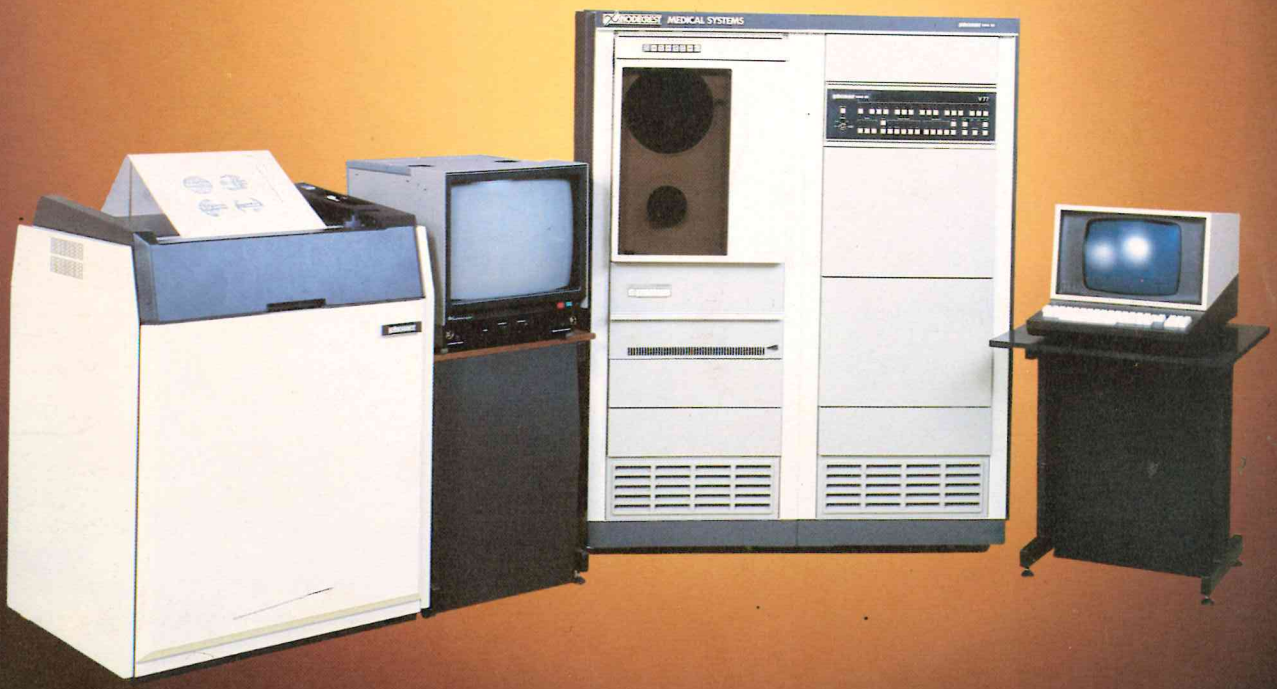
NODECREST
MEDICAL SYSTEMS LIMITED

NMS 80

Nuclear Medicine Data Processing System

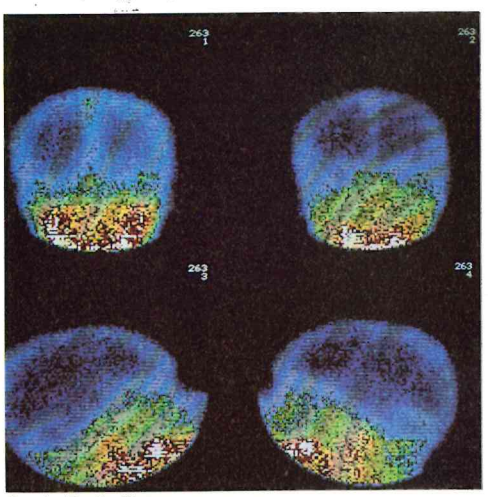


NMS-80

The NMS-80 system utilises the latest technology and software to process data acquired from gamma cameras to produce high resolution graphic output for clinical use.

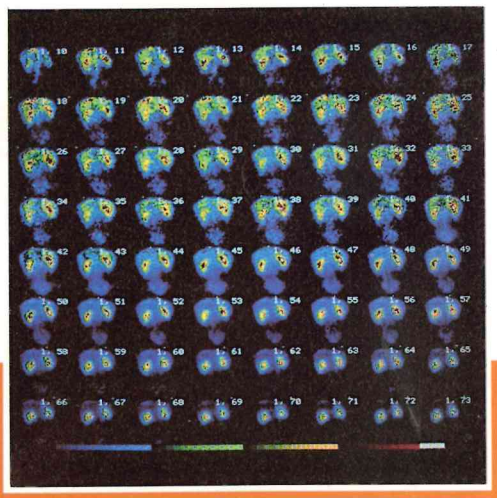
Main Features

- Acquisition modules with integral memory giving up to 256 × 256 resolution, dual isotope facilities and hardware zoom.
- Colour displays with 512 × 512 resolution, hardware zoom and cine mode for displays up to 50 frames/second. Software selectable colour scales.
- Hard copy to electrostatic printer/plotter or to grey scale photographic image recorder.
- Tomographic software package including control of a rotating gamma camera.
- Cardiac package including gated studies with up to 64 frames/beat.
- Multi-user facility expandable to support multiple cameras and terminals.
- Flexible easy to use software for user programming and research work.
- Comprehensive library of applications programs.



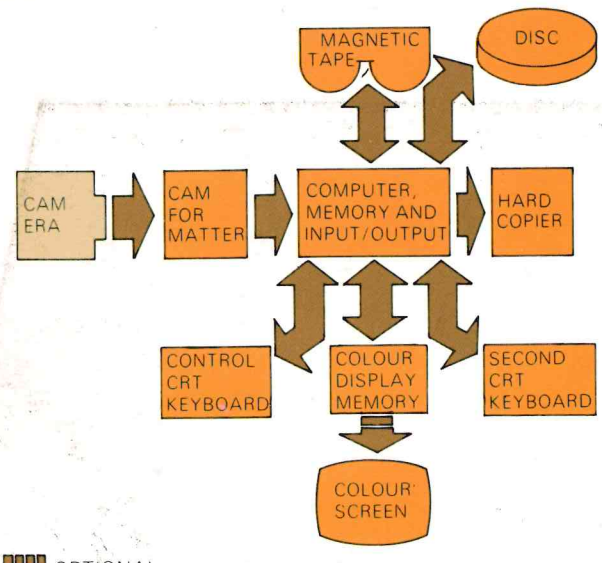
Static Brain Scan

64 frames of a dynamic study of the kidneys collected using varying frame rates

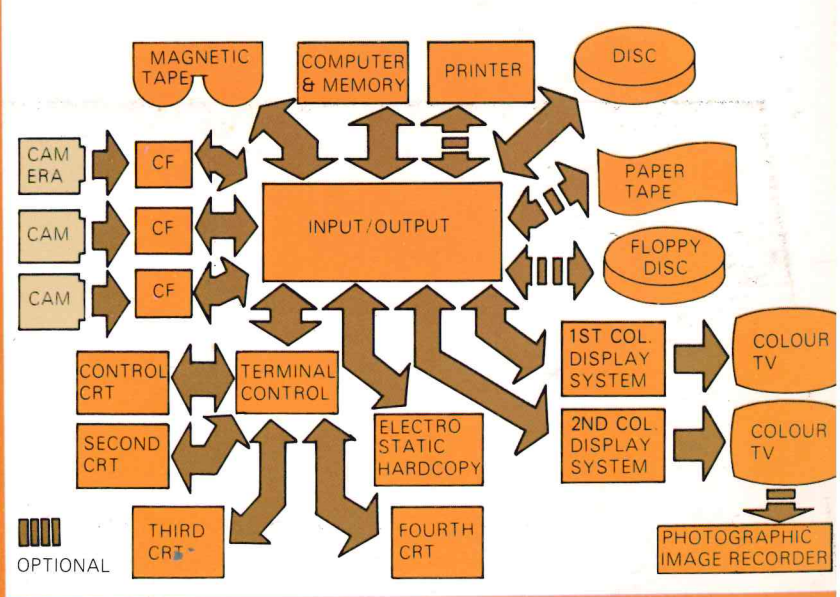


The NMS-80 System runs under the operating system SIS which allows the use of the system as a general purpose computer including foreground/background operation and user programming in Fortran, BCPL, Basic and Assembler.

BASIC SYSTEM



EXPANDED SYSTEM



Data Acquisition

The CAM formatter contains 64K words of 16 bit memory which allows matrices to be formed by direct memory increment. The memory is used to buffer counts in list mode, or matrices of any size (i.e. 32, 64, 128, 256 square or rectangular) in frame mode. Matrices may be read into the computer in word or byte format.

Facilities built into the CAM allow gated studies of up to 64 frames, dual-isotope studies, and zoom 2:1 with moveable window. The CAM will also support a rotating camera and an ECG trigger generator. The maximum acquisition rate without loss of data is 420 KHz and the high speed separate X & Y ADCs are 12 bit resolution to minimise the effects of differential non-linearity. The CAM memory can be written to as well as read from by the computer for diagnostic and other special purposes.

Dynamic studies are framed with a resolution of 1 millisecond and the framing process is controlled by internal timer to remove inaccuracies caused by the computer over-head.

Data Handling

The TV512 colour display provides 512 × 512 display resolution, with software colour scales selectable from 4096 hues. Up to 64 frames can be displayed in a cine mode to a rate of 50 frames/second.

Data Display

The NMS-80 applications software includes a complete range of digital filters, non-uniformity correction, and intermatrix arithmetic. The system can be used to provide summation, region of interest selection, curve formation and curve mathematics.

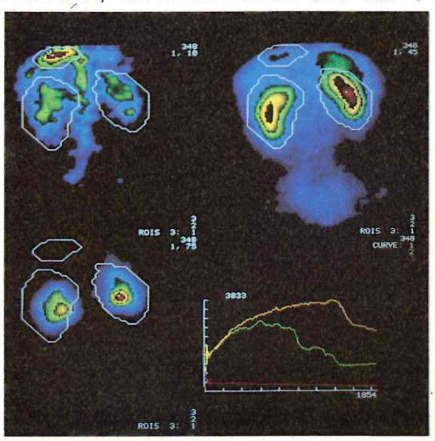
Tomography

The NMS-80 Tomographic package has the following important features:

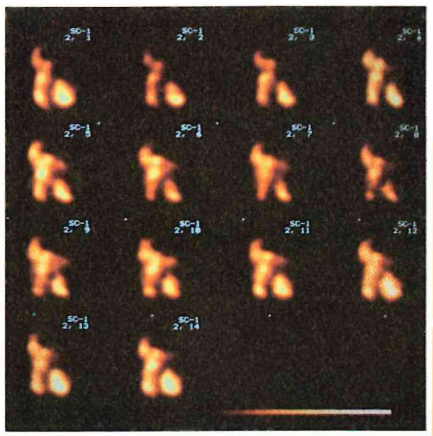
- Control of the rotating camera with choice of direction of rotation.
- Rapid setting up by software, using the ADC centering provided by the CAM formatter. This makes it practical to check alignment frequently.
- Decay correction during rotation reduces the isotope dose required for a given noise level as a result of which the data acquisition time can be increased.
- Data collection directly into slice files to save time by avoiding the sorting of data after acquisition.
- High speed reconstruction — less than 9 secs per slice — without the need for expensive computer options such as hardware floating point.
- These features combine to enable all 32 slices to be reconstructed within 5 minutes of the camera rotation being completed.
- Tomography can be performed simultaneously with other tasks on other terminals.

Hard Copy

An electro-static printer/plotter is available with the system providing software reconstructed grey-scale images giving high-resolution hard-copy graphics output. The printer/plotter may also be used as an output device for programs and data. Alternatively a grey-scale photographic image recorder may be used with the system to provide good quality permanent grey scale pictures direct from the TV display. This mode of hard-copy reduces computing to a minimum and records the exact grey-scale image displayed by the TV on film or paper.

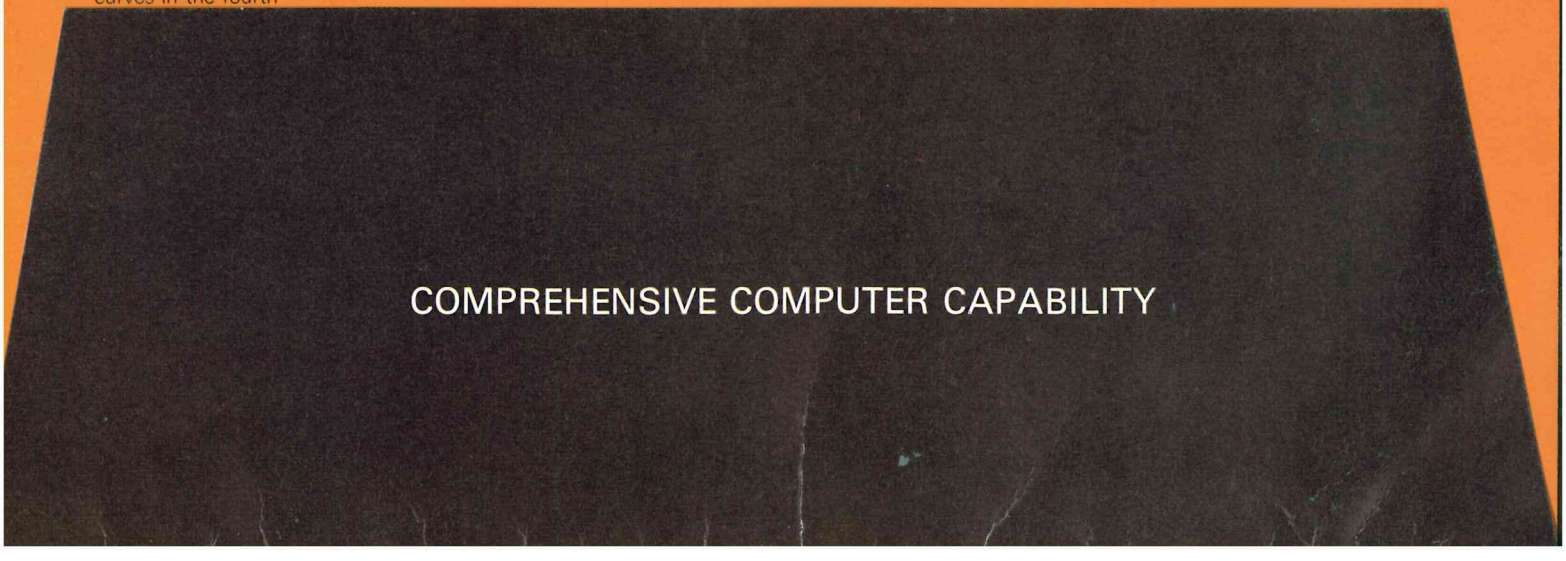


Regions of interest drawn simultaneously in three quadrants with resulting time-activity curves in the fourth



Gated cardiac study using optional colour scale

Frozen frame during cine mode of gated cardiac data



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