Use of a Light Pen Accessory for Analiyzing the Data of Radioisotope Images

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On the occasion of expanding the application fields of a computer and improving its performance, peripheral equipments in the system play an important role. As a peripheral equipment that accomplishes a man-machine system, a simple light pen accessory was connected to the clinical data analyzer CDS-4096. Its operations and applications were discussed. Of course, wide applications was not expected because of a simple type. But combining it with wired programs of CDS-4096, capabilities of the on-line image processing were expanded as follows.

Application: 1) As a general way, four regions of interest of any desired shape were selected one by one, and numbers of count and address in each region could be computed. This was useful for comparing with each accumulation of radioisotope in the liver and in the spleen, and also for examining accumulation and dimension of the brain tumor. 2) Contuor map of an organ image that has been obtained by off-line could be obtained with on-line by assigning any levels on an image histogram using the light pen. This image was useful to observe the outline of the organ and the lesion. 3) Also we could apply the light pen to a functional test which obtained the time histogram of radioactive accumulation in any four regions, for example, a certain organ, the abnormal area in it, the great blood vessel and other area to be compared, during several seconds or minutes. These are used of expanding the image processing functions included in CDS-4096.

Xe-133 Clearance Curve Analysis by Using Multistep Digital Simulation

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We have measured hepatic blood flow on various liver diseases with portal or intraparenchymal administration of Xe-133 saline solution (200–300 μCi). To analyse the clearance curve expressed as multiexponential functions, the automatic calculation program written in Fortran IV has been developed with digital computer (32K).

At the beginning 90 points input data obtained from 400 channel analyser are transferred punch cards with code number, date, name, and start channel. The computer program is devided into 6 main steps, which are as follows:

1)Normalizing Xe-133 clearance curve.

2) Background estimation.

3) Irregular curve checking, such as increased or not saturated data in the tail of clearance