

SITUATIONAL INTELLIGENCE, THE WORLD OVER



ABOUT KELVIN HUGHES SURVEILLANCE

The Kelvin Hughes Surveillance division is a global radar system solution provider. The company's technologies meet the surveillance, safety, and security needs of the world's navies, coastal and border operators, and military / quasi-military security agencies and organisations.

The company provides surveillance and navigation systems to 30 of the world's navies, and is continuously growing its market strengths with international ports, coastal and land border protection agencies, and civil infrastructures operators.

Kelvin Hughes Surveillance solutions span both land and sea; from border security and civil infrastructure integrated surveillance systems to naval integrated bridge systems, solid state surveillance radar and radomes for small fast boats.

Among the Company's key offerings are coherent SharpEye™ and non-coherent radar technologies capable of detecting the smallest of targets and lowest velocities in clutter.

KEY PRODUCTS

- Land security surveillance solutions
- Naval integrated bridge systems
- Vessel Traffic Service (VTS) radar
- Coastal Surveillance radar
- SharpEye™ solid state radar sensors
- MantaDigital™ display and tracker technology
- Flat panel phased array radar
- Integrated surveillance management display software
- Naval tactical radar displays
- Advanced radome radars
- Integrated bridge systems



ABOUT KELVIN HUGHES GROUP

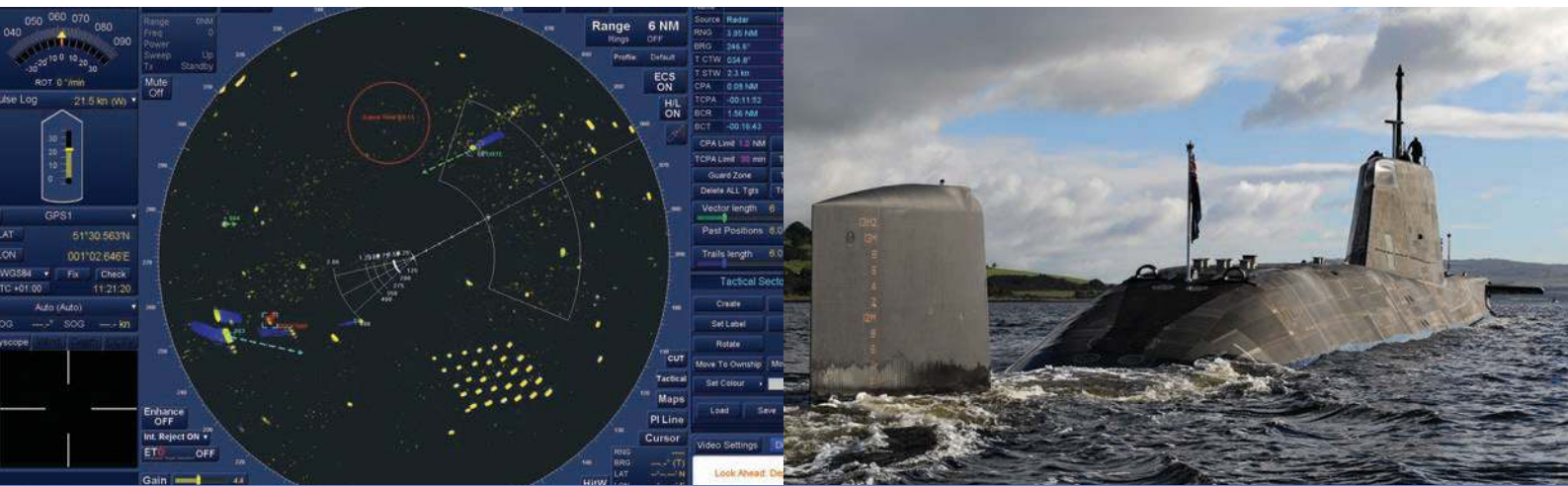


Kelvin Hughes is a world leader in the design and supply of navigation and surveillance systems. It has been in the forefront for more than 250 years, supplying advanced navigation solutions and services around the globe.

Technology 'firsts' include the first commercial radar in 1947, the first colour radar in 1988 with the naval CTD radar display, SharpEye™ the world's first commercial solid state radar, and recently, the SharpEye™ SCV: the world's first small watercraft situational awareness radar. Kelvin Hughes is dedicated to providing mariners, yachtsmen, soldiers, and security personnel with the most advanced radar centric surveillance, navigation and situational awareness solutions and services available.

Employing over 350 people, the company is divided into three core business units and headquartered in Enfield, North London, UK. Kelvin Hughes operates a worldwide support network with 12 offices in eight countries that meet customer requirements 24/7. With an eye to the future, Kelvin Hughes has embarked on a programme of continuous innovation to place it among the fastest-growing companies in the industry.

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KELVIN HUGHES SURVEILLANCE

NAVAL AND COAST GUARD

Using SharpEye™ technology, Kelvin Hughes Surveillance provides naval, military and quasi-military mariners with situational awareness radar for use at sea, in the littoral zone and in river systems.

This technology is for use on-board RHIBs, landing craft, FAC, patrol boats, search and rescue vessels, lifeboats, OPVs, frigates, LHDs and aircraft carriers.

NAVIGATION AND SITUATIONAL AWARENESS

The Kelvin Hughes Surveillance offering includes SharpEye™ I-band (X-band) and E/F band (S-band) radar systems. Supply can range from radar transceiver only to complete bridge systems incorporating all technologies.

SharpEye™ technology offers increased sub-clutter visibility by approximately 30dB, which enables the detection of small targets (0.5m² typical) even in high sea state and heavy rain clutter.

SUBMARINE RADAR SYSTEMS

For several decades, Kelvin Hughes Surveillance has been supplying surface situational awareness and navigation radar systems for naval submariners. Solid state SharpEye™ technology offers a low cost, lightweight, low power, small equipment envelope with reduced probability of being detected by counter surveillance techniques.

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RADOME SENSOR SYSTEMS

SHARPEYE™ SMALL CRAFT VARIANT (SCV)

Kelvin Hughes Surveillance has developed a smaller and lighter version of the SharpEye™ marine radar, complete with magnetron-free solid state technology. The smaller radar is designed for use in small watercraft from RHIBs to fast patrol boats operated by coast guard, police, military and navies.

Sensor only option includes:

- 585 mm (24") Radome enclosed SharpEye™ solid state transceiver and antenna
- Integrated GPS
- Immediate availability - no warm up
- Power amplifier dual redundancy / graceful degradation

Display option includes:

- 381 mm (15") 1024 x 768 XGA ruggedised console operators display
- 305 mm (12") 1024 x 768 XGA ruggedised console operators display
- Solid state ruggedised processor
- Tracker ball

The SCV is designed to detect stressing targets and asymmetric threats, which previously no radome could provide. This meant that even law enforcement, military and naval mariners were using leisure boat radars.

The technology uses a pulse compression and Doppler processing technique to enable the detection of small and slow targets in poor weather, day or night.

The SharpEye™ SCV lightweight I-band (X-Band) coherent marine radome radar utilises core SharpEye™ technology and shock resistant submersible radar display to offer low power consumption, ultra-high reliability, and improved performance.

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COASTAL

VTS RADAR SENSOR SYSTEMS

The SBS radar sensor offering from Kelvin Hughes Surveillance is specifically designed to meet the requirements of a coastal surveillance or Vessel Traffic Services (VTS) system, as defined in IALA recommendation V-128.

VTS radar system options include:

- SBS-700 transceiver, incorporating a low noise front end (LNFE) and an FET Modulator that results in enhanced and improved range discrimination
- SBS-800 SharpEye™ transceiver which brings the benefits of solid state coherent radar to the VTS user for the first time
- SBS-900 SharpEye™ dual redundant system which is designed to be housed in a separate mast mounted enclosure with antenna supplier options

COASTAL SURVEILLANCE RADAR SOLUTIONS

Coastal surveillance systems typically require 'standard' or 'advanced' solid state radar as IALA recommendation V-128 also suggests that X-band radar is required to detect small RCS and wooden boats at an extended range whilst also meeting target separation and accuracy parameters.

SBS 800 and 900 SharpEye™ coastal surveillance radars meet these requirements in full, whilst providing all the additional benefits and features associated with SharpEye™.

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ON LAND SECURITY

SharpEye™ technology has many applications and Kelvin Hughes Surveillance is now using its radar capabilities for continuous, all weather, and day or night surveillance and security mission applications.

On land security surveillance systems include:

- SharpEye™ - solid state radar sensors and integrated rotating open array platforms.
- SharpEye™ SxV – a lightweight, low cost, low power, and environmentally-sealed X-band surveillance and tracking system that provides enhanced capability in cluttered environments, day or night and in all weather conditions.
- BOXER Ground Surveillance Radar – a long range surveillance radar capable of providing detection of extremely small and slow moving targets in bad weather and difficult terrain, day or night.
- Integrated surveillance management display software

PORTABLE RADAR SOLUTIONS

The BOXER range of X-band radars is designed to be small and lightweight for easy portability on foot, quad bike and all-terrain vehicles. It uses SharpEye™ technology and is suitable for the battlefield, temporary or forward operating base protection, and security operations.

Portable radar applications include:

- Special event security
- Critical route protection
- Area reconnaissance
- Border monitoring
- Military airport protection

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MOBILE AND DEPLOYABLE RADAR SOLUTIONS

The BOXER and SharpEye™ SxV deployable systems are high performance X-band radars designed for easy transportation on long mission deployment. The systems provide options of transceiver power, mounting, coverage, phased array antenna and open array antenna.

Applications include:

- Anti-trafficking surveillance
- Border monitoring
- Coast monitoring and surveillance
- Early warning
- Flash point situational awareness
- Migration monitoring
- Military airport security
- Palace protection
- Perimeter protection
- Special event security
- Target indication
- UAV tracking and control

CRITICAL INFRASTRUCTURE RADAR SOLUTIONS

The BOXER and SharpEye™ SxV X-band radars are designed for direct installation on a building, perimeter boundary or mast. These systems offer the ability to detect walking persons, vehicles and airborne objects at extended ranges.

Applications include:

- Airports
- Chemical plants
- Gas processing and distribution plants
- Government buildings
- LNG plants
- LNG terminals
- Military bases
- Mining
- Nuclear power stations
- Oil and gas pumping and processing
- Pipelines
- Police stations
- Power stations
- Prisons
- Refineries

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SAFETY AND ENVIRONMENTAL

SharpEye™ radar technology can detect flocks of birds, ultra-lights and even livestock over land and sea. This enables the protection of both humans and wildlife through small target monitoring of the environment, and also helps landowners or organisations avoid violating environmental legislation.

Kelvin Hughes Surveillance technology is used for:

- Avian migration
- Bird strike
- Land animals and livestock tracking
- Habitat protection
- Airport Surface Movement Radar (SMR)
- Wind farm gap filling

AVIAN DETECTION

The SharpEye™ radar enables detection of large birds and flocks of birds at airports, airfields and landing approaches. KelvinHughes Surveillance has also collaborated with other specialists to provide monitoring, mapping and analysis of migratory birds and bird protection.

SharpEye™ avian detection projects (in collaboration

with DeTect Inc.) include:

- Bird strike avoidance radar system at Bagram Airfield, Afghanistan
- Bird strike avoidance system at Boston Logan International Airport
- Bird Strike avoidance system at Riga Airport in Latvia
- Bird scare system for migratory birds passing through the Tar Sands in Canada

WIND FARMS

The planning of wind farms demands investigation into effects on air traffic control radar and the mortality risk for migratory bats and birds. SharpEye™ solid state radar is an accepted technology for mitigating against any claims brought against wind farms. Kelvin Hughes Surveillance acts alongside wind farm mitigation consultancies to address these issues.

AIRPORT SURFACE MOVEMENT RADAR

During poor weather conditions, communications between the aircraft control tower, pilots and ground staff can be severely disrupted. SharpEye™ radar can provide much clearer and sharper target detection in fog, rain and snow, improving safety and decreasing disruption to operations.



COMPANY RESPONSIBILITY

CERTIFICATION

Kelvin Hughes takes its role in the safety and security of its customers extremely seriously.

ISO Certificates

- ISO 9001:2008 quality management
- ISO 14001:2004 environmental management

BUSINESS ETHICS

Kelvin Hughes has its own Code of Business Ethics which offers standards and guidance for the professional activity of every employee. It covers compliance with laws, fair competition, appropriate behaviour, health and safety, environmental responsibility and interaction with public issues among other company standards.

ENVIRONMENTAL RESPONSIBILITY

Kelvin Hughes promotes the reduction of environmental impact involved in its work, and has review systems in place to ensure that improvement objectives are met. Energy efficiency is also considered in the design of new technology, in order to offer customers the most environmentally-responsible products possible.

THE KELVIN HUGHES MANAGEMENT TEAM



RUSSELL GOULD
Chief Executive



CHRIS EASTEAL
Chief Financial Officer



BARRY WADE
Surveillance Systems Director



SPIKE HUGHES
Surveillance Systems Sales and
Marketing Director



MARTIN TAYLOR
KH Charts Managing Director



PAUL WATSON
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