

30 Meter - Fast Interceptor

Preliminary Specification

24 June 2017



High-Speed Operation WITH SHALLOW-DRAFT WATER JET PROPULSION

This fiberglass (or aluminum) 30 meter Fast Interceptor is designed as a Police and/or Coast Guard craft to perform many missions including search and rescue, marine environmental protection (MEP), enforcement of laws and treaties (ELT), ports, waterways, and coastal Security (PWCS) plus providing operation control of surveillance VTOL-UAV helicopter drones. Has the capability of operating at high-speed in shallow coastal waters or blue water. The vessel has the ability to conduct her missions safely in open Oceans up to Sea State 5.

MAJOR ASSETS:

- Intimidating and daunting vessel for your adversary to deal with
- Shallow draft with no underwater appendages at speeds approaching 45 knots
- Overall the vessel is designed to be easily maintained.
- Sea-Hawk radar SHN X9 polarimetric radar a multi polarized with extreme detection performance characteristics. This radar is designed for users with very high demands for surface detection as small and low reflecting objects travelling at high speeds (e.g. RIB's, Zodiacs, jet skies etc.), ships/vessels travelling at high speed, oil spill detection capabilities etc.
- Command control and monitoring center for Boss surveillance UAV-VTOL helicopter drones.
- Optional: Capable of handling (2) twin 9 meter (29.5') RIB tenders side by side off the aft deck
- Optional: Small helicopter pad to operate large surveillance helicopter drones (VTOL-UAV)
- The vessel is provided with Thrustmaster DJ-290 water jet propulsion system for shallow water operations powered by MTU 16V 2000 M93 marine diesels.
- Water cannon for fire fight, dispersing oil spill cleaning agents and aid in stopping small craft.
- Small Arms Ballistic Resistant composite in the vessels crew stations area with Armor Glass NIJ Level IIIA - installed in all wheel house windows

PRINCIPAL DIMENSIONS:

Length: 29.1 meters (95' 4')	Beam: 6.2 meters (20' 4")
Length Water Line: 26.3 meters (86'3")	Dead rise at Transom: 19 degrees
Normal Draft 1.21 meters (4')	Fully laden Draft 1.6 meters (5'3")
Displacement: Unladen 63.0 tons	Gross tonnage 90.1 tons
Fast cruise 32 knots	Maximum 45+ knots
Fast Cruise Range: 28 hours / 768 NM	Fuel 12,000 Liters (3,270 US Gallons)

CONSTRUCTION:

Hull; Deep “V” Reinforced Fiberglass/Kevlar with Core-Cell. Hand lay-up vacuum infused.. Designed with the use of Computer-Aided Design (CAD) and Computer-Aided Engineering (CAE) software. The vessel to be designed and built in accordance with American Bureau of Shipping Rules for Building and Classing of High-Speed Craft,

- Hull; Stepped deep “V” Reinforced Fiberglass/Kevlar with Core-Cell. Hand lay-up vacuum infused.
- The watertight bulkheads and engine mounts are of welded 5083 aluminum alloy reinforced with welded structural aluminum 5086-H116 alloy angles.
- Minimum of eight (8) watertight compartments with watertight doors and/or hatches
- Superstructure and deck; Kevlar/Reinforced Fiberglass with Core-Cell. Hand lay-up vacuum infused.
- Aluminum and/or stainless steel mounting, backing plate embedded in the core for cleats, handrails, doors, hatches, etc.
- Small Arms Ballistic Resistant composite in the vessels crew stations area
- Tempered/safety glass – ½” heated/frosted for the forward pilothouse windows, with 3/8” tempered/safety glass in the sling port, starboard and rear pilothouse windows
- Hand rails and railings of anodized aluminum
- Eight (8) aluminum welded 18” deck cleats.
- Bollard welded aluminum aft for towing with 500’ of 1 inch line held on a reel ahead and below deck from the bollard.
- Fuel and water tank aluminum EN-AW 5086/5083 thickness 0.190” minimum with full size inspection covers.
- All electrical and wiring to ABYC standards
- Hinged cast aluminum watertight engine compartment deck hatch with ladder.
- Cast aluminum watertight bow compartment deck hatch with ladder
- Pilothouse roof and mid mast spreader of fiberglass/Kevlar with Core-Cell. Hand lay-up vacuum infused. Providing higher strength & a lighter weight then could be achieved with aluminum.

PRIMARY PROPULSION POWER:

Two (2) MTU 16V 2000 M93 16 cylinder turbocharged after-cooled marine diesel rated 1,790 kW (2,400 bhp @ 1,800 rpm) Complete with MTU's Blue Vision Propulsion Monitoring system. Marine gear the ZF 3060. Note: These are the same engines that power the US Navy's Mark V.1 Special Operations Boats ZF Marine Electronic Engine Controls MC2000-4 (ZFME)

- The propulsion power plants are mounted within an isolated fireproof and watertight compartment. With the port propulsion engine mounted ahead of the starboard engine provides great all around access to the engines.



- Marine Electronic Engine Controls
- The propulsion power plants are mounted within an isolated fireproof and watertight compartment. With the port propulsion engine mounted ahead of the starboard engine provides great all around access to the engines.
- Each engine compartment equipped with Fire Extinguishing System and 24 volt DC engine compartment blowers (two in each engine compartment)

WATER JET PROPULSION SYSTEM:

Thrustmaster DOEN is a leading designer and manufacturer of waterjet propulsion systems focused on offering high-quality waterjet products that excel in the harsh operating conditions of the commercial and military marine market.

The Thrustmaster DJ290 waterjets have been specified with stainless steel pump assemblies fitted with 29-inch (737-milimeter) high volume single stage axial flow impellers.



The waterjets provide excellent high-speed efficiency with superior cavitation margins, allowing full power application at any load condition and also at zero speed for maximum possible thrust during docking and station keeping maneuvers at sea. Additionally, Thrustmaster's prefabricated aluminum intake duct installation combines maximum vessel integrity with simple installation.

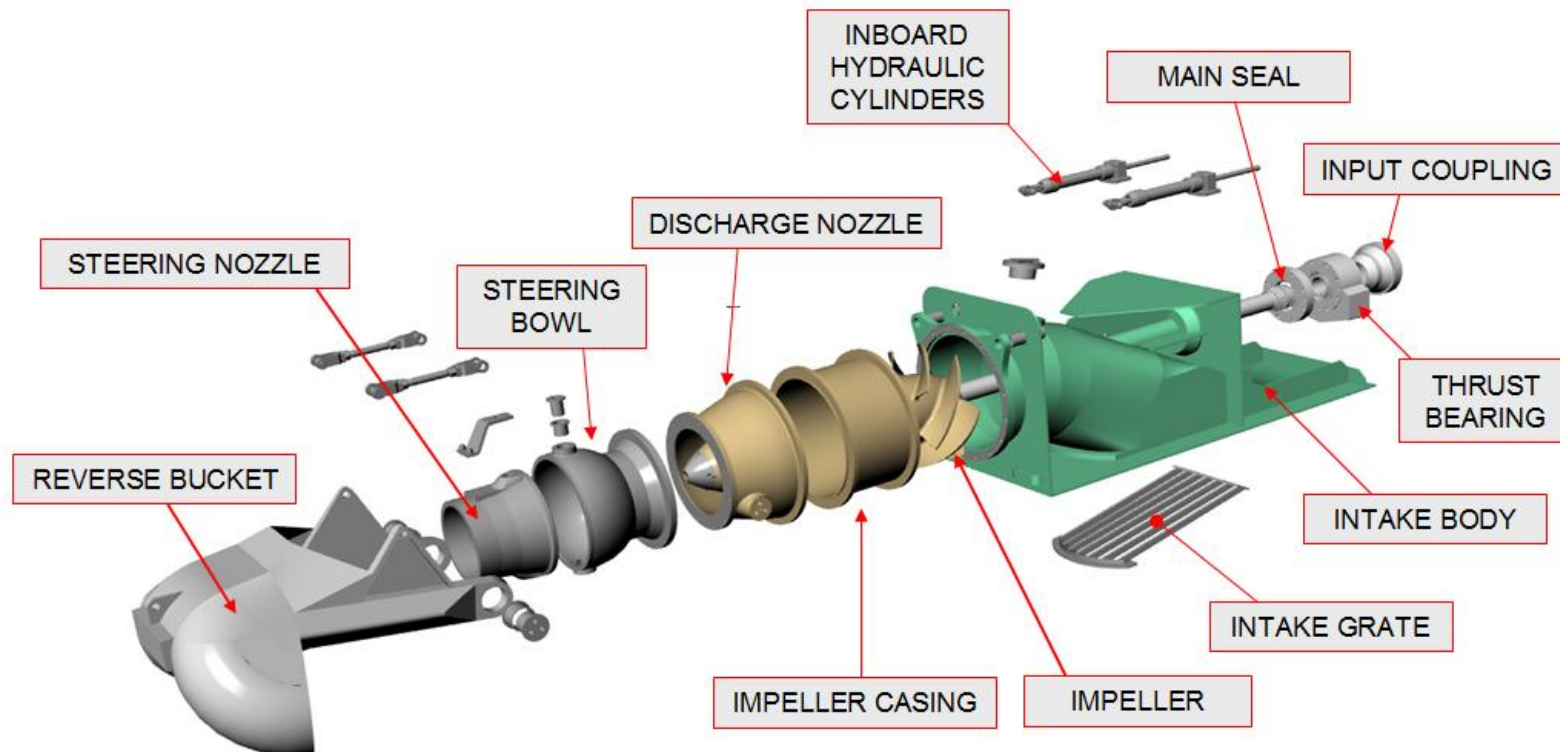
Each DJ290 has its own fully integrated hydraulic system providing steering and reverse control. All of the hydraulic equipment including cylinders hydraulic and associated hose connections are completely inboard mounted. All hydraulic pumps are directly driven from the gearbox PTOs.

Waterjet Propulsion Permits Shallow Draft Operations:

- Absence of underwater appendages
- Shallow draft – the waterjet intake is flush with hull bottom to allow access to shallow water areas and beach landings with no risk of damage to the drive

Shaft Assembly:

- Main Shaft Material: Stainless Steel Grade SAF 2205
- Rear Bearing: Water Lubricated Cutlass Bearing
- Spherical roller Bearing - Radial
- Shaft Seal: Face type Mechanical Seal
- Coupling Flange: GWB Series to suit application



ELECTRICAL SERVICE:

MAIN SYSTEM: 24-28 Volt DC System:

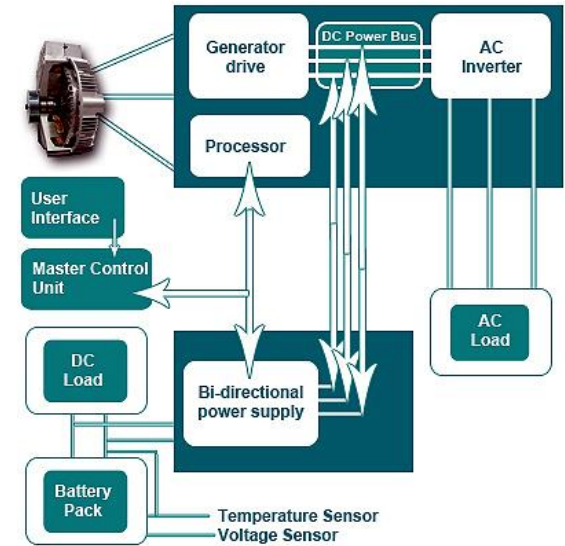
28 volt DC power provided by two engine driven alternators 65 amps each.

- Main engines starter motors 24 VDC
- Four pairs of 12 VDC Marine Gel-Cell Batteries, 225 amp hour, 1,470 cranking amps each.
- Powers Vessel Electronics
- Eight (One in each watertight compartment) automatic submersible bilge pumps, 2,000 GPH
- Fresh water pump
- LED Docking lights: Forward and Aft, (DC)
- LED Spreader / Deck Lights (DC)
- LED Searchlight
- LED Navigation lights and LED cabin lighting all (DC)
- Windlass/Capstan

AC SUB-SYSTEMS 110/220 Volt 50 or 60 Hz.

Xantrex Technology twin FREEDOM SW Inverter/Chargers: power provide by two engine driven alternators 180 amps each. (Two: P-Type Alternator, 24 Volt, J-180 #41110)

- ✓ Total of 6,800 watts (20.9 amps) of continuous 110/220 Volt with a total of 13,600 watts of peak power.
 - ✓ 24 volt 90 Amp of charge is available from each FREEDOM SW from Shore Power
 - ✓ Pure AC sine wave will not interfere with any electronics, computers or sensitive digital electronics.
 - ✓ Equipped with heat sensor and re-settable circuit breaker.
 - ✓ Maintenance free, no parts to replace.
 - ✓ Safe and reliable, no spark or hot components
 - ✓ Operating range: from engine speed, from idle to red line.
 - ✓ Shore Power 50 Amp Heavy Duty 220 VAC Cord set, 15.2 meters (50') long
- Main Air condition: Technicold by Northern Lights CW48 (48,000 BTU 220 VAC 13.3 amps)
 - Wheelhouse standby Air conditioning: Webasto FCF with reverse cycle cool or heat unit with Reverse Cycle is 12,000 BTU 230 VAC 8.6 amps.
 - Galley power for: built-in refrigerator, Microwave, four range, coffee maker etc..
 - Power outlets throughout the interior of the vessel.

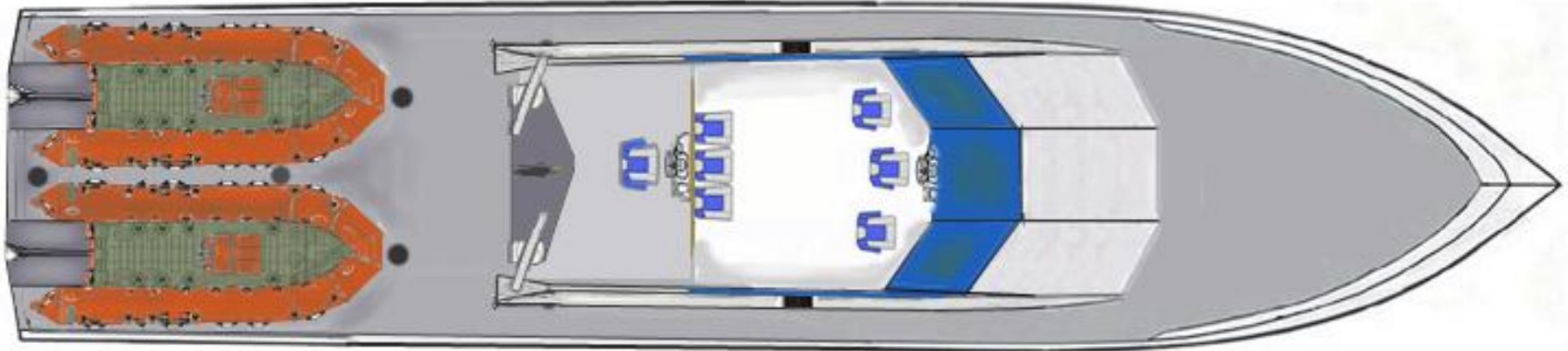


AUXILIARY POWER: 120/220 Volt AC 50 or 60 hz.

Two Generator 4 cylinder diesel heat exchanger cooled generators. Northern Lights M944W Generator 26kVA with PTO to drive the fire pump / de-watering pump.

CREW:

A six man crew is recommended for normal operations plus the two RIB crews for a total of twelve. The vessel may be controlled either from helm station on the flying bridge or in the enclosed wheel house.



CREW QUARTERS:

- The wheelhouse on the main deck is about 22 square meters has an arrangement to seat five (5) on bolster seat enclosed in air-conditioned comfort.
- Flybridge just aft and above the wheelhouse can accommodate four (4) men with three (3) bolster seats.
- Below decks, Amidships galley area with a large double sink, four burner range with oven, microwave, refrigerator.
- Adjacent to the galley is the wardroom/dining area/lounge capable of seating 15 men. On the bulkhead find two large TV monitors capable of network displaying the wheelhouse and/or flybridge monitors.
- Forward of the wardroom find two officer's cabins with a complete head to consist of a marine toilet, shower, sink and mirror. Each officer cabin is equipped with a TV monitors capable of network displaying the wheelhouse and/or flybridge monitors.
- Aft of the wardroom is a ten man berth area with a marine toilet, shower, three sinks and mirror.



ELECTRONICS:

AUTOPILOT:

Raytheon Autopilot NautoPilot 5000. Ease of use – NP 5000 features a large graphical display which offers different day and night modes. Clearly arranged functions are operated via hard keys and touch screens. You will feel familiar with the autopilot after a few minutes due to its intuitive operation philosophy.

- Precise steering
- Ease of use and intuitive handling: graphical display, touch screen
- Simple adjustment of autopilot parameters by use of Integrated Heading and Rudder Plotter Weather Adaptivity
- New mode Course Control compensates for wind and drift automatically
- Cross Acceleration Monitor
- Approved for High Speed Craft
- Approved as part of a Track Control System in combination with ECDIS

INTEGRATED INFORMATION, NAVIGATION DISPLAY SYSTEM:

Raymarine Electronic Helm and information System, a unique Electronic information system, means a clean and easy-to-use dashboard. More importantly – an enhanced overview and control of all the engines and navigation in one place.

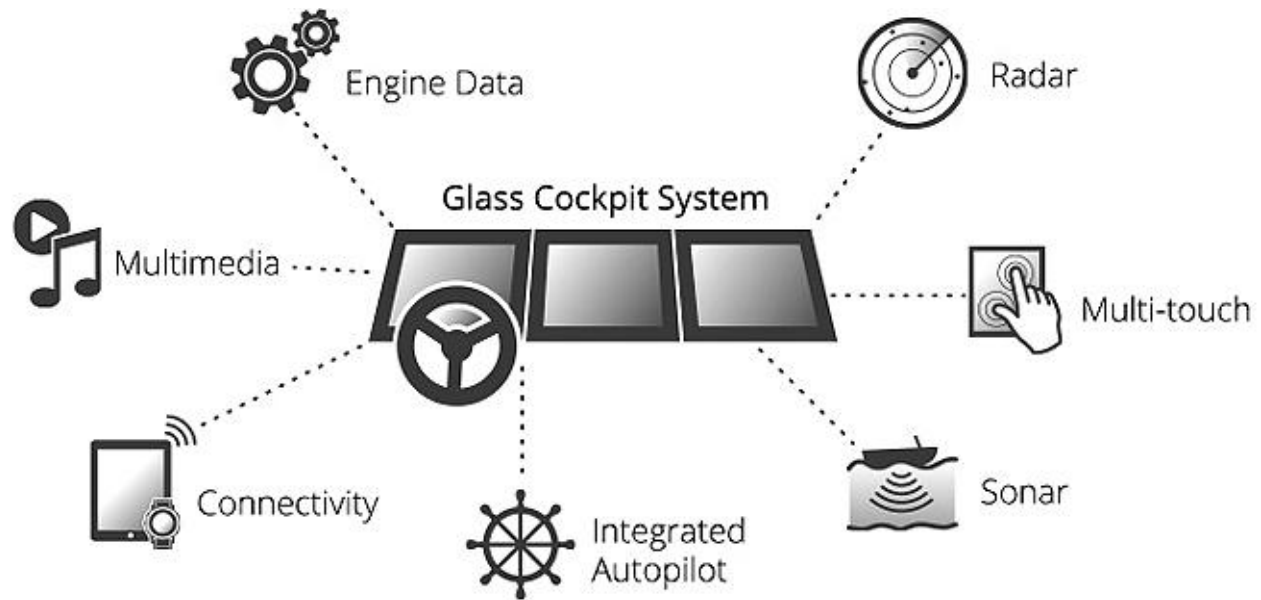
Raymarine GS195 (0.482m) Premium Glass Bridge Multifunction Navigation/Information Displays Elegant, flexible and simple to use, GS multifunction displays will transform your helm station into a powerful glass bridge navigation system. A step above black-box systems, each GS Series display is a smart, self-contained multifunction navigation display equipped with Raymarine's fastest dual core processor plus a third dedicated graphics processor, delivering super fast and responsive performance.

Key Features

- Integrated with the EVC system (Electronic Vessel Control), the Glass Cockpit gathers all driver information and displays this in one spot. The easy-to-handle, pinch-to-zoom displays provides instant control. Displays in the wheelhouse and CNC are the largest digital monitors currently available. The anti-glare touchscreen Monitor 1080p 48.2 cm is easy to read by the vessels captain/helmsman/deck and engineering crew.



- One look. One touch. One system. When the vessel is powered up, all screens light up simultaneously. All settings that you control, including instrument dimming, are carried out concurrently at the helm and CNC. The Glass Cockpit system is a common, ergonomic design – and interface – for the whole dashboard, with push-buttons on the controls and touch-buttons on the screens. Smart displays - a step beyond black box systems, each GS Series is a smart touch screen MFD
- Smooth and responsive multi-touch control with pinch to zoom
- Create a single display installation or expand GS Series into a multi-station system, the choice is the crews.
- For added flexibility, GS Series systems network seamlessly with any LightHouse II powered Raymarine MFD, allowing you to customize a navigation network that's just right for the mission.
- Auto guidance This unique feature searches through all relevant charts to create a route to follow – and avoid shallow water, buoys and other obstacles.



NAVIGATION AND SYSTEMS:

GPS Receivers: WAAS-capable

- The highly accurate GPS position receiver/antenna provides 10 Hz update rates for position, velocity and time data. It offers high-sensitivity reception and enhanced position acquisition to the multifunctional displays (MFD), instrument display and autopilots.
- Delivers Reliable Location Data: The 32-channel receiver is capable of tracking multiple global navigation satellite systems, including GPS, GLONASS, Galileo¹ and QZSS¹. Since more satellites are visible, it can provide more accurate fixes in challenging conditions. With its enhanced position, heading and speed accuracy delivered 10 times more often than other receivers/antennas, it provides smoother drawing of your position on the chart/plotter/MFD at higher speeds. It can determine ship's precise location to within 3 meters (9.84 ft).
- Heading Providers: Magnetic Compass, GPS and Gyro Compass

Sonar:

Raymarine CP570 Professional CHIRP™ Sonar Module. A Serious Offshore Sonar Superior target definition and enhanced sensitivity using Raymarine's exclusive wide spectrum CHIRP sonar technology.

- Target and track the sea floor down to 10,000ft. (3,000m) with two adjustable CHIRP sonar channels.
- Hunt in different parts of the water column with the CP570's two fully independent 2kW sonar channels.

Weather Instruments:

HF Weatherfax, Sea, Air and dew point temperature sensors, wind speed and direction.

Surface Radar: Sea-Hawk SHN X9 Radar:

The Sea-Hawk radar SHN X9 is one of the most advanced radars in Sea-Hawk's product line with extreme detection performance characteristics, and in particular in rough weather conditions. This radar is designed for users with very high demands for surface detection as small and low reflecting objects travelling at high speeds (e.g. RIB's, Zodiacs, jet skis etc.), ships/vessels travelling at high speed, oil spill detection capabilities etc.

Typical users for Sea-Hawk radar SHN X9, on large High Speed Craft, special task vessels and vessels operating in congested areas, such as Straights and approach areas with special requirements.



Important features:

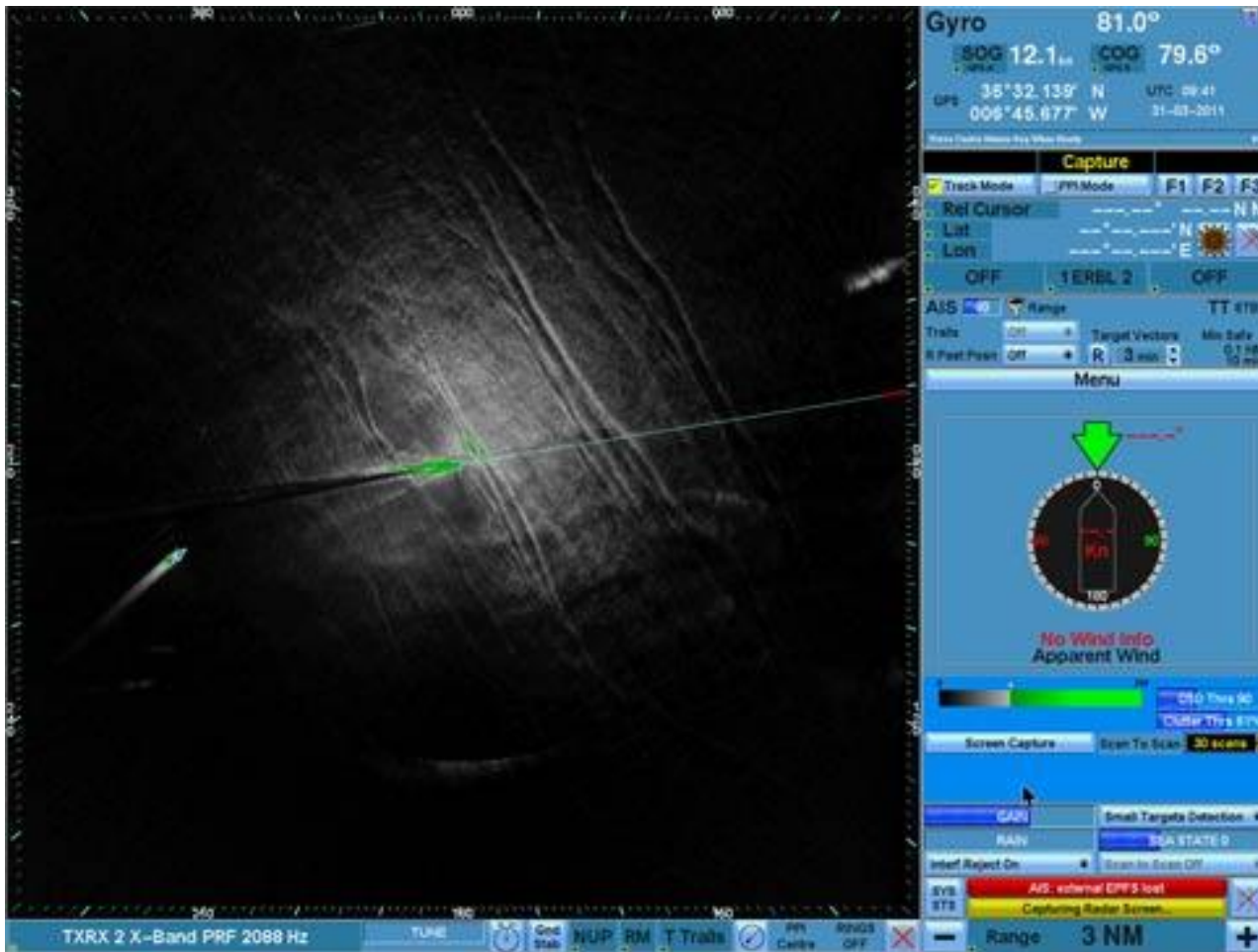
- Extreme detection performance, also in rough weather conditions such as white breaking seas and heavy precipitation
- High Performance Dynamics (i.e. its ability to detect and follow the smallest object/movement at the same time as detecting large objects)
- Detection of small high speed objects (which often is "lost" in standard navigation radar systems, if detected at all)
- Detection of small and/or low reflection objects on the surface
- Weather protection / reliable operation / long service intervals / life cycle costs
- Also designed for operation in Ex-zones (areas exposed to inflammable gases etc.)
- Easy access to Radom for sheltered service/maintenance (bottom)

Anti-piracy detection is important also in windy conditions. In sea-state 4 or higher, small targets become even more difficult to detect for a standard marine radar. Unlike normal X-band radars, Sea-Hawk still provides detailed and reliable data during wind, storm and rain.

Superior surface detection:

If you are looking for superior surface detection for your vessel, a polarimetric radar antenna should be your best choice. The Sea-Hawk radar is your future anti-piracy radar system.

Sea-Hawk polarimetric radars are multi polarized, resulting in far more detailed detection ability than traditional radar systems. Sea-Hawk can detect very small, fast moving objects and would therefore increase your anti-piracy capabilities to a level you could only dream about until recently.



Different Targets

These small and fast targets are obviously very different. It could be a skiff with a powerful outboard motor or perhaps a rapid RIB. In what shape the pirates materialize doesn't matter. They appear on the screen.

Polarization is the key. The size, shape and distance of the moving targets of course reflect the radar signals differently. However, they all generate a wake, which you will easily detect with a Sea Hawk radar, before the target is detected itself.

Superior small target detection:

If you are looking for superior small target detection for your vessel or for your offshore location, a polarimetric radar antenna should be your best choice. The Sea-Hawk radar is your future small target detection system.

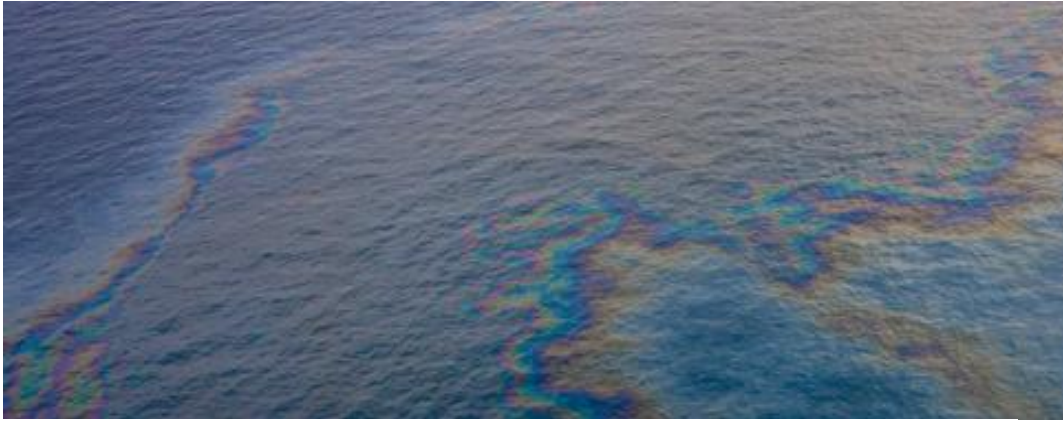
All kinds of small targets:

Small targets are obviously very different. It can be a person in the water, a life raft, a little fishing boat, a sailing boat, small fishing markers, driftwood or flotsam/ jetsam (like drifting containers with only one corner visible above the surface).

Polarization is the key. The size, shape and distance of the moving targets of course reflect the radar signals differently. The targets generate fluctuations in the surface. They also generate significant background clutter, in addition to the echo from the target itself.

Oil spill detection:

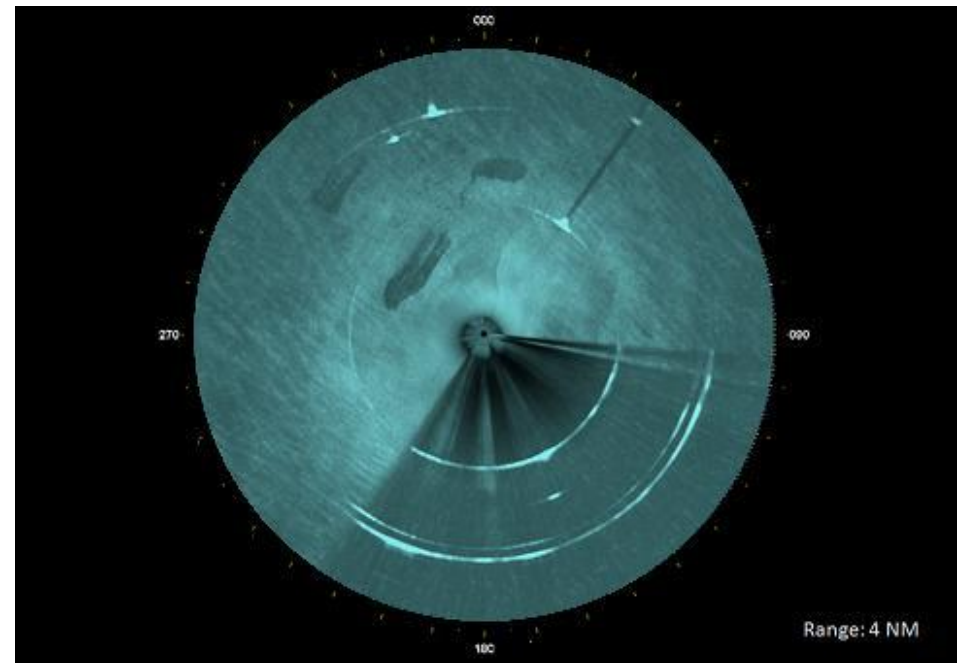
Sea-Hawk Radar can detect Oil slicks on the surface, in addition to debris from shipping in harbours and refineries. A valuable essential for SARs missions to help locate downed aircraft and ships which have sunk by their oil slick left behind



Time spilled = oil spilled

Night view – of course

The image shows three oil slicks in the water. This was part of an exercise in the North Sea, where oil was deliberately poured to the sea in order to detect the spill, follow the spreading oil, and finally collect the oil.



Behind the scene

If you are looking for very detailed surface detection for your vessel, a polarimetric radar antenna should be the solution for you. That is what Sea-Hawk radars are exclusively equipped with.

Sea-Hawk can detect the surface within the radar horizon, displaying it similarly to an unusually detailed aerial photo. We bring radar detection to a new level, which was unobtainable until recently.



The surface is constantly changing. The Sea-Hawk radar displays oil and dispersants, lenses and small work boats simultaneously, thanks to the multi polarized radar and advanced display system. Polarization is the key. The varying distribution of oil on the surface and the different kinds of small targets will produce different radar reflections and hence, different presentations on the radar screen.

If we add windy weather to the scenario described above, with sea-state 4 or higher, surface detection becomes more important. An oil spill quickly becomes more hazardous as the oil spreads faster.

It has been verified that a polarimetric Sea-Hawk radar is able to detect anything on the surface at a much longer distance than a standard navigational radar. The reason for the polarimetric radar's superior detection ability is the combined utilization of different polarizations (horizontal, vertical and circular), while standard navigation radars only utilize horizontal polarization. Furthermore, we are able to process the background clutter from the antenna, and the turbulence and fluctuations naturally produced by the sea.

In calm weather a vertical polarized antenna is superior for surface detection. The surface echoes are significantly stronger in the vertical plane than in the horizontal plane utilized in ordinary X-band radars.

We have verified that Sea-Hawk will detect an extremely thin skim of oil or chemicals, also in calm weather. Again it is the capability to use the sea clutter information that comes into play here.

Secondary Radar:

The Raymarine RA3072SHD open array with Super HD Digital technology is more than just the next step in radar evolution, it a giant leap into the future of marine radar technology. The RA3072SHD open array comes with a 12kW Super HD Digital antenna pedestal, a 72" open array antenna, the VCM100 voltage converter, 15-meter digital interconnect cable, mounting hardware, template and instructions.

With Raymarine's exclusive Super HD Digital radar technology which delivers twice the performance of conventional radar systems, dramatically improving small target detection by virtually eliminating all noise. Super HD Digital reduces the effective horizontal beam width delivering the target resolution of a much larger radar array. Adaptive digital receiver automatically adjusts to changing environmental and sea conditions for a dramatically clearer picture.

FLIR M400: Premium Multi-Sensor Maritime Thermal Night Vision System

The M400's advanced 640 x 480 sensor delivers crisp thermal video images in total darkness and lowlight conditions. An integrated HD Color visible camera and tight-beam LED spotlight augment target identification for added safety. M400 has a continuous optical thermal zoom lens (up to 4x) that allows operators to see other vessels and targets at longer ranges. Active gyro-stabilization ensures a steady image, plus radar tracking keeps potentially dangerous targets in view at all times. Capable of detecting a man at up to 1.3 n miles and vehicles as far away 3.2 n miles.



Raymarine RD424HD 4KW HD Radome

Communication

- Satellite Communication Iridium Secure Voice, Data and Broadband Terminal with link to vessel's Wi-Fi.
- VHF Communication Radio Two Raymarine Ray70 All-In-One VHF Radio w/AIS Receiver, Loudhailer & Intercom. VHF Automatic Identification System (ASI) system provides detailed data of your vessels surroundings, regardless of visibility. Crew has ship identification information, position, course and speed for vessels equipped with AIS within range. The VHF AIS also receives both Class A and Class B signals at the same time to ensure no critical information is lost.
- Marine HF/SSB transceiver
- Microwave data link: Secure line of sight down link of data from the drone and for line of sight secure communication between RIBs, shore and other vessels.
- Ships intercom system and hailer.
- Signal Flags and signal light.

MARINE SANITATION SYSTEM:

- AHEAD Tank™ AT-16D: A USCG TYPE II (MSD) marine sanitation device Sewage Treatment Systems for 16 men.
- Sanishower: the gray water discharge pump used to pump waste water away from a shower, hand basin, sink, MSD other fixtures.
- Two: Raritan PHC Super flush Manual Marine Toilet

SAFTY EQUIPMENT:

- First Voice FV3105 Responder JumpBag First Aid Kit with defibrillator.
- Two: 6 Person Canister Coastal life rafts, automatically inflated canopy with survival kit.
- Fifteen: Life Jackets U.S.C.G. Type III
- Ten: Portable 1A10BC Rated Fire Extinguisher
- Eight Manual Bilge Pump MK3 19 GPM self-priming pump

- Fire and de-watering pump driven off the generator PTO 27.6 kW (20hp) Head lift Max 116 meters (380') Output Maximum 44,000 liters per hour (18,000 GPH)
- Each engine and equipment compartment is equipped with Automatic Kiddle Fire System Marine ECS™ using Clean Agent Fire Suppression System.
- Two remote controlled fire monitors (water cannons) and fire hydrant. Designed for water, foam and CAF applications
 - Fire Fighting Foam
 - HazClean-ER 75 for emergency spill response agent for incidental hydrocarbon spills.
- Smoke and Fire detectors and bilge alarm monitor at the bridge.
- CCTV camera in key areas of the vessel, monitor placed at the bridge.
- To include all required safety equipment for this size and class of vessel
- Three: Satellite 406MHz EPIRB Category II, one for each life raft and one for the ship

FINISH:

- Exterior is primarily a Gel coat finish. Balance of exterior primed and painted according with INTERLUX specifications for their Perfection Topside Paint a, 2-part polyurethane.
- Below water line primed and painted according with INTERLUX specifications for Interlux Nautical Epoxycop hard modified-epoxy antifouling paint.
- Decks covered with grey Decko Dot Marine Flooring
- Interior walls/ceilings; Thermax non-combustible, laminated with HPL's FILPRO Certificates for SOLAS, IMO, EU, and USCG are issued by Bureau Veritas. (Colors to be specified by the clients.)

Most popular colors



- Decks covered with grey Decko Dot Marine Flooring

CUSTOM DECORATION: Interior decoration will be designed and provided by the Buyer.

OTHER EQUIPMENT:

- Two Compass (Magnetic)
- One anchor with windlass/capstan.
- Two capstans mounted aft on port and starboard sides
- Anchor with 45 meters of chain
- Lifting points (eyelets)

- Vessels Shipping Cradle
- Fuel polishing centrifuge for Diesel Fuel
- Providing all required galley equipment, range, ovens, etc.
- Dock Lines / Tow Bridle
- Bluetooth wireless combined wired submersible Intercom system 8 station

TRAINING: Intense Training will be provided for client's key personnel for operating all equipment installed and vessel maintenance in Florida. Plus on site training for other personnel provided in a maritime system simulator and on the vessel training.

SPARES: Provide recommended spare parts required for equipment installed on the vessel.



With Heli Pad for Boss Heavy Lift surveillance helicopter drones (VTOL-UAV) Operations:

WARRANTY: All fabrication work unconditionally guaranteed for 12 months. Installed equipment by Manufacturer's Standard Warranty based of the following utilization.

- Excess of 40 knots 150 hours annually or a 10% annual utilization
- Excess of 12 knots to 40 knots 1050 hours annually or a 70% annual utilization
- Excess of 5 knots to 12 knots 300 hours annually or a 20% annual utilization
- Total annual utilization 1,500 hours

Design & Built by: Puma Aero Marine Inc. of Florida

Sea Trail: Initial vessel's sea trials and commissioning to be conducted from the Port of Jacksonville, Florida at the cost of Puma Aero Marine and MTU Marine Power Systems.

Delivery: Possible within 12 months after a signed Purchase Agreement from the Port of Jacksonville, Florida a signed purchase agreement.



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