

At a time when magnetic tapes are very much in the news here is a sight to give any judge a headache. This is just part of the stock of 40 000 tapes which has been moved to the new computer building at CERN. It also illustrates the problem of data storage which is one of the present headaches in the field of high energy physics.

The r.f. system is designed to obtain a high quality beam. Unlike the present linac, where a modification to an accelerating cavity involves modifications to the other two as well, the systems in each cavity are separate from the point of view of the r.f., each with its own control arrangement. This will allow the phase and level of the r.f. to be maintained within very close limits (better than 1 % for the amplitude and 1° for the phase).

The protons leaving the new linac will join the beam-line from the present machine. A beam measuring system will be installed at the output of the new linac making it possible to monitor the beam quality independently of the present linac. This system will include transverse and longitudinal emittance measurements.

With its operational flexibility and the quality of the beam which it will provide, the new linac should satisfy the foreseeable requirements for years to come. In spite of the decision to build a new one, the present linac has not yet been abandoned. Its performance should still improve and it is required to accelerate protons for another four years — 30 % of its total working life so far. Thereafter, it will be allowed to collapse into well-earned retirement.

Computers

After a running-in period which was expected to last about a year, the new central computer, the CDC 7600, can now handle more work than all the other computers at CERN put together. However, it is difficult to measure the work load of a computer, whose state of health can be compared to that of the economy of a country — a different opinion comes from each expert consulted.

A sector now giving cause for concern is that of magnetic tapes



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(mere coincidence). Difficulties arise in computing for high energy physics because they are so numerous and differ in format. The large quantity of tapes poses problems in machine operation because the mass of information they transmit can saturate the information transfer channels. The diversity of format, creates software problems, since each type has to be processed separately in a different way.

However, a solution seems to be gradually emerging and the use of magnetic discs will help to deal with the tape bottle-neck. At the end of October a third large capacity disc was connected to the 7600. It will be used to store the data from several tapes in frequent use and will considerably lighten the operators' task. Furthermore, the work load of the channel linking the tape units and the central memory is considerably reduced.

For the multi-computer move to the new computer centre (see vol. 13, page 257), the difficult stages are over and the last computer, the 6500, is now being brought into operation in its new home.

And one for sale

An SDS 920 computer, nine years old by now, is no longer needed at CERN and is for sale at a very low price.

Old age strikes quickly in the world of computers!

It has a core memory of 8000 words, a typewriter, a paper tape reader and punch, two magnetic tape units and 16 priority interrupt levels. Its dotage may still be of use to someone, particularly in the field of education, and further details may be obtained from CERN, 1211 Geneva 23; telephone 41 98 11, extension 2180.

SCIP progress

In our October issue we published two topical photographs (page 299) concerning the improvement programme at the 600 MeV synchro-cyclotron. This work colloquially known as SCIP — Synchro-Cyclotron Improvement Programme — is now well under way.

The machine came into action at CERN in 1957 and has supported a very lively series of experiments for fifteen years. During this time the needs of many of the experiments (and the abilities of machine technology to meet these needs) have developed to the point where a rejuvenation of the synchro-cyclotron has become necessary. The improvement programme was accepted in 1968 and its main aims are to increase the circulating current from 1.5 to $10 \mu\text{A}$ and the ejected beam from 5×10^{11} to 10^{13} protons per second. After a long

Welding, on 14 November, of the metal joint between the vacuum chamber and the pole piece of the synchro-cyclotron magnet.



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period of preparation, installation work began in June 1973 and has reached the following stage:

The magnet has had a series of mechanical modifications which are now complete. A vertical hole has been drilled through the yoke and the pole pieces, to allow a new ion source to be introduced from below. New coils are mounted and the vacuum chamber is installed. For the previous chamber, O-rings were used to seal the vacuum chamber but were not very satisfactory. Flexible metal joints are therefore being used and their welding, which is now taking place, is one of the most delicate operations of the reassembly. First tests on the revamped magnet have taken place on schedule.

In parallel, work has been going on to replace almost all the cabling between the machine and the control room and also the cooling system. The new r.f. system, the most complicated

item of the SCIP, is being run in and the second rotary condenser is expected at CERN soon.

At the beginning of January, magnetic field measurements will begin and field corrections will be applied. This will involve around ten weeks of work. In March 1974 the r.f. system and ion source will be installed and, if the present rate of progress is sustained, it is hoped that the rejuvenated SC will be tested in May and June.

CERN School of Physics

The 1974 CERN School of Physics is being organized together with the Daresbury Laboratory and will take place at Cartmel Fell, Windermere, United Kingdom, from 16 to 29 June. The basic aim of the School is to teach various aspects of theoretical high energy physics to young experimental

physicists from the CERN Member States although some non-Member State, participants will also be accepted.

The Programme is devoted to electromagnetic and weak interactions and courses will be given on — Phenomenology of weak interactions by C. Jarlskog, CERN, with K. Kleinknecht, University of Dortmund, as discussion leader; Deep inelastic processes by P. Landshoff, University of Cambridge, with A. Hey, CERN, as discussion leader; e^+e^- by R. Gatto, University of Rome, with K. Schilling, University of Bielefeld, as discussion leader and Unified theories by J.S. Bell, CERN, with M. Veltman, University of Utrecht, as discussion leader. There will also be some additional lectures on special topics and reviews of the experimental programmes of some of the major physics Laboratories.

Further information may be obtained from Miss D.A. Caton, Scientific Conference Secretariat, CERN, CH-1211 Geneva 23, Switzerland.

Demineralised water on tap

Laboratory II is using a new method to demineralising the water for cleaning components to be used in the SPS vacuum system. This method makes use of the principle of reverse osmosis.

When two liquids are separated by a porous membrane, water passes by osmosis from the more dilute to the more concentrated solution. The difference in level after osmosis corresponds to the osmotic pressure. In the reverse direction, if a higher pressure than the osmotic pressure is applied to the more concentrated solution, water will pass towards the more dilute solution. This is used at Laboratory II for the primary demineralisation of water