On Her Majesty's Service

PROFILE

Newspaper of the Royal Ordnance Factories

NOVEMBER 1984 No 49

★ Stingray gun and turret

★ International turret

★ Vehicle intercom

In action with the 81 mm mortar

Two soldiers of the Green Howards simulate firing their 81 mm mortar during Lionheart 84 — the biggest British Army/NATO exercise since the war. Further reports on the action appear on pages 8 & 9 and include a view of exercise life through the eyes of an infantry officer, former ROF employee Second Lieutenant IAN BUCHANAN. Coloured pictures appear on page 12.

ALSO INSIDE:

In readiness for Vesting Day and beyond, a new corporate identity has been created for Royal Ordnance. It has been formulated by the consultants Wolff Olins Ltd who have produced a preview of the visual image specially for PROFILE readers. See pages 5 to 7.

TOP PROJECTS UNVEILED AT USA SHOW

First batch of Light Guns is sent to America

THREE major ventures, in which Royal Ordnance have teamed up with leading American defence manufacturers, were unveiled last month at the annual convention of the Association of the United States Army (AUSA) at the Sheraton Washington Hotel.

They were the Stingray gun and turret system for light tanks, produced in collaboration with the Cadillac Gage Company, the ROF/BMY International Turret and the vehicular intercom system (VIS) developed in conjunction with E-Systems Inc.

Stingray incorporates as main ordnance the combat-proven Nottingham manufactured L7 105mm gun, complete with cradle and specially designed recoil system to soften the force exerted at the trunnions.

The gun and turret complex has been designed initially for mounting on the Commando range of vehicles, but it can be fitted easily to the M41, M47, M551 and several T-series tanks. Chief advantages of the L7 Tank Gun are its rapid rate of fire, accuracy and effectiveness in anti-tank and infantry support roles.

Standard NATO equipment, it is the most universally used tank gun and is backed by a comprehensive range of ammunition including armour piercing fin stabilised discarding sabot (APFSDS), armour piercing discarding sabot (APDS) and high explosive squash head (HESH).

The International Turret developed by BMY mounts the 155mm Split Block Gun developed by Royal Ordnance. The complete system will provide a great improvement in the operational performance of the M109 tracked vehicle with range increased to 30km using 45 calibre barrel and M203 equivalent charge, or nearly 40km if M11 equivalent charge is available.

Accuracy is improved with automatic gun laying and optional on-board sensors add an increased firing rate to six rounds per minute with a burst rate of three rounds in 12 seconds.

The 155mm Split Block Gun uses a new design of self-obturating breech mechanism.

The teaming agreement with the Memcor Division of E-Systems Inc was made to develop a vehicular intercom system which will meet the needs of the US Army for at least the next two decades. Both companies have a long tradition in the area of military communications and ROF Blackburn have been designing and producing intercom systems for fighting vehicles for more than 30 years.

The pedigree began with the Larkspur system and followed through with the well known Clansman currently in service with the British Army. Their latest system uses time division multiplex techniques and microchip technology to achieve high capacity and versatility.

DURING the course of the AUSA show the American Assistant Secretary of Defense for research, development and acquisition, Dr Jay Sculley spent much time on the ROF stand where he met members of our senior management and took the opportunity to examine the 105mm Light Gun.

In late October, Phil Lee and Ray Collins of Weapons & Fighting Vehicles Division visited the USA and negotiated and signed an initial loan agreement for a quantity of six L119 Light Guns and associated spares and support equipment. The first three of these have now been despatched to the USA for evaluation trials which are due to start almost immediately.

Further negotiations are expected to take place in London early next month on a leasing agreement for a total of 20 L119 Guns (including the six which are the subject of the loan). The negotiations are also expected to encompass longer term arrangements between the two countries for future USA Light Gun requirements.

RICHARD'S WINNING RUN ON ITV QUIZ GAME

Richard Thompson poses with quizmaster Jimmy Tarbuck, opponent Mrs Flora Allen, and hostess Mari Kirkwood on his first appearance on the networked Yorkshire Television show "Winner Takes All"

RICHARD THOMPSON, who works at our Bridgwater factory, had a winning streak when he appeared on the Yorkshire Television quiz show "Winner Takes All".

As regular viewers know, contestants have to gamble on their ability to answer general knowledge questions which become progressively harder as the quiz goes on. In his first appearance Richard won through to the programme's final to become champion of the week with a tidy £660 winnings to his credit.

Spurred on by his success he accepted quizmaster Jimmy Tarbuck's invitation to have another flutter and returned for the following week's show. Yet again he won through as champion, topping up his previous winnings quite handsomely.

Returning for a third week in a bid for the hat-trick, his run of luck deserted him and he was knocked out of the contest. Under the rules of the game a returning champion gambles his previous winnings and if he loses out he takes home only half of his total prize money.

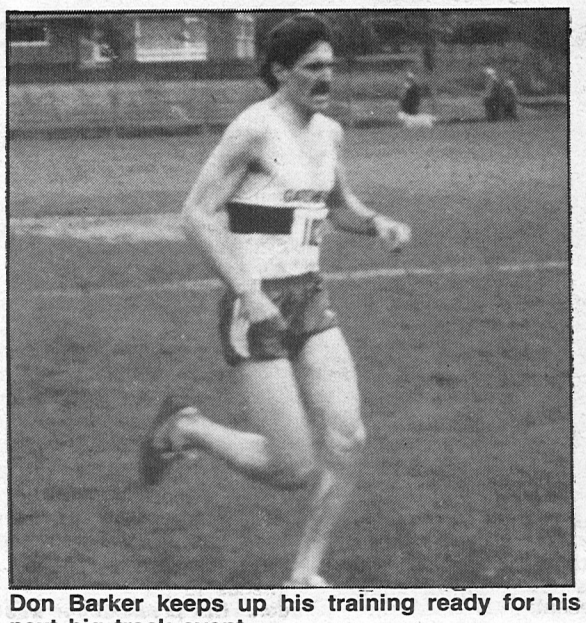
In Richard's case his half share amounted to £755 so he still took home more than his first week's winings, having enjoyed the fun and excitement of two additional contests.

Employed in the AMX explosives section at Bridgwater, Richard Thompson was born in India where he lived until he moved to the UK in 1945. After National Service in Hong Kong he worked in banking in Malaya, Indonesia, Lebanon, the Persian Gulf and India until 1970. He joined Bridgwater in 1978.

Aged 53, he is married and has three children. The two eldest are twins, both at university, and the third is a teenager living at home in Taunton.

Among his main interests Richard lists fruit and flower gardening, archaeology, shooting, crossword puzzles and sailing. Living in Somerset, he is well placed for some particularly good sailing potential.

How Don's keep-fit bid led to the competition tracks



Don Barker keeps up his training ready for his next big track event

DON BARKER started jogging to keep fit some six or seven years ago. As he gradually improved, his interest in running deepened and it led him to knock on the doors of Gateshead Harriers — a fine club with a very good reputation.

The lessons learned there in the early years are now beginning to bear fruit for this tall, quiet executive officer at Birtley.

He joined the Gateshead Northern Cross Country Team and thereafter the Gateshead National Cross Country Team. The need to keep fit had been replaced by that special something known to those who compete as the will to win.

Don became a member of the track team and runs now in the 800 metres, 1500 metres and 3000 metres. When he joined the track team they were in Division 6 of the League. Now they are in Division 2, and the competition gets tougher by the season.

In October last year Don ran in the Ministry of Defence Procurement Executive Cross Country race at Portland Down and came fifth. The MOD POE Championships this year told a different story. Don ran and qualified in the 1500 metres heat and then went straight back on to the track to do the 800 metres final. Although time between the races was very short he managed to achieve a second place. He had more breathing time before the start of the 1500 metres final which he wrapped up comfortably by coming first.

Don's ambition is to be accepted into the Gateshead Road Relay Team and we certainly wish him well — he deserves it.

Don and another member of the Birtley staff, Gillian Hornsby are also to be congratualated, not for sporting achievement this time, but on the occasion of their wedding in September.

We understand Don has already received well meant advice that no matter how fast he is able to run his wife will always beat him to the winning post!

Medal marks 46 years' service

Mr Bernard Gray has notched up 46 years in Government service and 37 of them have been spent at Westcott (formerly the Propellants Explosives and Rocket Motors Establishment before transfer to the ROFs earlier this year). To mark this proud record, Mr Harold Williams, Director of ROF Westcott and Waltham Abbey, presented him with the Imperial Service Medal. Bernard works as a Process and Supervisory Grade 'D' officer.

Historic photograph revives wartime memories for the Queen Mother

▲ **The year is 1941 and the Queen Mother is being issued with protective shoes during a visit with the late King to the then Royal Ordnance Factory at Thorp Arch.**

RESEARCHING photographic records of the Royal Ordnance Factory organisation history recently, Stan Taylor, Chief Training Officer at Chorley, came across a picture of the Queen Mother taken in 1941 when she and the late King George VI visited the former Royal Ordnance Factory at Thorp Arch, Yorkshire.

It occurred to Stan that she might not have this particular photograph among her extensive collection and so he arranged for a print to be made and sent it to her at Clarence House.

The picture, which we reproduce here, shows Her Majesty having a pair of protective overshoes fitted before entering the "clean" side of the explosives section. It was taken on October 29, 1941 when the King and Queen officially opened the Thorp Arch factory.

Within a few days of having posted the photograph to the Queen Mother, Stan received a personal letter of thanks from her private secretary.

The letter said: "I write at the bidding of Queen Elizabeth The Queen Mother to thank you for your letter . . . with which you enclosed that delightful photograph taken on the occasion of the visit of The King and Queen to the Royal Ordnance Factory, Thorp Arch . . .

"The Queen Mother asks me to tell you how grateful she is to you for writing as you did and for sending a photograph which is a charming memento of an occasion that she remembers so vividly."

Redundancies caused by fall in work load

IT IS with regret that we have to report that the Secretary of State for Defence has authorised schemes for redundancies at ROFs Bishopton, Birtley, Blackburn and Chorley. The total reductions in the worst case will be up to 1,819 employees, comprising 1,429 industrials and 390 non-industrials.

The redundancies are due to a significant fall in each of the affected factory's forward work load resulting largely from a reduction in the MOD ammunition requirements for 1985/6. A major factor in the fall of workload has been the United Kingdom Ministry of Defence's having to place an order with Germany for the supply of a further requirement of ammunition for FH70. The supply of ammunition for FH70 is governed by an inter-Governmental Memorandum of Understanding signed in 1970 between ourselves, the Federal Republic of Germany and Italy, for the production of the FH70 and its family of ammunition. The MOU specifies that each nation shall be entitled to a certain proportion f the work to be undertaken, by value.

Normally workshares are made proportional to the partner nations' offtake of the principle equipment involved. On this basis, the UK would have been entitled to something under 20 per cent of the work generated by the FH70 project. For a number of reasons, however, the UK has, to date, undertaken 38.24 per cent. of work done. In financial terms, this means that British industry has been awarded work worth nearly £11 million which should have gone elsewhere. Italy has a smaller work surplus of approximately £13.5 million. Conversely, Germany is owed just over £14 million worth of work. It is within this framework that the MOD has placed an order with Germany for the supply of a further requirement of FH70 ammunition.

A thorough examination has been conducted to see if there is any way in which this order could be given to UK industry. Sadly, the conclusion is that there is no means of doing this which would not involve either breaking an international agreement to which we were party and which offers the UK exceptionally favourable overall treatment and/or jeopardising wider interests, including those of the ROFs, in the field of defence equipment collaboration.

Every effort will be made to minimise the redundancies and to this end everything possible is being done to secure additional work for the factories affected.

PROFILE

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Pensions: keep an eye on the notice boards

Watch out for a special notice which is being displayed on noticeboards in all Royal Ordnance establishments from November 20.

This notice is one of the steps needed to ensure that you will continue to be contracted-out of the earnings-related part of the State Pension Scheme so maintaining, in this respect, your current position. Otherwise, employees and employer would have to pay higher National Insurance contributions from Vesting Day. The notice follows consultations with both the non-industrial and industrial Trade Unions.

An outline of the main features of the Royal Ordnance (Crown Service) Pension Scheme is also being displayed. This scheme is being set up as a separate Trust Fund and is designed specially for persons transferring from the Civil Service to the employment of Royal Ordnance plc.

PERSONNEL UPDATE

A FURTHER meeting of the ROF Parallel Working Group (Trade Union / Official Sides) was held on October 18 under its new Chairman, Mr John Reed, Director General, Personnel.

First item on the agenda was the Employees' Handbook and it was evident from the latest report from Terry Finch, Head of OF Personnel 6, that work on the subject was near completion. Final agreement has not yet been reached on the text of the handbook in relation to shift work / overtime and retirement plus a few minor matters but neither side of the Working Group felt that there were any insurmountable obstacles.

There was little to report that was new in the spheres of security guarding arrangements, Joint Consultative Machinery, procedures for dealing with disciplinary and inefficiency cases and a grading structure for Non-Industrial staff but work on these matters is still proceeding and more definite news will be given as soon as available.

Roger Shirley, Head of OF Personnel 2, reported the current position following meetings of his joint working party on future Personnel Management of Non-Industrials. A measure of agreement had been achieved but a number of matters were still outstanding. Further meetings of the joint working party will be held and early resolution of remaining problems is hoped for.

George Gamble with his wife Hazel and Assistant Director Ray Collins who made the presentation

George bids farewell . . .

AFTER 35 years' service in the Royal Ordnance Factories, George Gamble has retired from his job as a PPTO at the Weapons and Fighting Vehicles Headquarters at Leeds.

George joined ROF Patricroft as a technical assistant in 1949 and subsequently worked at the former ROF Wigan and then Birtley before moving to C&AS at ROF Nottingham in 1974.

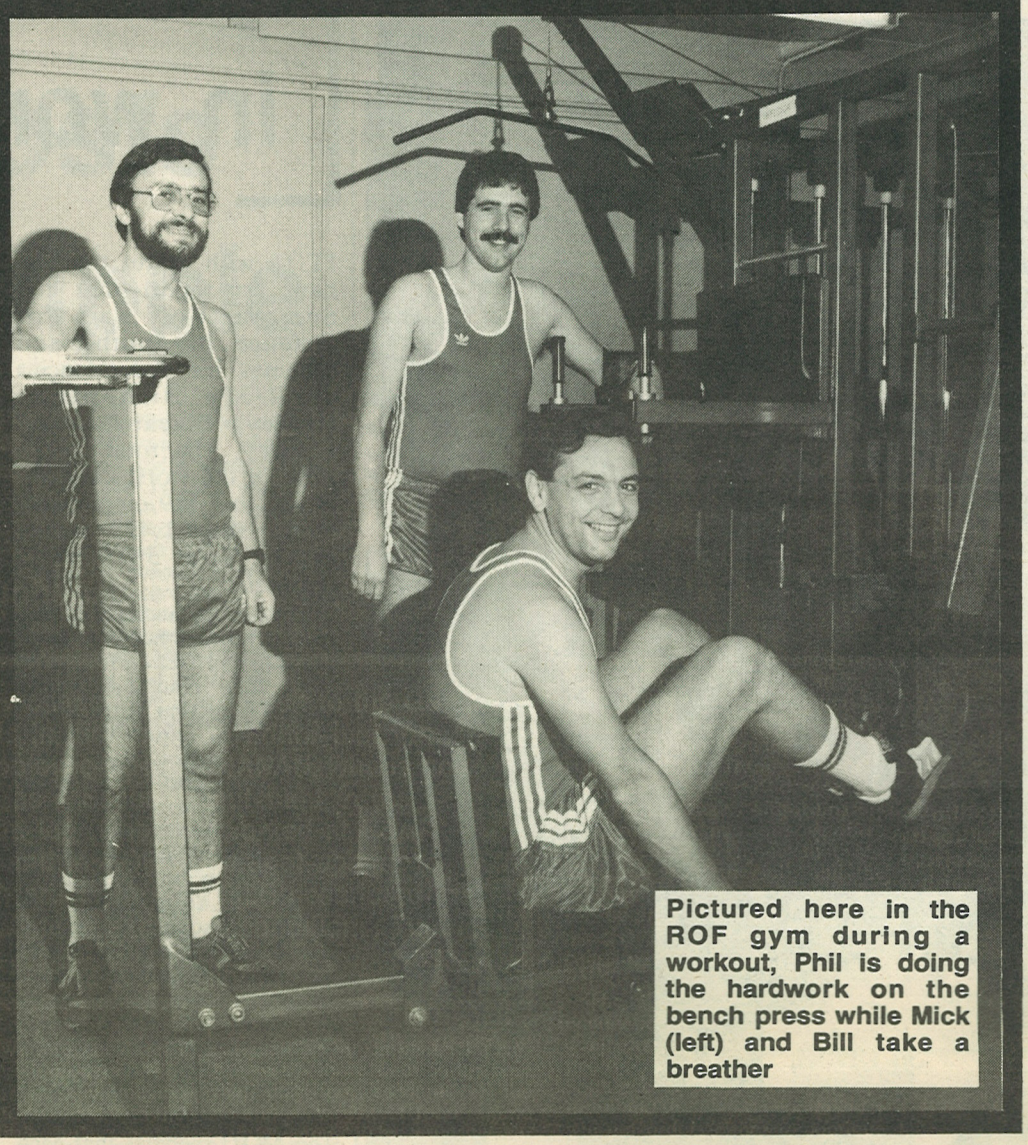
To mark his departure George received a plaque-mounted model of the Challenger Main Battle Tank, suitable inscribed, and a selection of fine rose bushes to restock his garden. The presentation was

Three shun Sunday lie-in to run for heart unit cash

MOST of us were enjoying an extra hour in bed on Sunday October 28, having put the clocks back the night before, but this was a luxury that Bill Edge, Phil Jones and Mick Freeman could not afford. They were up bright and early preparing for the Leeds Marathon.

Bill, aged 30, Phil (31), and Mick (36), of the ROF Leeds Material Supply section, were aiming to raise funds for the city's Killingbeck Hospital whose heart unit, under the guidance of Mr. Duncan Walker, performs invaluable work in open heart surgery and research into heart disease.

For weeks the three stalwarts had been pounding the pavements in the early hours each day to get themselves into tip-top condition for the big event. Their efforts paid off, for all three finished the gruelling course and can be proud that their combined achievements raised more than £200 for Killingbeck.



Pictured here in the ROF gym during a workout, Phil is doing the hardwork on the bench press while Mick (left) and Bill take a breather

Alec retires after 31 years' service

ALEC JOBLING

ALEC Jobling, Assistant Director, has retired after 31 years' service at ROF Birtley.

After serving his apprenticeship at Vickers Armstrong Ltd., and four years military service with the Royal Artillery and the Military Police, Alec joined Birtley in 1953 as a mechanic examiner on gauge examination and calibration.

Promoted to draughtsman in 1957, and two years later to PTO III Production Workshop foreman, progress followed steadily and in 1970, Alec was appointed Manager Production — in charge of all factory production activities — and in 1977 was appointed Assistant Director at Birtley.

Throughout his long career there, Alec has made many friends and they join us in wishing him and his wife Doris a long and happy retirement.

WEDDING BELLS FOR GILLIAN AND DON

The bells chimed for two popular staff members — Gillian Hornsby and Don Barker — who were married in September. Gillian is a clerical officer in the Wages Department and Don is an executive officer in Accounts.

Both kept the honeymoon venue a closely guarded secret, but it was subsequently discovered that during the first week Don left Gillian to the household chores while he escaped to the golf course!

The photographs show Gillian, suitably adorned, together with her friends in the Wages department, and the happy couple on their big day.

We wish them every happiness.

Daredevil skydives to aid hospital's funds

Mick Drube hands the sponsorship money collected after his parachute jump to Sister Jennings at Buckingham Hospital

Mick ready for the big event, just before take-off

INTREPID Mick Drube, a scientific officer at ROF Westcott, decided on a spectacular way of raising money for charity . . . he jumped out of an aircraft at 2,500 feet!

Mick, together with three other daredevil parachutists — all regulars at the White Hart public house at Preston Bissett in Buckinghamshire — were aiming to raise cash in sponsorship for the Buckingham Hospital.

Having secured a sufficient number of committed sponsors they enrolled at the Sibsen Parachute Centre near Peterborough. This centre is recognised as having superb facilities and the valiant four embarked on a training course comprising aircraft and emergency drills, canopy control and the all important parachute landing fall. They soon completed their training to the satisfaction of the instructors and were ready for their big event.

In fact they raised a total of £340 and Mick enjoyed the experience so much that he has since made three more jumps. He now has an ambition to do free fall parachuting eventually.

Bowls victory

The ROF Birtley Bowls Team secured victory with eight shots when they won the Ministry of Defence Procurement Executive Triples competition finals.

Venue was RAE Pyestock where the team of G. Trotter, J. Chandler and T. Cooper set out on their road to success when they defeated RSRE Malvern by just one shot in the quarter-finals.

The semi-finals were just as tightly contested and Birtley ensured their place in the final by two shots. This brought them into contest with 1983 champions ASWE Portsmouth.

The match lived up to expectations, swinging first one way and then the other. After 16 ends the score was even at 17 shots all. Birtley went two ahead at the 17th end, and at the final end some fine bowling by the trio, who scored six shots, saw them to victory by 25 shots to 17.

Royal Ordnance: A new identity

Every company has an identity–the face which is recognisable immediately to those with whom it does business, its customers and, indeed, the public.

Following the Government's decision that the Royal Ordnance Factories should be incorporated as a company under the terms of the Companies Act, the ROF Management Committee appointed a firm of corporate identity consultants. Their task was to advise on how we should look and behave as an organisation in the future.

The chosen consultants were Wolff Olins Ltd, whose work in devising design schemes has included projects for a number of well-known companies including Bovis, BOC and Renault.

Their brief was to examine how the ROFs have presented themselves in the past and, from this critical stance, to prepare a policy for the future presentation of the new organisation.

In the course of their investigations they spoke to many people within the ROFs and also to many outside who have direct and indirect dealings with us. It was upon what they found that the consultants based their subsequent recommendations.

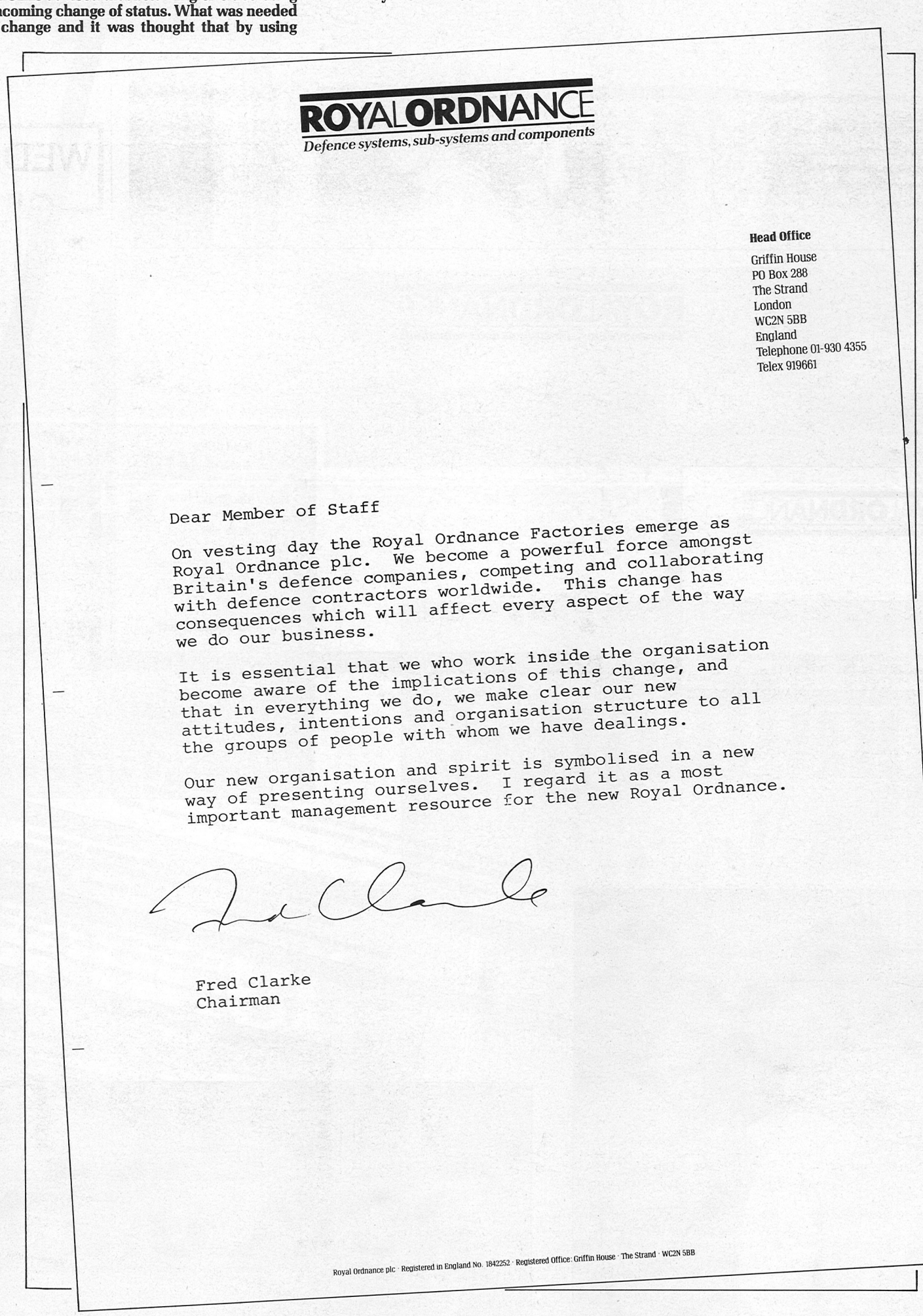
The present identity of the ROFs is influenced by its strong links with the Ministry of Defence and the Armed Forces. But Wolff Olins advised that retaining or elaborating on this image would not be right for our forthcoming change of status. What was needed was an identity which would signify this change and it was thought that by using the traditional name Royal Ordnance, in combination with a modern visual approach, there would emerge an appropriate image which would not lose sight of the organisation's heritage.

Our new identity will emerge gradually, but the way we look and the way we behave will have a great influence on the overall image we create for Royal Ordnance. The tangible factor in this is obviously the visual identity, of which the key elements are the logotype, a specified typeface, and a set range of company colours.

It is essential that our stationery, literature, offices, factories, reception areas and exhibitions all reflect this visual identity. Even the way in which we answer the telephone is complementary to the overall impression which the organisation gives.

The visual identity has a difficult function to perform. It must express the personality of Royal Ordnance and explain the complex hierarchy of information which the new identity and divisional structure have created. At the same time it must also remain sufficiently flexible to cater for the many changes in mood and attitude that a large company inevitably experiences over the years.

By using all the elements correctly and consistently we can create a cohesive image for Royal Ordnance.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Defence systems, sub-systems and components

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Dear Member of Staff

On vesting day the Royal Ordnance Factories emerge as Royal Ordnance plc. We become a powerful force amongst Britain's defence companies, competing and collaborating with defence contractors worldwide. This change has consequences which will affect every aspect of the way we do our business.

It is essential that we who work inside the organisation become aware of the implications of this change, and that in everything we do, we make clear our new attitudes, intentions and organisation structure to all the groups of people with whom we have dealings.

Our new organisation and spirit is symbolised in a new way of presenting ourselves. I regard it as a most important management resource for the new Royal Ordnance.

Fred Clarke
Chairman

Royal Ordnance plc · Registered in England No. 1842252 · Registered Office: Griffin House · The Strand · WC2N 5BB

Organisation change

Traditionally the Royal Ordnance Factories have been concerned primarily with manufacturing high quality products, usually designed in Ministry of Defence research establishments, to meet the requirements of Britain's Armed Forces. Production, therefore, was almost all that mattered for many years until the organisation became more active commercially with the growth of its overseas markets.

With our change of status the image becomes even more vital to our success. The factories remain very important, of course, but they now operate as part of a new structure, each taking its place in one of the four new divisions: Ammunition; Explosives; Small Arms; and Weapons and Fighting Vehicles. On Vesting Day these divisions will become the subsidiary companies of the holding company Royal Ordnance plc.

Each division operates within a specific area defined by product type, and also collaborates with its fellow divisions and with outside contractors to produce weapons systems. Increasingly, Royal Ordnance is developing its own research and development capabilities within these divisions. Furthermore, each division is now responsible for its own sales activities. The entire Royal Ordnance marketing effort is concentrated at the centre, in London.

From all this, then, it is clear that strong and active ties exist between all parts of the organisation.

Changing responses

This transition from the old to the new has a number of implications:

- The divisions will emerge as powerful, specialised units within the Royal Ordnance framework.
- The new Royal Ordnance, as a whole, will be perceived to play a dominant role in some key weapons systems worldwide.
- The more rapid, flexible reactions demanded by the new industrial and commercial environment, and created through the new organisation structure, with its emphasis on marketing and sales, will emerge for all the world to see and understand clearly.

Our intention is to go forward as a modern, powerful, stable and independent defence company–one of Britain's leaders.

Royal Ordnance has experience in technologies that are unique in the world of defence, and we must see to it that these are highly visible in order to make potential collaborators want to deal with us and potential customers want to buy from us.

We must therefore express who we are and what we do in a new, coherent and more clearly focussed way. The image we build must demonstrate and emphasise our new divisional structure and show our ability to deal with and be part of the industrial and commercial world.

It must show that we build, market and increasingly come to design sophisticated, modern products and systems. And it must shake off our old Ministry of Defence background, but simultaneously draw strength from our roots.

The primary means for creating our new image is verbal expression. All activities will contribute to the emergence of a single name, Royal Ordnance, which will appear in the form of a distinctive logo.

In conjunction with this there will be the descriptive corporate phrase:"Defence systems, sub-systems and components", also in a specified typeface.

Additionally, each division will have a short-form description to be used on letterheads and brochures. And, of course, a common visual style will be adopted by each division for its stationery, forms, signs, literature, uniforms, etc.

As we have seen, marketing is a head office function while divisions will operate their own sales offices. This will allow them to adjust their behaviour to respond to the markets they serve, but what they do will be in accordance with the spirit of the corporate identity, reinforcing the unity and strength of the group as a whole.

Having been created, the identity will be introduced so that the name, logo, standard colours, family of typefaces and other visual systems will become progressively evident. This introduction is being implemented by a small, specialist team of representatives from the corporate identity consultants, Wolff Olins Ltd, working closely with some of our own people.

The new identity will be carried on all communications material from letterheads to sales, promotional and technical brochures and leaflets. It will also be featured on products in the form of badges, and in environmental situations on signs, in entrance halls, reception areas, and other appropriate applications at all Royal Ordnance establishments.

Vast and important as this exercise is, it cannot be done half-heartedly, and its successful implementation calls for great enthusiasm and skill.

The Wolff Olins team are currently consulting divisions and individual factories to work out the requirements of individual sites so that the identity can be launched and sustained in the most effective ways.

For the identity launch a range of key material will be available, and after this date, additional material, communications and guidelines will be prepared so that the identity can emerge progressively.

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The Ammunition Division of Royal Ordnance–design, development and manufacture of ammunition, missiles, explosive devices, pyrotechnics and electronics for land sea and air.
Royal Ordnance Ammunition Limited, a wholly owned subsidiary of Royal Ordnance PLC · Registered in England No. 1842253

The Small Arms Division of Royal Ordnance–conception, development, manufacture and support of weapons and ammunition up to 40mm calibre.
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The Weapons and Fighting Vehicles Division of Royal Ordnance–design, development, production and support of armoured fighting vehicles, engineering vehicles, artillery, mortars and medium/large calibre guns.
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The Explosives Division of Royal Ordnance–research, development and production of explosives, propellants and rocket motors.
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ROYALORDNANCE

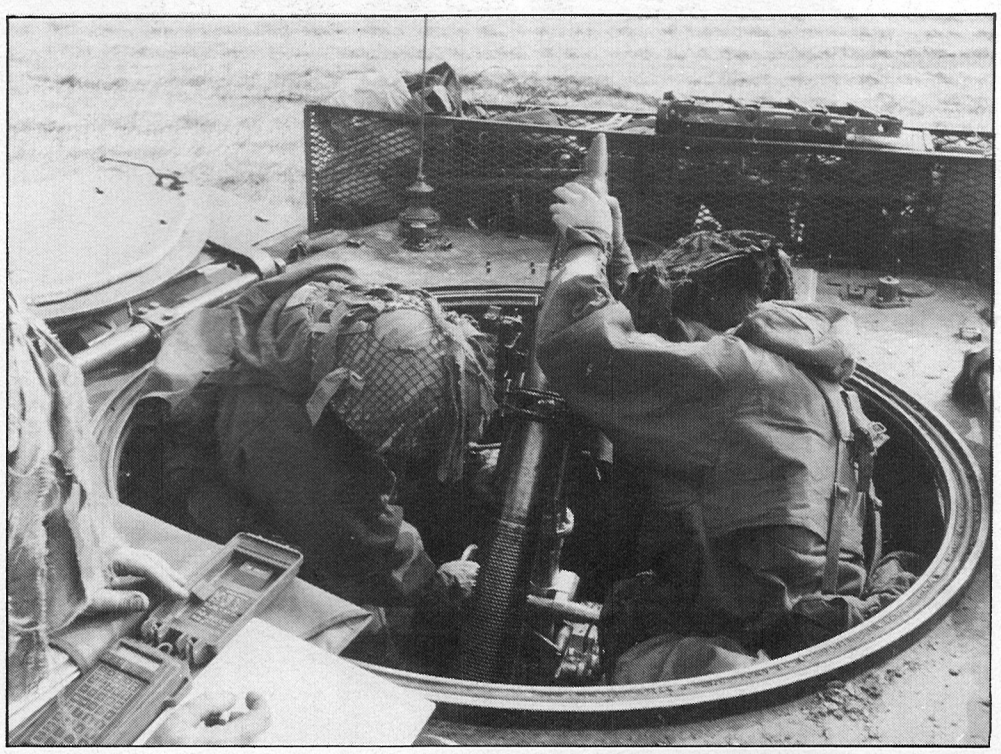
Explosives Division
Westcott

Spearpoint 84

SECOND REPORT ON THE

Following reports by Stuart Finn and photographs by John Green, of MOD Reprographic Services, in our last issue, we bring you further coverage of the British Army's biggest exercise for almost 40 years.

How the defenders make the terrain work for them



WHILE the fortunes of war can be very fickle indeed, the one thing that remains constant is the topography of the country in which the battles are being fought. Terrain features can be ally or enemy, depending on which side you are on, so it is hardly surprising that commanders seek to exploit these natural characteristics at every possible opportunity.

Germany is particularly rich in hills and forests, and no matter how good an enemy's armoured fighting vehicles are, trees in dense population are a traditional obstacle. Defenders can capitalise on this by identifying the lines of advance available to the invaders.

This calls for a familiarity with what one might call the "grain" of the country — the predominant direction of the valleys and gaps between forested hills. Use of this knowledge enables defensive positions to be established to bring extensive firepower to bear on the enemy.

Spearpoint, the combat phase of Exercise Lionheart, was fought across a front of at least 40 miles with Orange Forces skirting natural obstacles as they sought to maintain the momentum of their thrusts westwards.

The Sibbesse Gap (scene of Challenger's battle debut) was one such pass which the attackers had to use, and the area was well defended. Among the units which secured this vital line of access to river crossings were the 1st Battalion the Green Howards, 2nd Battalion Royal Green Jackets, 3rd Battalion The Royal Anglian Regiment, and the 5th Battalion The Queen's Regiment (a Territorial Army formation).

During our tour of this sector of the exercise we visited a number of positions which the Green Howards had established. This provided an excellent opportunity to examine the deployment of the 81mm Mortar.

A typical mortar section comprises 11 men and has two mortar carrying armoured personnel carriers. Each vehicle has a crew of four — commander, driver, and two mortar operators. The remaining three men are deployed thus: one with the company commander, one in the forward observation post, and the third as driver.

We found one mortar crew concealed in woods on a hillside just a few kilometres from Hildesheim. To demonstrate their role they deployed in rapid time to their firing position in a stubble field behind the hill. This illustrated all too clearly the need for good communications, because with the target area hidden from view they relied on range and bearing data to be fed from the forward observation post, which commanded a view of the area in which the enemy were likely to approach.

Within seconds of having reached the field the crew were ready to begin bombardment, firing from the vehicle. They had cut down target acquisition time even further by establishing a direction marker and sighting on this rod would provide the datum from which all bearings could be gauged.

The other half of the mortar section was deployed in a farmyard in the nearby village. Again, this location had been chosen because it afforded an effective field of fire over terrain ideally suited to the enemy advance.

This village was to be well and truly in the front line as was evident in the preparations made by the forces deployed there. Among the defensive points set up around the village there was a classic example of the General Purpose Machine Gun in its sustained fire role.

Its location was on the extreme edge of the village, where two soldiers in a sandbagged trench waited at full alert for the Orange Forces that they knew would eventually come.

This GPMG was set up where a wide arc of fire could be maintained across the fields and where fairly long range visibility was possible. The enemy would be assured of a very hot reception as they attempted to gain the village.

Right: an armoured personnel carrier speeds an 81mm mortar crew to their preselected firing site. The target area is over the other side of a wooded hill

Above: operating from the APC the crew go into action with their 81mm mortar, sighting on bearings received by radio from the forward observation post

Challengers play waiting game deep in forest hideout

IT WAS early on the day that was to culminate in the Battle of Sibbesse Gap that we set out in search of Challenger main battle tanks. The previous night we had received word that Blue Forces were planning a vital counter-thrust against advancing Orange armoured formations and we knew the general area where this was to take place.

This was an opportunity worth seizing — Challenger in battle for the first time in regimental strength, and in a major Allied exercise.

As the hours ticked by the tanks waited in various places of concealment and the search would have been impossible had it not been for our impeccable intelligence source. Armed with the grid references we set out to find one unit which had spent the night in the hills of the Hildesheimer Wald — thick forest which gave excellent cover.

Turning off a road we drove up rough tracks as they climbed into the trees. The going deteriorated rapidly until finally it was fit only for tracked vehicles. At the grid reference there was no tank to be seen. Obviously the formation had moved on in the night, although it did not need a Sherlock Holmes to deduce their direction.

Continuing on foot for a couple of kilometres we topped the escarpment and eventually found them on the opposite slope, parked in single file with the tree cover enhanced by extensive camouflage netting.

It was an impressive sight — an entire squadron of Challengers from the Royal Hussars preparing for action that was now less than three hours away. They had moved through the forest under cover of darkness to take up the most convenient position for their break-out and rendezvous with the rest of the regiment.

The location was a perfect example of how natural features serve to hide military personnel and equipment. The tanks were so well covered by the trees and their additional camouflage arrangements that visual sighting from the air would have been impossible. Likewise, on the ground, viewed from the surrounding countryside there was no clue that they existed.

It was fortuitous that the unit we had traced was "A" Squadron of the Royal Hussars. This was the squadron that had carried out the exhaustive programme of trials on Challenger during its entry into service with the regiment. They therefore had a lot of valuable experience with the tanks and were in an ideal position to assess its performance and capabilities in a wide variety of situations.

Major John Thoyts, Squadron Commander, gave it a very definite thumbs-up: "It certainly is a good tank. We converted to it from Chieftain and therefore appreciate the advances that have been made in design."

He went on to make special mention of its hydrogas suspension: "I would sooner be in a Challenger going over rough ground than in any other tank. It is, without doubt, a match for the German Leopard II and the American M1 Abrams."

Prophetic words as it turned out, for the Challengers more than proved their excellent capabilities in both that day's action and the big counter-attack several days later when the tide of war changed. This was the big battle that raged for 48 hours and in which Challengers and Chieftains were pitted against Leopards and Abrams. It resulted in the Orange ("enemy") Forces' capitulation.

Speed was another feature that had impressed Major Thoyts: "We can get from A to B faster than before — an important feature on the battlefield. Also the ability to go backwards fast is very useful because it enables us to keep the front Chobham armour facing the enemy."

His feelings were echoed by other members of the squadron. They appreciated the enhanced crew comfort given by the suspension which, in turn, contributed greatly to the tank's mobility.

The Members of Parliament in the visiting party were: Mr Michael Mates, Mr Neil Thorne, Mr Keith Speed, Mr Bruce George and Mr Winston Churchill.

MPs inspect Light Gun

Members of the House of Commons Select Committee on Defence got to grips with the 105mm Light Gun when they visited 204 Tyneside Scottish Field Battery of the Royal Artillery (v), during their tour of the exercise area.

As well as gaining a full appreciation of the operation of the gun they had an opportunity to sit in the seat to sight, and elevate the weapon.

This Territorial unit had set up an artillery location to provide supporting firepower to forward troops of Blue Forces in readiness for a major advance.

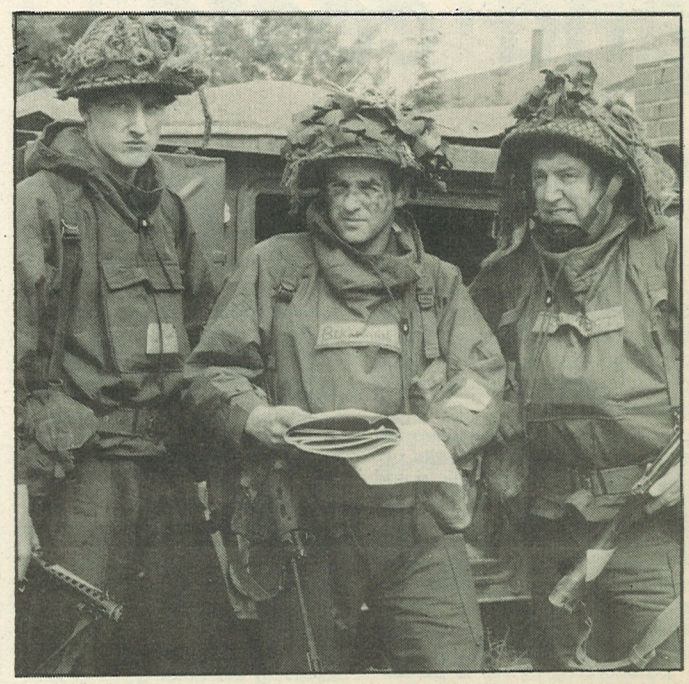
BIG EXERCISE

LIONHEART 84

● TURN TO BACK PAGE FOR COLOUR PICTURES

Life is rough, tough and dirty for soldiers in the field

by Second Lieutenant Ian Buchanan



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Regular sleep, washing, good hot food, toilets and soft toilet paper, and warmth are among the things that one misses out on the most. I shall describe some of my own experiences which are by no means unique and most soldiers will have similar stories to tell.

On every exercise one can expect to go without sleep for a couple of days at a time while we are hurriedly preparing defences or charging across country in an advance. On one occasion I had to forego sleep for three nights and four days and by the end of that time I was quite shattered.

LUXURY

Regular washing is a luxury we have to give up in the field. Although all British soldiers must shave every day it is not often that they get the chance to wash completely. On Lionheart I did manage to negotiate for the use of some showers in a sports complex for my platoon. After a week without showers the experience was, as one of my lads put it, "better than sex"! This was a lucky break — normally it is not unusual for soldiers to endure two weeks or more without using such facilities.

Food is something that is always on the minds of the troops. We are issued with 24-hour ration packs (rat packs or compo) which can keep you going quite well. However, these rat packs, although the best in the world, are incredibly boring, and it is positively maddening if you have to live on the same menu day after day.

BLESSING

It is often a blessed relief if you can get hold of some form of fresh rations such as bread, bacon and eggs to supplement the rat packs. The issued rations always consist of concentrated food which, after digestion, leaves very little waste, and not to put too fine a point on it, you don't need toilet facilities too often. Sometimes I have gone four or five days without the necessity of a toilet, and this is by no means exceptional as any soldier will bear out.

It is an interesting point to note that because of the slow movement of waste through the body, infection can sometimes break out and result in appendicitis. This lack of need for a toilet can be a blessing in disguise because it is not until you don't have one that you realise how useful they are! I shall not elaborate on details, but I am sure readers can imagine what it is like to be faced with the prospect of little holes in the ground.

Just as a final point to this fascinating topic you will be pleased to know that every soldier is issued with toilet paper in his ration pack. The stuff makes sandpaper seem smooth, so many of the lads take their own supply with them and it can be worth more than its weight in gold!

I am an infantryman and it is generally accepted that it is the hardest job in the Army to do properly. We have to contend with all the problems that I have described, plus many others.

The main one is, of course, the weather, and the infantry usually experiences this in its most unpleasant forms. Torrential rain, snow, sleet — all of which freeze you to your bones and produce the infantryman's worst enemy, mud.

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It sticks to you, especially when living in trenches. It covers clothing, boots, hands, face and hair. It gets into the weapons and stops them working effectively — its gets everywhere, and I mean everywhere!

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You may be wondering as to what extent the average infantryman comes into contact with ROF products. Let us consider an average infantry/armour attack.

First, the reconnaissance vehicles come into contact with the enemy and, if possible, they return fire. These vehicles are often the Scorpion which is armed with the 76mm tank gun, and the Scimitar which mounts the 30mm Rarden cannon. Radio messages and orders are sent to the various units via the reliable Clansman radio (which involves ROF Blackburn).

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MINEFIELD

If a minefield blocks the way, this is soon cleared by the Royal Engineers deploying their Combat Engineer Tractors and the Giant Viper minefield clearance system.

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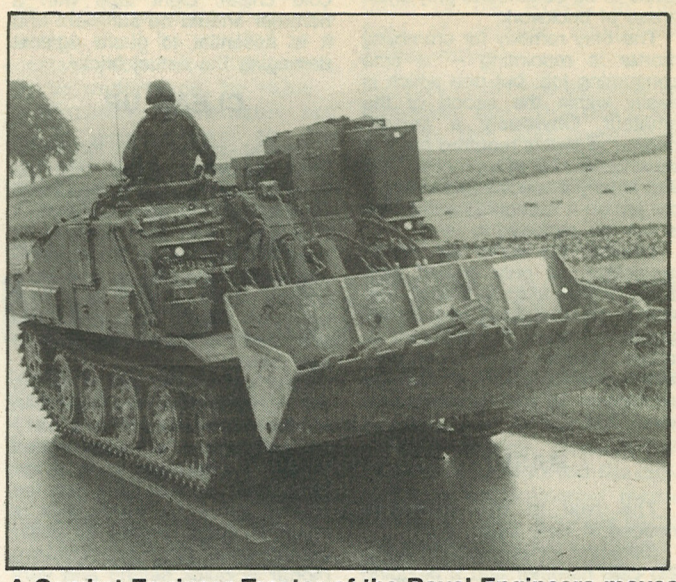
The final push through the enemy positions by the infantry is done under the cover of smoke provided by smoke grenades. Soon the enemy location is captured and the platoon commander will get orders either to continue the advance or to dig in and prepare a defensive position.

This is just an example of one possible military operation involving some of the ROF products. In addition there are deployments of kit such as the Barmine Layer, rapid cratering kits, demolition necklaces, bridging systems, Eager Beavers, trip flares, and all the various types of ammunition which play their part in maintaining the high fighting capability of the British Army.

I could go on further about life on exercise, but would risk boring you to tears. I shall conclude by saying that the best part of an exercise is the end (ENDEX in military parlance). I think ENDEX is best summed up by a comment from a little boy on the radio just after Lionheart had finished. He said: "When Daddy gets home from exercise he gets into the bath with Mummy, but Mummy gets out all dirty." Being young, free and single, I don't know about such things. But I am willing to learn . . .!

Equipment moves up for the big push



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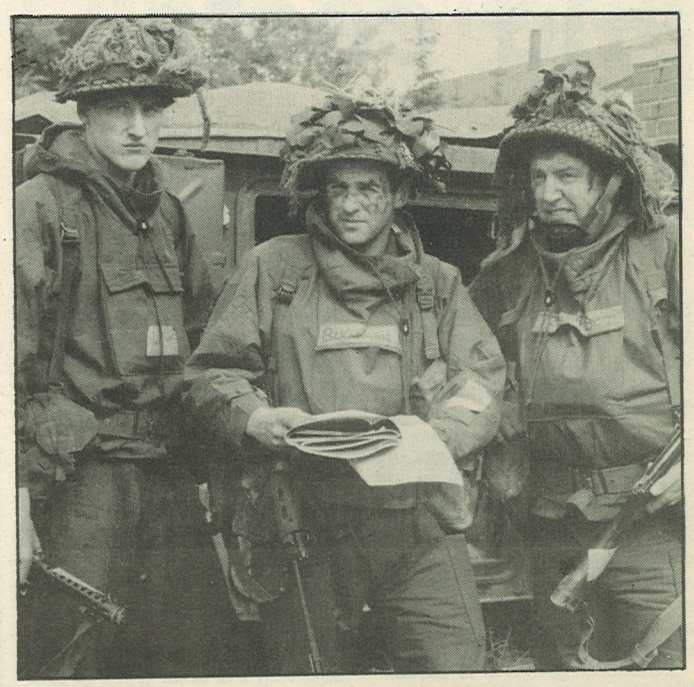

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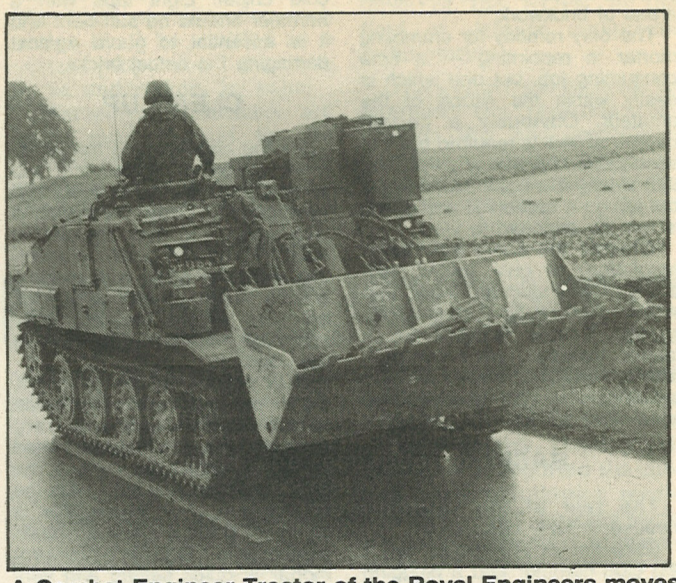

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DO IT YOURSELF and save money!

Prompt repointing avoids big trouble and costs that cripple

CRUMBLING mortar joints in brickwork can cause serious damage to a house and present crippling repair bills if left unattended.

The problems begin when the surface of the mortar breaks up, allowing rainwater to soak in and subsequently permeate the porous bricks. Water itself is bad for a building, but in winter when it freezes the resultant expansion creates pressures which can crack the bricks and even cause chunks of their face and sides to break away altogether.

Deteriorating mortar is particularly likely to occur in old houses where it has suffered the ravages of weather over many years. Signs to look for are powdering of the mortar face and also bulges along the joint lines.

Much newer buildings are also susceptible, and even houses built in the last ten years may show signs of crumbling. In the latter case the cause is likely to be the original mortar mix in which too much sand for too little cement was used. In newer buildings, therefore, the damage tends to be confined to only small areas of brickwork.

The only remedy for crumbling mortar is repointing — a time consuming job, but one which is easily within the scope of the amateur. Obviously a certain degree of skill is required but it is soon picked up with practice, and that is why it is advisable to begin the job on a section of wall which is not too exposed to view.

Whether the entire wall needs repointing, or only limited sections, always start at the top and work down. For the upper reaches never work from a ladder. Instead, have a firm platform on which to stand, and the solution is to hire a scaffolding tower and planks.

BASIC

The rest of the equipment needed is fairly basic stuff.

Essential for preparation are a 2lb club hammer and a plugging (jointing) chisel. This is a cold chisel whose sharp end is ground to a point. It is also useful to have a narrow width cold chisel with a straight cutting edge. Also ideal for removing old mortar is a pensioned-off screwdriver.

As far as applying new mortar is concerned you will need a pointing trowel, which is a smaller version of the standard bricklayer's trowel; a spot-board on which to mix and store a reserve of mortar; and a hawk — hand held board for holding a small amount of mortar as you work.

The 2ft square spot-board can be made up quite easily, as can the hawk which should measure 9ins x 9ins and be about ½in thick with a section of broom handle screwed to its underneath face. Making these items saves costs, but if you think you may have a lot of future use for a hawk, a very reasonably priced one made in a tough plastics material is now available from outlets such as B & Q. In addition to these items a soft hand brush as well as a wire brush should be at hand.

There are four chief types of joint finish, as shown in our diagram. None of them is difficult to achieve so long as the appropriate tools are used. Weatherstruck pointing features a sloping face to the mortar which slightly overhangs the bricks beneath. This requires the use of a frenchman and a straight edge.

The latter is easy enough to make from a timber batten by screwing two small wooden blocks at each end of one face. These will space it from the wall. The frenchman can be bought from a good builders merchant, but it is easy enough to make one from an old knife. Grind the tip of the blade to a point (not sharp) and then heat it and bend it at right angles to achieve the shape illustrated.

Its use, and the methods of achieving the other types of joint we shall look at a little later. When an entire wall needs repointing it creates a free choice of joint pattern, but obviously if only sections need attention the existing style must be matched.

First task in a repointing project is the removal of all loose mortar and this is where the old screwdriver is useful for chipping and raking. Chunks of mortar which, although still solid, have become detached but cannot be extracted, should be broken up by using the plugging chisel and/or cold chisel. Light taps with a hammer should be sufficient and it is essential to guard against damaging the actual bricks.

CLEAN UP

Having cleared both the horizontal (bedding) joints and the vertical ones (which builders call "perpends"), scrub them with a wire brush and then remove all dust with the soft brush. Incidentally, work should be confined to a square metre of wall at a time and this should be completely repointed before raking out the next section.

Now comes the job of mixing the mortar and you are faced with a choice between ordinary cement type and cement-lined mortar. It would be ideal if the type could be matched with the original mix, but where this is unknown some experts advocate cement-lime. Ordinary cement mortar is quick setting and very strong, but shrinkage in drying, and settling movements, can cause cracks. Cement-lime on the other hand, has equal strength but the lime reduces drying shrinkage and makes a workable mortar that is able to retain water.

For cement mortar the ratio should be one part cement: three parts builders' sand (the fine-grained orange stuff). Cement-lime mortar should be mixed as one part cement: one part lime: six parts builder's sand.

Consistency should be stiff so water should be added slowly otherwise a deluge will result in a runny mix which will not stay in the joints. A good rule of thumb is to have a mix just wet enough to be workable and as a test pick up an amount on the trowel and tilt it sideways. It shouldn't slide off.

As final preparation of the joints, moisten them with water applied on a soft brush. This prevents the existing mortar and bricks from soaking up moisture from the new mortar and causing it to dry out too rapidly.

Using the pointing trowel, cut a sufficient quantity of mortar from the store carried on the hawk. You should perfect the knack of moulding this small amount into a sausage shape by scooping and then turning, cutting and rolling, always picking up on the back of the trowel blade and at one edge. This should be the convenient edge according to whether you are right or left handed.

Push the sausage into the joint, and remember to do the vertical ones (perpends) before addressing the horizontal joints.

Surplus mortar should be cut off using the edge of the trowel. Next comes the job of smoothing the face of the joints, and if weather struck pointing is required, the trowel should be used to produce the slope (remembering to work the perpends first).

Final stage is to clean up the horizontal weather-struck overhangs by running the frenchman along the timber straight edge.

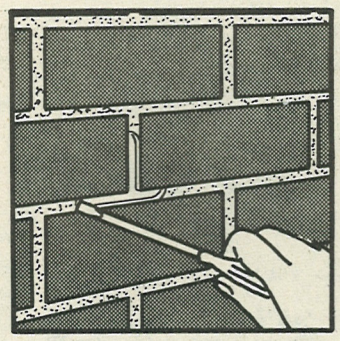
Flush finish, having been faced by trowel, can be completed by smoothing with a piece of wood or rubbing along the joint lines with a piece of sacking once the mortar has begun to dry.

The tooled appearance in which the face has a concave finish is achieved by rubbing a suitably rounded tool along the joints. This could be a section of discarded bucket handle, a length of garden hose or a piece of dowel of the right diameter.

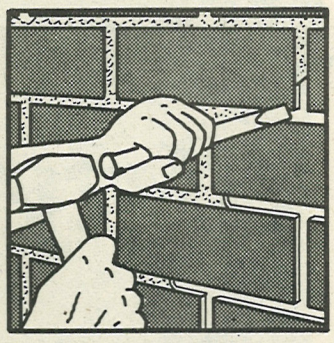
For a recessed finish it will have been necessary during preparation to rake out fairly deeply. Once new mortar is in place the surplus should be removed to desired depth of recess by scraping with a metal tool (eg, flat bladed cold chisel) or a piece of hardwood. Whatever is used its width should equal that of the joint.

A word of warning: recessed joints provide an effective decorative finish, but should be avoided where the wall is likely to receive a lot of rain.

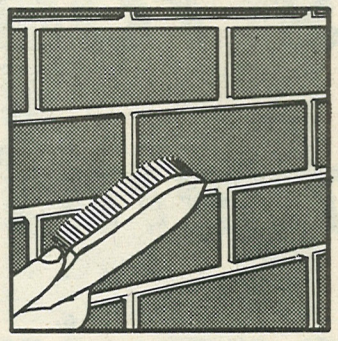
● Having tackled repointing successfully, many DIY enthusiasts are tempted to move on to simple bricklaying projects such as garden walls or base walls for greenhouses and conservatories. In the next issue we shall look at the basic techniques and the do's and don'ts of building with bricks, bearing in mind that while winter is not an ideal time for this work it is a good season for planning the job from the comfort of the armchair!



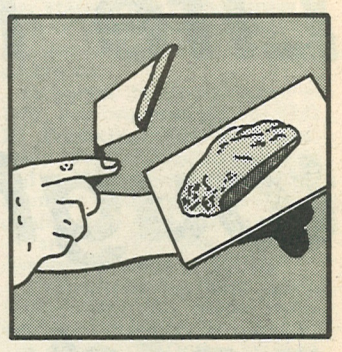
Rake out old and decayed mortar back to sound material, using the tip of an old screwdriver or similar tool



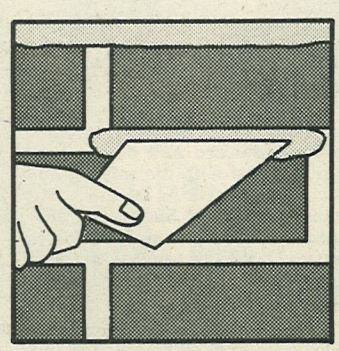
Using plugging chisel and narrow-tip cold chisel, chop out loose, but stubborn lumps, taking care not to damage bricks



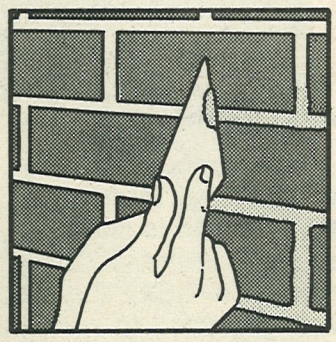
Thoroughly wire-brush all joints then clear dust with soft brush before wetting prepared mortar lines



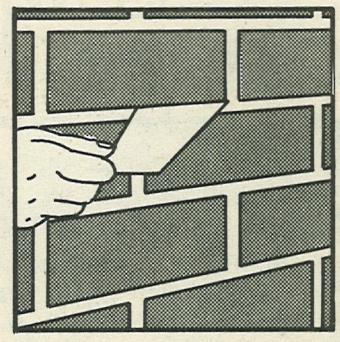
Mortar should be picked up on the back of the trowel in one lump and moulded into a thin sausage shape



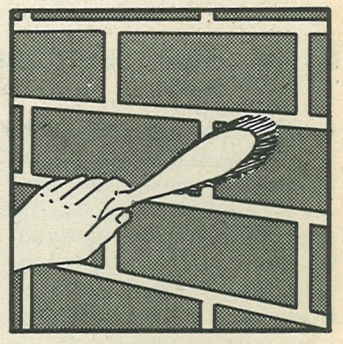
Press mortar firmly into the joints, attending to vertical ones (perpends) before the horizontal joints illustrated



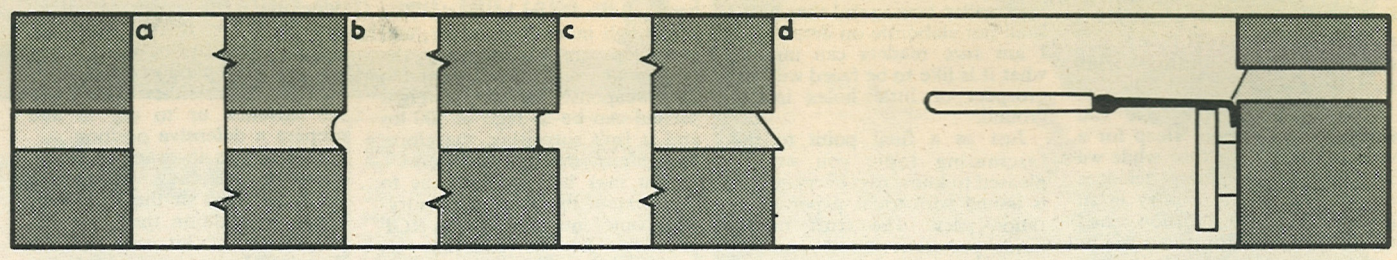
Scrape off surplus mortar with the edge of the trowel, but avoid smearing it over brick faces which can stain easily



After smoothing perpends repeat the process on horizontal joints using back of trowel, keeping hand to left of work and travelling leftwards if you are right-handed

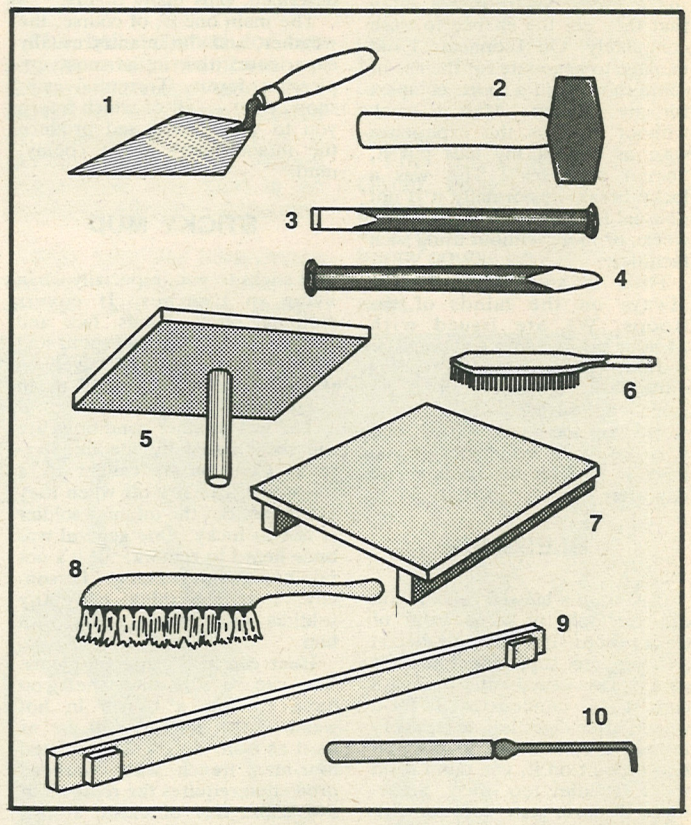


Whatever the style of finish, always brush over work area gently once mortar has begun to dry to remove unwanted splashes



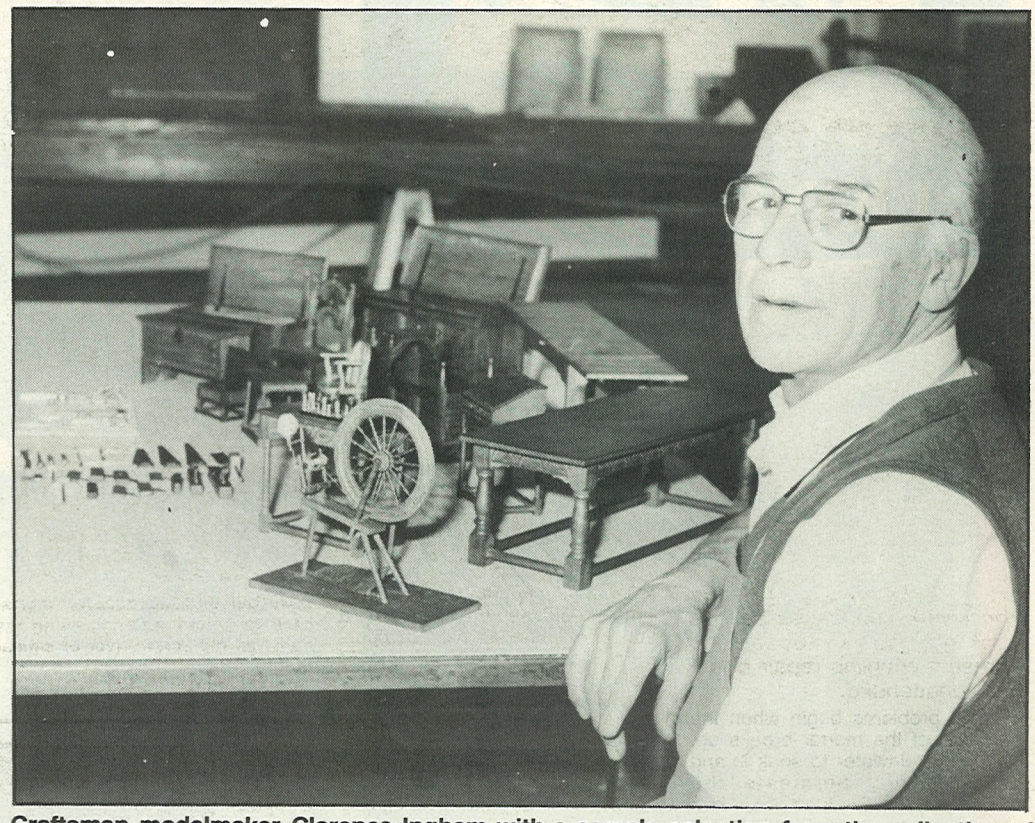
The chief styles of pointing: a — flush, which is prepared by trowel then rubbed over with a piece of wood or sacking when drying has begun; b — tooled or rubbed, in which the mortar is pressed in and slightly hollowed by a rounded tool (dowling or short length of hose); c — recessed square style achieved by rubbing with metal or wooden tool of appropriate width and thickness; and d — weatherstruck, in which a slope is achieved to encourage rainwater to run off. While the slope is trowel-finished, the underside of the overhang is cleaned up using the Frenchman in conjunction with the straight-edge as illustrated on the right

Necessary skill soon picked up with practice . . .



Tools and equipment needed for repointing: 1 — pointing trowel, a scaled-down version of the bricklayer's trowel; 2 — 2lb club hammer; 3 — flat-tipped cold chisel (narrow width); 4 — plugging or jointing chisel which has tapered and slightly rounded tip; 5 — hawk for holding working quantity of mortar (easily made from plywood or chipboard and length of broom handle); 6 — standard wire brush; 7 — spot board, 2ft square and raised on battens, used for mixing and storing reserve of mortar; 8 — soft bristle brush; 9 — straight edge with spacing blocks, used in conjunction with . . . 10 — Frenchman, for weatherstruck pointing. Frenchman can be made from old knife as described in main text.

Miniature world of Clarence Ingham



Craftsman modelmaker Clarence Ingham with a sample selection from the collection of miniature tools and furniture which he has made. Incidentally, the spinning wheel is a working model

FOR the past 30 years Clarence Ingham, of ROF Chorley, has devoted the greatest part of his spare time to a particularly delightful kind of modelmaking.

With keen eye and skilled hand he lovingly fashions items of furniture and workshop equipment in miniature. All are working models and included in his collection is the wood turning machine that he actually uses to produce many of the components.

A chief feature in his display of craftsmanship is a complete workshop of tools as used in the 19th Century. He has built these to two-inch scale and they include moulding planes, hand saws, gauges, a bow saw and a wheelwright's lathe. This is a fully functioning machine and, indeed, all the other tools can also be used.

A joiner by trade, Clarence served in the Royal Air Force during the Second World War and spent a fair chunk of the time in the Middle East. There he became fascinated in the tools used by the Arabs and he locked away in his memory a vivid picture of these pieces. So vivid, in fact, that in 1975 he produced in miniature an accurate representation of a whole range of tools used by a particular Arab carpenter with whom he worked in 1942!

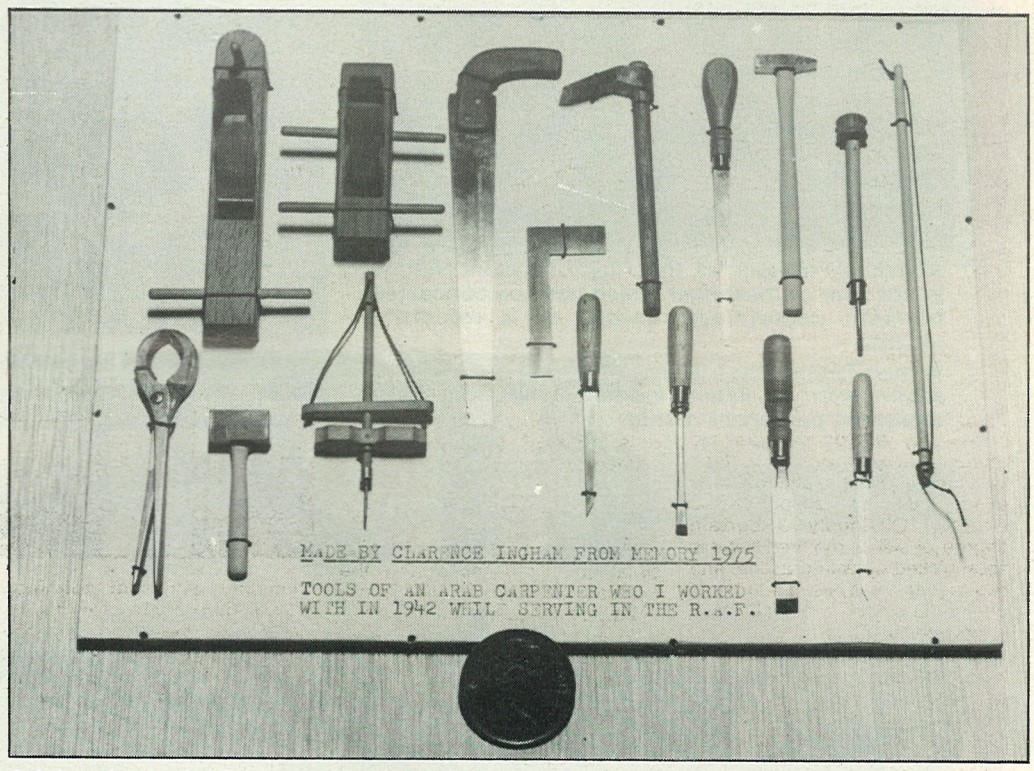
Clarence also has a feel for furniture, which is expressed in his fine small scale productions. These illustrate his interest in the Tudor period and many of the models he has made with reference to full-size items in the Victoria and Albert Museum.

When he brought his collection into work for the models to be photographed for this feature it caused quite a stir among his colleagues who were spellbound with admiration for his craftsmanship.

As these pictures show, he has a rare blend of skill and artistic appreciation, and obviously endless patience.

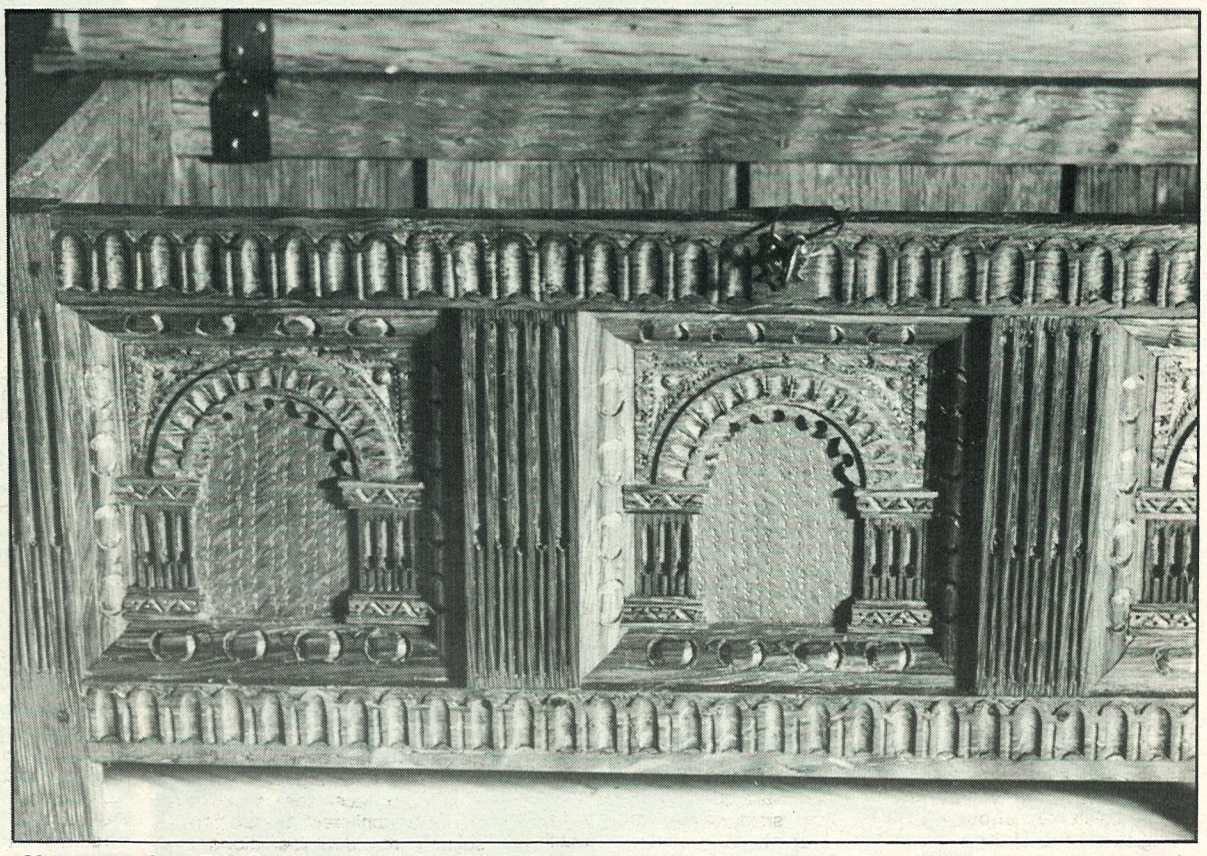
No figure could justifiably reflect the value of such a magnificent collection, nor the craftsmanship and care with which these models have been produced. However, we are sure that if ever Clarence decided to produce work for sale he would find a ready and enthusiastic market.

A minute chess set, also carved by this exceptional craftsman



A joiner by trade, Clarence was particularly impressed by a set of tools used by an Arab carpenter with whom he worked during his RAF service in the Middle East in the Second World War. From memory, he reproduced these tools in miniature, more than 30 years later. The 2p coin illustrates the scale

Another view of some of Clarence's fine work to which he devotes the greater part of his leisure time



Close-up of a 17th Century chest in which Clarence has skilfully represented, in scale, the style of woodcarving of the period. The lock itself can actually be operated

LIONHEART 84

Left: Part of the big counterthrust in which Challengers of the Royal Hussars charged down to the Sibbese Gap to join battle with German Leopards of the Orange ("enemy") Forces, in Exercise Spearpoint — the combat phase of Lionheart

Below: Challenger crews of "A" Squadron, Royal Hussars, are given a final briefing before the battle by their commander, Major John Thoyts, in their forest hide

Above: A trooper of the Royal Hussars stands guard near a Challenger which has ben concealed beneath camouflage netting in a woodland location

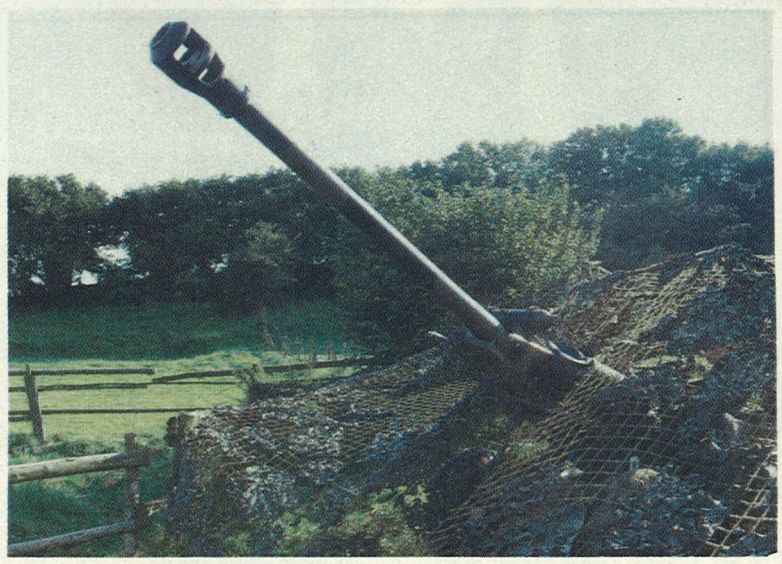
Below: Two soldiers of the Green Howards go into action with an 81mm mortar, firing from their armoured personnel carrier

Left: Soldiers of 204 Tyneside Scottish Field Battery, Royal Artillery (V) — a Territorial unit — with a 105mm Light Gun. The artillery provided supporting firepower in conjunction with the big counter-attack mounted by the defending Bue Forces

Below: A Challenger of the Royal Hussars sets off from its place of concealment in the forest to rendezvous with others from the regiment ready to break out and launch their attack

Left: As well as practising all aspects of mobilisation and combat, an exercise also tests technical support roles, such as servicing and repair of equipment. These soldiers are proving their efficiency in changing a sprocket in the field

Right: This 105mm Light Gun has been blended into the surrounding countryside with effective use of camouflage netting. From only a short distance away it was almost impossible to make it out



● Lionheart pictures by JOHN GREEN of MoD Reprographic Services

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