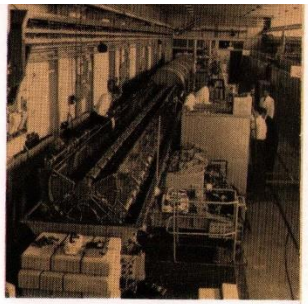
DESCRIPTION



A general view of the machine with the vacuum and inner lid off tank 3 showing the drift tubes.

The first accelerator at the Rutherford High Energy Laboratory to become operational was the Proton Linear Accelerator. This machine accelerates protons in a straight path as against synchrotrons etc., which accelerate protons in circular paths.

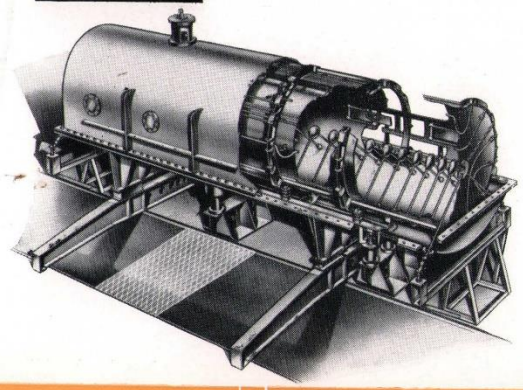
The machine consists of three evacuated tanks with a total length of 100′. Each tank consists of a resonant cavity excited at 200 Mc/s by pulsed R.F. power. Protons are injected at 500 KeV into the machine and progressively accelerated up to 50 MeV. Increase in energy occurs in the gap between a series of hollow cylindrical electrodes spaced at intervals down the axis of each resonant cavity.

In full operation it is expected that the mean proton current will exceed 5 micro-amperes (3×10^{13} protons/sec), corresponding to a peak pulse current of 0.5 milliamperes. This beam will be many times greater in intensity than is achieved with other accelerators of this kind. The beam has a well-defined energy, a very important factor in nuclear physics research.

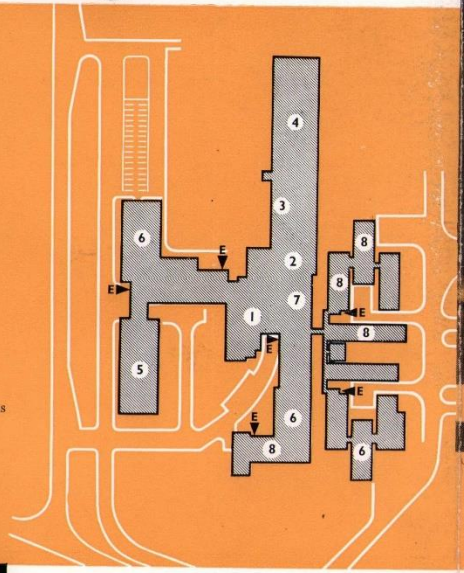
Nuclear research is carried out with the emergent pulses of protons from the accelerator. Teams of physicists from the Universities, the Atomic Energy Authority and the National Institute carry out experiments, all broadly aimed at studying details of nuclear structure. It is the prime purpose of the Rutherford Laboratory to provide all facilities including the design, manufacture and installation of experimental equipment, to user requirements.

A planned programme of development of the accelerator to higher energies and intensities is being carried out by a combined team of physicists and engineers.

TANK ONE



1. Workshop Area
2. Injector Room
3. Linear Accelerator
4. Experimental Areas
5. Radiochemical Labs.
6. Laboratories
7. Control & Counting Rooms
8. Office Block

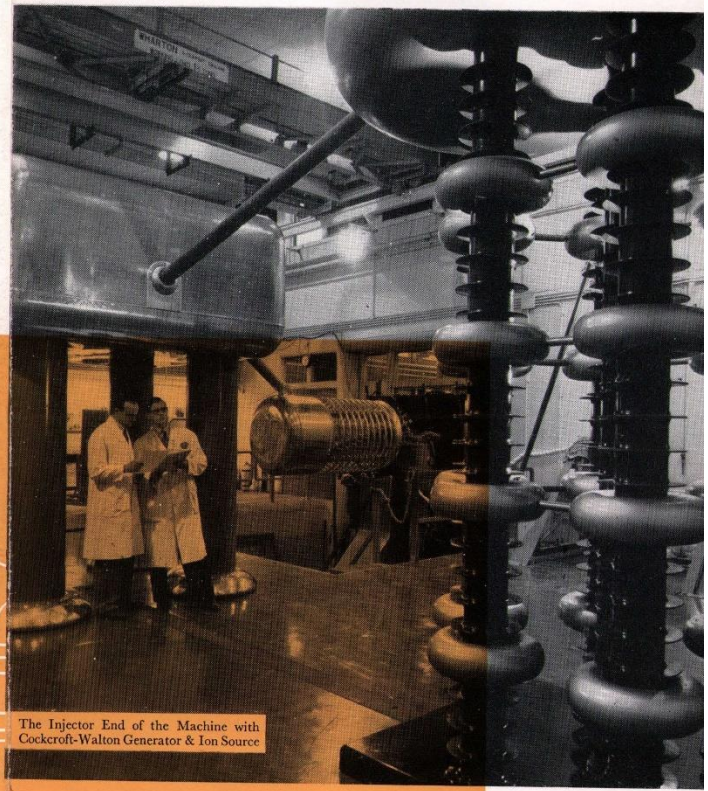


SITE PLAN

I.S. LEAFLET No. 291359

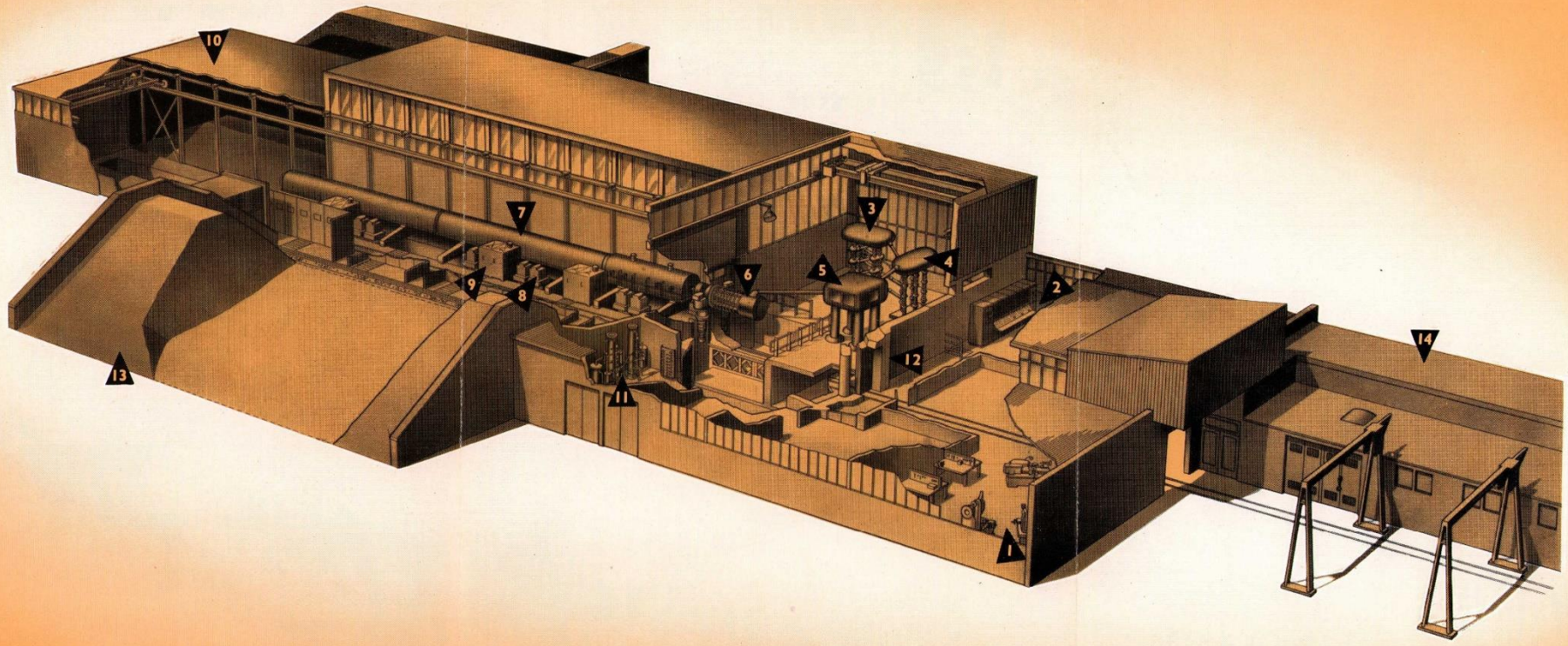
NIRNS

RUTHERFORD HIGH ENERGY LABORATORY



The Injector End of the Machine with Cockcroft-Walton Generator & Ion Source

50 MeV Proton Linear Accelerator



General View

50 MeV Proton Linear Accelerator

KEY

1. Main Workshop
2. Control and Counting rooms
3. Cockcroft-Walton 500 K.V. generator
4. Filter stack for 500 K.V. generator
5. High Voltage Platform
6. Proton Source and injector
7. Accelerator
8. Vacuum pumping units
9. R.F. Valves
10. Experimental areas
11. De-mineralised water plant
12. Shielding Wall
13. Earth Shielding
14. Offices and Laboratories