

THE CONTROL CONSOLE FOR THE KEK PS

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Abstract

The operator console in the central control room for the KEK proton synchrotron has been replaced by a new one for computer control in 1979. Using color character CRT terminals in the console, we can control and monitor the devices of the accelerators through the control computers. A cable television (CATV) system of the standard NTSC allows smooth communications with each other department.

Control Devices

The new console consists of six parts, each of which fits into internationally standard 19-inch rack containing a "viewing" panel ten units high and a "controlling" panel 8 units high disposed in a curve around the operator. The arrangement of control devices in the console is shown in Fig.1. Two color character CRT terminals with keyboards, light-pens and rotary encoders, and a large screen refresh-type graphic CRT terminal with a keyboard and a track-ball are mounted in the console to be used for many purposes. For instance, the character CRT terminals mostly display analog parameters and digital status of the accelerators, and are also used in up-down control of the machine parameters together with the light-pens and the rotary-encoders. The graphic terminal plots the intensities of the booster and the main ring, and displays their peak and average values.

For the observation of many analog waveforms by means of TV cameras and oscilloscopes, six black and white video monitors are used to save the space of the console and simplify the operation of selecting analog wave-forms. Two of the six B & W video monitors have manual video switches for selecting input video signals. In the central control room, about fifteen B & W video monitors in addition to those in the console are used to display the analog waveforms, because it is relatively easy to distribute and transmit the video signals.

When the beam (security) switch interlocked with the machine status and the system of door lock, emergency switch and personnel key, satisfies all their conditions, the beam is enable to be accelerated. The operator can select the operation mode of the accelerators (the booster, the main ring, the extraction and so on) by means of the mode switch, and see the status of their conditions by display lamps on the beam switch panel. The most of its electric circuits are wired with relay-logic, and in some parts of them, a programmable logic sequencer (STI Sequencer) is applied. This sequencer is flexible in changing program.

In order to record and sum up the operation data such as running time and failure time of the machines, a touch-key panel and a printer are built in. These are connected to the safety management computer (OKITAC-4300), and the data of one operating run (about ten days) are stored in its memory.

Besides the previous control devices in the console, there are a 35 m/m slide film projector with a random selecting switch, a microphone, an accelerated beam integrator of the main ring, PS standard ON-OFF control modules for extraction of the main ring beam, and power supplies for the console devices.

CATV System

In order to distribute various informations from the Accelerator Department, the Physics Department and the other facilities to all buildings on the KEK site, a cable television network has been installed. This CATV system has VHF band modulators with eleven channels which are standard NTSC system in color. More than thirty video terminals (TV receivers) are now connected to this network, and they display informations about the schedule of the accelerator operation, the present operation mode and the intensities of the accelerators, and their waveforms.

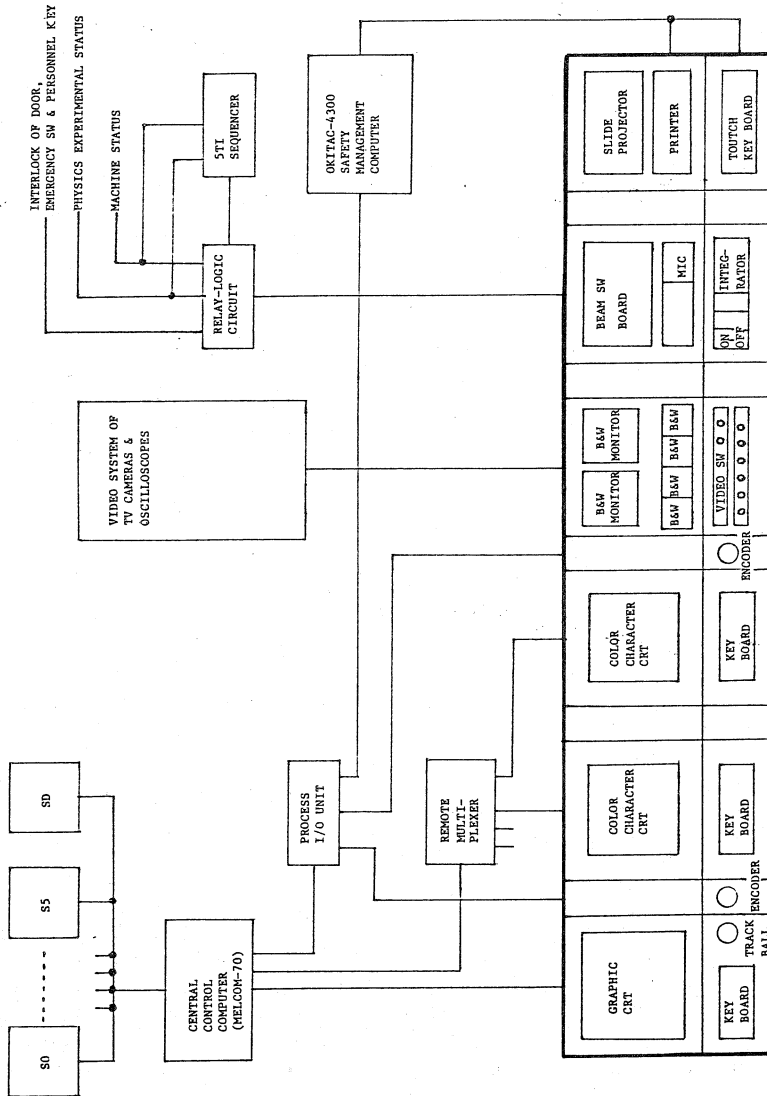


Fig.1 The operator console and its control devices