

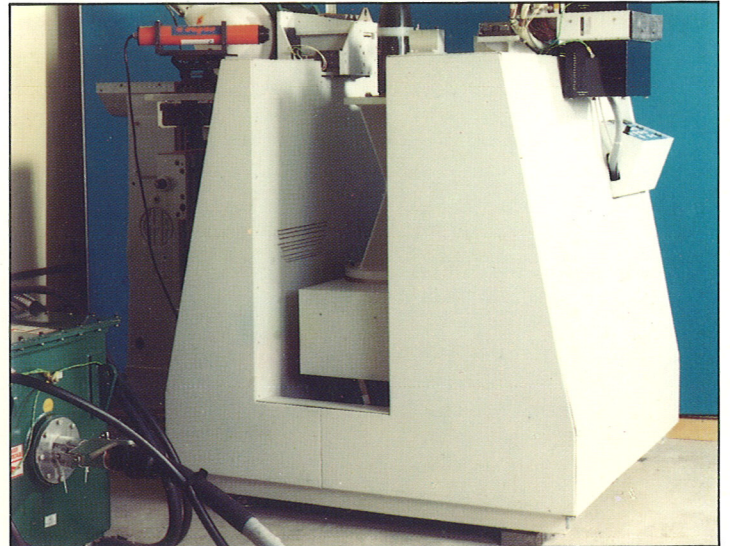
WASC 2040

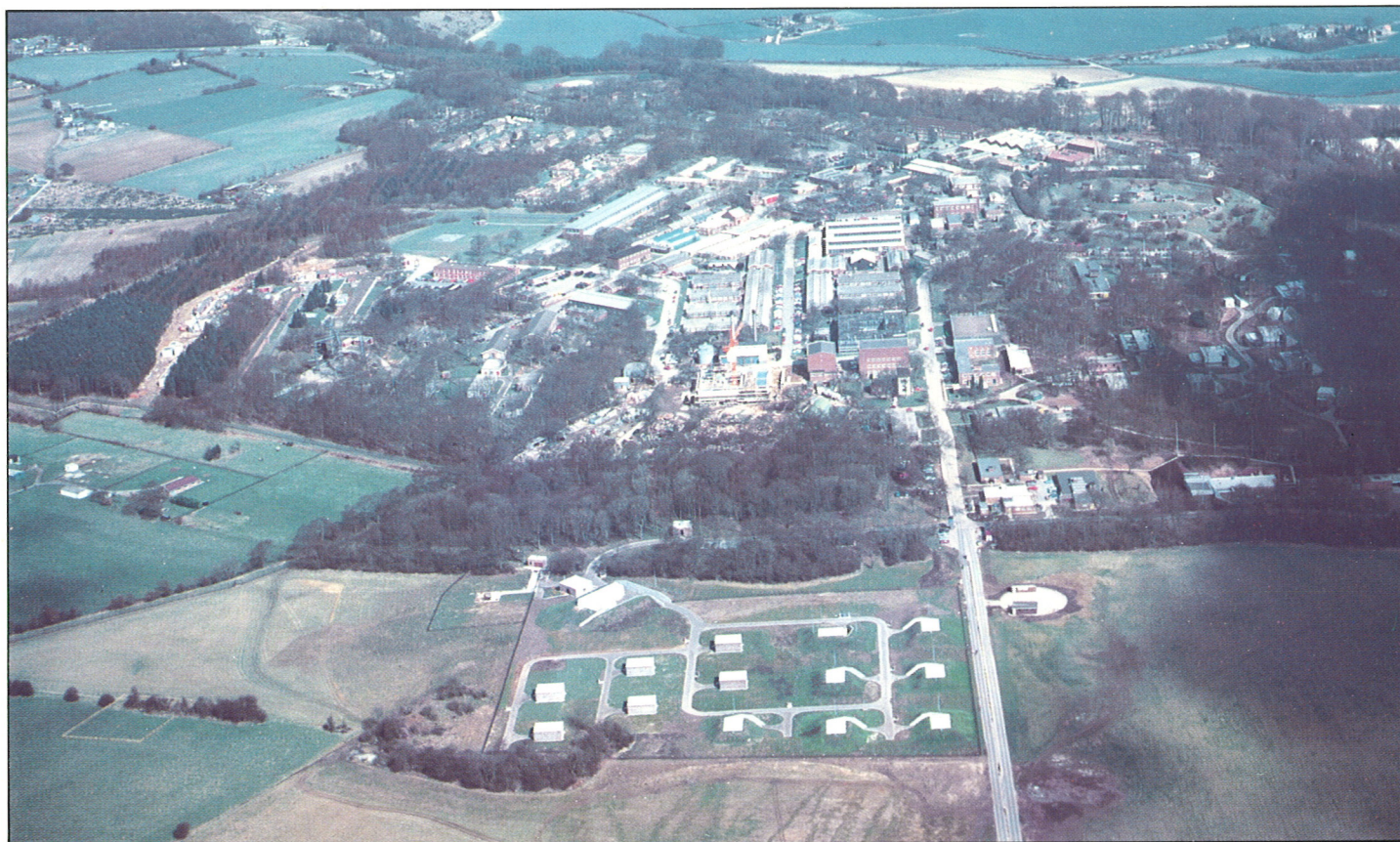
WAI 523

RARDE Test
Facilities



RARDE TEST FACILITIES





RARDE (Fort Halstead).

A message from Dr. T.P. McLean, Director RARDE

Within RARDE we have a unique range of skills and facilities. These facilities taken together have a replacement value of well over £250M. Some have always been available to industry and other outside customers, but recently we have started to promote all our facilities **actively** to customers. We are able to quote realistic terms as to price, timescales and other conditions and to negotiate when required. In this small brochure it is only possible to give a very brief outline of what our facilities are, but I do hope that it gives you a good picture of their scope and possible application in your work. We look forward to working with you.

Tom P. McLean

RARDE

The Royal Armament Research and Development Establishment (RARDE) is the Ministry of Defence's centre for research and development in the fields of weapons, ammunition, land vehicles and armour for the three services, and computers, information systems, assessment, military bridges and engineer equipment for the Army. The Establishment has a civilian staff of some 2500, including 1000 scientists, engineers and technicians covering a very wide range of disciplines and technologies, plus 200 officers and other ranks mainly from the Army.

The Headquarters of the Establishment is:

**RARDE, Fort Halstead, Nr SEVENOAKS,
Kent TN14 7BP**

Tel: Knockholt (0959) 32222

The Establishment has four other main sites as follows:

**RARDE, Chobham Lane, CHERTSEY, Surrey KT16 0EE
Tel: Ascot (0990) 23366**

**RARDE, Barrack Road, CHRISTCHURCH,
Dorset BH23 2BB**

Tel: Christchurch (0202) 484431

**RARDE, Powdermill Lane, WALTHAM ABBEY,
Essex EN19 1AX**

Tel: Lea Valley (0992) 713030

**RARDE, Girdstingwood, KIRKCUDBRIGHT,
Scotland DG6 4QZ**

Tel: Dundrennan (055 75) 271

Comprehensive Facilities

R and D activities at RARDE cover a wide spectrum from speculative long term research which can last many years, to testing and evaluation in direct support of equipment procurement and acceptance by the MOD. A very comprehensive range of test and trials facilities has been established to support these R and D functions. In line with the Government's drive for value-for-money, RARDE is now actively promoting the use of these facilities by industry and other organisations for Defence or Civil work at competitive rates. This activity is known as the Facility Management and Marketing Initiative (FMMI). There is a highly competent staff of professionals and technicians experienced in planning, designing, implementing, analysing, evaluating and reporting on tests, trials and experiments in the facilities. RARDE's reputation for professionalism, total integrity and impartiality is seen by present customers as a most valuable asset.

Your initial point of contact is:

**Mr C M (Mike) Cook
Facilities Exploitation Manager
RARDE**

Chobham Lane

CHERTSEY Surrey KT16 0EE

Tel: Ascot (0990) 23366 (Ext 2719/2582)

Mr Cook is the co-ordinator for the Facility Management and Marketing Initiative (FMMI).

The purpose of this brochure is to make potential customers, whether or not connected with the defence equipment industry, aware of what RARDE can offer in terms of test facilities. Facilities are grouped under nine headings each of which is briefly described. The brochure is amplified by an insert which lists all the facilities under each heading.

Environmental Testing

At Chertsey the recently commissioned Climatic Laboratories comprising two large chambers are unique in Europe. The Complete Vehicle Climatic Chamber (CVCC) is hexagonal, 19.8m across flats and 14 m high, and any realistic combination of temperature, humidity, wind, rain, ice and solar radiation can be produced under controlled and repeatable conditions which can be maintained even when the equipment under test is running at full power. This chamber is

not restricted to vehicles; extensive tests on a running helicopter have already been carried out. The Climatic and Altitude Chamber (CAC) can reproduce similar climatic conditions to the CVCC combined with altitude ranging from 0-4300 m (14000 ft). It is 20 m long, 5.6m wide and 5.6 m high.

Chertsey also has a range of smaller climatic chambers and cabinets.



Westland Lynx Mk3 in Climatic Chamber - Chertsey.

The Longcross Rain Facility - Chertsey.



Engine and Component Testing

The Automotive Laboratories at Chertsey have six engine and transmission test cells, each capable of dissipating 1120 kW (1500 hp) with a full range of sophisticated control, data recording and analysis facilities, in addition to facilities for the testing of heat exchangers and tyres. These laboratories are accredited to NAMAS.



Challenger power output testing in Automotive Test Cell - Chertsey.



10 tonne load capacity Tyre Test Machine - Chertsey.

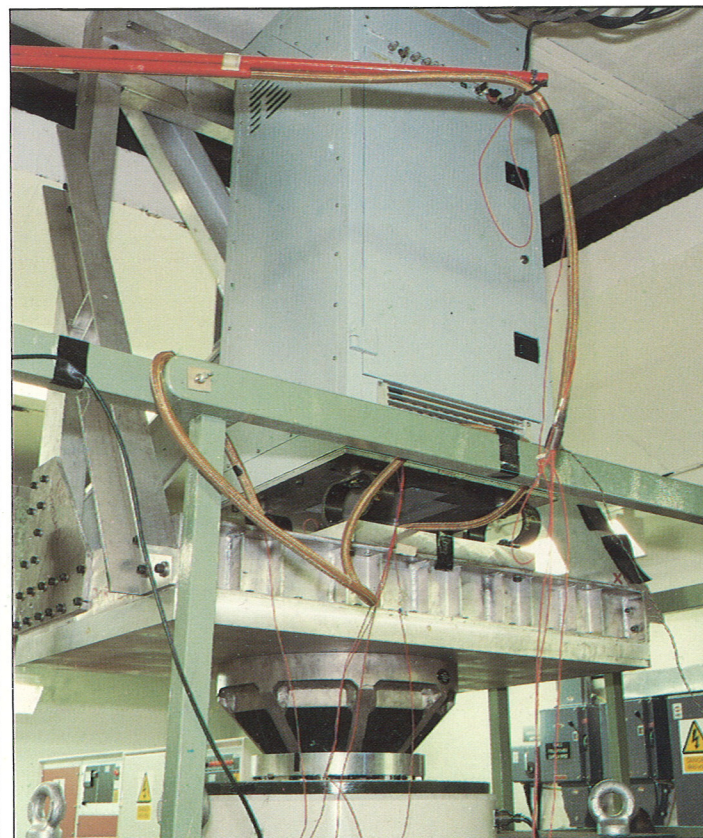
Mechanical and Structural Testing

Under this heading come the large structural load and fatigue facilities at Christchurch, which include the unique Bridge Testing Rig for structures up to 183 m x 10.5 m x 8 m, having a loading capacity of 5000 kN (500 ton f).

RARDE Christchurch, with its appropriate facilities, is the recognised UK centre for ISO freight container testing and also has equipment for subjecting materials to a variety of tensile, compressive and fatigue tests. In addition to these facilities at Christchurch, Chertsey's extensive vibration testing facilities can be applied to a wide range of systems, equipments and components such as vehicle suspensions, radios and optical sights.



Bridge Testing Rig - Christchurch.



Vibration test of electronic control cabinet - Chertsey.

Vehicle and Plant Testing

The scope of the test track facilities available at RARDE is unique in the UK and in some respects worldwide. Here all types of vehicles and civil construction equipment can be subjected to a wide range of tests, including durability and reliability testing under selected conditions, and a variety of performance and safety trials. This group of facilities is already used by a great many customers outside the Defence field, including the automotive and construction plant industries, film companies and motoring magazines.

In the Chertsey area is the Longcross Automotive Proving Ground which has an asphalt track 3.2 km long for both wheeled and tracked vehicles, a straight section and connections to other circuits including a "snake" (twisting hill) course designed to provide handling and stability testing for all types of vehicles. Longcross also has a tilt platform, slip pad, articulation gauges, suspension courses, sand and rocky terrain courses, and a variety of other facilities. Nearby, at Bagshot, are situated a 5.9 km rough-road course for wheeled vehicles and a 5.6 km Alpine track. The test area at Long Valley, near Aldershot, has a 1 km square cross-country area for tracked vehicles, a rough road, a high-speed tracked vehicle course and a wheeled vehicle cross-country course, all 6.4 km in length.

At the Plant and Mechanical Handling Test Centre, Hurn, about 16 km from Christchurch, is a full spectrum of test facilities for civil engineering construction equipment. Dynamometer cars are available, including one for the BS2800:1957 ten-hour test. Test tracks with various surfaces allow performance and braking efficiency assessment. There are also bogging and wading tanks, a stability platform, test slopes and facilities for earthmoving and shovel output testing. Safety assessment facilities include overturning ramps, plus falling object and roll-over protective structure test equipment.



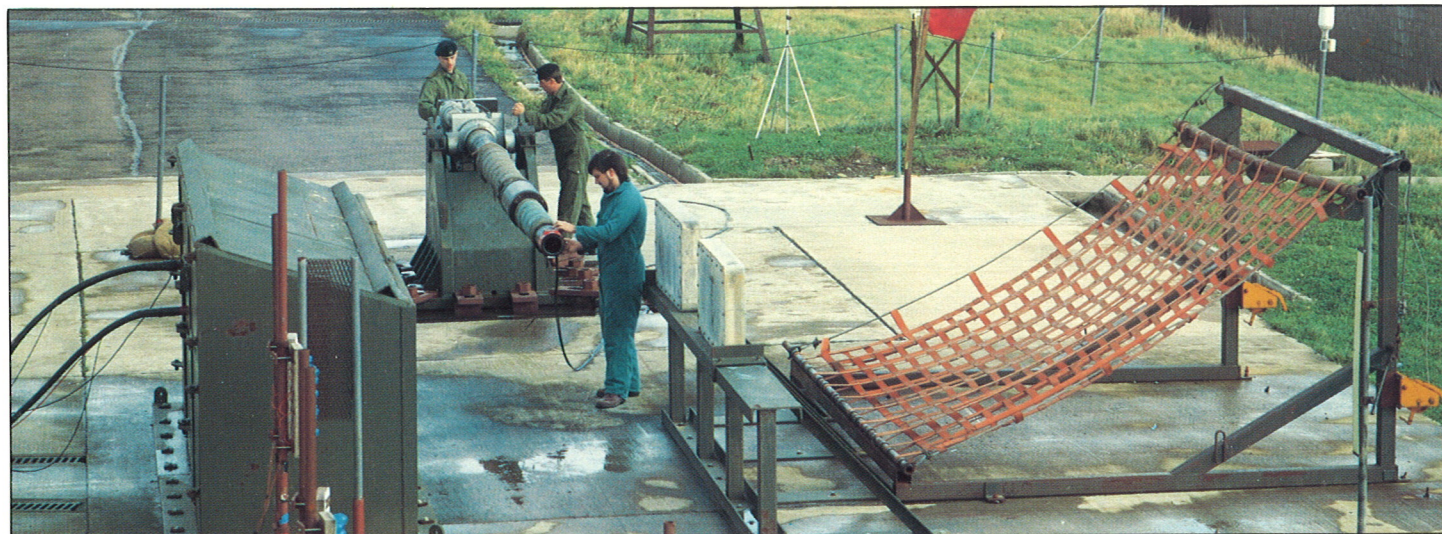
Commercial vehicle Press launch at the Longcross Automotive Proving Ground - Chertsey.



Rough terrain fork lift truck in the Hurn Wading Tank - near Christchurch.



The Hurn 60 tonne Tilt Platform - near Christchurch.



Flash X-ray and synchro ballistic projectile photography facilities - Kirkcudbright.

Ranges

At Kirkcudbright there is a 5000 acre firing range, with a sea safety area of 560 sq km under radar surveillance, for trials of large-calibre direct-fire weapon systems and protective armour subjected to ballistic and explosive attack. Static targets up to 3500 metres from fixed firing points can be engaged, and vehicle mounted weapons can be fired while on the move over a specially constructed "figure of eight" course. A computer controlled moving target facility provides crossing or approach speeds up to 28m/s. Kirkcudbright has comprehensive instrumentation, data analysis and high speed photographic facilities.

Fort Halstead has three enclosed ballistic firing

ranges of 80, 100 and 200m length with the ability to fire guns of up to 40mm calibre, supported by a full instrumentation service. Also at Fort Halstead is an enclosed firing facility primarily designed for rocket testing which includes a working section, a 50m flight range and silencer section. Camera ports are provided in the walls and roof of the flight range which has a soft recovery butt. A full instrumentation and data reduction service is available on this facility. There are also many facilities for testing pyrotechnic and similar devices.

The Chertsey site includes a covered range for investigating the effects of smaller calibre weapons on armour.

Explosives Facilities

The Waltham Abbey site has several points for the experimental firing of all types of energetic materials. Skid testing, where a bare charge is dropped obliquely onto a standard rough surface, is one special capability; another is a unique underwater facility known as Newton's Pool, where the performance of explosives detonated under water is assessed by blast gauges. Other special facilities include

blast overpressure measurement (at certain firing points) and ultra high speed photography (6 million frames per second) enabling detonation and deflagration-to-detonation phenomena to be investigated. Waltham Abbey and Fort Halstead have several other facilities for explosives testing listed in the insert.



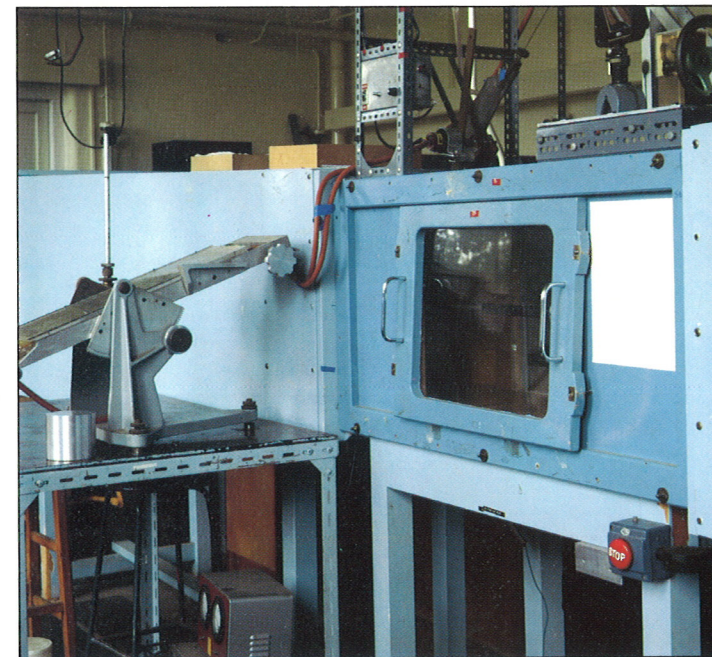
Harrier canopy fragmentation using miniature detonating cord - Fort Halstead.



Newton's Pool Underwater Firing Facility - Waltham Abbey.

Wind Tunnels

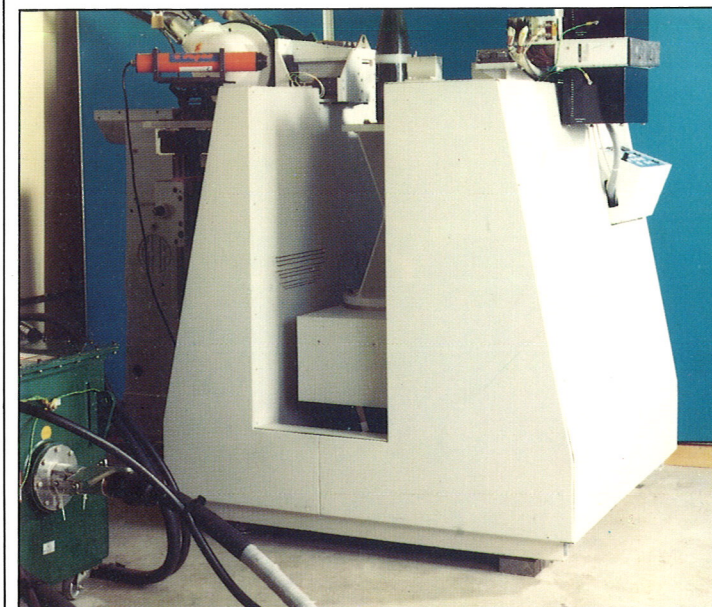
Fort Halstead has two wind tunnels. The first is a small open circuit tunnel 457mm (18in) square, capable of operating at velocities up to 45.8m/sec (150ft/sec). Its prime use is the study of subsonic projectiles. A six-component strain gauge balance, linked to a dedicated computer, provides tabulated or graphical printouts of the results. Other support items include pressure manometers, smoke for flow visualisation, a three degree of freedom rig and an air bearing for spin and spin/damp tests. The second tunnel is a blow-down tunnel capable of operating at Mach 5 to Mach 6 and at Reynolds Numbers of 5.9×10^6 per metre (2×10^6 per foot). Running time is 10 seconds with a 127mm (5 inch) diameter working section.



Subsonic Wind Tunnel - Fort Halstead.

Non-Destructive Testing

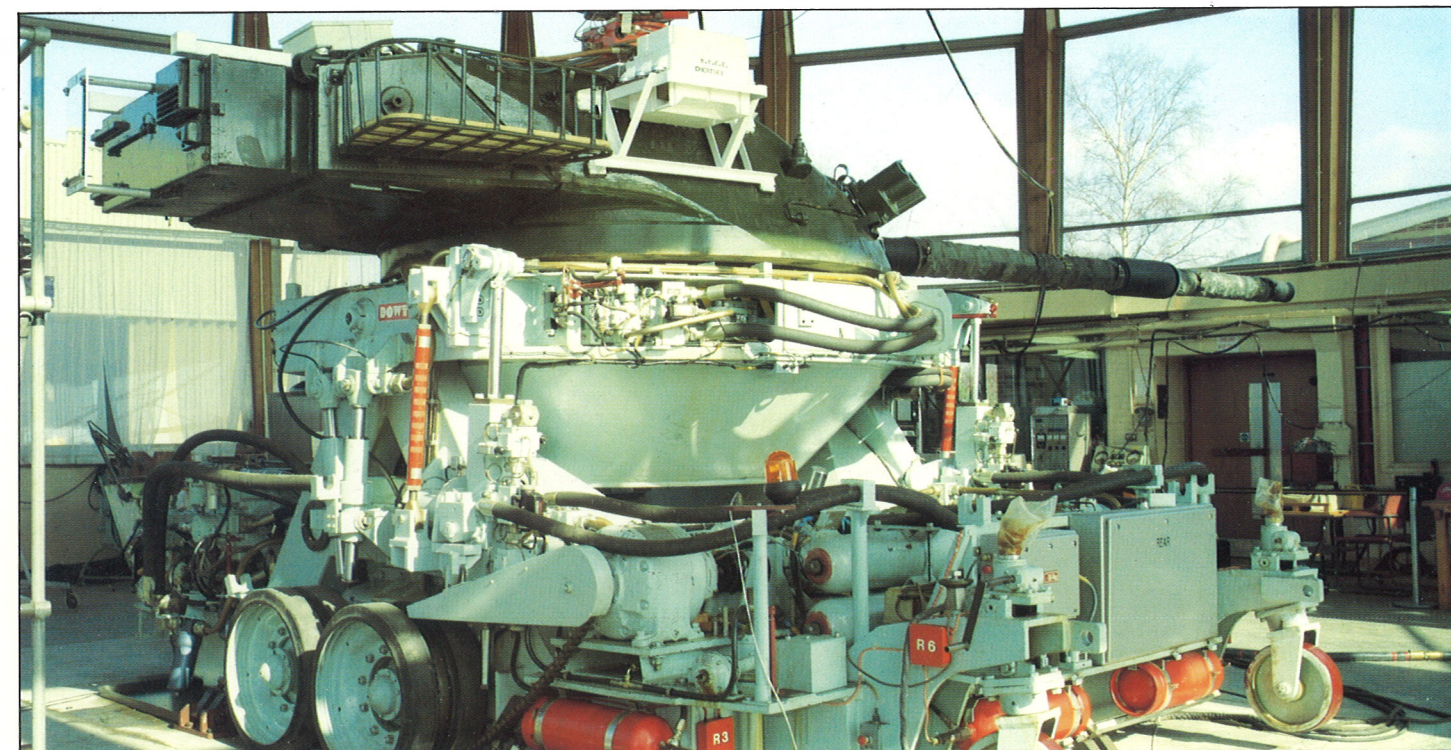
There are unique radiographic facilities available for non-destructive testing at Fort Halstead. The radiographic cells have a High Explosive capacity of 200 kg of 1.1 classification explosive. A high energy Linear Accelerator is available, capable of radiographing up to half a metre of steel. There is also a Computerised Axial Tomography scanner coupled to a 420 kV constant potential X-ray machine to give 50mm (2 inch) penetration in steel. A sealed-beam microfocus X-ray is available giving direct projected magnifications of up to 50 times. Other X-ray facilities for sensitive components are available, as are ultrasonic scanning equipments.



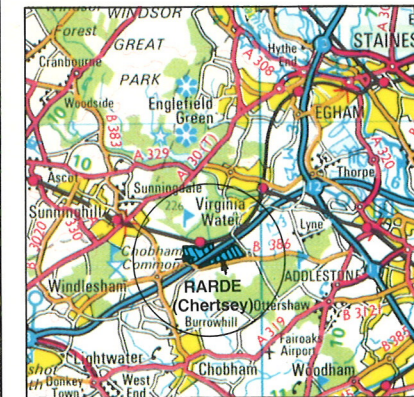
Computerised Axial Tomography - Fort Halstead.

Other Facilities

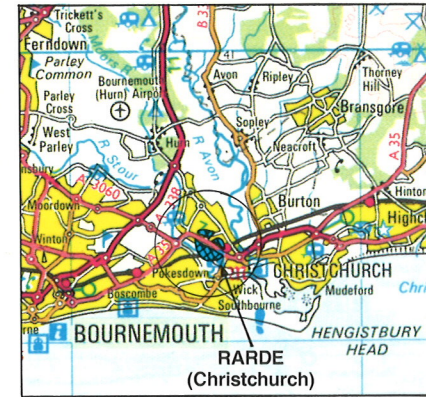
RARDE has a very wide range of other facilities not covered by the above headings, which are listed in the insert.



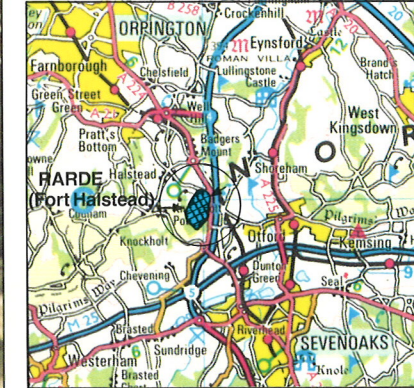
Turret system testing on the Hull Motion Simulator - Chertsey.



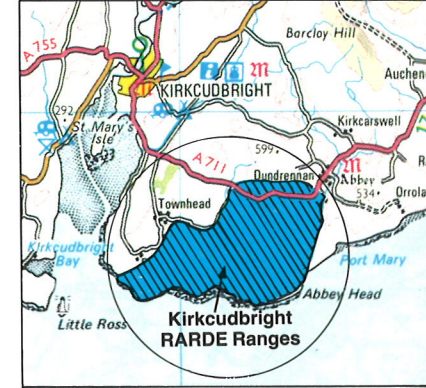
Chertsey



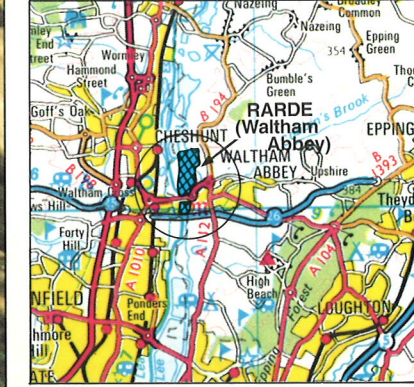
Christchurch



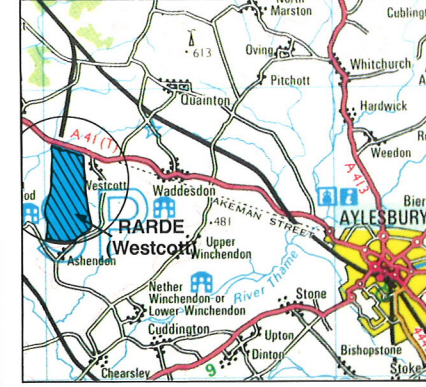
Fort Halstead



Kirkcudbright



Waltham Abbey



Westcott