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SHIPBOARD PANORAMIC ELECTRO-OPTIC INFRARED (SPEIR)

## Scalable 360-degree EO/IR passive automatic detection and tracking solution

The Shipboard Panoramic Electro-Optic Infrared (SPEIR) system offers a cutting-edge 360-degree EO/IR electronic support capability for surface ships. SPEIR passively detects and tracks threats across multiple domains, continuously monitoring the battlespace to provide early warning to the warfighter. SPEIR provides enhanced ship lethality and survivability, making it an essential asset in modern naval warfare.

SPEIR provides a common 360-degree EO/IR capability to all surface ships that will passively find, fix, track, target, engage and assess (F2T2EA) current and emerging threats in support of the following warfare missions: anti-ship cruise missile defense, counter-unmanned aircraft systems and counter-fast attack craft/fast inshore attack craft.

SPEIR is an asset in the F2T2EA model, enhancing security and operational efficiency across all phases. SPEIR locates and identifies targets, monitors movements, empowers operators with critical data for effective countermeasures and facilitates the evaluation of aftermath intelligence collection.

CAPABILITIES

> Passive EO/IR detection and targeting

> Full-motion video, 360-degree threat analysis

> Passive EO/IR search and track system provides an increased counter-C5ISRT capability informing maneuver decisions

> Accomplishes the Navy's vision for the future of threat detection and safety of navigation in an emission controlled or radio frequency-denied environment

> Integrated artificial intelligence for automatic target recognition – reduced cognitive workload by watch stander

NARROW FIELD OF VIEW (NFOV) SYSTEM

WIDE FIELD OF VIEW (WFOV) SYSTEM

> Superior detection, tracking, discrimination and weapon support to counter simultaneous air and surface threats across a broad defended area

> High-accuracy stabilization in sea-state roll and pitch movements

> Processes imagery streams based on user configuration commands

> Detects and tracks a wide range of targets including:

- Mine-like objects

- Periscope detection

- Fast in-shore attack craft

- Fast attack craft

- Large surface vessels

- Unmanned aerial systems

- Subsonic and supersonic anti-ship cruise missiles
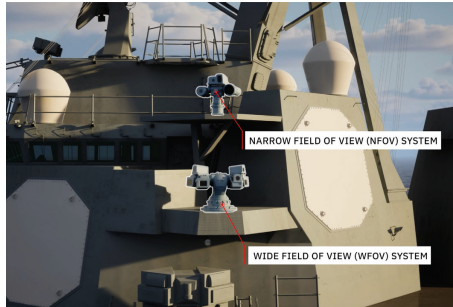
## "The Eyes of the Fleet"

KEY FEATURES

> Passive F2T2EA capabilities

> WFOV sensors for 360-degree situational awareness and target detection

> NFOV sensors for target recognition and identification

> Modular open systems architecture design

> Automatic video tracking

> Sequential auto tracking

> Sequential track revisit

> Multi-targeting, simultaneous tracking capability

> Sensor fusion

> Provides protection against evolving threats and tactics in anti-access and area denial environments

> Maintains operational effectiveness in severe electronic attack or land clutter environments

> GenICam compliant

KEY FEATURES

> MIL-STD-167

> MIL-STD-461G

> MIL-STD-464C

> MIL-STD-810H

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SPEIR KEY ELEMENTS

The wide field-of-view (WFOV) sensors for battlespace awareness (constant, 360-degree target detection and tracking).
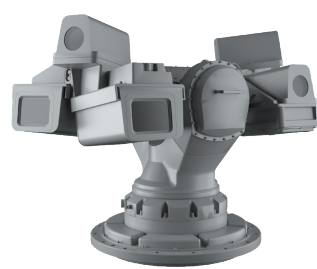
The narrow field-of-view (NFOV) sensors (pan, tilt, zoom) for zoomed-in, 3D high-resolution, both enhanced by automated detection and aided recognition. This system will automatically find, fix, track and identify threats.

WFOV

NFOV

THE NUCLEUS OF SPEIR

> Below-deck high performance processor: motion imagery and metadata processing, recording, storage, playback and dissemination, sensor control and coordination with the combat management system. SPEIR will be integrated with the ship's combat management system, delivering track-quality data for the operator

WFSS

NFSS

PJ-BOX

PJ-BOX

Fiber
AC Power
DC Power
Copper

Operator's Station
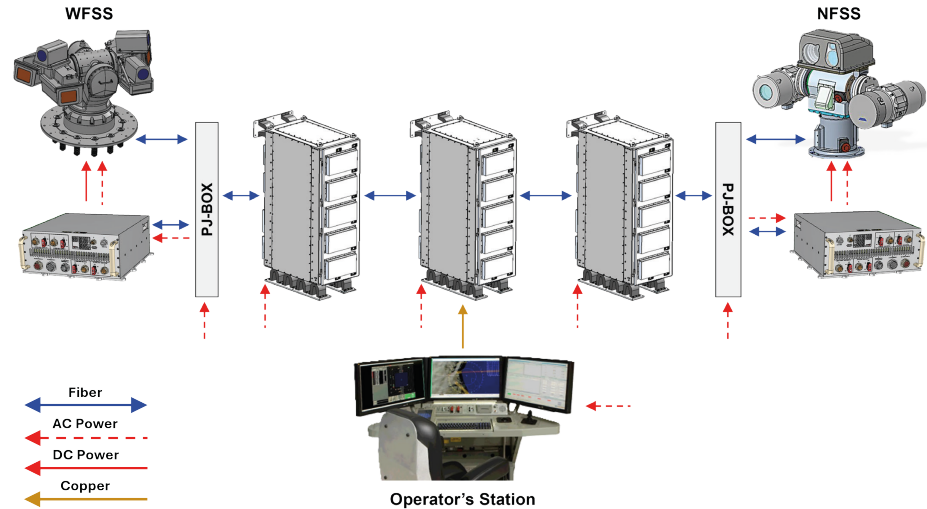
SPECIFICATIONS	
Temperature	-40°C to 49°C
Humidity	MIL-STD-810H, Method 507.6, Procedure I, hot humid, natural
Wind	(WFOV) Up to 59 knots sustained (NFOV) Up to 75 knots sustained
Weight	<12,000 lbs
Interfaces	10G and 40G high-speed fiber interfaces, motion imagery standards compliant, PTP time sync

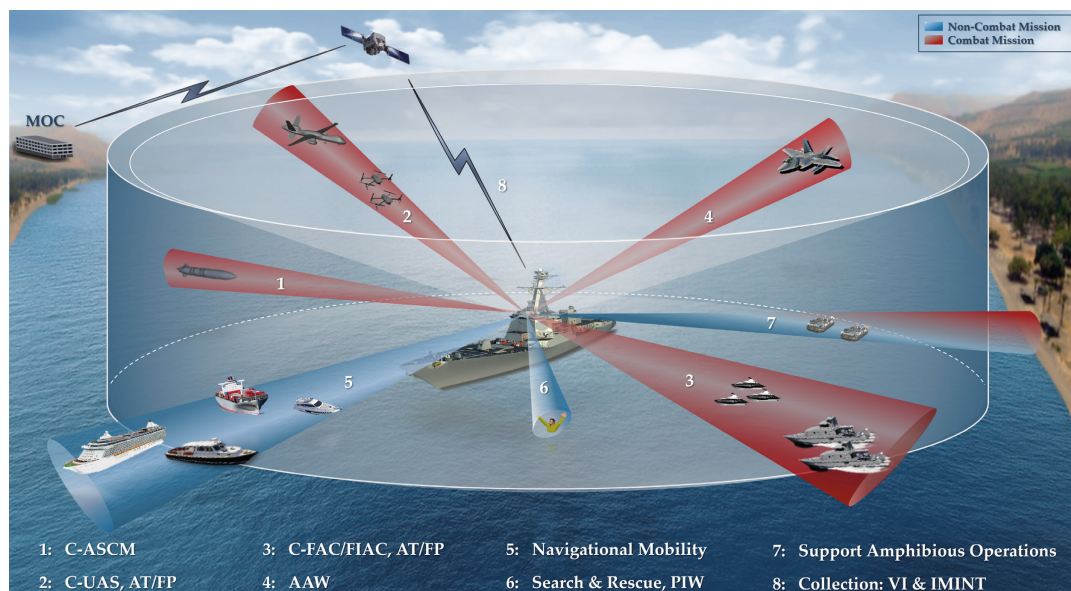| BELOW-DECK PROCESSOR	
Rolling Recording	24 hrs
User-Specified Recording	600 hrs
HUMS Storage	1 year
Detection and Tracking Capabilities	Simultaneous multi-target targeting for surface and airborne platforms
Image Processing Features	Edge enhancement Local area contrast Turbulence mitigation Waveband fusion
Consoles Supported	1-3
Number of Independent Video Streams	Up to 10
Weight	<5000 lbs
Image Processing and Distribution	Large (6144 x 4096) to standard (1440p or 1080p) format imagery
Design Standards	MISB ST 1900-series, 1801 surface profile metadata staging system, MISB 1906

WFOV ABOVE-DECK SENSOR UNIT	
Line of Sight	360° azimuth
Sensor Spectrums	EO and MWIR
Thermal Imaging Spectral Response	3.0 to 5.3 μm
Velocity (slew rate)	Greater than or equal to 25° roll/pitch/yaw axis
Shock Resistance	MIL-DTL-901E
Stabilization	3-axis, gimbal assembly
Size	4 ft (H), 41.4 ft^3 (vol.)
Weight	<1400 lbs per installation point
Power	6104 W

NFOV ABOVE-DECK SENSOR UNIT	
Field of View	360° azimuth
Sensor Spectrums	EO and MWIR
Laser Range Finder Spectral Response	1.5 to 1.6 μm
Velocity (slew rate)	Greater than or equal to 90°/sec in azimuth
Shock Resistance	MIL-DTL-901E
Stabilization	3-axis, gyro-assembly
Size	3.4 ft (H), 61.6 ft^3 (vol.)
Weight	<1,000 lbs per installation point
Power	DC power: 3406 W max AC power: 1050 W max

1 Pan and Tilt Control
Allows the user to look around
(change the displayed field of view)

2 Zoom Controls
Allows the user to increase or
decrease displayed field of view

1: C-ASCM	3: C-FAC/FIAC, AT/FP	5: Navigational Mobility	7: Support Amphibious Operations
2: C-UAS, AT/FP	4: AAW	6: Search & Rescue, PIW	8: Collection: VI & IMINT

Shipboard Panoramic Electro-Optic Infared (SPEIR)

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