RADAR MARKET RESILIENT

NEW ACQUISITIONS FOR LAND, SEA AND AIR

WORDS THOMAS WITHINGTON

The military radar market is enjoying good health thanks to a number of ongoing and expected acquisitions across the air, land and sea domains. Furthermore, 2014 has witnessed a significant number of new products entering the market place...

The airborne military radar domain has been particularly active over the past year. Important programmes are ongoing for Multi-Role Combat Aircraft (MRCAs), along with helicopters and special missions aircraft. In the MRCA domain the Eurofighter Typhoon has moved a step closed to receiving a new Active Electronically Scanned Array (AESA) radar. The Captor-E, developed by the Euroradar consortium is due to replace the aircraft's existing Captor-M mechanically scanned system. It was announced during the July 2014 Farnborough Air Show that the United Kingdom Ministry of Defence had awarded a contract to BAE Systems to perform a risk reduction for the installation of the Captor-E onboard the Tranche-3A/B Typhoon variant. A contract to fully develop the Captor-E could be awarded by late 2014 paving the way for the radar's installation on the Tranche-3 aircraft ordered by the Eurofighter partner nations (Germany, Italy, Spain and the United Kingdom), and export customers Oman and Saudi Arabia. The radar is expected to be available from 2016.

During the same event, Selex announced that it had received a contract from Saab to produce and supply its Raven ES-05 AESA radar for the latter's JAS-39E MRCA equipping the Flygvapnet (Royal Swedish Air Force). This X-band (8.5-10.68 Gigahertz/GHz) radar has a 100 degree field-of-view, although this can be expanded thanks to the swash plate onto which the antenna is affixed to widen the radar's gaze.

Northrop Grumman Scalable Agile Beam Radar (SABR) continues to move forward. The X-band SABR has been selected by Lockheed Martin to fulfil part of the Combat Avionics Programmed Extension Suite (CAPES) initiative for the General Dynamics/Lockheed Martin F-16C/D Block-50/52 jets operated by the United States Air Force, and similar aircraft flown by the Republic of China Air Force. On 25th September, Northrop Grumman announced that it had completed all Engineering and Manufacturing Development (EMD) design reviews for the SABR. Although the CAPES undertaking has been omitted from the USAF's 2015 fiscal budget request, Northrop Grumman is continuing to advance SABR, with EMD units expected to be delivered to Lockheed Martin by the end of 2014. Raytheon, meanwhile, is pressing ahead with its RACR (Raytheon Advanced Combat Radar) with which it is supplying to the Republic of Korea Air Force (RoKAF) as a retrofit for the force's KF-16C/D Block-50/52 planes. Deliveries of this X-band AESA radar to the RoKAF are expected to commence by 2016, with deliveries forecast to conclude in 2020.

Exelis of the United States was awarded a contract worth $32 million (£20 million) to supply its AN/APY-11 airborne multimode radars to furnish Lockheed Martin HC-130J Search and Rescue aircraft operated by the US Coast Guard. Based on Israel Aerospace Industries' (IAI) Elta Division's EL/M-2022, this radar has a range of circa 200 nautical miles (370 kilometres) with the ability to track up to 1,000 targets. Along with the

HC-130J, the AN/APY-11 also equips Lockheed Martin P-3 Orion family maritime patrol aircraft and Airbus C-295 turboprop planes, plus several Unmanned Aerial Vehicle (UAV) types. Away from the AN/APY-11, IAI Elta has launched its EL/I-3150 X-band combined maritime and land airborne surveillance radar. Designed for installation on a business jet-sized platform, this radar forms part of the company's MARS2 (Multi-Mission Airborne Reconnaissance and Surveillance System) package which includes electronics and communications intelligence payloads, enabling an aircraft thus equipped to perform maritime and ground surveillance.

Land Forces

In the land domain, Saab launched several new radars in May 2014. Exploiting advances in Gallium Nitride (GaN) technology, these radars promise enhanced detection ranges and better small target discrimination compared to legacy systems. New S-band (2.3-2.5/2.7-3.7GHz) radars to enter the firms' catalogue include the Giraffe-4A and Giraffe-8A ground-based air surveillance radars. The Giraffe-4A can perform air surveillance and weapons-locating, with a range of up to 151 nautical miles (280 kilometres) for conventional air targets. Regarding X-band radars, Saab has launched the Giraffe-1X to perform Short-Range Air Defence (SHORAD). With the ability to monitor 100 air targets and up to 200 surface targets, the radar is designed to perform weapons location, alongside camp and base protection. The Giraffe-1X will be ready for delivery in circa 2016 with the Giraffe-8A ready for delivery one year later. Along with these new radars, Saab has unveiled updated versions of its ARTHUR and Giraffe AMB radars; the former of which has a comparatively smaller antenna to improve its mobility, with the Giraffe AMB receiving enhancements to detect UAVs, and improvements to its detection of Rocket, Artillery and Mortar (RAM) fire. The Republic of Korea (RoK) is one country with a requirement for radars to detect UAVs, with the country planning an acquisition to this end by early 2015. It is expected that the RoK could eventually spend up to $191 million (£119 million) on this purchase.

In addition to Saab's products discussed above, new ground-based surveillance radars have been unveiled by SpotterRF of the United States in the form of the Shield Mobile X-band radar. Designed for the detection of people at a range of 130-850 metres (426-2788 feet), and vehicles at up to 1,500m (4,921ft), the radar is available in three versions; namely the C20, C40 and C550. Other new ground surveillance radars launched in 2014 include IAI Elta's EL/M-2138M Green Rock Counter-RAM product. Capable of installation onboard a four-wheel drive vehicle, this S-band AESA radar has a range in excess of ten kilometres (six miles) and can perform 360 degree and 180 degree of azimuth coverage, and 90 degrees of elevation coverage. Deliveries of this radar to the Israeli Defence Force are expected to commence by the end of this year.

In the passive radar domain, Czech defence electronics specialists ERA won a contract to supply two Vera-NG passive radars to the North

'The Giraffe-1X will be ready for delivery in circa 2016 with the Giraffe-8A ready for delivery one year later'

Atlantic Treaty Organisation. The Vera-NG detects the electromagnetic emissions from an aircraft such as communications and navigation signals, to determine the position of that aircraft via a process of triangulation. The asset of passive radar is that it is very difficult to detect as it produces no emissions, making it difficult to jam using electronic countermeasures, or to target with anti-radiation missiles. Staying in the Czech Republic Retia, one of the country's defence electronics specialists will deliver its second ReVISOR ground-based air surveillance radar to the Czech armed forces by the end of 2014. This X-band radar is designed to provide SHORAD using an AESA, and is particularly suited to detect targets with a low radar cross section with a range and azimuth accuracy of 50m (164ft) and 0.25 degrees for such targets respectively.

MAIN: SMART-S (Thales) – Thales has won orders for its S-band SMART-S Mk.2 radar from the Royal Malaysian Navy to equip that country's 'Gowind' class Offshore Patrol Vessels (OPVs), along with the Polish Navy's forthcoming Ślązak OPV.

Left: Giraffe 4A (Saab) – Saab has launched a raft of new radars in 2014. They include the company's new S-band Giraffe-4A ground-based air surveillance radar which has a range of circa 151 nautical miles (280 kilometres).

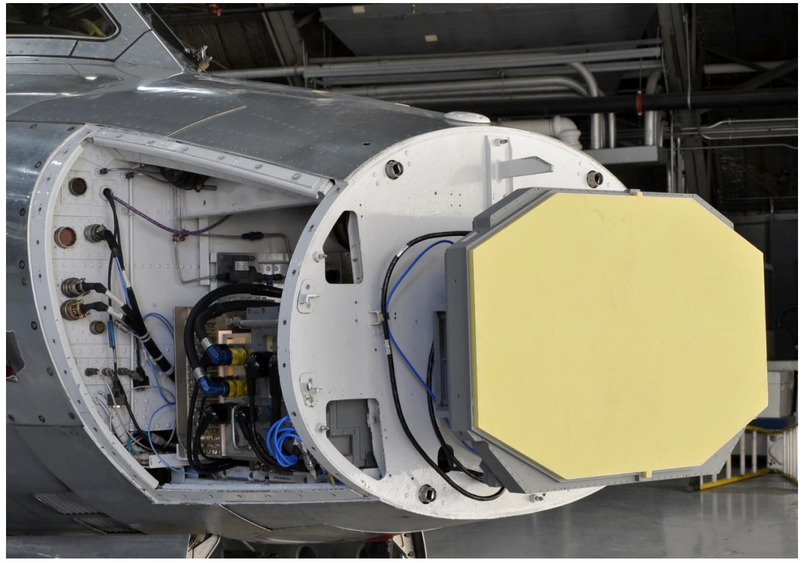
Northrop Grumman's S-band AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR) is on track to equip the United States Marine Corps (USMC). Intended for a diverse range of tasks including ground-based air surveillance and air traffic management, the AN/TPS-80 is designed to be both vehicle- and trailer-mounted. The USMC is expected to eventually receive a total of 69 AN/TPS-80 radars in a range of configurations, with the radar being approved for Low Rate Initial Production in March 2014.

Maritime Domain

The Royal Malaysian Navy is to receive Thales' Smart-S Mk.2 air and surface surveillance radars to equip its six 'Gowind' class Offshore Patrol Vessels (OPVs) which it currently has in production. The S-band Smart-S Mk.2 has a range of 130nm (250km) and can track up to 500 air and surface targets. The Smart-S Mk.2 uses solid state architecture and has in integral identification friend or foe antenna. In addition to the Malaysian 'Gowind' vessels, Thales announced in March 2014 that it had won a contract to equip the Ślązak OPV of the Marynarka Wojenna (Polish Navy) which is expected to enter service by 2016.

While the firm launched new ground-based surveillance radars (see above), Saab has also launched new radars in the maritime surveillance domain, including the S-band Sea Giraffe-4A and the X-band Sea Giraffe-1X. This AESA radar can detect and track up to 200 surface targets and 100 air targets, with a range of around 54nm (100km). A word should be said about the new Sea Giraffe AMB radar launched by the firm in May 2014. This radar's range is around 97nm (180km) and it can track 200 air targets and 400 surface targets. Meanwhile, Saab's new Sea Giraffe-4A ASEA radar is on contract for delivery by the firm, although it has demurred from disclosing the customer. Furthermore, IAI Elta has launched new naval surveillance radars in the form of the company's EL/M-2222S NAV-GUARD designed to enhance vessel protection against Anti-Ship Missiles (AShMs). Providing 360 degrees of azimuth coverage using four flat AESA panels, this S-band radar has a range of four nautical miles (seven kilometres) and can be teamed with Rheinmetall's MASS (Multi-Ammunition Softkill System) for the launch of chaff and flare decoys.

The need for nations around the world to invest in new radar capabilities, particularly in the field of AESA technology, is continuing to propel the military radar market. Although nations in Europe and the United States have suffered a reduction in their defence spending, the demand for new radars in the Middle East and Asia-Pacific regions is continuing to ensure that the market remains dynamic.



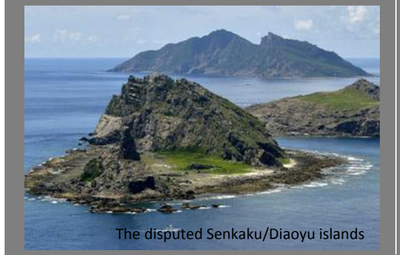
'The need for nations around the world to invest in new radar capabilities is continuing to propel the market'

Right: SABR (Northrop Grumman) – Northrop Grumman is forging ahead with its new Scalable Agile Beam Radar, better known as 'SABR', which is designed to equip the General Dynamics/Lockheed Martin F-16C/D Block-50/52 multirole combat aircraft operated by the USAF and Republic of China Air Force.

REGIONAL PROGRAMMES

CHINA

China is developing its air defence network in efforts to counter the most advanced stealth fighter aircraft. In a recent announcement, Beijing suggested that its new passive detection system, the DWL002, renders the American stealth capabilities 'obsolete'. The system is marketed by CETC International and was on display at the 9th China International Defense Electronics Exhibition in Beijing earlier in the year. DWL002 consists of a master reconnaissance station and two slave stations but can be enhanced to consist of four stations and mounted onto vehicles. With a reported detection range of 400 kilometres to detect fighters and 600 kilometres to reach airborne early warning and control (AWACS) aircraft, the system can cover all of Taiwan's territory as well as the disputed Senkaku/Diaoyu Islands in the East China Sea. For now, the Philippines, the Japanese mainland and the U.S. military bases on Okinawa remain beyond range. According to local media, the system provides a target capacity of 100 batches and a range of detectable signal types including pulse, frequency agility, pulse duration, tactical air navigation system, distance measuring equipment, jitter/stagger radar, and identification friend or foe.



The disputed Senkaku/Diaoyu islands

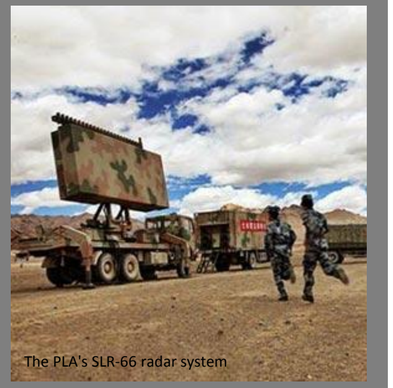
U.S.A

The U.S. Air Force has selected Raytheon and Saab Defense of DeWitt to produce its next generation of long-range radars. The companies are expected to seal a $1.3 billion deal in total sales over the next 10 years, creating around 100 new jobs. Competing bids had been made by Lockheed Martin and Northrup Grumman, the latter having also subcontracted Saab Defense. Lockheed and Saab Defense had previously spent years developing the mobile ground-based radar, designed to detect, identify and track aircraft, missiles and other incoming aerial threats. The new Three-Dimensional Expeditionary Long-Range Radar (3DELRR) will take the USAF to new horizons, providing it with the ability to detect emerging threats such as stealth cruise missiles. Looking ahead, the Air Force plans on spending $71.8 million to complete development of the 3DELRR and produce the first six units for deployment. The contract will complete the initial engineering, manufacturing and development phase. The contract will complete the initial engineering, manufacturing and development phase. Three Dealer will serve as the Air Force's principal long-range, ground-based radar of the future, replacing the AN/TPS-75 air search radar.

The outgoing AN/TPS-75

INDONESIA

Indonesia is currently reportedly holding talks with China to purchase a version of the Chinese maritime radar system SLR-66 in order to monitor foreign vessels in the Strait of Malacca, Celebes Sea and Torres Strait. Indonesian minister of defence, Purnomo Yusgiantoro, said his country is assessing the capabilities of the SLR-66 over-the-horizon radar and its potential for compatibility with existing Indonesian Navy assets. China's Global Times stated that Indonesia was discussing the possibility of securing the radar system with China National Electrics Import & Export Company. The organisation is not believed to be involved in the development of the radar but is working with other state-run companies to export the system. Jane's Defence Weekly reported on the pending agreement, suggesting that the cost of the system has been evaluated in recent years at $163 million.



The PLA's SLR-66 radar system

MILITARY RADAR

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