

SHARPEYE™ TECHNOLOGY

SHARPEYE™ TRANSCEIVER



**I-BAND (X-BAND)
E/F-BAND (S-BAND)**



Kelvin Hughes has developed SharpEye™ to deliver superior radar performance and reliability, meeting today's challenging situational awareness requirements in both land and sea theatres. SharpEye™ is the world's first affordable military grade solid state radar sensor offering high reliability and low cost of ownership. First adopted for use in marine and naval platforms the SharpEye™ patented pulse sequence, advanced processing and algorithms, and clever use of power management has proven its self-time and again.

Now SharpEye™ is defining new standards in surveillance missions at sea, onshore and on land with transmit powers up to 200W and as low as 50W (BOXER and SharpEye™ SCV product families), SharpEye™ is used by navies, military, vessel traffic services, border, coastal surveillance and security agencies, and critical infrastructure operators. SharpEye™ I-band (X-band) and E/F-band (S-band) technology is the only sensor and fully coherent radar transceiver providing situational awareness in all weather conditions, at sea or on land, in high sea states and ground clutter, day or night. Other key SharpEye™ features and benefits include long and short range transmission, no 'lifer' components requiring routine replacement, low power usage, and high reliability from the commercial-off-the-shelf solid state components (no magnetron). SharpEye™ achieves its superior detection performance by carrying out a large proportion of the processing within the sensor itself and unique Doppler processing enabling more information to be extracted from radar returns.

SHARPEYE™ APPLICATIONS

NAVAL, COASTGUARD, WATERBORNE MILITARY & QUASI-MILITARY
CAPITAL SHIPS
FAST ATTACK CRAFT
FAST INSHORE ATTACK CRAFT
SUBMARINES
PATROL VESSELS
RHIBS

SPECIAL FORCES, ARMY
BATTLEFIELD
RECONNAISSANCE
ENCAMPMENT / FORWARD OPERATING BASE
LOW ALTITUDE AIRBORNE OBJECTS
UNMANNED AERIAL VEHICLES
UNMANNED GROUND VEHICLES

CRITICAL INFRASTRUCTURE
AIRPORT
UPSTREAM OIL & GAS PROCESSING
CHEMICAL & PETROCHEM
POWER GENERATION
PALACE PROTECTION
BUILDING & INSTITUTION PROTECTION

LITTORAL ZONE
RIVER TRAFFIC SERVICE & SURVEILLANCE
OFFSHORE INFRASTRUCTURE
VESSEL TRAFFIC SERVICE
COASTAL SURVEILLANCE

BORDER & HOMELAND SECURITY
BORDER MONITORING
RAPID RESPONSE
ANTI-TRAFFICKING
SPECIAL EVENT

SAFETY & ENVIRONMENTAL
BIRD STRIKE
HAZARD DETECTION
AIRPORT SURFACE MOVEMENT RADAR
WELFARE OF WILDLIFE AND INHABITANTS
WIND FARM MITIGATION

SharpEye™ uses the Doppler Effect to determine target velocities. This is achieved by processing received echoes into velocity bands, enabling the separation of genuine targets from clutter. Extracting the relative motion of targets by measuring the phase of the received echo relative to the phase of the transmission enables the velocity to be determined; this can only be achieved with a solid state SharpEye™ solution as the transmitter and receiver of the radar must be extremely stable, precluding the use of a magnetron with its inherent instability as well as other less stable radars available.



SITUATIONAL INTELLIGENCE, THE WORLD OVER

BENEFITS		FEATURES	
VALUE	ADVANCED CAPABILITY AFFORDABLE LOW COST OF OWNERSHIP	LOW POWER	PULSE COMPRESSION RATIOS UP TO 1000:1
ULTRA-HIGH RELIABILITY	SOLID-STATE ELECTRONICS GRACEFUL DEGRADATION MINIMUM MOVING COMPONENTS	CONTINUOUS HEALTH MONITOR	BUILT-IN SELF TEST SYSTEM STATUS MONITOR
CLUTTER INSUSCEPTIBILITY	SMALL TARGET DETECTION FAST FOURIER TRANSFORMATION	OPEN ARCHITECTURE	INDEPENDENT DISPLAY OPTIONS CAMERA/SENSOR INTERFACE GIGABIT ETHERNET SERIAL I/O
INCREMENTAL CAPABILITY	CAPABILITY ENHANCEMENTS MISSION UPDATES USEFUL LIFE EXTENSION	FULLY COHERENT	PATENTED PULSE SEQUENCE DOPPLER PROCESSING MOVING TARGET DETECTION

SPECIFICATION		X-BAND PERFORMANCE	
	X-BAND	S-BAND	
TRANSCEIVER			
SOLID-STATE, COHERENT			
UPMAST & DOWNMAST OPTIONS			
PEAK RF POWER	200W	200W	
AVERAGE RF POWER	26W	20W	
PRF - 24NM	2300Hz	2300Hz	
PRF - 48NM	1180Hz	1180Hz	
PULSE LENGTHS	0.1µs - 100µs	0.1µs - 100µs	
RELIABILITY	UP TO 50,000 HRS	UP TO 50,000 HRS	
SIGNAL PROCESSOR			
PULSE COMPRESSION WITH DOPPLER PROCESSING FOR:			
CLUTTER DISCRIMINATION	UP TO 64 FILTERS	UP TO 64 FILTERS	
FREQUENCY DIVERSITY	OPTIONAL	OPTIONAL	
AUTOMATIC, ADAPTIVE CLUTTER SUPPRESSION			
SECTORISED TRANSMISSION / PROCESSING MODES			
			<p>Probability of detection graph 10m² target in sea state 5 and heavy clutter conditions</p>
			<p>Probability of detection graph 0.5m² target in sea state 5 and heavy clutter conditions</p>
			<p>Today's tactical environment demands an X-band radar that is able to provide superb performance in clutter, together with the ability to detect small RCS targets, both on the surface and in the air.</p>
			<p>S-BAND PERFORMANCE</p> <p>Probability of detection graph 10m² target in sea state 5 and heavy clutter conditions</p>
			<p>Probability of detection graph 0.5m² target in sea state 5 and heavy clutter conditions</p>
			<p>Sharpeye S-band completes the range of solid state radar providing superb small target detection and tracking in high clutter conditions for air and surface targets.</p>

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