

특수기기 소개

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전산화 단층촬영

CT/T (Computerized Transverse Tomography)

1. 역사적 고찰

- 1895 Röntgen X-선 발견
- 1917 J. Radon 2차원 또는 3차원의 물체는 그 투영도의 무한집합에서 일의적(一意的)으로 재생시킬수 있다는 재생기술에 관한 논문발표.
- 1921 Bocage 단층촬영법 고안
- 1956 Bracewell 천문학 분야에서 우주전파원의 분포도 작성에 응용.
- 1961 W.H. Oldendorf CT Scanner의 기본원리를 실험연구
- 1964 Kuhl, Edwards 뇌종양의 단층 촬영상을 Scanner로 진단 시도함.
- 1972 Godfrey Newbold, Hounsfield EMI장치를 완성, Mac Robert상을 수상
- 1972 James Ambrose, G.N. Hounsfield 뇌조직의 진단효과를 영국 방사선학회에서 발표
- 1973 Mago Clinic에 EMI(The International Music Electronics) 뇌주사장치

2. CT Scanner System의 원리

- ① X-선의 흡수차가 별로없는 부분에 주위의 흡수차로 변화시킴으로써 간접적으로 병변을 알아내는 조영방법이다.
- ② 모든 연부조직에 있어서의 X-선의 흡수차는 4%에 불과하다.
- ③ 작은 조직밀도를 판별하기 위해서 강도 높은 X-선 검출기가 사용되고 있고
- ④ 용적(3차원)체를 연속된 slice상태의 2차원상으로서 취급할 수 있게 단층 횡단촬영의 도입이 필요하다.
- ⑤ CT Scanner는 감도가 높은 X-선 검출기와 단층촬영 기술을 결합한 것으로서 작은 변화까지 많은 양의 정량을 computer로 처리하고 있다.

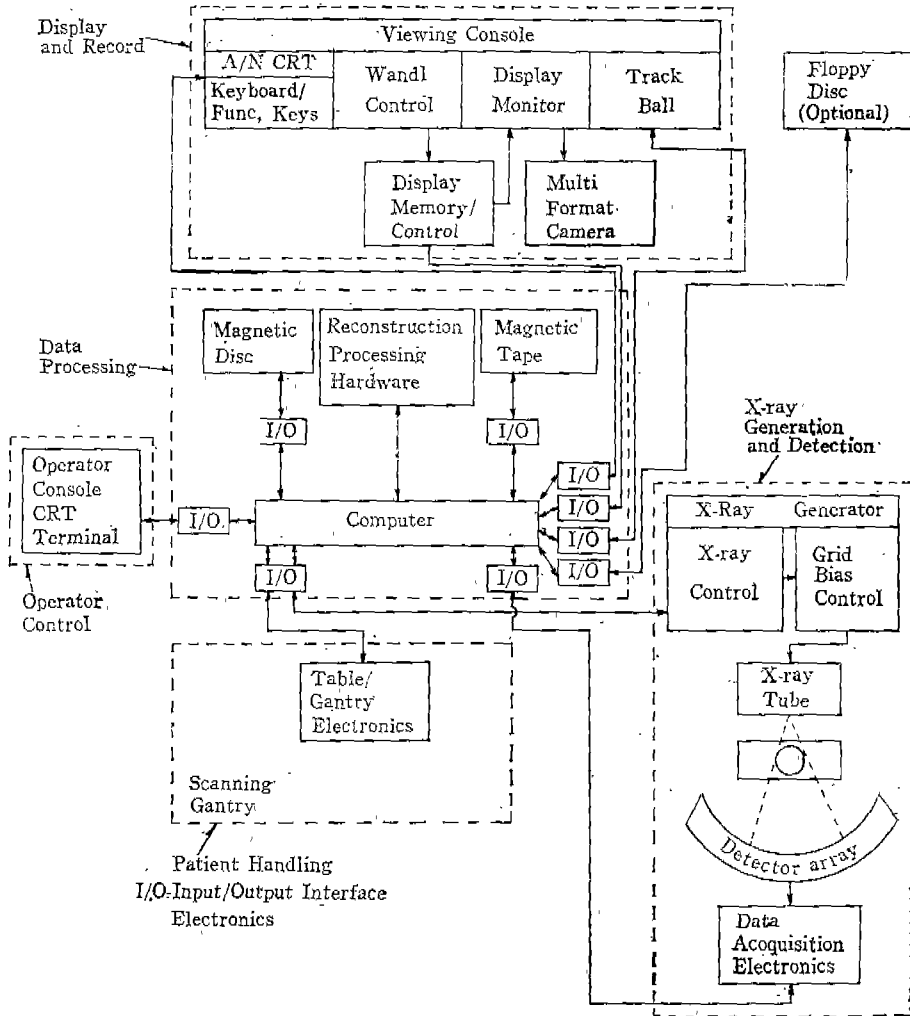
3. 본 서울대학교 병원 진단방사선과의 설치되어 있는 Scanner는 미국 General Electric회사의 기계로서 Scanner System의 기능은 <표 1>과 같다.

- 4. 기능별 구성기기는 <표 2>와 같다.
- 5. GE CT/T Scanner의 모든 특징은 <표 3>에 실려있다.

(표 1)

CT/T Scanning System Functional Diagram

1) CT/T Scanning System Functional Diagram



(표 2)

Major System Components Grouped by Function

Function	Components
Patient Handling	Scanning Gantry, Table, Table/Gantry Electronics
X-ray Generation & Detection	X-ray tube, X-ray Generator, Detector Array, Data Acquisition Electronics
Data Processing & Storage	Computer Processor, Magnetic Disc, Magnetic Tape, Reconstruction Processing Hardware
Display/Record	Viewing Consoles, Multifformat Camera, Line Printer/Plotter (Optional to B7800A)
Operator Control	Operator Console, CRT Terminal, Table/Gantry Controls

from the hands of five nurses among the ten after their contacts with infants, Staphylococcus (4 nurses), Bacillus subtilis (1 nurse) and Gram negative bacillus (3 nurses) were isolated. Two of them had both Staphylococcus and Gram negative bacillus, and other one had both Bacillus subtilis and Gram negative bacillus; i.e. three of them had two microorganisms. And the remainder five aseptic.

5. From the nipples of ten mothers before being cleared by sterilized water sponge, Staphylococcus (8 mothers) and Bacillus subtilis (1 of these 8) were isolated, and aseptic were two. After clearing, Staphylococcus (10 all) and Bacillus subtilis (1 of them) were isolated.
6. Staphylococcus (3 nurses), Gram positive diplococcus (2 nurses), and Bacillus subtilis (3 nurses) were isolated from the throats of ten nurses. One of the above had both Gram positive diplococcus and Bacillus subtilis, and so three were aseptic.
7. And from the throats of ten mothers, Staphylococcus (2 mothers), Gram positive diplococcus (4 mothers), Bacillus subtilis (2 mothers) and Gram negative bacillus (3 mothers) were isolated. Two of them had respectively two kinds of Microorganism; One had both Bacillus subtilis and Gram negative bacillus, and the other had both Staphylococcus and Gram negative bacillus.
8. From ten sheets of cleaned blanket, Staphylococcus (7 sheets), Bacillus subtilis (1 sheet) and Gram negative bacillus (2 sheets) were isolated.
9. From ten suits of cleaned clothes, Staphylococcus (4 suits), Gram positive diplococcus (3 suits) and Bacillus subtilis (4 suits) were isolated. One suit had both Staphylococcus and Bacillus subtilis.
10. All of the Staphylococcus were identified as negative in coagulase test and they were all non-pathogenic.
11. E. coli(26.3%) and Aerobacter aerogens(5.26%) were isolated from Gram negative bacillus by biochemical test. ■

<85페이지에서>

<표 3> 특징

	General Electric G/T		General Electric G/T
Generation	third	Table Features	Computer Controlled
Application	head & body	Computer	DG Eclipse
Gantry Tilts	yes $\pm 15^\circ$	Additional compute time	200sec
Scan time (sec)	4.8 & 9.6sec	Number of pixels	320×320
Number of Detectors	320	Pixel Size	1.3mm×1.3mm
Detector type	Xe	Density Accuracy	0.5%
Field Size(cm)	42cm	Simultaneous View/Scan Reconstruction	yes
Number of Slices/Scan	1	Std. Archival Storage Media	Digital Magnetic tape
Slide width	10mm	Primary Photo Record	Standard X-ray film
Tube Type	Maxiray 125 (rotating anode)	Line printer	Optional
Radiation Skin dose	2-4 Rad		