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Sonic bangs to fibre "whiskers"

Researches behind the closed doors

E.R.D.E. AT WALTHAM ABBEY LIFTS THE CURTAIN OF MYSTERY

By Lesley Richards

THE Explosives Research and Development Estab-I ment, Waltham Abbey, which has been shrouded in mystery throughout its life, opened its doors to a cross-section of the public recently and revealed itself as a research centre of tremendous importance in the fields of explosives and of industry.

In the establishment's extensive research work in connection with weapons, discoveries are made that are of great practical use in everyday life. It is also the establishment's

world

E.R.D.E to weapon-design es-

tablishments for trial. Propel-

lant processing plants at the establishment range in size

facility unique in the free

A rocket motor, which had

been packed with propellant

at the E.R.D.E. before the pro-

ject was abandoned, was on

display to visitors, as were

solid propellants with a burn-

ing time ranging from a few

seconds to one or two minutes

Recent work on solid pro-

with the Martin Baker Air-

and one of 550lb.

proud boast that every weapon which goes into service with the armed forces of Britain contains something that has been made within its 500-acre site at Waltham Abbey

All this is achieved with the The establishment has been maximum degree of safety for concerned in many missile projects, including that of the all the 900 employees and the establishment is entering new abandoned Blue Water. fields all the time in the protection of employees. Rocket motor

All services

As the only research organi-sation in the United Kingdom engaged in the field of propel-lants and explosives, E.R.D.E. serves all fighting services.

The establishment carries out a great deal of research and testing so that it can ad-vise on the production, use and safety of weapons and this work is necessary whether the weapon is British or, like the Polaris, purchased from abroad.

of an aircraft ejector seat Every eventuality is catered suitable for use within a few for in the production of ex-plosives. Because the Army feet of the ground. Ejector seats made by this company drop their weapons from the backs of trucks, the E.R.D.E. are sold in many foreign countries, including America. research into the effects of this and ensure that weapons The establishment has also are safe in these circumbeen responsible for the improvement in the manufacture stances.

Taxpayers spend a great deal of money on them so armaments must still be usable in 12 or 14 years' time and retain maximum efficiency.

Age effects

So that weapons will store for these lengths of time the establishment carries out ex-tensive experiments into the weathering and effects of age on charges.

Examples of solid propellants that had deteriorated

On the side that would seem more practical to the layman, the establishment is carrying out research into the behaviour of plastics, rubbers, adhesives, fibrous substances and other materials.

Recent months at the factory have seen the discovery of a process that should substantially improve the ageing characteristics of ted X-ray machine to ensure

there are no faults.

Sonic bangs

Noise is a source of_constant interest to the factory and research into sonic bangs is going on at the moment. When a new aircraft is designed the establishment can pack ex-plosive into a "washing-line" type form to produce the exact sonic bang that particular aircraft will produce.

In this way it is possible to judge the nuisance that will be caused by a particular aircraft and, if necessary, reduce it while it is still in the design stage. Over 100 sonic bangs have been produced at the factory in recent weeks. from laboratory to full-pro-duction scale and provide a

The "whisker" plant at the establishment-which is known to be one of the largest of its kind in the world — is produc-ing perfect fibres in the form of short whiskers, which will be used in the reinforcement of aluminium alloy and nickel alloys and give them many times their natural strength. Still in the experimental stage, the process has enormous possibilities.

The 900 employees engaged on these and other works in the 250 buildings of the establishment include 80 university graduates, 120 people with Higher National Certificates, about an equal number with manual skill and 100 trained in the processing of explosives.

pellants includes collaboration Immense precautions a r e taken to protect these men and, in the testing of explocraft Co. in the development sives, the operators are placed in separate chambers from the work they are carrying out, protected from the explosives by a thickness of concrete and heavy earth banks. Work in these cases is by remote control.

An ear protector which saves the men from permanent deafness caused by exploof combustible cartridge cases yet enables them sions. and export sales are hoped hear all other sounds at the normal frequency, has refor. These cases are particu-larly important in tank warcently been patented by the ERDE fare where they obviate the storage of used shell cases in

the confined space of a tank. In the field of liquid pro-pellants the E.R.D.E. is concentrating on the study of heat-transfer characteristics under the conditions encountered in liquid rocket propellant engines. The find-ings are proving of great interest to the designers of industrial boilers.

TWO bangs, although more usually heard as one, are made by this representation by the E.R.D.E. of a sonic bang. Explosive is packed into a "skipping rope" in varying amounts to give an

> **First-ever** newspaper photographs from E.R.D.E. by

> > JIM TAYLOR

accurate representation of the

TO ensure the safety of employees many processes are carried out by remote control with the employees separated from the process by a thickness of concrete and earth. Here an operative is seen controlling a process with the aid of closed-circuit television.







during the period of storage had been unable to escape were on display for visitors to inspect.

Solid propellants produced at the establishment are required to burn at a precisely predetermined rate for a precise time with a standard thrust and should retain their characteristics for an indefinite period. This is a tall order, but an order the establishment are meeting all the time

New compositions ranging improve the safety of people from a few pounds to many handling the final weapons. tons are supplied by the

Test firing

The marked increase in the performance of military explosives has resulted in the construction of a new building at the establishment where raw materials will be processed into explosive compositions and fired under predetermined conditions. These operations are carried out with employees under safe cover and data is collected that will be used to



MOLTEN high - explosive is seen being transferred into a "kettle" prior to its transfer to a mould. This toffee-like substance will soon set into a solid mass from which test charges will be machined.