# The Scintillation Camera Data Processing System for Dynamic RI Image Study

M. Moti and A. Koyano

*Japan Radiation and Medical Electronics, Inc., Mitaka*

Z. Hompo, M. Koga and S. Hakariya

*Department of Radiology, Faculty of Medicine, Nagasaki University, Nagasaki*

In this presentation we would like to introduce a new digital data processing system of scintillation camera data.

The system is assembled by following components, a data acquisition unit including dual high-speed analog-to-digital converter, a data display unit with light-pen, a central processing unit having 8K words core memory (1 word=24 bits), a direct memory access channel, a high-speed burst channel, a magnetic drum (100K words), a high-speed digital magnetic tape recorder and teletypewriter. A rectilinear scanner and a RI dynamic function test instrument such as renogram apparatus can also be connected to the system.

The signals from scintillation camera are digitized X- and Y-coordinates and they used to direct each incoming count to the proper address area in the magnetic-core memory of the central processing unit via direct memory access channel. There are two data areas in the magnetic-core memory and used like flip-flop, so that the counts detected by scintillation camera can be recorded with no dead time between frames. Then, the data is transfered to magnetic tape semi-permanently using a high-speed digital magnetic tape recorder. Recorded frames are identified by an identification number entered by the operator through the teletype keyboard before transfer of the recorded frame to magnetic tape. The stored frame data on core memory are displayed on an oscilloscope and displayed dot represents the counts accumulated in that particular address. The irregular shape of region-of-interest for computer integration can be chosen by a light-pen. All of the system regulation instructions are given by the operator through the teletype keyboard to the system like conversation.

According to the phantom tests and some clinical evaluations, it is recognized that the system has sufficient characteristics.

# Clinical Evaluation of Processed Scan Images with an On-Line Computer System

E. Yabumoto, T. Matsumoto and N. Fukuda

*National Institute of Radiological Sciences, Chiba*

In order to obtain more diagnostic information in interpretation of scintigrams, an on-line computer system was applied to routine radioisotope scans using a 3-inch rectilinear scanner. The system has capability of data acquisition, construction of digital image, image processing and CRT display all in an on-line mode. The following image processing methods are available in the system, 1) simpel smoothing, 2) weighted smoothing, 3) matched filtering, 4) non-linear matched filtering (Fukuda), 5) differential operator method (Nagai, Iinuma and Fukuda), 6) least square method (Fukuda), 7) iterative