COMPUTER CONTROL SYSTEM FOR THE RCNP AVF-CYCLOTRON

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Abstract

The control system of the RCNP AVF-cyclotron is interfaced to computer system In this report, the specifications of computer control system of the cyclotron[1] and the softwares for this system are outlined.

HARDWARE: The computer is PDP11/40 with 64 K, 16 bit word memory. This system consists of the following components as shows in Fig. 1. The control system is connected to CPU through two general purpose interfaces (DR11-C). The first DR11-C is used for the operation of digital control system for setting accelerating parameters, for digital outputs, for digital inputs, for a 36 bit general output register and for a 36 bit general input register. The second DR11-C is used for the analog input system which has two ADCs with 16 point analog MPX. and 128 point analog MPX., respectively, and for a program selection box with push buttons.
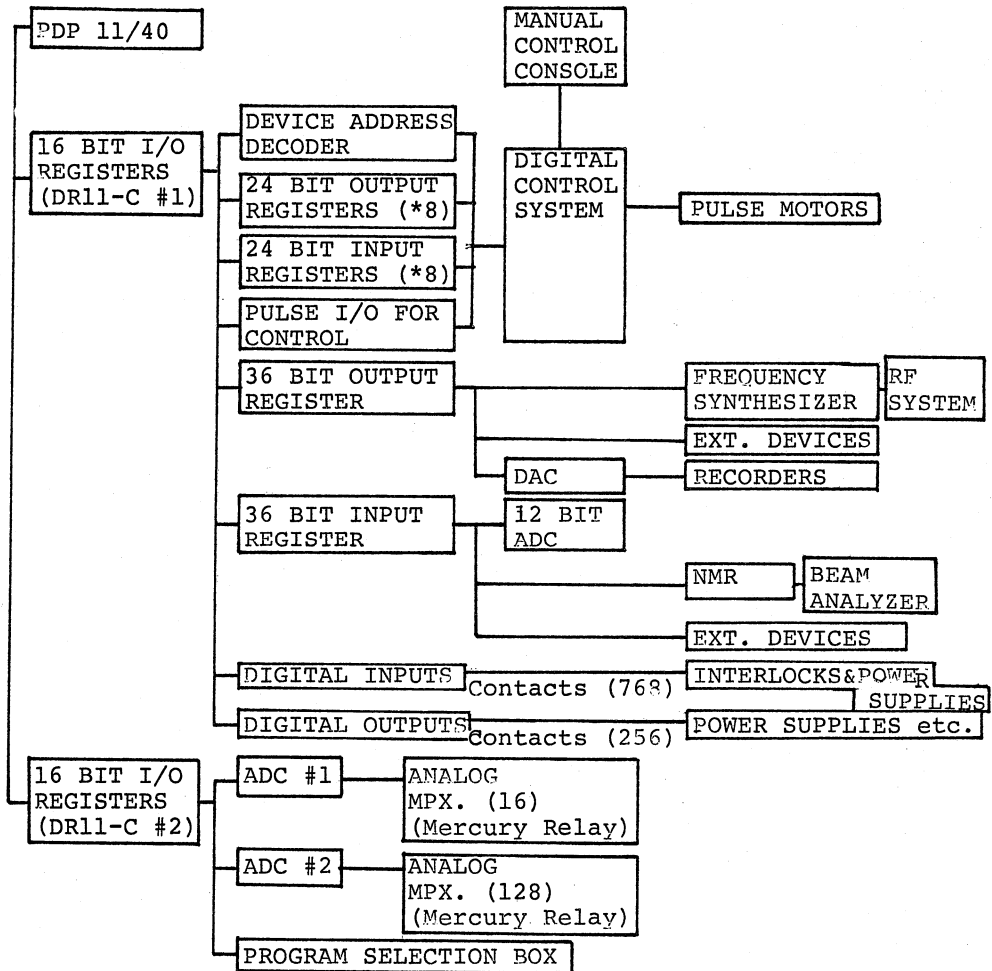

Fig. 1. Block diagram of computer control system.

SOFTWARE: This computer control system with these hardware components is available for following works; (1) to select necessary program for control of devices and for data acquisition, (2) to turn on-off switches of power supplies and other accelerator devices, (3) to set parameters, (4) to read operational data from devices and (5) to monitor operational conditions. Fig. 2 shows the simplified flow chart of a program for setting parameters. This program is selected with program selection box, and is running in conversation type with an operator, who inputs energy, species of accelerating particle and Y(yes)/N(no) from TTY. The data acquisition programs and other programs are running in similary way.

These control system works satisfactorily. At present the parameters are set by using these system and data from devices in cyclotron operation are automatically measured and listed. Especially, the necessity to introduce data acquitision system for AVF cyclotron will be reported with emphasis.

Reference
1)   The Osaka University RCNP 230-cm Isochronous Cycrotron, M. Kondo et al.: Seventh Int. Conf. on Cyclotrons and their Applications, P. 95.
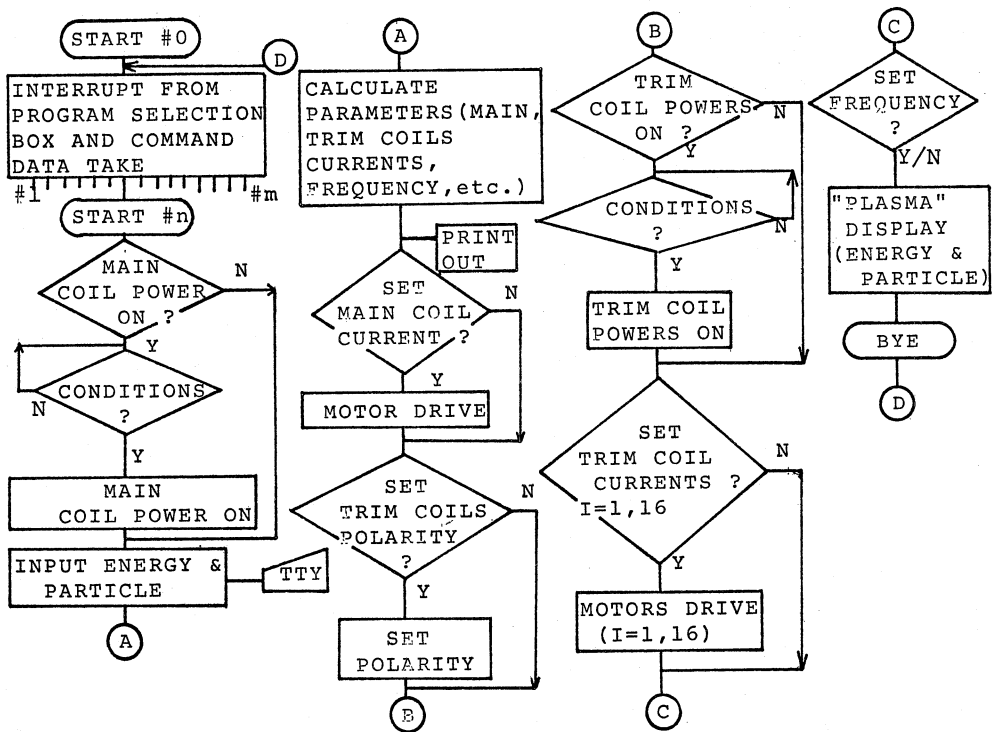

Fig. 2. Simplified flow chart of a program for setting parameters.