SHARP Eye™

The Extra Dimension

KELVIN HUGHES

total marine navigation solutions

Solid State

Unbeatable Performance

For 60 years radar has had to use short, high power pulses of microwave energy to detect contacts on the sea surface. ***SharpEye™*** changes all that. With patented ***SharpEye™*** technology, Kelvin Hughes has eliminated the magnetron and high voltage modulator from its latest series of radar transceivers and taken detection performance and reliability to a new level unrivalled by the competition.

The problems haven't changed but the risks have . . .

Today's crowded shipping lanes and increasing environmental pressures mean that mistakes in ship operations can be costly.

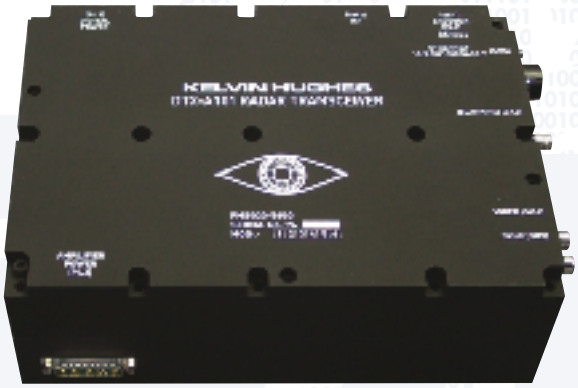
Kelvin Hughes has developed ***SharpEye™*** to meet this challenge with unsurpassed levels of radar performance and reliability.

Detection performance for radar using conventional magnetron technology is at an end, now there is ***SharpEye™***.

SharpEye™ takes a radical approach within the transceiver to enable more information to be extracted from the radar returns before processing by the display.

SharpEye™ technology has enabled detection techniques, which are normally only found in multi-million dollar military systems, to be available in commercial marine radars.

SharpEye™, a monostatic pulse Doppler solid state transceiver uses the Doppler effect to determine the size of the target velocities. It features advanced pulse compression to obtain exceptional performance.



The system processes received echoes into velocity bands enabling it to separate the wanted targets from clutter. This 'extra' dimension gives ***SharpEye™*** a major performance advantage in detecting small targets in clutter.

SharpEye™ extracts the relative motion of targets by measuring the phase of the received echo relative to the phase of the transmission. Using this phase measurement to determine velocity requires that the transmitter and receiver elements of the radar are extremely stable; this precludes the use of a magnetron with its inherent instability.

In the ***SharpEye™*** radar the solid state power amplifier has a peak output power of just 170W, this contrasts with typical marine radar systems in which the magnetron has a 30kW peak output. But ***SharpEye™*** produces more energy than the magnetron system therefore exceeding conventional radar in detection performance.

- The Extra Dimension

Guaranteed Reliability

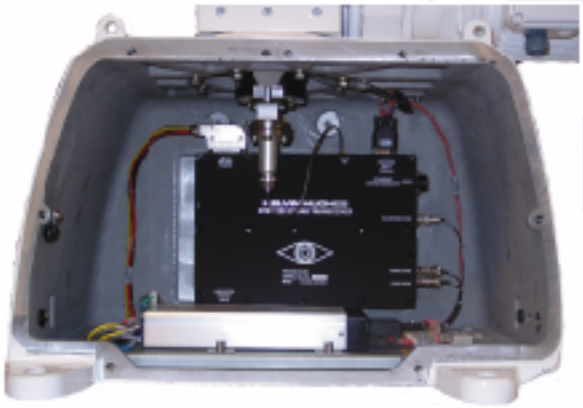
The new S-Band ***SharpEye™*** system will detect targets in clutter long before conventional radar.

See it long before conventional radar.

SharpEye™ continuously measures key performance parameters, such as RF output power, VSWR, oscillator frequencies and receiver sensitivity and informs the operator that the radar is operating within its performance envelope. The system automatically alarms if there is any degradation in radar performance and removes the need for periodic performance checks.

With no lifed items requiring routine replacement, ***SharpEye™*** is a truly 'fit and forget' technology, reliability is maximised, maintenance is minimised and performance is enhanced to a new level.

SharpEye™ can be fitted to existing Kelvin Hughes Nucleus 3 and Manta systems.



SharpEye's™ low voltages and 'non-magnetron' technology give higher reliability and lower support costs and ensure that maintenance and through life costs are kept to a minimum.

Reliable radar means
- never having to go off hire or charter.

Reliable radar means
- easy maintenance schedule planning for the ship.

Reliable radar means
- no delays in ports where service is difficult to find.

RELIABLE RADAR IS THE FUTURE AND THE FUTURE IS ***SharpEye™***.

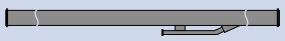
www.kelvinhughes.com
www.sharpeye.biz

SHARPEye™

Technical Specifications

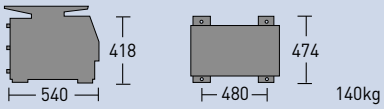
Antenna		
Part Number		LPA-A3
Turning Circle		4.0m
Frequency		2.9GHz – 3.1GHz
-3dB Beamwidth	Horizontal	1.9°
	Vertical	26°
Sidelobes	Within ±10°	< -30dB
	Outside ±10°	< -35dB
Polarisation		Horizontal
Antenna Gain		28dB
Transceiver		
Part Number		DTX-A1
Type		Upmast
Antenna Rotation		24 or 46RPM options
Compass Safe Distance		Grade I (0.25°)
		Grade II (1°)
Transmitter		
Solid State		
Coherent		
RF Power	Peak	170W
	Average	20W
PRF	24NM	2300Hz
	48NM	1180Hz
	96NM	640 Hz
Pulse Lengths		0.1µs - 128µs
Receiver		
Type		Linear Coherent
Noise Figure		4dB at output of A/D
IF Frequency		60MHz
Bandwidth		20MHz
Dynamic Range		120dB
Signal Processor		
Pulse Compression		
Doppler Processing for Clutter Discrimination		4 - 32 Filters
Frequency Diversity		Optional

S-Band 4.0m Antenna
Antenna dimension is turning circle.



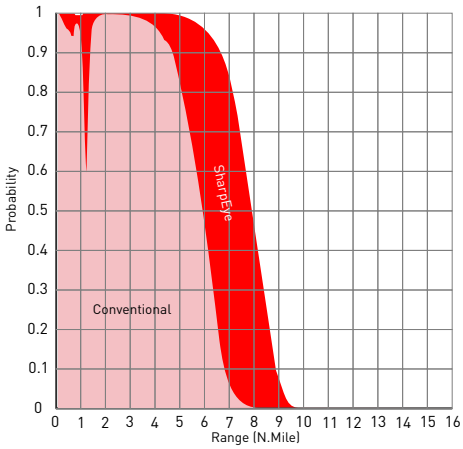
70kg

S-Band Turning Mechanism

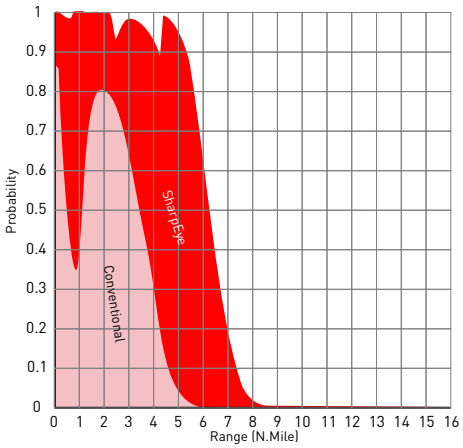


140kg

Probability of Detection Graphs



10m² target in sea state 5 and heavy clutter conditions



0.5m² target in sea state 5 and heavy clutter conditions

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UK (Head Office): Kelvin Hughes Limited
New North Road, Hainault, Ilford, Essex IG6 2UR
T: +44 20 8502 6887 F: +44 20 8500 0837

www.kelvinhughes.com

www.sharpeye.biz

smiths

Benelux: Kelvin Hughes (Nederland) bv
Klompenmakerstraat 64, 3194 DE Hoogvliet,
Rotterdam, The Netherlands
T: +31 10 416 76 22 F: +31 10 416 72 18
China: Kelvin Hughes Shanghai Representative Office
Unit H, 15/F, Majesty Building, 138 Pu Dong Avenue,
Shanghai 200120, PR China
T: +86 21 58772105 F: +86 21 58785944
Far East: Kelvin Hughes (Singapore) Pte Ltd
8 Pandan Avenue, 2nd Floor, Singapore 609384
T: +65 6545 9880 F: +65 6545 8892
Scandinavia: A/S Kelvin Hughes
Marselis Boulevard 175, DK-8000 Århus C, Denmark
T: +45 86 11 28 88 F: +45 86 11 27 26
Sandviksboder 1C, 5035 Bergen, Norway
T: +47 55 59 94 00 F: +47 55 59 94 01

Local Agent

KH8044 ISSUE 3