

language and have 14 kinds of function elements which covered all faculties of analog computer.

### Results

The simulated RI angiocardioqram was in good agreement with the serrated curves obtained from serial scintiphotos of cardioac chambers. The main results obtained were (1) decrease of ejection fraction resulted in the diminution of both

ascending and descending slope of RI angiocardioqram in RV and LV, (2) prolongation of pulmonary circulation time resulted in a dominant peak delay of RI curve in LV with diminution of the slopes, and (3) studies on a program to calculate hemodynamic parameters from the serrated RI angiocardioqram were made.

## A Method for Analytical Studies on the Circulation Function Using a Minicomputer System

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Complicated procedure and inaccurate results of the examination have made the RI dynamic studies, difficult to use in the field of routine examination, and several trials have been tested to improve this problem in our department using a minicomputer system.

Estimation of disappearance rates by the ordinary graphic measurement were proved inaccurate, especially when the model was two com-

partments or more.

A computer system including a 12K words CPU, disk memory, CRT display, MT and a hard copy unit, which connected to a scintillation camera was tested and the results were presented.

In conclusion, the computer system in the test have made the RI dynamic studies more reliable and more convenient in routine examination.

## First Order System Component and Transportation Lag Component in Cerebral Mean Transit Time

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Radioencephalogram (REG), which obtained by intravenous nondifusible R.I. injection and external collimation method, has much clinical values for it's safety, naturalness and facility. But some problems remain in REG analysis. The input pattern of indicator to cerebral circulation system has been distorted by hearts and lung functions. And the distribution function of cerebral circulation system has not been obvious.

As previously reported, we have used the Radiocardiogram (RCG), which obtained by simultaneous external collimation on the heart, as the input to REG. Cerebral circulation system was

approximated by composition of a first order system and a transportation lag.

In our several hundred experience, almost all cases have been simulated successfully by our method. We believe our approximation method to have sufficient clinical property.

The ratio of transportation lag ( $\tau_h$ ) in cerebral mean transit time (MTc) was distributed between 40 to 90% in each cases. In most cases of severe arteriosclerosis, such as cerebral thrombosis, SLE or diabetes melitus, this ratio revealed more than 80%. In cases of right heart failure or intracranial tumor the ratio was less than 60%.