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Royal Ordnance

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ROYALORDNANCE
Defence systems, sub-systems and components

A British Aerospace Company



Introduction

Royal Ordnance has played a crucial part in the defence of Britain for over 400 years. Since being established as the Royal Powder Mill in 1560, our explosive munitions and weapons have been used from the time of the Spanish Armada to the Falklands campaign, and are in service with the British Armed Forces worldwide.

We have consequently built up a level of experience of defence requirements and conditions around the world that few other defence contractors can match, and the Company has the capability to design, develop, manufacture and support every aspect of conventional weapons.

We became a public limited company in 1985 and a wholly owned subsidiary of British Aerospace in 1987. With our independence from the Ministry of Defence and the challenge of the international market, we are expanding our business interests worldwide and presently provide equipment and service to more than 50 countries across the globe.

As a result, Royal Ordnance is one of the West's leading defence companies, with a very comprehensive product range. This covers small arms, tank guns, mortars, aircraft guns, fighting vehicles and artillery, and we are Europe's largest volume manufacturer of ammunition. We are also closely involved in Naval Systems such as torpedoes, naval guns and mines, and in Air Systems, we produce bombs, air to air guns, ammunition and sub-munitions for dispenser weapons. We possess Britain's only fully integrated rocket motor capability, which supplies propulsion systems for air to air, surface to air and other tactical missiles. The Company also designs and manufactures mechanical and electronic devices for the fuze and safe functioning of ammunition, guided weapons and barrier warfare systems.

Within our overall capability, Royal Ordnance is involved with weapons and ammunition that are compatible with systems designed by other companies. We also actively seek customers who wish to improve their design and manufacturing abilities and a number of international co-operative ventures testify to the Company's success in the transfer of technology. For example, North American Explosives is a joint venture formed with the

Ensign Bickford Company in the United States, which is now manufacturing explosive products at its new facility in Kentucky.

Royal Ordnance is structured into four core businesses or Divisions, namely Ammunition, Guns and Vehicles, Rocket Motors and Control Systems and Fuzes. All the Divisions have achieved notable sales worldwide and our aim is to build on these successes. Significant sales have been made with products such as our 81mm Mortar system and 105mm Light Gun. The extremely accurate Enfield Weapon System (SA80) produced in our new facility at Nottingham, is now in service with the British Army and has proved itself in a variety of environments worldwide from the Arctic to the Desert. Our new 105mm fin-stabilised tank round, the H6/62, incorporates the latest improvements in ammunition technology. The 120mm mortar, the 52 calibre 155 ordnance, the 105mm low recoil force gun and the "T" series upgrading kit are all evidence of the innovation of the Guns and Vehicles Division. The Company has a continuing involvement in Armoured Vehicles, not only producing the Combat Engineer Tractor but also seeking to be the prime contractor for vehicle refurbishment programmes worldwide. The Company also has a considerable expertise in electronic systems, particularly in the field of fuzes, communication systems and Safety and Arming Units for all types of projectiles and munitions. Each Division possesses its own market led research and development programmes which will keep the company at the forefront of technology, to meet our customers current and future needs.

In addition to the four divisions, Royal Ordnance Speciality Metals Ltd is a subsidiary company which manufactures Kinetic Energy penetrators for ammunition, using high density materials.

Royal Ordnance remains committed to serving the forces of the free world; to providing them with equipment to meet their needs at a competitive price and in whatever operational or climatic environments they may be involved; and in providing integrated logistic support for that equipment throughout its operational life.

The era has changed . . . the commitment has not!

Ammunition Division

Centred at Chorley in Lancashire, Ammunition Division is the largest of the Company's four Divisions. It has a complete capability in natures of ammunition from 5.56mm Calibre up to 155mm and larger, for use on land, at sea, and in the air.

Their ammunition is designed to defeat all targets on the battlefield, and the Division provides cost effective ammunition natures for many types of weapons. This includes a number specifically tailored for export customers.



A family of 120mm Mortar Ammunition is now under development. As well as being able to be fired from the Royal Ordnance 120mm Mortar, it will be compatible with other systems.

Artillery Ammunition

Royal Ordnance is one of the principal producers of the L15 155mm Shell, which is a high performance munition for use with the FH70 Howitzer. Complementing this, we have also privately developed a range of 155mm Ammunition, so that we can offer customers everything from an Impact Indicator Round for training, to the RO30 Extended Range Base Bleed round. Of course a full range of Triple Base Charge Systems using combustible containers is also available.

For the 105mm Light Gun high terminal effect ammunition offers unrivalled performance out to over 17kms, which gives tremendous firepower and flexibility to the artillery commander.

Additionally, Royal Ordnance is a major subcontractor for the European production of the MLRS providing explosives, bomblets and warhead skins.



Millions of rounds of Small Arms Ammunition are produced each year in 5.56mm, 7.62mm and 9mm in a variety of natures.

120mm Ammunition being loaded into a Challenger Tank. A complete range of ammunition is available for both 120mm and 105mm Rifled Guns, which are effective against all types of target.



Mortar Ammunition

A complete range of high performance ammunition is available for the 51mm and 81mm Mortar, and a new family of 120mm Mortar ammunition is now under development. All of these are capable of being fired from systems produced both by Royal Ordnance and other manufacturers.

As well as the actual range of projectiles, Royal Ordnance can offer propelling charges for 155mm Artillery systems.

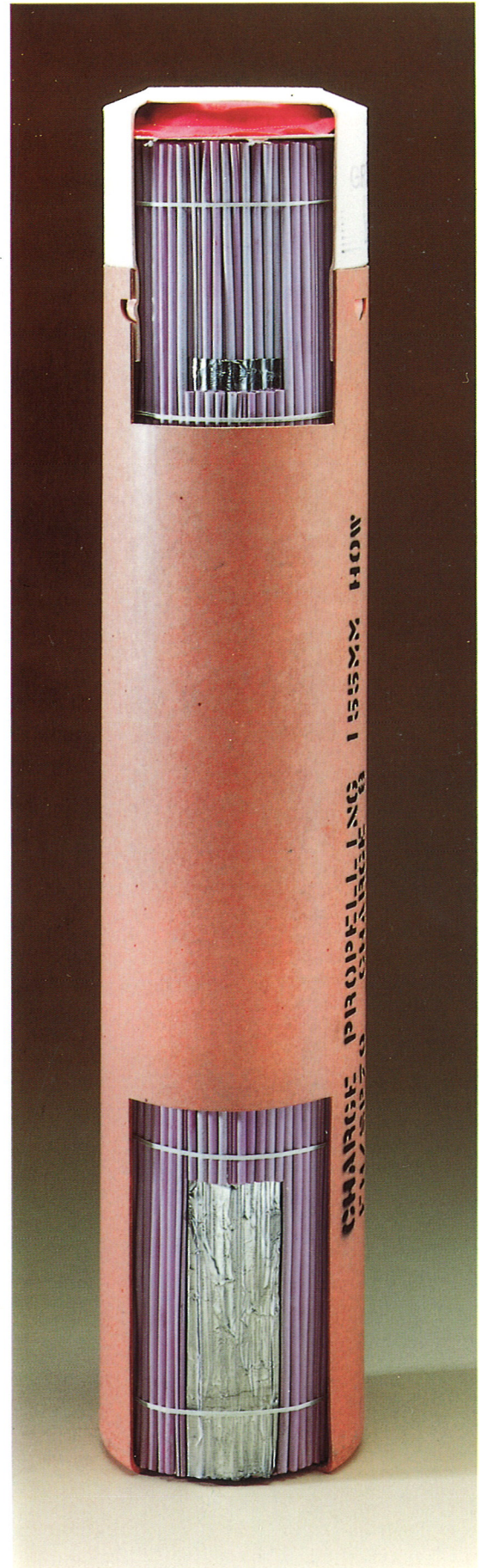


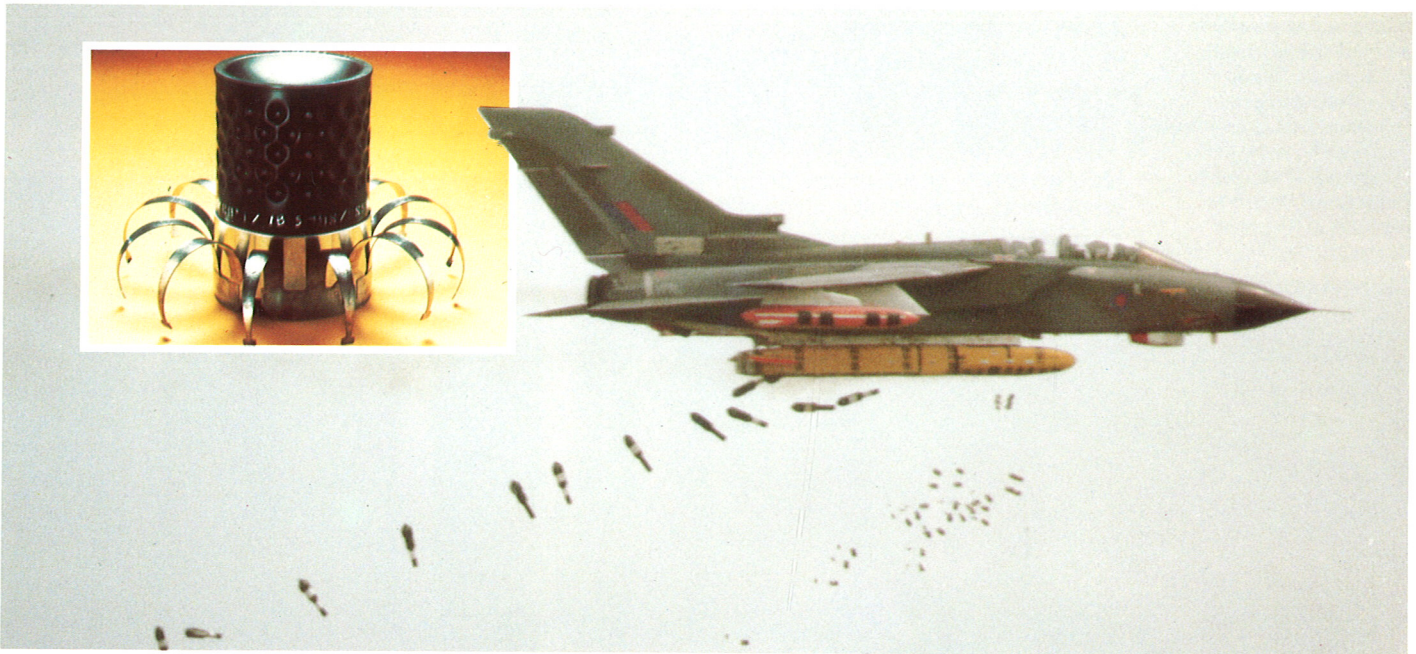
The LAW80 is now in service with the British Army. The spotting rifle provides it with an unsurpassed accuracy against static and mobile targets.

Photograph courtesy of Hunting Engineering Ltd

Small Arms

At Radway Green, over 200 million rounds of high quality ammunition for small arms in 5.56mm, 7.62mm and 9mm calibre are manufactured every year. All natures including ball, tracer and blank are available, as well as the famous 'Green Spot' for 7.62mm Target Shooting.





Both the Cratering and the area denial mine submunitions for the HEL JP233 Airfield Attack System are produced by Royal Ordnance.

The HB876 Area Denial Mine.

Photograph courtesy of Hunting Engineering Ltd

Engineer Stores

Barrier warfare is becoming increasingly important, and Royal Ordnance can offer a full range of products to meet requirements in this field. The Barmine, with its Full Width Attack Mine (FWAM) Fuze, is an extremely powerful anti-tank mine, whilst the Giant Viper has a unique ability to clear a path for armoured vehicles through minefields. The successor to the Barmine is already under development. These products are complemented by a full range of demolition stores including Explosive Cutting Tape, a product which is finding many new applications.

All these products are backed up by a unrivalled expertise in explosives, including RDX, TNT and HMX. This enables Royal Ordnance to offer explosives configured to meet any requirement.

The TRIGAT Anti-Tank missile will provide NATO armies with a potent tank killing capability in the 1990's. Royal Ordnance is a major subcontractor on the programme.



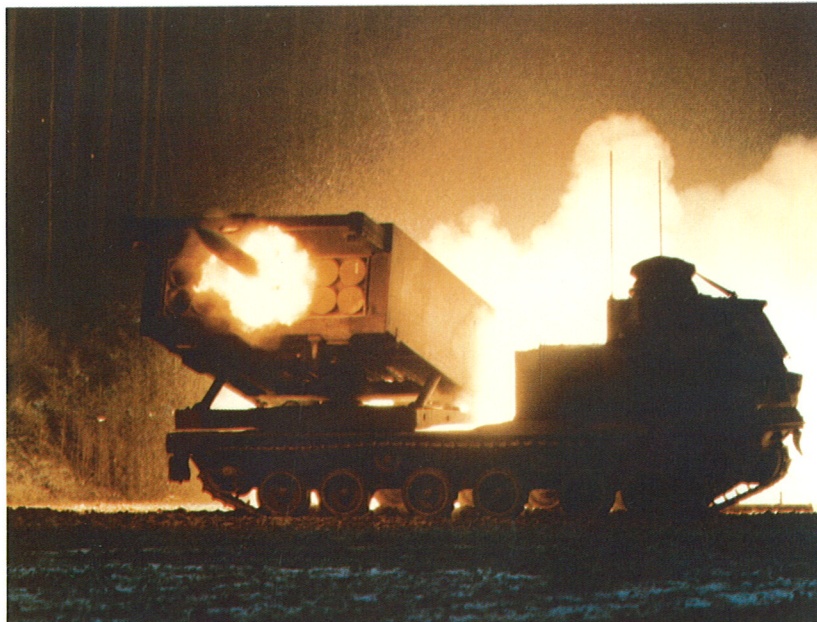
Armour piercing Fin Stabilised Discarding Sabot Tank Ammunition is available from Royal Ordnance.



Tank Ammunition

The latest technology is being applied to the ammunition for a new improved 120mm armament system which will provide the British Army with its future tank fire power. Meanwhile, Royal Ordnance has developed new Armour Piercing Fin Stabilised Discarding Sabot (APFSDS) rounds in 105mm Calibre, and the H6/62 provides excellent second generation armour penetration capabilities.

Royal Ordnance is a leader in underwater warhead technology. The Stonefish Mine is a joint project between Royal Ordnance and MUSL.



Warheads

Royal Ordnance is the principle Warhead Design Authority in the United Kingdom and provides warheads for a vast number of systems. On land the LAW80 missile and the European MLRS warheads are in full production, whilst at sea the family of British torpedoes (Stingray, Spearfish, Tigerfish), and the Stonefish Naval Mine are all armed by Royal Ordnance warheads. This technology is also being applied to systems used for destroying sea mines, which are now under development.

For air systems the Company produces the submunitions for the JP233 airfield denial weapon, as well as conventional and Cluster bombs and ammunition for air cannon such as Aden 30 and Mauser 27. For the future the Company is working on warheads for new generation weapon systems such as Rapier 2000 and the TRIGAT missile.

Ammunition for Training

Armed Forces are under increasing pressure to find cheaper alternatives to operational ammunition. To meet this requirement Royal Ordnance has developed a complete family of ammunition for Training. From the 5.56mm ROTA, up to the 155mm Impact Indicator Shell, all of the range offer cost effective, realistic training, with a greatly reduced safety area.



The American MLRS is being produced by a European Consortium. Royal Ordnance has a purpose built facility for the bomblet production.

Photograph courtesy of Ministry of Defence

Demex 400 is one of a range of explosive products Royal Ordnance has developed, to enable Engineers complete flexibility in demolition work.

ROTA is a new concept in ammunition for Small Arms Training, that is compatible with indoor trainers and requires a greatly reduced safety area.



Guns and Vehicles Division

The Guns and Vehicles Division based at Nottingham is one of the world's foremost designers and manufacturers of artillery, armour, tank guns and small arms, supplying a wide range of weapon systems and sub-systems. The Division has a proven record of success, which goes back over 70 years, and is today designing and manufacturing products for customers on a world wide basis.

Armour Weapons

The 105mm Rifled Tank Gun was first built at Nottingham in the 1950's, and in various forms is still in widespread service around the world. It has been licence produced in 11 countries including America and West Germany, and is fitted to the Leopard I and M1 Abrams main battle tank. The latest version is the Low Recoil Force 105mm, which is fitted to the Cadillac Gage Stingray Light Tank and V600. This weapon enables Light Armoured Vehicles to achieve the firepower previously only available on Main Battle Tanks. Additionally, Royal Ordnance has been regunning Russian T-Series tanks belonging to countries in the Free World with the 105mm L7, providing these vehicles with much improved firepower over their original 100mm Guns.

Worldwide demand is now primarily for Smoothbore tank guns in the larger calibre and a 115mm Ordnance is now available for fitting to T62 main battle tanks. The 120mm rifled gun has been in service on the Chieftain and



The 81mm Mortar provides lightweight manportable firepower for the infantry out to a range of over 5600m.



A development of the standard tank gun, the 105mm Low Recoil Force Gun permits main battle tank firepower to be matched with the mobility and cost effectiveness of light armoured vehicles.

Challenger tanks for some years, and a new improved 120mm gun, has now been chosen by the British Army as its next generation armament. This high performance weapon is now at an advanced stage of development, and keeps Royal Ordnance at the leading edge of tank gun technology.

Artillery Systems

The 105mm Light Gun has been sold to over 14 countries around the world, and the US Army is one of the latest customers. Its airmobility, ease of deployment and powerful ammunition system, which enables it to reach out to over 17kms with standard ammunition and 21 kms with extended range projectiles, puts it in a class of its own for rapid reaction and intervention forces. 155mm Calibre is now NATO Standard, and Royal Ordnance has an expertise in ordnances for weapon systems of this calibre. The new VSEL AS90 Self Propelled Howitzer mounts a Royal Ordnance 39 calibre Ordnance enabling it to reach 24kms with standard ammunition and 30kms with extended range projectiles. Longer barrels are under development which will enable both current vehicles such as the M109, and future platforms to achieve even greater ranges.

Vehicle and Armour Systems

Explosive Reactive Armour is the latest defence for armoured vehicles against chemical energy attack, such as handheld anti-tank missiles. ROMOR-A is a lightweight system which can be economically retrofitted to existing fleets of vehicles, or designed into new vehicles. It is now attracting great interest at home and abroad, following its launch at BAEE'88.

The SP122 is a collaborative project undertaken with Egyptian industry to provide a purpose built self propelled artillery system for the Egyptian army, using the Russian built D-30 Howitzer mated to a Royal Ordnance RO2000 Chassis. Royal Ordnance is looking for industrial partners from other countries with whom to undertake similar projects.



ROMOR A is a Lightweight Explosive Reactive Armour which provides cost effective protection against Shaped Charge Warheads.

For the Army's Engineers, the Combat Engineer Tractor (CET) is an amphibious vehicle with a prodigious earthmoving capability which provides a uniquely versatile platform for mobile operations.



The 120mm Mortar is now under development, to provide mobile, survivable fire support in the 1990's.



Support Weapons

The RARDEN Cannon has provided the British and overseas armies with a highly accurate 30mm vehicle gun system, which is being fitted to the new Warrior vehicle. To complement this weapon Royal Ordnance is now marketing the 30mm ASP cannon, which offers a lightweight, low cost upgrade for those who have used .50" calibre in the past.

Complementary to these weapons, the 7.62mm Chain Gun is manufactured under licence agreement with McDonnell Douglas. It is an externally powered weapon, giving a high level of reliability, and the weapon ejects spent cases externally, so minimising the toxic gases which enter the crew compartment. It has been selected by the British MoD for its tracked and wheeled fighting vehicles, but can also be fitted to helicopters, light aircraft and ships. In the air the Aden 30, and now the Aden 25 Cannon provide unsurpassed firepower for the modern aircraft, and the RAF Harrier GR5 is now being equipped with the latter.

Infantry Weapons

The SA80 is now in service with the British Army, and is operating under all conditions, from the Arctic to the Jungles and Desert. It has provided unsurpassed standards of marksmanship because of its inherent accuracy, superb SUSAT sight, and ease of use. As well as the Individual Weapon and Light Support Weapon adopted by the British Army, the Company has gone on to privately develop a Carbine version, and 40mm Grenade Launcher, to provide a complete family of Small Arms.

The Infantry has always needed integral fire support, and the 51mm Mortar provides this at Platoon level, while the medium Calibre 81mm Mortar is a battalion level weapon which



The SA80, is in service with the British Army. Royal Ordnance has now developed a Carbine version (centre) for use by people such as Armoured Vehicle Crews in confined spaces.



Russian T Series tanks can have their firepower greatly increased by the retrofitting of the L7 105mm Tank Gun.

provides an excellent combination of light weight and long range, unequalled by any other system. The result is that it has been sold in thousands to 40 countries around the world, including the USA.

Internal Security Systems

Royal Ordnance has a long experience of providing high quality equipment for Internal Security. The application of modern technology has resulted in the single and multiple shot ARWEN. This non-lethal anti riot weapon is highly accurate and fires a wide range of ammunition, enabling security commanders to meet any situation with which they may be faced.

The HOBO and URCHIN remote controlled vehicles now enable Explosive Ordnance Disposal experts to reconnoitre suspect situations and take appropriate action without having to risk human life.

Additionally, the Company provides a full range of pyrotechnic and explosive stores, including such items as Stun grenades for use in seige breaking operations.

The ARWEN ACE is one of the ARWEN family which gives internal security forces a non lethal option, in responding to riot situations.



The 105mm Light Gun can be transported by a Medium Helicopter such as the Puma shown here.



Self Propelled Artillery. AS90, which is VSELs front running contender for the British Army will mount the Royal Ordnance 39 Calibre 155mm gun system.

The Future

The requirements of the battlefield are evolving, and the Guns and Vehicles Division has an integral Research and Development team that is working on future needs. Two of these projects have already attracted much attention:-

The 120mm Mortar is a totally new concept in firepower support. It is a breech loaded turret mounted system that will be able to provide rapid, accurate fire including top attack 'smart' ammunition, and will be far more survivable than today's systems.

The Lightweight Towed Howitzer will provide a 155mm system able to fire all natures of ammunition out of a standard ordnance, whilst being much lighter than anything currently available. This will give commanders a potent combination of air and land mobility and fire power which will greatly increase their operational flexibility.

Rocket Motors Division

The Rocket Motors Division provides the only fully integrated rocket motor facility in the United Kingdom. It has been created by drawing together the various interests and abilities of the Company in all aspects of rocket propulsion. The Division is based at Summerfield and also has facilities at Westcott. Together, they represent a totally integrated organisation undertaking research, design, development, manufacture and in-service support for rocket motors fuelled by all types of solid and liquid propellants.

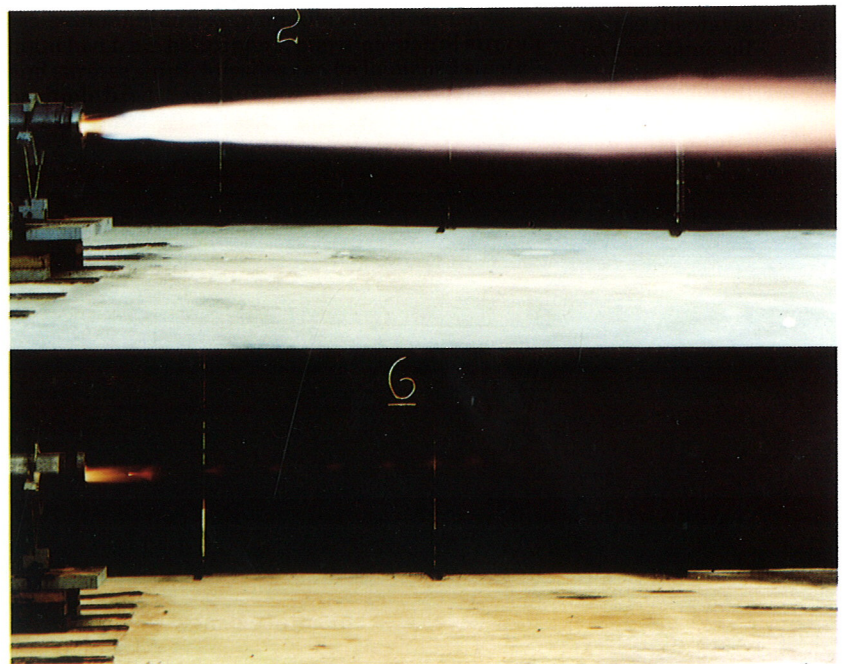
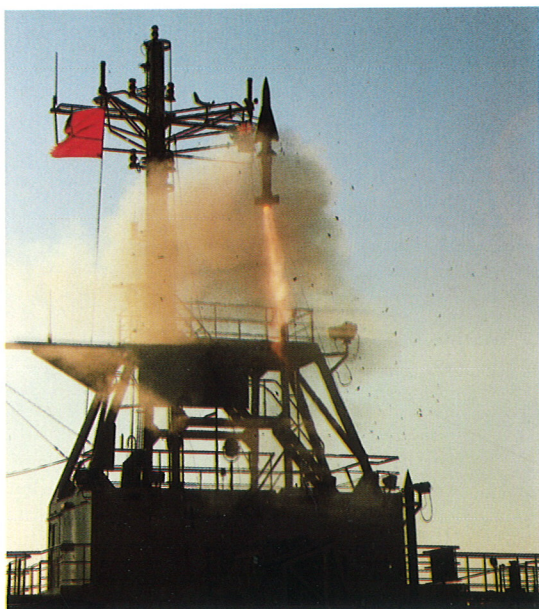
The Division has comprehensive experience across the whole range of rocket propulsion systems which are used in land, sea and air guided missiles, as well as underwater and in space. These propulsion systems utilise both cast and extruded double base and composite solid propellants, and a range of liquid propellants including storable mono and bi-propellants and cryogenics.

Experience within the Division also extends to rocket motor case design and production using a wide range of materials and methods of construction. Pioneers of the strip laminate motor case, the Division has used this technology to make a major breakthrough in meeting stringent insensitive munitions requirements worldwide. Combining conventional metal technology with advanced laminate bonding, the strip laminate technique produces rocket motor cases which, when used with the appropriate propellant technology, give freedom from explosion when the rocket motor is subjected to fragment attack or external fire.



Sea Skua is a combat proven lightweight all weather sea-skimming anti-ship missile which can be launched from helicopters, maritime patrol aircraft and surface ships. Missiles can be launched singly or ripple fired. Sea Skua is designed to destroy or disable warships up to destroyer size.

Comparative motor firings displaying flame-on and flame-off characteristics with and without flame suppression additives.



A launch of Vertical Launch Seawolf. Designed as an anti-missile missile, VL Seawolf is a close area defence weapon for naval vessels using the Seawolf missile with a tandem boost motor.

Optimum designs for all applications are made possible by the wide range of propellant types. New formulations have provided zero smoke capabilities and complete flame suppression, with controlled exhaust signature in both the infra-red and ultra-violet spectrums. These represent a significant breakthrough in rocket motor technology.

Advances such as these have many stealth applications such as line of sight guided missiles where smokeless propulsion is essential, and systems where a low signature is vital to help the operators or the missile evade detection, and so enhance survivability. Propellant performance covers total impulses from 11Ns to 9,500,000 Ns with burning times from 0.008 seconds to 600 seconds, charge masses from a few grammes to more than 5000 kg, and thrust levels from 88 N to 200,000 N. Diameters from 22mm to over 1 metre are within the normal production range and plant is available to manufacture large rocket motors. The Division also provides rocket motor components worldwide, including:

- Nozzles
- Ignition Devices
- Thrust Vector Control Systems
- Gas Generators
- Power Cartridges
- Igniters

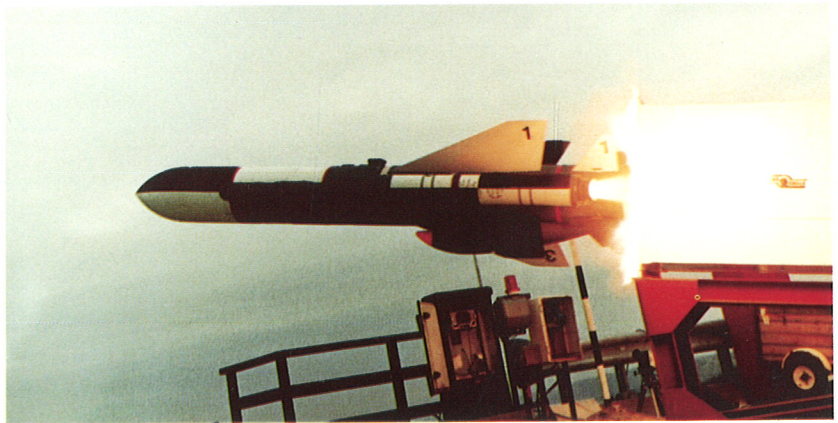
Rocket Motors Division offers a complete service covering:

- Feasibility
- Assessment Studies
- Design and Post Design Services
- Development
- Manufacture
- Integrated Logistic Support
- Technology Transfer

Whatever the requirement, Rocket Motors Division has the expertise to take it through every stage from concept to reality.

Sea Eagle SL is the ship launched version of the Sea Eagle long range all weather sea-skimming anti-ship missile.

The missile is housed in a sealed box which protects it during transport and also acts as a deck-mounted launcher. Two solid propellant boosters accelerate the missile to a speed at which the turbojet engine takes over and the spent boosters are jettisoned.



The high velocity Starstreak has been selected by the UK Ministry of Defence to meet its close air defence requirements into the 21st Century. Very short flight times, potent forward-kill capability, operator control to target and immunity to counter-measures are key features which make Starstreak the world's most advanced close air defence weapon systems.

Photograph courtesy of Short Brothers plc

Powered by a Royal Ordnance Rocket Motor, the Rapier low level air defence system is in service with the British Army, Royal Air Force Regiment and twelve overseas countries. The future evolution of Rapier is funded by the British Government to meet the anticipated threat into the next century.



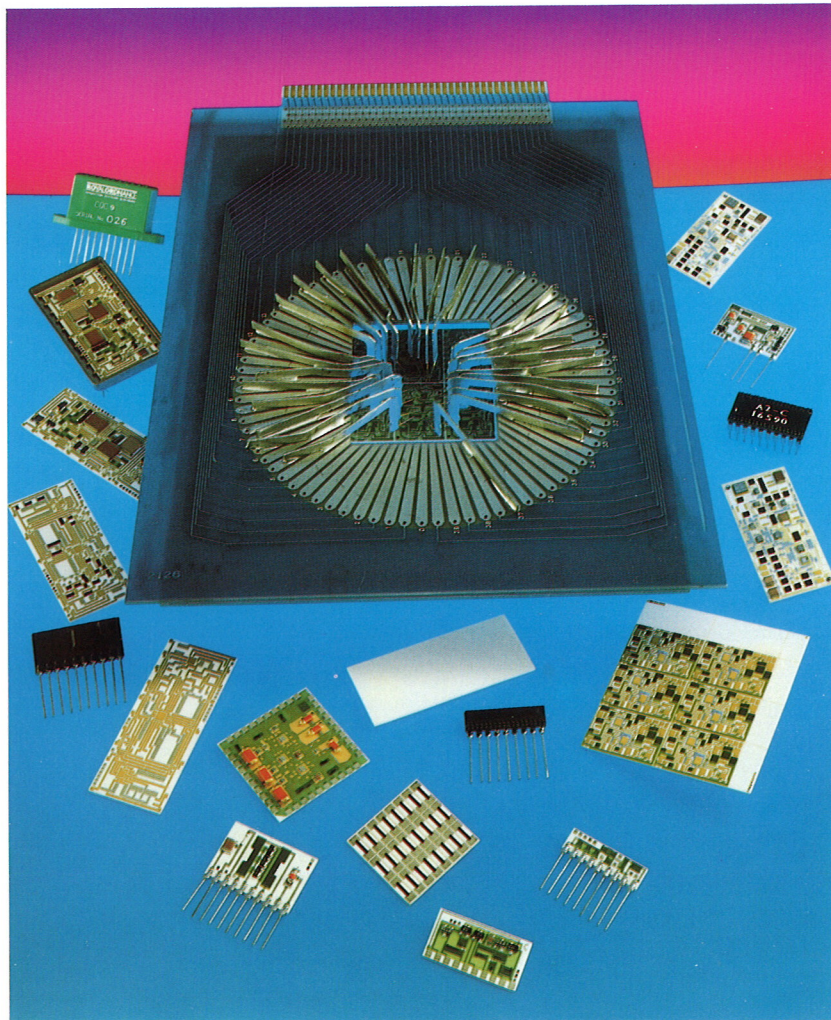
Control Systems and Fuzes Division

The Control Systems and Fuzes Division, based at Blackburn, specialises in the design, development and manufacture of mechanical and electronic devices for safe functioning of ammunition, guided weapons and barrier warfare systems. The Division is the centre of excellence for electronic products and systems in Royal Ordnance.

The Division's product range includes:

- Safety, arming and break-up systems for guided weapons and missiles.
- Fuzes for artillery, tank, mortar, naval and air ammunition.
- Vehicle Communication and Control Systems.
- Gas Motors.
- Micro-hybrid Electronics.

The Electronic Fuze setter is used to programme electronic time fuzes for 155mm and 105mm Artillery Ammunition.



Micro Hybrid electronics are used in many communication weapon and weapon support systems.



We have designed a new, second-generation proximity fuze for operation with a wide range of ammunition calibres. This fuze, known as the Simple Proximity Fuze, needs no special setting equipment in use and provides a most cost effective solution to modern artillery requirements.

The RO VIS Vehicle Intercom System has been developed, using state of the art technology, for use in all classes of fighting vehicles to give the highest possible standards of intelligibility in high noise environments.

Computer aids to design, engineering and manufacturing are used extensively by the Division in the supply of high quality products.

The Division's Project Managers have the necessary skills and experience required to take products from the initial concept through to production. They have powerful support in:

- Management Information Systems.
- Trials Management.
- Quality Assurance.
- Safety and Reliability Management.
- Trials Engineering.
- Environmental Testing.

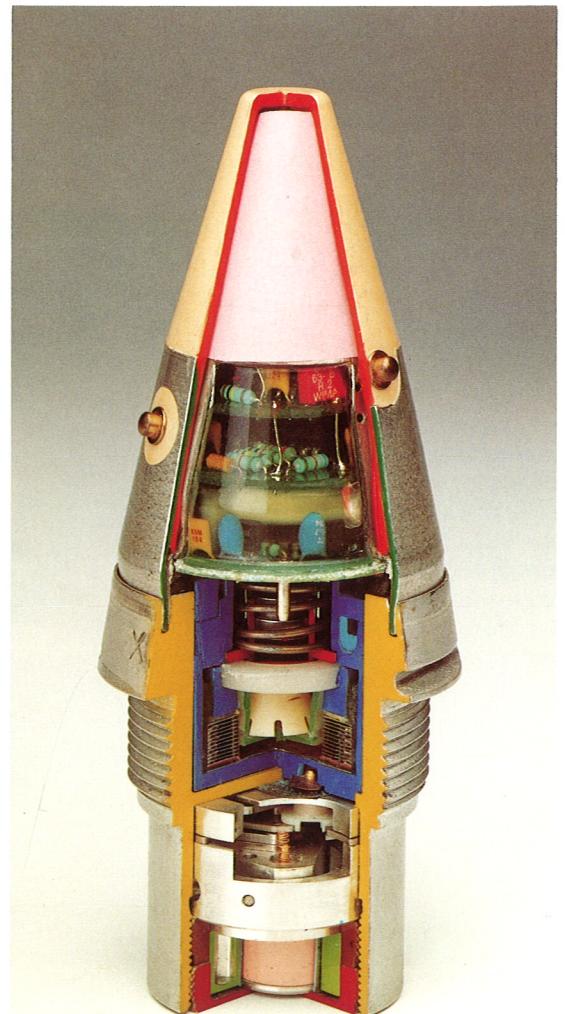
With the availability of these facilities, Blackburn is clearly equipped for the design and precision manufacture of high reliability mechanical and electronic equipment to meet worldwide requirements.

The Vehicle Intercom System enables Crews to communicate clearly in the high noise levels found in modern AFVs.

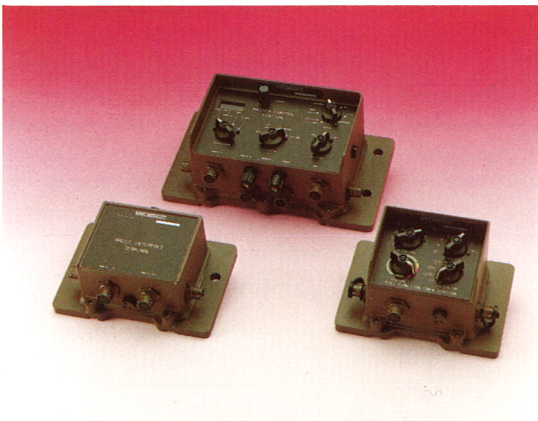


Safety and Arming and Break Up units are provided for a number of missile systems, including the Shorts Javelin seen here.

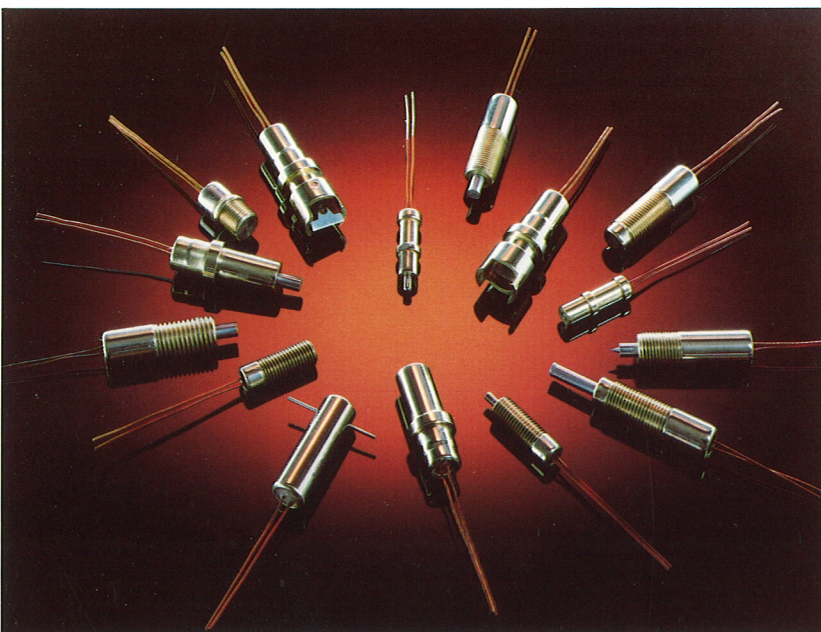
Photograph courtesy of Short Brothers plc



A sectioned view of the Electronic Time Fuze, which gives precision control of artillery ammunition.



Gas Motors are used in Parachute Strap/Bobbin Cutters, Switch actuators and compression of piezo crystals.



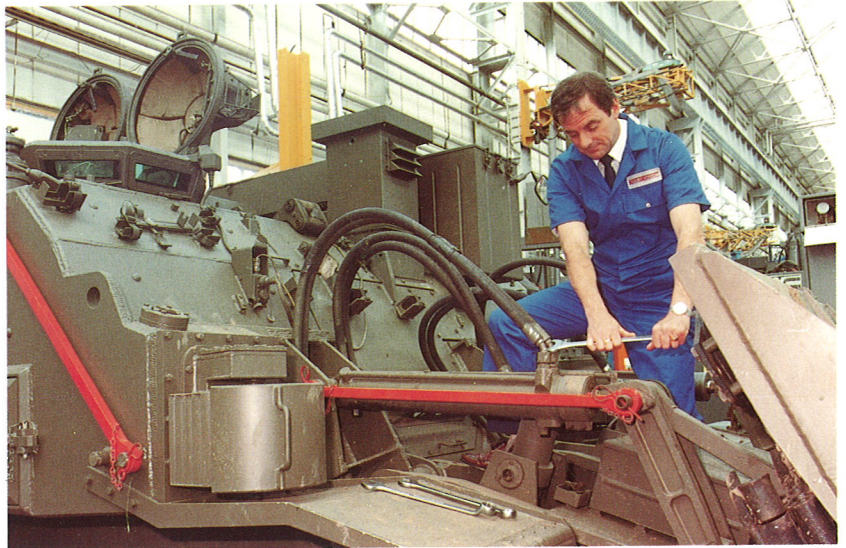
Services

Product Support Group

Royal Ordnance is committed to supporting all of its products fully throughout their operational life. Product Support Group (PSG) exists to perform this function for the whole of the Company and currently services customers in over thirty countries.

Royal Ordnance believes that after-sales service is a corner-stone of achieving complete customer satisfaction, and to this end PSG provides a complete maintenance and logistic support service which includes:

- Provision of a spare part and repair service
- Supply of ancillary equipment and product improvement packages
- Planning and provision of maintenance facilities
- Provision of training and training aids
- Publication and provision of technical handbooks
- Technical assistance teams
- Logistic analysis and management



Although primarily concerned with Royal Ordnance products, a professional service can also be offered on many products not originally produced by Royal Ordnance.

Support Engineers are involved in the product support assessment of all products from the earliest stages of design and development.

Technology Transfer

The transfer of technology from an experienced company with a proven design and production base over a wide product range can be the effective solution to the problems inherent in developing or improving an ordnance manufacturing capability in country. Easy access to state of the art design and production techniques and to specialist personnel can replace much of the need for expensive time-consuming Research and Development.

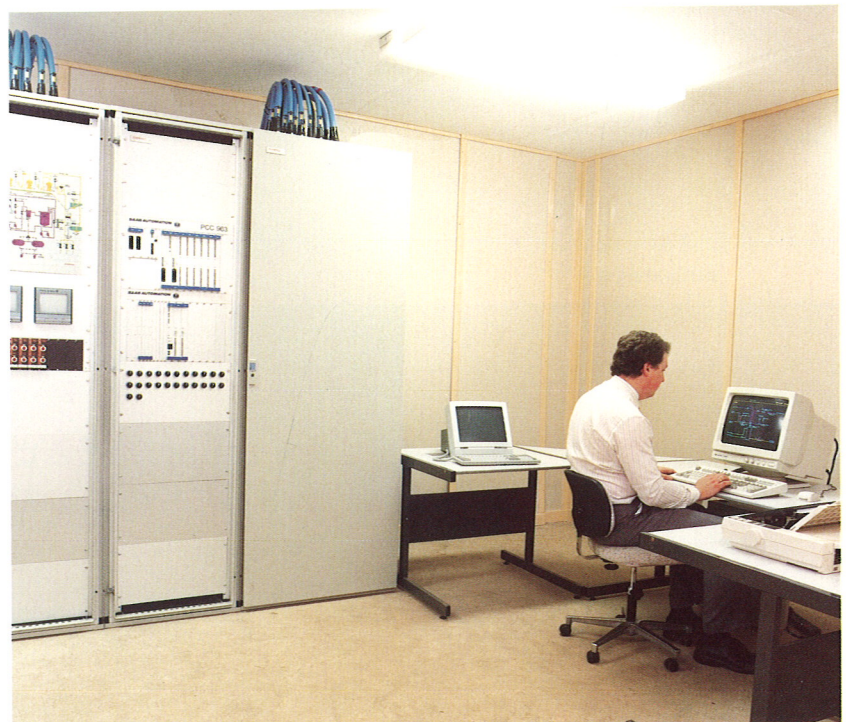
Royal Ordnance is exceptionally well qualified to provide this facility.

Principal services, which can be provided directly to a customers requirement or as a support to sale of Royal Ordnance products, include:

- Project Management
- Design Services from Concept to Commissioning
- Feasibility Studies
- Hazard Analysis
- Consultation
- Training Packages
- Support of Joint Venture Proposals.

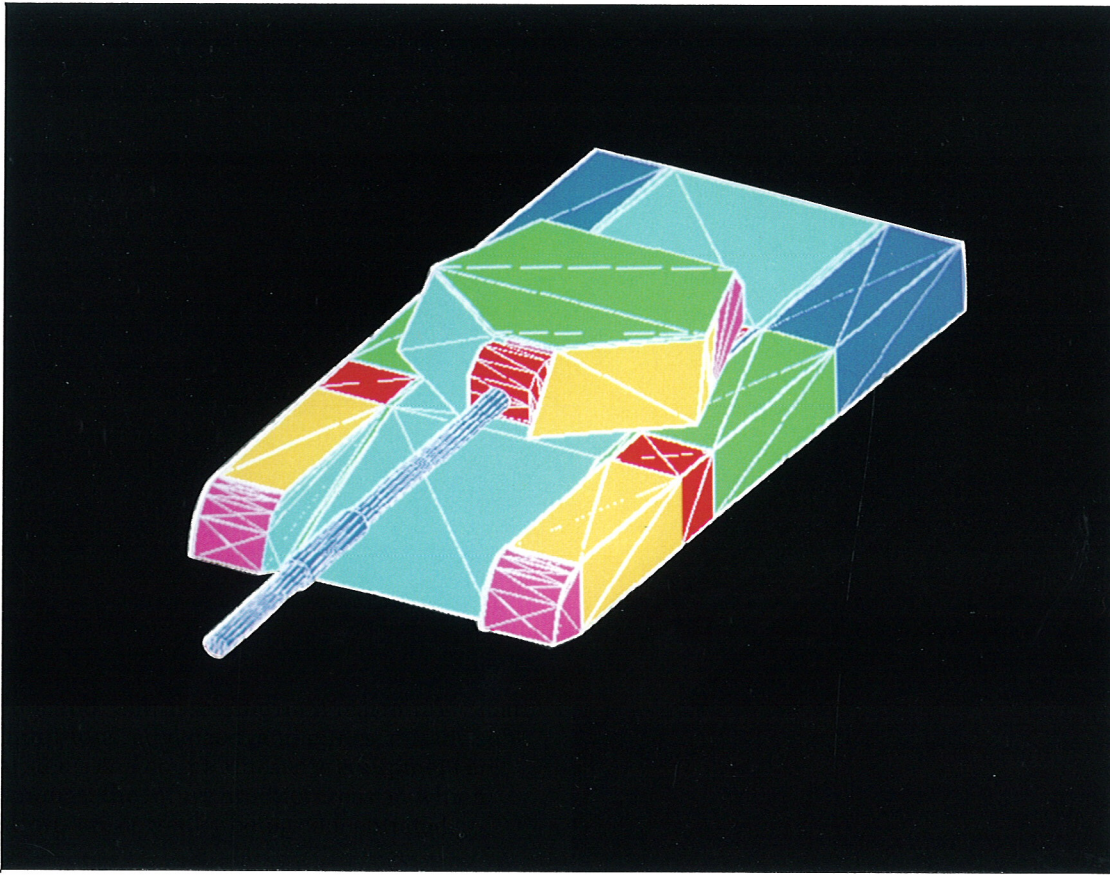
Technology Transfer contracts successfully concluded round the world include:

- Gun Manufacture



- Chemical Processes
- Munitions Factories
- Armoured Fighting Vehicles Manufacturing Plants
- Small Arms Production Facilities

The development of automatic computer control, offering substantially increased efficiency and safety, represents a significant contribution from the technology centre.



A target Tank being modelled on a VDU screen at Future Systems Group.

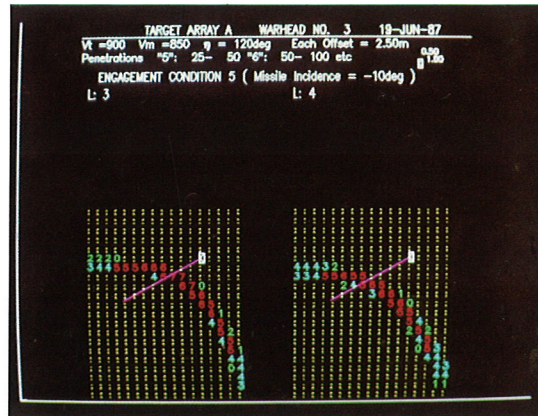
New Projects Department

To ensure that Royal Ordnance stays at the forefront of weapon development, and generates new and improved products to meet the battlefield needs of the future, the New Projects Department works closely with the Divisions. Within the Department, the Future Systems Group (FSG) is involved in:

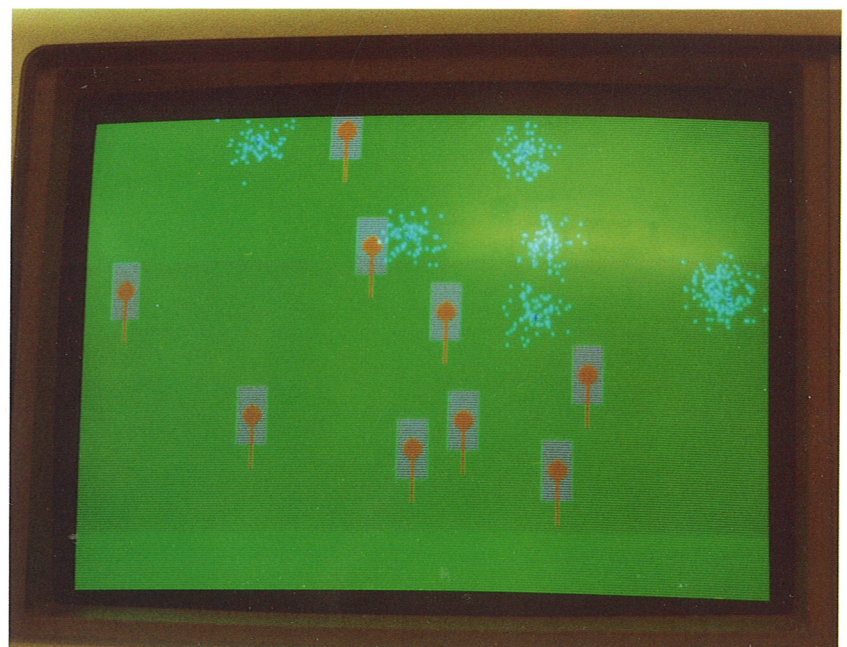
- conducting military operational analyses.
- modelling the battlefield performance of weapon arrays.
- identifying product needs and opportunities.
- undertaking vulnerability and lethality studies.

The Weapon Concepts Group works closely with FSG in formulating new cost effective concepts, and assessing their feasibility. Smart munitions, advanced land mines, missile sub-systems and countermeasure equipment are amongst the future product areas on which efforts are currently being concentrated.

This range of services are provided not only for Royal Ordnance, but also under contracts from other major customers.



A target Array for a Warhead being modelled.



The VDU showing an array of tanks under attack by bomblet munitions.

The Divisions

Ammunition Division

HQ Chorley

Ammunition for small arms, cannon, mortars, tank guns and artillery; gun propellants and combustible charge containers; shell and cartridge cases; rocket motor bodies; high explosive and rocket propellant manufacture; assembly and filling of warheads, bombs and shells.

Guns and Vehicles Division

HQ Nottingham

Manufacture of small arms, cannon, mortars, tank guns and artillery; fighting vehicle production; AFV upgrading, including the areas of firepower, mobility and armour; internal security systems; engineering equipment.

Rocket Motors Division

HQ Summerfield

Rocket motor research, development and manufacture, including cast double base motors; strip laminate casings.

Control Systems and Fuzes Division

HQ Blackburn

Fuzes; safety and arming units; electronic sub-systems; thick film technology; vehicle intercom systems.

Royal Ordnance Speciality Metals Ltd

Wolverhampton

Manufactures kinetic energy penetrators for ammunition, using high density materials.

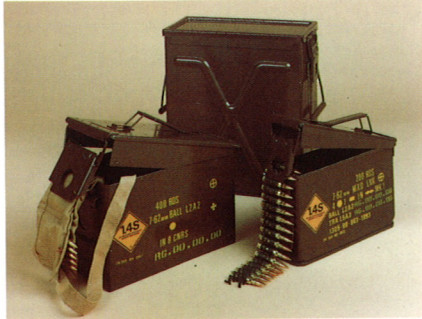
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Product Support Group

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