

WASC 2024
WAI 509
WAROC 9

Law Firing
Demonstration
1978 and

'Answering Ordnance'
No. 20 1998

AMAZING ORDNANCE

No. 20: The LAW 80

The 94mm Light Anti-tank Weapon can be very unpleasant from the wrong side of armour plate. Mark Ribbands investigates.



The LAW 80 was developed by Hunting Engineering in the 1980s to replace the Carl Gustav 84mm anti-tank gun in UK service. The LAW 80 is a single shot, cheap, disposable weapon, designed to be easy to use and so give any battlefield soldier the ability to defeat modern armour out to about 500m. The weapon also fills the short range gap not covered by existing Guided Missile systems, most of which have minimum range problems.

To use the weapon, the soldier removes and discards the two foam rubber end caps and the rifle ejection port cover, extends the launch tube, sets the safe/arm lever, and takes up position. Should a likely target emerge, the firer has the choice of pre-engaging with up to five rounds of 9mm spotting ammunition before sliding a selector lever forwards to enable the main projectile. The same trigger is used to fire both the spotting rounds and the main rocket.

On firing, the propellant charge is all burned well before the projectile exits the muzzle, saving the operator from an unhelpful blast of hot gas and debris directly into his face. The weapon is made even more pleasant to use by the fact that noise is surprisingly low, and recoil insignificant. Once fired, the empty tube is discarded, and all sensible people withdraw from the firing point.

Incorporating an integral spotting rifle was an inspired idea. The semi-automatic aluminium and plastic gun is pre-loaded with five rounds of 9mm flash-head tracer ammunition, of a highly unusual design. On contact with a hard target, the explosion of each flash head bullet, which is ballistically matched to the main projectile, gives the operator a chance to correct his aim before engaging with the main rocket and so revealing his position. This procedure gives a much enhanced probability of first round kill. All anti-tank

weapons produce a highly characteristic cloud of smoke and flame, which, when spotted by the crew of the tank you've just missed, can be very unhealthy indeed.

The LAW 80 consists of a light-weight filament-wound tube, containing the sealed 94mm projectile. A percussion cap in the firing mechanism is connected by a length of HMX shock tube to an igniter assembly within a vaned HTPB rocket motor.

A piezoelectric stack in the safety and arming unit generates enough electricity on launch to charge a firing condenser, which is connected to the initially misaligned electric detonator via a double ogive nose switch. On contact with a hard target the nose cone deforms, which closes the nose switch, completes the circuit and fires the detonator.

No self-destruct is fitted, and it is believed that the firing condenser may hold its charge for some time. Therefore if no crush impact occurs, an armed blind results.

The main warhead is thought to contain about 1kg of EDC1, behind a copper cone. Penetration is reputed to exceed 700mm into rolled homogenous armour. Attached to the launch tube is an 1x optical sight, configured so that a sighting graticule is projected into the firer's line of view. Both eyes may be kept open, and the sight picture is particularly effective and comfortable. A tritium illuminator is provided for low light conditions.

LAW 80 is usually supplied in Unit Load Containers of 24 rounds. Logistics are very simple, in that the weapons are issued directly from the ULC in the same way as ammunition.

All in all, a very well designed and user-friendly piece of kit. Highly recommended.



Visuals from the top:

- Law 80
- 1 Sight
- 2 Carrying strap
- 3 Spotting rifle
- 4 Nose switch
- 5 Warhead
- 6 Warhead initiating train
- 7 Detonator
- 8 SAFU
- 9 Igniter
- 10 Non-electric initiation
- 11 HTPB rocket motor
- 12 Fins

• Mark Ribbands with LAW 80

• The spotting rifle is pre-loaded with five rounds of very unusual 9mm. The first round, already chambered, is nickel plated, presumably to prevent barrel corrosion.

RVA WIN BLUE CHIP CONTRACTS FOR 1998

Richard Vann Associates, Yorkshire-based demolition consulting engineers, has started 1998 with a bang by winning three new contracts from blue chip clients.

The Defence Evaluation and Research Agency has engaged RVA, through RVA client Comax Secure Business Services Limited, to demolish a number of buildings on sites in Malvern and Pershore, Worcestershire. The company's role entails the preparation of the safety plan and contract documentation, the selection of the contractor and assistance with engineering and safety matters throughout.

The sites house some highly sensitive pieces of operational equipment, requiring scrupulous control methods with regard to dust and noise.

Rhône-Poulenc Agriculture Limited has asked RVA to act as planning supervisors and consulting engineers with regard to the demolition of the Diuron plant on Rhône-Poulenc's site in Staveley, Derbyshire.

And an existing RVA client - Tyseley Waste Disposal, based in the West Midlands - in a joint venture as Midlands Construction Materials Limited, has engaged Richard Vann Associates to act as planning supervisors and consulting engineers during Stage One of the works on the Castle Bromwich site, which involve the partial demolition of existing buildings originally used for incineration but more recently for material processing, as well as the dismantling and removal of plant for re-use.

Stage Two will see RVA involved in contract administration, engineering supervision, financial controls and the fulfilment of the planning supervisor role.

Richard Vann, principal of RVA, said he was very pleased with three contracts. "It's a more than satisfactory way to begin 1998," he said.

ICI to sell explosives interests to Orica

ICI has announced the intended sale of its American and European commercial explosives businesses to its former sister company ICI Australia, which was sold by the ICI Group during 1997.

The new company intends to trade under the name Orica and will be the world's largest manufacturer of commercial explosives, commanding approximately 20 per cent of the global explosives market, with its main manufacturing sites in Australia, Canada, the US, Brazil and the UK.

ICI manager Allan Clements said: "This is excellent news for the extractive industries world-wide. Orica is primarily an explosives group, focused entirely on supplying the needs of the mining, quarrying and related industries, and will bring a fresh and innovative approach to the application of explosives technology.

"The group includes the two major technical centres of the former ICI Explosives, at McMasterville in Canada and Kurri-Kurri in Australia, thereby assuring access to leading edge technology and a continued stream of innovative new products and services."

ICI Explosives/Orica are working to ensure a seamless transition to the new ownership as soon as possible.

A new general manager of the European operations has already been appointed. He is Stephen Connolly, formerly the ICI Nitrocellulose business manager, whose considerable experience in explosives includes a period as general manager of Emirates Explosives (EMEX) in Dubai.

CHIEF INSPECTOR RETIRES



Ian McKay (Vice President) presents Eddie Williamson on his retirement with an inscribed tankard as a gift from the Institute.

George Edward (Eddie) Williamson retired on Friday 6 February as HM Chief Inspector of Explosives. He began his career with ICI and joined the HSE with considerable practical experience in industry. He rose through the ranks of the Explosives Inspectorate to become Chief Inspector in 1986, the thirteenth in an unbroken line which began in 1875 when Col. Vivien Majendie (who wrote the Explosives Act almost single-handed) became the first Government Inspector of Explosives. Eddie worked tirelessly to promote health and safety in the explosives industry - he was determined that the industry should recognise that it had onerous duties under health and safety legislation and should shoulder them squarely, but he was aware of the industry's problems and was ever alert to means whereby they could be overcome. His tenure as Chief Inspector will be remembered for the tremendous changes in explosives legislation brought about by the UK membership of the EC. The thanks of all of us go to him for his persistent battling for UK rights in this difficult area. We thank too his colleagues in the Inspectorate and send best wishes to Alan Duckworth who takes over as acting Chief Inspector.



LAW
Firing Demonstration
1978

The UK Light Anti-Armour Weapon for the 1980s (LAW)

LAW is being developed to meet the UK General Staff Requirement 3658. This calls for an inexpensive, man-portable, discardable system to replace the existing M72 and Carl Gustav. The weapon is required to have the following major characteristics

Effectiveness	A high Single Shot Kill Probability (SSKP) against the Warsaw Pact Main Battle Tank (WP MBT) of the 1980s
Maximum weight	6 kg
Maximum length	1 m in the carrying position

The Royal Armament Research and Development Establishment (RARDE) aided by the Rocket Motor Executive and the Royal Ordnance Factories has now concluded the Project Definition phase by establishing a sound technological base on which to build the Full Development phase. Full Development, which started on 1st July 1978, is being conducted under the Prime Contractorship of Hunting Engineering Limited.

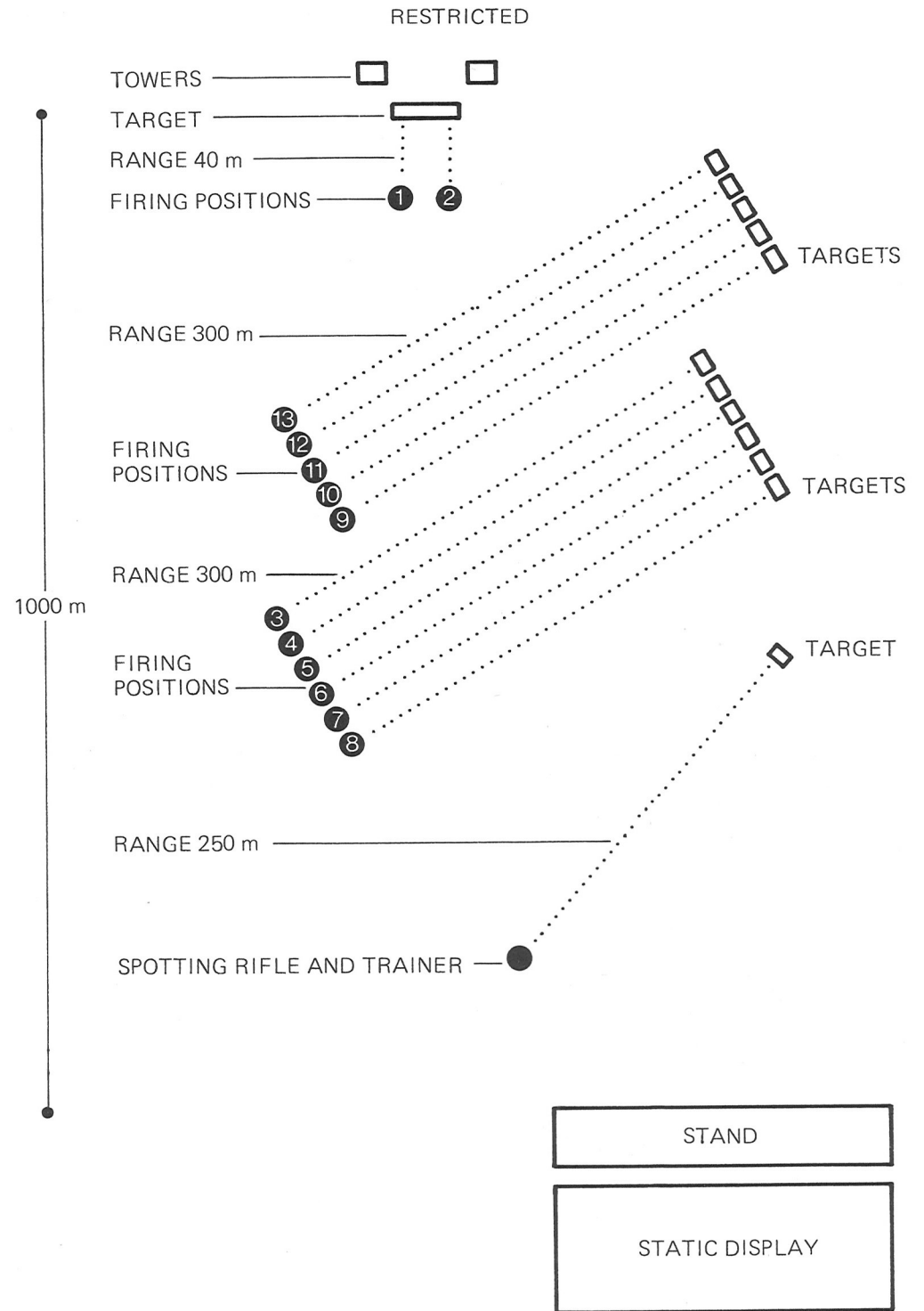
To-day's programme will include the firing of test vehicles and warheads developed by RARDE during the Project Definition phase to demonstrate the range, accuracy and lethality achieved to date.

PM Wpns 3
Ministry of Defence
St Christopher House
Southwark Street
London SE1

Programme-19th July 1978

The static display and firing demonstration are classified CONFIDENTIAL.

- 08.30 Hrs** Depart Fleetbank House by coach for Shoeburyness
- 10.00 Hrs** Assemble at Shelford Battery P&EE Shoeburyness
- 10.30 Hrs** Static Equipment Display and Introduction
- 11.00 Hrs** Firing Demonstration
 - Serial 1 — Warhead firing at 40 m to demonstrate penetration of representative armour plate
 - Serial 2 — Accuracy shoot to demonstrate dispersion at 300 m
 - Serial 3 — Safety Arming and Functioning Unit (SAFU) demonstration
 - Serial 4 — Spotting Rifle firing against 6 ft x 6 ft steel plate at 250 m
 - Serial 5 — Training Launcher firing to demonstrate the Noise Generator
- 12.45 Hrs** Lunch in RA Officers Mess Shoeburyness
- 14.15 Hrs** Discussion and briefing on the Full Development phase by Hunting Engineering Limited in the RA Officers Mess Ante-Room
- 15.30 Hrs** Depart Shoeburyness by coach for Unity Pier Woolwich
- 17.00 Hrs** Depart Woolwich on sightseeing cruise of the Thames
- 21.00 Hrs** Disembark at Tower Pier and Disperse



Visitors and Staff Attending the Demonstration

IEPG Panel Members

Federal Republic of Germany

R Dir Dr H. Schmidt	Ministry of Defence (Armament vii 4)
RB Dir R. Schwab	Office for Defence Technology and Procurement
Lt Col W. Lemb	Office for Defence Technology and Procurement

France

ICA R.M. Meunier	Technical Director of Tactical Missiles
Lt Col C. Mouton	General Staff

Italy

Lt Gen G. Piovano	Director General of Land Armament and Ammunition
Maj Gen P. Valentini	Chief of Armament Procurement
Lt Col S. Fantuzi	General Staff

Netherlands

Maj IR J.G.C. Kiemeneij	Army Material Procurement Command
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Norway

Maj R. Andersen	Army Material Command
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Turkey

Col S. Canova	Ministry of Defence
Mr A. Tosun	Chief of Rocket Research and Production Centre

UK Ministry of Defence

Gen Sir Hugh Beach	Master-General of the Ordnance
Maj Gen D.E. Isles	Director General of Weapons (Army)
Rr Adm W.D. Lang	Military Deputy to Head of Defence Sales
Mr R.L. Goldsmith	Director Light Weapons Projects
Col T.A. Teague	General Staff (Operational Requirements) 2
Maj T.A. Marsh	General Staff (Operational Requirements) 2
Lt Col C.J. Airy	Military Assistant to Master-General of the Ordnance

Lt Col P. Marsh	Master-General of the Ordnance Secretariat 3(bc)
Maj M.A. Willcocks	Master-General of the Ordnance Secretariat 3(b)
Col P.R. Haslam	Project Manager Weapons 3
Lt Col S.B. Ball	Deputy Project Manager Weapons 3
Mr R. Robins	Weapons 3

Royal Armament Research and Development Establishment

Mr W.B.H. Lord	Director Royal Armament Research and Development Establishment
Mr W.A. Clayden	Head of Guns and Rockets Department
Mr A. Sutherland	Superintendent Guns and Rockets 3
Mr L.A. Wareham	Development Project Officer LAW
Mr N. Griffiths	Head of Explosive Engineering and Terminal Effects Department
Mr C.R. Evans	Superintendent Explosive Engineering and Terminal Effects Department 2
Col D. Ewart-Evans	Guns and Rockets 3

Propellants' Explosives and Rocket Motor Establishment

Mr K.E. Silman Superintendent Solid Motors
 Dr G. Williams Project Officer LAW
 Mr G. Spickernell Solid Motor Development

Royal Ordnance Factories

Mr A.G. Whitehead Assistant Director ROF Blackburn
 Mr J.D. Cheetham Factory Secretary ROF Blackburn

Hunting Engineering Limited

Mr D.B. Fowden Defence Sales Director
 Mr J.T. Southgate Project Manager LAW
 Mr A.A. Butler Project Chief Designer
 Mr M.H.V. Brown Assistant Project Manager (Finance)
 Mr A.P.H.B. Fowle Land Systems Development Co-ordinator

Directory of Embassies and National Airlines

Embassy

Federal Republic of Germany

199 Knightsbridge
 London SW1X 7JT
 Telephone: 01-589-8263

France

58 Knightsbridge
 London SW1X 7JT
 Telephone: 01-235-8080

Italy

5 Lygon Place
 London SW1W 0JR
 Telephone: 01-730-8800

Netherlands

38 Hyde Park Gate
 London SW7 5DP
 Telephone: 01-584-504

Norway

25 Belgrave Square
 London SW1X 8QD
 Telephone: 01-235-7151

Turkey

43 Belgrave Square
 London SW1X 8PA
 Telephone: 01-235-1959

Airline

Lufthansa

Telephone: 01-437-9797

Air France

Telephone: 01-499-8611

Air Italia

Telephone: 01-408-1188

KLM

Telephone: 01-568-9266

SAS

Telephone: 01-734-6777

Turkish Air Lines

Telephone: 01-499-9249

Notes
