

## Programs for the R.I. Image Display by Means of Computer-controlled Display Units

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One of the purposes of our R.I. imaging system is to display R.I. images of the best quality, since various image processing such as sumoothing and enhancement is no use without good display. In this paper, several software for the image display are described employing CRT unit, line printer and curve plotter that are I/O peripherals of NIRS on-line computer system.

### (1) C.R.T. display unit

Characteristics of our CRT unit are as follows: effective area is  $80 \times 80$  mm, resolving power is  $1024 \times 1024$  points over effective area. If the image data (counts/picture cell) are converted to the display data (X and Y coordinates and brightness level/picture cell) by the software, the picture is displayed either as a pattern of brightness modulation or as a volumetric pattern. The brightness levels can be assigned to 5 levels including blank level, and each level corresponds to a certain count in a picture cell which can be set by an I/O typewriter. When the image must be displayed during the data accumulation, an interrupt signal called "Trigger" is used. It calls a program for converting image data into display data and transfers the latter

to the display area at 2 second intervals.

### (2) Display by a line printer

A program has been developed to print various characters (including numbers, alphabet and special characters) corresponding to X and Y co-ordinates and counts of each picture cell of a R.I. image. The character includes multi-print of up to 6 characters which can be pre-assigned in the program.

### (3) Display by a curve plotter

A program has been developed to discribe a pattern in volumetric display using a curve plotter. The program uses various subroutines which are supplied with the on-line system. The potter draws a one-dimensional curve by reading image data as a function of X co-ordinate for a fixed Y co-ordinate. When one curve is drawn, the plotter starts again by incrementing one to the Y co-ordinate. Size of X and Y direction and a viewing angle are arbitrarily changed, and type of the data (integer or real) can be assigned. The size of the picture is made up to 34 cm (X direction) by 25 cm (Y direction) and the smallest distance of the plot is 0.2 mm. The various examples of the display methods mentioned above are shown.

## Analogue Processing of RI Image in Scintiscanning

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RI image obtained by a scintiscanner is deteriorated because of a finite geometrical resolution of a focused collimator used and statistical fluctuation in count rate. In order to improve the deteriorated RI image an

analogue technique is proposed for smoothing and enhancement using a system comprising an operational count rate-meter with two RC circuits, a 4-channel data recorder and an X-Y recorder.