Construction and Performance of the Whole Body Counter at Nagasaki University

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In April 1968, a low-level whole body counter was built at Nagasaki University. A major effort has been made toward reducing the background to a very low level and producing a reasonably uniform response.

Data are as follows:

Monitoring room
- Inside dimension: L-260, W-140, H-210 (cm)
- Shielding: Fe-200, Pb-3, Plastics-3 (mm)

Detectors
- Detector number 2
- NaI(Tl) $8''\phi\times4''$ A light pipe of inactive NaI ($8'\phi\times3''$) seperates the active crystal from the phototube.

Basic ancillary equipment
- Analyzer: 400 channel pulse height analyzer
- Read out units: typewriter, tape, X-Y plotter, 2 pen recorder

Methods
- Stretcher, standard chair, 1 m arc, linear scanning

Background index

$$=\frac{\text{Integral background (0.1}\sim\text{2.0 MeV)}}{\text{Total crystal volume}}=0.27$$

Calibration data

Technique	stretcher method	
Radionuclide	^{40}K	^{137}Cs
Energy band (MeV)	1.35~1.57	0.57~0.75
Net background (cpm)	62.7	194.3
Net pulse rate	0.94 cpm/gk	1.38×10^4 cpm/μCi
Spectrometric resolution (in vivo)	6.2%	9.5%

Other some features
1. Double scanning
2. Scanning speed control
   - program method
   - live time scanning
3. Geometrical mean value recording

A New Design of 5″ Whole Body Scanner

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Comparing with the scintillation camera, the scintiscanner needs a long time to produce a scintigram of certain definite area, but, it has the advantage that is the capability to enlarge its scanning area to necesitive size, if, it is given a suitable mechanical construction.

A new disigned 5″ twin-head whole body scanner is able to perform whole body scanning efficiently with a high delecting sensitibity and extremely high scanning speed.

It has peculiar mechanical construction to conform to high speed wide scanning, that is the two detectors are supported oppositely by upper and lower arms of the carridge. The carridge make possible vary its arm height for adjusting upper detector height. A treatment