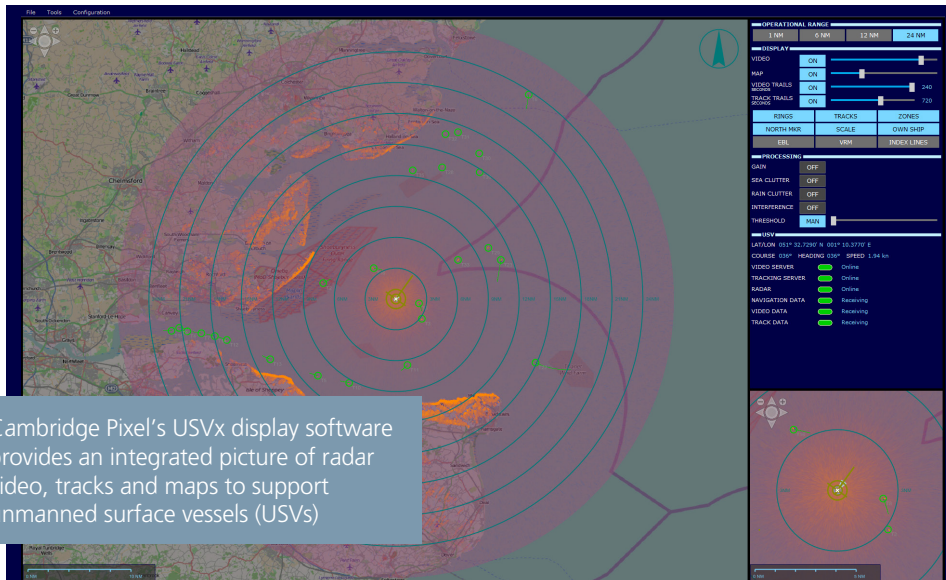# Cambridge Pixel

Cambridge Pixel's USVx display software provides an integrated picture of radar video, tracks and maps to support unmanned surface vessels (USVs)

David Johnson has a background in software and image processing and has been working with radar systems for over 20 years. Cambridge Pixel's specialist technology is now deployed in over 40 countries around the world

Cambridge Pixel celebrates its tenth anniversary in 2017, in what will be a record year of export sales for the business. A specialist provider of software components for radar processing and display, the Company has achieved steady year-on-year growth over ten years, with exports now accounting for over 70% of business to customers in over 40 countries.

Cambridge Pixel develops specialised software that processes radar signals to extract information and create radar displays. It's a niche market and we have grown to become the world's leading supplier of this technology. The products find application in a wide range of market segments from military naval systems, including the Royal Navy and the US Navy, to air traffic displays, commercial ships and security applications that use radars for intruder detection. Our software finds application in the world's most advanced ships, but then also helps to guard fish farms from intruders with big nets!

Starting Out

Evolutions in technology create opportunities to do things differently. When we started, computer graphics cards were being developed to meet the demands of computer gaming. We were able to exploit these cards to provide high-end data processing capabilities at low cost. Gone was the need to design special hardware products for radar display: software replaced hardware and Cambridge Pixel was born.

KEY FACTS ABOUT CAMBRIDGE PIXEL

» CEO: David Johnson
» Headquarters: Cambridge, UK
» Founded: 2007
» Company: Private
» Employees: 10
» Export: 70% to over 40 countries
» Turnover: £3M

> ❝Our software finds application in the world's most advanced ships, but also guards fish farms from intruders with big nets❞
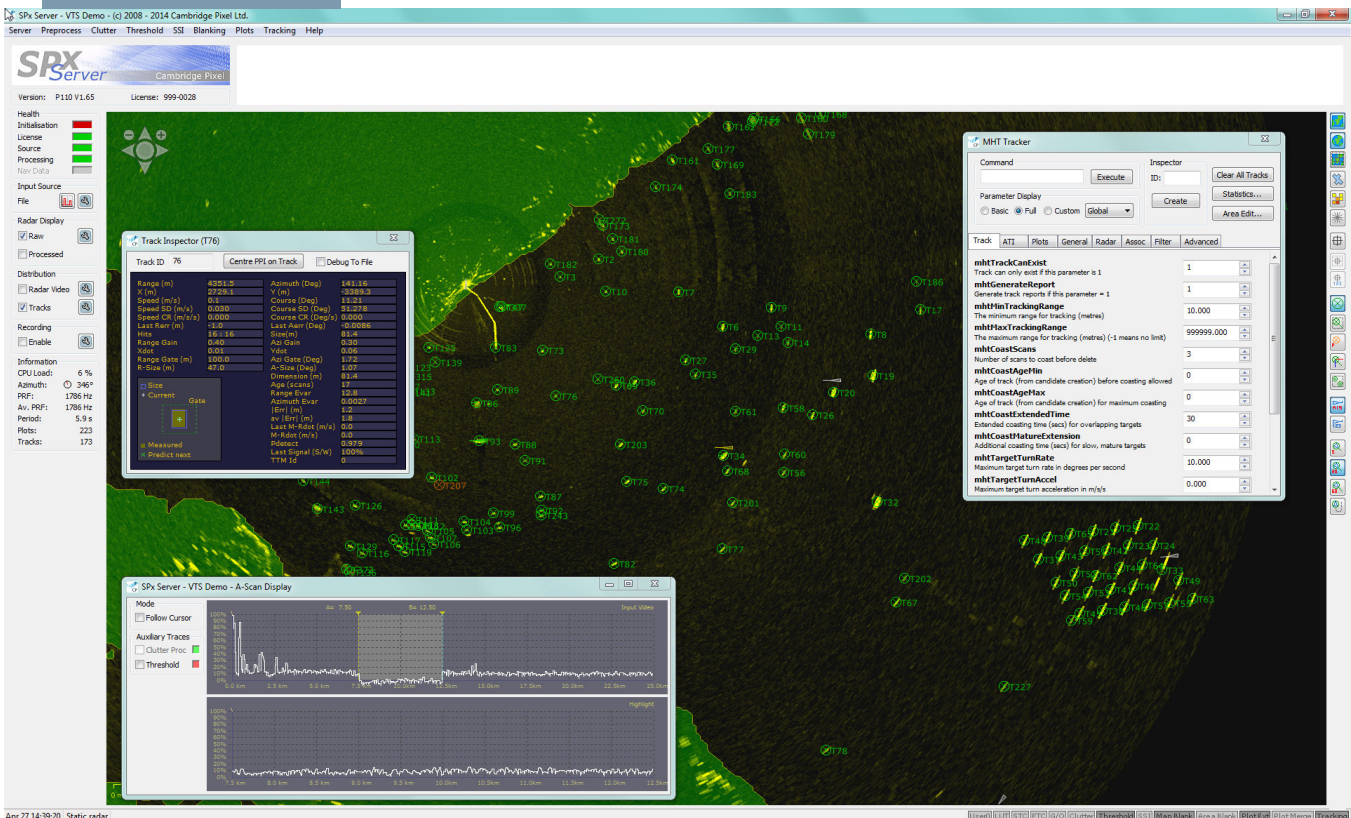
The early-stage challenge of a small technology company, whose principal market is the military, is credibility. Having the right product is step 1 and opens the door for discussions. But step 2 is whether a long-term military program can commit to a product from a new-on-the-block company. Obvious questions have to be asked, due diligence performed, contingencies planned for. But these are all soluble if the product offers compelling benefits in terms of cost, performance or flexibility.
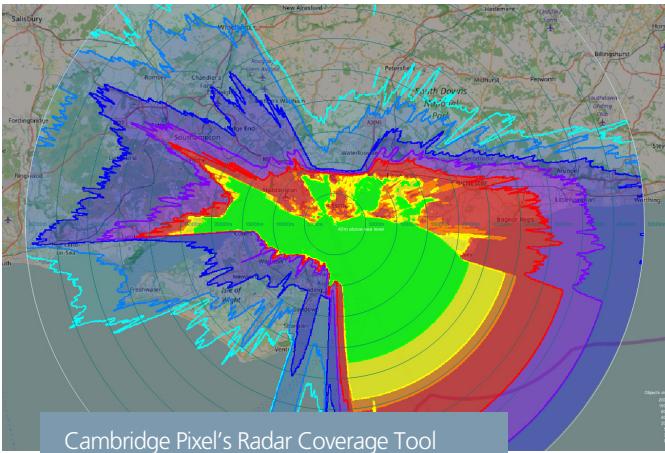
Cambridge Pixel's first customer was a US system integrator providing radar display technology to the US Navy. We are still working with the same customer ten years later. A successful partnership with BAE Systems in the UK allowed us to supply our products for the T45 class ships and we are pleased to be associated with the new Queen Elizabeth Aircraft Carrier due for commissioning later this year and the new state-of-the-art T26 frigates. The successful relationship with BAE Systems was critical to Cambridge Pixel growing exports in similar naval markets. It was a statement of

credibility that BAE had selected us for the Royal Navy and this served as a springboard to similar business with South Korea, India, Indonesia, China and Singapore, in addition to Europe and the US.

Exporting Success

Cambridge Pixel won the Queen's Award for Export in 2015, reflecting our success in developing significant overseas business. Export brings its challenges for a small high-technology company, but we recognised early on that it was essential for growth. A key factor in our success has come from the tailoring of our business approach to meet the needs of different markets. Some customers are looking for a black-box solution, meaning the product takes an input, delivers an output and what happens in the middle is hidden. In other situations, customers want to adapt and tailor the solution. We observed that some markets were hungry for technology transfer, where local companies, especially in developing countries, wanted knowledge as well as a product.

Cambridge Pixel's SPx Server software provides advanced target tracking capabilities to automatically acquire and track targets ranging from small drones or RIBS through to fast-moving agile air targets.

Cambridge Pixel's Radar Coverage Tool provides a visualisation of where a radar can see, allowing an appropriate location to be chosen for coastal surveillance.

David Johnson and Richard Warren started Cambridge Pixel in 2007. The UK Royal Navy's T45 ship (background) is one the platforms that has benefited from Cambridge Pixel's technology.

Our approach was to tailor the offering so that customers could expand and enhance what we provided, thereby providing a degree of local content to the final solution. We achieved this by preserving our intellectual property, but giving customers sufficient inside-knowledge for them to customise the products to meet local needs. It's a compromise solution, where a customer might not have the expertise to build a complex solution, but nevertheless wants to customise as the first step to acquiring knowledge.

The German Mittlestand model defines many attributes of Cambridge Pixel's business. Being small means being responsive and listening to customers. All businesses claim to be customer focused, but words and practice are different. Our customers appreciate the here-when-you-want-us service that we aim to supply, although with our customers in time zones all over the world, that is sometimes a challenge. We aim to be seen as an extension of our customer's organisation, so that an engineer sitting in Lockheed Martin or BAE Systems can engage with Cambridge Pixel's engineers as if they part of the same team. It isn't uncommon for us to be asked technical questions that don't even relate to the product we have supplied – happy to help!

Future Radar

Although radar has been around for over 75 years, changing needs and threats bring new challenges and opportunities. Investing in new products and ideas is essential for any business to thrive and selecting the right export markets, where there is both opportunity and access, is critical.

Looking to the future, security applications provide a fertile ground for new radar technologies. New radar sensors are being developed to provide early detection of security threats, including monitoring political borders or searching the sky for drones with malicious intentions. Cambridge Pixel has recently developed enhancements to its target tracking software to look for very small targets in high clutter situations – detecting threats early means more time to act. It's important to keep evolving and inventing. Even for a highly specialised company, we remain vigilant to the subtle shifts in the niche that we work in. Expectations change, technology evolves, opportunities arise. It's a dynamic situation and that keeps the business interesting. With the uncertainties of what Brexit will bring, identifying and developing the right export markets goes hand-in-hand with developing the right products. Success means getting both right.

"Our customers appreciate the here-when-you-want-us service"