The Ultra Electronics Group manages a portfolio of specialist capabilities, generating highly-differentiated solutions and products in the DEFENCE & AEROSPACE, SECURITY & CYBER, TRANSPORT and ENERGY markets, by applying electronic and software technologies in demanding and critical environments to meet customer needs.

Ultra businesses constantly innovate to create solutions to customer requirements that are different from and better than those of the Group’s competitors. By applying these differentiated solutions to a wide range of international platforms and programmes, Ultra has built an exceptionally broad range of specialist capability areas. Where the Group has a number of complementary capabilities it can also combine these to offer wider solutions. Furthermore, the products, capabilities and the associated domain expertise uniquely position Ultra to be able to provide system and sub-system solutions. These solutions are underpinned by through-life management support offerings that ensure the capabilities are delivered and sustained in-service. The Group has an active programme of reinvestment of funds to strengthen its capabilities in its specialist markets.

Ultra offers solutions to its customers through the design, delivery and support phases of a programme. Ultra’s businesses have a high degree of operational autonomy so that they provide exceptionally agile and responsive support to customers and partners normally associated with a smaller business. These benefits of customer focus and agility are augmented by the access to wider and complementary technology and expertise that lies elsewhere in the Group and by Ultra’s strong financial position.

The Group provides systems and equipment for manned and unmanned vehicles which improves their reliability and performance, whilst reducing the burden on the operators and maintainers. Ultra also offers a range of innovative products optimised to support the unique challenges of the dismounted soldier.

Combat systems & sensors

Ultra offers a family of surface ship combat management and mission systems, which integrate sensors and effectors to provide combat computation, tactical analysis, decision-making, responsive and engagement solutions. The systems utilise advanced sensors and processors, comprising military and commercial-off-the-shelf (COTS) modules, to provide cost-effective and scalable solutions for different ship classes and applications.

Fire control & weapon systems

Ultra is a supplier of specialist naval electro-optical (EO) surveillance and fire control systems. Ultra provides predictive EO tracking for gun calibres up to 127mm and supports various fire control modes. Ultra’s products are deployed on a wide range of ships, from small patrol vessels to aircraft carriers. Ultra has extensive experience of designing, manufacturing and integrating safety-critical weapon systems. The capability and flexibility provided by Ultra’s weapon interface systems support and enable the integration of an extensive assortment of current and future weapons and interfaces.

Mission support

Ultra has a comprehensive collection of innovative mission support capabilities encompassing long-range acoustic-hailing, shallow-water detection systems and HMI solutions. Ultra provides the effective formal logistic support needed by the warfighter.

Underwater warfare

Capabilities related to underwater warfare covering military, paramilitary and civil domains. These include transducers, hydrophones, sonobuoys, sonobuoy receivers, towed arrays, periscope detecting radars, torpedoes, towed sonobuoys, countermeasures and surface ship local systems.

Maritime

Capabilities related to signal and power management, operating, controlling, supporting and maintaining maritime/military (surface and sub-surface) military platforms, both manned and unmanned.

Land

Capabilities related to operating, controlling, supporting and maintaining land military platforms, both manned and unmanned, and the dismounted soldier.

Aerospace

Capabilities related to the design, manufacture, production, operation, support and maintenance of commercial and military aircraft, both manned and unmanned.

C2ISR*

Capabilities related to C2, Security and Surveillance solutions, covering both military and civil domains as well as military Electronic Warfare, reconnaissance and targeting systems, and forensic solutions for law enforcement.

Communications

Capabilities related to the secure communication and timely exchange of data, voice and video information providing some of the most capable communication systems, platforms and integration support in the world.

Nuclear

Capabilities related to nuclear, covering both civil energy, national and international law enforcement.

Infrastructure

Capabilities related to airport and airline information systems, rail freight power control and control, as well as non-nuclear civil energy related capabilities.

2017 revenue by segment

1. Underwater warfare 25%
2. Maritime 8%
3. Land 3%
4. Aerospace 13%
5. C2ISR* 19%
6. Communications 16%
7. Nuclear 8%
8. Infrastructure 4%
Combat systems & sensors

Ultra’s world-leading capabilities are delivering dominance in the maritime battlespace.

...maximum operational effectiveness to combat the ever-evolving threat.

Ultra has developed the OSIRIS® combat and mission management system, a highly capable, cost-effective solution, readily configurable for any naval ship. Designed on open architecture principles, OSIRIS® is modular and scalable, enabling integration of selected sub-systems into one rugged, reliable and user-friendly multi-function system. Customer-specific system solutions can range from a simple situational awareness and self-defence system for a coastal patrol craft, through to a turn-key integrated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR), implementation for a major combatant platform. Ultra’s navigation data distribution systems are in service with many of the world’s navies, providing accurate low-latency navigation and meteorological data for multiple time-critical ship’s systems, such as combat management systems and weaponry. They are based on state-of-the-art, ruggedised, COTS hardware modules and proven, flexible software applications.

To support the naval C2 combat and navigation management systems, Ultra has worked with customers to develop: Tactical Local Area Networks (TaLAN), which can link sensors, weapon systems, defensive suites and combat management systems. Ultra’s TaLAN, with its open system architecture, increases system reliability and bandwidth whilst minimising future equipment integration thereby reducing the through-life cost to the customer.

To reduce the through-life cost to the customer.

Ultra has established a strong reputation for designing, developing and integrating complex systems for maritime applications. The Group’s excellent track record has been achieved through developing a detailed understanding of its customers’ requirements and the willingness to work closely to develop and establish an environment that promotes cost-effective programmes.

Ultra’s undersea communications technology is a world leader in underwater acoustic communications technology. The Group’s offerings include a family of expendable communications buoys, which enable submarines to remain at tactical postures, yet provide indistinct and sustained one-way and two-way communications. Ultra’s product range also includes underwater telephones, advanced acoustic communications sonar, situational awareness buoys, emergency rescue beacons, tethered and untethered designs for tactical and gateway missions and Submarine Emergency Position-Indicating Radio Beacons (SEPIRB). The SEPIRB is a radio signalling device used for signalling, communications and navigation. The unique physical properties of the magneto-inductive channel enable it to operate through almost any medium including ice, rock, sand, water and concrete. Ultra’s DiverCOMM is a state-of-the-art wireless diver communication system that provides secure, short-range, two-way voice communications between divers in the most challenging underwater environments. Operable in both fresh and salt water, DiverCOMM offers superior performance and reliability in acoustically noisy environments, confined spaces and in areas where physical obstructions can interfere with communications. The system is highly suited for diving operations in the littorals, shallow water, surf zones, waterways, harbours and ports. The M1 channel produces no far field (RF) emissions, thereby eliminating the possibility of detection outside of the operating area. This contributes to the M1 channel’s high resilience to conventional countermeasures and provides low probability of intercept during covert operations.

Ultra’s modern integrated approach to naval Command and Control (C2) and combat management systems offers numerous benefits to navies and coastguards worldwide, in terms of operational capability, flexibility and through-life costs. Ultra’s systems enable effective and seamless integration of weapon systems, sensors (electro-optic, radar, navigation, meteorological, identification friend or foe, automatic identification system and electronic support measures), decoy systems and multi-function consoles, in order to ensure maximum operational effectiveness to combat the ever-evolving threat.

Reducing the through-life cost to the customer.

Ultra has a proven track record in the support and modernisation market, working with customers and third parties to deliver cost effective solutions.

...execution to the customer’s overall satisfaction. Ultra’s experience and expertise covers a broad spectrum of capabilities including: mission and combat management systems; combat systems; naval weapon control systems; naval electro optical surveillance and tracking systems; navigation data distribution systems; electronic systems support; and upgrades and ship modernisation.

More navies are looking at life extension and system upgrades of their legacy vessels to avoid purchasing new platforms. These upgrades increasingly require additional capability to allow the platform to carry out new roles. Ultra has a proven track record in the support and modernisation market, working with customers and third parties to deliver cost effective solutions.

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Ultra’s experience and expertise covers a broad spectrum of capabilities including: mission and combat management systems; combat systems; naval weapon control systems; naval electro optical surveillance and tracking systems; navigation data distribution systems; electronic systems support; and upgrades and ship modernisation.
Platform systems

Ultra’s world-leading capabilities are delivering dominance in the maritime battlespace.

**ELECTRIC CRUISE PROPULSION**

Ultra has developed a range of electric cruise propulsion systems to satisfy today’s needs for increased efficiency, lower emissions and low operational propulsion power, brought on by stringent environmental regulations and the escalating cost of fuel. Ultra’s systems incorporate its high-efficiency, compact, power-dense electronics, coupled with its power-dense motor technology. By utilising the ‘spare’ electrical capacity of the ship’s service electrical systems, Ultra is able to eliminate the need to operate the main propulsion engines during low power operations.

**GAS TURBINE ELECTRIC START (GTES)**

Ultra’s GTES system replaces the traditional hydraulic or pneumatic start systems for gas turbines with an electric drive and motor. This delivers significant advantages in terms of efficiency, reliability and reduced through-life costs. The GTES system can be programmed to deliver optimum starting torques and ramp speed profiles, which significantly reduce the gas turbine starting stresses. Ultra’s solution, comprising a power-dense motor and drive, is inherently smaller, lighter and more cost-effective than the alternatives. To date, it has successfully started not only civil gas turbines, but also the latest generation naval gas turbines, designed for use by both the US Navy and the UK Royal Navy.

**POWER CELLS**

Ultra designs, tests and manufactures the future of portable power: solid oxide fuel cell technology. Ultra is committed to providing dependable, portable fuel cell power, using readily accessible fuel, which can be taken into the wild or into combat. Solid oxide fuel cell power systems have proven to be reliable in field testing for military, leisure and emergency use. Ultra’s flexible fuel cell technology will provide the exact solution required. From powering unmanned surface systems to providing portable power to support expeditionary operations, Ultra is creating new options for how military customers power mission-critical systems. Ultra’s ROAMO D245XR and ROAMO D300 are fuelled by globally available propane. They deliver lightweight, portable power in the most austere, remote and dangerous locations. This delivers better operational outcomes through reduced logistics burden allowing for longer mission duration.

**POWER CONVERSION AND CONTROL**

Ultra is a leader in the ability to package power-dense static converters, whilst maintaining the required structural integrity, thermal performance and ease of maintenance. The power converters are highly modular in construction and incorporate packaged ‘core’ modules, used across the range of equipment. This philosophy facilitates design flexibility and efficient manufacturing. The modular construction enables Ultra to package them to fit into virtually any space-constrained location. Ultra’s range of power converters has been designed specifically for the harsh environment of naval applications, giving it a reliability and compatibility that is well in excess of commercial equivalents. This level of rugged reliability is now also available for non-naval applications. Key aspects of this fit-for-purpose design include EMC compliance, climatic rating, operational reliability, a mechanical construction to withstand severe shock and vibration and a greater flexibility to meet non-standard requirements.

**SIGNATURE MANAGEMENT**

Ultra offers its integrated signature management capabilities to naval customers worldwide. With over thirty years of experience in underwater signature prediction, measurement and analysis, Ultra is a world leader in the supply of multi-sensor, underwater, fixed and portable signature measurement range systems, onboard systems and magnetic and electric sensors. These types of products have been implemented for steel ships, submarines and mine counter measure vessels. Therefore Ultra understands the interaction of the ship’s signature and electromagnets, as well as the importance of precise measurement and control.

**DESCRIPTION**

Eliminating the need to operate the main propulsion engines during low power operations.

**NUCLEAR INSTRUMENTATION AND CONTROL**

Ultra has been supplying nuclear qualified temperature sensors, thermowells and transmitters, pressure transmitters and fibre-optic thermowells and transmitters, design solutions, and control systems for three decades. The Group’s intense focus on quality and reliability has contributed to its recognition as a global leader in these technologies. Its products have been qualified for use in all of the leading nuclear technologies, including pressurised water reactors. Ultra is the equipment designer and integrator for the control and instrumentation suite for the UK’s Royal Navy nuclear submarine production system, where significant priority is applied to design for equipment supportability. This is achieved using an in-house-developed design solution, through well-established and strong procurement links to manufacturers and suppliers, together with a positive approach to obsolescence management.

**HMI EQUIPMENT**

Ultra’s technologies and options for grips and throttles have proven to be ideal for use in unmanned vessel control stations. Ultra introduced the first fully ruggedised game-style controller in 2004. By using this form of hand controller familiar to today’s warfighters, Ultra was able to mitigate a control system which reduced training time and has become an ideal controller for the operation of numerous unmanned vessels.

**D E S C R I P T I O N**

The data produced by these systems is used to reduce a ship’s electric and magnetic signatures. Ultra supplies ranges suitable for use in open ocean and in harbour entrances, which have a full system modelling capability and are in operation with the UK MoD, the US Navy and other countries’ defence forces. Laser products include multi-influence measurement ranges for fixed and transportable applications. Influences measured include: magnetic, electric, acoustic, seismic and pressure, as well as extremely low frequency emissions. The Group also provides capabilities in signature analysis, magnetic and electric field modelling and advanced signature control systems, including on-board degaussing.

**D I S T R I B U T O R S**

Ultra is a global leader in these technologies.

Ultra understands the interaction of the ship’s signature and electromagnetic countermeasures, as well as the importance of precise measurement and control.

**D E S C R I P T I O N**

Designed specifically for the harsh environment of naval applications, giving a reliability and compatibility that is well in excess of commercial equivalents.
Fire control & weapon systems

Ultra’s strength in electro-optic fire control, weapon interface and combat management systems provides proven capability to naval forces worldwide.

WEAPON INTERFACE SYSTEMS

Ultra offers a family of surface ship combat management and mission systems, which integrate sensor and effectors to provide picture compilation, tactical analysis, decision-making, response, and engagement solutions. Ultra has over 30 years of experience in designing, manufacturing and integrating weapon interface management systems into both combat systems and weapon systems. Such capabilities are key to weapon safety, providing the safety interlock between combat management systems and weapon handling and launch systems. The capability and flexibility provided by Ultra’s weapon interface systems has been significantly increased through the use of COTS-based products. This allows the interface system to be easily upgraded, enabling the integration of a wide selection of current and future weapons and interfaces.

NEXT GENERATION SURFACE SEARCH RADAR

Ultra has exploited modern hardware and software data fusion technologies to develop a robust real-time data aggregation and synchronisation radar architecture. This has enabled the development of an affordable, operationally effective next generation surface search radar. This system is based on the AN/SPS-74 system that is deployed on the US Navy’s aircraft carrier fleet and is designed to offer improved navigation and surface search capabilities to the fleet. It also has the capability to detect submarine periscope targets with high probability, whilst maintaining a low probability of false alarm. Its open architecture is designed to enable integration with multiple types of radar systems to enable a common data acquisition and processing environment.

ELECTRO-OPTIC FIRE CONTROL

Ultra is the UK’s primary supplier of naval electro-optical (EO) and fire control systems. With decades of experience in naval EO, Ultra has supplied over 150 systems to some 15 navies and coastguards worldwide, including the UK Royal Navy. Ultra’s products are deployed on a wide range of ships, ranging from small patrol vessels to aircraft carriers. Ultra provides precision EO tracking for gun calibres up to 127mm and gun fire control modes for naval surface, naval air and shore bombardment.

Mission support

Committed to offering flexible and cost-effective logistic support packages, which are tailored to suit the customer’s need.

LOGISTIC SUPPORT

Ultra is committed to offering flexible and cost-effective logistic support packages, which are tailored to suit the customer’s needs. These can range from straightforward ‘spares and repairs’, through to integrated logistic support contracts, and through-life capability services. These include availability-based contracts, where the Group has already demonstrated its repeated ability to meet performance requirements at under target cost. For its portfolio of products, Ultra is able to offer 24-hour on-call support, including technical helpdesks, and contractor-on-deployed-operations engineers. Out-of-area contractor support is also available. In addition to maintenance and training, these packages can include comprehensive obsolescence mitigation plans. Full cradle-to-grave inventory management is offered, covering products from their initial design to eventual disposal.

ACOUSTIC HAILING AND NON-LETHAL DETERRENT CAPABILITY

Ultra’s Hyperspike acoustic hailing devices are highly-directional speakers, designed to focus sound in a narrow beam. They are the lightest and loudest acoustic hailers in the world and have been proven in all environments. The unparalleled range, clarity and ease-of-use of Hyperspike render it ideal for maritime hailing, military operations, and infrastructure protection. The ability to clearly communicate and determine intent, at a safe range, allows stand-off distances to be enforced and reduces the necessity of carrying out boarding operations, thus protecting both people and assets. Hyperspike also supports covert (non-RF) communications, during such tasks as replenishment at sea.

Repeated ability to meet performance requirements at under target cost.
Ultra has a broad portfolio of specialist capabilities which can be combined flexibly to generate innovative, highly-differentiated solutions, which are delivered in close collaboration with customers, partners and suppliers. Ultra is well positioned to support customers and provide solutions to complex needs across the Defence & Aerospace, Security & Cyber, Transport and Energy markets.

<table>
<thead>
<tr>
<th>Capabilities Related To</th>
<th>Underwater Warfare</th>
<th>Maritime</th>
<th>Land</th>
<th>Aerospace</th>
<th>C2ISR*</th>
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*Command & Control, Intelligence Surveillance and Reconnaissance

The matrix on the left shows how Ultra’s core capabilities map to each Ultra business.