022 International Defense & Aerospace Exhibition? What do you expect from the SAHA EXPO 2022?

Sinan ŞENOL: Leonardo has already demonstrated that it is a reliable partner and a significant inward investor in Turkey; and now is looking to build on this long-standing collaboration and take-on new opportunities, in the future relating to a wide range of potential programs, in the helicopter, airborne, space and electronics sector.

Leonardo has been partnering with Turkish industry for many years now and we value the collaborations we have built over that time. This has created mutually beneficial relationships involving Small and Medium Enterprises (SMEs) and major Turkish suppliers across a range of capabilities from aero-structures and mechanical manufacturing to training, engineering services and investment, supporting many Leonardo activities.

Leonardo's desire is to be involved in the major Turkish programs related to security and aerospace, both in the civil and defense domains. We have the field and world proven technologies that Turkey needs, and we are ready to share our experience with our Turkish partners.

Leonardo takes its offset obligations very seriously as well and actively seeks to find innovative solutions that comply with requirements but also those that deliver the mutual, sustainable, economic benefits both parties expect.

The supply chain is a strategic element of Leonardo' business model. Thousands of suppliers contribute to the Group's competitiveness and value creation through the quality of the products and services supplied and the collaboration in the project management, including focus on risk management.

Leonardo's commitment is to build a solid and reliable supply chain, in an innovative, integrated and resilient eco-system, able to sustain the social and economic development of the territories where Leonardo has a strong presence.

SAHA EXPO Daily: Thank you for sparing your time for our readers.

27 October 2022 - Thursday

10:00	**Doors Open**
10:30-18:00	**Exhibitor Product and Start-Up Project Presentations (Hall 8 Presentation Area)** *Hall 8 Presentation Area*
10:30-18:00	**B2B Meetings** *Exhibitor Stands and B2B Area – Foyer*
10:30-18:00	**Signing Ceremonies** *Hall 6 and Hall 8 Signing Ceremony Areas*
11:00-12:30	**PANEL 5: The Future of Unmanned Naval Systems and Türkiye's Potential** *Panel Area 1 - Hall 5*
1:00-12:30	**PANEL 6: From Game-Changing Technologies to Game-Setting Technologies** *Panel Area 2 - Hall 5*
14:00-15:00	**Keynote: Bülent ALTAN - Developments in Space Technology** *Panel Area 1 - Hall 5*
15:00-16:00	**Keynote: Arif KARABEYOĞLU - Türkiye's Place in the Space Ecosystem** *Panel Area 1 – Hall 5*
16:00-17:30	**PANEL 7: The Impact of Russia's War Against Ukraine on Global Defence Industry** *Panel Area 2 - Hall 5*
18:00	**End of Day**

HAVELSAN **Cyber Security** Products and Solutions

It is of great importance for nations to have and produce domestic cyber security solutions in order to truly ensure national security. Domestic solutions not only allow funds to remain within the country but also affords independence for countries in defining defense mechanisms according to their exact needs.

In this context, HAVELSAN takes on the mission to develop cyber security products and solutions to satisfy demands rising mostly from strategically critical projects and programs.

Ensuring the security and integrity of critical institutions against cyber threats and attacks is one of HAVELSAN's primary goals in the field of cyber security. For this purpose, activities are carried out to detect and analyze existing vulnerabilities in information systems, and to implement the necessary cyber security measures to tighten them. In the broadest sense, for this purpose, HAVELSAN and the Turkish Cyber Security Cluster conduct activities such as providing consultancy and technical support to public and private sector institutions, providing training at different levels, and developing critical cyber security software under HAVELSAN's control in cooperation with competent companies in the Cluster.

In order to surmount existing global vendor dominance in endpoint security, concrete steps have been taken towards creating an integrated endpoint security solution with a vision that even most of the global suppliers could not foresee. HAVELSAN XDR is Turkey's one and only endpoint security product to deliver complete endpoint protection. It is designed to detect and prevent both signature based and advanced persistent threats. HAVELSAN XDR is designed to serve large deployments with ease of management and operability from a single pane of glass. It incorporates AV engine, EDR engine, DLP & NAC features and CTI as well. The solution to be created with the perspective presented here will reach a point throughout its lifecycle offering an integrated security solution that provides protection at every layer of cyber security with an in-depth security perspective rather than being an endpoint solution. With this solution, the aim is to ensure the data privacy and security of the public, especially military institutions, with a domestic and national solution.

Other HAVELSAN products and services include:

HAVELSAN DLP – Data Loss Prevention

HAVELSAN DLP is designed to prevent data leakage from the organization, to provide information security in accordance with the determined blocking rules, to control data whether it is located correctly or not and is accessed by the right users. It has high performance design criteria to meet the private security needs of large scale institutions including military

institutions as well. HAVELSAN DLP is one of the core elements of the XDR vision.

HAVELSAN WAF – Web Application Security

HAVELSAN WAF is a web application firewall product with load balancing features that ensure the availability and security of web applications with high levels of network traffic. It is designed to detect and block threats aimed directly at web applications which are impossible to prevent with the use of legacy firewalls.

HAVELSAN İleti – Secure Communication

HAVELSAN İleti is designed to protect personal keys in software which prevent them from being captured. This takes İleti's security level one step further compared to other IM solutions. HAVELSAN İleti only supports on-premise deployments in order to not compromise cloud system vulnerabilities.

Operators are able to conduct user initializations and group management via the management console.

HAVELSAN Data Diode – Network and Infrastructure Security

The HAVELSAN Data Diode solution is a new generation data diode developed in a modular structure to meet the inter-network data transfer needs of institutions and businesses that have isolated networks containing sensitive data. Data diode comes with an access control management feature on itself. Both management and file transmission interfaces use a fully encrypted communication infrastructure.

HAVELSAN Cyber Security Security Maturity Level Assesment Service

With the HAVELSAN cyber security maturity level assessment service, the inventory records of information assets of institutions are ensured to be up-to-date and complete as a result of the meticulous analysis and classification of all information assets owned by institutions. In the next step after the aforementioned records are created, the cyber risks of the institution in its current situation are revealed, and HAVELSAN teams carry out risk determination and gap analysis regarding information assets. Subsequently, determining and raising the level of cyber maturity through check lists determined by taking into account all national regulations, especially the Information and Communication Security Guide published by the Digital Transformation Office is intended.

This service includes methods applicable to all levels, including large public institutions and military institutions, as well as medium-sized enterprises. Naval Forces Command is among the reference institutions where relevant work has been carried out so far. The most value-added aspect of this service is to measure the current performance of the cyber security efforts of institutions and to ensure that investments in the field of cyber security are transferred to the most accurate resources.

All in all, as Türkiye's biggest cyber security solution provider, HAVELSAN is dedicated to offering new innovation with state of the art cyber security technology to defend Türkiye's domain.

Cooperation Protocol Between REPKON DEFENCE and ASISGUARD

Two big names from Defence Industry companies are joining forces to support national developments in the defence industry. A cooperation protocol was signed between the parties to carry out more systematic studies by integrating the REPKON DEFENCE 6-Drum Grenade Launcher (RDS40-MGL), the lightest in its class among its counterparts, into the ASISGUARD product national drone system, SONGAR.

Agreement between BAYKAR and ORDULU TEKNOLOJİ on the **Next Generation Image Transfer and Processing Center**

SAHA **Enterprise** Program

15 Entrepreneurial Companies selected to participate in the SAHA Enterprise program for the first time this year at SAHA EXPO 2022

Within the scope of the SAHA Enterprise program initiated by SAHA Istanbul with the aim of increasing the indigenization rate of the Turkish defense and aerospace industry, bringing foreign-dependent critical technologies to the country and elevating competitiveness of businesses, a total of 15 entrepreneurial companies, who were found eligible by SAHA Istanbul last July, are debuting their products and capabilities this year at the SAHA EXPO 2022 project market, while also meeting with participants and investors.

Within the framework of the SAHA Enterprise program, entrepreneurial companies with high-tech initiatives are provided with training, mentoring and investor access support. As part of the program, entrepreneurs are offered the opportunity to benefit from preparation for investor meetings, access to investment, training and mentoring, high-level meetings with industry leaders, business development, and promotion, free booth allocation and demo day presentations at SAHA EXPO, access to SAHA "Project Committees", financial, legal, and technical consultancy, infrastructure access support, and access to first-customer support.

Entrepreneurs participating in the program are expected to perform activities in the following sectors: defense technologies, aerospace technologies, space technologies, maritime technologies, advanced materials and production technologies, advanced electronic machinery and manufacturing technologies, information, communication, cyber security technologies, unmanned systems, artificial intelligence technologies, and logistics technologies.

With the support of the SAHA Istanbul ecosystem, Türkiye's and Europe's largest industrial cluster, this program, which was launched to provide business development and investment access support in the defense and aerospace sector, and also aims to support entrepreneurial companies in understanding the global competition and the global positioning of products they have developed, to get to know its competitors, and to reach global customers through participation in various organizations and events such as project markets.

Let's learn more about some of these entrepreneurial companies...

ASARTECH R&D, Design and Engineering Inc.

ASARTECH R&D, Design and Engineering performs High Frequency RF and Microwave Microelectronic Component Design, Prototyping and Production, and provides RF Test, Verification, and System Integration Services within the framework of Naval and Airborne Platforms System Engineering. It is the sole supplier of narrowband and broadband high frequency microelectronic components up to 40 GHz for the critical needs of Radar, Electronic Warfare, and Communication Systems manufacturers (main contractor and subcontractor companies).

In addition to the current indigenization, national design, and production needs in Türkiye, ASARTECH seeks to provide services in a wider frequency spectrum and with a wider product family on a global scale. It also aims to support the national technological move by investing in production and conducting exports. To fulfill the smaller, more cost-effective, higher frequency, greater volume requirements in the field of defense and civil communication, ASARTECH aims to have the technological infrastructure required to develop and produce various microwave components. For this strategic manufacturing investment, ASARTECH needs both financial support and connections with international clients that are interested in exports.

Alloy Additive Technologies Inc.

Alloy Additive is specialized in wire arc additive manufacturing (WAAM) technology. With this technology, it is possible to produce parts manufactured with high-cost and long-lasting machining processes in a more affordable manner and in a shorter time. Alloy Additive, which develops a 3D metal printer at pre-prototype and MVP stages with the TÜBİTAK 1512 grant program, is advancing its 3D printer to a patentable stage with the TÜBİTAK 1501 project support program.

It is aimed that SAHA Enterprise program's mentorship and its various business networks would open doors for the initiative to both domestic and foreign markets.

Since its foundation, Alloy Additive has sought to improve metal manufacturing efficiency, provide customers with a cost-effective solution, and minimize the environmental impact associated with the manufacturing process. Alloy Additive aims to speed up its initiatives through the SAHA Enterprise program and contribute to Türkiye's Industry 4.0 to have a voice in global markets.

AstroTech Aerospace Inc.

Operating in the field of aerospace, the company provides services regarding surveillance, transportation, and defense with its high-speed, long-range drones, as well as the new generation propulsion technologies it has developed. In addition to mechanical processes such as precision machining, additive manufacturing, and composite production of high-tech products, the company has the capacity to produce avionic systems and associated software in-house. The company, which is a pioneer in the field of defense and aerospace with its detonation engines that open the doors to supersonic flight and space missions, hybrid boosters that enable drones to take off from confined spaces, continues to perform activities in international markets with the technologies it has developed.

Stop Grup Inc.

Stop Grup, an R&D and innovation business, has added the Vertical Wind Tunnel to its product range, which is a first in Türkiye and completely unique.

The company, which successfully produced the Vertical Wind Tunnel through its R&D efforts, represents the basic starting point of parachute sports and training with its product approved in line with international standards. With this product, the company is listed in the inventory of the Presidency of Defense Industries (SSB - Yeten) and NATO.

The company has started cooperation negotiations with three leading Vertical Wind Tunnel manufacturers in an effort to establish itself as a global R&D and innovation business in the aerospace sector and aims to complete another critical task through product exports to be realized soon.

Bilsa Defense Technologies Inc.

Founded in 1993 as a molding shop in Istanbul, Bilsa Defense Technologies has developed advanced processing and mold production methods with the experience and knowhow it has gained over time and has provided final part production services to leading businesses in their respective fields. In 2005, Bilsa Defense Technologies altered the metal parts production approach in Türkiye with the strategic production method

called Metal Injection Molding (MIM) Technology and became Türkiye's first and only MIM facility.

As Türkiye's first and only company with an MIM process, it produces military firearm parts for the defense industry and biopsy forceps tips for the medical sector. In the face of imposed embargoes, the company is involved in the domestic manufacturing of critical parts that were previously imported for these strategic industries. MIM Technology enables the manufacturing of components for air platforms, rockets, and cell phones.

BINTECH Robot Technologies Inc.

The company manufactures automatic cleaning robots to clean skyscrapers and solar energy plants more effectively, safely, and affordably. It also exports the patented robots it has developed.

All R&D processes of the robots produced are carried out by the company. BINTECH aims to develop professional solutions in solar energy and the skyscraper sector and to establish a global presence in these sectors.

CET Composite and Epoxy Technologies Inc.

The company has indigenized more than 100 epoxy-based products and technologies used in aerospace, defense, automotive, maritime, electrical & electronics, and composite sectors over the last three years. It develops custom solutions for various sectors by conducting R&D studies for high performance polymers, high performance adhesives, and mold systems in line with customer demands.

Novumare Technologies Inc.

Novumare has developed a nanoscale drone with a system that transmits video and images to the user. It has one IMU sensor, two DC motor driver circuits, an analog camera, a thermal camera feed input and a wireless connection module. The choice of motor and propeller design were made for a maximum flight speed of 5 meters per second. It has a 4-gr payload capacity and can also carry a thermal camera or explosives for requested missions.

Modüler Makina Inc.

Modüler Makina Inc. was established in Teknopark Istanbul in 2017 to develop the concept of the ENOCH multi-purpose, upgradeable, powerful, autonomous, off-road heavy-duty electric platform.

Developed and tested in a virtual environment, ENOCH is a modular heavy-duty machine that can be modified by the user. It is designed and patented according to the user's requirements, capable of performing all the tasks that off-highway vehicles can perform in the fields of construction, mining, industry, and agriculture. It offers a game-changing solution that will alter the way machines are manufactured, stored, and used. It can run for up to 8 hours on its Li-Ion battery without making any noise or emitting any CO2. With its electric-driven feature, the vehicle operates without carbon emissions. Since a single vehicle has the ability to perform the duties of multiple vehicles, it contributes to reduce the overall carbon emissions. At locations remote from the charging station, it can be run as a hybrid vehicle using 50% less fuel thanks to the DC generator.

ENOCH can be converted from an unmanned to a manned vehicle by mounting a cabin. It can also operate as a hybrid vehicle by adding a diesel-powered generator module in locations far from the power grid.

Wheel loaders, tractors, and telescopic handlers are the three primary machines that are based on the ENOCH design requirements. Special equipment has been designed for each of these machines. It takes 15-40 minutes for users to switch between vehicle types. In addition, ready-made equipment from on-vehicle equipment manufacturers can be supplied and adapted to the machine. For example, an unmanned fire extinguisher or an off-road crane can be built. A wide range of heavy-duty machines can be built by adapting ready-made equipment.

The company was awarded the European Commission's Seal of Excellence in 2019, a gold medal from the Istanbul International Invention Fair in 2021 and another gold medal from the Zagreb International Fair. The ENOCH machine was patented in 2020 and 2021 for its modularity and platform structure.

NOVART Space Technologies Inc.

Novart carries out all design, production, and testing processes of hybrid fuel rocket engine systems on its own infrastructure. Along with the development of the product, rocket orientation determination and control systems were also developed and marketed. For product testing, probe rockets were developed, and services were provided with these rockets.

Ozztech Information Security and Software Inc.

Ozztech, a company that specializes in cyber security software, develops software in the fields of SIEM, SOAR, LOG MANAGEMENT, SOAP and space technology for the defense industry, public and private sectors and is currently marketing its solutions. Developing domestic software with a team of 25 people, Ozztech aims to realize a domestic and national vision with software that supports legal regulations such as 5651-5070-KVKK-GDPR and has started its European operations and is on its way to globalization.

The company's .ORIANALOG and IGNISKMS products, the first software of the .ORIANA family and .IGNIS family, was successfully developed within the scope of indigenization and has garnered a great deal of interest in both the private and public sectors. International operations have started for the software, which was awarded by Imagine Tomorrow.

Onlab Inc.

Onlab is a technology and R&D business that develops solutions in power electronics and motor control systems. It has successfully accomplished a number of projects offering technological motor drive solutions for various sectors and different motor types. Currently, more than 10 products are in mass production for both domestic and foreign markets. There are currently two motor drive projects being worked on in the defense and aerospace industry. Projects in the defense industry are at the TRL5 and TRL6 levels. Additionally, many motor drive projects have been developed and completed for use in civil applications.

Selvi Technology's Artificial Intelligence Solutions for UAV Systems

Selvi Technology specializes in generating data from images. It has solutions including Görü® software, which can detect objects, incidents, and anomalies from camera images, and UYAZ® software, which enables unmanned aerial vehicles (UAVs) to fly autonomously without crashing into obstacles and without utilizing GPS and similar positioning infrastructures, and to perform special-purpose missions autonomously.

Görü® is an indigenous and national system that provides computer vision capability to the platform to which it is integrated. Its technology readiness level is 9 (TRL-9) and is commercialized. It recognizes objects (drones, ships, cars, people, etc.) in the images from its internal camera using a pre-trained convolutional neural network (CNN), and determines the position of the recognized objects in space according to the platform to which it is integrated, and detects malfunctions, anomalies, and incidents, if required. It provides situational and spatial awareness. It transmits what it detects (the information it generates) to the platform.

UYAZ® is an indigenous and national "flying artificial intelligence" system being developed to enable unmanned aerial vehicles to fly autonomously without relying on GPS and similar positioning infrastructures, and to perform special-purpose missions autonomously. Its technology readiness level is 6 (TRL-6). The prototype is being tested in a simulated operational environment. It is incorporated as a hardware module into the embedded system of the UAV. It recognizes civilian or military objects (trees, cars, people, etc.) in the image from the UAV's internal camera using a pre-trained convolutional neural network. It determines the positions of the recognized objects in space and maps the objects, calculating airworthy space and performs mission-specific route planning. It transmits flight commands to the UAV's autopilot. It functions both indoors and outdoors. The workflow is as follows:

- Recognition of objects in camera images with pre-trained convolutional neural network
- Positioning and mapping objects in space
- Calculates airworthy space
- Mission-specific route planning
- Transmitting flight commands to autopilot

TEXINSIGHT Inc.

TEXINSIGHT, specialized in image processing, offers solutions in areas such as safe-hazardous area control, employee monitoring, face recognition, mobility tracking, OHS, productivity assessment by analyzing human-human, human-machine interaction with its video analysis platform.

The company has two solutions that are being developed with artificial intelligence-based image processing methods. effiDoc is an intelligent document management system powered by artificial intelligence where web and mobile platforms work in synchronization, reading and analyzing handwritten and computer printouts and enabling sharing. This project is currently at TRL 5-6 level and development activities are ongoing. The TEXINSIGHT Platform is an artificial intelligence-based image processing platform. It detects and reports anomalies by analyzing human-machine, human-human, human-product interactions in the camera footage at enterprises and the environment. This project is at TRL 5-6 level.

YKSN Marine, Energy, Defense Industries Inc.

Since 2017, YKSN has been actively involved in the simulation and analysis of amphibious vehicles for their movements in water, resistance/power calculations, and the design and production of propulsion systems for these vehicles under the MILPOD brand it has established. It has a skilled staff with experience in computational fluid dynamics (CFD), as well as authorized software and hardware infrastructure.

KOÇ Bilgi ve Savunma Teknolojileri A.Ş. Displays **Smartium Clean Catamaran Boat** at SAHA EXPO

KOÇ Bilgi ve Savunma Teknolojileri A.Ş. Managing Director Mehmet Hakan ÖKTEM shared updated information to our SAHA EXPO Daily about the Smartium Clean Cataraman Boat that showcased for the first time in the show during the second day of the show

SAHA EXPO Daily: Dear M. Hakan ÖKTEM; Could you please inform us about the Smartium Clean Catamaran Boat?

Mehmet Hakan ÖKTEM: This product is called Smartium Clean, a very small catamaran boat. It can be used in manual or autonomous mode with a remote control and is suitable for customization according to different usage purposes.

SAHA EXPO Daily: Is it remote controlled by cable or uses RF (Radio Frequency)?

Mehmet Hakan ÖKTEM: It is RF with an approximate range of 2 kilometers. This product was developed for a variety of uses. One of them served civilian needs, for surface cleaning of marinas, bays, beaches, lakes and ponds. There is a lot of pollution in those places.

SAHA EXPO Daily: How does it clean the water surface?

Mehmet Hakan ÖKTEM: It has an easy-to-change garbage net cassette at the back, and it travels autonomously by moving around with the reservoir in front of it, you can set a route if you want, it goes autonomously. Or, as I said, by remote control.

SAHA EXPO Daily: It's like vacuum cleaners in our houses...

Mehmet Hakan ÖKTEM: Exactly the same as the electronic vacuum cleaners at our houses, but it is made for marinas and harbors. It removes solid wastes such as pet bottle, bags, and other floating suspended wastes, or natural debris and oil leaks. Its second use is for both military and underwater environmental monitoring. It can accommodate a variety of sonars, including side-scan sonars and multi-beam echo sounders. It can also be used to study the underwater environment, or, for example, it can be used for search and rescue operation. Of course, I am talking about calm waters, from searching for bodies to missing persons.

SAHA EXPO Daily: But it's searching on the surface, right?

Mehmet Hakan ÖKTEM: Yes, it's looking down. It uses acoustic sensors pointing down, scanning either with sonar or with a multi-beam echo sounder. You already know that sonars are our main field of activity.

SAHA EXPO Daily: It has two

propellers at the back...

Mehmet Hakan ÖKTEM: Yes, it has two propellers at the back with garbage blocker fence for protection. It weighs around 50 kilograms and can be lifted and lowered easily with two people. It has an onboard camera, GPS receiver, and 4 ultrasonic anti-collision sensors at the front and back. Therefore, we can prevent accidents or collisions. It is battery-operated; it has Lithium-ion battery technology with on duty charge adapter and plug-in battery replacement capability. We delivered a similar system to Fethiye Municipality recently. We added a new feature; it can collect samples now. In other words, it can go to the middle of the sea and collect a water sample. Thus, it can be a very useful tool, especially for local governments or units of the Ministry of Health, which are responsible for measuring the quality of seawater.

SAHA EXPO Daily: So, do you have any plans to make it autonomous in the future?

Mehmet Hakan ÖKTEM: It already has an autonomy feature similar to the one you mentioned. It has one remote; you set a route on the touchscreen display, and it follows that route. The level of autonomy is not very high, but it can move autonomously to a certain degree. But it's not a fully autonomous system. We call it autonomous ready (with software upgrade). You can watch the camera; it also has partial night vision capability. It is suitable for both military and civil use. We have developed a new product

Gürbağ Defence Technologies **Launches GIDS Intelligent Defense System** at SAHA EXPO

Gürbağ Defence Technologies (GST), which started its operations in the field of the defence industry in 2020, launched the GST Intelligent Defence System (GIDS) during SAHA EXPO. Launched at a ceremony attended by Prof. Dr. Ismail DEMİR, President of Defense Industries, GIDS comprises a radar, electro-optics, hydrogen-propelled launcher, and communication systems mounted on a trailer.

Thanks to the original software developed by Gürbağ Defence Technologies, the system can automatically detect, identify and track asymmetric targets and fire fixed-wing ammunition and similar precision-guided ammunition through its launcher.

The most critical feature of GIDS, which can transfer target data obtained through radar and electro-optical payloads to the command-control center, is the hydrogen-fed propulsion system used in the launcher. Thanks to this propulsion system, launchers can be used multiple times after the ammunition has been fired, and the ammunition is exposed to much less shock, thus eliminating the risk of possible malfunctions.

Gürbağ Defense Technologies, which has already completed the production of a prototype of the GIDS System, which can launch fixed-wing ammunition, continues working on GIDS configurations capable of launching different ammunitions. The GIDS System is scheduled to be available to security forces this year.

LIVE

SAHA EXPO 2022 Panel 8

28 Oct Friday 11:00-12:30

The Impact of Defence Industry R&D Studies on the Economic and Technological Development of the Country within the Scope of the National Technology Initiative, Move

Moderator

Mehmet Fatih KACIR
Deputy Minister of Industry & Technology

Panelists

Ali Fazıl BÖYET
Deputy General Manager - AKIM Metal

Ahmet ÖZKAYAN
General Manager - ERMAKSAN

Ulaş TUTAN
Deputy General Manager - Volt Technology

Mehmet AKŞİT
President - SDM

SAHA EXPO 2022 Panel 9

28 Oct Friday 11:00-12:30

Potential for International Cooperation in Naval and Air Platforms

Moderator

Air Vice Marshall Hüseyin DUMAN
General Manager - Technical Services - MOD

Panelists

Esad AKGÜN
CEO- ASFAT

Özgür GÜLERYÜZ
General Manager - STM

Assad KAMAL
CEO GIDS (Global Industrial Defence Solutions

Usman BHATTI
CEO WIL (Wah Industries Ltd.)

Air Vice Marshall Abbas GHUMMAN
Chairman, National Aerospace Technological Park (NASTP)

LIVE

TEI Signed Agreements with Sabancı University and GDMF

Within the scope of the signing ceremonies held at the TEI stand on October 26, 2022 during SAHA EXPO 2022 International Defense, Aviation and Space Fair, TEI signed contracts with Sabancı University under the project named "Development of Fan Inner Casing System from Composite Materials for the Turbofan Engines" and with General Directorate of Military Factories (GDMF/AFGM) within the scope of the Depot Level Maintenance and Repair Service Procurement Project for Makila 1A1 Turboshaft Engines which powers AS532 Cougar Helicopters in Turkish Land Forces and Turkish Air Force (TLF).

Contracts were inked by TEI General Manager Prof. Dr. Mahmut F. AKŞİT on behalf of TEI, Sabancı University Rector Prof. Dr. Yusuf LEBLEBİCİ on behalf of Sabancı University and GDMF General Manager İmdat ERSOY on behalf of GDMF.

TEI was previously commissioned by the Turkish Defence Industry Agency as the Main Contractor for 3,000-hour or 15-year Depot Level Maintenance (DLM) of the Makila 1A1 Turboshaft Engines in the inventory of Turkish Armed Forces as well as for the unscheduled maintenance of engines and modules. Accordingly, an agreement for the Cougar Makila 1A1 Engines Logistic Support Project was signed with the Presidency of Defense Industries on December 26, 2011. Under the project, TEI acquired the necessary capabilities to carry out DLM, repair, modernization and refurbishment processes domestically for Makila 1A1 Engines of the AS532 Cougar Helicopters with the cooperation of and in collaboration with the 1st Air Maintenance Factory of the GDMF.

TUSAŞ Signed a New Order Agreement for New Generator Sets from İŞBİR for **ANKA and AKSUNGUR UCAV Systems**

Within the scope of SAHA EXPO 2022 International Defence & Aerospace Exhibition on October 26, 2022, a contract was signed between TUSAŞ and İŞBİR regarding the supply of Mobile Electric Power Supply (MEGK) Generator Systems to be used in both the ANKA and AKSUNGUR UCAV Ground Control Stations that will be put into service soon. Contract was inked by TUSAŞ CEO and General Manager Prof. Dr. Temel KOTİL on behalf of TUSAŞ and İŞBİR General Manager Burhan ÖZGÜR on behalf of İŞBİR.

The number of MEGK Generator Systems to be delivered under the new order agreement is not disclosed. During SAHA EXPO 2021 on November 11, 2021 a contract was signed between TUSAŞ and İŞBİR for the supply of 6 units of 2x40kVA Mobile Electric Power Supply (MEGK) Sets (each of which has two separate redundant generators) for the AKSUNGUR UCAVs.

Agreement between BAYKAR and ASELSAN for the **CATS Electro-Optical Sensor System**

Agreement between BAYKAR and ASELSAN for the CATS Electro-Optical Sensor System The "CATS Electro-Optical Sensor System Procurement Agreement" was signed between Baykar and ASELSAN under the supervision of SSB at SAHA EXPO. President of Defence Industry Agency Prof. İsmail DEMİR, CEO of Baykar Haluk BAYRAKTAR, and Chairman of the Board of Directors & CEO of ASELSAN Prof. Haluk GÖRGÜN attended the signing ceremony.

Cooperation Protocol Between BAYKAR and SSB (Defence Industry Agency) on **Bayraktar KIZILELMA Unmanned Combat Aerial Vehicle (UCAV)**

President of the Defence Industry Agency, Prof. İsmail DEMİR, and CEO of Baykar, Haluk BAYRAKTAR, attended the signing ceremony. In his speech at the ceremony, President DEMİR stated that when the TB2 was built and moved from prototype to maturation, Baykar continued its studies by always aiming for the next move with KIZILELMA.

Cooperation Protocol between TÜBİTAK BİLGEM, ULAK Communications Inc., and Istanbul Medipol University on **Patent Development Studies for 6G Standards**

The agreement aims to develop patents in the studies to be carried out for the development of countrywide 6G standards and to deliver the solutions with our own patents, thus reducing the costs. In this way, our companies will contribute to technology standardization by increasing competition with other companies in the world. The agreement also aims to enrich the general patent profile of Türkiye and ensure cooperation with our Universities, Industry, and Institutes to create the right ecosystem.

Cooperation Protocol between TRTEST and BMC POWER under the supervision of the Defence Industry Agency **for the Establishment of Test Center**

The PowerPack Test Center was established by BMC POWER under the ownership of the Defence Industry Agency (SSB) to test Engine, Transmission, and Powertrain systems and started to serve in 2021. The facility, which is one of the most advanced test centers in Turkey and Europe, is currently used for the tests of engines, transmissions, powerpacks, and their subsystems developed by BMC Power. With the protocol, other companies operating in this field will also benefit from the Test Center through TRTEST.

HAVELSAN and BMC Automotive Industry and Trade Inc. Signed the **Vehicle Electronic Control System Development Project**

SAHA EXPO 2022 Panel 1
Women in the Defence Industry

Within the scope of SAHA EXPO 2022 Defense & Aerospace Exhibition on October 26, 2022 a panel was weld under the title of "Women in the Defence Industry". Moderated by Dr. Alime ÖZYILDIRIM Deputy Manager - TUBITAK Space Technologies Research Institute, Zeynep Bodur OKYAY President & CEO - KALE Group, Filiz AKKAŞ Chairman & General Manager - MAPSIS Metal, Aerospace & Defence Corp., Meysun A. ÖZGÜN Manager - ASELSAN Balistic Missile Defence Systems, Hülya AKHAN Manager - BAYKAR Human Resources.

SAHA EXPO 2022 Panel 2
Regional Cooperation Opportunities in the Defence Industry

Within the scope of SAHA EXPO 2022 Defense & Aerospace Exhibition on October 26, 2022 a panel was weld under the title of "Regional Cooperation Opportunities in the Defence Industry". Moderated by Murat ÖZDEMİR Presidency of the Republic of Türkiye Investment Office Advisor, Haluk BAYRAKTAR CEO, BAYKAR & Chairman of the Board SAHA İstanbul, Murat İKİNCİ General Manager - ROKETSAN, Tareq Abdulraheem Al-HOSANI CEO, Tawazun Economic Council, Faisal Al-BANNAI Executive Chairman of EDGE Group.

SAHA EXPO 2022 Panel 4
Risks and Opportunities for the Defence Industry in the Changing Global Security Conjuncture

Within the scope of SAHA EXPO 2022 Defense & Aerospace Exhibition on October 26, 2022 a panel was weld under the title of "Risks and Opportunities for the Defence Industry in the Changing Global Security Conjuncture". Moderated by (R) Gen.Ergin SAYGUN, Osman OKYAY Vice President of KALE Group & Chairman of the Board SaSaD, Hakan ALTINAY ALTINAY Technology Group Chairman of the Board, (R) Lt.Gen. Uğur TARÇIN, PHD Lecturer - Marmara University & SAHA MBA, (R) Lt.Gen.Alpaslan ERDOĞAN STM ThinkTech Coordinator.

Ghost Robotics Vision 60
Now in Türkiye with the Cooperation of Volt Technology

The Most Sophisticated Robot Dog in the World

The launch meeting of the important cooperation between Volt Technology and Ghost Robotics, one of the world's leading robot manufacturers, was held at SAHA EXPO. One of the most cutting-edge robot dogs in the world, "Ghost Robotics Vision 60," was unveiled at the launch event for the first time in Türkiye.

Speaking at the event Volt Technology General Manager Burçin ELBİRLİK underlined that Volt Technology has the electrical, electronic, mechanical designs, analytical modeling, prototype and serial production capabilities to address the high technology requirements. "We have also contributed significantly to many Turkish Aerospace projects that have been completed or are currently in progress. The generators and alternators used in aviation are the most significant projects that our company has developed in Türkiye," ELBİRLİK added. Volt Technology General Manager Burçin ELBİRLİK made the following statements at his address:

"Our company was given the task of developing and producing the electrical power systems and control units for the Turkish Fighter (MMU/TF-X), one of Türkiye's most significant projects, in addition to the GÖKBEY Light Utility Helicopter, the ATAK Helicopter, HÜRKUŞ Trainer Aircraft, HÜRJET Advanced Jet Trainer. Another strategic product produced in our country is precision guidance kits. In this regard, we continue to cooperate with the top businesses in our country. The robotic system which will introduce today is one of the major initiatives of Volt Technology, which closely follows global technological advancements. It is the "Vision 60" robot dog of Ghost Robotic. Robots, which I am sure you all follow closely, are replacing humans in many fields. Or, to put it more precisely, it takes on possible risks on behalf of humans. One of the most significant businesses in the world in this field is Ghost Robotics. As Volt Technology, we are now the strategic partner of the world-renowned company in Türkiye. Our main objective is to improve the payloads employed on the robot dog. To upgrade the robot dog, in other words, by adding new features and capabilities to it. As part of our collaboration, we also wish to assume maintenance and technical responsibility for these systems and other products of a similar nature over time. Our ultimate goal is to produce this product with entirely domestic resources."

Following the speeches, "Ghost Robotics Vision 60" took the stage and demonstrated its capabilities. The "Ghost Robotics Vision 60" is capable of moving on all types of terrain, climbing stairs, and navigating in water, snow, and ice. It can be used in both military and civilian fields. It is also capable of conducting missions like reconnaissance, search, and rescue.

Features of Ghost Robotics Vision 60

- 2 hours 45 minutes of standard walking at 0.9 m/s
- Walking speed up to 1.2 m/s
- 9 kilometers of range depending on terrain conditions and integrated payload
- 22 hours standby (when sensors, calculations, and radio are all on)
- Direct charging feature
- Modular design with easily interchangeable subassemblies
- Load carrying capacity: 10 kg
- Weight: 51 kg

SAHA EXPO **Metaverse Exhibition** Will Be Launched Soon

The physical part of the SAHA EXPO 2022 International Defense and Aerospace Exhibition, which is planned to be hybrid like the previous exhibition, will take place on October 25-28, 2022, while the Metaverse Exhibition, which will be the first of its kind across the defense industry fair organizations, will be held on the XperExpo platform between November 1, 2022, and February 1, 2023.

All businesses that have a booth at the physical fair are eligible for free entry into the Metaverse Exhibition. Thanks to the Metaverse Exhibition, business people from all around the world who are unable to attend the event physically will still be able to access participating businesses and communicate with their own avatars in the Metaverse. Additionally, there will be online meeting (video meeting) spaces in the Metaverse where businesses may conduct B2B meetings. All the benefits and opportunities provided by the virtual world, such as product promotion videos, catalogs, and business card exchanges, will be covered at the Metaverse Exhibition.

On the SAHA EXPO official website, there is a section on how to register for the Metaverse Exhibition. In addition, an area/stand of approximately 20 sqm in size has been allocated for the Metaverse concept in the foyer area at SAHA EXPO 2022 Physical Exhibition. Visitors and high-level participants will be able to enter the Metaverse in this area by wearing virtual reality glasses and the appropriate clothes and will be able to experience the Metaverse. On the LED screens mounted on the back side, you can view what the person entering the Metaverse sees through their virtual reality glasses. When the virtual reality glasses are worn, avatars will be able to visit the booths where businesses display their products, interact with one another, and exchange business cards. Therefore, things that can be done in the virtual environment, in the Metaverse environment, will be experienced in this booth area.

exail

ECA Group and iXblue Join Forces and **Become Exail**

Following the acquisition of iXblue by Group Gorgé end of September, ECA Group and iXblue announced on 18/10/2022 that both companies will be operating under a new joint brand: Exail. With this alliance, Exail becomes a global high-tech industrial champion specializing in cutting-edge robotics, maritime, navigation, aerospace and photonics technologies. Combining complementary technological expertise and geographical footprint with a strong legacy of innovation, Exail provides its global base of customers with cutting-edge in-house manufactured technologies ranging from components and sensors to products and complex systems.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STRONGER TOGETHER
We strive to create an ecosystem where experts come together and generate the solid foundations upon which our nation thrives. By partnering with world-class organizations, we are revolutionizing our security and defense industry and transforming the future of Qatar.
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