

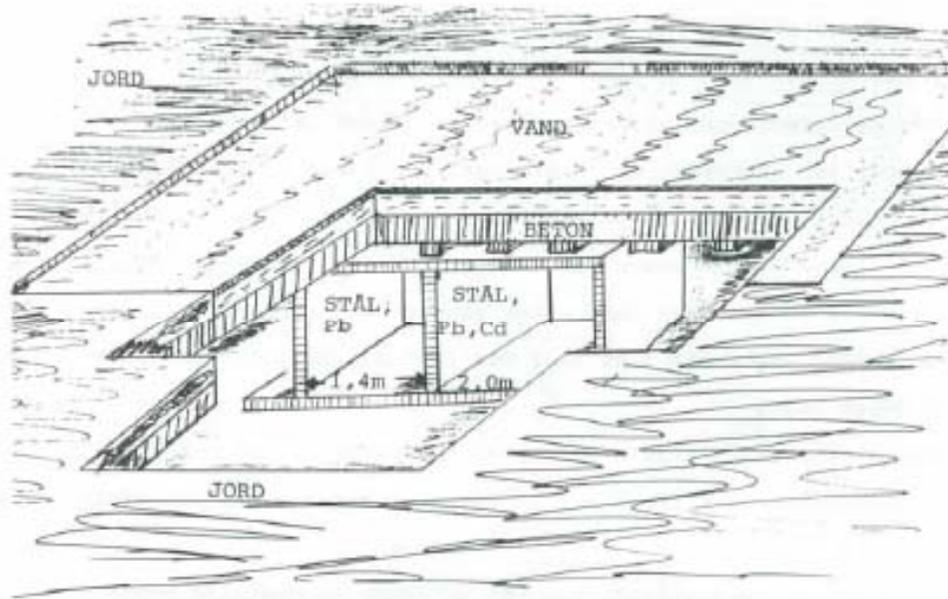
WBC

at Rigshospitalet, Copenhagen

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Pianolib Workshop, Gothenburg, 15.-16. September 2011

WBC build ~1976



Described in a master's thesis in 1979 by
Steen Hoe



Water pond (now emptied)

70 cm concrete (made from carefully selected materials)

2*7.5 cm steel (before 1945)

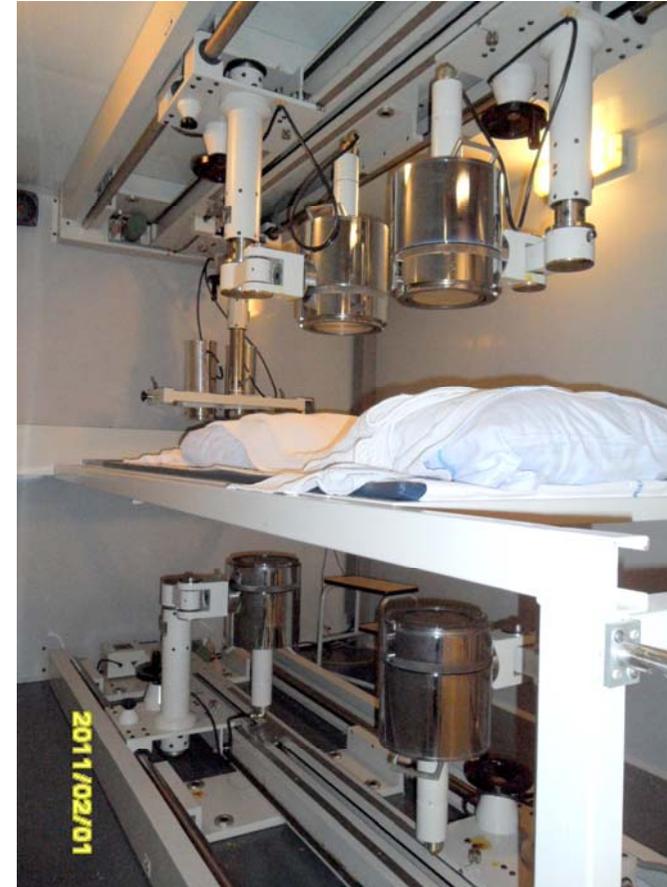
\$2011 2/0.2 cm Pb + 0.1 cm Cd

The two chambers:



”Plast-chamber”

\$2011 Four plastic scintillator crystals (91,5x76,2x25,4 cm)



”NaI-chamber”

Four NaI crystals (DxH 6x4”)

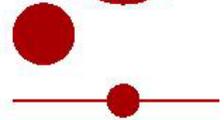


Irina visiting

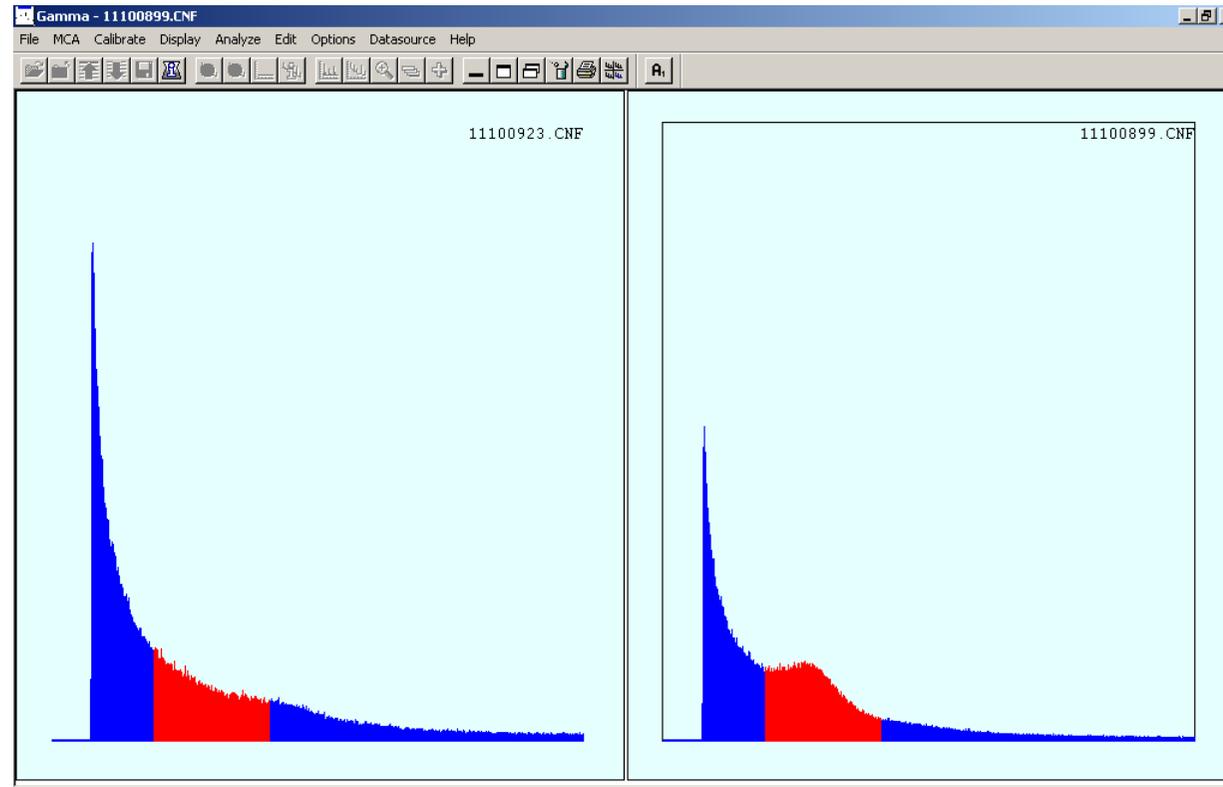


November 2010



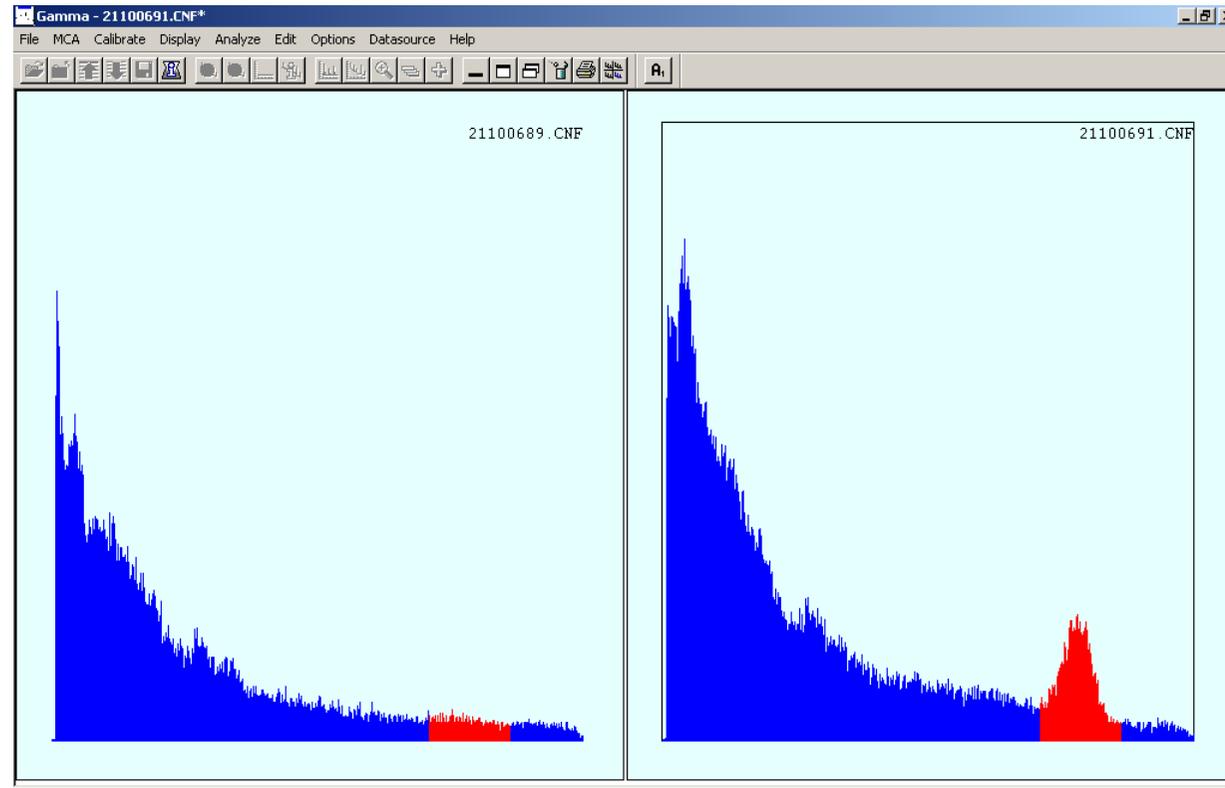
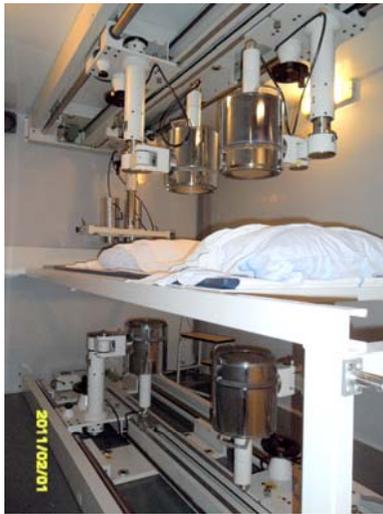


Irina (-+ ^{40}K) in "Plast-chamber"



Figur 1 Typical spectra measured in CS-1 with the *Irina* phantom without- and with ^{40}K sources respectively. Please notice that the absolute scale is 4k and 8k respectively.

Irina (-+ ^{40}K) in "NaI-chamber"



Figur 2 Typical spectra measured in CS-2 with the *Irina* phantom without- and with 40K sources respectively. Please notice that the absolute scale is 0,5k for both spectra.

Calibrations: ^{40}K



Solution of KCl can be prepared to a very high accuracy

A calibration curve is created through 6-7 points of different weights

Actual objects (patients) are interpolated from this

Calibrations: ^{137}Cs



Point source placed in small, sealed vial and suspended in water filled bottle.

OR

Cs-137 in solution

Bottle is moved to all positions.

Absolute activity is only specified to an accuracy of 6% which will dominate results.

Plast-chamber report

CS-1:

1. Stability

Spectrum	Measurement time	ROI channels	Gross counts	Net counts
Background	600	198-417	80822	
1	600	198-417	162040	81218
2	600	198-417	161933	81111
3	600	198-417	161462	80640
4	600	198-417	162243	81421
5	600	198-417	163866	83044

Examples of spectra measured with CS-1 and *Irina* are shown in figure 1.

2. Activity of K-40

The estimated activity was: $6,79 \pm 0,06$ kBq. Uncertainty due to counting statistics only: **0.04** kBq.

3. Activity of Cs-137

The estimated activity was: $31,6 \pm 1,9$ kBq. Uncertainty due to counting statistics only: **0.02** kBq.

4. Minimum detectable activity – MDA:

MDA(K-40) = **70** Bq and MDA(Cs-137) = **10** Bq.

Nal-chamber report

CS-2:

1. Stability

Spectrum	Measurement time	ROI channels	Gross counts	Net counts
Background	1800	729-880	2229	
1	1800	729-880	7859	5630
2	1800	729-880	7800	5571
3	1800	729-880	7874	5645
4	1800	729-880	8046	5817
5	1800	729-880	7906	5677

Examples of spectra measured with CS-2 and *Irina* are shown in figure 2.

2. Activity of K-40

The estimated activity was: $7,07 \pm 0,15$ kBq. Uncertainty due to counting statistics only: **0.13** kBq.

3. Activity of Cs-137

The estimated activity was: $30,8 \pm 1,9$ kBq. Uncertainty due to counting statistics only: **0.06** kBq.

4. Minimum detectable activity - MDA

MDA(K-40) = **180** Bq and MDA(Cs-137) = **22** Bq.

Attenuation properties

- CT-scan, 120 kV 200 mA:
 - K-40 bottle: 13.3 +- 3 HU
 - IRINA: ~-110 HU

- PET transmission (Ge-68, 511 keV)
 - K-40 bottle: 0.095 cm⁻¹
 - IRINA: 0.089 cm⁻¹