

**Darren Lake** talks to some of the companies most closely involved in the development of USVs, and assesses what current and future technologies offer.

## USVs ahoy

This year, for the first time Shephard's *Unmanned Vehicles Handbook* listed unmanned surface vehicles (USVs) alongside UAVs and UGVs. The USV market is currently quite small, but if requirements and technology development are any indication, it is a sector poised for rapid expansion.

As with the growth of the UAV market, the current 'garden of Eden' for USVs is Israel, which has pioneered unmanned systems technology on a number of fronts. Three of the major UAV manufacturers in the country – Aeronautics Defense Systems, Elbit Systems and Rafael – all have products in development and available for purchase.

The Israeli navy is in the process of assessing its USV needs, and all three companies are assisting with trials to help shape those requirements. According to Giora

Katz, VP and general manager, protection systems section at Rafael, the main obstacle now to the day-to-day utilisation of USVs is closing the cultural gap: 'That is something everybody in the business knows. In the UAV world that took 20 years. For USVs it's going to be much faster.'

### FROM SKY TO SEA

In fact, the fast growth of the UAV market and Israel's strength in such systems hasn't only closed the cultural gap, but also the technology gap. Many of the technologies, whether sensors, control systems or autonomy, leverage the companies' existing UAV capabilities.

Aeronautics is one of the developers busily turning its UAV expertise to the challenges of operating in the naval environment. The

company has built a 7-metre prototype USV called SeaStar that it has busily been testing in Ashdod Bay. The boat is equipped with both an EO/IR payload and a machine gun and has done several hundred hours of sea trials.

'The product is partially autonomous,' states Dany Eschar, Aeronautics' VP for technologies. 'We're now working on a fully autonomous mode.' He says that making that a reality will take both hardware and software developments to overcome difficult challenges such as obstacle avoidance.

'We're now integrating those devices in the lab. We want the vessel to be capable of manoeuvring around both static and dynamic obstacles,' he states. Aeronautics believes that one of its edges in development is that the building blocks for autonomy are the same for both UAVs and USVs.

'We bring experience, reliability and an understanding of control systems,' Eschar states. 'We have more than 70,000 hours in the UAV world now that we can apply to the USV world.'

SeaStar is currently in its second spiral of technology development and Aeronautics plans to get the USV back in to the water soon. It also hopes to provide the Israeli navy with a prototype to experiment with as it tries to develop its own concepts of operation.

'There is a lot of effort and money being expended on this sector,' Eschar, who is also a



Elbit's Stingray is a high-speed USV, suitable for port and infrastructure security duties. (Photo: Elbit systems)

### ECA – INSPECTOR



**Type:** USV **Manufacturer:** ECA **Performance:** up to 35 kt **Dimensions:** Length 7-11 m **Payloads:** K-Ster mine killer, side scan sonar, forward looking/obstacle avoidance sonar, multi-beam echo sounders, sub-bottom profiler, magnetometer **Communications:** 3 modes of operation: manually onboard the USV, remotely controlled using computer console up to 10 nm, autonomous with supervision from computer console up to 10 nm **Applications:** Coastal and port security, coast guard missions including underwater search, mine warfare, naval combat, shallow water survey, hydrography and oceanography, surveillance and reconnaissance missions.