

The cryostat of the 3.7 m European hydrogen bubble chamber swinging into position in the bubble chamber hall at the end of November. Further news from BEBC — the last pancake for the superconducting magnet coils was completed on 14 December.

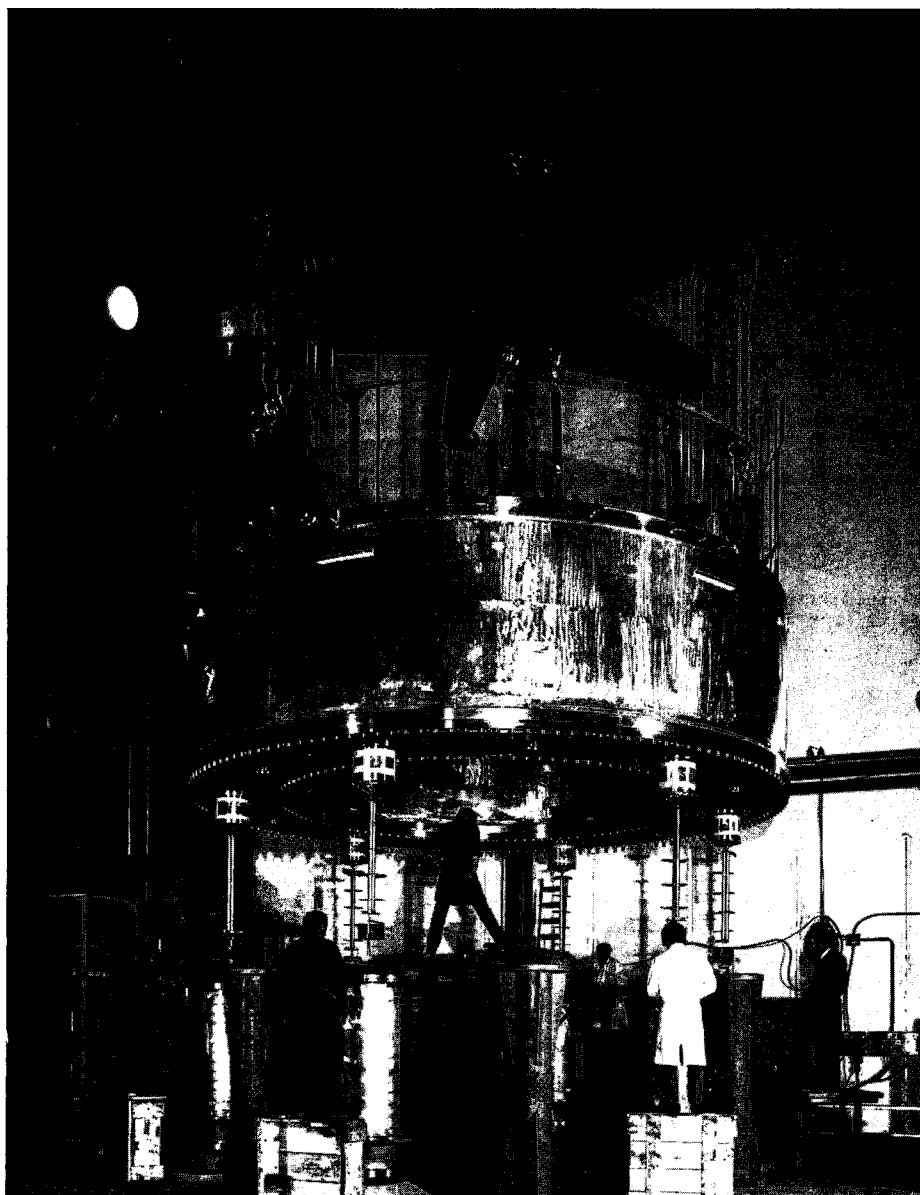
European Molecular Biology Conference

The European Molecular Biology Conference resumed its 1970 session on 26, 27 November under the Presidency of H. Voirrier. (The earlier meeting in April, which was also held at CERN, was reported in vol. 10, page 117.) Major items on the agenda were a discussion on a plan of activities covering five years and decisions on aspects of administrative structure.

Working parties were set up by the Conference to study the proposal for a European Laboratory of molecular biology and other plans of collaboration, the intention being to submit specific plans to the governments of the Member States in the near future. Most delegations to the Conference gave strong support to the proposal to set up a European Laboratory for molecular biology, in line with the scientific opinion within their countries. The Federal Republic of Germany has already offered to be host to such a Laboratory and has suggested Munich as its site. The possibility of locating the Laboratory close to CERN site in Geneva has also been mentioned. The Scandinavian delegations, however, and Sweden in particular, believe that, rather than an international centre, more collaboration between national centres could prove the better way to further the research.

Four working parties together with the European Molecular Biology Organization (EMBO), are to prepare detailed plans for the development of a European Laboratory and at the same time investigate possible ways of extending collaboration between national centres. They will report back to the Conference at a special session in October 1971.

In discussing a five year plan of activities, covering the years 1970-74, a total budget of 6 million units of account (a unit of account being equivalent to a US dollar) was agreed. It is predicted that the current budget for 1970 (714 000 units) will rise to about double in 1974. For 1971 the agreed budget is about one million units and will be used mainly for funding various types of fellowship in molecular biology research. A Finance Committee was formally constituted under the Chairmanship of A. Alline.



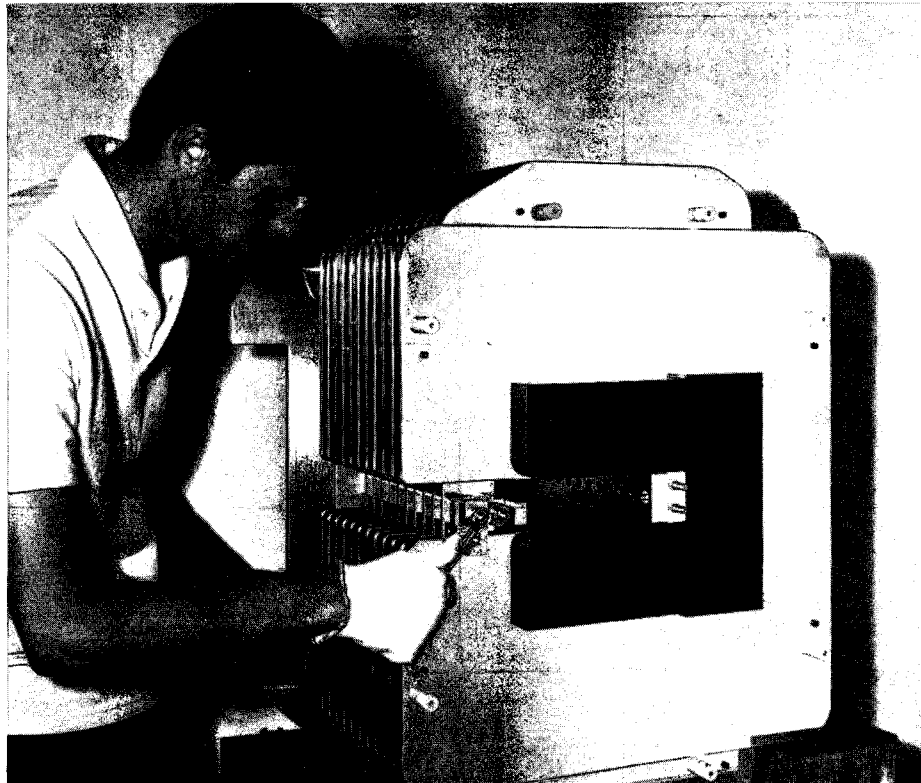
CERN/PI 248.11.70

Fast ejection

Fast ejection facilities at the 28 GeV proton synchrotron are being developed in several ways. On the one hand, a fast kicker magnet identical to the existing one in straight section 97 (see CERN COURIER vol. 8, page 175) has been installed in straight section 13, adding some redundancy in case of failures and to help realize exploitation schedules of increasing complexity (several shots per cycle at short intervals, fast change to ejection

towards the ISR, etc.). This kicker system has been assembled to a large extent from spare parts and will be brought into operation during the first half of 1971. Much painstaking laboratory work has gone into improving the pulse performance of these fast kickers; the necessary modifications will be implemented in the forthcoming months.

On the other hand, a new fast kicker system is being developed (in connection with the PS Improvement Programme) which differs from the type mentioned



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above in that it will use static magnets of full machine aperture. Furthermore, it will have faster rise and fall times (typically 70 ns instead of 90 ns) in order to eject cleanly the longer bunches which are expected at the higher intensities when the Booster is operational. It should be remembered that an ejection efficiency of 90 % which is now considered reasonable, could then result in proton losses of more than 10^{12} particles per pulse.

Adequate deflecting power cannot be obtained from a single magnet because this would entail an excessively high operating voltage. A pulse voltage limit of 40 kV (normally 30 kV now) has been set for the new system, which in turn will necessitate the use of 12 identical magnet modules for ejections at 28 GeV/c (two identical units are used in each of the present systems). Tests have shown however that the number of modules can be reduced by a local modification of the focusing properties of the PS magnet lattice; it is estimated that in many cases powering eight modules will be sufficient for ejection at top energy.

Initially it is intended to install nine magnet modules in one long straight section (71 for example). Each module will be excited from its own 100 MW pulse generator installed in an extension to the Central Building. The type of pulse generator selected will allow a minimum interval between ejections of 25 ms (now 100 ms).

Much effort has gone into life testing of components for the new scheme. Six EEV Co. CX 1171 thyratrons have been in continuous operation for over six months and one tube has switched over 140 million pulses (40 kV and 2600 A) and several others over 80 million pulses without noticeable fall-off in performance. The important feature of switch time jitter with the CX 1171A thyatron is as low as 5 ns overall from the low voltage synchronizing pulse through the trigger stages to the high voltage output pulse.

A prototype magnet (shown in the photograph) has been built and pulsed nearly 40 million times at 40 kV and pulse lengths between 100 and 2100 ns. This prototype has yielded valuable information concern-

Partly assembled prototype of the full aperture kicker magnet showing the C-shaped ferrite core and diamond machined capacitor plates.

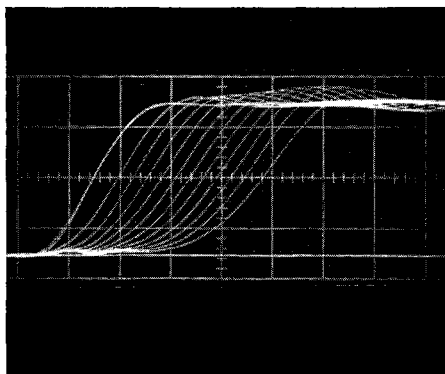
1. Pulse propagation through the prototype full aperture kicker measured on successive capacitor plates. The horizontal scale is 20 ns per division.
2. Pulse shape when 40 kV is applied to the prototype. The scale is 500 ns per division.
3. Pulse shape (opposite polarity) in the existing small aperture kicker, when used for the ejection of eleven of the PS bunches. The scale is again 500 ns per division.

ing kick rise and fall times, flat-top oscillations, field uniformity in the aperture and high voltage breakdown in vacuum. Sufficient detailed information has now been acquired to optimize the magnets and pulse generators.

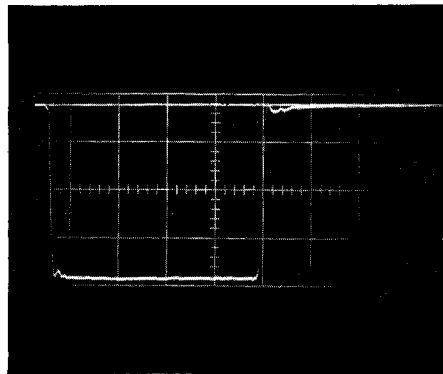
Finally, a new scheme for the ejection of short bursts of particles for use with bubble chambers, which has been receiving increasing attention at Batavia, Brookhaven and in the 300 GeV study during the past months, is also being studied at the PS. It involves two fast kickers with a rise time of the order of one microsecond (rather than $0.1 \mu s$ in the present technique) and an electrostatic septum to replace the fast kickers used at present. This proposal has the attraction that the fast burst can be produced while the beam is debunched (during the slow ejection process). This has great interest when a bubble chamber can be expanded 3 or 4 times while most of the beam is being slowly ejected for counter experiments, and it would at the same time reduce the 'multishooting' requirement for the present fast kickers.

Current transformer for the ISR

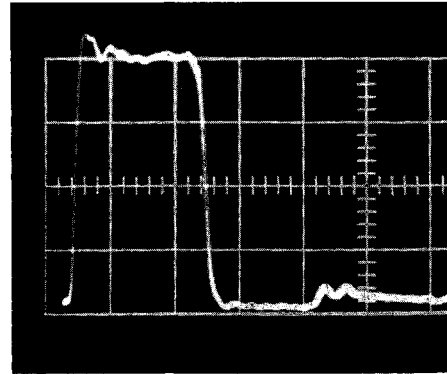
Beam current transformers are used to monitor beam intensities on nearly all particle accelerators. They use the beam itself as effectively the primary of a transformer, the secondary side of which consists of several turns wound around a high permeability toroid (made of ferrite or nickel-iron alloy) encircling the beam. A signal proportional to the beam intensity is collected from the secondary (see



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2.



3.