

AN AUTOMATIC CONTROL OF PHOTONUCLEAR REACTIONS MEASUREMENTS

J. Böhm, U. Miklavžič, B. Pucelj, J. Šnajder, M. Tiringier

J. Stefan Institute, University of Ljubljana

A special, fully automatic system was designed to control the experiment in which the cross-sections of the reactions $^{90}\text{Zn}(\gamma, p_1)^{89}\text{Y}$ and $^{90}\text{Zn}(\gamma, n_1)^{89}\text{Zn}$ were measured. The experiment involved repetitive irradiations of the Zn target with bremsstrahlung followed by activity measurements of the isomeric states of ^{89}Y ($t_{1/2} = 16$ s, $E_\gamma = 909$ keV) and ^{89}Zn ($t_{1/2} = 4.18$ min, $E_\gamma = 588$ keV). Precise timing, fast acquisition and fast output of data were required.

The system consists of the hardware controller, the mechanical device which alternately transports the target between the betatron beam and the *Ge(Li)* detector, and the CDC1700 computer. The latter performs the pulse height analysis and stores the data (γ -ray spectrum and bremsstrahlung dosis) while the timing of the whole experiment is governed by the controller.

The timing scheme and the experimental layout are shown in Fig. 1 and 2.

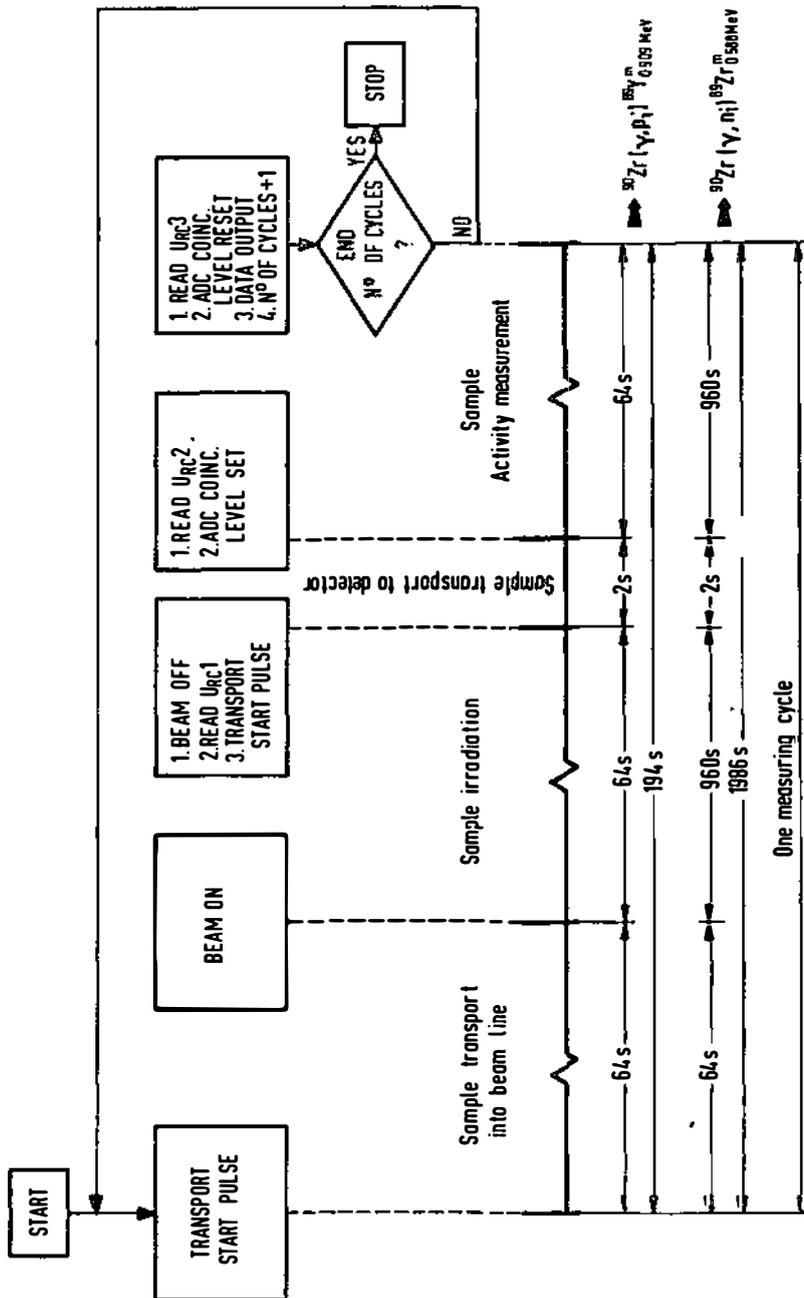
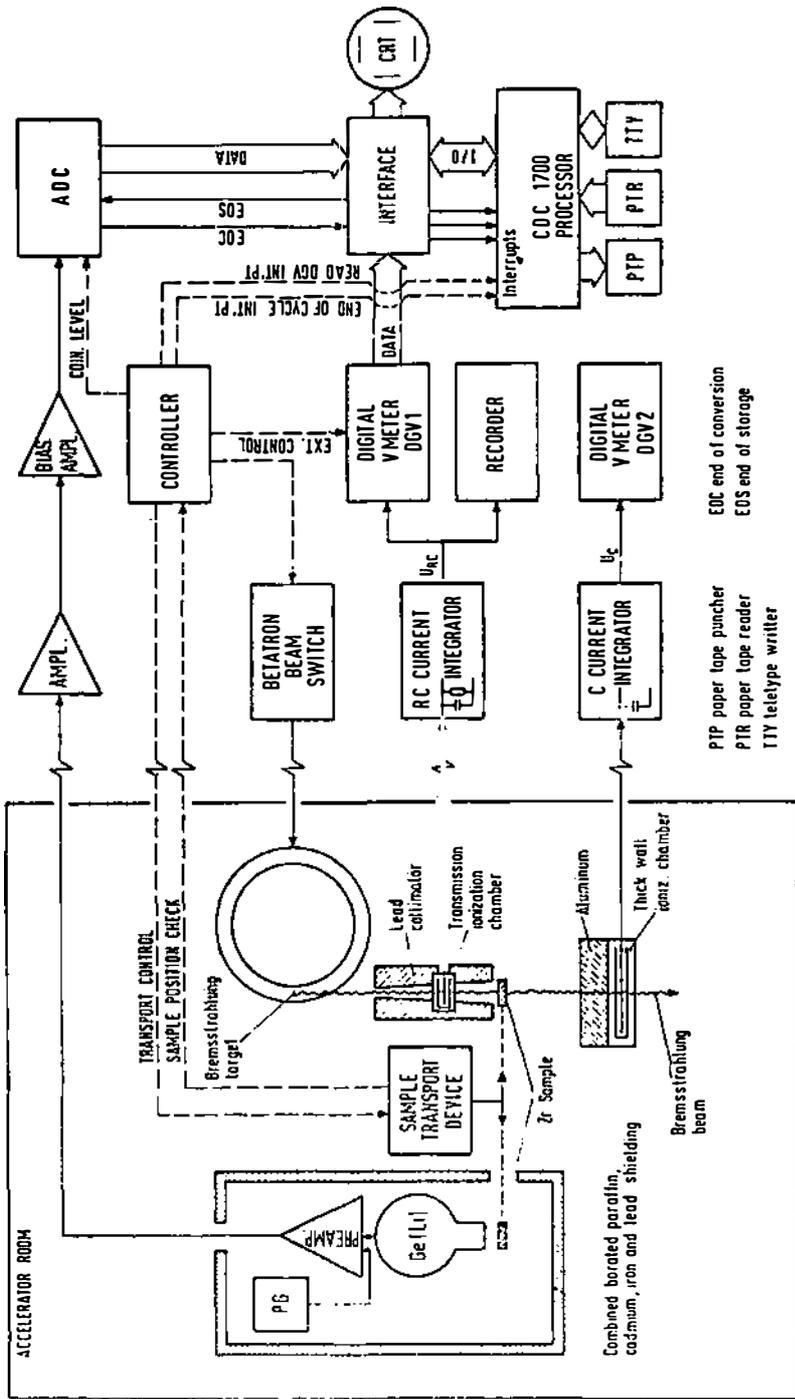


Fig. 1.



PTP paper tape puncher
 PTR paper tape reader
 TTY teletype writer

EOC end of conversion
 EOS end of storage

Fig. 2.