AN APPLICATION OF TSS FOR THE KEK PS CONTROL COMPUTER SYSTEM

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Abstract

The central computer of the KEK PS control computer system has been replaced by an upper class one in the MELCOM-70 series, then the memory capacity has been extended to 128 K words, and two 20 M words disk-pack units have been added to. As the software system has been changed to time-sharing system (TSS), we can use six TSS terminals simultaneously.

1. General Descriptions

The new software system for the central computer is called RDOS/T, which is a real-time disk operaing system supporting TSS.

For the TSS operation, four color character CRT terminals and two graphic ones are prepared, and three of them are mounted on the operator's console.[1] Maximum size of an application program running under the TSS monitor is 8 K words for the former and 16 K words for the latter (Figure).

2. Application Programs

Using the character CRT terminal, we can select an application program by pointing the program menu displayed on the screen with a light-pen. Then we can see status of the interlock data or analog data of the machine. We can also change the machine parameters by means of the light-pen and a rotary-encoder. Programs listed below are implemented to adjust parameters of the machine.

a. Booster timing control.
b. Main ring timing control.
c. Pre-injector to linac transport line control.
d. Linac to booster transport line control.
e. Booster to main ring transport line control.

On the graphic CRT terminal, we can see the beam characteristics of the accelerators by the programs as follows:

a. Time variation plots of the beam intensities in the booster and the main ring.
b. The beam profile and emittance measurement of the transport lines from the linac to the booster ring, form the booster to the main ring.
c. The beam position of the main ring.[2]
d. The measurement of the betatron oscillation frequencies for the booster and the main ring.[3]
e. The state of the beam-loss in the main ring.
f. The beam emittance measurement of the pre-injector.[4]
g. The control of the main ring steering magnets.

For the application programs, we have developed many Fortran callable libraries, such as libraries for the communication between the satellite computer and the central one, general purpose libraries for the color character CRT terminals, specific subrountines for up-down controls using the character CRT terminal with the light-pen and the rotary-encoder, and subroutines for beam profile measurements.

References

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4) H. Ishimaru, et al., "750 KeV Beam Monitoring at the KEK", Proc. 1976 Proton Linac Conf., Chalk River (Nov. 1976), AECL-5677, pp.202 ∿ 207.

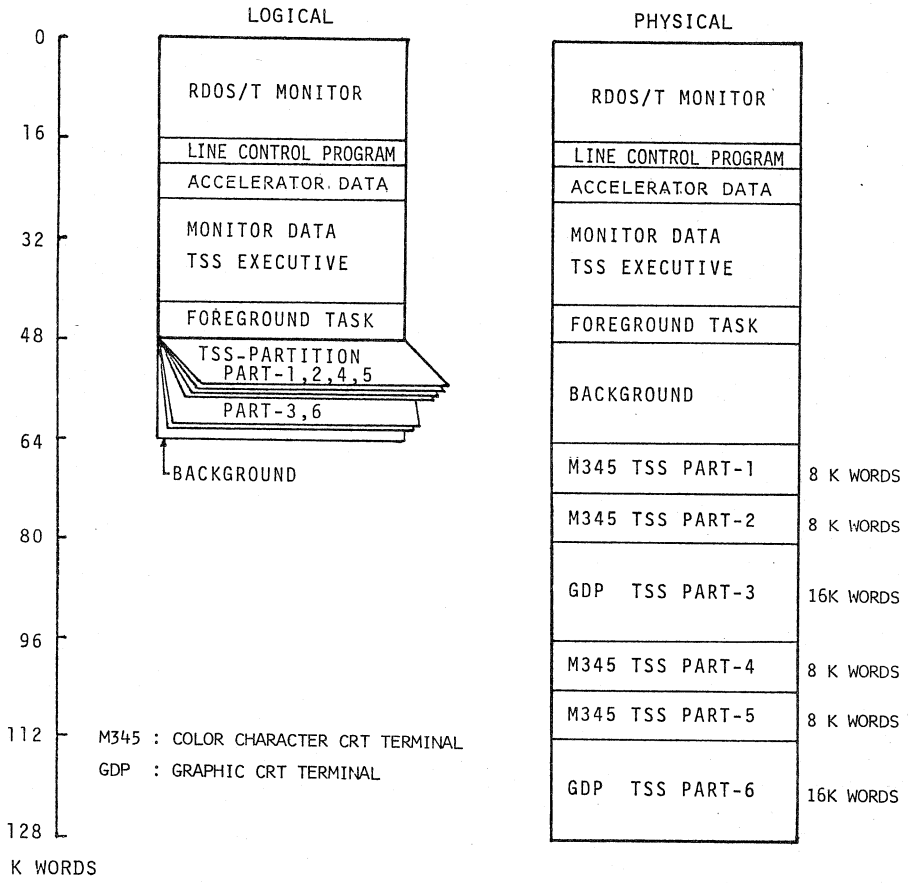

Figure Memory map of the central computer.