

CERN News

The CDC 3800 computer counting the votes cast in the Canton of Geneva during the elections last October.

would be ready to make a recommendation if called upon to do so by the Council.

Professor Perrin expressed the profound concern of the French government at the further delays in the project. He was afraid that it indicated a lack of confidence in Europe's ability to maintain a pre-eminent position in this field of research which was perhaps the only major one in which we were on a par with the USA. The Director General said that we have to restrain our impatience and work to ensure that we are poised ready to start as soon as a decision is forthcoming.

Budgets

Professor B.H. Flowers for the UK delegation called for efforts to reduce the budget figures proposed by the CERN administration for 1969 and 1970 to ease the present difficulties of the UK. He also said that the rate of growth in CERN expenditure is too steep and that perhaps the time has come to assign priorities to the activities, all of them ideally desirable, that CERN would like to undertake.

The Director General said that the problem is related to the fact that the budget is dictated by the demand. This has even exceeded that predicted by ECFA and the requests for the use of CERN facilities by visiting scientists from the European Universities is still growing. To reduce the budgets would mean that the demand could not be met and all the participating countries would need to be a party to such a decision.

New appointments

Mr. J.H. Bannier was appointed Vice-President of the Council to replace Ambassador Giusti del Giardino who is leaving Geneva to represent his country, Italy, in Tokyo.

The President also said good-bye on behalf of the Council to another of its prominent members — Dr. W. Schulte-Meermann (Federal Republic of Germany).

Dr. E.G. Michaelis was appointed Leader of the Synchro-cyclotron Division in succession to Dr. G. Brianti.

CDC 3800 to Geneva

The Grand Conseil of Geneva accepted in February the purchase of the CDC 3800 which has been at CERN on rental since September 1966. The computer will move to a building of the University of Geneva probably towards the end of this year and will be used both by the University and also for some of the administrative work of the Geneva cantonal authorities.

The 3800 came to CERN to replace a 3400, of which it is an improved version, as part of a temporary exercise to ease the computing problems of CERN during the teething troubles of the CDC 6600. This exercise is now over and CERN had the possibility to purchase the 3800 under very favourable terms. Geneva had already manifested its interest in acquiring a large computer to cope with its growing needs for computation and CERN was able to offer the 3800 at a sum much below the cost of the machine as new. The cost to Geneva is 4.9 million Swiss francs.

The Geneva administration envisage a 2 to 5 year period of training personnel to

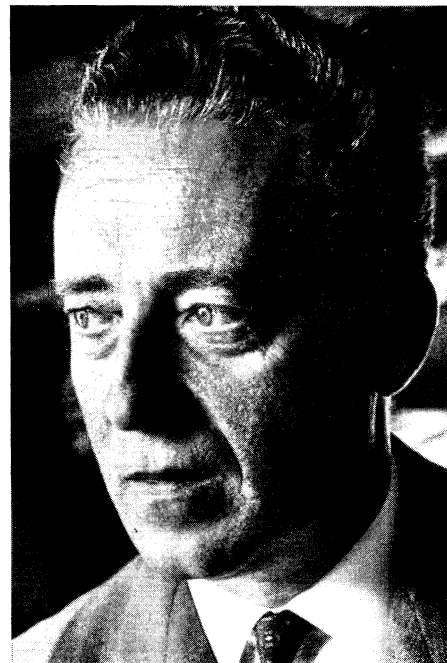
use computers, the programming of a large amount of administrative data, a detailed analysis of the work of various departments, the reorganization of work, etc... The computer has already had a trial run for the administration when it was used in the analysis of the results of the Cantonal elections last October. The University intends to set up a training programme to produce computer specialists. It has considered the possibility of establishing an Institute, specializing in Information Studies.

The 3800 has a central memory of 65 536 words of 48 bits. It is fed by eight magnetic tape units capable of transferring 120 000 characters per second, and by a punched-card reader which can read 1200 cards per minute. A line-printer prints out results at the speed of 100 lines per second.

The University is already making considerable use of the computer. It will remain at CERN until the building made available is ready to receive it, and CERN will help in the training of staff to operate the machine. When the computer leaves CERN, CERN will still have some limited use of it in Geneva.



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There have been long discussions concerning the purchase of the computer and the decision has not been an easy one for the Geneva authorities to take. CERN's decision to dispose of the machine, which was always here as a temporary measure and which does not line up with the rest of the central computer system, was sometimes misinterpreted as a rejection of an outmoded machine. A reply to this question was given to a journalist by Dr. G. R. Macleod, Head of the Data Handling Division — NASA has just bought eight computers for its centres throughout the world which track and correct the orbits of their satellites. They are all CDC 3800's.

Contracts

Some contracts for the intersecting storage rings project recently placed by CERN:

Brown, Boveri and Co., Federal Republic of Germany, was awarded the contract for the manufacture of 169 quadrupole magnets for the beam transfer system of the ISR at a cost approaching 3.5 million Swiss Francs.

The task of guiding the accelerated proton beams from the synchrotron to the ISR and to the associated experimental hall (West Hall) is a formidable one. It involves taking beams through an underground tunnel from the PS towards the ISR dividing half-way into two branches one to feed each of the storage rings. In addition, a beam goes direct to the West Hall without connecting with the ISR and one goes from the ISR to the West Hall. A total length of 1.6 km of beam-line, involving a large number of quadrupoles (to keep the beams focused) and bending-magnets (to steer them along the right path), is needed.

The quadrupoles will be placed at intervals of about 9 m along the beam-lines and, as usual, will be of two types — focusing (73 magnets) and defocusing (74 magnets). There will also be special longer quadrupoles (22 magnets) to 'match' the beam from the synchrotron to the beam-line, from the beam-line to the ISR and so on. The poles of the magnets have to be laminated, so that they can be adjusted quickly as the energy of the beams is changed. Also, the pole profiles have to be manufactured to tight tolerances to meet the need for field gradients

accurate to about 1 part in 10^3 over most of the magnet aperture.

Twenty-two European firms were contacted concerning the contract and 12 tenders were received. From these the Finance Committee approved the offer of Brown, Boveri and Co.

The contract for the main power supplies of the ISR magnets has been placed with Smit, Netherlands, and Brentford, UK, for a cost of almost 1.8 million Swiss francs.

Two d.c. supplies each of 6.9 MW (1840 V, 3750 A) are needed, one for each ring of magnets. To ensure that the ISR can store protons at a variety of energies, the supplies have to be capable of operation from the peak current of 3750 A down to a quarter of this value. Within this range continuous adjustment must be possible so that the stored protons can be slowly accelerated or decelerated.

The stability requirements are severe. Since even short-term fluctuations of the magnet field strength can result in the beams being lost, the supplies have to be stable for large voltage fluctuations (+ 5 to - 8%). A long-term precision of $\pm 10^{-4}$ of the selected current is required with even tighter precision during injection. The voltage on the magnets has to be ripple-free (less than 2×10^{-4} peak to peak) to avoid affecting the stacking process when beams are being fed into the rings, and also to permit efficient slow-ejection of the protons.

A solid-state rectifier system is cheaper than motor-generator sets at the power levels involved and 21 European firms were invited to tender on this basis. Ten offers were received and the Finance Committee approved the contract with Smit-Brentford at its meeting of 31 January.

The copper cables for connecting the ISR main magnets will be supplied by Kabel und Metallwerke, Federal Republic of Germany, at a cost of just over 1.6 million Swiss francs.

The magnet coils in each of the rings will be connected in series by water-cooled single core cables. The contract covers the supply of a total cable length of 15.1 km in 672 sections. In addition, 996 connection pieces are required to join cable lengths and to connect the cables to the coils on the magnets.

To carry the peak current of 3750 A, it was calculated that 1800 mm² would be the most economical copper cross-sectional area. But water-cooled cable with this bulk of copper would be extremely difficult to install and it has been decided to divide the load for each connection between two cables each with 900 mm² of copper cross-section. The cooling water will run through the centre of the cable.

Twenty European firms were contacted and six offers were received. The Finance Committee, at its meeting on 31 January, approved that of Kabel und Metallwerke.

Professor O. Reverdin

Professor Olivier Reverdin has been elected President of the Swiss National Foundation for Scientific Research. He is already President of the Swiss Society for Social Sciences and of the Commission for Science and Culture of the Council of Europe, and now fills one of the key posts concerned with Swiss policy on higher education and research.

Professor Reverdin was born in Geneva in 1913 and studied at the University of Geneva, at the Sorbonne in Paris and at the French Athenaeum School. After serving in the Diplomatic Corps during the war, he moved into journalism becoming a Director of the Journal de Genève, a post which he occupied until Autumn 1967. He has also had a distinguished career in education and has been Professor of Greek Language and Literature at the University of Geneva since 1958.

Professor Reverdin has always been concerned to give Swiss policy in cultural and scientific affairs a forward looking approach. He is interested particularly in the development of high energy physics research and in molecular biology. This latter interest was particularly noticeable when Professor Reverdin was elected President of two European Molecular Biology Conferences held at CERN.