NAVAL COMMUNICATIONS SYSTEMS
Selex ES has a strong tradition in the supply of naval systems. In fact, we supplied the first naval communications to Italian and Royal Navy ships in 1896. Since then, we have grown to become a subsidiary of Finmeccanica, employing 17,000 people worldwide, manufacturing and supplying modern, fully integrated, internal and external communications systems, designed to meet the needs of a wide variety of naval platforms and to enable the digitization of the maritime battlefield.

AN EXPERIENCED PARTNER
Finmeccanica is the third largest defence and Aerospace contractor in Europe and eighth in the world. Selex ES works closely with sister companies AgustaWestland; MBDA; Vega; Oto Melara; and DRS to develop improved integration strategies for aviation, combat and command & control systems, and provide a comprehensive, through-life naval communications capability. Selex ES also has an excellent record in partnering with prime contractors and systems integrators to deliver complex or demanding requirements. This wide range of interactions creates an environment that inspires innovation.

We have delivered communications systems into naval programmes in Italy, the UK and over 40 countries including the USA, France, Turkey, China, Malaysia and New Zealand. Over 250 naval platforms have been fitted with Selex ES equipment. With offices and production plants in Italy, the UK, Turkey, Germany, Romania, Brazil and the USA, Selex ES is a truly global provider of integrated communications systems.

Selex ES integrated communications systems are:
- Modular, scalable, flexible and rapidly reconfigurable
- Interoperable with military and civilian communications
- Integrated with ships’ systems and guest military and civilian equipment
- Secure – hosting NATO and national encryption algorithms
- Designed according to requisite military and civilian standards

Selex ES systems make effective use of:
- Standard Interfaces and protocols (including IP) – facilitating access for all systems users and a wide range of technology insertion options
- Automated management, maintenance and control to reduce manpower
- Simple, user-friendly and intuitive graphical interfaces which remain error tolerant even under pressure
- Resources and space – typically requiring fewer, smaller cabinets
- Common modules – reducing spares requirements, simplifying logistic support and training and facilitating emergency repairs
- Selex ES’ mature design and implementation life-cycle processes enable us to work with the shipyard to reduce project risk
- Simulation, integration and test facilities to prove system configuration and validate system outputs before installation, avoiding more costly adjustments afterwards
- Our experience of a wide range of military platforms means that we have previously resolved many issues that can arise during implementation. This reduces the risk of programme delays.
Selex ES has provided advanced solutions to meet the ever-growing communications needs of a wide variety of vessels serving many Navies worldwide.

**CAPABILITY**

**Network Enabled Capability**
Selex ES is uniquely placed to lead the delivery of Network Enabled Capability. We have proven, in-service, modular, scalable, secure systems, for land, sea and air, designed to function at the heart of modern military operations; enabling interoperability with allies, joint forces and civil authorities for effective exploitation of information. Selex ES is a founder member of EURO MIDS.

**Naval capability**
Selex ES has played a leading role in numerous naval communications programmes. Our role as prime contractor or lead systems integrator is effectively supported by our full suite of Selex ES designed and manufactured product and our detailed understanding of the technology, platform and operational requirements.

We provide:
- Strategic communications systems
- Messaging and information systems
- Cryptographic equipment
- Naval radios
- Satcom
- Maritime networks
- Navy shore stations
- Specialist antennas
- Electromagnetic modelling
- Ruggedisation and marinisation of COTS products
- Integration of COTS

We also provide Information Assurance services, including digital forensics, vulnerability testing and ICT security consultancy.
Manufacturing capabilities
The greater understanding and flexibility that come from designing and manufacturing the product, and the ability to resolve for any missing links, enables us to work in partnership with shipyards and prime contractors to make significant reductions in programme risk.

R&D capability
Our R&D capability began with Guglielmo Marconi’s early radio experiments. Today, we direct and exploit the latest thinking to produce innovations in software, hardware, sensors and enclosures that will ensure that our customers’ communications systems continue to provide world leading performance. This investment in innovation drives our complete range of world-class HF, UHF, crypto, satellite communications and management systems products, constantly developing and enhancing our portfolio and delivering significant benefits to our users, including a clear upgrade path and, uniquely; a single source for the entire communications capability life-cycle.

Maritime capability
In addition to naval systems, Selex ES is also the leading supplier of maritime electronics to the commercial and leisure markets, with the most comprehensive international after-sales support, including internet and mail-order facilities. We provide equipment, surveys and onboard maintenance services for GPS, VHF and MF/HF radio, marine radar, satellite communications, weather information receivers, INMARSAT, GMDSS, voyage data recorders, emergency beacons and echo sounders.

Adapting COTS
Our extensive experience with COTS technology enables us to benefit from the considerable investment in fast-moving, high volume telecommunications markets. In conjunction with our proven range of cryptographic equipment, information systems, switching, radio and other bearer systems, COTS products often provide a route to innovative, best-value, market-leading solutions. Optimum use of common modules and proven COTS equipment simplifies support requirements, and delivers integrated communications to budget and on time. Our unique ability to design, supply and integrate sophisticated military capability, adapt COTS and MOTS products, and to satisfy the demands of the commercial marine market puts Selex ES in an ideal position to support naval logistics and fleet auxiliary operations in particular.

PROJECT SUPPORT
Selex ES offers a complete package in support of the prime contractor, designer, shipbuilder, system integrator and end user, whether for new build, refit or repair, entire capability or partial scope, uniquely, providing all of the following:
- System design
- System testing and validation documentation
- Equipment selection and installation design to optimise performance against budget, space, cabling constraints
- Topside modelling and simulation to define antenna arrangements for signal strength, interference effects and blind spot performance
- Internal electromagnetic modelling for wire-free installations
- Security and safety assessments
- Comprehensive installation and maintenance packages including maintainer training
- Logistic support studies
- Effective, local, whole-life logistic support
- Complete supply chain management ensuring full traceability and configuration control

Selex ES is structured to ensure that we will provide all support services, to recognised military standards, to establish and maintain the required communications capability throughout the capability life-cycle.
From innovative new build communications solutions to capability upgrades of existing ship fits, Selex ES has the depth of electronic systems integration expertise to enhance the operational capability of all sized of vessels.

A COMPREHENSIVE APPROACH
Selex ES has a full understanding of the technologies with which the communications system must integrate and considers the whole ship while addressing the communications requirement. Our team of communication systems integrators draws on in-company expertise in safety, security and navigation products to ensure that information needs are met in the most effective manner.

Selex ES designers work with customers to optimise usability and satisfy operator needs. We assess the organisational impacts, the opportunities to reduce infrastructure and the improved methodologies released by new technologies, in addition to the central issues of interoperability, security, training, capability maintenance and support, to ensure information is with the right person, in the right place at the right time.
<table>
<thead>
<tr>
<th>WHAT</th>
<th>Communications</th>
<th>Security</th>
<th>Safety</th>
<th>Navigation</th>
<th>Welfare</th>
<th>Through-Life Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fully Integrated modular systems providing Strategic and Tactical, Internal and External (Ship to Ship, Ship to Shore, Ship to Air) services</td>
<td>Products and services supporting personal security, information security, physical security and naval security roles</td>
<td>Extensive experience in the design and installation of leading systems for crew protection. Vessel safety and battle damage control</td>
<td>Integration of best of breed equipment from a broad range of suppliers. Designing and installing navigation solutions for world-leading shipping companies</td>
<td>Technology to improve quality of life onboard, provide relief from stress and contact with family. Helping to maintain high levels of wellbeing, motivation and crew retention</td>
<td>Proven global support operation providing full range of services for the prime contractor, designer, shipbuilder, systems integrator and end user to ensure lifetime capability maintenance</td>
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<tr>
<td>• LF/HF (including ALE mode)/V-UHF bands</td>
<td>• High Grade encryption</td>
<td>• GMDDSS/EPIRB</td>
<td>• Sonar</td>
<td>• Human factors engineering interactive web applications</td>
<td>• Prime contractor</td>
<td></td>
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<tr>
<td>• Military (UHF/SHF bands) and civilian (L/Ku bands) satellite</td>
<td>• Secure messaging</td>
<td>• Voyage Data Recorder</td>
<td>• Radar</td>
<td>• Satellite TV</td>
<td>• Project management</td>
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<tr>
<td>• Software Defined Radio</td>
<td>• Secure telephones</td>
<td>• NR headsets</td>
<td>• Radar modelling</td>
<td>• Personal calls</td>
<td>• System integration, testing and validation</td>
<td></td>
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<tr>
<td>• IP networks</td>
<td>• Bulk encryption</td>
<td>• Wireless intercom</td>
<td>• Integrated bridge</td>
<td>• Internet access</td>
<td>• Configuration management</td>
<td></td>
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<tr>
<td>• Management and control</td>
<td>• CCTV/sensors</td>
<td>• PMR/TETRA/PRR</td>
<td>• Collision warning</td>
<td>• Web conferencing</td>
<td>• Obsolescence management</td>
<td></td>
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<tr>
<td>• Information management and distribution</td>
<td>• Information Assurance</td>
<td>• ISAT – situational awareness</td>
<td>• Situational awareness</td>
<td>• Environmental monitoring</td>
<td>• EM modelling</td>
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<tr>
<td>• Data compression</td>
<td>• TEMPEST</td>
<td>• AIS</td>
<td>• Auto pilot</td>
<td>• Remote medical diagnostics</td>
<td>• TEMPEST</td>
<td></td>
</tr>
<tr>
<td>• Interphone/intercom, voice and alarms broadcast, telbrief, emergency and wire free</td>
<td>• COMSEC aspects</td>
<td>• SART</td>
<td>• Red Haz modelling</td>
<td>• Wireless intercom</td>
<td>• Information Assurance</td>
<td></td>
</tr>
<tr>
<td>• Shore lines access</td>
<td>• Electronic Key Management</td>
<td>• CCTV/sensor systems</td>
<td>• IF</td>
<td>• GPS/GDGPS</td>
<td>• CCTV/sensor systems</td>
<td></td>
</tr>
<tr>
<td>• Tactical data links</td>
<td>• Digital forensics</td>
<td>• Red Haz modelling</td>
<td>• Collision warning</td>
<td>• Gyrocompass</td>
<td>• SART</td>
<td></td>
</tr>
<tr>
<td>• Automatic naval messaging</td>
<td>• CLAS consultancy</td>
<td>• CBRN nano sensors</td>
<td>• CB</td>
<td>• Heading data</td>
<td>• WWW headsets</td>
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<tr>
<td>• Video conference</td>
<td>• ECM consultancy</td>
<td>• Radio safety certification</td>
<td>• Encryption</td>
<td>• Seafloor mapping</td>
<td>• GMDSS/EPIRB</td>
<td></td>
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<tr>
<td>• Marineisation and Waterproofing</td>
<td>• EDM consultancy</td>
<td>• METOC</td>
<td>• Broadcast</td>
<td>• Satellite TV</td>
<td>• Agents for:</td>
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<tr>
<td>• Fully Integrated Communications System for Type 45, Horizon, FREMM and Cavour Carrier programmes</td>
<td>• High-grade voice, data and IP cryptographic products to UK, Italy and NATO fleets</td>
<td>• IFF delivery for the UK CVF programme</td>
<td>• Agents for:</td>
<td>• Type 45, Horizon, FREMM entertainment and internet services</td>
<td>• Lead communications system integrator on the Type 45, Italian FREMM and Horizon programmes</td>
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<tr>
<td>• Swedish HF 2000 programme</td>
<td>• Supply and support 75% of the UK’s high-grade data and voice cryptographic equipment</td>
<td>• Royal Navy IFF support authority for over 50% of the fleet and IFF design authority for Mk10/12 and Carrier IFF</td>
<td>• - Alphatron</td>
<td>• Type 45 and CVF topside electromagnetic modelling</td>
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<tr>
<td>• Software Defined Radio ESSOR consortium</td>
<td>• Common criteria/FSEC evaluations for UK and Italian MoD</td>
<td>• Noise reduction headsets for Type 23 and HNS Ocean</td>
<td>• - Koden</td>
<td>• Exclusive provider of radio safety surveys, port state control and general inspection services to the UK DETR and the UK Maritime &amp; Coastguard Agency</td>
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<tr>
<td>• RN NAMC messaging</td>
<td>• CLEF available</td>
<td>• TETRA wire free system, for the FREMM onboard emergency telephone</td>
<td>• - Navitron</td>
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<td>• External communications for US Navy LHD (WASP class)</td>
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<td>• - Olex</td>
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<tr>
<td>• Secure HF for operationally deployed RN and US Navy Task Groups</td>
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<td>• - TRAX</td>
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<tr>
<td>• Military satellite terminals</td>
<td></td>
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<tr>
<td>• NATO ship-shore-ship buffer stations</td>
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<tr>
<td>• NATO BRASS</td>
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