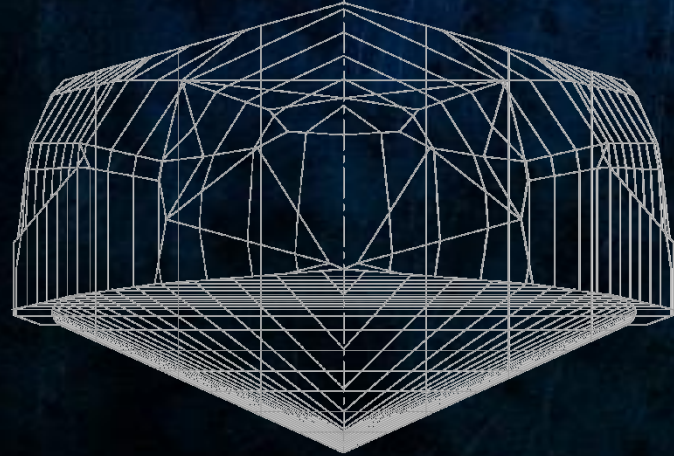


SEA *RANGER*

MIK II



UNMANNED SURFACE VESSEL

SEA  *RANGER*



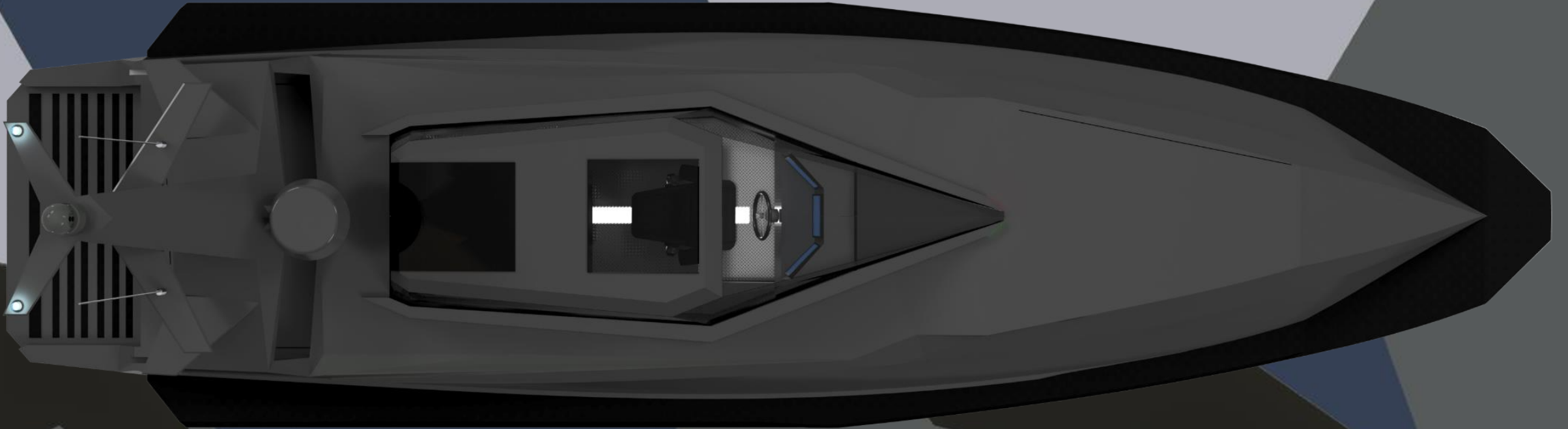
SEA RANGER



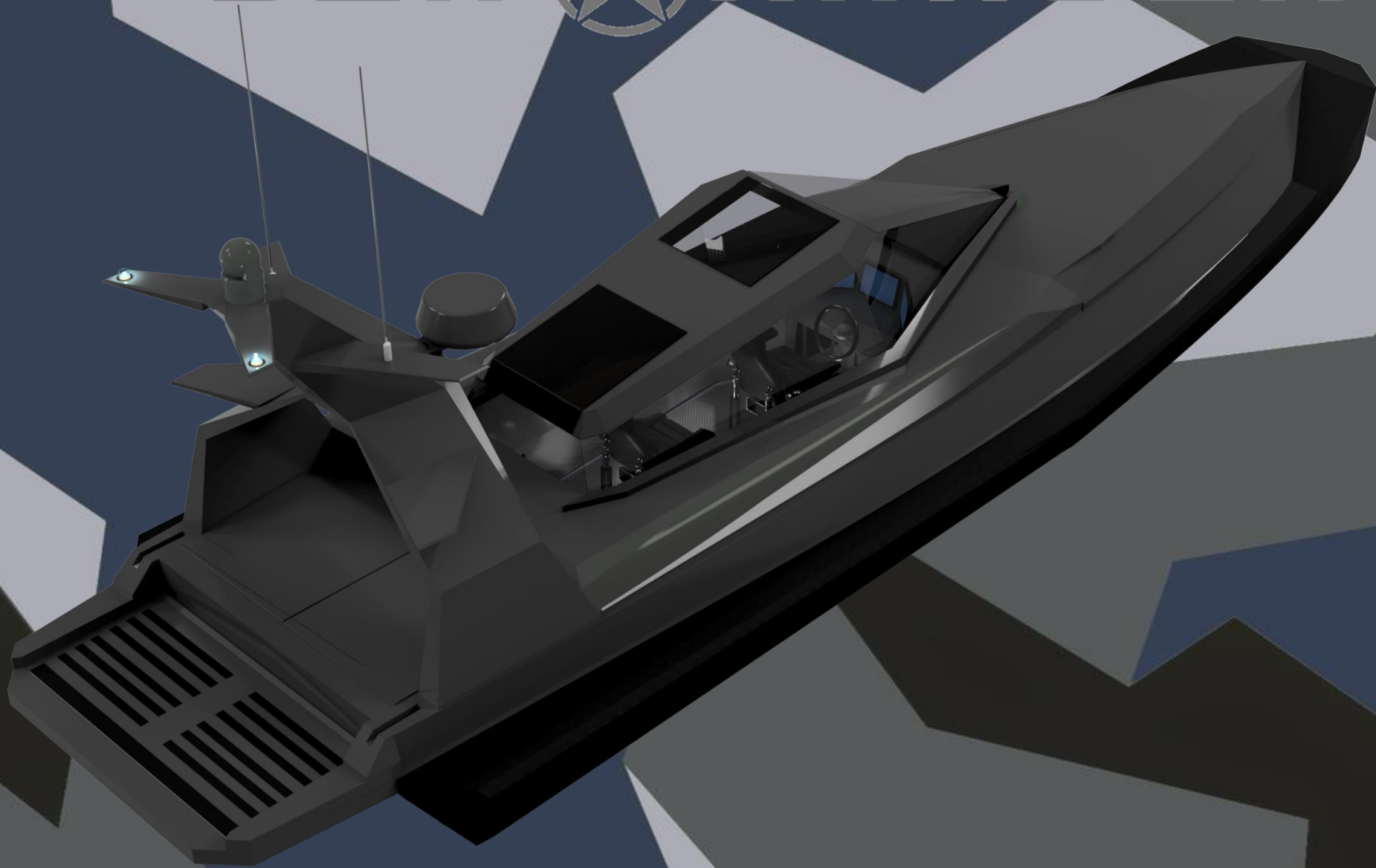
SEA RANGER MK II are based on the well proven 10 meter High Speed Interceptor hull. Over 100 units has been produced.



SEA RANGER



SEA RANGER



The **SEA RANGER MK II** combines racing design pedigree with a proven high-speed interceptor hull, High-quality manufacturing to deliver the very best in performance-driven development for the marine security environment.

Key features include:

- Arma-Tech **ATTACK** USV system
- Radar reflective stealth paint
- Strengthened core and structural lamination using Carbon and Kevlar fibre
- Anti-impact buoyancy fender
- Patent pending integrated radar mast system
- Secure long-range fuel tanks



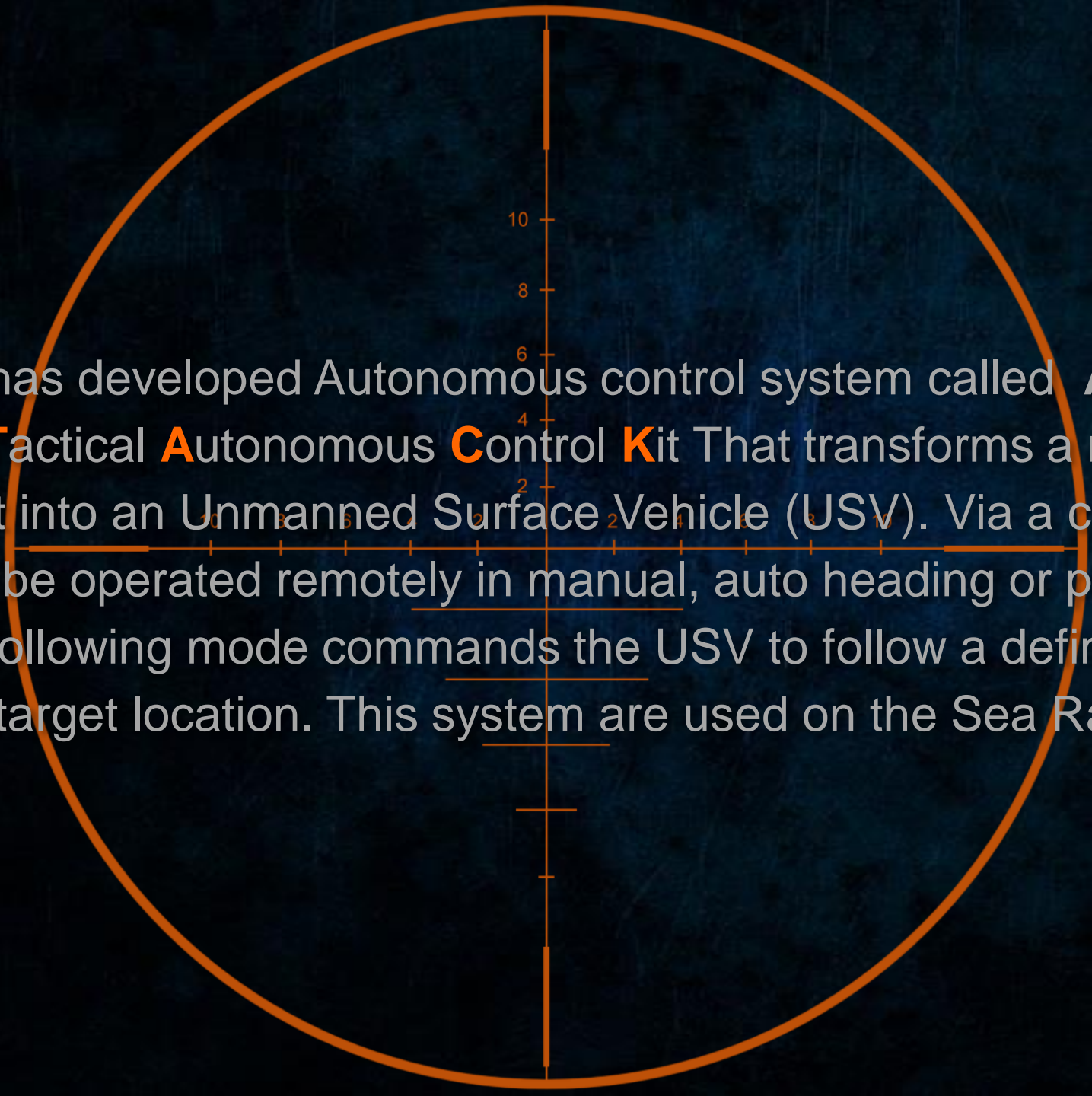
Technical Information:

LOA: 10 M
Beam: 2,3 M
Dead rise: 24 degrees
Draft: 0.71M
Hull Weight: 3200 Kg
Fuel Capacity: 500 Litres
Engine: Bukh VGT 550
Drives: Sterndrive
Gearbox: ZF
Speed Max: 60 knots
Range: 400-700 NM

Key Attributes:

500 kg payload
2 Crew in manned operation
On-site operator training programme
Standard 2-Year warranty package
Support and technical advice
Removable hard top
2 x Ullman suspension seats
surveillance sensors
High tech EO/IR camera system
Basic ground control system
Foldable mast system

AC cabin and electronics compartment
Digital and integrated cockpit display
Radar / GPS / AIS / Marine VHF
Integrated high-power search light
Flood lights
Integrated hailer system
Satellite communications uplink
3 screen on-board display
Obstacle avoidance system with LiDAR
Dual GNSS, 10Hz receiver, 72 channels,
Forward looking sonar
Remote control weapon system (option)



Arma-Tech has developed Autonomous control system called **ATTACK**. **Arma-Tech Tactical Autonomous Control Kit** That transforms a regular manned boat into an Unmanned Surface Vehicle (USV). Via a command link, the boat can be operated remotely in manual, auto heading or pattern mode. The pattern following mode commands the USV to follow a defined course, or head to a target location. This system are used on the Sea Ranger MK II

UNMANNED SURFACE VESSEL

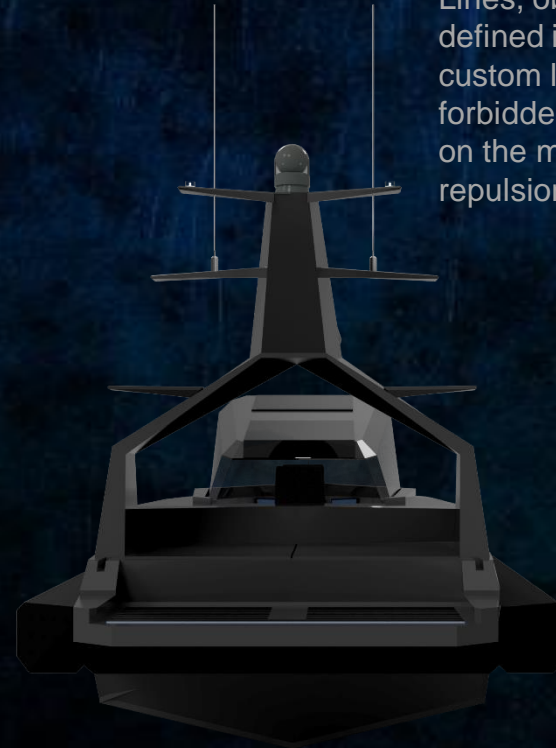
By using Arma-Tech Tactical Autonomous Control Kit (ATTACK), the vessel can operate independently or combined in swarm. Completely autonomously or a combination of both manned and unmanned. Plug / Play integration of numerous payloads or weapon systems. Platform versatility applications. While keeping personnel out of harm's way.

What if your Navy could perform some of its toughest and most dangerous missions using a large number of small and inexpensive unmanned surface craft, instead of with a small number of large and very expensive manned platforms? The concept of teams of inexpensive unmanned surface vehicles (USVs) becomes not only interesting but increasingly relevant. In addition, a team of USVs could be more survivable less detectable and more effective for certain missions than individual larger manned vessels.

Autonomous control greatly reduces the bandwidth required to operate the USV, and the amount of cognitive workload on humans. This will allow USVs to operate much farther away from the control station and allows human supervisors to control multiple USVs. It is also possible to use a swarm of USVs to relay and extend range further. A team of USVs can be programmed to work together and escort a mothership to give that extra awareness protection

ATTACK is engineered to provide USVs with an ability to handle dynamic operational situations. Fast-moving USVs could lower risk and increase efficiency for a large number of missions, including Intelligence, Surveillance and Reconnaissance (ISR), countermine operations, search and rescue, electronic warfare, supply and weapons transport.

There are several tools that can be used to make the elements of the map used for the mission. Some of these tools include: Lines, obstacles, circles, and waypoints. Waypoints can be defined in the software, relative waypoints to an object in motion, custom links in between waypoints, obstacle definition and forbidden areas. The obstacle tool is used to determine an area on the map that cannot be crossed by the USV. This area is a repulsion potential field for the USV



Applications

- Border Patrol
- Offshore Asset Protection
- Search And Rescue
- Convoy Escort
- Commercial Ports
- Naval Bases
- Force Protection / Anti-Terror
- Anti-Surface Warfare
- Mine Warfare
- Littoral Anti-Submarine Warfare
- Pollution Detection and Treatment

SYSTEM OVERVIEW

The USV autopilot control system is a configurable control system that was designed with state-of-the-art technology, guaranteeing the reliability and quality of the system all through the procedure. The system is designed to integrate aerospace components that are highly reliable, as well as a radio module, an IMU, and a dissimilar arbiter processor to be used to take charge of Unmanned Surface Vessels. The system is highly enhanced particularly when used on unmanned vehicles. It has an autopilot control system that can work with any unmanned vehicle. You can software to control any unmanned vehicles if you make use of the configure it through same hardware and software

GROUND CONTROL STATION

The CGS is the major control element for USVs. Operators in the GCS directly control the Unmanned System (US) and its payloads through RF communication systems. Depending on variations in different environments during the missions, GCSs are established to carry great potential for maximizing quick judgment. It has also been found that the GCS design should offer the appropriate levels of information required for the mission in order to avoid information overload, which may cause shutting down of the prefrontal cortex. By employing graphical techniques like augmented reality for the GCS displays mission performance can be improved. This can also help in rapidly identifying threats, hence faster decision making.



LINE-OF-SIGHT (LOS)

LOS is the ability to see a transmit or receive antenna. Any obstruction between the transmit and receive antennas will block the signal just like blocking what the eye can see. Radio LOS and fair conditions, the radio link will work at a range of 40 km.

360° SITUATION AWARENES

The understanding of the elements in the surroundings is particularly important when operating Unmanned Systems where poor decisions may lead to serious consequences.



SENSE AND AVOID

Throughout the mission, the system is informed of the distance to all objects in the environment so it can calculate a safe route. In case the USV approaches dangerously close to an object during the mission, the system is warned of that risk to safely avoid it. The system will detect, track, evaluate, prioritize, declare, determine, command and execute. These functions will be repeated as long as the object can be seen. Return home can be programmed without pre-setting a route. Where the USV automatically will avoid obstacles while coming back in a straight line.

CONCLUSION

- The current investment in terms of effort and budget demonstrates that USV will soon be an integrated part of maritime operations, both military and civilian.
- On the military side, the USV are already finding their way into applications and future concepts. As a first step, unmanned systems allows the high value units to stay away from the danger zone, whether this is the enemy coast or a mined stretch. This will reduce both the risk for the own-forces and high-value units.
- As unmanned system capabilities further improve, their range of operations and sustainability will also increase, turning manned platforms obsolete in the very long term. Unmanned systems will be monitoring enemy movements and repositioning themselves autonomously to maintain advantage, and as the enemies also develop unmanned technologies, the high-value units would need to be pushed further and further back, raising the need for persistently operating unmanned systems. Ships will be transformed to transport mechanisms and sea-bases for unmanned systems from which to operate.
- Unmanned systems are continuously improving, one must be part of this rapid technology development to keep one step ahead of the enemy. Unmanned systems are the future of modern warfare and the future is already here.

"The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable." — Sun Tzu 500 BC