high-resolution spectrum showed the $^{235}UF_6$ Q-branch (consisting of many superimposed $\Delta J = 0$ transitions) to be clearly separated from nearby individual $^{238}UF_6$ rotational lines. Robinson said that these results were a key first step to doing laser isotope separation, but he did not discuss further steps at the meeting.
—GBL

Funding approved for British laser facility

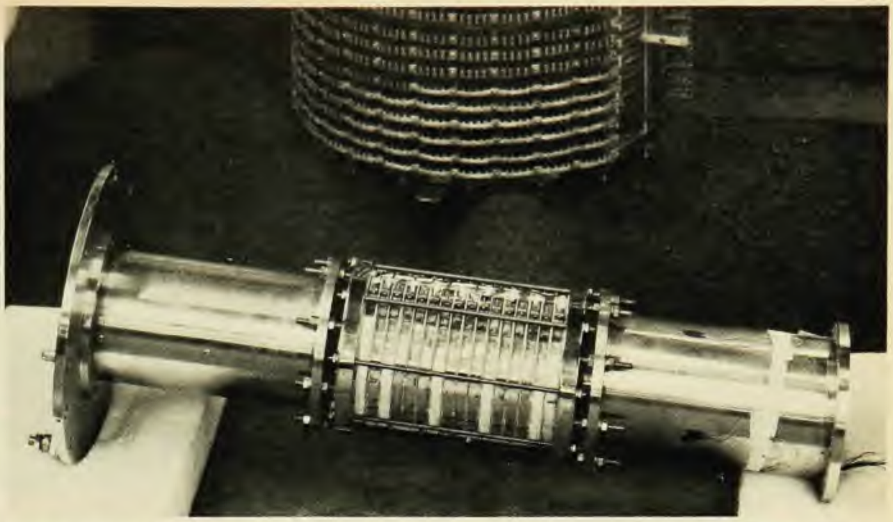
A large, central laser facility for academic users groups has been approved by the British government and will be constructed at the Science Research Council's Rutherford Laboratory at Chilton, Oxfordshire. The facility will have a neodymium-glass laser system capable of achieving power densities greater than 10^{15} watts/cm^2 on target. The laser will have a rod amplifier expected to be able to deliver 10 joules in 100 picosec on a plane target or to act as a driver for a disc amplifer capable of delivering more than 200 joules in 300 picosec. Splitting the disc-amplifier output into two beams will be possible, so that the beams can be separately focused onto a spherical target for symmetrical irradiation.

The facility will be used mainly for the study of the interactions of very intense optical and infrared radiation with matter and the study of very dense plasmas produced by laser compression of matter. In addition, development of high-power lasers will be pursued.

Initial installations are expected to cost about £ 1.5 million, and the total expenditure on the facility is anticipated to be about £ 1 million per year. Plans for the project were drawn up by a steering committee headed by Dan J. Bradley (Imperial College, London).

Rutherford Lab staff will set up and operate the lasers and provide equipment and support for users; the laser-facility staff is expected to reach 40 in about two years. Close consultation with potential users is expected to continue.

Strongest superconducting magnet installed in Japan



Inner section of 175-kG superconducting magnet, wound with vanadium–gallium tape, produces 40 kG. The length of the inner magnet is 23 cm, and it has a clear bore of 31 mm. The outer section (visible in rear), which is wound with niobium–tin tape, produces 135 kG in a 160-mm bore.

A 175-kG superconducting magnet was recently installed at the Japanese National Research Institute for Metals in Tsukuba Science City, an hour's ride from Tokyo. Built by Intermagnetics General Corp of Guilderland, New York, the magnet is the highest-field completely superconducting magnet in the world. The previous record, established two years ago, was held by an IGC magnet with a field of 158 kG, built for the Mullard Cryogenic Laboratory at Oxford University.

The new magnet system is made in two concentric sections. The outer magnet, which produces 135 kG , is wound with a superconducting niobium–tin tape manufactured by IGC. It has a clear bore of 160 mm. The inner magnet, which produces the remaining 40 kG, is wound with a superconducting vanadium–gallium tape. The inner magnet has a clear bore of 31 mm; in other words the 31-mm-diameter area is available for experiments at 175 kG, and experiments can be done to 135 kG in the 160-mm bore of the outer magnet. The lengths of the outer magnet and inner magnet are 63 cm and 23 cm respectively. According to Carl H. Rosner, president of IGC, the 175-kG field is uniform within 1% over a length of about 5 cm.

The magnet is operated at 4.2 K in liquid helium and energized with less than 2kW of power. Vanadium–gallium is used for the inner magnet because it has a higher current-carrying capacity than niobium–tin above 150 kG. Both materials, however, remain superconducting to about 225 kG at 4.2 K.

The $450 000 magnet system "... represents the nucleus of a new and significant national facility available for use to the entire Japanese scientific community," Kyoji Tachikawa of the Japanese National Research Institute for Metals said. The Institute, a metallurgical research facility, will use the new magnet to study the behavior of magnetic materials and high-field superconductors. Tachikawa actively worked on the development of vanadium–gallium and has had its properties tested at the Francis Bitter National Magnet Laboratory at MIT. The material is now commercially available from Vacuum Metallurgical Co. Ltd. in Japan and IGC in the US.

Tachikawa said that the success of the new magnet system demonstrates that vanadium–gallium and niobium–tin "can now be used successfully for the production of ultrahigh-field magnets, and that the scientific goal of a 200 000-gauss superconducting magnet is now within grasp."

The record for most intense continuous magnetic field is essentially shared by two laboratories. The Bitter Laboratory has a water-cooled magnet that reached 255 kG in 1965. About two years ago the Kurchatov Institute in Moscow operated a hybrid magnet (a combination of a water-cooled magnet and a superconducting magnet) at about 250 kG.—GBL

PETRA and PEP

continued from page 17

device by a 40-MeV or a 400-MeV linear accelerator, to a final energy of 7.5 GeV. DORIS, a double-beam storage ring linked to DESY, was upgraded last year to store 4.3-GeV positrons and electrons. DESY and DORIS are expected to be employed to inject particles into PETRA according to the following scheme: Trains of 30 bunches of positrons or electrons would be injected at a rate of 50 Hz from one of the two linear accelerators into DESY, where they would be accelerated to an energy of 2.2 GeV. The particles would then be transferred to DORIS and accumulated there, while single bunches of positrons or electrons would be simultaneously ejected from DORIS to DESY at a rate of 1–10 Hz and further accelerated to 7 GeV. At this energy the particles would be injected into PETRA. For comparison, injection into PEP is simple, since electrons and positrons can be injected directly from the 20-GeV linear accelerator at SLAC.

Voss notes that both DORIS and DESY, in addition to their new function, are expected to continue in their present roles. DORIS would have a pair of horizontal "kicker" magnets added on to permit single-bunch particle ejection.