

WASC 2398

Royal Ordnance
Factories

Product Range
1974

THE
ROYAL ORDNANCE
FACTORIES

Introduction

This brochure is intended as a guide to the Royal Ordnance Factories. It describes, in brief, the structure of the organisation, its product range and its services and skills. It outlines the capability of each factory and describes their facilities.

More detailed information can be obtained by reference to any of the addresses listed on the back cover flap.

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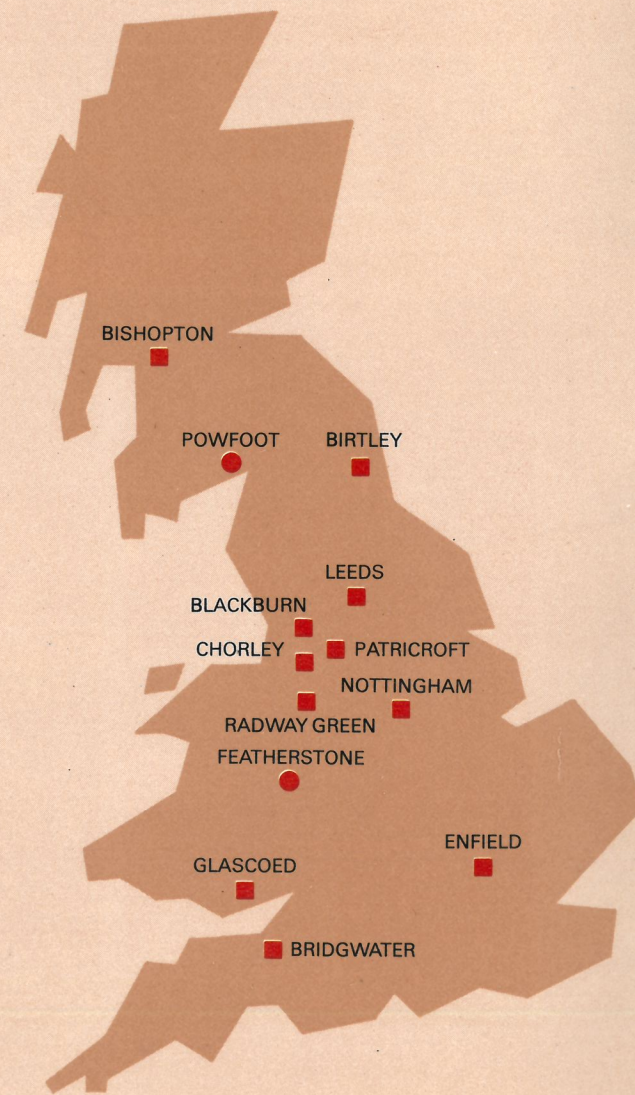
The Organisation

The Royal Ordnance Factories are part of the Procurement Executive within the Ministry of Defence.

For generations the ROFs have manufactured defence stores designed and developed by the Ministry's own Research and Development Establishments (eg. RARDE, MVEE) as required by the British Navy, Army and Air Force. The British armed services continue to be the organisation's major market and therefore the ROFs can offer all the experience, expertise, quality and user tested reliability necessary to satisfy the needs of their customers.

In 1973/74 the Royal Ordnance Factories had a turnover of about £100 million. A substantial proportion of this turnover was generated by overseas sales, which represent an increasingly important part of our business (see Chart 1). There are about 18,000 employed in eleven factories. There are also two agency factories managed by industry on our behalf.

Chart 2 shows the relationship between factories. Much of the factory work is concerned with the manufacture of sub-assemblies and components. These items are themselves for sale as required, but the ROFs are known mainly for the manufacture of finished products particularly guns, heavy armoured fighting vehicles, engineering equipment, ammunition, bombs and guided weapons. The skills and capabilities of each of the eleven directly managed factories and of the two agency factories are set out in the subsequent pages.



■ Royal Ordnance Factory ● Agency Factory

CHART 1. Summary of Sales

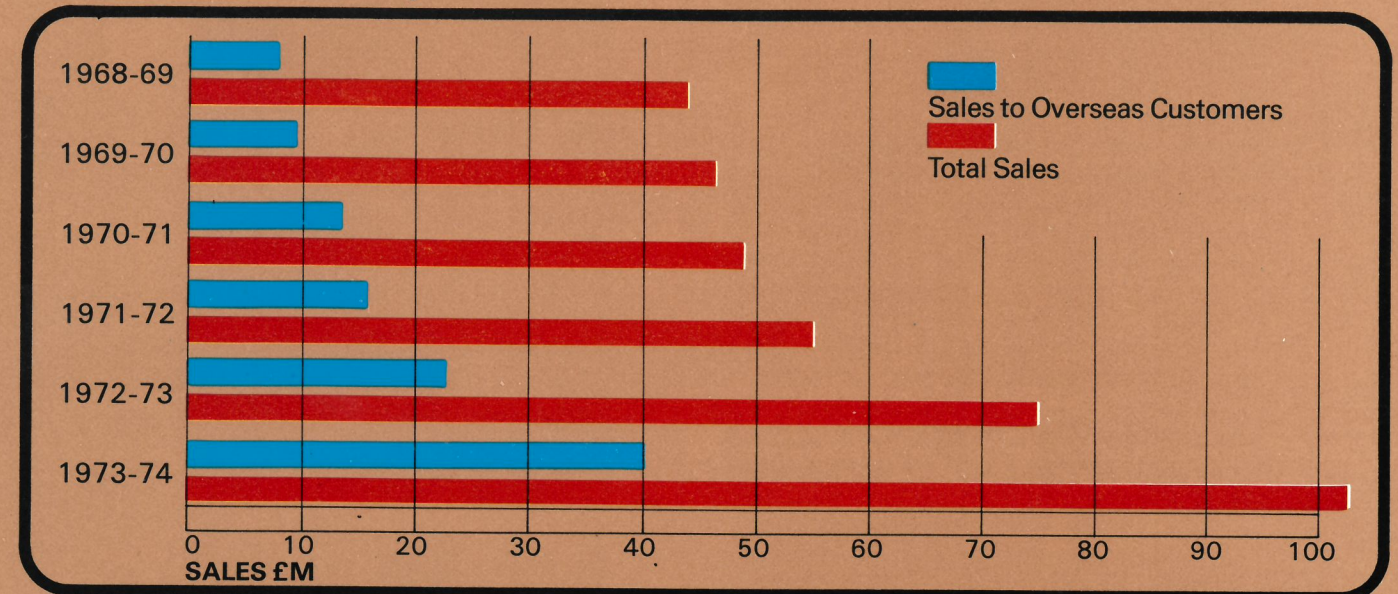
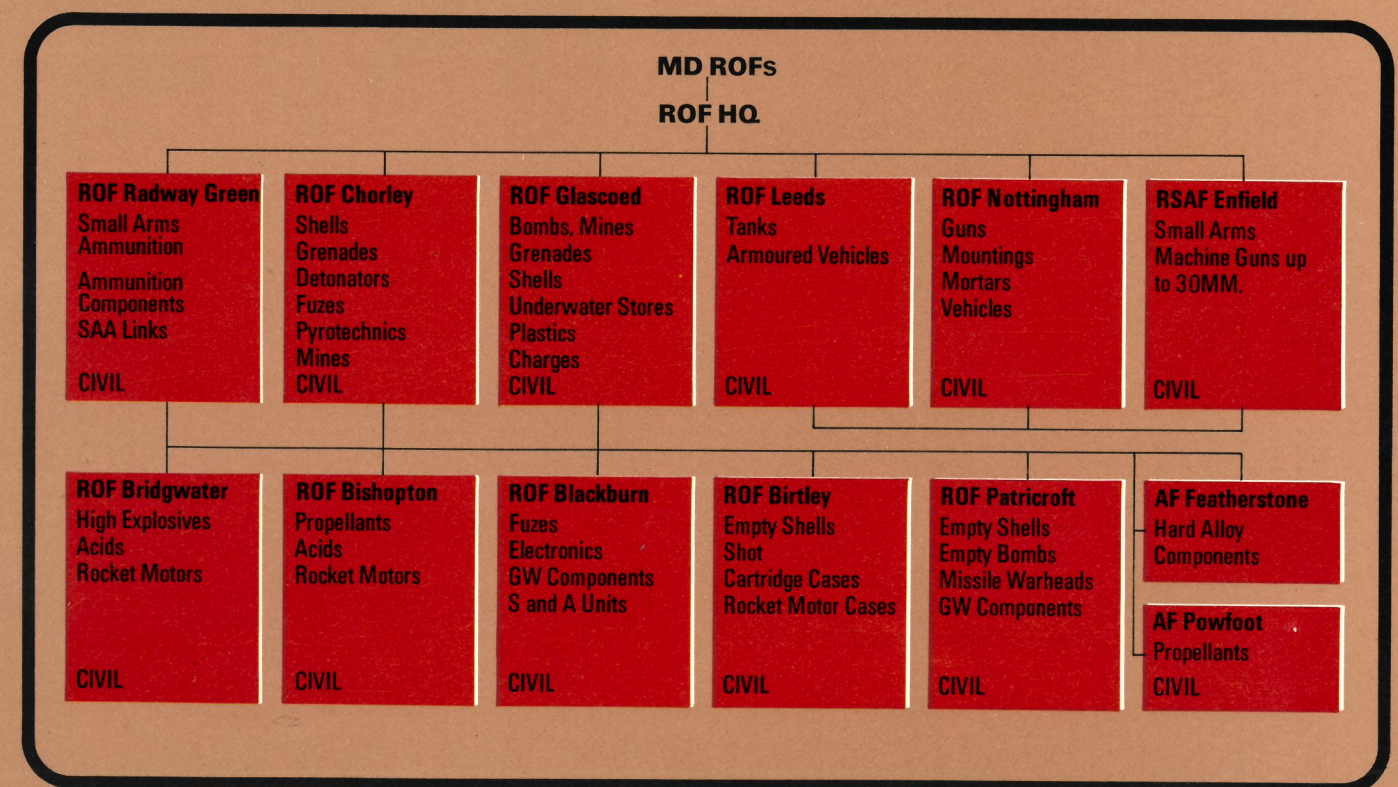


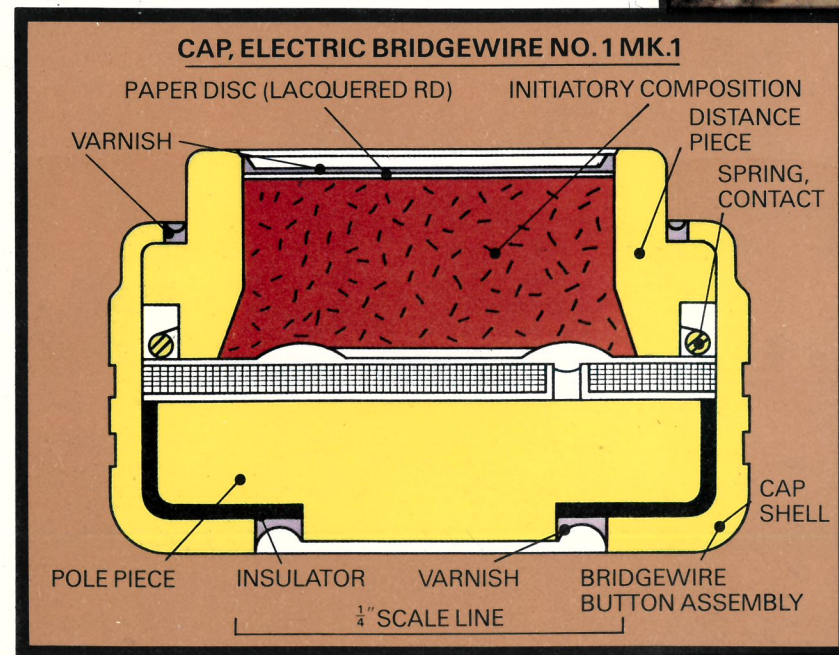
CHART 2. ROF Product



The Product Range

Products such as Chieftain, Fox and Light Gun are well known and, of course, are of very great importance. What is sometimes overlooked is that, besides very considerable expertise in explosives, guided weapons and similar sophisticated devices, much of the organisation's revenue is derived from small arms, small arms ammunition, bombs, shells and large calibre ammunition. Ammunition – of many types and sizes – is one of the most important single products of the organisation.

In this brochure are illustrated our major products and with them other products in which we play a major part. We also undertake work of a civilian nature either from companies engaged in the manufacture of Defence equipment or others engaged in quite different fields. Considerable facilities are available for this purpose. Full details can be obtained by reference to the product brochures. Any British Defence Attache would also be very pleased to give further assistance and to communicate any request for further information.



CHIEFTAIN

Quality and Value for Money

Quality, costs, delivery and value for money are all aspects of the product to which the Royal Ordnance Factories pay special attention. Our reputation has been earned by consistent performance over many years supported by very extensive quality inspection and control resources. The special importance which reliability has for defence equipment is one which continues to concern the ROF organisation even more than cost. Therefore while we aim to be competitive we also aim to manufacture a product that does all it was designed to do throughout its life.



LIGHT GUN

Design and Development

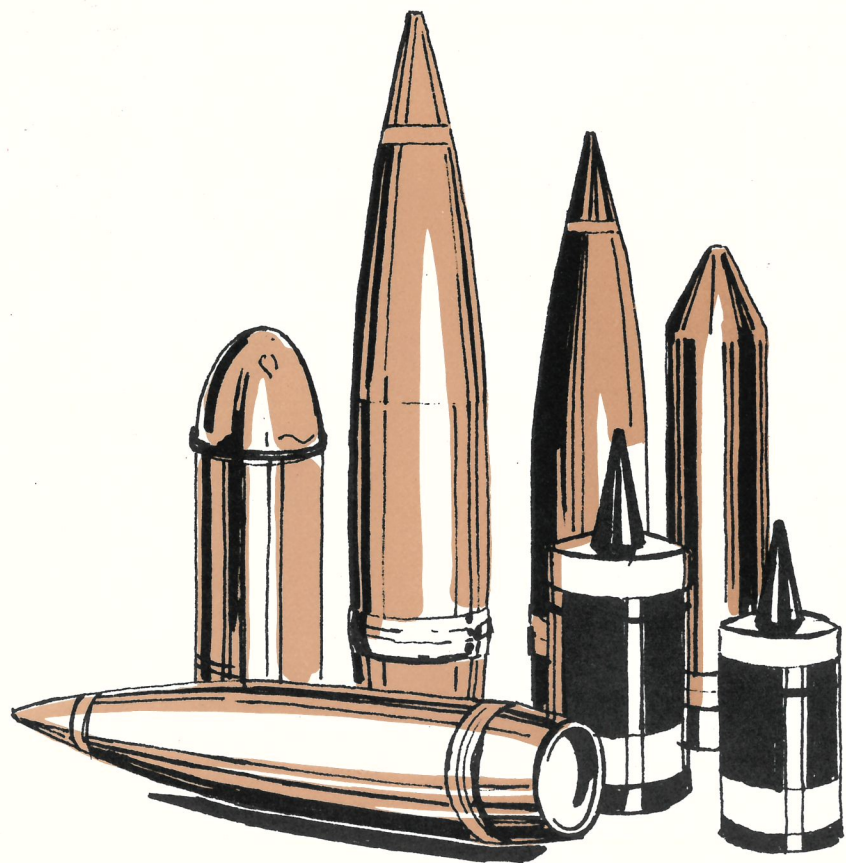
Design and Development facilities in the factories operate in close relationship within the Ministry of Defence, with the appropriate R & D Establishments. The facility such as the explosive metal forming unit at Radway Green is but one of the special services available for development work. We will be very pleased and interested in any enquiries relating to the development of new products.



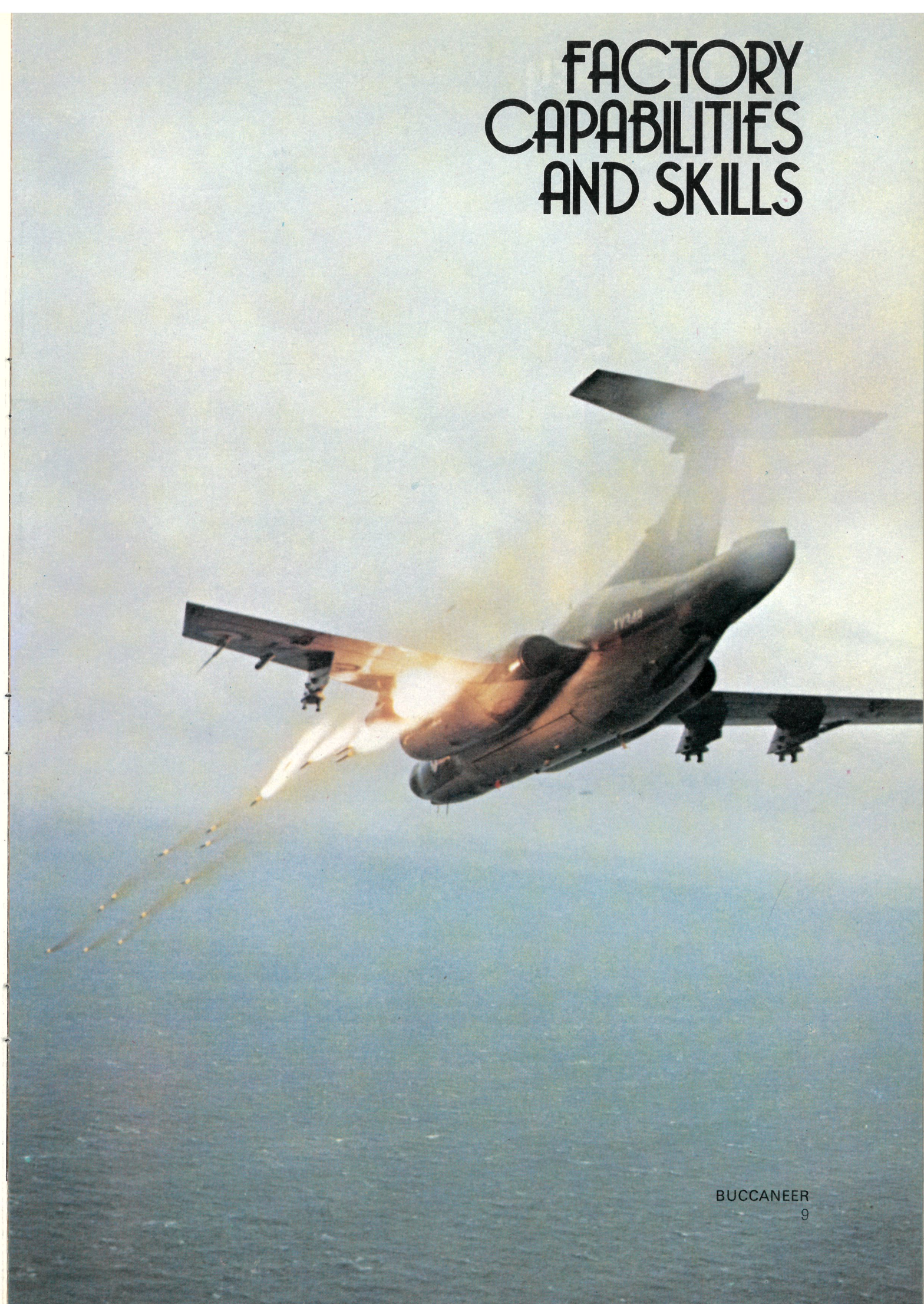
BEAVER

Flexibility and Adaptability

But by their very nature many products can only be manufactured in part, or in whole, after the customer's requirements are known in detail. We believe that through our factories, their inbuilt skills, the machinery available and our vast resources we have the flexibility and capability to be able to offer capacity either for development, pre-production or production activity. We are interested in any component, sub-assembly, assembly or manufacturing opportunity, whether this be re-furbishing, converting, updating or entirely new. This applies in both the military and civil fields.



FACTORY CAPABILITIES AND SKILLS



ROF Birtley

This factory is equipped for the mass production of brass and steel cartridge cases, armour piercing shot, high explosive shells and rocket motor tubes. It has a non ferrous foundry and rolling mill, and facilities for forging, cold and warm extrusion, impact extrusion, pressing drawing, swaging and flange-turning. There is a comprehensive range of machine tools and protective finishing processes. The factory has a D & D facility working closely with MOD Research and Development establishments.

ROF Birtley's main products are :—

- 105mm, 120mm APDS and DST shot.
- 76mm, 105mm, 120mm, 155mm and 4.5ins. empty shell of all natures.
- Tank Gun and artillery cartridge cases.
- Cartridge electric engine starter cases and smoke containers.
- Rocket motor components and other components for man portable missile systems.
- Recoilless projectiles.

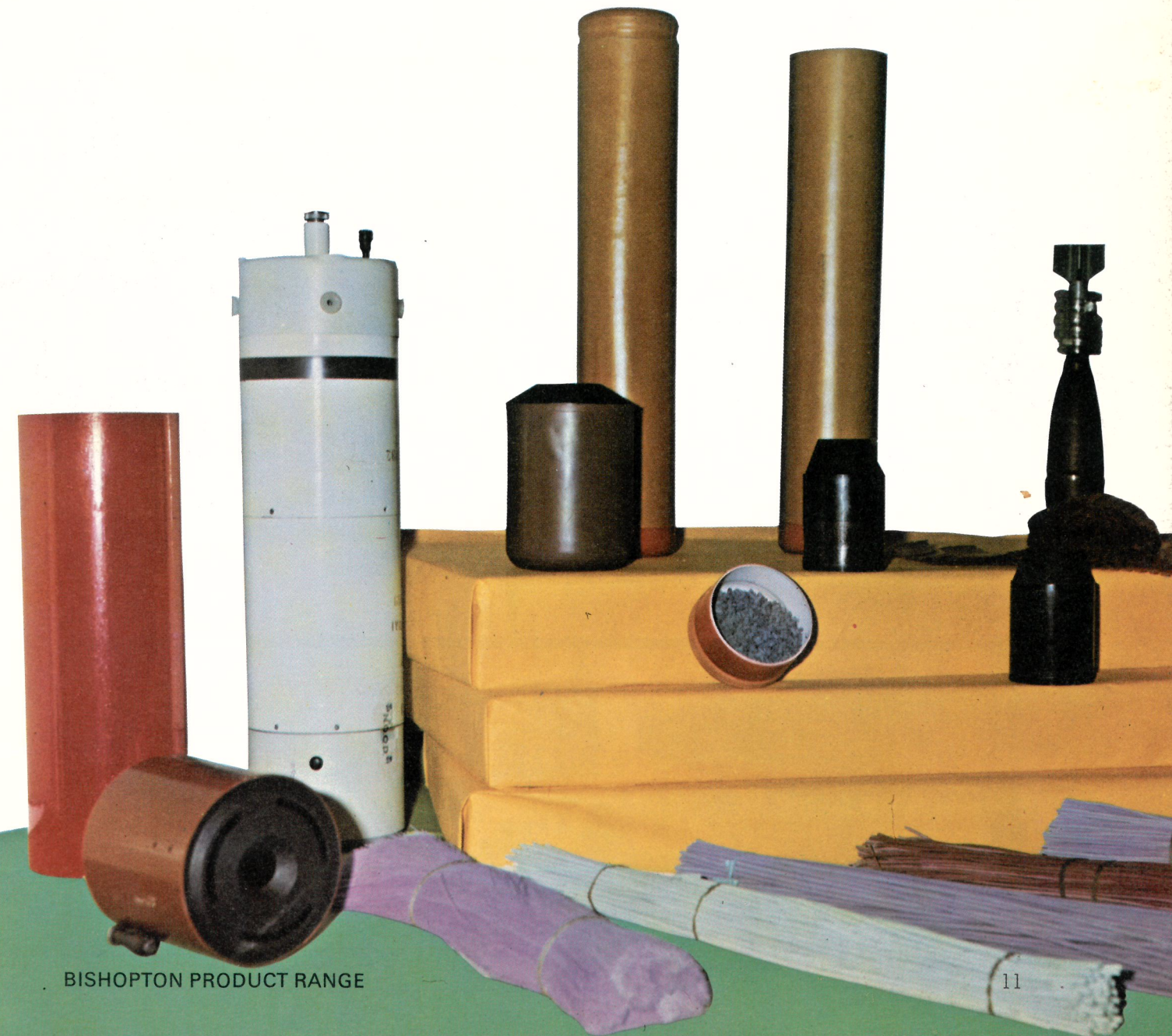
BIRTLEY PRODUCT RANGE



ROF Bishopton

This is the main factory for producing propellants in the UK, and the processes include manufacture of nitric acid, picrite, nitro-glycerine, nitrocellulose, ammonium perchloride, combustible charge cases and the filling of white phosphorus stores.

The materials are used in guided weapons, rockets and gun ammunition. A major asset is staff expertise in the manufacture and handling of explosives and chemicals for military and industrial purposes.



BISHOPTON PRODUCT RANGE

ROF Blackburn

ROF Blackburn was originally built as a fuze factory, but over the years it has expanded and diversified such that it is currently concerned with all aspects of design, development and production of conventional artillery fuzes, electro-mechanical arming units, guided weapon components and a wide range of electronic equipment.

Modern machine tools and plant are installed for the economic manufacture of precision components and there are air conditioned and "clean room" assembly areas. Design and development both mechanical and electronic is supported by teams of professional engineers, technicians and drawing office staff, together with adequate laboratories including a full range of environmental test equipment.

ROF Blackburn's main products are currently:—

Artillery fuzes (proximity and percussion) and primers for 105mm, 120mm, 155mm and 175mm ammunition.

Time and percussion fuzes for the 81mm mortar bomb.

Aircraft bomb fuzes and pistols.

Explosive guided missile break-up units.

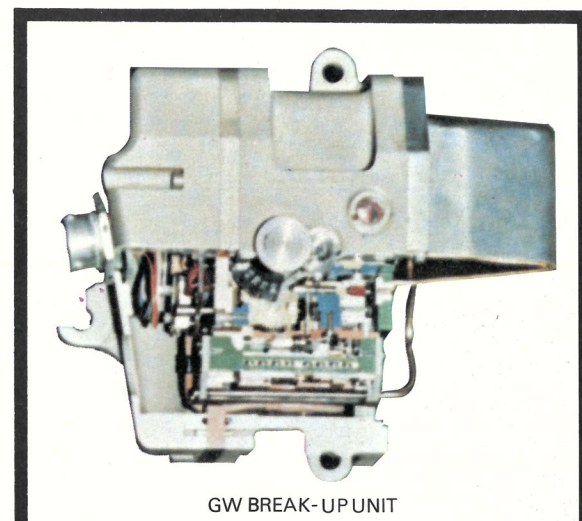
Safety and Arming Units for guided weapon systems.

Weapon Dispenser Arming Units.

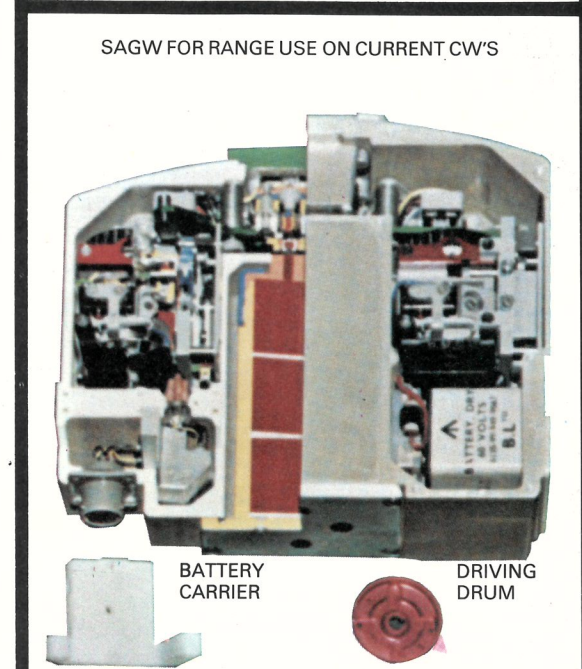
Clansman vehicle inter-communication harness equipment.

Infantry portable and fixed targets.

MCS Miniature Control Systems for Air Traffic control.



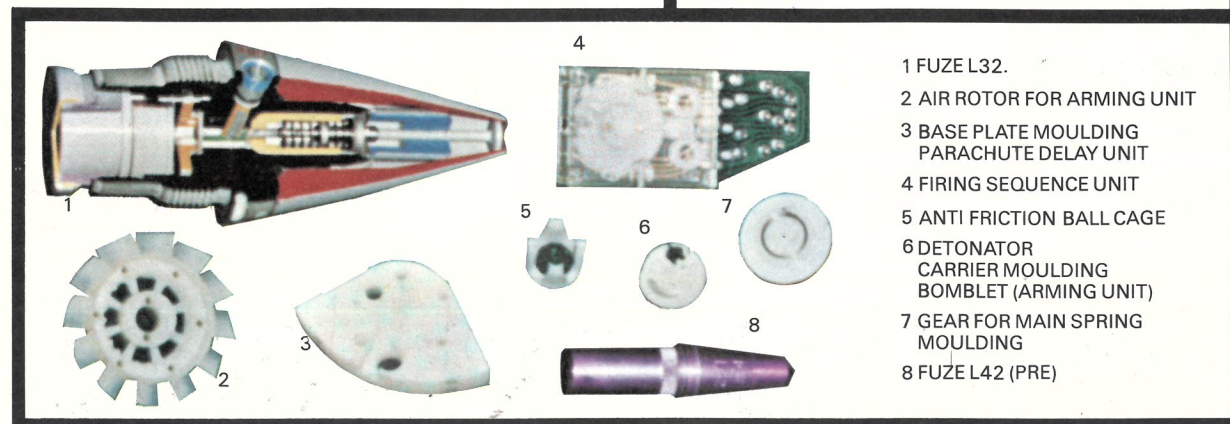
GW BREAK-UP UNIT



SAGW FOR RANGE USE ON CURRENT CW'S

BATTERY CARRIER

DRIVING DRUM



- 1 FUZE L32.
- 2 AIR ROTOR FOR ARMING UNIT
- 3 BASE PLATE MOULDING PARACHUTE DELAY UNIT
- 4 FIRING SEQUENCE UNIT
- 5 ANTI FRICTION BALL CAGE
- 6 DETONATOR CARRIER MOULDING BOMBLET (ARMING UNIT)
- 7 GEAR FOR MAIN SPRING MOULDING
- 8 FUZE L42 (PRE)

ROF Bridgwater

This is the main factory for making military high explosives in the United Kingdom. Its facilities include extensive acid plants and plant for the manufacture of hexamine, RDX, HMX, nitric acid, tetryl and plastic propellants.



TEST EXPLOSION

ROF Chorley

This factory has been designed to fill all types of munitions for the armed services and its capacity has been maintained and recast to keep abreast of the latest techniques. It has facilities to deal with all aspects of the complete explosives trains required by modern ammunition. Air conditioned "clean rooms" suitable for explosive assembly are available where the standard of assembly warrants its use. A development and experimental department supports the factory's production activities.

Currently the main activities of the factory are the filling and assembly of the following types of stores:—Caps and detonators.

Igniters. Tracers. Primers.
Fuzes of all types for shells and bombs.
Grenades.
30mm ammunition.
Medium calibre ammunition, 76mm – 155mm Recoilless projectiles.
Mine barrier systems and mine clearance devices.
Rocket motors.
Guided weapon warheads.
Safety and arming mechanisms.
Power cartridges.
Miniature detonating cords.
Pyrotechnics including distress and warning flares.

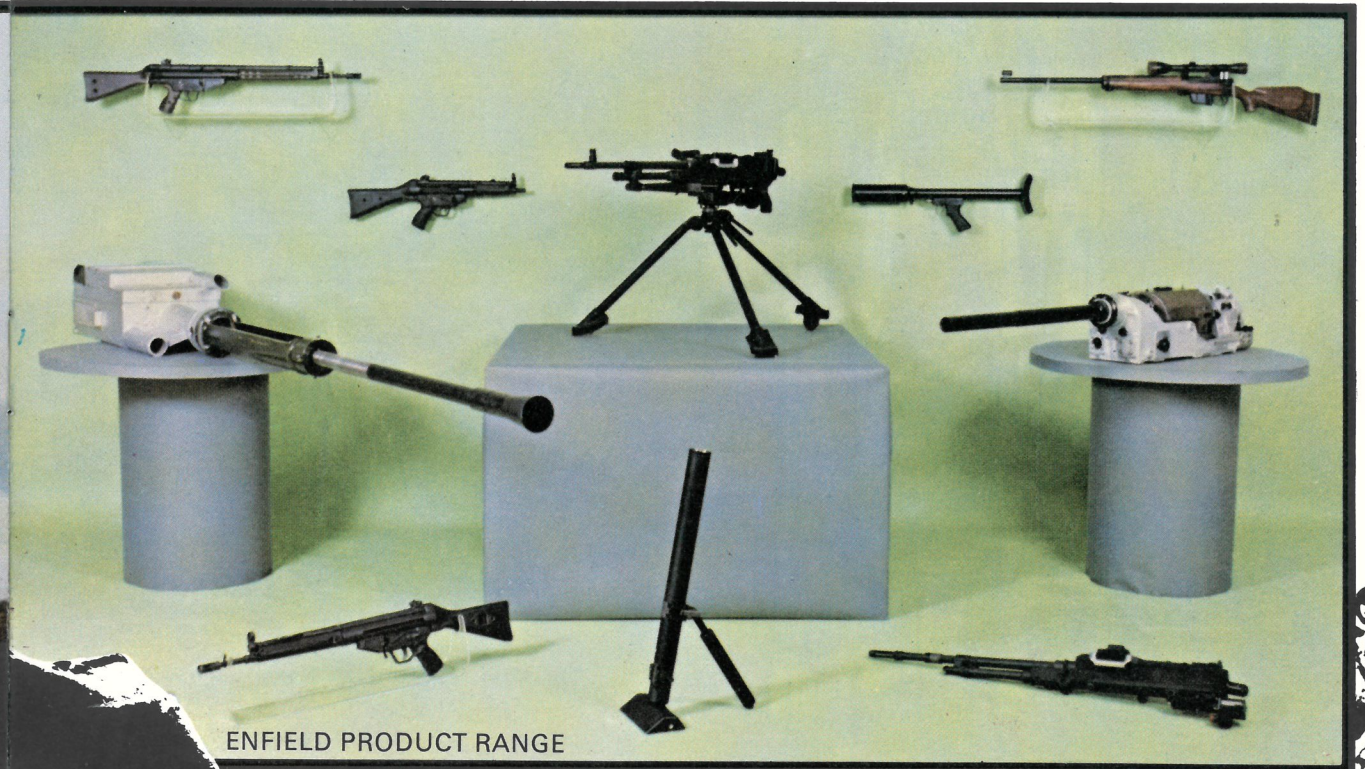


RSAF Enfield

RSAF Enfield is one of the leading arms manufacturing factories in the world capable of designing, developing, manufacturing and testing complete products. It is a light engineering factory which can undertake precision engineering work either in the initial stages of a project or full scale production. The factory is fully equipped with modern machine tools many of which are numerically controlled. There is a precision casting foundry, a press shop and heat treatment and metal plating plants.

The factory is currently engaged in the following:—

- 30mm Rarden gun.
- 7.62mm L1 A1 Rifle, 0.3ins. and 0.5ins.
- Browning spares.
- 30mm Aden gun and spares.
- 7.62mm GPMG (infantry and vehicle role).
- 7.62 target and sniper rifles and spares.
- Target rifle conversion kits for No. 4 rifle.
- Small arm accessories including buffered tripods blank firing attachments and night sights.

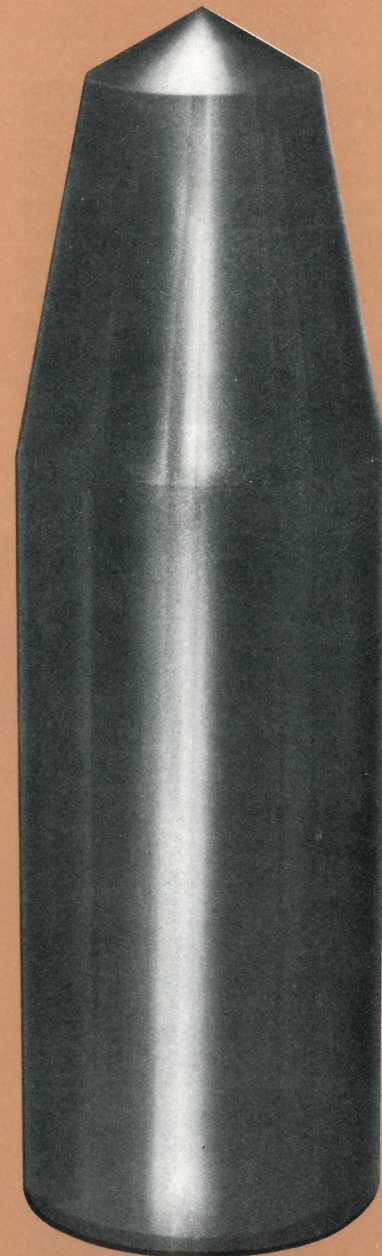
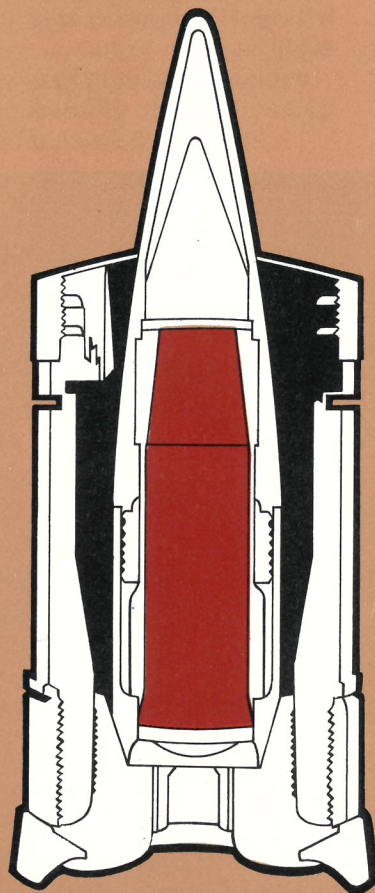


ENFIELD PRODUCT RANGE

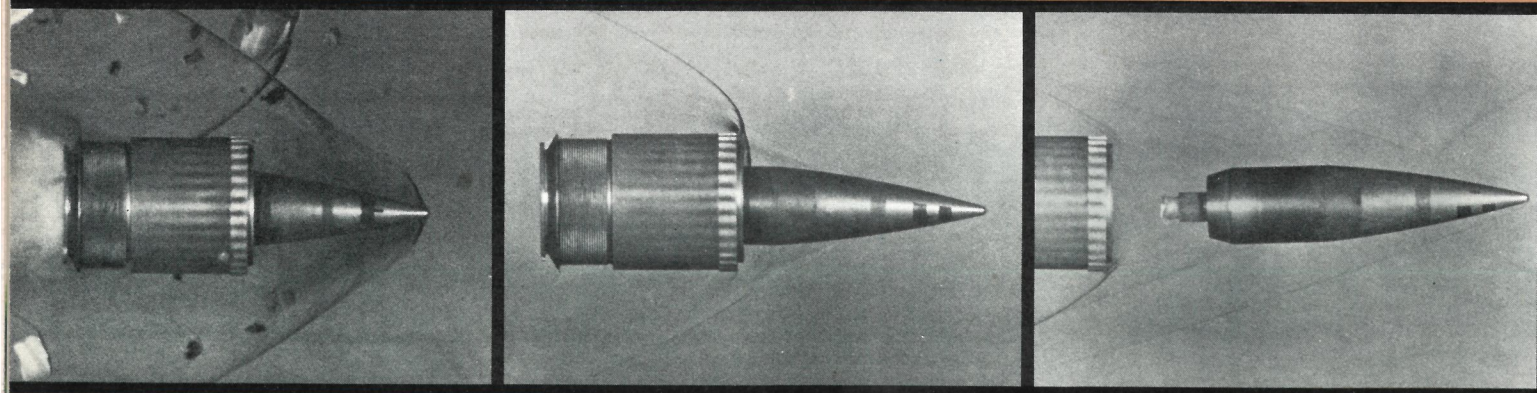


MOD Agency factory (Wickman Wimet) Featherstone

This factory manufactures high density metal components used in kinetic energy projectiles. It is the only factory with the expertise and knowledge to mass produce special alloys necessary to meet the exacting requirements of UK service specifications.



HI-SPEED SHOTS

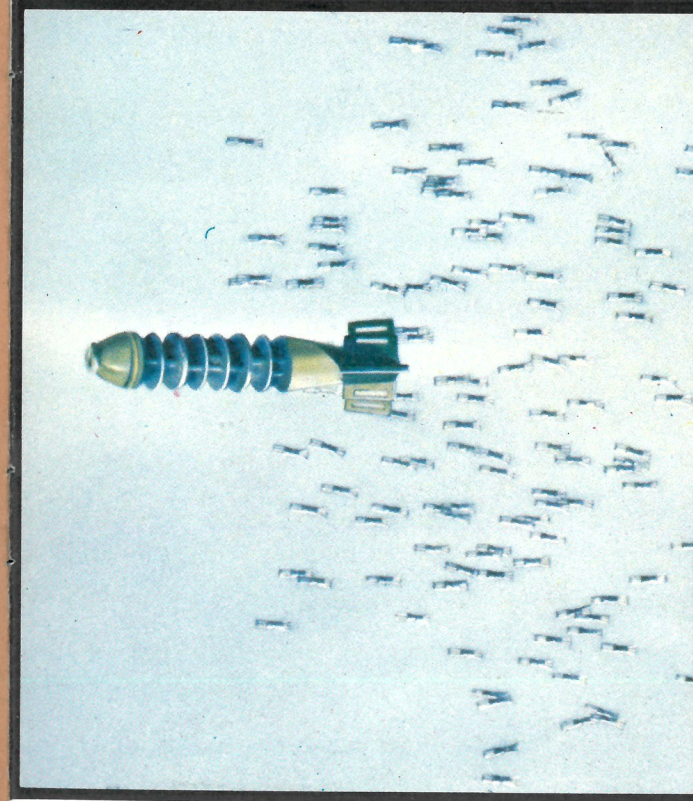
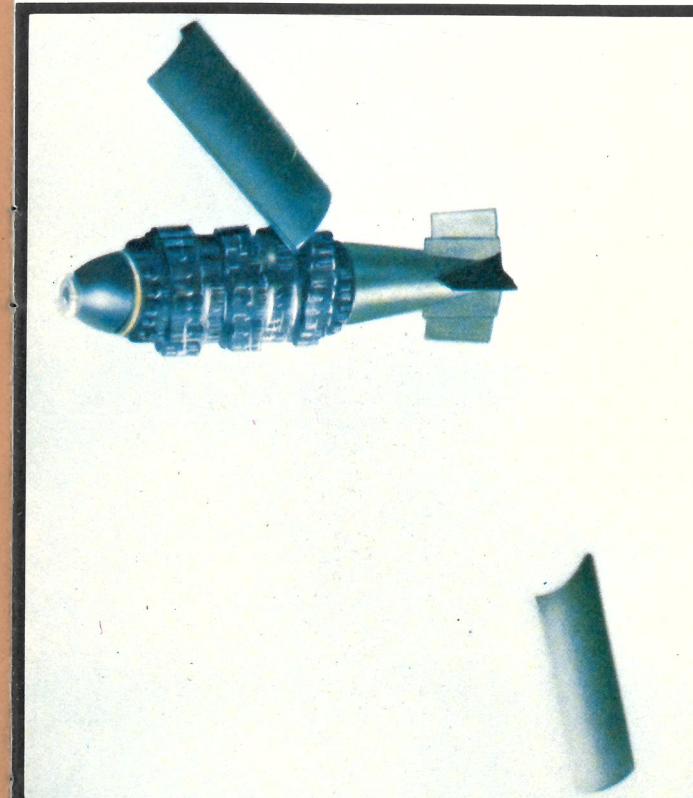


ROF Glascoed

This factory's prime function is the assembly and filling of gun ammunition, mines, bombs, rockets and grenades with propellants, explosives, smoke compositions and explosive substitutes utilising up to date filling techniques and compositions developed in collaboration with Research, Design and Development establishments. The factory has particular expertise in the field of smoke generating stores and CD work.

The factory's main products are :—

- Naval shell and underwater stores.
- Mortar bombs.
- Cluster bombs.
- Cartridge engine starters.
- Aircraft bombs.
- Smoke shells, grenades and generators.
- 120mm, 105mm, 76mm ammunition.
- Respirators, air filtration units and other CD work.
- Plastic components and packages.



GLASCOED
PRODUCT RANGE



ROF Leeds

ROF Leeds is a heavy engineering factory specialising in fabrications and component machining, and the erection of tracked and wheeled armoured fighting vehicles. The factory is capable of processing the largest items associated with any form of fighting vehicle in steel, armoured steel and aluminium alloy. Whilst Leeds reputation is founded on the production of Main Battle Tanks, it has also worked closely with MVEE in the design and manufacture of Fox, Vixen and CET.

The factory has a comprehensive range of machine tools, many of which are numerically controlled. It is fully equipped for all type of welding processes, heat treatment, and metal finishing.

Currently the resources of the factory are employed in the manufacture of:—

- Chieftain Main Battle Tanks.
- Chieftain and Centurion spares.
- Fox and Vixen wheeled combat reconnaissance vehicles.
- Combat Engineering Tractor.



FOX



COMBAT ENGINEER TRACTOR

ROF Nottingham

ROF Nottingham is a heavy engineering factory engaged in the design and manufacture of guns and mountings, mortars, rocket launchers, engineer equipment and special vehicles.

Extensive machine shops exist to undertake every type of machine and assembly work along with forging, heat treatment and fabrication using modern techniques. The factory possesses a wide range of numerically controlled machine tools.

The factory's main products are:—

- 105mm Tk guns.
- 120mm Tk guns.
- 4.5ins Naval guns.
- 76mm Guns.
- 105mm Light Gun.
- Light Mobile Digger.
- Barmine Layer.
- Eager Beaver.
- 81mm Mortar.



105mm LIGHT GUN



BARMINE SYSTEM

ROF Patricroft

The factory is equipped to produce bombs and projectiles, shells, missile warheads, heat-resistant plastics, rocket motors and aircraft rocket heads. The facilities of the factory include plant for iron casting, high quality steel making, forging, hot pressing in ferrous and non-ferrous metals, submerged and IG welding, swaging and high energy forming. There is a comprehensive range of machine shops and surface treatment plants.

R & D department, staffed by professional engineers, works in close liaison with R & D establishments.

The factory's main products are :—

- HESH, practice and smoke shells.
- Warheads.
- Cluster bomb warheads.
- HE and smoke mortar bombs.
- High quality steel ingots.
- Rocket booster and sustainer motors.
- Naval and air drop mines.
- Aircraft bombs.

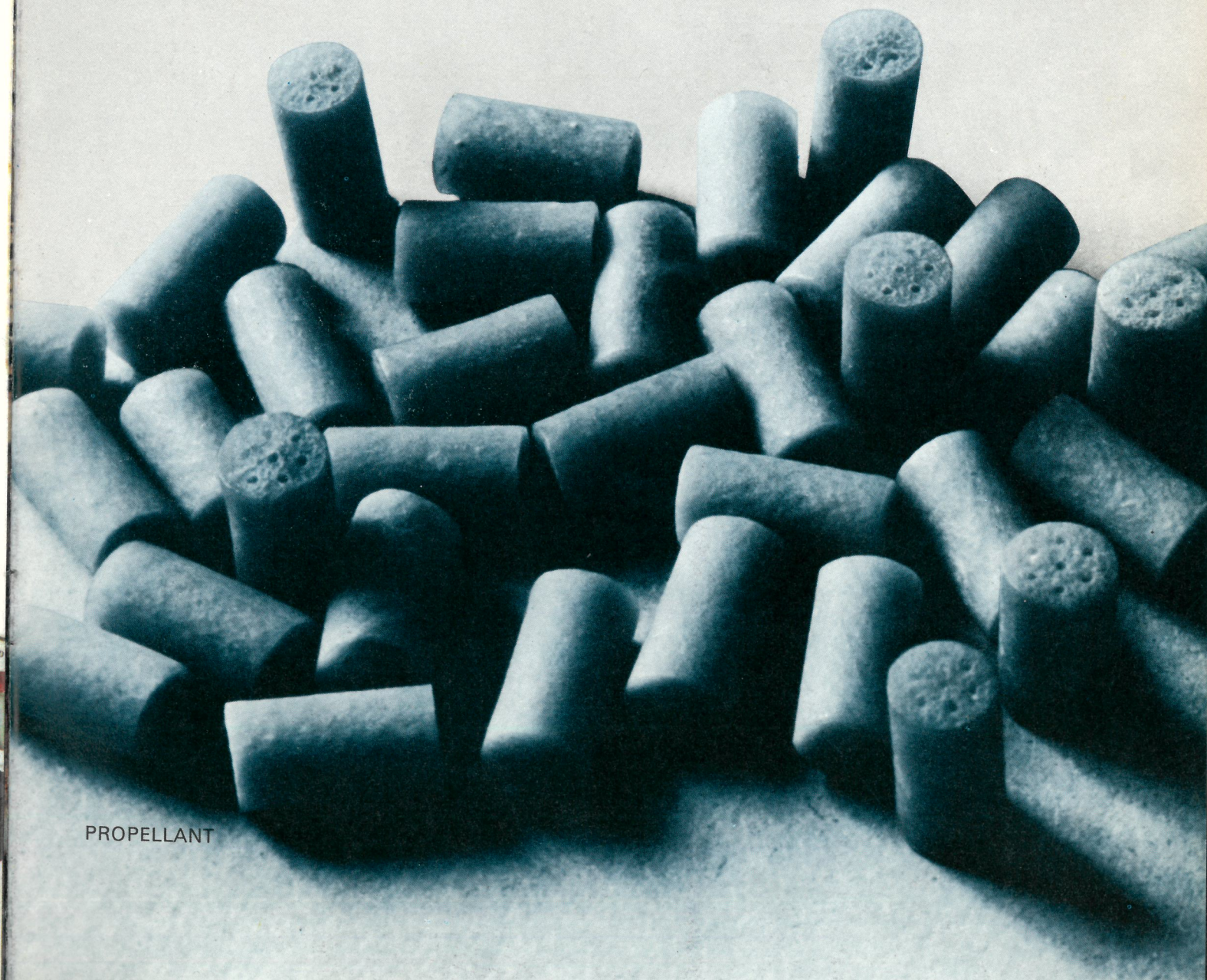
PATRICROFT
PRODUCT RANGE



MOD Agency Factory Powfoot

The factory which is managed by the Nobel Explosive Company Limited is the only UK source of single base propellants. The main products are rifle and cannon powders. Rifle powders are used in ammunition such as

7.62mm rounds, 30mm Aden and Rarden rounds, 0.5" MG observing rounds and 81mm mortar bombs. Cannon powders are manufactured for 105mm Tank and 105mm Pack Howitzer rounds.



PROPELLANT

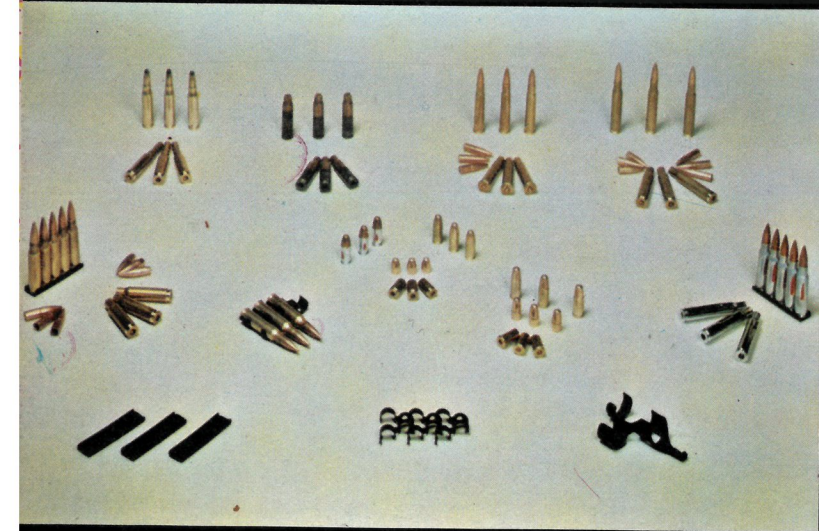
ROF Radway Green

ROF Radway Green

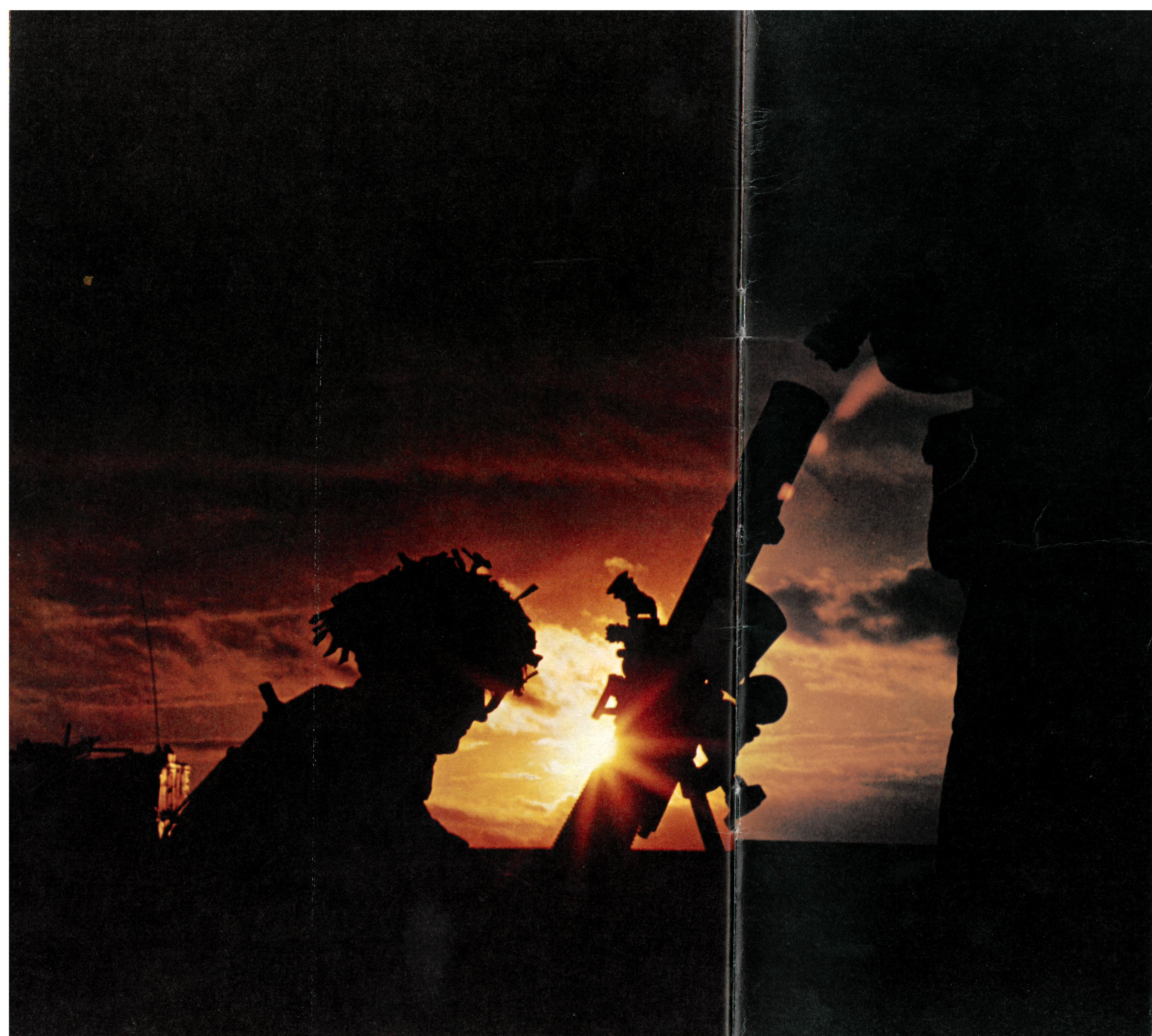
ROF Radway Green is both a light engineering and filling factory, having complete facilities for manufacture of small arms ammunition in its entirety. The factory has an explosive forming facility which has special value in the manufacture of unusual shapes and prototype work. The factory possesses excellent machine shops, press shops and a non-ferrous foundry and rolling mill. There is particular expertise in non-ferrous metal forming and manufacture.

Some of the main stores made at ROF Radway Green are :—

- 7.62mm rounds - all natures.
- 9mm ball rounds.
- Copper based alloy strip.
- 81mm Bombs components.
- Primer cartridges.
- Signal cartridges.
- Cartridge eject release units.
- SAA Links.
- Steel ammunition boxes.







Contact and Information Points

Information and further help concerning any of the aspects of the activities set out in the foregoing pages can be obtained from:—

Royal Ordnance Factories
Marketing Co-ordinator,
St. Christopher House, Southwark Street,
London SE1 0TD.
Telephone : 01-928 7999
Extension : 4332

Director,
Royal Ordnance Factory,
Birtley, Co. Durham.
Telephone : Birtley 2241

Director,
Royal Ordnance Factory,
Bishopton, Renfrewshire, Scotland.
Telephone : Bishopton 2261

Director,
Royal Ordnance Factory,
Lower Darwen, Blackburn, BB1 2LE.
Telephone : Blackburn 55131

Director,
Royal Ordnance Factory,
Puriton, Bridgwater, Somerset.
Telephone : Puriton 683000

Director,
Royal Ordnance Factory, Chorley, Lancs.
Telephone : Chorley 5511

Director,
Royal Small Arms Factory,
Enfield Lock, Enfield, Middlesex.
Telephone : Waltham Cross 23391

Wickham Wimet Limited,
MOD Agency Factory, PO Box 27
Wolverhampton, Staffs, WV10 7NX

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Usk,
Mon. NP5 1XL.
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Director,
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Yorkshire LS15 8ST.
Telephone : Leeds 648123

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Royal Ordnance Factory,
Kings Meadow Road, Nottingham, NG2 1EQ.
Telephone : Nottingham 863341

Director,
Royal Ordnance Factory,
Green Lane, Patricroft, Manchester M30 8AB.
Telephone : 061-789 2301

Nobels Explosive Co Ltd
MOD Agency Factory, Powfoot
Annan, Dumfrireshire.

Director,
Royal Ordnance Factory,
Radway Green, Near Crewe, Cheshire.
Telephone : Alsager 2261

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This brochure is intended for general descriptive purposes only.

