Our goal is to provide customers with efficient and optimized solutions to fulfill their individual needs.”
Our in-house capabilities include the development and production of standard products up to customized system solutions. We offer extensive know-how and personal support for all kinds of naval systems and integration programs. We can take on the role as design authority from system definition through to delivery and final acceptance.

Strong cooperation with our customers is our key success factor. We not only strive to meet the current requirements, but also have developed a system architecture which allows us to offer a customized solution that is even able to adapt to evolving operational requirements. Besides supply and integration of our broad range of navigation and mission management systems, this includes the integration of different shipboard systems such as automation, internal communication, or entertainment systems. All of our systems are supported by a range of services to provide customers with a seamless solution through the full lifecycle.

Raytheon Anschütz is a leader in manufacturing and integrating navigation equipment, world-class radars and customized system solutions for naval and merchant marine customers around the world. Besides our unparalleled domain experience and knowledge in integration system architecture, we are committed to the ongoing development and proven combat systems as well as mission management solutions.
Our diverse technology base, competent staff and expertise gained through previous and current programs make us one of the world’s most capable naval system integrators. We offer a wide range of products ranging from high performance sensors through navigation workstations up to scalable command and control (C2) solutions.

All solutions developed, produced and engineered by Raytheon Anschütz are in compliance with a quality management system according to ISO 9001-2008 as well as in compliance with an environmental protection system according to ISO 14001-2009. Additional military standards will be applied where necessary.

MISSION: PROVIDE CUSTOMERS WITH INDIVIDUALLY OPTIMIZED SOLUTIONS

PRODUCT PORTFOLIO

- Command and Control Systems
- Mission Management Systems
- Integrated Fire-Control Systems (FCS)
- Naval Navigation Data Management Systems (DMS DDU)
- Electro Optical Systems (EOS)
- Integrated Bridge and Navigation Systems (IBS/INS)
- Navigation Sensors
- Tactical Radar Display Systems
- Small/Automatic Target Tracker
- ARPA-Radar-Systems
- Heading Sensors and Inertial Navigation Systems
- WECOISEC/CDIS
- External/Internal Communication
- Automation

CUSTOMER SERVICES

- System Supplier
- System Integrator
- Program Management
- Project Planning
- Information- and Training Programs for Board- and Service Personnel
- Equipment for Depot- and Service Stations
- In Service Support solutions
- Design studies
SYNTACS: OUR ANSWER TO TODAY’S MISSION REQUIREMENTS

Our Synapsis Tactical Command System (SYNTACS) is an innovative and efficient Command and Control (C2) solution for effective decision making and appropriate counteraction of dangers or threats. It is especially developed for today’s conflicts and asymmetric threats. SYNTACS meets the concept of operation (ConOps) as well as particular tactical mission requirements of small and medium platforms (e.g. OPVs, PVs, FPVs, FACs) and contributes significantly to enhancing the ships’ capabilities, e.g. self-defense.

SYNTACS is smart — its powerful and scalable system architecture makes it not only flexible enough to adapt to individual and evolving requirements but also to fit into the budgetary limits of navies or coast guards.

INTEGRATED SOLUTIONS: FROM SYNAPSIS TO SYNTACS

SYNAPSIS is our latest generation of an IMO-certified Integrated Navigation System (INS). It is based on a task oriented architecture which provides access to the navigational functions of radar, ECDIS and conning simultaneously on multifunctional workstations. In addition to the navigational functions, SYNTACS integrates the situational awareness task to this architecture and transforms the former Integrated Navigation System into a tactical oriented Mission Management System. With additional modules like Sensor and Fire Control it can be enhanced to a capable Command and Control solution to meet customer goals and expectations.

KEY BENEFITS:

- Significantly enhanced situational awareness and common operating picture (COP)
- Additional situational awareness and self-defense capabilities on the bridge, even if a dedicated Combat Management System (CMS) is aboard
- Various scalable extension options to adapt to different missions and individual requirements
- Highly affordable system and low lifecycle cost (built on COTS technology)
- Reduced and flexible manning/training through intuitive operation and standardized HMI
- Low risk with only one responsible contractor for development, integration, supply and support
- Customer proven system with many systems already delivered
- IMO-compliant system with type approval MSC.252(83)
- Space saving by using multifunctional workstations or upgrading existing bridge workstations
SYNTACS offers the operator a complete tactical overview of the ship’s surroundings. SYNTACS can integrate different sensors and weapon systems appropriately for different missions.

Through data correlation of all organic and external sensor information (radar, AIS, camera and other sensors), SYNTACS provides a comprehensive dashboard for the operating picture. The dashboard includes classification possibilities and tools for tactical maneuvers (e.g. intercept and tactical maneuvering/stationing). SYNTACS also features a target management and correlation capability which offers a common operating picture to all connected workstations onboard and ashore.

**SYNTACS PROVIDES THE FULL TACTICAL PICTURE**

SYNTACS also features a target management and correlation capability which offers a common operating picture to all connected workstations onboard and ashore.

**DEPENDING ON SYSTEM CONFIGURATION, SYNTACS CAN OFFER THE FOLLOWING FEATURES:**

- Integration of IMO-compliant navigation systems on multifunctional workstations
- Consistent HMI and central change of colors/dimming
- Customer defined HMI
- Fully functional electro optical sensor integration
- Freely movable sea chart representation
- GEOTIF charts
- Track presentation based on MIL-STD-2525 or others
- Track list and track history
- Track filtering controls (range affiliation, source and alarm status)
- Tactical intercept heading/speed recommendation
- Sensor range and current alignment
- Alarm zones, safety areas with freely configurable parameters
- Intelligent alarm management throughout the entire system guns / weapon alignment and status information
- Fire Control Solutions for guns

**C2 operator HMI incl. georeferenced satellite image**

**C2 operator HMI in bright sun colors**
**OWN SHIP NAVIGATION DATA**
SYNTACS displays own ship navigation data.

**INTEGRATED ELECTRO-OPTICAL SENSOR**
SYNTACS integrates the Electro-Optical Sensors, fully functionally. The system can be controlled manually or automatically. Snapshots and video recording are supported.

**CLASSIFICATION OF CONTACTS**
SYNTACS enables target classification according to MIL-STD e.g. as unknown, suspicious and friendly.

**ALARM ZONES**
Alarm zones can be created with reference to shore lines structures, relative to own ship or randomly. If unknown contacts enter the zone, an alert is raised and the EO-System automatically slews to the alerting track.

**EOS FIELD-OF-VIEW**
The EOS Field-of-View is displayed on the chart, which enhances operator orientation and simplifies interpretation.

**TRACK LIST**
The Track List displays all important Target Information (e.g. course, speed, distance, bearing, affiliation) additionally also the threat level is indicated.

**INTEGRATED ALARM MANAGEMENT**
Relevant alerts from the whole SYNAPSIS navigation system are also displayed within SYNTACS. Likewise, SYNTACS security alerts are also displayed on other Synapsis workstations.
The entire SYNTACS solution is built upon the Raytheon Anschütz OASIS (Open Architecture Software for Integrated Systems) framework to provide the customer with a homogeneous solution. Thus, SYNTACS is available as a standalone mission management system but also as an integrated IMO-certified solution that combines tactical situation awareness/C2 capability as a part of an Integrated Navigation System.

The flexibility provided with SYNTACS includes the integration of further sensors such as radars, sonars, or optical trackers as required by the customer and a respective mission, but can also relate to integration with other ship systems and effectors. A variety of standard options and modular extensions is available.

CUSTOMER-ORIENTED PROJECT MANAGEMENT

We have long experience and expertise in naval system integration in accordance with cost, quality and schedule. Our project managers provide competent advice with respect to IMO regulations, requirements engineering (including GFX), class requirements and special military standards, and system design. Our team remains responsible for the execution and performance excellence of their projects, through project realization, and testing to delivery and beyond.

THE LEVEL OF FLEXIBILITY OFFERED WITH THE SYNTACS ARCHITECTURE PROVIDES:

- Multifunctional workstation for navigation and situational awareness with a standardized user look and feel
- Easy integration and flexibility for future adaptations/extensions
- Significant advantages over less integrated approaches, which often only interface separate, non-integrated systems without using a consistent and unified system architecture (e.g. intelligent alarm management, target management)
- Rapid integration of additional sensor data
- Add-on, replacement or removal of individual sub-systems and components — e.g. self-contained weapons, electro-optical sensors, small target trackers, data links, 2D radars, ESMs or sonars
- Space saving by using multifunctional consoles or upgrading existing bridge workstations

DEVELOPED TO SUPPORT THE INDIVIDUAL MISSION
SYNTACS Modules and Options

**TACTICAL DATA/COMMUNICATION LINK MODULE**
SYNTACS is able to share operational data such as tracks, overlays, screenshots, video or mission data via the ship’s existing SatCom or other communication lines like VHf or HF. Ship-to-ship and ship-to-shore communication provides a common operating picture beyond the ship’s organic sensor range.

**ELECTRO-OPTICAL (EO)**
SYNTACS integrates naval-specific electro optics (EOS: HDTV daylight camera, IR-night sight, laser range finder, thermal imagers) to further enhance detection and identification capabilities. The SYNTACS display features an additional separate window for the tailor-made HMI to operate the EOS. The camera position as well as the field of view is shown on the map. Based on the selected track, alarming track or selected position, the system allows automatic slewing of the camera. Alternatively, manual control via joystick and/or control panel of the EOS is possible. An additional console for EOS sensor operation is not needed, which creates an opportunity to reduce manning on the bridge. Raytheon Anschütz offers integration of a wide range of EOS-Sensors to suit the customer’s specific requirements.

**SYSTEM INTEGRATION MODULE**
- Target acquisition: integration of a high-quality military standard Camera for identification and observation of potential threats
- Target tracking: automatic video-tracking function
- Laser range finder function to provide information for the ballistic calculation
- Range of interface options: control of any gun mounted on the vessel
- Comfortable and complete integration into the existing bridge system

**SEARCH AND RESCUE FUNCTION MODULE**
The SYNTACS search and rescue (SAR) function is able to generate search patterns with the most appropriate position calculated from wind speed and direction as well as currents. The calculations and available patterns are in accordance with IAMSAR manuals. A vessel using the SYNTACS SAR module can act as On-Scene-Commander (OSC) of a SAR task group and coordinate specific tasks within the search area.

**SOFTWARE**

**MISSION DATA RECORDING MODULE**
The C2 mission data recorder (MDR) module opens up the possibility to record, store and replay mission relevant information for debriefing or training meetings. The MDR collects videos and photos taken by the camera(s) as well as other available data (e.g. console screen recordings, voice, own ship data, target data, alarm data) to store them safely and securely.

**FIRE CONTROL SYSTEM MODULE**
SYNTACS features an advanced electro optical fire control system which is characterized by:
- Target acquisition: integration of a high-quality military standard Camera for identification and observation of potential threats
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- Laser range finder function to provide information for the ballistic calculation
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**INTEGRATION OF WEAPON CONTROL**
SYNTACS offers integration of small and medium weapon stations of various types and manufacturers as well as a fire control module for ballistic computation. The workstation HMI can be configured to include a display for gun and ammunition status, gun direction, weapon arcs and their effective range. Depending on the system architecture either the EO system or the track source can provide the gun or fire control module with target indication. If desired pedal and joystick controls of the guns can be integrated into the tactical console to save space.

**SMALL / AUTOMATIC TARGET TRACKER**
An additional high performance multi-target radar tracker analyzes the radar videos from the existing onboard radars to track all targets automatically. Even small targets such as small rubber boats can be shown and analyzed. The small target tracker also allows automatic tracking, in order to facilitate watch keeping with small crews, enabling personnel reduction in the watch team.

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SYNTACS
COMMAND CONTROL & NAVIGATION

HARDWARE

MODULES

DATA LINK

CAMERA

WEAPON

NAVIGATION
OFFERING EXCELLENCE IN DIFFERENT DEPLOYMENT SCENARIOS

Thanks to its versatile functionality, SYNTACS meets all the operational requirements of small and medium naval platforms and can be deployed for many different mission profiles. Those tasks range from fishery protection, search & rescue missions up to maritime interdiction missions onboard naval vessels in worldwide out-of-area operations.

POWERFUL MISSION MANAGEMENT FOR SMALL NAVAL SHIPS, COAST GUARD AND POLICE VESSELS

SYNTACS supports the crew of smaller naval, coast guard and police vessels in the appropriate response to terrorism, piracy, smuggling, illegal immigration and more.

ADD-ON CAPABILITIES FOR CORVETTES, FRIGATES AND DESTROYERS

SYNTACS can be applied as an add-on and interfaced to the CMS for corvettes, frigates and destroyers. SYNTACS provides the crew on the bridge with important tactical information. Furthermore, the crew can carry out appropriate actions outside classic warfare areas/operations, including basic self-defense as well as near and mid-range engagements.

COMPLETE MARITIME DOMAIN AWARENESS

Together with our SMARTBLUE Command & Control solution for land-based maritime surveillance, we can provide a commercial off-the-shelf solution for the complete maritime domain awareness of a nation’s EEZ, including both shore and offshore assets.

POWERFUL AND AFFORDABLE FOR ANY BUDGET

SYNTACS is a really cost-efficient solution. Why?
- Highly affordable system employing COTS technology
- State-of-the-art architecture for minimal mechanical integration and cabling effort
- Multifunctional systems reduce need for hardware and contribute to space saving arrangements
- Reduced and flexible Manning/Training through intuitive operation and standardized HMI
- Simplified logistic, low life-cycle costs, and worldwide service support
- ITAR-free technology
Raytheon Anschütz is a subsidiary of Raytheon Company and headquartered in Kiel, Germany. We have an international reputation as a world-leading manufacturer and integrator of navigation and naval systems.

In the past century, we have proven to be a reliable partner for worldwide navies, shipping companies and shipbuilders. Today 35,000 high-sea vessels are underway using our navigation systems, supported by more than 550 employees at the Raytheon Anschütz headquarters in Kiel, Germany, as well as by worldwide subsidiaries, sales partners and more than 200 certified service stations.

Our history has strongly influenced the navigation on board of ships. Our tradition makes us a truly maritime company with unique know-how and experience in navigation technology. It all started with the gyro compass:

Around the turn of the 20th century reliable course-keeping was a common problem of high-seas navigation, because the magnetic compass did not work properly when used in connection with steel ships or near the poles. In those days Dr. Hermann Anschütz-Kaempfe’s ambition was to develop a suitable course-keeping instrument and he invented the gyro compass in 1904. One year later in 1905 the company Anschütz & Co. GmbH was founded in Kiel.

The first product developed in the following years was the first commercial gyro compass, presented in 1908. Further innovations followed, for example the world’s first chart plotter, the predecessor of the present generation of electronic sea chart systems, or the first autopilot for ships, the so-called “iron helmsman”. To the present day, Raytheon Anschütz has been a driver for navigation system innovations which had a significant impact on the evolution of navigation.
WORKING WITH RAYTHEON ANSCHÜTZ

With more than 110 years in the navigation system business, our strength is our long experience in designing and integrating navigation and naval systems. However, our support is not limited to the production and supply of high-quality products but aims to provide customers with optimized, efficient and capable solutions over the entire lifecycle of a ship.

GLOBAL CUSTOMER SUPPORT

As one of the world's largest service providers we take care of our products and systems on ships around the world. We offer central service coordination, worldwide maintenance and repair as well as customer-oriented handling of repairs and warranty processes which complete the Raytheon Anschütz after sales management services.

INTEGRATED LOGISTIC SUPPORT (ILS) & IN-SERVICE SUPPORT (ISS)

Raytheon Anschütz looks back upon many years of experience in supporting its customers while always striving to utilize the latest tools in customizing logistics. Reliable, safe and easily maintainable systems are crucial for an efficient operation at sea. With this in mind our customized ILS takes all of your specific requirements into account and characterizes all relevant logistic support measures as a prerequisite for economical and effective operation.

On the basis of detailed system knowledge Raytheon Anschütz offers ILS packages that provide customer support into the future. Our customized solutions cover performance-related payments to ensure maximum system availability at predictable low costs. Further key factors are the handling of obsolescence, refreshing through technical updating, ensuring a suitable training level and documentation updates.

AFTER SALES MANAGEMENT

Naval ship systems are often specially designed, and due to a long life span do not keep up with the latest technology. To cope with the continuous need for obsolescence management, Raytheon-Anschütz offers long term support and logistic services, as well as customer-oriented handling of repairs and warranty processes which complete the Raytheon Anschütz after sales management services.

GLOBAL CUSTOMER SUPPORT

Our worldwide support is backed with a world-spanning network of certified service stations, as well as our own subsidiaries and regional offices. For more information about our Global Customer Support, please visit our website:

http://www.raytheon-anschuetz.com/global-presence/
“We are proud of having contributed to the world’s most advanced naval projects.”