

## Study on CERN Library use

With the coming spread of CERN's activities on to the new French site, various services available to the personnel will have to be extended and located so as to best serve the whole enlarged area. One of these services is the Library, with its related activities, and the Library Committee has recently set up a 'Working Party on future policies of CERN's Scientific Information Service' to enquire into its future. The Working Party, which brings together Library users and Library staff under the chairmanship of Prof. L. Kowarski, has as its first task the study of the future type and distribution of reading rooms on the site and the location of the main holdings of books and periodicals.

A necessary part of this study is a reappraisal of the scope of the Library and the relative weights to be given to the central field of interest (high-energy physics) and the more peripheral fields (such as chemistry, astrophysics, computer science, questions of managements etc.). Other tasks of the Working Party will be concerned with more extensive use of computer techniques in the various operations of the Scientific Information Service, as well as the position of CERN in relation to developments elsewhere in information retrieval.

It is hoped that the full recommendation of the Working Party can be presented before the end of this year; preliminary answers to the first part of the study will be available earlier. As part of this study, a questionnaire was circulated at the end of June to a widely defined spectrum of actual and potential users of CERN's library facilities with the aim of establishing more precisely the present user pattern, including the proportion of people in particular groups who in fact *do not* use the Library, and whether this proportion is in relation to the services available.

The Working Party intends to use the replies to this questionnaire as a basis for its recommendations on Library scope and siting. At the same time, it recognizes that the smaller the response, the less accurate the conclusions that can be drawn (does a missing reply denote a non-user of the



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Library or an extensive user who did not send back the questionnaire?), so that a high proportion of replies is being eagerly awaited. First indications were favourable (in the first ten days after the Questionnaire was mailed, about 500 replies were received); more replies are expected to come in, thus bringing the response closer to a truly significant expression of the users' opinions.

## New r.f. cavities

In the May issue (page 87) we reported the arrival of the motor-alternator set which will increase the repetition rate of the proton synchrotron by a factor of two or three. The new power supply enables the rate of rise of the magnetic field in the synchrotron ring to be doubled and, to make full use of the consequent increase in repetition rate, the addition of extra radio-frequency cavities to the ring is being studied.

The new cavities are very different in design to the existing cavities. In order to fit into short straight sections, their axial

length is limited to 1 m, and they have the maximum diameter, 2.4 m, which can be accommodated with the height of the beam path over the floor of the ring tunnel. The cavities would come into operation 80 ns after injection, at the second harmonic of the acceleration frequency, and would make it possible to accelerate the protons twice as fast during most of the rise-time of the magnet field.

To study the interaction between the proton beam and a 'high-Q' cavity of the new type, a test cavity, tuned to 19 MHz, has recently been installed in the synchrotron ring. Measurements which were carried out with the cavity connected to its damping network showed no effect on the beam. However, the importance of such studies for the future is evident from the measured value of about 30 kV which was induced in the unloaded cavity (i.e. without its damping network) by a beam of  $10^{12}$  protons. This would correspond to about 300 kV induced by a beam of  $10^{13}$  protons, and beams of this intensity are scheduled in the second stage of the improvement programme.



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A prototype r.f. power amplifier, intended for laboratory tests with the 19 MHz cavity has been delivered by Brown Boveri and Co., and is installed in the Ejection Building. This amplifier works in the frequency range of 17.2 to 19.1 MHz. The peak power dissipation amounts to 680 kW, whereas the average power is about 100 kW. The amplifier is being run-in in preparation for its acceptance tests.

## ISR Magnet Core Contract

The contract for the production of the steel cores of the main magnets of the intersecting storage rings has been authorized to go to the firm ASGEN, Italy, with ITALSIDER, Italy, as subcontractor for the steel. The value of this contract is just over 17 million Swiss Francs.

The two intersecting storage rings, which have an average diameter of 300 metres, will each consist of two kinds of magnet core, a focusing type and a defocusing type (96 of each per ring). Their purpose is to hold the proton beams

to effectively constant orbits in the rings and to maintain a focusing effect to prevent the beams dispersing.

The stringent requirements of beam storage impose very tight tolerances on the magnetic field configuration across the magnet aperture and from one magnet unit to another. The fields at corresponding points of the apertures of the various magnet units in one ring must be the same to 0.05 %. These restrictions apply over the range of magnetic field levels that might be required (corresponding to various energies of the stored beams).

The field configuration is determined by the geometric shape of the magnet pole profiles and by the magnetic characteristics of the steel. To keep within the specified tolerances for the magnetic field, the pole profiles must be punched with an accuracy of 0.015 mm and the average magnetic permeability of the steel cores must be very uniform (e. g. to within 2 % at 15 kilogauss).

The magnets will be constructed of low carbon steel laminations, 1.5 mm thick, punched by a precision die and welded

together. To achieve the specified degree of uniformity between the different magnets, each one will be made up of laminations from batches of steel coming from all parts of the delivery.

In the tendering process, many firms in the Member States were contacted and tenders were received from 8 manufacturers with 6 steelmakers as potential sub-contractors. The contract was finally authorized at the meeting of the Finance Committee on 13 June.

## Visits to Russia

In the latter part of June and in early July, about a dozen CERN scientists visited the Soviet Union. First of all, Dr. Goldschmidt-Clermont and Dr. Winter went to the Institute of Professor Budker at Novosibirsk. They then went to Serpukhov where they were joined by Professor Cocconi and Drs. Kuiper, Lazeyras, Lengeler, Lock and Ramm for several days of discussions with Professor Logunov and his colleagues on all aspects of the collaboration now being established between CERN and the High-Energy Physics Institute.

Some of the group then returned to Geneva, while the remainder travelled on to Riga (Latvia) where they were joined by the Director General, Professors Bethelot (Saclay), Citron (Karlsruhe), Van Hove, and Dr. de Raad, for a meeting of senior scientists organized by the Joint Institute for Nuclear Research, Dubna. Three days were spent discussing the future perspectives in high-energy physics with particular reference to CERN, Dubna and Serpukhov. The Soviet participants included Professors Bogolubov (Director of Dubna), Blokhintsev, Dzhelepov and Pontecorvo.

After this meeting, the Director General with four other colleagues from CERN went to Leningrad where they visited the Electro-physics Institute (Komar) of the State Committee for the Utilization of Atomic Energy, which is responsible for the design and construction of most of the accelerators in the Soviet Union. The Director General then flew to Moscow where he was joined by Mr. Hampton for the signing of the Agreement on collaboration at Serpukhov. (See the article on page 123.)

A reproduction of a page from the logbook of the 600 MeV synchro-cyclotron recording the first circulating beam on 1 August 1957. The entry is by Professor W. Gentner, who was then Head of the Synchro-cyclotron Division, followed by the signatures of many of those who contributed to the construction and commissioning of the first CERN accelerator.

## Vacation students

Once again this year some 100 students have chosen to spend their summer vacation working at CERN. For times varying from two to four months they will mingle with the CERN personnel, studying physics problems, taking part in an experiment and following a series of lectures, instead of sun-bathing on a beach at the seaside.

The students come from the 13 Member States of CERN and were carefully chosen from over 350 who applied. They have all spent at least three years at University specializing in physics, electrical engineering, electronics or mathematics. During their stay they join one or other of the Divisions: proton synchrotron, synchro-cyclotron track chambers, nuclear physics apparatus, storage rings, data handling and health physics where they will be involved in the everyday work. They can, in particular, take part in the development and use of the experimental equipment, become familiar with the use of electronic computers and work on the new accelerator projects.

This annual invasion is not designed to step up the output of work from CERN but rather to give the young university students the opportunity to gain experience in the field of their studies, to learn to work in a team, to have some foretaste of their future careers in research laboratories and in industry.

In addition, the students have the chance to attend a series of lectures and special courses given by CERN specialists including some of the Directors of Departments and Division Heads, on subjects such as computer programming, accelerator technology, theoretical physics, experiments in sub-nuclear physics, etc...

In this way, the 100 vacation students will take part in the life of a big laboratory such as CERN, and will be able to improve their theoretical grounding through the lectures and their practical experience though their work in the different Divisions which receive them.

The 1<sup>st</sup> of August 1957 we had a short celebration after the appearance of the first circulating beam

W. Gentner

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