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OAK RIDGE NATIONAL LABORATORY
OPERATED BY UNION CARBIDE CORPORATION FOR THE DEPARTMENT OF ENERGY

MASTER

ORNL/BCTIC-1/R1
(Revised)

**Directory
of
Computer Users
in
Nuclear Medicine**

ASSEMBLED BY THE BIOMEDICAL COMPUTING TECHNOLOGY INFORMATION CENTER
IN COOPERATION WITH VANDERBILT UNIVERSITY

Jon J. Erickson, Jane Gurney, William J. McClain

NOTE

THIS WORK PARTIALLY SUPPORTED
BY THE BUREAU OF RADIOLOGICAL HEALTH
FOOD AND DRUG ADMINISTRATION

**BIOMEDICAL COMPUTING TECHNOLOGY
INFORMATION CENTER**

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Contract No. W-7405-eng-26

DIRECTORY OF COMPUTER USERS
IN NUCLEAR MEDICINE

Assembled by the Biomedical Computing Technology Information Center
in Cooperation with Vanderbilt University

Jon J. Erickson, Jane Gurney, William J. McClain

NOTE:

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HEW/FDA Bureau of Radiological Health

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Oak Ridge, Tennessee 37830
operated by
Union Carbide Corporation
for the
Department of Energy

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DIRECTORY OF COMPUTER USERS IN NUCLEAR MEDICINE

Compiled and edited by:

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Jane Gurney²

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Under the auspices of the Biomedical Computing Technology Information Center (BCTIC), in cooperation with Vanderbilt University and the Bureau of Radiological Health (BRH) of the Food and Drug Administration (FDA).

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TABLE OF CONTENTS

	<u>Page</u>
Introduction.	1
Organization of the Directory	2
Users' Section	
Installation Descriptions.	5
Installation Index	203
User System Index.	206
Studies Index	208
Central Computer Index	211
User System Questionnaire	213

INTRODUCTION

The rapid expansion of computer applications in nuclear medicine has thrust persons with little or no formal instruction in computer science into computer-related positions. This has provided the field with a source of new ideas and fresh enthusiasm, uncontaminated by the opinions and prejudices acquired after being associated with a discipline for extended periods of time.

However, due to the inability of the published literature to maintain any semblance of currency in a field of such rapid growth, much of this fresh talent has been wasted on the redevelopment of procedures and algorithms already well-known and tested elsewhere. While this may constitute a good learning experience for the persons involved, it does little to further the state of knowledge or the quality of patient care.

The Directory has been designed to provide for both newcomers and seasoned users the ability to quickly identify and contact others with similar equipment and interests, thus hopefully reducing the need to devote precious resources to duplications of effort.

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ORGANIZATION OF THE DIRECTORY

The *Directory of Computer Users in Nuclear Medicine* consists primarily of detailed descriptions and indexes to these descriptions. A typical *Installation Description* contains the name, address, type, and size of the institution and the names of persons within the institution who can be contacted for further information. If the department has access to a central computer facility for data analysis or timesharing, the type of equipment available and the method of access to that central computer is included. The dedicated data processing equipment used by the department in its nuclear medicine studies is described, including the peripherals, languages used, modes of data collection, and other pertinent information.

Following the hardware descriptions are listed the types of studies for which the data processing equipment is used, including the language(s) used, the method of output, and an estimate of the frequency of the particular study.

Particularly useful are the equipment and studies indexes from which institutions using specific equipment or performing particular studies can easily be found. Critical to the use of these indexes is the four-digit number appearing in angle brackets (in numerical sequence) in the upper right-hand corner of each installation description. This is the *index number* which may be used in the *indexes* to locate individual installations.

The *Installation Index*, which appears immediately following this text, lists the name of each responding institution in alphabetical order. With each institution is listed the *index number* by which the respective *Installation Description* may be located.

Following the *Installation Descriptions* are two hardware indexes. The *Central Computer Index* lists the index numbers of all installations using specific types of central computing facilities. The *System Index* lists the index number of those installations using specific types of data processing equipment in their nuclear medicine department.

The *Studies Index*, which follows the *System Index*, lists index numbers of those installations performing specific types of nuclear-medicine studies on their data processing equipment. In general, the studies appear as an organ followed by a letter abbreviation specifying the type of study on that organ. The letter abbreviations used in the *Studies Index* are as follows:

<u>Letter</u>	<u>Type of Study</u>	<u>Letter</u>	<u>Type of Study</u>
S	Static	Ø	Output
F	Function of Flow	G	Gated
P	Perfusion	I	Image
V	Ventilation	U	Uptake
E	Effusion		

All information included in this directory was obtained from the users by means of questionnaires distributed by BCTIC and accumulated by the Nuclear Medicine Department, Vanderbilt Medical Center. The rapid growth of the use of computers in nuclear medicine is the major factor in the value of a directory such as this; however, this rapid growth also is the cause for inclusion of some obsolete data in the directory. In an attempt to reduce the amount of obsolete data and to include new installations in future updates of the directory, as configurations change and new systems are added, a user questionnaire is attached at the end of the directory. New and old computer users are invited and urged to submit this form to BCTIC, Nuclear Medicine Department, Vanderbilt Medical Center, Nashville, Tennessee 37203, any time that the data included are changed or new systems are put into operation.

<50>

Installation: Eisenhower Medical Center
Address: 39000 Bob Hope Drive
Rancho Mirage, California 92270
USA

Phone: (714) 346-3911 Ext. 1387

Eisenhower Medical Center is a Clinical institution which has 156 beds.

For further information, contact:

Dr. Ron Taylor (software)

2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

Nuclear Data MED 4; Nuclear Data MED 3

System descriptions:

System 1: Med IV 32K (16 bit) words of memory; capable of simultaneous collection and processing.

System 2: Med III 32K (16 bit) words of memory.

The responding department made the following comments concerning its operation:

Two GE computers on order.

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Installation: Santa Clara Valley Medical Center
Address: 751 South Bascom Avenue
San Jose, California 95128
USA

Phone: (415) 293-0262 Ext. 272

Santa Clara Valley Medical Center is a Teaching institution which has 500 beds.

For further information, contact:

W. T. McLaughlin(clinical)
W. T. McLaughlin(hardware)
W. T. McLaughlin(software)

The responding department operates the following data acquisition and processing equipment:

H-P 5407-A

System descriptions:

System 1: H-P 5407A with 12K (16 bit) words of memory; 75 cps paper tape punch; 500 cps paper tape reader; 1600 bpi 45 ips tape, 1.25-meg removable pack disk; languages used assembler, FORTRAN IV, BASIC, ALGOL; interfaced to 2 scintillation cameras; camera collection in frame mode (32 X 32 50/sec) (64 X 64 20/sec) 160 max frames, list mode (128 X 128) 1.25-meg max counts.

On the computers described above, the following studies are performed:

1. Brain (Static); Language used assembler; CRT output
2. Brain (Flow); language used assembler, BASIC, FORTRAN; CRT, list, graph output; objective of study is symmetry
3. Heart (Flow); language used assembler; CRT output
4. Heart (Effusion); Language used assembler; CRT output
5. Liver (Static); Language used assembler, CRT output
6. Liver (Function); Language used assembler, CRT output; vascularity
7. Spleen; Language used assembler; CRT output

Installation: Charing Cross Hospital
Address: Fulham Palace Road
London W6
England

Phone: (01) 748-2050 Ext. 2412

Charing Cross Hospital is a Clinical institution which has 600 beds.

For further information, contact:

Dr. P. Jewkes (clinical)
P. Vernon (hardware)
P. Vernon (software)

The institution operates a central computing facility containing Xerox Sigma 6 equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Varian 620L-100

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Varian 620L-100 32K (16 bit) words of memory, 300 cps paper tape reader, 70 cps paper tape punch, two 9 tr 800 hpi 25 ips tapes, 2 X DRI 5 meg-w fixed disks, 2 X DRI 5 meg-w removable disks; electrostatic printer/plotter, modem, 2 X Color T.V. with 16 greyscales and color, 611 scope with 16 greyscales, capable of simultaneous collection and processing, Languages used--FORTRAN, BCPL, assembler, "Command Language"--Protocols, and BASIC. Interfaced to one camera and scanner. Camera: collection at (32 X 32 30/second), (64 X 64 15/second), (128 X 128 3/second) 256 max number of frames, 32K cts/ele max number of counts (See comments), 256 X 256 list mode, 3.5 million max counts. Position, time, energy and physiological signals collected. 1.0mm steps, max resolution (96 X 128) image size, 255 counts/cell max counts on scanner collection.

On the computers described above, the following studies are performed:

For languages used in studies see comments

1. Brain (Static); picture output, 15-20 per week
2. Brain (Flow); picture and graph output, #2 per week
3. Renal; picture and graph output, # 7 per week
4. Thyroid (Scanner); picture output, # 5 per week
5. Lung (Perfusion); picture and graph output, # 10 per week
6. Lung (Ventilation), picture and graph output, # 10 per week
7. Lung (V/Q); picture and graph output, # 10 per week
8. Heart (Gated); picture and graph output, 1 per week
9. Liver (Static); picture output, 15 - 20 per week
10. Liver (Function); picture and graph output, 1 per week
11. Spleen; picture output, 1 per week
12. Bone; picture and number output; # 18 per week
13. Tumor Localization, # 1 per month

The responding department made the following comments concerning its operation:

1. All frame mode collection can be in bytes (max 255 c/cell) or words (32K counts/cell) regardless of frame size and for both static and dynamic studies
2. All clinical studies are handled by "Protocols" using programs written in all three languages (FORTRAN, BCPL, and assembler).
3. All clinical studies produce a single comprehensive report printed by the computer, usually containing both pictures and graphs plus descriptive information and patient identification.

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Installation: Providence Veterans Administration Hospital
 Address: Davis Park
 Providence, Rhode Island 02908
 USA

Phone: (401) 521-1700 Ext. 3390 FTS 838-3390

Providence Veterans Administration Hospital is a Clinical and Teaching institution which has 347 beds.

For further information, contact:

Ben C. Claunch (clinical)
 Marshall A. Weissberger (hardware)
 Marshall A. Weissberger (software)

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; DEC PDP-11/40

Software development, about 50/50 new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital Equipment Corporation PDP 11/34 80K (16 Bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800 bpi 45 ips incremental tape, RK05P fixed disks with 2.4 meg-w capacity, RK05J removable disks with 1.2 meg-w capacity, matrix imager, DEC CRT display with 32 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, assembler and Pocal. Interfaced to 1 camera. (32 X 32 50/second) (64 X 64 12/second) camera collection, 512 frames max number of frames, 65,535 cts/ele at 64 X 64 max number of counts, (64 X 64) 65534 max counts in list mode. Position, time, energy, and physiological signals collected.

System 2: Digital Equipment Corporation PDP 11/40 28K (16 bit) words of memory RK05J 2.4 meg-w removable disks. Languages used FORTRAN BASIC, Assembler, and Pocal. Interfaced to 1 camera. (32 X 32 50/second) (64 X 64 12/second) camera collection. 512 max number of frames, 65,535 cts/ele (64 X 64) max number of counts, (64 X 64) 65535 max counts in list mode. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); Systems 1 and 2 used, 10-15 per week
2. Brain (Flow); Systems 1 and 2 used, 10-15 per week
3. Renal; Systems 1 and 2 used, 5 per week
4. Lung (Perfusion); System 1 used, 5 per week
5. Lung (Ventilation); System 1 used, 5 per week
6. Heart (Flow); 1-2 per week
7. Heart (Gated); 1-2 per week
8. Liver (Static); 10-15 per week
9. Spleen; 10 per week
10. Bone, 10 per week
11. RIA, System 1 used, Language used BASIC, graph and list output, objective of study is numbers, 15-25 per week.

Installation: Cancer Foundation of Santa Barbara
Address: 300 W. Pueblo Street
Santa Barbara, California 93105
USA

Phone: (805) 966-6121

Cancer Foundation of Santa Barbara is a Clinical and teaching institution which has Approximately 500 beds. For further information, contact:

Santa Barbara Collage Hospital(clinical)
ADAC(hardware)
ADAC(software)

The responding department operates the following data acquisition and processing equipment:

ADAC LSI-11

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: ADAC 64K (16 bit) words of memory, removable floppy disks with 2.4 megabytes capacity, remote terminal, Dunn Instruments Model 414 Dual format camera, CRT videomonitor, capable of simultaneous collection and processing, interfaced to two cameras. (32 X 32 20 frames/second) (64 X 64 5 frames/second) (128 X 128 1 frame/second) camera collection, 440 at 20/sec max number of frames, 32,892 cts/ele at (128 X 128 X 116) max number of counts. Position, time, and energy signals collected.

On the computers described above, the following studies are performed:

1. Heart (Flow); objective of study images and EF, 1 per week
2. Heart (Gated); objective of study images and EF, 1 per week
3. Heart (Effusion); objective of study images,
4. Heart (Output) (Thalliums); objective of study images, 10 per week

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Installation: Institute of Medical and Veterinary Science
Department: Division of Nuclear Medicine
Address: Box 14, Rundle Street Post Office
Adelaide, South Australia 5000
Australia

Phone: 223-0230

Institute of Medical and Veterinary Science is a 10% research, 85% clinical, 5% teaching institution which has 1,200 beds.

For further information, contact:

Dr. D. J. Cook (clinical)
Mr. R. J. O'Reilly (hardware)
Mr. P. J. Collins (software)

2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

DEC Gamma-11/T55; DEC Gamma-11/34

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by consultant service.

System descriptions:

System 1: DEC Gamma 11/T55 80K (16 bit) words of memory, RK05, 2 X RK05 removable disks with 7, 2 X 1.2 meg-w capacity, line printer (200 LPM) 1 X Decwriter, 4 X VT52, 1 X Conrac CRT display with 16 greyscales and color, capable of simultaneous collection and processing, Languages used FORTRAN, BASIC, assembler, and Pocal. Interfaced to 1 camera (32 X 32 up to 50/second) (64 X 64 up to 12/second) frame mode, 512 max number of frames, 65535 cts/ele at 64 X 64 max number of counts, (128 X 128) list mode size with 7m max counts. Position, time, energy, and physiological signals collected.

System 2: DEC Gamma 11/34 32K (16 bit) words of memory, 2 X RK05 removable disks with 2 X 1.2 meg-w capacity, 1 X decwriter, VDUs shared, 1 X conrac CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used: FORTRAN BASIC, Assembler, and Pocal. Interfaced to 1 camera, (32 X 32 up to 50/second) (64 X 64 up to 12/second) frame mode camera collection. 512 max number of frames, 65535 cts/ele (64 X 64) max number of counts, (128 X 128) list mode with 1.2m max counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); System 1 or 2 used, Language used FORTRAN, list and graph output, objective of study flow c. and status, 25 per week
2. Renal, System 1 or 2 used, Language used FORTRAN, list and graph output,
3. Lung (Perfusion); System 1 or 2 used, Language used FORTRAN, list and functional output, objective of study image, 15 per week
4. Lung (Ventilation), System 1 or 2 used, Language used FORTRAN, list and functional output, objective of study image, 15 per week
5. Lung (V/Q) System 1 or 2 used, Language used FORTRAN, list and functional output, objective of study image, 15 per week
6. Heart (Flow); System 1 or 2 used, Languages used FORTRAN, list and graph output, objective of study flow curves, 1 per week
7. Heart (Gated); System 1 or 2 used, Languages used FORTRAN, and assembler, list and graph output, objective of study images and volume curves, 3 per week
8. Heart (Output); System 1 or 2 used, Languages used FORTRAN, and assembler, list and graph output, objective of study volume curves and numbers, 2 per week
9. Pancreas, System 1 or 2 used, Language FORTRAN, list output, objective of study images, 1 per week
10. Bone, System 1 or 2 used, Language FORTRAN, list and graph output, objective of study image and profile, 2 per week
11. Gall Bladder, System 1 or 2 used, Language FORTRAN, list and graph output, objective of study image and flow curves, 1 per week
12. Parathyroid, System 1 or 2 used, Language FORTRAN, list output, objective of study image, 1 per week

The responding department made the following comments concerning its operation:

1. A switching circuit (see enclosed diagram) enables any of three cameras and associated VDUs to be switched to either of the two computers.
2. The Gamma 11 acquisition plus analysis programs are being rewritten for the RSX,11M multi-task operating system

<350>

Installation: Nuclear Medicine Associates
Address: 500 West 10th Place
Tucson, Arizona 85201
USA

Nuclear Medicine Associates is a Clinical Institution which
has 300 beds.
For further information, contact:
Bland Giddings (software)

The responding department made the following comments
concerning its operation:
No systems at present; 3 scintillation cameras, 4
rectilinear scanners.

<400>

Installation: Duke University Medical Center
Address: Box 2986
Durham, North Carolina 27710
USA

Phone: (919) 684-6077

Duke University Medical Center is a Research, clinical, and teaching institution which has 950 beds.
5 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370/165, DEC PDP 11/70, DEC PDP 11/45 equipment. The responding department uses primarily Mag tape, modem (terminal), and punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by magnetic media.

The responding department operates the following data acquisition and processing equipment:

Baird Atomic-77 D116

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

Hardware development is performed by permanent staff along with other duties and by consultant service.

System descriptions:

System 1: Baird Atomic-77 D-116 128K (16 bit) words of memory, 2 fixed disks with 1.5 meg-w, 9 tr tape, CRT display with 16 greyscales and color. Languages used FORTRAN, PL/1, Assembler. Interfaced to a camera and a scanner. 5000 max number of frames, 32767 cts/ele at (56 X 84) max number of counts.

On the computers described above, the following studies are performed:

1. Heart (Flow), S-77 system used, 45 per week.

<450>

Installation: Cleveland Clinic Foundation
 Address: 9500 Euclid Avenue
 Cleveland, Ohio 44160
 USA

Phone: (216) 444-2667

Cleveland Clinic Foundation is a Research and clinical institution which has 1000 beds.

For further information, contact:

Dr. W. J. MacIntyre (clinical)

Dr. Joseph H. Gallagher (hardware)

W. J. Sufka, T. S. Houser, Dr. Joe Gallagher (software)

The institution operates a central computing facility containing DEC PDP-15/76 with XVM; 2 B-4700's equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-15/76

System descriptions:

System 1: PDP 15/76 with XVM 64K (18 bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800 bpi 45 ips tape, DEC tapes, 2 removable disks with 1.2 meg-w capacity, line printer, card reader, XY slotter, VT15 and VP15 with 7 greyscales Languages used FORTRAN, and assembler. Interfaced to 2 cameras (32 X 32 20/second) and (64 X 64 5/second) frame mode 2500 max number of frames.

On the computers described above, the following studies are performed:

1. Renal; System 1 used, Languages used FORTRAN and assembler, dilution curves output 20 per week
2. Lung (Perfusion); System 1 used, Languages used FORTRAN and assembler, 8 per week
3. Heart (Flow); System 2 used, Languages used FORTRAN and assembler, dilution curves output, 5 per week
4. Heart (Gated); System 2 used, Languages used FORTRAN and assembler, dilution curves output, 5 per week

5. Heart (Perfusion); System 2 used, Languages used FORTRAN and assembler, dilation curves output, 10 per week
6. Heart (Output); System 2 used, Languages used FORTRAN and assembler, dilation curves output, 5 per week
7. Liver (Static); System 1 used, Languages used FORTRAN and assembler, 20 per week
8. Spleen; System 1 used, Languages used FORTRAN and assembler, 20 per week

<500>

Installation: Queens Hospital Center
Department: Department of Nuclear Medicine
Address: 82-86 164th Street
Jamaica, New York 11432
USA

Phone: (212) 990-2215

Queens Hospital Center is a Clinical institution which has 800 beds.

The responding department operates the following data acquisition and processing equipment:

Data General Nova-1220; Elscint Dycom-80; Data General Nova-3

Software development, mostly new analysis routines, is performed by consultant service (volunteer).

System descriptions:

System 1: Data General NOVA-1220 cpu with 32K (16-bit) words of memory 60 cps paper tape punch, 300 cps paper tape reader; 2.5-meg removable pack disk; languages FORTRAN, BASIC, and assembler; interfaced to 1 scintillation camera, system under development.

System 2: Elscint DYCOM 80 NOVA 3 16K (16 bit) words of memory, 1 data general fixed disk at 2.5 meg-w, 1 data general removable disk at 2.5 meg-w, color scope (output), line printer, capable of simultaneous collection and processing. Languages used FORTRAN IV, BASIC, Assembler, and machine. Interfaced to cameras.

The responding department made the following comments concerning its operation:
Standard Elscint Dyson 80 Model Ac-2 now in process of installation. We do not have all the data on performance.

<550>

Installation: Citibank
Address: 399 Park Avenue
New York, New York 10043
USA

Phone: (212) 559-4947

Citibank is a Clinical institution.
For further information, contact:
C. G. Weiman (clinical)
Meditech (hardware)
Meditech (software)

The institution operates a central computing facility containing PDP equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Is analyzed on the spot.

The responding department operates the following data acquisition and processing equipment:
Meditech

Software development, mostly modification of routines in use, is performed by full time programmer.

System descriptions:

System 1: Meditech, CRT display, capable of simultaneous collection and processing

<600>

Installation: University of Iowa Hospital
Address: Iowa City, Iowa 52242
USA

Phone: (319) 356-1911

University of Iowa Hospital is a Research, clinical and teaching institution which has 1100 beds.

For further information, contact:

Dr. J. C. Ehrhardt (clinical)

Dr. J. C. Ehrhardt (hardware)

Dr. J. C. Ehrhardt (software)

The institution operates a central computing facility containing IBM 360/65 equipment. The responding department uses primarily Mag tape, Modem (terminal), punched cards, and paper tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-3; Data General Nova-1200

Software development, mostly new analysis routines, is performed by part time programmer.

System descriptions:

System 1: MDS Nova 3 32K (16 bit) words of memory, 100 cps paper tape reader, 8 tr 800 bpi tape, 2 removable disks with 2.4 meg-w capacity, light pen, CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and assembler. Interfaced to 2 cameras, (32 X 32 0.1/second) (64 X 64 0.1/second), (128 X 128 0.1/second) frame mode, 500 max number of frames, 64K cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 2M max counts. Position, time, and physiological signals collected.

System 2: MDS Nova 1200 32K (16 bit) words of memory, 1 removable disk with 2.4 meg-w capacity, light pen, CRT display with 16 greyscales, Language used BASIC. Interfaced to 1 camera, (32 X 32 0.1/second), (64 X 64 0.1/second), (128 X 128 0.2/second) camera collection; 500 max number of frames, 64K cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 750K max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); 5 per week
2. Renal; 3 per week
3. Heart (Flow); 5 per week
4. Heart (Gated); 25 per week

<650>

Installation: Loma Linda University Medical Center
Address: Anderson Street
Loma Linda, California 92354
USA

Phone: (714) 796-7311 Ext. 2206

Loma Linda University Medical Center is a Research and clinical institution which has 500 beds.

For further information, contact:

Department of Neurosurgery (software)

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/10; DEC PDP-11/34

Software development, about 50/50 new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: PDP 11/10 24K RK05 removable disks, LA 36, VR 17 CRT display with 1-8 greyscales, Languages used, FORTRAN and BASIC

System 2: PDP 11/34 8K Floppy disk removable disks, X-Y plotter, Languages used, FORTRAN.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 1 used, Language used FORTRAN, list and CRT output, objective of study is CBF measurements, # 10 per week
2. EEG; system 2 used, Language used FORTRAN, plotter output, objective of study is spectral analysis of EEG, # 10 per week.

<700>

Installation: Temple University Hospital
Address: 3401 N. Broad Street
Philadelphia, Pennsylvania 19046
USA

Phone: (215) 221-3475

Temple University Hospital is a Research, clinical and teaching institution which has 550 beds.

For further information, contact:

Dr. Todd Makler (clinical)
Dr. Todd Makler (hardware)
Dr. Todd Makler (software)

The responding department operates the following data acquisition and processing equipment:

H-P 5407; H-P 2100

Software development, mostly new analysis routines, is performed by permanent staff along with other duties.

System descriptions:

System 1: H-P 5407 HP2100 12K (16 bit) words of memory, paper tape reader, mag tape, HP fixed disks with 1.2 meg-w, HP removable disks with 1.2 meg-w, CRT display with 16 greyscales. Language used BASIC. Interfaced to 1 camera, (64 X 64) 320 max number of frames available, 255 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size at 1.2M max counts. Position, time, and energy signals collected with two isotopes.

On the computers described above, the following studies are performed:

1. Renal: Language used BASIC, table and graph output, objective of study is percent of function of each kidney, 2 per week
2. Research, Language used BASIC, 10 per week

The responding department made the following comments concerning its operation:

An MDS system will be delivered during October.

<750>

Installation: Massachusetts General Hospital
Address: Boston, Massachusetts 02114
USA

Phone: (617) 726-8350

Massachusetts General Hospital is a Research, clinical and teaching institution which has 1000 beds.

For further information, contact:

H. W. Strauss, R. A. McRusick, G. Lauser (clinical)

W. Aipart and E. Taroui (hardware)

W. Aipart and E. Taroui (software)

6 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

NDS; Data General Nova-312; Modcomp II/25; Ohio Nuclear
VIP-450

Software development, about 50/50, new and modification, is performed by full time programmer.

System descriptions:

System 1: NOS (3) Nova 312 32K (16 bit) words of memory, paper tape reader, 9 tr 800 bpi 75 ips tape, Diablo and Ampex removable disks with 2.5 and 40 meg-w capacity respectively.

System 2: VIP (2) with removable 5.0 meg-w disks.

System 3: MODCOMP II/25 32K (16 bit) words of memory, 9 tr 800 bpi 45 ips tape, Diablo 2.5 meg-w removable disks

Installation: Radiofysikaudelningsn
Address: Akademiska Sjukhuset
S-75014 Uppsala
Germany

Phone: 018-111000 Ext. 1685

Radiofysikaudelningsn is a Clinical institution.
For further information, contact:
Bo Jung (clinical)
Hans Dahlin (hardware)
Per Gestrom (software)

The institution operates a central computing facility containing IBM 370/155 equipment. The responding department uses primarily mag tape, modem (terminal) and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:
DEC PDP-11/10

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: User system PDP 11/10 24K (16 bit) words of memory, RK05 removable disks with 1.2 meg-w capacity, Gamma Camera CRT display. Languages used FORTRAN and assembler. Interfaced to 1 camera, (128 X 128 1/second), 65K cts/ele max number of counts. Position signals collected.

On the computers described above, the following studies are performed:

1. Liver (Static) Language used FORTRAN, graph output, objective of study is images.

<850>

Installation: Kaiser Hospital
Department: Department of Nuclear Medicine
Address: 280 West MacArthur Blvd.
Oakland, California 94661
USA

Phone: (415) 645-5829

Kaiser Hospital is a Clinical institution which has 340 beds.

For further information, contact:

Dr. Paul Weber (clinical)

David Schurr (hardware)

David Schurr (software)

2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

General Electric 812; DEC PDP-11/34

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: GE 812 16K (12 bit) words of memory, 10 cps paper tape reader, 10 cps paper tape punch, 800 bpi 45 ips incremental tape, WANGO fixed disks with 2 meg-w capacity, WANGO removable disks with 2 meg-w capacity, Diablo printer/plotter, Tectronix 602 CRT display with 4095 greyscales, Languages used NUTRAW, and assembly, interfaced to 2 cameras, (32 X 32 40/second), (64 X 64 10/second) camera collection, 738 max number of frames, 4095 cts/ele at (64 X 64) max number of counts, list mode max counts 60K counts/sec. Position, time, and physiological signals collected.

System 2: DEC 11-34 64K (16 Bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, DEC RK05 removable disks with 1.2 meg-w capacity, AED 40 MW disk, DSD Dual Floppy disk, DEC VTJ2 terminal, ADM 3A terminal, DEC VSV01 CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and assembly. Interfaced to 3 cameras (32 X 32 80/second) (64 X 64 20/second) camera collection frame

mode, # 8000 frames max number of frames, 32,768 cts/ele at (64 X 64) max number of counts, list mode max counts 100K counts/sec. Position time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 1 used, languages used NUTRAN and assembly, list, graph, and polaroid output, objective of study is images, ERP, curves, and numbers, 3 per week
2. Lung (V/Q); system 1 used, languages used NUTRAN and assembly, plot output, objective of study is function and images, 1/2 per week
3. Heart (Flow) system 1 used, languages used NUTRAN, assembly, PORTRAN, and BASIC, numbers, curves, list and images output, objective of study is images, numbers, curves and movies, 5-8 per week
4. Heart (Gated) system 1 and 2 used, languages used NUTRAN, assembly, PORTRAN, and BASIC, numbers, curves, list and images output, objective of study is images, numbers, curves and movies, 5 per week
5. Heart (Effusion) system 1 and 2 used, languages used NUTRAN, assembly, PORTRAN, and BASIC, numbers, curves, list and images output, objective of study is images, numbers, curves and movies, 2 - 3 per week
6. Heart (Output), system 1 used, languages used NUTRAN, assembly, PORTRAN, and BASIC, numbers, curves, list and images output, objective of study is images, numbers, curves and movies, 5 - 8 per week
7. Placenta, system 1 used, language used NUTRAN, polaroid output, objective of study images, 1/2 per week
8. Heart (Shunts); system 1 used, language used NUTRAN, graph output, objective of study is numbers, 1 - 2 per week

The responding department made the following comments concerning its operation:

The installation of our Gamma-11 System is not yet complete-- we, therefore, have limited experience with it.

<900>

Installation: Mount Sinai Medical Center (New York)
Address: Fifth Avenue and 100th Street
New York, New York 10029
USA

Phone: (212) 650-6967

Mount Sinai Medical Center (New York) is a Research, clinical, and teaching institution which has 1200 beds. For further information, contact:

Dr. S. J. Goldsmith (clinical)
John Rogers (hardware)
John Rogers (software)

The institution operates a central computing facility containing IBM 370 equipment. The responding department uses primarily Mag Tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 80% is analyzed on the spot and 20% is done by magnetic tape..

The responding department operates the following data acquisition and processing equipment:

Varian V-74; Baird Atomic-77

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Varian V-74 48K (16 bit) words of memory, 9 tr 1600 bpi 75 ips tape, and cassette tapes, removable disks with 14 meg-w capacity, card reader, printer/plotter, line printer, camera interfaces, analog I/O, (128 X 128) CRT display with 32 greyscales, capable of simultaneous collection and processing. Languages used FORTRAN and assembler. Interfaced to 2 cameras, (64 X 64 200/second) (128 X 128 50/second) frame mode, 500 max number of frames, 64K cts/ele at (128 X 128) max number of counts, (128 X 128) list mode with 20M counts max. Position, time, and physiological signals collected

System 2: Baird-Atomic 77, 9 tr 800 bpi 45 ips tape, removable disks with 5 meg-w, hard copy, 112 X 84 CRT display with 32 greyscales and color, no languages used, interfaced to 1 camera, (128 X 128 25/second) frame mode, 2000 max number of frames.

System 3: Ohio Nuclear VIP-450 128K (10 bit) words of memory, 9 tr 800 bpi 37 1/2 ips tape, cassette tapes, 8 X 10 multiformatter, light pen, 256 X 256 CRT display with 32 greyscales, interfaced to 2 cameras, (32 X 32 18/second) (64 X 64 4.5/second) (128 X 128 1.1/second) frame mode, 2800 max number of frames, 1024 cts/ele at (128 X 128) max number of counts.

<950>

Installation: University of Miami School of
Medicine/Jackson Memorial Hospital
Department: Division of Nuclear Medicine
Address: P. O. Box 520875 Piscayne Annex
Miami, Florida 33136
USA

Phone: (305) 325-6345

University of Miami School of Medicine/Jackson Memorial Hospital is a Research, clinical and teaching institution which has 1200 beds.

For further information, contact:

A. Serafini (clinical)

E. Garcia (hardware)

E. Garcia

(Technical Contact) J. Pain (software)

The institution operates a central computing facility containing Univac 1108 equipment. The responding department uses primarily Mag Tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-1200

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: MDS Nova 1200 32K (16 bit) words of memory, paper tape reader & tr 800 bpi 45 ips tape, HD-12 fixed disk with 1.2 meg-w capacity, HD-12 removable disks with 1.2 meg-w capacity, VTR, (2) H-P1300 CRT display with 16 greyscales and color, (1) Sony KV1204 CRT display, capable of simultaneous collection and processing. Languages used Assembler, BASIC, and FORTRAN. Interfaced to 5 cameras and 1 tomographic scanner (64 X 64 25/second) camera collection frame mode, 600 max number of frames, 256 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 37,500 max counts/sec with 12.4M counts total. Position,

time, and physiological signals collected. Pho/Con tomographic scanner collection is .3cm steps, .6cm steps, and .9cm steps max resolution, (65 X 65) (35 X 35) and (15 X 15) image sizes, 37,500 counts/sec with 12.8K counts total.

On the computers described above, the following studies are performed:

1. Renal, Assembler language used, CRT output, objective of study is images and curves, 5 (perfusion and functional) per week
2. Lung (Perfusion), Assembler language used, CRT output, objective of study is images and curves, 3 per week
3. Lung (Ventilation), Assembler language used, CRT output, objective of study is images and curves, 3 per week
4. Heart (Plcw), Assembler language used, CRT output, objective of study is images and curves, 8 per week
5. Heart (Gated); Assembler and FORTRAN languages used, CRT output, objective of study is images, 6 per week
6. Heart (Effusion) Assembler language used, CRT output, objective of study is images and curves, 1 per week
7. Heart (Output); Assembler language used, CRT output, objective of study is images and curves, <1 per week
8. Liver (Static), Assembler language used, CRT output, objective of study is images, <1 per week
9. Spleen; Assembler language used, CRT output, objective of study is images and numbers, <1 per week
10. Pancreas, assembler language used, CRT output, objective of study is images, <1 per week
11. Bone, assembler language used, CRT and list output, objective of study is to quantitate lesions, <1 per week

The responding department made the following comments concerning its operation:
See Diagram.

<1000>

Installation: Edward Hines VA Hospital
 Address: 5th and Roosevelt
 Hines, Illinois 60141
 USA

Phone: (312) 343-7200 Ext. 2675 and 2440, PTS
 378-6700

Edward Hines VA Hospital is a Research, clinical and teaching institution which has 1500 beds.

For further information, contact:

James S. Arnold, M.D. (clinical)

Samuel M. Shponka (hardware)

Samuel M. Shponka (software)

3 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

Elscint; Data General Nova-2; Data General Nova-3D

Software development, mostly by new analysis routines, is performed by permanent staff along with other duties and by a full time programmer.

System descriptions:

System 1: Elscint Data General Nova 2 32K (16 bit) words of memory 600 cps paper tape reader, 10 cps paper tape punch, 9 tr 800 bpi 37 1/2 ips tape, DG 6045 removable disks with 5 meg-w capacity, light pen, 2 terminals, Brattle gate, color printer, CRT Display with 8 greyscales and color. Languages used FORTRAN, BASIC, and D.G. Assembler, interfaced to cameras, (32 X 32 100/second) (64 X 64 25/second) (128 X 128 6/second) camera collection frame mode, 1000 (64 X 64) max number of frames, 32767 cts/ele at (128 X 128) max number of counts, 500K counts/sec max list mode. Position, time, and physiological signals collected.

System 2: Data General Nova 3D 128K (16 bit) words of memory, paper tape reader and paper tape punch is shared with system 1, 9 tr 800 bpi 75 ips tape, D.G. 6045 removable disks with 5 meg-w capacity, Diablo Model 33 2.5 Mbyte disk, 4 terminals. Languages used FORTRAN, BASIC, and D.G. Assembler.

On the computers described above, the following studies are performed:

1. Brain (Static); system 1 used, FORTRAN language used, CRT output, objective of study is images, 30 per week
2. Brain (Flow); system 1 used, FORTRAN language used, CRT output, objective of study is flow curves, 30 per week
3. Renal; system 1 used, FORTRAN language used, CRT and printer output, objective of study is flow curves, 4 per week
4. Lung (Ventilation); system 1 used, FORTRAN language used, CRT and printer output, objective of study is numbers, 4 per week
5. Heart (Perfusion) system 1 used, FORTRAN language used, CRT output, objective of study is images, 1 per week
6. Liver (Function) system 1 used, FORTRAN language used, CRT and printer output, objective of study is curves and images, 1 per week
7. Bone; system 1 used, FORTRAN language used, CRT and printer output, objective of study is images and curves, 2 per week
8. Thallium, system 1 used, FORTRAN language used, CRT output, objective of study is images, 3 per week

The responding department made the following comments concerning its operation:

All students in our nuclear medicine technologist training program and physicians in our residency program receive training in computer technology. We also have an advanced course for training nuclear medicine computer specialists who will be responsible for managing and programming nuclear medicine computer systems.

<1050>

Installation: St. Joseph Mercy Hospital
Address: P. O. Box 995
Ann Arbor, Michigan 48106
USA

Phone: (313) 572-3597

St. Joseph Mercy Hospital is a Teaching institution which has 558 beds.

For further information, contact:

Jeff Colvin(clinical)

Jeff Colvin(hardware)

Jeff Colvin(scftware)

1/2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

MDS-Trinary;Data General Nova-1200

Software development, about 50/50 new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: MDS-Trinary Nova 1200 64K (16 bit) words of memory, 60 cps paper tape reader, Diablo removable disks with 1.2 meg-w capacity 2 ADDs terminals, 1 TI terminal, 1 Tectronic-640 CRT display, with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and assembler. Interfaced to 2 cameras, (32 X 32 20/second) (64 X 64 9.25/second) frame mode camera collection, 1200 max number of frames, 4096 cts/ele at (64 X 64) max number of counts. Position, and time signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static) Assembler language used, polaroid output, objective of study is to improve contrast, 30 per week
2. Brain (Flow), Assembler, BASIC, and FORTRAN languages used, polaroid, curves, and list output, objective of study is images, curves, and numbers, 25 per week
3. Lung (Ventilation); assembler language used, polaroid output, objective of study is backup, 15 per week

4. Heart (Gated), Assembler language used, CRT and curves output, objective of study is curves, pictures, and numbers, 5 per week
5. Heart (Statics); Assembler language used, polaroid output, objective of study is images, 4 per week

<1100>

Installation: Mayo Clinic
 Address: 200 First Street, SW
 Rochester, Minnesota 55901
 USA

Phone: (507) 284-3055

Mayo Clinic is a Clinical institution.
 For further information, contact:
 MDS, Data General (hardware)
 MDS, Data General (software)

The institution operates a central computing facility containing 370/158 equipment. The responding department uses primarily Mag tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 1s analyzed on the spot by portable computer and camera, by wire 5,000 feet long and magnetic disc cartridge.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-1200; DEC PDP-11/03

Software development, about 50/50, new and modification, is performed by full time programmer.
 Hardware development is performed by consultant service.

System descriptions:

System 1: MDS DG 1200 32K (16 bit) words of memory, 800 bpi 75 ips tapes, cartridge fixed disks with 1.2 meg-w capacity, cartridge removable disks with 1.2 meg-w capacity, Hewlett-Packard CRT display with 16 greyscales capable of simultaneous collection and processing. Languages used FORTRAN, and assembler. Interfaced to 3 cameras (64 X 64 2/second) camera collection frame mode, 298 max number of frames, (64 X 64) list mode with 1 mil max counts. Position and physiological signals collected.

System 2: MDS DG 1200 32K (16 bit) words of memory, removable cartridge disks with 1.2 meg-w capacity, Tektronix 604 CRT display with 16 greyscales. Languages used FORTRAN and assembler, interfaced to two cameras, (64 X 64 2/second) frame mode camera collection, 249 max number of frames, (64 X 64) list mode with 1/2 mil max counts. Position and physiological signals collected.

System 3: DEC FDP11/V03 32K (16 bit) words of memory, removable floppy disks with 0.2 meg-w capacity, DEC VT-11 CRT display with 8 greyscales capable of simultaneous collection and processing. Languages used FORTRAN and assembler. Interfaced to 1 scanner. Position signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static) systems 1 and 2 used, assembler language used, film output, objective of study is curves and numbers, 7 per week
2. Brain (Flow); systems 1 and 2 used, assembler language used, film output, objective of study is curves and numbers, 7 per week
3. Renal; systems 1 and 2 used, FORTRAN and assembler language used, film output, objective of study curves and numbers, 6 per week
4. Lung (V/Q); systems 1 and 2 used, assembler language used, film output, objective of study is images, 6 per week
5. Heart (Gated); systems 1 and 2 used assembler language used, objective of study is numbers and images, 1 per week
6. Shunt; systems 1 and 2 used, FORTRAN and assembler languages used, film output, objective of study is curves, 1 per week
7. Gallium; system 1 used, Assembler language used, film output, objective of study is numbers and images, 1 per week

<1150>

Installation: Albany Veterans Administration Medical Center
Address: Holland Avenue
Albany, New York 12209
USA

Phone: (518) 462-3311, Ext. 525, FTS 563-9524

Albany Veterans Administration Medical Center is a Teaching institution which has 800 beds.

For further information, contact:

Lawrence H. Flesh, M.D. (clinical)
Joseph R. Tatarczuk, Ph.D. (hardware)
Joseph R. Tatarczuk, Ph.D. (software)

The responding department operates the following data acquisition and processing equipment:

DEC Gamma-11/40; DEC MDA-11/03

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC Gamma-11/40 64K (16 bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800/1600 bpi tape, cassette tapes, RK05P fixed disks with 2.5 meg-w capacity, 2-RK05J removable disks with 1.2 meg-w capacity each LA36, VT50, printer, plotter, dual floppy disks, AR11 analog I/O, Video and Tek 611 CRT display with 32 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and assembler. Interfaced to 2 cameras, (32 X 32 50/second) (64 X 64 12/second) frame mode camera collection, 512 max number of frames, 65K cts/ele at (64 X 64) max number of counts, (128 X 128) list mode with 1.2M max counts. Position, time and physiological signals collected.

System 2: (On order) DEC MDA-11/03 32K (16 bit) words of memory, dual floppy removable disks with 256K, VT100. Languages used Assembler. Interfaced to 4 cameras, (32 X 32 12/second) (64 X 64 4/second) frame mode camera collection. 65K cts/ele at (64 X 64) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Static); system 1 used, assembler language used, objective of study is images, 20 per week
2. Brain (Flow); system 1 used, assembler language used, objective of study is images, 20 per week
3. Renal, system 1 used, assembler and FORTRAN language used, objective of study is images and curves, 3 per week
4. Lung (Ventilation), system 1 used, assembler language used, objective of study is images, and curves, 1 per week
5. Heart (Flow) system 1 used, assembler language used, objective of study is images, flow curves, and ejection fraction, 5 per week
6. Heart (Gated); system 1 used, assembler and Basic languages used, objective of study is images, flow curves, and ejection fraction, 5 per week
7. Heart (Perfusion); system 1 used, assembler language used, objective of study is images, flow curves, and ejection fraction, 5 per week
8. Bone; system 1 used, assembler language, count output, objective of study is images and count ratios, 1 per week
9. Tc-99m Decay; system 1 used, FORTRAN language used, list output, 5 per week
10. RBC calculation; system 1 used, BASIC language used, list output 1 per week
11. Schilling calculation; system 1 used, Basic language used, list output, 2 per week

The responding department made the following comments concerning its operation:

RIA analysis and recordkeeping. Work load status: Gate synchronized acquisition on each unit with up to 52 frames per R-R interval.

Installation: Hospital of the Albert Einstein College of
Medicine
Address: 1825 Eastchester Road
Bronx, New York 10461
USA

Phone: (212) 430-2923

Hospital of the Albert Einstein College of Medicine is a
Research, clinical and teaching institution which has 400
beds.

For further information, contact:

Dr. John P. Wexler (clinical)
Mr. Ari M. Rabinowitz (hardware)
Mr. Ari M. Rabinowitz (software)

The institution operates a central computing facility
containing Sigma 6 equipment. The responding department
uses primarily Mag tapes for data interchange with the
central facility. Data are transmitted between the remote
site and the central computing facility by Collected by
wire 100 feet long.

The responding department operates the following data
acquisition and processing equipment:

DEC Gamma-11/34; Elscint Dycom-80; Data General Nova-3

Software development, mostly new analysis routines, is
performed by permanent staff along with other duties and by
a full time programmer.

Hardware development is performed by permanent staff along
with other duties.

System descriptions:

System 1: DEC Gamma-11 PDP 11/34 128K (16 bit) words
of memory, 9 tr 800 bpi 75 ips tape, 2 removable disks with
5 meg-w capacity, CRT display with 16 colors capable of
simultaneous collection and processing. Languages used
FORTRAN and BASIC. Interfaced to 3 cameras, 512 max number
of frames, 65535 cts/ele at (64 X 64) max number of counts,
(128 X 128) list mode size. Position, time and
physiological signals collected.

System 2: Elscint-Dycom 80 Nova 3 32K (16 bit) words of memory, 300 cps paper tape reader, 9 tr 800 bpi 75 ips tape, 1 fixed disk with 2.5 meg-w capacity, 1 removable disk with 2.5 meg-w capacity, CRT display with 64 greyscales and 16 colors. Languages used FORTRAN. Interfaced to 3 cameras (32 X 32 100/second) (64 X 64 25/second) (128 X 128 12/second) frame mode camera collection, 1000 max number of frames, 255 cts/ele at (64 X 64) max number of counts, (128 x 128) list mode size with 5 million max counts. Position, time and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 2 used, graph output, objective of study is curves, 2 per week
2. Heart (Gated); system 1 used, BASIC and FORTRAN languages used, objective of study is ejection fraction and wall motion, 15 per week

The responding department made the following comments concerning its operation:

System 1 is devoted to cardio-vascular research and clinical applications. System 2 is available for general nuclear medicine procedures.

<1250>

Installation: Mt. Sinai Hospital (Cleveland)
 Address: 1800 East 105th Street
 Cleveland, Ohio 44106
 USA

Phone: (216) 795-6000 Ext. 407

Mt. Sinai Hospital (Cleveland) is a Teaching institution which has 600 beds.

For further information, contact:

S. W. Wiener (clinical)
 R. M. Mares (hardware)
 R. M. Mares (software)

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; DEC PDP-11/40; DEC PDP-11/03

Software development, about 50/50, new and modification, is performed by full time programmer.

System descriptions:

System 1: DEC PDP 11/34 124K (16 bit) words of memory, 300 cps paper tape reader, 9 tr 800 bpi 45 ips incremental tape, 2 RX02 removable disks with 0.5 meg-w capacity, 2 PL01 removable disks with 5.0 meg-w capacity, PP11A floating point processing, KK11A cache memory, electrostatic printer/plotter, graphic digitizer, VSV01 CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, Assembler, and RSX11-M operating system.

System 2: DEC PDP 11/40 48K (16 bit) words of memory, 1 PL01 removable disk with 5.0 meg-w capacity, 2 RX02 removable disks with 0.5 meg-w capacity, KE11P PIS, KE11P EIS, VSV01 CRT display with 16 greyscales and color. Languages used FORTRAN, BASIC, Assembler, RT-11 operating system, and Gamma-11. Interfaced to 2 cameras, (32 X 32 80/40/second) (64 X 64 20/10/second) camera collection frame mode, 4800 max number of frames, 65,535 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 2.4M max counts. Position, time, energy, and physiological signals collected.

System 3: DEC ISI 11/03 32K (16 bit) words of memory, 2 RX02 removable disks with 0.5 meg-w capacity. Languages used FORTRAN, BASIC, Assembler, RT-11 operating system, and Gamma-11. Interfaced to 1 camera, (32 X 32 12/6/second) (64 X 64 4/2/second) camera collection frame mode, 480 max number of frames, 65,535 cts/ele at (64 X 64) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 2 used, gamma-11 language used, CRT output, objective of study is images, 10 per week
2. Renal; system 2 used, gamma-11 and FORTRAN languages used, CRT and graph output, objective of study is curves and numbers, 2 per week
3. Thyroid (Image); system 2 used, gamma-11 language used, CRT output, objective of study is images, 1 per week
4. Lung (Ventilation); system 2 used, gamma language used, CRT output, objective of study is images, 5 per week
5. Lung (V/Q); system 2 used, gamma-11 language used, CRT output, objective of study is images and numbers, 1 per week
6. Heart (Flow); systems 2 and 3 used, Gamma-11 language used, CRT output, objective of study is images, 1 per week
7. Heart (Gated); systems 2 and 3 used, Gamma-11 and FORTRAN language used, CRT and list output, objective of study is images and numbers, 4 per week
8. Heart (Perfusion); systems 2 and 3 used, Gamma-11 and FORTRAN language used, CRT output, objective of study is images, 10 per week
9. Heart (Output); systems 2 and 3 used, Gamma-11 and FORTRAN languages used, CRT and list output, objective of study is images and numbers, 4 per week
10. Bone; system 2 used, gamma-11 language used, CRT output, objective of study is images, .5 per week
11. Uniformity; systems 2 and 3 used, gamma-11 and FORTRAN language used, CRT and list output, objective of study is images and numbers, 15 per week
12. Residual urine; system 2 used, gamma-11 language used, CRT output, objective of study is images, .1 per week
13. Angiograms, system 2 used, gamma-11 language used, CRT output, objective of study is images and numbers, .5 per week

The responding department made the following comments concerning its operation:

See attached service distribution chart.

System #1 CLINICAL RADIOLOGY COMPUTER FACILITY					
NUCLEAR MEDICINE	RADIOTHERAPY	DIAGNOSTIC RADIOLOGY	ULTRASOUND	COMPUTERIZED TOMOGRAPHY	DEPARTMENTAL ADMINISTRATION
<ul style="list-style-type: none"> -image processing support -RIA support -research -teaching -archival storage of images 	<ul style="list-style-type: none"> -treatment planning -dose calculations -tumor registry -research 	<ul style="list-style-type: none"> -quality control 	<ul style="list-style-type: none"> -research -teaching 	<ul style="list-style-type: none"> -image analysis support -research -teaching 	<ul style="list-style-type: none"> -statistical reporting -word processing support

System #2 NUCLEAR MEDICINE COMPUTER FACILITY
NUCLEAR MEDICINE
<ul style="list-style-type: none"> -gamma camera data collection and analysis -quality control

MOBILE DATA ACQUISITION SYSTEM System #3	
NUC. MED.	ULTRASOUND
<ul style="list-style-type: none"> -gamma camera data collect. -research 	<ul style="list-style-type: none"> -research data collection

<1300>

Installation: Strong Memorial Hospital, University of
Rochester
Address: 601 Elmwood Avenue
Rochester, New York 14642
USA

Phone: (716) 275-4741

Strong Memorial Hospital, University of Rochester is a
Teaching institution which has 700 beds.

For further information, contact:

G. A. Wilson and R. E. O'Hara (clinical)
D. A. Weber (hardware)
D. A. Weber (software)

The institution operates a central computing facility
containing Yes equipment. The responding department uses
primarily Mag tape for data interchange with the central
facility. Data are transmitted between the remote site and
the central computing facility by 9 magnetic tape.

The responding department operates the following data
acquisition and processing equipment:

MDS; Data General Nova-2

Software development, about 50/50, new and modification, is
performed by permanent staff along with other duties.

System descriptions:

System 1: Medical Data System Data General Nova 2 32K
(16 bit) words of memory, 9 tr tape, one 2315 fixed disk
with 1.5 meg-w, two 2315 removable disks at 1.5 meg-w
capacity, Refresh CRT with variable numbers of greyscales
and color video, capable of simultaneous collection and
processing. Languages used FORTRAN, BASIC, and assembler.
Interfaced to 4 cameras, (64 X 64 25/second) frame mode
camera collection, 1650 max number of counts, 255 cts/ele
at (64 X 64) max number of counts. Position, time and
physiological signals collected.

On the computers described above, the following studies are
performed:

1. Brain (Static); system monitor language used, CRT
output, objective of study is pictures, variable number
per week
2. Brain (Flow); system monitor language used, CRT
output, objective of study is curves, variable number per
week

3. Renal; system monitor language used, Graph output, objective of study is curves, variable number per week
4. Lung (Perfusion); system monitor language used, CRT and graph output, objective of study is pictures and curves, variable number per week
5. Heart (Flow); system monitor language used, CRT and graph output, objective of study is pictures and curves, variable number per week
6. Heart (Gated); system monitor language used, CRT and graph output, objective of study is pictures and curves, variable number per week
7. Bone; system monitor language used, Graph and list output, objective of study is curves and numbers, variable number per week
8. Tumor Localization; system monitor language used, CRT and list output, objective of study is pictures and numbers, variable number per week

<1350>

Installation: University of North Carolina/North Carolina
Memorial Hospital
Department: Radiology--Imaging Division
Address: Chapel Hill, North Carolina 27514
USA

Phone: (919) 966-5223

University of North Carolina/North Carolina Memorial
Hospital is a Clinical and teaching institution which has
400 beds.

For further information, contact:

J. R. Perry and R. C. James (clinical)

R. C. James and P. Chan (hardware)

R. C. James (software)

Less than 100 persons support the research performed in the
department.

The institution operates a central computing facility
containing 370/155 equipment. The responding department
uses primarily Mag tape for data interchange with the
central facility. Data are transmitted between the remote
site and the central computing facility by Video digital
mag tape.

The responding department operates the following data
acquisition and processing equipment:

DEC PDP-11/20

Software development, about 50/50, new and modification, is
performed by full time programmer.

Hardware development is performed by permanent staff along
with other duties and by part time engineer.

System descriptions:

System 1: DEC 11/20 28K (16 bit) words of memory, 300
cps paper tape reader, 30 cps paper tape punch, 9 tr 800
bpi 45 ips tapes, RK05 removable disks with 2.4 meg-w
capacity, LP 100 cps, ASR 33, Bechive video character CRT,
techtronix storage tube, CRT display with 32 greyscales,
capable of simultaneous collection and processing.
Languages used BASIC, Assembler, and Gamma-11 macros.
Interfaced to 3 cameras, (32 X 32 50/second) (64 X 64
12/second) (128 X 128 1/static) camera collection frame
mode, 512 max number of frames per study, 64K cts/ele at
(64 X 64) max number of counts. (128 X 128) list mode size
with 1.2M max counts. Position and time signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); BASIC language used, objective of study is numbers, < 1 per week
2. Brain (Flow); BASIC language used, objective of study is curves, < 1 per week
3. Renal; BASIC language used, objective of study is curves, 5 per week
4. Lung (Ventilation); BASIC language used, regional output, objective of study is mean TT's, < 1 per week
5. Heart (Flow); BASIC language used, objective of study is PG images, edges and ejection fraction, 10 per week
6. Heart (Gated); BASIC and assembler languages used, objective of study is PG images, edges and ejection fraction, 10 per week
7. Liver (Function); BASIC language used, objective of study is images, 7 per week
8. Pancreas; gamma-11 macro language used, objective of study is images, < 1 per week
9. Blood Volumes; BASIC language used, < 1 per week
10. Flood (Q/C); BASIC language used, 15 per week

The responding department made the following comments concerning its operation:

Entire system is about to be replaced with new generation hardware.

<1400>

Installation: Medical College of Pennsylvania
 Address: 3300 Benry Avenue
 Philadelphia, Pennsylvania 19129
 USA

Phone: (215) 842-6585

Medical College of Pennsylvania is a Research, clinical and teaching institution which has 329 beds.

For further information, contact:

Janet A. Parker, M.D. (clinical)
 John G. Woladzki, B.A. (hardware)
 John G. Woladzki, B.A. (software)

The institution operates a central computing facility containing Decsystem 10 and Prime 300 equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by video tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40

Software development, about 50/50 new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital Equipment PDP 11/40 32K (16 bits), 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800 bpi 45 ips tape, RK05 removable disk with 1.2 meg-w capacity, LPS-11 ADC, LA-30 decwriter, VT-52 CRT terminal, Video hard copier, VSV01 CRT display with 16 black and white greyscales, 64 levels of color, capable of simultaneous imaging and processing. Languages used Assembly, FORTRAN IV, BASIC and POCAL. Interfaced to two cameras One is (32 X 32 55/byte-second) (64 X 64 15/second) frame mode, 512 max number of frames, 255 cts/ele at (32 X 32) and (64 X 64), up to (128 X 128) list mode size with 1 million max counts. Position time, energy and physiological signals collected. The other is (32 X 32 25/word-second) (64 X 64 6/second), 512 max number of frames, 65,535 cts/ele at (32 X 32 and 64 X 64) max number of counts

On the computers described above, the following studies are performed:

1. Brain (Flow); BASIC and FORTRAN IV languages used, CRT output, objective of study is curves, 40 per week
2. Renal; FORTRAN IV languages used, CRT and list output, objective of study is curves, 10 per week
3. Thyroid (Uptake); FORTRAN IV language used, list output, objective of study is numbers, 10 per week
4. Heart (Flow); BASIC language used, CRT and list output, objective of study is numbers, 1/2 per week
5. Heart (Gated); BASIC language used, CRT and list output, objective of study is numbers, 1/2 per week
6. Heart (Effusion); BASIC language used, CRT and list output, objective of study is numbers, 1/2 per week
7. Heart (Output); BASIC language used, CRT and list output, objective of study is numbers, 1/2 per week
8. RIA's; BASIC and FORTRAN IV language used, list output, objective of study is numbers, done occasionally

The responding department made the following comments concerning its operation:

See diagram

SECTION OF NUCLEAR MEDICINE
HOSPITAL OF THE MEDICAL COLLEGE OF PENNSYLVANIA

<1450>

Installation: Academic Hospital of St. Rafael
Address: Capucynenvoer 35
3000 Ieuven, B-3000
Belgium

Academic Hospital of St. Rafael is a Research and clinical institution which has 1200 beds.
3 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370/158 MVS equipment. The responding department uses primarily Mag tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:
Varian Medical 620

Software development, mostly new analysis routines, is performed by permanent staff along with other duties and by full time programmer.

System descriptions:

System 1: Varian Medical 620 L100 32K (16 bit) words of memory, paper tape reader, 9 tr 800 bpi 25 ips tape, Diablo fixed disks with 2.5 meg-w, Diablo removable disks with 2.5 meg-w, Sratos 33, Printronics dual printer. Languages used FORTRAN and assembler. Interfaced to 1 camera (32 X 32 30/second) (64 X 64 10/second) frame mode, 256 max number of frames, 32K cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size. Position, time, energy and physiological signals collected.

System 2: Varian Medical 620 L100 16K (16 bit) words of memory, Diablo fixed disks with 2.5 meg-w capacity, Diablo removable disks with 2.5 meg-w capacity. Languages used FORTRAN and assembler. Interfaced to 1 camera (32 X 32 30/second) (64 X 64 10/second) frame mode, 256 max number of frames, (200 X 200) list mode size. Position, time, energy and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); Systems 1 and 2 used, FORTRAN language used, list output, objective of study is images, 24 per week
2. Brain (Flow); Systems 1 and 2 used, FORTRAN language used, graph output, objective of study is flow curves, 18 per week
3. Renal; systems 1 and 2 used, FORTRAN language used, number image output, objective of study is numbers, 3 per week
4. Thyroid (Image); system 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 26 per week
5. Thyroid (Uptake); systems 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 26 per week
6. Lung (Perfusion); system 1 used, FORTRAN language used, image output, objective of study is numbers, 3 per week
7. Lung (Ventilation); system 1 used, FORTRAN language used, image output, objective of study is numbers, 3 per week
8. Lung (V/Q); system 1 used, FORTRAN language used, image output, objective of study is numbers, 3 per week
9. Liver (Static); systems 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 30 per week
10. Liver (Function); systems 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 30 per week
11. Spleen, systems 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 4 per week
12. Pancreas; systems 1 and 2 used, FORTRAN language used, image output, objective of study is numbers, 3 per week
13. Bone; system 1 used, FORTRAN language used, image output, objective of study is numbers, 30 per week

The responding department made the following comments concerning its operation:

Heart studies will be performed in the next month.

Installation: University College Hospital
 Department: Medical Physics Department
 Address: Gower Street
 London, WC1
 England

Phone: (01) 387-9300 Ext. 119

University College Hospital is a Clinical, research and teaching institution which has 1200 beds.

For further information, contact:

Andrew Todd-Pickrope (clinical)

Christine Sweeting (hardware)

Evan MacLane (software)

25 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6600, 6800, 7650 equipment. The responding department uses primarily Mag tapes, punched cards, and a modem terminal for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Collected by wire 1200 feet long, and magnetic tape..

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/45; ILC PDP-11/10

Software development, about 50/50 new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC 11/45 120K (16 bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800 bpi 45 ips tapes, 2 CDC 6600 and 2 DEC RK05 removable disks with 134 meg-w capacity, line printer, calcomp drum plotter, video disc, statos es plotter, magnetostriptive tablet, CRT display with 64 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, RATFOR, MACRO II. Interfaced to 1 camera and scanner (64 X 64 3/second) frame mode, 64 max number of frames, 32K cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 25K max counts/sec. Position and time signals collected. 1/32 in. steps max scanner resolution with $n \times m < 32K$ ($n \times m$) image size, and 32K max counts.

System 2: DEC 11/10 16K (16 bit) words of memory, inter-processor link, Languages used FORTRAN and MACRO II.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 1 used, FORTRAN language used, graph and parameters output, objective of study appropriate parameters, 2 per week
2. Renal; system 1 used, FORTRAN language used, graph and parameters output, objective of study is appropriate parameters, 10 per week
3. Lung (Perfusion), system 1 used, FORTRAN language used, image output, 10 per week
4. Lung (Ventilaticn); system 1 used, FORTRAN language used, image output, 10 per week
5. Lung (V/Q); system 1 used, FORTRAN language used, image and graph output, 10 per week
6. Heart (Flow); system 1 used, FORTRAN language used, image output, objective of study is shunts, 4 per week
7. Liver (Static); system 1 used, FORTRAN language used, image output, 6 per week
8. Bone, system 1 used, FORTRAN language used, image output, objective of study is uptake ratios, 40 per week
9. Tumor Localization; system 1 used, FORTRAN language used, image output, objective of study is uptake ratios, 20 per week
10. Ultrasonic scanning; system 2 used, FORTRAN language used, image output, research--so number per week varies

The responding department made the following comments concerning its operation:
See diagram

University College Hospital
London, U. K.

<1550>

Installation: Radiation Medicine Centre, B.A.R.C.
 Address: Tata Memorial Centre Annex, Jerbai Wadia Road
 Bombay, 400012
 India

Radiation Medicine Centre, B.A.P.C. is a Research, clinical, and teaching institution which has 24 only for therapy and research beds.
 #30 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:
 General Electric MED 2; Nuclear Data 812

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.
 Hardware development is performed by consultant service.

System descriptions:

System 1: GE MED II ND 812 16K (12 bit) words of memory, paper tape reader, paper tape punch, BASF, 2200 8pi removable disks with 10 X 10 to the 6th power bits capacity, teletype (TTL) with paper output, ADD's TV display terminal with keyboard input, Tektronix 602 CRT display with 10 greyscales. Languages used MED II NUTRAN, and NUTRAN. Interfaced to one camera with (32 X 32 24/second) (64 X 64 6/second) camera collection frame mode, (64 X 64--2 frames) and (32 X 32--8 frames) max number of frames, 4K cts/ele at (64 X 64) max number of counts, (64 X 64) list mode size with 720K max counts per study. Position signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); MED II NUTRAN language used, CRT and graph output, objective of study is images and flow curves, 8 per week.
2. Renal; MED II NUTRAN language used, CRT and graph output, objective of study is images and flow curves, 2 per week
3. Thyroid (Uptake); MED II NUTRAN language used, CRT and graph output, objective of study is flow curves, done on request.

4. Lung (Ventilation); MED II NUTRAN language used, CRT and graph output, objective of study is images and flow curves, 2 per week
5. Heart (Flow); MED II NUTRAN language used, CRT and graph output, objective of study is images and curves, 4 per week
6. Heart (Cated) MED II NUTRAN language used, CRT and graph output, objective of study is images and curves, just started
7. Liver (Function); MED II NUTRAN language used, CRT and graph output, objective of study is curves, 2 per week
8. Pancreas; MED II NUTRAN language used, CRT output, objective of study is images, done on request
9. Blood Flow IVC; MED II NUTRAN language used, CRT output, objective of study is images, done on request

The responding department made the following comments concerning its operation:

1. System works with occasional breakdowns
2. We have written many off-line programs like statistical programs, RIA, library, educational programs etc.
3. The software provided is quite flexible and versatile and is adequate for many of the clinical problems. But occasionally when the user has to write his own NUTRAN FUNCTIONS and incorporate into the main program, clearcut instructions for this are not available. a step by step procedure along with a few examples for writing and reading new NUTRAN FUNCTIONS will be extremely useful.

<1600>

Installation: V. A. Hospital (Tampa)
Address: 13000 W. 30th Street
Tampa, Florida 33612
USA

Phone: (813) 971-4500 Ext. 301 FTS 826-6011

V. A. Hospital (Tampa) is a Research, clinical and teaching institution which has 700 beds.

For further information, contact:

Edward Pikman (clinical)

Joseph Madden (hardware)

Joseph Madden (software)

#30 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370 equipment. The responding department uses primarily Mag tape, modem (terminal), and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-12/40; DEC PDP-8e; Baird Atomic-77

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by part time programmer.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC PDP-12/40 32K (12 bit) words of memory, 10 cps paper tape reader, 10 cps paper tape punch, LINC tape, DEC tape, 1 fixed disk with 1.6 meg-w capacity, 1 removable disk with 1.6 meg-w capacity, printer, plotter, A-D, D-A, PDP, CRT display with greyscales, Languages used Assembly, FORTRAN II, and FORTRAN IV. Interfaced to 1 camera, (32 X 32 25/second) (64 X 64 10/second) camera collection frame mode with 808 max number of frames, 4095 cts/ele max number of counts at (64 X 64). Position and physiological signals collected.

System 2: DEC PDP-8/E 32K (12 bit) words of memory, paper tape reader, DEC tape, 1 removable disk with 1.6 meg-w capacity, printer, Diablo Hyterm, CRT display. Languages used Assembly, FORTRAN II, FORTRAN IV. Interfaced to 1 profile scanner.

System 3: Baird-Atomic 24K (16 bit) words of memory, cassette tapes, 1 removable disk with 1.2 meg-v capacity, video hard copy, CRT display with greyscales and color. Assembly language used. Interfaced to 1 camera, 2000 max number of frames, 65,535 cts/ele max number of counts.

The responding department made the following comments concerning its operation:

Our system was purchased in 1972 (PDP-12). The PDP-12 has been obsolete for more than three years. Although still useful as a general-purpose laboratory computer, it is unwise to continue supporting it for clinical nuclear medicine. With the rapidly improving price/performance ratios of commercially-supported systems, many laboratories will be faced with a similar situation.

<1650>

Installation: Radiologische Universitätsklinik
 Address: Arnold-Heller-Str. 9
 D-2300 Kiel
 Germany

Phone: (0431) 597-4115

Radiologische Universitätsklinik is a Clinical institution which has 160 beds.

For further information, contact:

Prof. Gremmel (clinical)
 Dipl.-Inf. Hetbinghaus (hardware)
 Dipl.-Inf. Hetbinghaus (software)

The responding department operates the following data acquisition and processing equipment:

H-P 21 MXM; H-P 21 MXE; H-P 2100

Software development, about 50/50, new and modification, is performed by full time programmer.

System descriptions:

System 1: Hewlett-Packard HP 21 MXM 64K (16 bit) words of memory, 500 cps paper tape reader, 75 cps paper tape punch, 9 tr 1600 bpi tapes, HP 7005 fixed disks with 2.5 meg-w capacity, HP 7005 removable disks with 5 meg-w capacity, HP 9972A-Plotter, Calcomp 562, HP22767A-Printer HP2648 Graphics terminal, HP 2645 Terminal, Texas Instr. ASR 700, CRT display capable of simultaneous collection and processing. Languages used FORTRAN and assembler.

System 2: Hewlett-Packard HP 21 MXE 64K (16 bit) words of memory, 500 cps paper tape reader, 75 cps paper tape punch, 9 tr 1600 bpi tapes, 2 x HP 7900 fixed disks with 1.25 meg-w capacity, 2 x HP 7900 removable disks with 1.25 meg-w capacity, Tektronix 4010-1 Terminal, HP X 44 display, El-Scint VDP1, HP 181 A/AR CRT display with 8 greyscales, capable of simultaneous collection and processing. Languages used FORTRAN and Assembler.

System 3: Hewlett-Packard HP 2100 32K (16 bit) words of memory, 500 cps paper tape reader, 75 cps paper tape punch, ASR-33-terminal, HP 5417A ADC, HP 181 A/AR CRT display with 8 greyscales. Languages used FORTRAN and Assembler. Interfaced to 1 whole body scanner, (64 X 64) and (128 X 128) frame mode camera collection.

<1700>

Installation: Clinical Physiology Lab C.N.R.
Address: via Savi 8
Pisa, I56100
Italy

Phone: (050) 47231-53

Clinical Physiology Lab C.N.R. is a Research, clinical and teaching institution which has 20 beds.

For further information, contact:

A. Maseri (clinical)

A. Benassi (hardware)

R. Guzzardi and W. Bencivelli (software)

120 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370/168 and IBM 370/158 equipment. The responding department uses primarily Mag tape, punched cards, and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by RY magnetic tape.

The responding department operates the following data acquisition and processing equipment:

H-P 2100B; H-P 21 MK

Software development, mostly new analysis routines, is performed by full time programmer.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: User HP2100B 32K (16 bit) words of memory, 300 cps paper tape reader, 120 cps paper tape punch, 9 tr 800 bpi 37.5 ips tapes, 7905 HP fixed disks with 2.5 meg-w capacity, 7905 HP removable disks with 5 meg-w capacity, D/A C, Card reader, Tek 611 CRT display capable of simultaneous collection and processing. Languages used FORTRAN and HP assembler. Interfaced to 1 camera (64 X 64) and (128 X 128) camera collection frame mode, list mode size (64 X 64). Position, time, energy and physiological signals collected.

System 2: HP21EX 64K (16 bit) words of memory, 500 cps paper tape reader, 75 cps paper tape punch, 9 tr 800 bpi 37.5 ips tapes, 7905 HP fixed disks with 2.5 meg-w, 7905 HP removable disks with 5 meg-w, plotter--D/A C, card reader--line, Printer-- Versatec, Matrix IV, Digital display CRT with color and capable of simultaneous collection and processing. Languages used FORTRAN and HP assembler. Interfaced to one camera, (64 X 64) list mode size with 80K/sec max counts. Position, time, energy, and physiological signals collected.

The responding department made the following comments concerning its operation:
The system is in the stage of testing.

<1750>

Installation: University of Michigan Hospital
Department: Division of Nuclear Medicine
Address: Ann Arbor, Michigan 48109
USA

Phone: (313) 763-4521

University of Michigan Hospital is a Research, clinical, and teaching institution which has Less than 1000 beds. For further information, contact:

John W. Keyes, Jr., M.D. (clinical)

W. L. Rogers, Ph.D. (hardware)

W. L. Rogers, Ph.D. (software)

10 persons support the research performed in the department.

The institution operates a central computing facility containing Andohr 470 equipment. The responding department uses primarily Mag tape and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Is collected with a portable computer system with a disc cartridge and analyzed on the spot..

The responding department operates the following data acquisition and processing equipment:

MDS-Trinary;Data General Nova-3

Software development, mostly new analysis routines, is performed by permanent staff along with other duties, and by a part time programmer..

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Trinary MDS Nova 3 32K (16 bit) words of memory, paper tape reader, 9 tr 800/1600 bpi 25 ips tapes, 1 fixed disk with 1.2 meg-w capacity, 2 removable disks with 1.2 meg-w capacity, 3-Thermal printers video formatted, CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN and assembler. Interfaced to 3 cameras (see MDS factory literature).

System 2: (Simul.) MDS Nova 3 32K (16 bit) words of memory, paper tape reader, 9 tr 800/1600 bpi 25 ips tapes, 1 fixed disk with 1.2 meg-w capacity, 1 removable disk with 1.2 meg-w capacity, 2 thermal Printers, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN and assembler. Interfaced to 1 camera (see MDS factory literature).

System 3: (Muqa Cart) MDS Nova 3 32K (16 bit) words of memory, paper tape reader, 1 fixed disk with 1.2 meg-w, 1 removable disk with 1.2 meg-w capacity, 1 thermal printer, CRT display with 16 greyscales. Languages used FORTRAN and assembler. Interfaced to 1 camera (see MDS factory literature)

On the computers described above, the following studies are performed:

1. Brain (Static), systems 1, 2, and 3 used.
2. Brain (Flow); systems 1, 2, and 3 used.
3. Renal; system 1 used
4. Thyroid (Image); system 1 used
5. Thyroid (Uptake); system 1 used
6. Heart (Flow); systems 1, 2, and 3 used
7. Heart (Gated); systems 1, 2, and 3 used
8. Tomographic; systems 1 and 2 used
9. Coded Aperture; systems 1, 2, and 3 used

The responding department made the following comments concerning its operation:

Three other MDS computer systems in lab.

<1800>

Installation: Kettering Medical Center
Address: 3535 Southern Blvd
Kettering, Ohio 45429
USA

Phone: (513) 298-4331 Ext.5511

Kettering Medical Center is a Clinical and teaching institution which has 580 beds.

The responding department operates the following data acquisition and processing equipment:

ADAC LSI-11

System descriptions:

System 1: ADAC LSI-11 64K (16 bit) words of memory, paper tape reader, paper tape punch, floppy disks with 3 drives and double density, Refresh CRT display with 64 greyscales and capable of simultaneous collection and processing. Languages used PORTRAN. Interfaced to 3 cameras and one well counter. (32 X 32 20/second) (64 X 64 5/second) (128 X 128 1/second) camera collection frame mode, 32 to 512 max number of frames, 256 to 65K cts/ele max number of counts

On the computers described above, the following studies are performed:

1. Brain (Static); PORTRAN language used, film and image output, objective of study is images, 3 to 4 per week
2. Brain (Flow); PORTRAN language used, graph output, objective of study is flow curves, 3 to 4 per week
3. Renal; PORTRAN language used, graph output, objective of study is flow curves and numbers, 1 to 2 per week
4. Thyroid (Image); PORTRAN language used, film and image output, objective of study is images, 3 to 5 per week
5. Heart (Flow); PORTRAN language used, graph output, objective of study is flow curves and ejection function, 1 to 2 per week
6. Heart (Gated); PORTRAN language used, cine output, objective of study is cine, numbers, and ejection function, 1 to 2 per week
7. Pancreas; PORTRAN language used, image and film output, objective of study is images, 1 per month

8. Tumor Localization; FORTRAN language used, film and images output, objective of study is images, 1+ per week
9. PIA Analysis: FORTRAN language used, list and graph output, objective of study is numbers, 14 per week (300 Patients)
10. Heart Images; FORTRAN language used, film and image output, objective of study is images, 2 to 4 per week

The responding department made the following comments concerning its operation:
Standard ADAC system.

Installation: Presbyterian Hospital (New York)
Department: Nuclear Medicine
Address: 622 W 169th Street
New York, New York 10032
USA

Phone: (212) 694-2721

Presbyterian Hospital (New York) is a Research, clinical and teaching institution which has 1200 beds.

For further information, contact:

Peter D. Esser(clinical)
Peter D. Esser(hardware)
Peter D. Esser(software)

The responding department operates the following data acquisition and processing equipment:

MDS;Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: MDS Nova 3 48K (3 bit) words of memory, paper tape reader, 9 tr 800 bpi 45 ips tape, 1 fixed disk at 24 meg-w capacity, 2 removable disks at 48 meg-w capacity, CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN and Assembly. Interfaced to 2 cameras, (64 X 64 5/second) (128 X 128 3/second) camera collection frame mode, 255 cts/ele at (128 X 128) max number of counts, (128 X 128) list mode size with 2 million max counts. Position and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); polaroid output, objective of study is curves, 4 per week
2. Renal; polaroid output, objective of study is curves and images, 10 per week
3. Lung (Ventilation); polaroid output, 3 per week
4. Lung (V/Q); polaroid output, special
5. Heart (Flow) polaroid output, varies per week
6. Heart (Gated); polaroid output, varies per week
7. Heart (Perfusion); polaroid output, varies per week
8. Heart (Output); polaroid output, varies per week
9. Bone; polaroid output, 2 per week
10. L to R shunt, polaroid output, special studies
11. Scrotal Scans; polaroid output, special studies

<1900>

Installation: Kent and Canterbury Hospital
 Address: Ethel Bert Road
 Canterbury, Kent
 England

Phone: (0227) 668-77 Ext. 203

Kent and Canterbury Hospital is a Clinical institution which has 450 beds.

For further information, contact:

Dr. P. M. Hall (clinical)

Mr. J. S. Corfield and Mr. C. P. Wells (hardware)

Mr. J. R. Corfield, Mr. C. P. Wells, and Dr. P. L. Diffey (software)

The responding department operates the following data acquisition and processing equipment:

DEC PDP-8e

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital PDP 8P 28K (12 bit) words of memory, 500 cps paper tape reader, DEC tape, TD 8/EH, RK01 removable disk with 0.8 meg-w capacity, RK05 removable disk with 1.6 meg-w capacity, VDU real time clock, Color Video CRT display with 8 greyscales and color teleprinter, Schmidt Trigger 1/P, 8 and W CRT display with 8 greyscales, Acoustic coupler, hardware arithmetic, black and white point plot CRT display with 64 greyscales. Languages used FORTRAN II, FORTRAN IV, Focal, Assembler, and Basic. Interfaced to 2 cameras, (32 X 32 20/second) (64 X 64 80/second) frame mode camera collection, 200 max number of frames, 4095 cts/ele max number of counts at (64 X 64).

On the computers described above, the following studies are performed:

1. Brain (Static); FORTRAN and spex languages used, CRT, 8" X 10" x-ray polaroid output, objective of study is SOL and vascular abnormalities, 10 per week
2. Renal; FORTRAN and spex languages used, CRT, 8" X 10" x-ray polaroid output, objective of study is function, 12 per week

3. Thyroid (Image); FORTRAN and spex languages used, CRT, 8" x 10" x-ray polaroid output, objective of study is morphology, 10 per week
4. Lung (Perfusion); FORTRAN and spex languages used, CRT, 8" x 10" x-ray polaroid output, objective of study is function, 10 per week
5. Lung (Ventilaticn); FORTRAN and spex languages used, CRT, 8" x 10" x-ray polaroid output, objective of study is function, 10 per week
6. Heart (Gated); FORTRAN and spex languages used, 11 + video cine output, objective of study is LVEF, 1 per week
7. Liver (Static); FORTRAN and spex languages used, 11 + video cine output, objective of study is cirrhosis/mets, 6 per week
8. Liver (Function); FORTRAN and spex languages used, 11 + video cine output, objective of study is cirrhosis/mets, 1 per week
9. Pancreas; FORTRAN and spex languages used, 11 + video cine output, done rarely
10. Bone; FORTRAN and spex languages used, 11 + video cine output, objective of study is secondaries, 10 per week
11. Heart (Thallium); FORTRAN and spex languages used, 11 + video cine output, objective of study is infarcts, 2 per week

The responding department made the following comments concerning its operation:

Original system was NUKAB 2530 with 12K of core and RK01 disk. Now has 28K of core, RK05 disk (as well as RK01) and other hardware additions. Also a completely re-written software SPFX, a Scan Protocol Executive now implemented which has very fast overlays, can be driven from keyboard, FORTRAN II or Pocal and is able to support sophisticated protocols and development work.

<1950>

Installation: Sutter Memorial Hospital
 Department: Division of Nuclear Medicine
 Address: 52nd and "P" Streets
 Sacramento, California 95819
 USA

Phone: (916) 452-1559

which has 550 beds.

For further information, contact:

Donald W. Brown, M.D. (clinical)

Troy Brannon, M.S. (hardware)

Troy Brannon, M.S. (software)

1 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

MDS;Data General Nova-2

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: MDS DG Nova II 32K (16 bit) words of memory, high speed paper tape reader, 60 cps paper tape punch, 1 2315 Diablo fixed disk with 1.2 meg-w capacity, 3 2315 Diablo removable disks with 1.2 meg-w capacity, Tektronix 604 CRT display with 32 greyscales and capable of simultaneous collection and processing. Languages used FORTRAN, Basic, and Algol. Interfaced to 3 cameras sharing 2 interfaces, (64 X 64 0.1/second) (128 X 128 static only/second) camera collection frame mode, 500 max number of frames, 65,536 cts/ele max number of counts at (64 X 64), (64 X 64) list mode size with 2 X 10 to the 6 power max counts. Position, time and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow), FORTRAN language used, list output, objective of study is flow curves and numbers
2. Renal; FORTRAN language used, list output, objective of study is flow curves and numbers
3. Lung (Ventilation); FORTRAN language used, list output, objective of study is numbers and images

4. Lung (V/Q); FORTRAN language used, list output, objective of study is numbers and images
5. Heart (Flow); FORTRAN language used, graph and list output, objective of study is flow curves, numbers, and images
6. Heart (Gated); FORTRAN language used, list output, objective of study is images, curves and numbers
7. Heart (Effusion); FORTRAN language used, objective of study is images
8. Heart (Output); FORTRAN language used, list and graph output, objective of study is flow curves and numbers
9. Liver (Static); FORTRAN language used, list output, objective of study is images and numbers
10. Liver (Function); FORTRAN language used, objective of study is images
11. Spleen; FORTRAN language used, list output, objective of study is images and numbers
12. Pancreas; FORTRAN language used, objective of study is images
13. Bone; FORTRAN language used, graph output, objective of study is images
14. Myocardial Perfusion; FORTRAN language used, list output, objective of study is numbers and images
15. Myocardial Infarct; FORTRAN language used, objective of study is images
16. Tumor Localization; FORTRAN language used, objective of study is images

<2000>

Installation: Georgetown University Hospital
Address: 3800 Reservoir Road, NW
Washington, D.C. 20007
USA

Phone: (202) 625-7316

Georgetown University Hospital is a Clinical, research, and teaching institution which has 500 beds.

For further information, contact:

Stanley M. Levenson and John C. Harbert (clinical)

Stanley M. Levenson and James E. Boland (hardware)

Stanley M. Levenson and James E. Boland (software)

1/2 persons support the research performed in the department.

The institution operates a central computing facility containing DEC Gamma 11, PDP-11/40 cpu equipment. The responding department uses primarily 2 RK05 disks, paper tape reader/punch, 4 gamma cameras for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y wire 1000 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40

Software development, about 50/50, new and modification, is performed by part time programmer.

Hardware development is performed by consultant service.

System descriptions:

System 1: DEC 1140 48K (16 bit) words of memory, paper tape reader, paper tape punch, 2 removable RK05 disks with 1.3 meg-w capacity, CRT display with color, capable of simultaneous collection and processing. Languages used Basic, focal and FORTRAN. Interfaced to 4 cameras, (32 X 32 50/second) (64 X 64 12/second) camera collection frame mode, 2000 max number of counts, 65535 cts/ele max number of counts at (64 X 64) 256 max list mode counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); unusual
2. Brain (Flow); unusual
3. Renal; Assembler language used, graph and CRT output, objective of study is flow curves, 6 per week
4. Thyroid (Uptake); Basic and Gamma languages used, list output, objective of study is uptakes, 10 per week
5. Lung (Perfusion); Gamma language used, Graph and CRT output, objective of study is tumor and surgery, < 1 per week
6. Lung (Ventilation); Gamma language used, Graph and CRT output, objective of study is tumor and surgery, < 1 per week
7. Lung (V/Q); Gamma language used, graph and CRT output, objective of study is tumor and surgery, < 1 per week
8. Heart (Flow); Assembly language used, CRT output, objective of study is images and histogram, < 1 per week
9. Heart (Gated); Assembly language used, LPTTY output, objective of study is images and data, 10 per week
10. Heart (Effusion); Assembly language used, CRT output, objective of study is images, < 1 per week
11. Heart (Output); Basic language used, LPTTY output, objective of study is data, 10 per week
12. Liver (Static); Assembly language used, rarely done
13. Liver (Function); Assembly language used, rarely done
14. Pancreas, Assembly language used, < 1 per week
15. Radioimmunoassays: Basic language used, list and graph output, objective of study is numbers, 22 per week
16. NM In-Vitro Studies; Basic language used, list output, objective of study is numbers, 7 per week

The responding department made the following comments concerning its operation:

Our system uses primarily the Gamma-11 software from Digital Equipment Corporation for the acquisition and processing of data from three Anger cameras within and one remote to the department. Though at this writing we use primarily Basic II with Gamma 11 and RT-11 graphics and filing support we expect to add FORTRAN and Pocal in the near future. Our staffing is as follows: one principle physician user, one principle technologist user and other staff technologists trained in specific uses, plus one part-time programmer.

<2050>

Installation: St. Luke's Hospital Center
Address: Amsterdam Avenue and 113th Street
New York City, New York 10025
USA

Phone: (212) 870-6143

St. Luke's Hospital Center is a Clinical institution which has 700 beds.

For further information, contact:

Richard N. Pierson, Jr. M.D. and Derek Eulander
M.D. (clinical)

Marvin I. Friedman, Ph.D. (hardware)

Marvin I. Friedman, Ph.D. (software)

2 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 360/55 equipment. The responding department uses primarily Mag tape, punched cards, and paper tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y wire 800 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/05

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by consultant service.

System descriptions:

System 1: DEC PDP 11/05 28K (16 bit) words of memory, 10 cps paper tape punch, 10 cps paper tape reader, 9 tr 800 bpi 45 ips tape, Diablo fixed disks with 2.5 meg-w capacity, Diablo removable disks with 2.5 meg-w capacity, Tektronix 4012, Versatec line printer/plotter, Video display, Tektronix 4012 CRT display with 32 greyscales. Languages used FORTRAN and Assembler. Interfaced to 1 camera, (32 X 32 50/second) (64 X 64 25/second) (128 X 128 15/second) camera collection frame mode, 511 max number of frames, 65K cts/ele max number of counts at (64 X 64), (128 X 128) list mode size with 2M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Lung (V/Q); FORTRAN language used, Graph and photo output, objective of study is images and curves, 1 per month
2. Heart (Flow); FORTRAN and Assembler language used
3. Heart (Gated); FORTRAN and Assembler language used
4. Heart (Effusion); FORTRAN and Assembler language used
5. Heart (Output); FORTRAN and Assembler language used

<2100>

Installation: Manchester Royal Infirmary
 Address: Oxford Road
 Manchester, M13 9WL
 England

Phone: (016) 273-3300 Ext. 172

Manchester Royal Infirmary is a Research, clinical and teaching institution which has 600 beds.

For further information, contact:

H. J. Testa (clinical)
 R. A. Shields, and R. S. Lawson (hardware)
 R. A. Shields, and R. S. Lawson (software)

The responding department operates the following data acquisition and processing equipment:

MDS-Trinary; Data General Nova-3; Nuclear Data MED 2; Nuclear Data 812; DEC PDP-12

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Medical Data Systems "Trinary" Nova 2/10 32k (16 bit) words of memory, 300 cps paper tape reader, teletype paper tape punch, Diablo fixed disks with 1.2 meg-w capacity, Diablo removable disks with 2 X 1.2 meg-w capacity, HP 7221 Graphics plotter, Tektronix 604 CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and Assembler. Interfaced to 2 cameras (64 X 64 6/second) (128 X 128 3/second) (also special 25 frame/sec possible) camera collection frame mode, 300 frames max number of frames, 64K cts/ele at (64 X 64) or 255 cts/ele at (128 X 128) max number of counts, (128 X 128) or (256 X 256) list mode size with 2 X 10 to the 6th power max counts. Position, time, and physiological signals collected.

System 2: Nuclear Data "Med II" ND 812 16K (12 bit) words of memory, teletype paper tape reader, teletype paper tape punch, Wangco fixed disks with 1.5 meg-w capacity, Wangco removable disks with 1.5 meg-w capacity, Tektronix 602 CRT display with 12 greyscales and color. Languages used NUTRAN and Assembler. Interfaced to 1 camera, (32 X

32 24/second) (64 X 64 6/second) camera collection frame mode, 700 max number of frames, 4K cts/ele max number of counts at (64 X 64), (64 X 64) list mode size with 3 X 10 to the 6th power max counts. Position and time signals collected.

System 3: CEC FDP 12 8K (12 bit) words of memory, 200 cps paper tape reader, teletype paper tape punch, dual lincatpe, X-Y plotter, TV Video CRT display with 12 greyscales, Languages used FORTRAN and assembler. Used for off-line analysis only.

On the computers described above, the following studies are performed:

1. Brain (Static); systems 1 and 2 used, CRT output, objective of study is images, 5 per week
2. Brain (Flow); system 1 used, graph and CRT output, objective of study is curves
3. Renal; systems 1, 2 and 3 used, graph and CRT output, objective of study is images, curves and numbers
4. Lung (Perfusion); systems 1 and 2 used, CRT output, objective of study is images, 10 per week
5. Lung (Ventilation); systems 1 and 2 used, CRT output, objective of study is images, 5 per week
6. Lung (V/Q); systems 1 and 2 used, NUTRAN language used, list output, objective of study is numbers
7. Heart (Flow); systems 1 and 2 used, Assembler and NUTRAN languages used, CRT output, objective of study is images and curves, 2 per week
8. Heart (Gated); Systems 1 and 2 used, CRT output, objective of study is images, 2 per week
9. Heart (Output); systems 1 and 3 used, list output, objective of study is numbers
10. Liver (Static); system 1 used, CRT output, objective of study is images, 20 per week
11. Liver (Function); systems 2 and 3, graph output, objective of study is curves, 3 per week
12. Spleen; system 1 used, CRT output, objective of study is images
13. Pancreas; system 2 used, NUTRAN language used, CRT output, objective of study is images, 8 per week
14. Bone; systems 1 and 2 used, CRT output, objective of study is images, 10 per week
15. Tumor Localization; systems 1 and 2 used, CRT output, objective of study is images
16. Probe Renography; system 3 used, POCAL language used, graph output, objective of study is curves and numbers, 15 per week
17. Heart (Myocardial); systems 1 and 2 used, objective of study is images, 2 per week

<2150>

Installation: Brookhaven National Laboratory
Department: Medical Department
Address: Upton, New York 11973
USA

Phone: (516) 345-3590 PTS 666-3590

Brookhaven National Laboratory is a Research institution which has 11 beds.

For further information, contact:

Farold L. Atkins, M.D. (clinical)

Irving Montanel (hardware)

Ralph Fairchild, Ph.D. (software)

#40 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6600, and CDC 7600 equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

General Electric MED 2; Interdata 7/16

System descriptions:

System 1: GE MED II 16K (12 bit) words of memory, paper tape reader, paper tape punch, 9 tr 800 bpi 45 ips tape, 1 fixed disk with 1 meg-w capacity, 1 removable disk with 1 meg-w capacity, teletype hi-speed printer, ADDS model 840 terminal CRT display with 32 greyscales. NUTRAN language used. Interfaced to 2 cameras, (32 X 32 24/second) (64 X 64 6/second) camera collection frame mode, 4700 max number of frames, 4096 cts/ele max number of counts at (64 X 64), (256 X 256) list mode size with 2048 max counts per frame. Position, and time signals collected.

System 2: Interdata (We have 2 of the "System 2" described) 7/16 HS ALU 32K (16 bit) words of memory, 9 tr 800 bpi 45 ips tape, 1 fixed disk with 2.5 meg-w capacity, 1 removable disk with 2.5 meg-w capacity, Conway display, (mag tape + CRT), Interdata model H6-100 CRT display with 32 greyscales. (We have two identical computers as described in "System 2". One is used for data acquisition and one for data analysis.) Languages used FORTRAN. Positron scanner, interfaced to Interdata Computers.

On the computers described above, the following studies are performed:

1. Brain (Static); systems 1 and 2 used, NUTRAN and FORTRAN languages used, objective of study is images and numbers, 1-2 per week
2. Brain (Flow); system 1 used, NUTRAN language used, objective of study is images, 2 per month
3. Renal; system 1 used, NUTRAN language used, objective of study is images and curves, 2 per month
4. Thyroid (Image); system 1 used, NUTRAN language used, objective of study is images, 2 per week
5. Lung (Perfusion); system 1 used, NUTRAN language used, objective of study is images, numbers, and curves, 2 per week
6. Lung (Ventilation); system 1 used, NUTRAN language used, objective of study is images, numbers, and curves, 2 per week
7. Heart (Flow); system 1 used, NUTRAN language used, objective of study is numbers, 2 per week
8. Heart (Gated); system 1 used, NUTRAN language used, objective of study is numbers and images, 2 per week
9. Liver (Static); system 1 used, NUTRAN language used, objective of study is images, 2 per month
10. Spleen, system 1 used, NUTRAN language used, objective of study is images, 2 per month
11. Pancreas; system 1 used, NUTRAN language used, objective of study is images, 2 per month
12. Bone; system 1 used, NUTRAN language used, objective of study is images, 2 per month
13. Tumor Localization; system 1 used, NUTRAN language used, objective of study is images, 2 per month
14. Heart Perf.; systems 1 and 2 used, NUTRAN and FORTRAN languages used, objective of study is images and numbers

<2200>

Installation: National Institutes of Health
 Department: Nuclear Medicine
 Address: 9000 Rockville Pike, Building 10
 Bethesda, Maryland 20014
 USA

Phone: (301) 496-5675

National Institutes of Health is a Research institution which has 516 beds.

For further information, contact:

S. Bacharad and M. Green(clinical)

S. Bacharad and M. Green(hardware)

S. Bacharad and M. Green(software)

Many (hundreds) persons support the research performed in the department.

The institution operates a central computing facility containing DEC PDP 11, and IBM 370 equipment. The responding department uses primarily Mag tape and modem (terminal) for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

H-P 21 MX; H-P 21 MXE

Software development, mostly new analysis routines, is performed by permanent staff along with other duties and by part time programmer.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: User Hewlett Packard 21MX 160K (16 bit) words of memory, 300 cps paper tape reader, (two) 9 tr 1600 bpi 45 ips tapes (one with drive), HP7920 removable disk with 2.5 meg-w, light pen, joy stick paddles, dual ADC, 2 peripheral terminals, HP181 CPT display with 128 greyscales 0 to 1 converted, capable of simultaneous collection and processing. Languages used FORTRAN 4 and Assembler. Interfaced to 3 cameras, 9400 max number of frames, 32767 cts/ele at (32 X 32) (645 X 64) and (128 X 128) max number of counts, list mode size is any size up to 128 X 128 with 12 X 10 to the sixth power max counts or the capacity of the mag tape, if used. Position, time and physiological signals collected.

System 2: User HP21MX-E 96K (16 bit) words of memory, 300 cps paper tape reader, 75 cps paper tape punch, 9 tr 1600 bpi 45 ips tape, (two) HP79W fixed disks with 2 1/2 meg-w capacity, (two) HP79W removable disks with 2 1/2 meg-w capacity, light pen, joy stick paddles, Dual ADC, CRT terminal, HP181 CRT display with 128 greyscales D to A converted capable of simultaneous collection and processing. FORTRAN 4 and Assembler languages used. Interfaced to 3 cameras, 1050 max number of frames, 32767 cts/ele max number of counts at (32 X 32) (64 X 64) and (128 X 128), any size list mode up to (128 X 128) with 12 X 10 to the sixth power, or capacity of the mag tape, if used. Position, time and physiological signals collected.

System 3: User HP2100 32K (16 bit) words of memory, 300 cps paper tape reader, 9 tr 1600 bpi 45 ips tape, HP79W fixed disk with 1 1/4 meg-w, HP79W removable disk with 1 1/4 meg-w, light pen, joy stick paddles, Dual ADC, HP181 CRT display with 128 greyscales A to D converted capable of simultaneous collection and processing. FORTRAN 4 and Assembler languages used. Interfaced to 3 cameras, 350 max number of frames, 32767 cts/ele max number of counts at (32 X 32) (64 X 64), and (128 X 128), list mode size is any size up to (128 X 128) with 12 X 10 to the sixth power max counts, or capacity of mag tape, if used. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 3 used, FORTRAN and assembler languages used, CRT output, 4-5 per week
2. Thyroid (Image); not done via computer
3. Thyroid (Uptake); not done via computer
4. Lung (Perfusion); system 2 used, FORTRAN language used, objective of study is V/Q, # 15-20 per week
5. Lung (Ventilation); system 2 used, Assembler language used, CRT output, objective of study is function, # 15-20 per week
6. Lung (V/Q); system 2 used, terminal output, objective of study is mapping, # 15 to 20 per week
7. Lung (Gated); spirometer and pneumitach system used, # 15 -20 per week
8. Heart (Gated); system 1 used, FORTRAN 4 and assembler language used, CRT and terminal output, objective of study is ejection function, wall motion, and volume curves, # 80 per week

The responding department made the following comments concerning its operation:

All software is our own design with multiple users, real time acquisition and display, high count rate data acquisition simultaneous with all processing

<2250>

Installation: Scientific Data Systems Branch, E G and G
Idaho, Inc.
Address: P. O. Box 1625
Idaho Falls, Idaho 83401
USA

Phone: (208) 526-4563 FTS 583-4563

Scientific Data Systems Branch, E G and G Idaho, Inc. is a Research institution.

For further information, contact:

G. O. English 526-4138(hardware)

R. C. Davies 526-4131(software)

30 (Physics Division) persons support the research performed in the department.

The institution operates a central computing facility containing IBM 360/75 and CDC 7600 equipment. The responding department uses primarily Mag tape, punched cards, modem (terminal) and paper tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by It is analyzed on the spot, or transferred by wire or by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-15;Data General Nova;Data General Eclipse;DEC PDP-8e

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by a full time programmer.

Hardware development is performed by permanent staff along with other duties, and by full time engineer.

System descriptions:

System 1: Digital Equipment PDP-15 64K (18 bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 7 tr 200-800 bpi 45 ips tape, DEC tape, CDC fixed disk with 5 meg- capacity, Modem control, pulse height ADC interface, hardware multiplexor, line printer, VT-15 CRT display capable of simultaneous collection and processing. Languages used Assembler, Pocal, and FORTRAN.

System 2: Data General NOVA and ECLIPSE 48K (16 bit) words of memory, 7 tr 556-800 bpi 25 ips tape, 1 fixed disk with 10 meg-w capacity, 1 removable disk with 10 meg-w capacity, Pulse height ADC interface, line printer, Telectronics 604 CRT display capable of simultaneous collection and processing. Languages used FORTRAN and Assembler.

System 3: Digital Equipment PDP-8/E 32K (12 bit) words of memory, 20 cps paper tape reader, 7 tr 556-800 bpi 25 ips tape, CDC fixed disk with 80 meg-w capacity, Gamma-Gamma pulse height coincidence ADC interface, Telectronics 604 CRT display capable of simultaneous collection and processing. Assembler language used.

The responding department made the following comments concerning its operation:

The Scientific Data Systems Branch of F G and G Idaho designs, develops and maintains minicomputer-based real-time data systems for physics and engineering applications. Particular areas of expertise include radiation measurement systems (gamma spectroscopy) and Nuclear Reactor (experimental) Plant data systems. Some off-site work is done, including medical systems at NASA Johnson Spacecraft Center.

<2300>

Installation: University of Colorado Medical Center
Address: 4200 E. Ninth Avenue
Denver, Colorado 80262
USA

Phone: (303) 394-7801

University of Colorado Medical Center is a Research, clinical and teaching institution which has 450 beds. For further information, contact:

William C. Klingensmith, M.D. (clinical)

Victor M. Spitzer, Ph.D. (hardware)

Victor M. Spitzer, Ph.D. (software)

2 (within division) persons support the research performed in the department.

The institution operates a central computing facility containing CDC-6600 equipment. The responding department uses primarily Mag tape, punched cards, and modem (terminal) for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Ohio Nuclear VIP-450

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: Ohio-Nuclear VIP 450 160K (8 bit) words of memory, 9 tr 800 bpi 75 ips tape, cassette tapes, fixed disks with 5 meg-w capacity, removable disks with 5 meg-w capacity, 4 lens camera, Video display, CRT display with 64 greyscales. Languages used are BASIC. Interfaced to 1 camera (64 X 64 33/second) (128 X 128 8/second) camera collection frame mode, 1200 max number of frames, 1024 cts/ele at (64 X 64) (128 X 128) or (256 X 256) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Static); film output, objective of study is images, 10 per week
2. Brain (Flow); film output, objective of study is

- images, curves, and numbers, 10 per week
3. Renal; film output, objective of study is curves and numbers, 10 per week
 4. Lung (Perfusion); film output, objective of study is images, 5 per week
 5. Lung (Ventilation); film output, objective of study is images, 5 per week
 6. Lung (V/Q); film output, objective of study is images, 5 per week
 7. Heart (Flow); film output, objective of study is images, 8 per week
 8. Heart (Gated); film output, objective of study is curves, images, and numbers, 8 per week
 9. Liver (Static); film output, objective of study is images, 14 per week
 10. Liver (Function); film output, objective of study is numbers, 14 per week
 11. Spleen; film output, objective of study is images, 8 per week
 12. Bone; film output, objective of study is numbers, 1 per week

<2350>

Installation: Denver Veterans Administration Hospital
Address: 1055 Clermont Street
Denver, Colorado 80220
USA

Phone: (303) 399-8020, Ext. 428 FTS 322-3322

Denver Veterans Administration Hospital is a Research, clinical and teaching institution which has 450 beds. For further information, contact:

William C. Klingensmith, M.D. (clinical)

Victor W. Spitzer, Ph.D. (hardware)

Victor M. Spitzer, Ph.D. (software)

3 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6400 equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DRC PDP-11/34; Ohio Nuclear VIP-450

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital Equipment Corporation 11/34 48K (16 bit) words of memory, 9 tr 800 bpi 45 ips tape, fixed disk with 5 meg-w capacity, PLO 1 removable disk with 5 meg-w capacity, CRT display with 16 greyscales and color, capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and Assembler. Interfaced to 2 cameras (32 X 32 60/second) (64 X 64 15/second) camera collection frame mode, 512 max number of frames, 255 cts/ele at (128 X 128) max number of counts, list mode size (256 X 256). Position, time and physiological signals collected.

System 2: Ohio-Nuclear VIP-450 160K (8 bit) words of memory, 9 tr 800 bpi 75 ips tape, cassette tapes, fixed disk with 5 meg-w capacity, removable disk with 5 meg-w capacity, 4 lens camera, video monitor, CRT display with 64 greyscales. Languages used BASIC. Interfaced to 2 cameras, (64 X 64 33/second) (128 X 128 8/second) camera collection frame mode, 1200 max number of frames, 1023 cts/ele at (64 X 64) and (128 X 128) max number of counts.

System 3: Ohio-Nuclear 128K (8 bit) words of memory, 9 tr 800 bpi 75 ips tape, CRT display with greyscales. Interfaced to 2 cameras, list mode size is (256 X 256).

Position, time and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); system 2 used, film output, objective of study is images, 3 per week
2. Brain (Flow); systems 1, 2, and 3 used, FORTRAN and BASIC languages used, film output, objective of study is curves and numbers, 3 per week
3. Renal; systems 1, 2, and 3 used, FORTRAN and BASIC languages used, objective of study is images, curves, and numbers, 3 per week
4. Heart (Flow); system 2 and 3 used, film output, objective of study is images, 5 per week
5. Heart (Gated); system 2 used, film output, objective of study is curves, numbers and images, 5 per week
6. Liver (Static); system 2 used, film output, objective of study is images, 20 per week
7. Liver (Function); systems 1 and 2 used, FORTRAN and BASIC languages used, film output, objective of study is curves and numbers, 20 per week
8. Spleen; system 2 used, film output, objective of study is images, 18 per week
9. Heart (Tomographic); systems 1 and 2 used, FORTRAN language used, film output, objective of study is images, 5 per week

<2400>

Installation: Institute of Nuclear Medicine and Allied
Sciences
Address: Probyn Road
Delhi, 110 007
India

Institute of Nuclear Medicine and Allied Sciences is a
Research, clinical and teaching institution.
For further information, contact:

A. Nagaratnam (clinical)

A. Nagaratnam (software)

50 persons support the research performed in the department.

The institution operates a central computing facility
containing IBM 360/44 equipment. The responding department
uses primarily Mag tape and punched cards for data
interchange with the central facility.

The responding department operates the following data
acquisition and processing equipment:

IBM 360/44

Software development, about 50/50, new and modification, is
performed by permanent staff along with other duties.

System descriptions:

System 1: FORTRAN language used.

On the computers described above, the following studies are
performed:

1. Radiation Dosimetry; IBM 360/44 used, FORTRAN language
used, list output, objective of study is research, 4 per
week
2. Collimator Performance, IBM 360/44 used, FORTRAN
language used, list output, objective of study is research,
1 per week
3. Curve Fitting Statistical Analysis, IBM 360/44 used,
FORTRAN language used, list output, objective of study is
research, 2 per week
4. Compartmental analysis, IBM 360/44 used, FORTRAN
language used, list output, objective of study is research,
1 per week

The responding department made the following comments
concerning its operation:

We use computer (IBM 360/44) mostly for radiation
dosimetry, bio-medical statistical analysis, curve fitting,
compartmental analysis, collimator performance studies,
etc. on batch process.

<2450>

Installation: George Washington University Medical Center
Address: 901 Twenty-third Street, NW
Washington, District of Columbia 20037
USA

Phone: (202) 675-3458

George Washington University Medical Center is a Clinical and Teaching institution.

For further information, contact:

Michael L. Cianci (software)

10 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370 equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by As of 12/78, and will be analyzed on the spot.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-2

System descriptions:

System 1: MDS NOVA-2 32K (16 bit) words of memory, 150 cps paper tape reader, 2315 fixed disk with 2.5 meg-w capacity, 2315 removable disk with 2.5 meg-w capacity, HP 1311A CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used Machine, FORTRAN, BASIC, and Assembler. Interfaced to 2 cameras (32 X 32 2/second) (64 X 64 1/second) camera collection frame mode, 60 and 120 max number of frames. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); Vendor language used, objective of study is curves, 5 per week
2. Brain (Flow); Vendor language used, objective of study is curves, 5 per week
3. Renal; Vendor and BASIC languages used, objective of study is curves, 4 per week
4. Lung (Perfusion); Vendor language used, CRT output, objective of study is images, 10 per week
5. Lung (Ventilation); BASIC language used, CRT output, objective of study is images, 6 per week

6. Lung (V/Q); BASIC language used, CRT output, objective of study is curves, 6 per week
7. Heart (Gated); Vendor language used, CRT and graph output, objective of study is curves and images, 3 per week

<2500>

Installation: William Beaumont Hospital
Address: 3601 West 13 Mile Road
Royal Oak, Michigan 48072
USA

Phone: (313) 288-8017

William Beaumont Hospital is a Clinical institution which has 900+ beds.

For further information, contact:

Howard J. Dworkin, M.D. (clinical)

Jack Hill (hardware)

Jack Hill (software)

The institution operates a central computing facility containing Burroughs 2100 equipment. The responding department uses primarily Punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

H-P 2100A

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: Hewlett/Packard 2100A 32K (16 bit) words of memory, 500 cps paper tape reader, 75 cps paper tape punch, 9 tr 800 bpi 45 ips tape, 7900A fixed disk with 1.25 meg-w capacity, 7900B removable disk with 1.25 meg-w capacity, Raster CRT display. Languages used FORTRAN, BASIC, and Assembler. Interfaced to 6 cameras (32 X 32 20/second) (64 X 64 20/second) camera collection frame mode, 1200/300 max number of frames, 65K cts/ele max number of counts at (64 X 64), (128 X 128) list mode size with 1.2M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); BASIC language used, CRT output, objective of study is images, done occasionally
2. Brain (Flow); BASIC language used, CRT output, objective of study is curves, done occasionally
3. Renal; BASIC, FORTRAN, and assembler languages used, list, graph, CRT and picture output, objective of study is numbers and flow curves, 1 per week

4. Thyroid (Image); BASIC language used, list and picture output, objective of study is curves and images, done occasionally
5. Thyroid (Uptake); BASIC language used, list output, objective of study is curves, done occasionally
6. Lung (Ventilation); BASIC language used, list output, objective of study is curves, done occasionally
7. Heart (Flow); BASIC and FORTRAN languages used, list and curve output, objective of study is images, numbers and curves, 1 per week
8. Heart (Gated); BASIC and FORTRAN languages used, list and curve output, objective of study is images, numbers and curves, 1 per week
9. Heart (Output); BASIC and FORTRAN languages used, list and curve output, objective of study is numbers and curves, done occasionally
10. Liver (Function); BASIC and FORTRAN languages used, image output, objective of study is images, done occasionally
11. Pancreas; BASIC and FORTRAN languages used, image output, objective of study is images, done occasionally

<2550>

Installation: Ralph K. Davies Medical Center
Address: Castro and Duboce
San Francisco, California 94114
USA

Phone: (415) 565-6370

Ralph K. Davies Medical Center is a Clinical and teaching institution which has 800 beds.

For further information, contact:

David L. Lilien, M.D. (clinical)

David L. Lilien, M.D. (hardware)

David L. Lilien, M.D. (software)

The responding department operates the following data acquisition and processing equipment:

ADAC LSI-11

Software development, about 50/50, new and modification, is performed by part time programmer and consultant service.

System descriptions:

System 1: ADAC LSI 11 64K (16 bit) words of memory, 3 double density floppies, printronix printer 300 ips, CRT display with 64 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and Assembler. Interfaced to 2 cameras, (32 X 32 20/second) (64 X 64 5/second) (128 X 128 1-2/second) camera collection frame mode, max number of frames depends, 2 to the 16 power cts/ele at (128 X 128).

On the computers described above, the following studies are performed:

1. Brain (Flow)
2. Renal
3. Heart (Flow)
4. Heart (Gated)
5. PBC survival calculations; FORTRAN language used
6. Various record keeping routines, FORTRAN and BASIC languages used

The responding department made the following comments concerning its operation:

Standard ADAC CDS configuration except for the line printer.

<2600>

Installation: Veterans Administration Medical Center
(Indianapolis)
Department: Nuclear Medicine
Address: 1481 West 10th Street
Indianapolis, Indiana 46202
USA

Phone: (317) 635-7401 Ext. 2493 PTS 332-2493

Veterans Administration Medical Center (Indianapolis) is a Clinical and Teaching institution which has 660 beds. For further information, contact:

Robert W. Furt, M.D., Chief of Nuclear
Medicine (clinical);
Robert W. Burt, M.D. and Robert M. Witt,
Ph.D. (hardware)
Robert W. Burt, M.D., and Robert M. Witt,
Ph.D. (software)

The responding department operates the following data acquisition and processing equipment:

General Electric MD 812; Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: GE MD 812 32K (12 bit) words of memory, 120+ cps paper tape reader, 15 cps paper tape punch, 9 tr 45 ips incremental tape, WAMCO fixed disks, TTY, Video, Diablo Hi-Speed printer, CRT Display with greyscales. Languages used NUTRAW. Interfaced to 2 cameras, (64 X 64 .1/second) camera collection frame mode, 740 max number of frames, (128 X 128) list mode size with 230K max counts. Position and time signals collected.

System 2: GE MD 812 16K (12 bit) words of memory, 15 cps paper tape punch, 9 tr 45 ips incremental tape, Diablo fixed disks, TTY, Video, CRT Display with greyscales. Languages used NUTRAW. Interfaced to 1 camera, (64 X 64 .1/second), 190 max number of frames, (64 X 64) list mode size with 230 max counts. Time and position signals collected.

System 3: GE General Data Nova III 32K (16 bit) words of memory, Diado fixed disks, TI Silent 10, CRT Display with greyscales. Languages used PORTRAN. Interfaced to camera, (64 x 64 .1/second) camera collection frame mode. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 1 used, NUTRAN language used, graph output, objective of study is flow and functional curves, 20 per week
2. Thyroid (Uptake); system 1 used, NUTRAN language used, 10 y hsk output, objective of study is percent of uptake, 1 per week
3. Lung (Perfusion); system 1 used, NUTRAN language used, V/Q+ output, objective of study is functional
4. Lung (Ventilation); system 1 used, NUTRAN language used, V/V output, objective of study is images, 3 per week
5. Lung (V/Q); system 1 used, NUTRAN language used, number output, objective of study is V/Q images
6. Heart (Gated); systems 1 and 2 used, NUTRAN language used, image output, objective of study is images and EJ Flow, 1-2 per week
7. Heart (Total); system 1 and 2 used, NUTRAN language used, statistical analysis output, objective of study is images, 7 per week

<2650>

Installation: National Institute of Radiological Sciences
Address: 9-1, 4-chome Anagawa
Chiba-shi, 280
Japan

Phone: (0472) 51-2111

National Institute of Radiological Sciences is a Research, clinical and teaching institution which has 10 beds.

For further information, contact:

Y. Tateno, and F. Shishido (clinical)

E. Tanaka, and K. Fukuhisa (hardware)

T. A. Yinuma, K. Fukuhisa, and T. Matsumoto (software)

10 persons support the research performed in the department.

The institution operates a central computing facility containing Toshiba, TOSBAC 3400-Model 31 equipment. The responding department uses primarily Mag tape, punched cards, paper tape, and by transmission by on-line cable for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Toshiba TOSBAC 3400/31; Hitachi HITAC 1011/A

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

Hardware development is performed by permanent staff along with other duties, and by consultant service.

System descriptions:

System 1: Toshiba TOSBAC 3400 Model 16K (24 bit) words of memory, 1000 cps paper tape reader, 200 cps paper tape punch, 7 tr 800 bpi 28.8 ips tape, MKM-0016F removable tape with 2.4 meg-w capacity x 2, curve plotter, I/O typewriter, line printer, card reader, Tokyo Electric Co. ST-5036 CRT display with 4 greyscales capable of simultaneous collection and processing. Languages used FORTRAN and assembler. Interfaced to cameras and scanners, (32 X 32 0.13/second) (64 X 64 0.13/second) camera collection frame mode, 400 max number of frames, 8388607 cts/ele max number of counts at (32 X 32), (512 X 512) list mode size with 1.8 meg-max counts. Position, time, energy and physiological signals collected. Scanner collection is continuous steps max resolution, (512 X 512) image size, with 1.8 meg max counts.

System 2: Hitachi HITAC 1011/A 32K (16 bit) words of memory, 400 cps paper tape reader, 100 cps paper tape punch, 9 tr 800 bpi 37.5 ips tape, (Disk 1) IBM 5440 fixed disk with 2.4 meg-w capacity, IBM 5440 removable disk with 2.4 meg-w capacity, (Disk 2) 8-2850 removable disk with 24 meg-w capacity, graphic display, Micro-dot imager, Hitachi-4200HD CRT display with 64 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and Assembler. Interfaced to cameras, (32 X 32 170/second) (64 X 64 85/second) (128 X 128 15/second) camera collection frame mode, 24000 max number of frames, 32767 cts/ele at (32 X 32) max number of counts, (256 X 256 list mode with 24 Meg-w max counts. Position, time, energy, and physiological signals collected. Scan-mode collection by a camera is 0.1 in steps max resolution, (256 X 256) image size, with 24 Meg-w max counts.

On the computers described above, the following studies are performed:

1. Lung (Perfusion); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week.
2. Lung (Ventilation); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week
3. Lung (V/Q); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week
4. Lung (Gated); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images. 0.5 per week
5. Heart (Flow) system 2 used, FORTRAN language used, graph output, objective of study is curves, 1 per week
6. Heart (Gated); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week
7. Heart (Output); system 2 used, FORTRAN language used, graph output, objective of study is curves, 0.5 per week
8. Liver (Static); system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 5 per week
9. Liver (Function); system 1 or 2 used, FORTRAN language used, graph output, objective of study is curves and images, 1 per week
10. Bone; system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week
11. Tumor Localization; system 1 or 2 used, FORTRAN language used, graph output, objective of study is images, 1 per week

<2700>

Installation: University of Washington Hospital
Department: Division of Nuclear Medicine
Address: 1959 NE Pacific
Seattle, Washington 98195
USA

Phone: (206) 543-3538

University of Washington Hospital is a Research, clinical and teaching institution which has 327 beds.

For further information, contact:

Dr. Thomas G. Redd (clinical)
Dr. Tom K. Lewellen (hardware)
Dr. Tom K. Lewellen (software)

The institution operates a central computing facility containing CDC 6400 and PDP 10 equipment. The responding department uses primarily Mag tape, punched cards, and modem (terminal) for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Data General Nova-214; Data General Nova-3112

System descriptions:

System 1: NOVA 214 (2) 32K (16 bit) words of memory, paper tape reader, removable cartridge disks with 1.25 meg-w capacity, Display scope, light pen, TI 702, 5" and 10" CRT display with 16 greyscales and color. Languages used Assembler, BASIC, and FORTRAN. Interfaced to 2 cameras, (64 X 64 max 25/second) (128 X 128 static/second) camera collection frame mode, 456 max number of frames (byte mode), 65535 cts/ele max number of counts at (64 X 64), (64 X 64) list mode size with 65535 max counts. Position, time, energy and physiological signals collected.

System 2: NOVA 3112 (2) 32K (16 bit) words of memory, paper tape reader, removable cartridge (2) disks with 1.25 meg-w capacity, color display, light pen, 5" and 19" video CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used Assembler, BASIC, and FORTRAN. Interfaced to 2 cameras (64 X 64 max 25/second) (128 X 128 static/second) camera collection frame mode, 456 X 2 max number of frames, 65535 cts/ele max number of counts at (64 X 64), (64 X 64) list mode size with 65535 max counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); systems 1 and 2 used, DEM CP language used, CRT output, 10 per week
2. Brain (Flow); systems 1 and 2 used, SYS language used, 10 per week
3. Renal; systems 1 and 2 used, DEM CP SYS language used, CRT output, 4 per week
4. Thyroid (Image); systems 1 and 2 used, DEM CP SYS language used, CRT output, 4 per week
5. Lung (Perfusion); systems 1 and 2 used, DEM CP SYS language used, CRT output, 5 per week
6. Lung (Ventilation); systems 1 and 2 used, DEM CP SYS language used, CRT output, 1 per week
7. Lung (V/Q); systems 1 and 2 used, DEM CP SYS language used, CRT output, 1 per week
8. Heart (Flow); just beginning, expect 10-20 per week
9. Liver (Static); systems 1 and 2 used, DEM language used, CRT output, 6 per week
10. Liver (Function); systems 1 and 2 used, CT SYS language used, CRT output, 2 per week
11. Spleen, systems 1 and 2 used, CT SYS language used, CRT display, combined with liver

<2750>

Installation: St. Joseph's Hospital (Ontario)
Address: 268 Grosvenor Street
London, Ontario N6A 4V2
Canada

Phone: (519) 439-3271 Ext. 496

St. Joseph's Hospital (Ontario) is a Research, clinical and teaching institution which has 600 beds.

For further information, contact:

University of Western Ontario, Department of
Medicine (clinical)

Digital Equipment Corporation, Bell (hardware)

Laboratories, Murray Hill, New Jersey (software)

The institution operates a central computing facility containing DEC-System 10 equipment. The responding department uses primarily Mag tape and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y wire 100 feet long and by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; Faird Atomic-77 D116

Software development, mostly new analysis routines, is performed by permanent staff along with other duties and by full time programmer.

Hardware development is performed by consultant service.

System descriptions:

System 1: DEC PDP 11/34 48,000 (16 bit) words of memory, 300 cps paper tape reader, 50 cps paper tape punch, 9 tr 800 bpi 45 ips tape, RK05 removable disk with 1.2 meg-w capacity, Gamma-11 interface, triple probe interface, Tektronix black and white Conrac Color CRT display capable of simultaneous collection and processing. Languages used RAT FOR, FORTRAN, BASIC, and assembler. Interfaced to cameras and elscint triple probes, (32 X 32 50/25/second) (64 X 64 12/6/second) camera collection frame mode, 512 max frames, 65535 cts/ele max number of counts at (64 X 64), (64 X 64) list mode size with 30,000 max counts. Position and time signals collected. Elscint triple probe has smallest collection time interval of 0.1 second, an image size of (4" X 5") with 2 to the 24 power - 1 max counts.

System 2: Cordis-Baird Digital Computer Controls D116
 24000 (16 bit) words of memory, 9 tr 800 bpi 45 ips tape,
 Baird Atomic, Cassette, and Recorder Model 80 tapes, Diablo
 removable disk with 1.2 meg-w capacity, Baird System 77,
 Baird black and white Sony Color CRT Display. No languages
 used. Interfaced to cameras, (32 X 32 14 X 21 -
 100/second) camera collection frame mode, 2000 max number
 of frames, 65535 cts/ele at (14 X 21) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 2 used, Assembler language used, CRT output, objective of study is infarcts, 30 per week
2. Renal; system 1 used, RAT FOR and assembler language used, CRT and graphic output, 7 per week
3. Lung (Perfusion); system 1 used, Gamma-11 language used, CRT output, objective of study is embolism, 8 per week
4. Lung (Ventilation); system 1 used, RAT FOR language used, objective of study is localization, 5 per week
5. Lung (V/Q); system 1 used, CRT output, objective of study is research, 1 per week
6. Heart (Flow); systems 1 and 2 used, Gamma-11 language used, CRT output, objective of study is infarct, 10 per week
7. Heart (Gated); systems 1 and 2 used, RAT FOR language used, CRT output, objective of study is localization, 1 per week
8. Heart (Perfusion); system 2 used, 5 per week
9. Heart (Output); system 2 used, Assembler language used, 1 per week
10. Liver (Function); Gamma-11 and RAT FOR language used, CRT output, objective of study is obstruction, 1 per week
11. Pancreas; system 1 used, Gamma-11 language used, CRT output, objective of study is tumor localization, 1 per week
12. Bone; system 1 used, RAT FOR language used, objective of study is tumor localization

<2800>

Installation: Clinica Puerta De Hierro
Address: San Martin De Porres 4
Madrid, 35
Spain

Phone: 2162340 Ext. 328

Clinica Puerta De Hierro is a Research, clinical and teaching institution which has 740 beds.

For further information, contact:

J. Ortiz Berrocal (clinical)

J. R. Martinez Alonso (software)

250 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

H-P 2116B; DEC PDP-11; Intertechnique Multi-20

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by consultant service.

System descriptions:

System 1: Hewlett-Packard H-P 2116-B 16K (16 bit) words of memory, 300 cps paper tape reader, 120 cps paper tape punch, 7 tr 200/556/800 bpi 10/45 ips tape, fixed disks with 1.5 meg-w capacity, removable disks with 1.5 meg-w capacity, 1 console T, 2 line printers, 1 plotter. Languages used Assembler, BASIC, Algol, and FORTRAN IV.

System 2: Digital PDP 11 64K (16 bit) words of memory, 300 cps paper tape reader, 120 cps paper tape punch, 9 tr 800 bpi 45 ips tapes, 5 removable disks with 1.2 meg-w capacity, 2 consoles T, 5 display T, 2 line printers. Languages used Assembler, BASIC, and FORTRAN IV.

System 3: Intertechnique (Two systems) Multi 20 32K (16 bit) words of memory, 300 cps paper tape reader, fixed disks with 1.5 meg-w capacity, removable disks with 1.5 meg-w capacity, 1 console T, 1 Versates, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used Assembler, Lem S, and FORTRAN IV. Interfaced to 2 cameras, (32 X 32 20/second) (64 X 64 20/second) (128 X 128 8/second) camera collection frame mode. (128 X 128) list mode size with 62000 max counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); system 3 used, Assembler language used, graph output, objective of study is images, 50 per week
2. Brain (Flow); system 3 used, Lem and Assembler languages used, list and graph output, objective of study is images and curves, 40 per week
3. Renal; system 1 used, FORTRAN language used, list and graph output, objective of study is images
4. Renal; system 3 used, Lem and Assembler language used, list and graph output, objective of study is images and curves, 25 per week
5. Thyroid (Image); system 1 used, FORTRAN language used, graph output, objective of study is images, 100 per week
6. Thyroid (Uptake); system 1 used, FORTRAN language used, report and data list output, objective of study is images, curves, and numbers, 100 per week
7. Lung (Perfusion); system 3 used, Lem language used, report and data and graph output, objective of study is images and curves, 10 per week
8. Lung (Ventilation); system 3 used, Lem language used, report, data and graph output, objective of study is images and curves, 10 per week
9. Lung (V/Q); system 3 used, Lem language used, report, data and graph output, objective of study is images and curves, 10 per week
10. Heart (Flow); system 3 used, Assembler language used, graph output, objective of study is curves and images 10 per week
11. Heart (Perfusion); system 3 used, Assembler language used, objective of study is curves and images
12. Heart (Output); objective of study is images and curves
13. Liver (Static); system 1 used, FORTRAN language used, report and data output, objective of study is numbers, 140 per week
14. Liver (Function); system 3 used, Assembler language used, graph output, objective of study is curves and images, 20 per week
15. Spleen; system 3 used, Assembler language used, report and data output, objective of study is images, 10 per week
16. Bone; system 3 used, Assembler language used, report and data output, objective of study is images and curves, 50 per week
17. Tumor Localization; system 3 used, Assembler language used, objective of study is images

The responding department made the following comments concerning its operation:

There are two systems Type 3. The system 2 is not performing yet.

<2850>

Installation: Loyola University Medical Center
Department: Nuclear Medicine
Address: 2160 South First Avenue
Maywood, Illinois 60153
USA

Phone: (312) 531-3777

Loyola University Medical Center is a Clinical and teaching institution which has 500 beds.

2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-3

Software development, mostly modification of routines in use, is performed .

System descriptions:

System 1: MDS NOVA III 32K (16 bit) words of memory, paper tape reader, 9 tr tape, 1 fixed disk with 1.2 meg-w capacity, 2 removable disks with 1.2 meg-w capacity, Refresh scope CRT display with 16 greyscales capable of simultaneous collection and processing, color display CRT with 16 greyscales and color. Languages used FORTRAN, BASIC, and assembler. Interfaced to 2 cameras, (64 X 64 25/second) camera collection frame mode, 54K cts/ele at (64 X 64) 256 cts/ele at (64 X 64) and 256 cts/ele at (128 X 128) max number of counts, (64 X 64) list mode size with 37.5 max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); Assembler language used, image output, objective of study is enhancement, 25 per week
2. Brain (Flow); Assembler language used, graph output, objective of study is graphs, 25 per week
3. Renal; assembler language used, graph output, objective of study is quantity, 2 per week
4. Lung (Ventilation); Assembler language used, image and graph output, objective of study is V/Feg, 7 per week
5. Lung (V/Q); Assembler language used, objective of study is V/Q, 7 per week
6. Heart (Flow); Assembler language used, 1 per week

7. Heart (Gated); Assembler language used, graph and image output, objective of study is curves and numbers, 7 per week
8. Pancreas; image output, objective of study is subtraction, 1 per week
9. Tumor Localization; image output, objective of study is enhancement, 15 per week

<2900>

Installation: Ochsner Medical Institutions
Address: 1516 Jefferson Hwy.
New Orleans, Louisiana 70121
USA

Phone: (504) 837-3000 Fxt. 2216

Ochsner Medical Institutions is a Research, clinical and teaching institution which has 520 beds.

For further information, contact:

Drs. Stanton Shuler, and Lynn Witherspoon (clinical)

Drs. Stanton Shuler, and Lynn Witherspoon (hardware)

Drs. Stanton Shuler, and Lynn Witherspoon (software)

49 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370-138 equipment. The responding department uses primarily We do not interact with the central computer at this time. for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by By wire 300 feet long with line driver.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; DEC PDP-11/40

Software development, mostly new analysis routines, is performed by permanent staff along with other duties, by part time programmer, and by consultant service.

System descriptions:

System 1: Digital 11-40 32K (16 bit) words of memory, paper tape reader, paper tape punch, RK05 (2) removable disks with 1.2 meg-w capacity, Versitek Printer/Plotter, Sci. Acces. spark pad, P4010-1 Tektronix scope, CRT display with color and capable of simultaneous collection and processing. Languages used FORTRAN and BASIC. Interfaced to 2 cameras. Camera collection is per Gamma-11 system.

System 2: Digital 11/34 32K (16 bit) words of memory, RK05P fixed disks, RK05 removable disks with 1.2 meg-w capacity, CRT display with color and capable of simultaneous collection and processing. Languages used FORTRAN and BASIC. Interfaced to 2 cameras. Camera collection is per the Gamma-11 system.

On the computers described above, the following studies are performed:

1. Brain (Flow); systems 1 and 2 used
2. Renal; systems 1 and 2 used
3. Lung (Perfusion); systems 1 and 2 used
4. Lung (Ventilation); systems 1 and 2 used
5. Lung (V/Q); systems 1 and 2 used
6. Heart (Flow); systems 1 and 2 used
7. Heart (Gated); systems 1 and 2 used
8. Bone; systems 1 and 2 used
9. RIA Programs; systems 1 and 2 used
10. Dept. Administration; system 2 used
11. Radiation Rx; system 1 used

Installation: General Infirmary
Department: Nuclear Medicine
Address: St. George Street
Leeds, LS1 3EX
England

General Infirmary is a Teaching institution which has 600 beds.

For further information, contact:

- A. H. Smith(clinical)
- A. B. Palmer(hardware)
- A. H. Smith(scftware)

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC 11/40 64K (16 bit) words of memory, paper tape reader, 9 tr 800 bpi 12 1/2 ips tapes, 2 X RK05 removable disks with 1.2 meg-w capacity, Versatec printer-plotter, Color TV Conrac display with 16 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, and assembler, but runs under Gamma-11. Interfaced to 2 cameras, (32 X 32 50/second) (64 X 64 12/second) camera collection frame mode, 512 max number of frames, 64K cts/ele at (64 X 64) max number of counts, (64 X 64) list mode size with 256 max counts per block. Position and time signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); Macro and FORTRAN languages used, color TV output, objective of study is count rate distribution, 20 per week
2. Brain (Flow); Macro and FORTRAN languages used, ES plotter output, objective of study is count rate distribution, 20 per week
3. Renal; Macro language used, TV output, objective of study is flow curves, 1 per week
4. Lung (Perfusion); Macro and FORTRAN languages used, Color TV output, objective of study is count rate distribution, 5 per week

4. Lung (Ventilation); Macro and FORTRAN languages used, ES plotter output, objective of study is flow curves
5. Heart (Gated); Macro and FORTRAN languages used, Color TV (cine) output, objective of study is count rate distribution and flow curves, 2 per week
6. Heart (Effusion); Macro and FORTRAN languages used, Color TV (cine) output, objective of study is count rate distribution and flow curves, 1 per week
7. Heart (Output); Macro and FORTRAN languages used, Color TV (cine) output, objective of study is count rate distribution and flow curves, 2 per week
8. Liver (Static); Macro and FORTRAN languages used, Color TV and ES plotter output, objective of study is count rate distribution, 2 per week
9. Spleen; Macro and FORTRAN languages used, Color TV and ES plotter output, objective of study is count rate distribution
10. Pancreas; Macro and FORTRAN languages used, Color TV and ES plotter output, objective of study is count rate distributions, 1 per month
11. Bone; Macro and FORTRAN languages used, Color TV and ES plotter output, objective of study is count rate distributions and flow curves, 6 per week

The responding department made the following comments concerning its operation:

We usually use the GAMMA 11 software utilizing the MACRO command structure. Basic and Fortran programs have been written to improve data analysis. Hardcopy output is via electrostatic plotter using the Fortran program.

Installation: Vanderbilt University Medical Center
Department: Division of Nuclear Medicine
Address: 21st Avenue South at Garland Avenue
Nashville, Tennessee 37232
USA

Phone: (615) 322-2394

Vanderbilt University Medical Center is a Research, clinical and teaching institution which has #500 beds. 6 full time, plus 6 more part-time (along with clinic duties) persons support the research performed in the department.

The institution operates a central computing facility containing XDS Sigma 7 and DEC system 10 equipment. The responding department uses primarily Mag tape, punched cards, modem (terminal) and Minicomputer (PDP-9) to Sigma 7 for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 9y wire 500 - #1000 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/05; DEC PDP-9; DEC PDP-11/55

Software development, about 50/50, new and modification, is performed by full time programmer.
Hardware development is performed by full time engineer.

System descriptions:

System 1: DEC PDP 11/05 32K (16 bit) words of memory, PK05 removable disk with 1.2 meg-w capacity, Contrac CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used FORTRAN, BASIC, Assembler, and POCAL. Interfaced to 5 cameras, (32 X 32 100/second) (64 X 64 25/Second) (128 X 128 not allowed) max values for camera collection frame mode, 511 max number of frames, 65535 cts/ele max number of of counts at (64 X 64), list mode size is (64 X 64) with 65535 max counts or (128 X 128) with 255 max counts. Position time, and physiological signals collected.

System 2: DEC FDP-9, 32K (18 bit) words of memory, 9 tr 800 bpi 45 ips tape, paper tape reader, paper tape punch, DFC tape, fixed data disks with .144 X 2 meg-w capacity, CAMAC (for rectilinear scanners) video disk, 4096 computer memory, PEF display, Tektronix 503 CRT Display which operates like a gamma camera display. Languages used FORTRAN, BASIC, Assembler, and POCAL. Interfaced to 2 scanners. Scanner collection is .001 in steps with variable (128 X 128) image size, with 128K - 1 max counts.

System 3: DEC FDP 11T/55 64K (16 bit) words of memory, RK05 removable disk with 1.2 meg-w capacity, CAMAC (for rectilinear scanner) video digitizer, Tektronix 603 character-coded (16 levels) CRT display which is capable of simultaneous collection and processing but not used as such. Languages used FORTRAN, BASIC, Assembler, and POCAL. Interfaced to 1 scanner. Scanner collection is .001 in steps with variable (128 X 128) image size, with 32K - 1 max counts.

On the computers described above, the following studies are performed:

1. Renal; system 1 used, FORTRAN and assembler languages used, list, graph, and photo output, objective of study is curves and numbers, # 25 per week
2. Thyroid (Uptake); system 2 used, FORTRAN and Assembler languages used, list and graph output, objective of study is images and numbers, < 1 per week
3. Thyroid (X-ray Fluorescence); systems 2 and 3 used, FORTRAN and assembler languages used, list and graph output, objective of study is images and numbers, # 4 per week
4. Lung (Gated); System 1 used, FORTRAN and assembler languages used, list, graph, and photo output, objective of study is images, numbers and curves, 1 per week
5. Heart (Flow); system 1 used, FORTRAN and assembler languages used, photo output, objective of study is images, 3 per week
6. Heart (Gated); system 1 used, FORTRAN and Assembler languages used, list, graph, and photo output, objective of study is images, curves and numbers, 3 per week
7. Liver (Function); System 1 used, assembler language used, images (photo) output, objective of study is images, # 1 per year
8. Spleen; system 1 used, assembler language used, image and list output, objective of study is numbers, # 1 per year

- 9. Pancreas; system 1 used, assembler language used, photo output, objective of study is images, \$ 1 per year
- 10. Heart (Thallium); system 1 used, Assembler language used, photo output, objective of study is images, \$ 1 per two weeks
- 11. Blood Flow (Any Organ); system 1 used, assembler language used, photo output, objective of study is images, \$ 1 per month
- 12. In-Vitro Tests (GFP, Blood Volume, TSH, Gastrin, and Beta-2); systems 1, 2, and 3 used, FORTRAN language used, list and graph output, objective of study is numbers, \$ 30 per week

The responding department made the following comments concerning its operation:

- System 1: All data collection is done with Gamma-11 software. Analysis done with Gamma-11 and our programs.
- System 2: Data collection and analysis done with our programs.
- System 3: Data collection and analysis done with our programs

<3050>

Installation: Addington Hospital
Department: Radiophysics
Address: Marine Parade
Durban, NATAL 4001
South Africa

Addington Hospital is a Clinical institution.
For further information, contact:

- A. E. Houlder (clinical)
- A. E. Houlder (hardware)
- A. E. Houlder (software)

The responding department operates the following data
acquisition and processing equipment:
DEC PDP-8/I

Software development, about 50/50, new and modification, is
performed by permanent staff along with other duties.

System descriptions:

System 1: Zenithon DEC PDP-8/17 28K (12 bit) words of
memory, 10 cps paper tape reader, System Industries fixed
disks with 3.3 meg-w capacity, Systems Industries removable
disks with 3.3 meg-w capacity, Ann Arbor CRT display with
16 greyscales and color. Languages used FORTRAN, BASIC,
Assembler (Pascal) and Pascal. Interfaced to 1 camera with
(64 X 64 1/second) camera collection frame mode, 100 max
number of frames, 4096 cts/ele max number of counts at (64
X 64), (64 X 64) list mode size with 100K max counts.
Position signals collected.

On the computers described above, the following studies are
performed:

1. Brain (Flow); Pascal language used, images on CRT and TV
output, 10 - 20 per week
2. Renal; Pascal language used, images and graph output,
objective of study is flow curves, 5 per week
3. Lung (Perfusion); Pascal language used, image and graph
output, objective of study is images
4. Lung (Ventilation); Pascal language used, image and
graph output, objective of study is images and graphs, 3
per week

<3100>

Installation: Letterman Army Medical Center
Department: Nuclear Medicine
Address: Presidio of San Francisco, California 94129
USA

Phone: (415) 561-3717

Letterman Army Medical Center is a Clinical and teaching institution which has 400 beds.

For further information, contact:

Robert J. Lull, M.D. (clinical)

Robert J. Lull, M.D. (hardware)

Robert J. Lull, M.D. (software)

1 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

Data General Nova-3

System descriptions:

System 1: Data General Nova 3 64K (16 bit) words of memory, paper tape reader, paper tape punch, 9 tr 300 bpi 75 ips tapes, fixed disks with 1.25 meg-w, 3 removable disks with 1.25 meg-w each, CRT display with 16 greyscales capable of simultaneous collection and processing.

Languages used FORTRAN IV, BASIC, algol, and assembler. Interfaced to 3 cameras, (64 X 64 25/second) (128 X 128 5/second) camera collection frame mode, 1400 max number of frames, 32767 cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size. Position, time, energy and physiological signals collected.

System 2: Data General Nova 3 32K (16 bit) words of memory, paper tape reader, 1 fixed disk with 1.25 meg-w capacity, 1 removable disk with 1.25 meg-w capacity, mobile cardiac package, muga cart, 120 X 128 CRT display with 16 greyscales. Languages used FORTRAN IV, BASIC, and assembly. Interfaced to 1 camera, (64 X 64 25/second) (128 X 128 5/second) camera collection frame mode, 300 max number of frames, 32767 cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 1 used, MDS and FORTRAN languages used, CRT output, objective of study is improved sensitivity, 40 per week
2. Renal; system 1 used, MDS language used, CRT and graph output, objective of study is data backup, 6 per week
3. Lung (Ventilation); system 1 used, MDS and FORTRAN languages used
4. Heart (Flow); systems 1 and 2 used, MDS and FORTRAN languages used, printer output, objective of study is L-R shunt quantitation, 1-2 per week
5. Heart (Gated); systems 1 and 2 used, MDS and FORTRAN languages used, CRT printout output, objective of study is ejection fractions
6. Heart (Output); systems 1 and 2 used, MDS and FORTRAN languages used, printer output, objective of study is cardiac output, done rarely
7. Liver (Static); FORTRAN language used, CRT output
8. Pancreas, system 1 used, MDS language used, CRT output, objective of study is improved visualization, done rarely
9. Bone; system 1 used
10. Tl-201 Myocardial Perfusion: MDS and FORTRAN language used, CRT output, objective of study is improved visualization

The responding department made the following comments concerning its operation:

1. We are planning to upgrade main system to MDS A2 configuration during this year.
2. "Muga Cart" by MDS not installed at this time but ordered

<3150>

Installation: Los Angeles County Harbor--UCLA Medical Center
Department: Division of Nuclear Medicine
Address: 100 W Carson Street
Torrance, California 90509
USA

Phone: (213) 533-2842

Los Angeles County Harbor--UCLA Medical Center is a Research, clinical and teaching institution which has 550 beds.

For further information, contact:

Ismael Mena, M.D., Director Division of Nuclear Medicine (clinical)

Sheldon Chelsy, Program Analyst (hardware)

Sheldon Chelsy, Program Analyst (software)

700 persons support the research performed in the department.

The institution operates a central computing facility containing HP-3000 equipment. The responding department uses primarily Mag tape and modes (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Collected for ICU by wire 500 feet long and magnetic tape.

The responding department operates the following data acquisition and processing equipment:

Informatek Jiun 3-3; Varian 620/L

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties, and by full time programmer.

System descriptions:

System 1: Informatek Jiun 3-3 Varian 620/L-100 32K (16 bit) words of memory, 9 tr 800 hpi 50 ips tapes, CDC 9427H fixed disk with 4.7 meg-w capacity, CDC 9427H removable disk with 4.7 meg-w capacity, Textronix 611 storage scope, and color CRT display capable of simultaneous collection and processing. Languages used FORTRAN, DAS Assembler, and Informatek Macropunch generator. Interfaced to 2 cameras, (64 X 64 13/second) (128 X 128 3/second) camera collection frame mode, 350 max number of frames at (64 X 64), 32767 cts/ele at (64 X 64) max number of counts (256 X 256) list mode size with 2.4M max counts. Position, time, energy and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; Macrof language used, graph output, objective of study is curves, 2 per week
2. Heart (Flow); Macrof language used, graph output, objective of study is ejection fraction and LVSW, 30 per week
3. Heart (Gated); Macrof language used, image output, objective of study is ejection fractions and LVSW, 5 per week
4. Heart (Output); Macrof language used, curves output, objective of study is curves, 2 per week
5. Liver (Function); Macrof language used, curves output, objective of study is curves, 1 per week

<3200>

Installation: Hopital Maisonneuve-Rosemont
Address: 5415 Ed. de l'Assomption
Montreal, Quebec H1T 2M4
Canada

Phone: (514) 254-8341 Ext. 531

Hopital Maisonneuve-Rosemont is a Clinical institution.
For further information, contact:
Maurice Page (hardware)
Maurice Page (software)

The responding department operates the following data
acquisition and processing equipment:
DEC PDP-8/I; Baird Atomic DCC 116

Software development, mostly new analysis routines, is
performed by permanent staff along with other duties.
Hardware development is performed by permanent staff along
with other duties.

System descriptions:

System 1: User PDP 8I 12K (12 bit) words of memory, 10
cps paper tape reader, 10 cps paper tape punch, 2 Dec
tapes, ADC, Tektronix 611 CRT display with 16 or 64
greyscales. Languages used Assembler. Interfaced to 1
scanner with 1/8 in. steps, image size (128 X unlimited),
and 2047 max counts.

System 2: Baird-Atomic DCC 116 16K (16 bit) words of
memory, 10 cps paper tape punch, 10 cps paper tape reader,
9 tr 800 bpi 24 ips tapes, Diablo 33P removable disks with
2.4 meg-w capacity, cassette tapes, 3 refreshed CRT
displays with 16 greyscales and color. Languages used
Assembler. Interfaced to 1 camera, (32 X 32 20/second)
camera collection frame mode, 2000 max number of frames,
64K cts/ele max number of counts at (14 X 21).

System 3: User DCC 116 32K (16 bit) words of memory,
10 cps paper tape reader, 10 cps paper tape punch, (2)
Wango P1212 fixed disks with 2.4 meg-w capacity, (2) Wango
P1212 removable disks with 2.4 meg-w capacity, Centronics
Printer. Languages used Assembler and GETRAN.

On the computers described above, the following studies are performed:

1. Brain (Static); system 2 used, Assembler language used, CRT plot output, objective of study is images, 60 per week
2. Brain (Flow); system 2 used, Assembler language used, graph output, objective of study is curves, 60 per week
3. Renal; system 2 used, Assembler language used, graph and CRT plots output, objective of study is images and curves, 5 per week
4. Heart (Flow); system 2 used, Assembler and FORTRAN languages used, CRT output, objective of study is cine cycle, 3 per week
5. Heart (Output); system 2 used, Assembler and FORTRAN languages used, CRT output, objective of study is numbers, 3 per week
6. Bone; system 1 used, Assembler language used, persistence scope picture output, objective of study is images, 5 per week
7. Tumor Localization; system 1 used, Assembler language used, persistence scope picture output, objective of study is images, 5 per week

The responding department made the following comments concerning its operation:

System 2 or System 3 computer may be connected to the system 70's I/O bus. System 3 is used essentially for software development and data processing if the program has been written in FORTRAN. An extensive FORTRAN library has been developed for using system 70's peripherals. Both DCC 116's may exchange data with the PDP 8/I by the means of an asynchronous line (9600 bauds)

Installation: University of Minnesota Hospitals
Department: Division of Nuclear Medicine
Address: Box 382 Mayo Bldg., 420 Delaware St., SE
Minneapolis, Minnesota 55455
USA

Phone: (612) 373-8650

University of Minnesota Hospitals is a Research, clinical, and teaching institution which has 800 beds.
For further information, contact:

W. K. Loken (clinical)
L. E. Williams and R. A. Ponto (hardware)
L. E. Williams and R. A. Ponto (software)

The institution operates a central computing facility containing CDC 3300 and CDC Cyber equipment. The responding department uses primarily Mag tape, punched cards, and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Collected by magnetic tape and disk cartridge.

The responding department operates the following data acquisition and processing equipment:

MDS:Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

System descriptions:

System 1: MDS/FAS Data General Nova 3 32K (16 bit) words of memory, 1 removable disk with 1.5 meg-w capacity. Interfaced to 1 camera, (64 X 64 25/second) (128 X 128 7/second) camera collection frame mode, 200 estimated max number of frames, 64 X 10 to the third power cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size with 37 X 10 to the third power max counts. Position, time, energy and physiological signals collected.

System 2: MDS/SIMUL Data General Nova 3 32K (16 bit) words of memory, paper tape reader, 2 removable disks with 3 meg-w capacity, Color video CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used BASIC, FORTRAN, and Assembler. Interfaced to 3 cameras, (64 X 64 25/second) (128 X 128

3/second) camera collection frame mode, 600 max number of frames, 64 X 10 to the third power cts/ele at (64 X 64), (256 X 256) list mode size with 37 X 10 to the third power max number of counts. Position, time, energy and physiological signals collected.

System 3: Not on site yet

System 4: Not on site yet

On the computers described above, the following studies are performed:

1. Brain (Flow); system 4, assembly language used, graph output, objective of study is numbers, 1 estimated per week
2. Renal; systems 1 and 2 used, FORTRAN language used, graph output, objective of study is curves, 15 per week
3. Lung (Perfusion); system 1 used, FORTRAN language used, image output, objective of study is images, 1 per week
4. Lung (Ventilation); system 1 used, FORTRAN language used, image output, objective of study is images, 1 per week
5. Heart (Gated); systems 3 and 4 used, Assembly language used, graph output, objective of study is curves and images, 5 estimated per week
6. Heart (Output); systems 3 and 4 used, Assembly language used (called by a MACRO); number output, objective of study is EF numbers, 5 estimated per week
7. Liver (Function); system 1 used, FORTRAN language used, graph output, 3 per week
8. Cardiac Muscle (T-2-1); system 1 used, FORTRAN language used, image output, objective of study is images, 3 per week

The responding department made the following comments concerning its operation:

The RAS system will be used in Cardiology for acquisition only with manual data transfer to the SIMUL for eventual cardiac analysis. The MED II is primarily used for renogram acquisition and analysis. The MEDSTOR is mounted on a dolly and functions as a mobile data acquisition unit.

<3300>

Installation: University of Virginia
Department: Department of Radiology
Address: Charlottesville, Virginia 22908
USA

Phone: (804) 924-5201

University of Virginia is a Teaching institution which has 650 beds.

For further information, contact:

B. Y. Croft, Ph.D. or D. D. Watson, Ph.D. (clinical)
B. Y. Croft, Ph.D. or D. D. Watson, Ph.D. (hardware)
B. Y. Croft, Ph.D. or D. D. Watson, Ph.D. (software)

The institution operates a central computing facility containing Cyber 172 and Burroughs 4700 equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by It's analyzed on the spot, returned to the lab by wire 400 feet long, and by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; MDS

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by part time programmer.

Hardware development is performed by permanent staff along with other duties, and by part time engineer.

System descriptions:

System 1: DEC 11/34 32K (8 bit) words of memory, 9 tr 800 bpi tapes, 2 removable disks, color scope, TTY, Conrac color CRT display capable of simultaneous collection and processing. Languages used FORTRAN, Basic, and Pocal. Interfaced to 2 + cameras, 65000 cts/ele at (64 X 64) max number of counts. Position and physiological signals collected.

System 2: MDS Muga-cart 32K (8 bit) words of memory, paper tape reader, paper tape punch, 1 fixed disk, 1 removable disk, color scope, printer, CRT display with color. Languages used FORTRAN. Has a mobile camera. Position and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 1 used, Focal language used, graph and list output, objective of study is curves, 5 per week
2. Thyroid (Uptake); system 1 used, Focal language used, numbers and list output, objective of study is technetium uptake, 5 per week
3. Heart (Flow); system 1 used, FORTRAN language used, objective of study is images, 5 per week
4. Heart (Gated); system 1 used, FORTRAN language used, objective of study is images, 5 per week
5. Liver (Static); system 1 used, FORTRAN language used, image output, objective of study is images, 15 per week
6. Tl-201 Heart; systems 1 and 2 used, picture and graph output, objective of study is images, 12 per week

<3350>

Installation: U. S. Veterans Administration Medical Center
(Wood)

Address: USVA Center 115
Wood, Wisconsin 53193
USA

Phone: (414) 384-2000 Ext. 2138 FTS 362-7138

U. S. Veterans Administration Medical Center (Wood) is a
Research, clinical, and teaching institution which has 900
beds.

For further information, contact:

C. Kronenweter and R. C. Heade, M.D. (clinical)
C. Kronenweter and R. C. Heade, M.D. (hardware)
C. Kronenweter and R. C. Heade, M.D. (software)

The responding department operates the following data
acquisition and processing equipment:

DEC PDP-12;MDS;Data General Nova-3

Software development, mostly new analysis routines, is
performed by permanent staff along with other duties.
Hardware development is performed by full time engineer.

System descriptions:

System 1: DEC PDP 12 32K (12 bit) words of memory, 110
cps paper tape reader, 110 cps paper tape punch, lintape,
2 2315 removable disks with 3.2 meg-w, floating point
processor, VT-52 incremental plotter, line printer, VR-12
CRT display (part of PDP 12) with 64 greyscales and capable
of simultaneous collection and processing. Languages used
are Assembler, FORTRAN, BASIC, and Pascal. Interfaced to 3
cameras, (32 X 32 20/second) (64 X 64 12/second) camera
collection frame mode, 1600 max number of frames, 4095
cts/ele at (64 X 64) max number of counts. Position, time,
and physiological signals collected.

System 2: MDS (Being Acquired) Nova 3 32K (16 bit)
words of memory, 300 cps paper tape reader, 9 tr 800 bpi 37
ips incremental tapes, 2 2315 removable disks with 2.4
meg-w, color CRT display, Interfaced to 2 cameras, (32 X
32 25/second) camera collection frame mode, 32000 cts/ele
at (64 X 64) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Flow); system 1 used, Assembler language used, graph output, objective of study is flow curves
2. Renal; system 1 used, Assembler language used, graph and photo output, objective of study is curves and images, 1-2 per week
3. Heart (Flow); systems 1 and 2 used, Assembler language used, graph and photo output, objective of study is curves and images, 2-4 per week
4. Heart (Gated); systems 1 and 2 used, Assembler language used, graph and photo output, objective of study is curves and images, 2-4 per week
5. Heart (Output); systems 1 and 2 used, Assembler language used, graph and photo output, objective of study is curves and images, 2-4 per week
6. Liver (Static); system 1 used, Assembler language used, photo output, objective of study is filtered images, 1-2 per week
7. Bone; system 1 used, Assembler language used, graph and photo output, objective of study is images and graphs, 1-2 per week
8. Tl-201 Cardiac; systems 1 and 2 used, Assembler language used, photo and graph output, objective of study is filtered images, 2 per week

The responding department made the following comments concerning its operation:

Additional MDS MUGA CART being purchased for use with portable camera for cardiac studies, especially gated equilibrium and Tl-201 uptake. A data link between the PDP 12 and MUGA CART will be established using a serial data line. Software is now written to allow simultaneous data collection and processing/program development on the PDP-12.

<3400>

Installation: University Hospital
Address: 59 Oostersingel
Groningen, 9713 EZ Groningen
The Netherlands

Phone: (0) 50-619111 or 50-612670 Ext. 2670

University Hospital is a Research, clinical and teaching institution which has 1100 beds.

For further information, contact:

D. A. Piers (clinical)

H. Beekhuis and A. M. J. Paans (hardware)

H. Beekhuis and A. M. J. Paans (software)

5 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6600 equipment. The responding department uses primarily Modes (Terminal); punched cards, and mag tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by paper tape.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-2; DEC PDP-15; Varian V72

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by part time engineer.

System descriptions:

System 1: MDS Nova 2 32K (16 bit) words of memory, paper tape reader, 1 fixed disk with 1.2 meg-w, 1 removable disk with 1 meg-w capacity, CRT display with color capable of simultaneous collection and processing. FORTRAN language used. Interfaced to 2 cameras.

System 2: PDP KP 15 32K (18 bit) words of memory, paper tape reader, 9 tr 800 hpi 45 ips tapes, 1 fixed disk with 0.5 meg-w, line printer, card reader, plotter, CAMAC, CRT display capable of simultaneous collection and processing. Languages used are FORTRAN and Assembler. Interfaced to 1 camera with dual head scanner.

System 3: Varian V 72 48K (16 bit) words of memory, paper tape reader, 1 fixed disk with 2.8 meg-w, 1 removable disk with 2.8 meg-w, CRT display with color. Languages used Assembler and FORTRAN. Interfaced to 1 camera.

On the computers described above, the following studies are performed:

1. Brain (Reg. Blood Flow); system 3 used, Assembler language used, Pilt. output, objective of study is images and curves, 2 per week
2. Brain (Flow); system 1 used, FORTRAN language used, objective of study is curves, 10 per week
3. Renal; system 1 used, FORTRAN language used, objective of study is images and curves, 10 per week
4. Lung (Ventilation); system 1 used, FORTRAN language used, objective of study is images, 5 per week
5. Heart (Flow); system 1 used, objective of study is images and curves, 5 per week
6. Heart (Gated); system 1 used, objective of study is images and curves, 5 per week
7. Liver (Function); system 1 used, objective of study is images and curves, 5 per week
8. Bone; system 1 used, objective of study is images and curves, 5 per week
9. Tumor Localization; system 1 used, objective of study is images, 5 per week
10. Heart Shunts; system 1 used, objective of study is images, 2 per week
11. Bone marrow; system 1 used, objective of study is images, 2 per week
12. Patient Administration; system 1 used, objective of study is data
13. Research writer; system 2 used, Assembler and FORTRAN languages used, objective of study is tomography
14. Labelled Radiopharmaceuticals; system 2 used, objective of study is imaging, 1 per week

The responding department made the following comments concerning its operation:

System 1: MDS-Bicam systems--coupled to 2 gamma camera's for general use

System 2: PDP 15 coupled to home made position camera

System 3: Varian computer coupled to multi-detector system for brain blood flow with xenon

<3450>

Installation: White Memorial Medical Center
Address: 1720 Brooklyn Avenue
Los Angeles, California 90033
USA

Phone: (213) 268-5000 Ext. 2560

White Memorial Medical Center is a Clinical and teaching institution which has 377 beds.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-3

System descriptions:

System 1: MDS EG. C. NOVA 32K (16 bit) words of memory, 1 2315 fixed disk with 2.5MB capacity, 2 2315 removable disks with 5.0MB combined, 604 (TEK) CRT display with 15 greyscales and capable of simultaneous collection and processing. PORTRAW and Assembler languages used. Interfaced to 2 cameras. One with (64 X 64 byte 10/second), (128 X 128 3/second) frame mode, #600 frames at 64 X 64 byte, 255 cts/ele at (64 X 64 and 128 X 128) byte max number of counts. The other with (64 X 64 word 6/second) frame mode, #300 max number of frames at 64 X 64, 65535 cts/ele at (64 X 64) max number of counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); image output, objective of study is images, 8 per week
2. Brain (Flow); graph and image output, objective of study is images and flow curves, 5 per week
3. Renal; image and graph output, objective of study is images and flow curves, 1 per week
4. Thyroid (Image); image output, objective of study is images, #1 per month
5. Lung (Perfusion); graph and image output, 3 per week
6. Lung (Ventilation); graph and image output, 3 per week
7. Heart (Flow); image output, objective of study is images and curves, 1 per week
8. Heart (Gated); graph and image output, objective of study is images, curves, and numbers, 1 per month
9. Liver (Static); image output, objective of study is images, 7 per week
10. Liver (Function); graph and image output, objective of study is images and flow curves

- 11. Spleen; image output, objective of study is images, 1 per month
- 12. Pancreas; image output, objective of study is images and flow curves, 1 per month
- 13. Bone; image output, 4 per week
- 14. Tumor Localization; image output, objective of study is images, 4 per week

The responding department made the following comments concerning its operation:

Standard MDS "trinary" system interfaced to two gamma cameras.

Will be updated to 42 MDS system by 6/79 which will have remote acquisition and processing terminals in CCU and/or ICU in addition to two interfaced cameras in the Nuclear Medicine Department.

<3500>

Installation: V. A. Medical Center (Tucson)
 Address: Tucson, Arizona 85704
 USA

Phone: (602) 792-1450 Ext. 512 PTS 765-6512

V. A. Medical Center (Tucson) is a Clinical institution which has 275 beds.
 2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:
 H-P 5407A

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

System descriptions:

System 1: Hewlett Packard 5407A 2100S 32K (16 bit) words of memory, 180 cps paper tape reader, 10 cps paper tape punch, 9 tr 800 bpi 10-45 ips tape, Hewlett Packard 7900 fixed disks with 1.228 meg-w capacity, Hewlett Packard 12869A removable disks with 1.228 meg-w capacity, 2 GE terminals, Soror Video, Hewlett Packard 1300 CRT display with 16 greyscales. Languages used FORTRAN IV, BASIC and Assembler. Interfaced to 3 cameras, (32 X 32 50/second), (64 X 64 20/second) frame mode, 300 max number of frames, 65000 cts/ele at (128 X 128) max number of counts, (128 X 128) list mode with 1.25×10 to the 6th power max counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; BASIC language used, list and graph output, objective of study is flow curves and numbers, 3-5 per week
2. Heart (Xe-133 Regional Perfusion); FORTRAN language used, list and functional map output, objective of study is functional images and numbers, 4 per week
3. Heart (Output--TL-201); FORTRAN language used, CRT output, objective of study is images, 2 per week
4. Liver (Function); BASIC language used, curve and number output, objective of study is functional map images, 10 per week

5. Skin (Perfusion); FORTRAN language used, number output, objective of study is numbers, 2-4 per week
6. Blood Volume; BASIC language used, number output, objective of study is numbers, 2 per week
7. Shillings Test; FORTRAN language used, number output, objective of study is numbers, 1 per month

<3550>

Installation: St. Paul Hospital
Address: 5909 Harry Hines Blvd.
Dallas, Texas 75235
USA

Phone: (214) 689-2580

St. Paul Hospital is a Clinical and teaching institution which has 500 beds.

For further information, contact:

Dr. Carlos Lugo, M.D., Medical Director (clinical)
ADAC or J. Lippert, Technical Director (hardware)
ADAC or J. Lippert, Technical Director (software)

The responding department operates the following data acquisition and processing equipment:

ADAC LSI-11; H-F 5407A

Software development, mostly modification of routines in use, is performed by permanent staff along with other duties.

System descriptions:

System 1: ADAC LSI-11 64K upgraded to 96K byte (16 bit but may choose 8) words of memory, 1 fixed disk with 5 megabyte capacity, 1 removable disk with 5 megabyte capacity, 5 floppy drives with 0.8/each--3 with CPU and 2 with remote acquisition module,--remote acquisition and processing terminal, CAM remote acquisition module--96K total,--ramtek color, image formatter (9/8 X 10), zoom hardware (1X, 1.5X, and 3X), light pen, line printer, 512 X 512 interpolated CRT display with 64 greyscales and 256 colors capable of simultaneous collection and processing. Language used is FORTRAN IV. Interfaced to 3 cameras. Hard disc frame mode is (32 X 32 100/second), (64 X 64 25/second), (128 X 128 4/second), 2035 max number of frames, 32,000 cts/ele at any matrix size is max number of counts. Floppy disc frame mode is (32 X 32 20/second), (64 X 64 5/second), (128 X 128 1/second) frame mode 543 max number of frames, 32,000 cts/ele at any matrix size is max number of counts. Position, time, and physiological signals collected.

System 2: Hewlett Packard 5407A which is to be sold.

On the computers described above, the following studies are performed:

1. Brain (Static); system 1 used, FORTRAN language used, image output, objective of study is enhancement and background, 15 per week
2. Brain (Flow); system 1 used, FORTRAN language used, graph output, objective of study is curves, 15 per week
3. Renal; system 1 used, FORTRAN language used, graph and image output, objective of study is curves, 2 per week
4. Thyroid (Image); system 1 used, FORTRAN language used, image output, objective of study is enhancement, background and curves, 12 per week
5. Lung (Perfusion); system 1 used, FORTRAN language used, image output, objective of study is enhancement, 10 per week
6. Lung (Ventilation); system 1 used, FORTRAN language used, image and graph output, objective of study is curves, 10 per week
7. Lung (V/Q); system 1 used, FORTRAN language used, number output, objective of study is numbers, 10 per week
8. Heart (Flow); system 1 used, FORTRAN language used, image and curve output, objective of study is graphs, 7 per week
9. Heart (Gated); system 1 used, FORTRAN language used, image output, objective of study is ejection fraction, 7 per week
10. Heart (Effusion); system 1 used, FORTRAN language used, image output, objective of study is enhancement, 1 per week
11. Liver (Static); system 1 used, FORTRAN language used, image output, objective of study is enhancement, 20 per week
12. Liver (Function); system 1 used, FORTRAN language used, graph output, objective of study is A.O.I., 20 per week
13. Liver (Gated); system 1 used, FORTRAN language used, motion and graph output, objective of study is pulsatile ratios, 20 per week
14. Spleen; system 1 used, FORTRAN language used, liver/spleen output, objective of study is pulsatile ratios, 20 per week
15. Pancreas; system 1 used, FORTRAN language used, enhancement output, objective of study is images, rarely done
16. Bone; system 1 used, FORTRAN language used, image output, objective of study is SI ratios, 10 per week
17. Tumor Localization; system 1 used, FORTRAN language used, image output, objective of study is enhancement, 3 per week
18. Testicular; system 1 used, FORTRAN language used, image and enhancement output, objective of study is enhancement and curves, 1 per week

19. Gastric Emptying, system 1 used, FORTRAN language used, image and enhancement output, objective of study is enhancement and curves, 1 per week
20. Meckels; system 1 used, FORTRAN language used, image and enhancement output, objective of study is enhancement and curves, 1 per week
21. Myocardial; system 1 used, FORTRAN language used, image output, objective of study is enhancement, 8 per week

<3600>

Installation: V. A. Medical Center (Portland)
 Address: 3710 SW Veteran's Hospital Road
 Portland, Oregon 97201
 USA

Phone: (502) 222-9221 Ext. 338 PTS 424-9338

V. A. Medical Center (Portland) is a Clinical and teaching institution which has 527 beds.

For further information, contact:

G. T. Krishnamurthy, M.D. (clinical)

Alan A. Jansen (hardware)

Paul H. Brown (software)

1 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

NDS; Data General Nova-3

Software development, mostly new analysis routines, is performed by permanent staff along with other duties.

System descriptions:

System 1: Medical Data Systems Nova III 32 K (16 bit) words of memory, paper tape reader, 3 removable RK05 disks with 1.2 meg-w capacity, Sony 12" CRT display with 16 greyscales and color capable of simultaneous collection and processing, TEK 5" CRT display with 16 greyscales. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 2 cameras, (32 X 32 25/second) (64 X 64 25/second) frame mode, 1200 byte fast frames and (825 64 to the second power word mode) max number of frames, 64K cts/ele at (64 X 64) word max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Flow); BASIC language used, graph and percentages output, objective of study is flow curves and numbers, 20 per week
2. Renal; Modumed language used, graph output, objective of study is flow curves, 1 per week
3. Lung (Perfusion); Modumed language used, area counts output, objective of study is percentages, 5 per week
4. Lung (Ventilation); Modumed language used, area counts output, objective of study is percentages, 5 per week
5. Lung (V/Q); Modumed language used, area counts output, objective of study is percentages, 5 per week

6. Heart (Flow); Modured language used, area counts output, objective of study is ejection fraction, 2 per week
7. Heart (Gated); Modured language used, wall motion output, 2 per week
8. Heart (Perfusion Tc); Modured language used, area counts output, objective of study is percentage of perfusion, 2 per week
9. Heart (Output); Modured language used, area counts output, objective of study is ejection fraction, 2 per week
10. Liver (Function); Modured and POPTRAN languages used, graph output, objective of study is gallbladder, 2 per week
11. Bone; Modured language used, graph output, objective of study is joints, 5 per week
12. Tumor Localization; Modured language used, image output, objective of study is subtraction, 1 per week

<3650>

Installation: Walsgrave Hospital
Department: Clinical of Physics and Bioengineering
Address: Coventry, CV2 2DX
United Kingdom

Phone: Cov 613232 Ext. 529

Walsgrave Hospital is a Clinical institution which has 800 beds.

For further information, contact:

Dr. D. Cavser (clinical)

Dr. A. K. Boardman (hardware)

Dr. A. K. Boardman (software)

2 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

Elscint; Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Elscint Nova 3/12 32K (16 bit words of memory, 75 cps paper tape reader, Diablo fixed disk with 5M byte capacity, Diablo removable disk with 5M byte capacity, CRT display with color capable of simultaneous collection and processing. FORTRAN, BASIC and Assembler languages used. Interfaced to 2 cameras, (32 X 32 100/second) (64 X 64 25/second) and (128 X 128 25/second) frame mode, 200 max number of frames, 256 cts/ele at (128 X 128) max number of counts, (128 X 128) list mode size with 256 max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); FORTRAN language used, CRT output, objective of study is images, 20 per week
2. Brain (Flow); FORTRAN language used, CRT output, objective of study is flow curves, 20 per week
3. Renal; FORTRAN language used, CRT output, objective of study is images and curves, 2 per month
4. Lung (Ventilation); FORTRAN language used, CRT output, objective of study is images and curves, 1 per week

5. Heart (Gated); FORTRAN language used, CRT output, objective of study is images and ejection fractions, 2 per month
6. Spleen; FORTRAN language used, CRT output, objective of study is sizing, 1 per month

<3700>

Installation: University of Texas Health Science
Center/Bexar County Hospital
Department: Division of Nuclear Medicine
Address: San Antonio, Texas 78294
USA

Phone: (512) 691-6838

University of Texas Health Science Center/Bexar County Hospital is a Clinical and teaching institution which has 500 beds.

For further information, contact:

Marion L. Nusynowitz, M.D. (software)

The responding department operates the following data acquisition and processing equipment:

MDS

System descriptions:

System 1: 12 MDS on order.

The responding department made the following comments concerning its operation:

Delivery of system expected in April 1979.

<3750>

Installation: Kent and Canterbury Hospital
Address: Ethelbert Road
Canterbury, Kent CT1 3WG
England

Phone: 0227-66877 Ext. 402

Kent and Canterbury Hospital is a Clinical institution which has 425 beds.

For further information, contact:

Dr. F. M. Hall (clinical)

Mr. J. R. Corfield and Mr. C. P. Wells (hardware)

Mr. J. R. Corfield, Mr. C. P. Wells, and Dr. B. L. Diffey (software)

3 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-8e

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: User PDP 8/P 28K (12 bit) words of memory, 500 cps paper tape reader, 10 cps paper tape punch, DEC tape and TDA/P tapes, RK05 removable disk drives with 1.6 meg-w and RK01 disk drives with 0.8M capacity, VDU, TTY, Calcomp, color TV, H.P. 1332A CRT display with 128 greyscales. Languages used are FORTRAN and Assembler. Interfaced to 1 camera, (64 X 64 10/second) frame mode, 200 max number of frames, 4095 cts/ele at (64 X 64) max number of counts.

On the computers described above, the following studies are performed:

1. Brain (Static); Spex language used, x-ray film output, objective of study is images, 8 per week
2. Renal; Spex language used, x-ray film and curves output, objective of study is images, flow curves, and deconvolution, 10 per week
3. Thyroid (Image); Spex language used, polaroid output, objective of study is images, 10 per week
4. Heart (Gated); Spex language used, x-ray film output, objective of study is images and ejection fraction, 1 per week

5. Heart (Effusion); Spex language used, x-ray film output, objective of study is images, 2 per week
6. Liver (Function); Spex language used, x-ray film output, objective of study is biliary obstruction, 1 per month
7. Pancreas; Spex language used, x-ray film output, objective of study is images, rarely done
8. Bone Fracture Study; Spex language used, x-ray film output, objective of study is curves and images, 1 per week

The responding department made the following comments concerning its operation:

The original system was WUKAB 2530 but with subsequent additions of 16K core, RK05 disk, CRT display etc., it is hardly recognizable. The software which has been completely written in the department allows acquisition and processing of image data using PORTRAM (or other high-level language) with full access to all assembler routines and devices. This software system is called SPEX (Scan Protocol Executive).

<3800>

Installation: Palmerston North Hospital
Department: Division of Nuclear Medicine
Address: Heretaunga Street
Palmerston North
New Zealand

Phone: 81067 Ext. 841

Palmerston North Hospital is a Clinical institution which has 350 beds.

The institution operates a central computing facility containing DEC PDP 11/40 which is used only for some Ria's equipment. The responding department uses primarily Terminal for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Data General Nova-3; Nuclear Enterprises

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by two full time engineers as part of their other duties.

System descriptions:

System 1: Nuclear Enterprises/Scintag/Data General Nova 3 32K (16 bit) words of memory, Phoenix fixed disks with 4.8 meg-w, Phoenix removable disks with 4.8 meg-w. The computer is interfaced to a Nuclear Enterprises gamma camera. VDU (Tele-Tec), keyboard (Tele-Tec), Scintag CRT display with 10 levels of greyscales and color. Languages used are FORTRAN and Assembler. Interfaced to 1 camera, (64 X 64 20/second) frame mode, (120/study; 492 dynamic/disc; 246 static/disc) max number of frames, list mode is expected this year.

On the computers described above, the following studies are performed:

O/P hardcopy on color polaroids

1. Brain (Static); Assembler and FORTRAN languages used, image and text output, objective of study is images, 20 per week
2. Brain (Flcw); Assembler and FORTRAN languages used, image and text output, objective of study is images and curves, 20 per week

3. Renal; Assembler and FORTRAN languages used, list and graph output, objective of study is images and curves, 1 per week
4. Thyroid (Image); Assembler and FORTRAN languages used, image output, objective of study is images, 6 per week
5. Thyroid (Uptake); Assembler and FORTRAN languages used, list and display output, 6 per week
6. Lung (Perfusion); Assembler and FORTRAN languages used, image output, objective of study is images, 5 per week
7. Heart (Flow); Assembler and FORTRAN languages used, list and graph output, objective of study is curves, 1 per week
8. Heart (Effusion); Assembler and FORTRAN languages used, image output, objective of study is images, seldom done
9. Heart (Output); Assembler and FORTRAN languages used, list and graph output, objective of study is output and transits, 1 per week
10. Liver (Static); Assembler and FORTRAN languages used, image output, objective of study is images, 15 per week
11. Spleen; Assembler and FORTRAN languages used, image output, objective of study is images, 15 per week
12. Pancreas; Assembler and FORTRAN languages used, image output, objective of study is images, 1 per week
13. Bone; Assembler and FORTRAN languages used, image output, objective of study is images, 13 per week
14. CSF Flow; Assembler and FORTRAN languages used, image and data output, objective of study is images and numbers, seldom done

Installation: Lloyd Noland Hospital
Address: 701 Ridgeway Road
Fairfield, Alabama 35064
USA

Phone: (205) 783-5118

Lloyd Noland Hospital is a Clinical and teaching institution which has 307 beds.

For further information, contact:

University of Alabama in Birmingham (clinical)

Informatek States (hardware)

Informatek States, University of Alabama in

Birmingham, University of Chicago (software)

The institution operates a central computing facility containing Informatek States Simis 3 equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 3y wire 500 feet long.

The responding department operates the following data acquisition and processing equipment:

Informatek Simis-3

Software development, mostly modification of routines in use, is performed by permanent staff along with other duties.

System descriptions:

System 1: Informatek Simis 3 32K (8 bit) words of memory, moving head fixed disks with 2.35 meg-w capacity, removable disks with 2.35 meg-w capacity, CRT display with color and capable of simultaneous collection and processing. FORTRAN IV, BASIC, and Assembler languages used. Interfaced to 2 cameras, 230 max number of frames, 100K cts/ele max number of counts, 2m max counts in list mode,. Position, time, energy and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); Analog output, objective of study is images, 1-2 per week
2. Renal; graph output, objective of study is numbers and curves, 1-3 per week

3. Heart (Flow); FORTRAN language used, list output, objective of study is images and numbers, 0-4 per week
4. Heart (Output); FORTRAN language used, list output, objective of study is images and numbers, 0-4 per week
5. Pancreas: image output, objective of study is images, 0-1 per week
6. Thallium; scaling output, objective of study is images, 1-4 per week

<3900>

Installation: V. A. Medical Center (Northport)
Address: Northport, New York 11768
USA

Phone: (516) 261-4400 Ext. 2773, FTS 663-2773

V. A. Medical Center (Northport) is a Clinical and teaching institution.

For further information, contact:

S. J. Tassinari, Ph.D., RTMM(clinical)
S. J. Tassinari, Ph.D., RTMM(hardware)
S. J. Tassinari, Ph.D., RTMM(software)

The institution operates a central computing facility containing MDS Trinary equipment. The responding department uses primarily Mag tape, Modem (Terminal), and paper tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

MDS

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: MDS (User) 32K, paper tape reader, paper tape punch, 9 tr 800 bpi 45 ips incremental tape, removable disks with 300 word data images capacity, CRT display capable of simultaneous collection and processing. Languages used are FORTRAN IV, BASIC, and Logic. Interfaced to 2 cameras. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static)
2. Brain (Flow)
3. Renal
4. Thyroid (Image)
5. Thyroid (Uptake)
6. Lung (Perfusion)
7. Lung (Ventilation)
8. Lung (V/Q)
9. Lung (Gated)
10. Heart (Flow)
11. Heart (Gated)
12. Heart (Effusion)

13. Heart (Output)
14. Liver (Static)
15. Liver (Function)
16. Spleen
17. Pancreas
18. Bone
19. Tumor Localization
20. Aortic Arch
21. Cardiac Exercise--T1-201
22. Cardiac Resting--T1-201

<3950>

Installation: Naval Submarine Medical Research Laboratory
Address: Box 900 Naval Submarine Base New London
Groton, Connecticut 06340
USA

Phone: (203) 449-3668

Naval Submarine Medical Research Laboratory is a Research institution.

For further information, contact:

Bernard L. Ryack, Ph.D. (clinical)

Bernard L. Ryack, Ph.D. (hardware)

Bernard L. Ryack, Ph.D. (software)

5 (on project) persons support the research performed in the department.

The institution operates a central computing facility containing Univac 1108 equipment. The responding department uses primarily Mag tape, Modem (Terminal) and punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by Collected, but not computer processed until it reaches the lab..

The responding department operates the following data acquisition and processing equipment:

Data General Nova-1220; Tektronix 4051

Software development, mostly new analysis routines, is performed by permanent staff along with other duties and by full time programmer.

System descriptions:

System 1: Data General Nova 1220 32K (16 bit) words of memory, 600 cps paper tape reader, 63.3 fps paper tape punch, 9 tr 800 bpi tapes, removable moving head discs with 1.25 meg-w capacity, CRT display capable of simultaneous collection and processing.

System 2: TEKTRONIX 4051 32K Bytes (8 bit) words of memory, cartridge tapes.

The responding department made the following comments concerning its operation:

We are working with medical diagnosis in the areas of abdominal pain and chest pain and will expand to emergency medical care and psychiatric disorders. Thus we collect and process data in almost all of the areas listed but not within the categories listed.

<4000>

Installation: The University of Texas System Cancer Center
Address: 6723 Bertner Avenue
Houston, Texas 77030
USA

Phone: (713) 792-6534

The University of Texas System Cancer Center is a Research and clinical institution which has 430 beds.

For further information, contact:

Thomas P. Haynie, M.D. (clinical)

Monroe P. Jahns, Ph.D. (hardware)

Monroe P. Jahns, Ph.D. (software)

345 persons support the research performed in the department.

The institution operates a central computing facility containing Dual Cyber 171 equipment. The responding department uses primarily Mag tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34

Software development, about 50/50, new and modification, is performed by part time programmer.

System descriptions:

System 1: DEC PDP 11-34 48K (16 bit) words of memory, 9 tr 800 bpi 12.5 ips incremental tapes, 2 removable discs with 2.6 meg-w capacity, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC, and Assembler. Interfaced to 4 cameras, 512 max number of frames, 65535 cts/ele at (64 x 64) max number of counts, 2.4 M max counts in list mode. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); BASIC language used, objective of study is images, 5 per week
2. Renal; BASIC language used, graph output, objective of study is flow curves, 2 per week
3. Lung (Perfusion); BASIC language used, objective of study is images, 15 per week

4. Lung (Ventilation); BASIC language used, objective of study is images, 3 per week
5. Heart (Flow); BASIC language used, objective of study is images, 15 per week
6. Heart (Gated); BASIC Language used, graph output, objective of study is curves and numbers, 15 per week
7. Pancreas; BASIC language used, objective of study is images, 1 per week

<4050>

Installation: Medical College of Virginia
Address: Box 16
Richmond, Virginia 23298
USA

Phone: (804) 786-9843

Medical College of Virginia is a Clinical, research, and teaching institution which has 1000 beds.

For further information, contact:

Dr. Panos P. Fatouros, Ph.D. (clinical)
Dr. Frank Kane (hardware)
David Brobst (software)

The institution operates a central computing facility containing Xerox Sigma 7 equipment. The responding department uses primarily Mag tape, Modem (Terminal), punched cards, paper tape, analog to digital and direct digital input. for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by By wire 1000 feet long.

The responding department operates the following data acquisition and processing equipment:

Xerox Sigma 7; DEC Gamma-11

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Xerox/Honey Well Sigma 7 96K (32 bit) words of memory, 120 cps paper tape reader, 9 tr 800 hpi 75 ips tapes, 4 removable disks with 50 meg-w capacity, plotter, card reader, line printer, 24 com lines, A/D-D/A, CRT display with greyscales and capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC, and Assembler. DEC Gamma 11 System interfaced to 2 cameras, 200 max number of frames, 65K cts/ele at (64 X 64) max number of counts, 65K max counts in list mode. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static)
2. Brain (Plcw)

3. Renal
4. Thyroid (Image)
5. Thyroid (Uptake)
6. Lung (Perfusion)
7. Lung (Ventilation)
8. Lung (V/Q)
7. Lung (Gated)
8. Heart (Flow)
9. Heart (Gated)
10. Heart (Effusion)
11. Heart (Output)
12. Liver (Static)
13. Liver (Function)
14. Spleen
15. Pancreas
16. Bone
17. Tumor Localization

<4100>

Installation: University Hospital (Knoxville)
Address: 1924 Alcoa Highway
Knoxville, Tennessee 37920
USA

Phone: (615) 971-3394

University Hospital (Knoxville) is a Clinical and teaching institution which has 525 beds.

The responding department operates the following data acquisition and processing equipment:

Nuclear Chicago CDS

Software development, mostly modification of routines in use, is performed .

System descriptions:

System 1: Nuclear-Chicago CDS-4096 (4.2 X 10 to the ninth power) words of memory, light pen, CRT display with greyscales. Hardwired language used. Interfaced to 1 camera.

On the computers described above, the following studies are performed:

1. Renal; Histogram language used, graph output, objective of study is curves, 1 per week
2. Thyroid (Image); CRT output, objective of study is images, 10 per week

<4150>

Installation: V. A. Medical Center (Bay Pines)
Department: Nuclear Medicine Service
Address: Bay Pines, Florida 33504
USA

Phone: (813) 391-9644 Ext. 271

V. A. Medical Center (Bay Pines) is a Clinical institution which has 758 beds.

For further information, contact:

MDS(clinical)

MDS(hardware)

MDS(software)

16 in separate lab persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

MDS;Data General Nova-1200

System descriptions:

System 1: Medical Data Systems Nova 1200 32K (16 bit) words of memory, paper tape reader, fixed disks with 65 meg-w capacity, color video, two terminals, 8" CRT display with color and capable of simultaneous collection and processing. FORTRAN and (MDOS) language used. Interfaced to 3 cameras, 298 max frames per dish, 6400 cts/ele in word mode, 256 cts/ele bite mode. Position, time, energy, and physiological signals.

On the computers described above, the following studies are performed:

1. Brain (Static); FORTRAN language used, CRT, list, and graph output, objective of study is images and curves, 25 per week
2. Brain (Flow); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 25 per week
3. Renal; FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 1 per week
4. Thyroid (Image); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 5 per week
5. Thyroid (Uptake); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 5 per week

6. Lung (Perfusion); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 8 per week
7. Lung (Ventilation); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 8 per week
8. Lung (V/Q); FORTRAN language used, CRT, list and graph output, objective of study is images and curves, 8 per week
9. Lung (Gated); FORTRAN language used, CRT, list and graph output, objective of study is images, numbers and curves, rarely done
10. Heart (Flow); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 2 per week
11. Heart (Gated); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 2 per week
12. Heart (Effusion); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 2 per month
13. Heart (Output); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 2 per week
14. Liver (Static); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 20 per week
15. Liver (Function); FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 20 per week
16. Spleen; FORTRAN language used, CRT, list and graph output, objective of study is images, curves and numbers, 20 per week
17. Pancreas; FORTRAN language used, CRT, list and graph output
18. Bone; FORTRAN language used, CRT, list and graph output, objective of study is images, 10 per week
19. Tumor Localization; FORTRAN language used, CRT, list and graph output, objective of study is images, 2 per week

<4200>

Installation: V. A. Medical Center (Miami)
 Department: Nuclear Medicine Service
 Address: 1201 NW 16th Street, 115
 Miami, Florida 33125
 USA

Phone: (305) 324-3144 FTS 350-3144

V. A. Medical Center (Miami) is a Research, clinical and teaching institution which has 600 beds.

For further information, contact:

Stephen P. Rosenthal, M.D. (clinical)
 Stephen P. Rosenthal, M.D. (hardware)
 Stephen P. Rosenthal, M.D. (software)

The responding department operates the following data acquisition and processing equipment:

MDS-Trinary; Data General Nova-1200

Software development, mostly new analysis routines, is performed by consultant service.

System descriptions:

System 1: MDS Trinary Nova 1200 32K (16 bit) words of memory, paper tape reader, paper tape punch, 1 Diablo fixed disc with 24 megabits capacity, 1 Diablo removable disk with 24 megabits capacity, 2 ASE 33, TI-1200, 2 Tektronix scope CRT displays with 16 greyscales capable of simultaneous collection and processing. Language used is BASIC (very weak). Interfaced to 2 cameras, (32 X 32 50/second) (64 X 64 Byte 10/second) (64 X 64 word 5/second) and (128 X 128 byte 3 to the fifth power/second) frame mode, (64 X 64 byte) 600 max number of frames, (64 X 64 word) 300 max number of frames, (128 X 128 byte) 150 max number of frames, 256 byte cts/ele, 32K words cts/ele at 256 (32 X 32) byte, 32K (64 X 64) word, 256 (64 X 64) byte, 256 (128 X 128) byte max number of counts, (128 X 128) and (64 X 64) list mode size with 2 X 10 to the sixth power max counts. Position, time, energy (two possible), and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; modumed language used, list, graph and images output, objective of study is time activity and hippuran, 2 per week

2. Lung (Perfusion); Modumed language used, list, graph and image output, objective of study is split field curves, done occasionally
3. Lung (Ventilation); Modumed language used, list, graph and image output, objective of study is washout, done occasionally
4. Heart (Flow); Modumed language used, list, graph and image output, objective of study is chamber size and position, 2 per week
5. Heart (Gated); Modumed language used, list, graph and image output, objective of study is LV function, 2 per week
6. Liver (Static); Modumed language used, list, graph and image output, objective of study is image enhancement, done occasionally
7. Liver (Function); Modumed language used, list, graph and image output, objective of study is PIPIDA, done occasionally
8. RIA; objective of study is T2, T9, T3 RIA, TSH and D160tm, 20 per week

<4250>

Installation: St. Louis V. A. Medical Center
Department: Nuclear Medicine Service 115 JC
Address: St. Louis, Missouri 63125
USA

Phone: (314) 652-4100 Ext. 359 FTS 276-4359

St. Louis V. A. Medical Center is a Research, clinical and teaching institution which has 1000 beds.

For further information, contact:

J. W. Fletcher (clinical)

P. K. Herbig (hardware)

P. K. Herbig (software)

1 full time, and 13 part time persons support the research performed in the department.

The institution operates a central computing facility containing Honeywell 6000 equipment. The responding department uses primarily Mag tape and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8" disc cartridge from Cath and ICU, and from 201C modems for 5 remote Nuclear Medicine Laboratories.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-2

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by full time programmer.

Hardware development is performed by part time engineer.

System descriptions:

System 1: MDS Data General Nova 2/12 32K (16 bit) words of memory, 300 cps paper tape reader, 9 tr 800 bpi 45 ips tapes, cassette on TI terminal, 3 removable disks with 1.2 meg-w, 1 removable disc with 80 meg-w, light pen, printer-plotter, 2 CRT terminals, card reader, refreshed CRT display with 16 nominal greyscales (depends on mode) capable of simultaneous collection and processing. Languages used are Assembler, PORTPAN and BASIC. Interfaced to telecommunications, 255 or 65K cts/ele at (64 X 64 and 128 X 128) max number of counts.

System 2: MDS Data General Nova 2/12 32K (16 bit) words of memory, 9 tr 800 bpi 45 ips tapes, 3 removable disks with 1.2 meg-w, printer-plotter, 3 30 cps terminals, digitizer, refreshed CRT display with 16 nominal greyscales (depends on mode). Languages used are Assembler, FORTRAN and BASIC. Interfaced to cameras, and telecommunications, (64 X 64 25/second) (128 X 128 4/second) frame mode, 600 max number of frames, 255 or 65K cts/ele at (64 X 64 and 128 X 128) max number of counts, (64 X 64) list mode with 41K counts. Position, time, and physiological signals collected.

System 3: MDS Data General Nova 2/4 32K (16 bit) words of memory, 1 removable disk with 1.2 meg-w, console terminal, refreshed CRT display with 16 nominal greyscales (depends on mode), languages used are Assembler, FORTRAN and BASIC. Interfaced to camera, (64 X 64 25/second) (128 X 128 4/second) frame mode, 500 max number of frames, 255 or 65K cts/ele at (64 X 64 and 128 X 128) max number of counts, (64 X 64) list mode with 2.8 M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); All systems used, Assembler language used, image output, objective of study is images, 50 per week
2. Brain (Flow); All systems used, Assembler language used, image and curve output, objective of study is quantity, 50 per week
3. Renal; All Systems used, Assembler language used, image and curves output, objective of study is quantity, 15-20 per week
4. Thyroid (Image); All systems used, Assembler language used, image output, objective of study is images, 4 per week
5. Lung (Perfusion); All systems used, Assembler language used, image output, 30 per week
6. Lung (Ventilation); All systems used, Assembler language used, image and curves output, 30 per week
7. Lung (V/Q); All systems used, Assembler language used, objective of study is differential images, 30 per week
8. Heart (Flow); All systems used, Assembler language used, image and curves output, 10 per week
9. Heart (Gated); All systems used, Assembler language used, image and curves output, 10 per week
10. Heart (Effusion); All systems used, Assembler language used, image output, 2 per week
11. Liver (Static); All systems used, Assembler language used, image output, 40 per week
12. Liver (Function); All systems used, Assembler language used, image and curves output, 40 per week

- 13. Spleen, All systems used, Assembler language used, image output, 40 per week
- 14. Pancreas; All systems used, Assembler language used, image output, 2 per week
- 15. Bone; All systems used, Assembler language used, image output, 30 per week
- 16. Tumor Localization; All systems used, Assembler language used, image output, 10 per week

<4300>

Installation: University of Texas Medical Branch
Department: Nuclear Medicine Division
Address: Galveston, Texas 77550
USA

Phone: (713) 765-2926

University of Texas Medical Branch is a Research, clinical and teaching institution which has 1200 beds.

For further information, contact:

Ralph J. Gorten, M.D. (clinical)
Raleigh F. Johnson, Jr., Ph.D. (hardware)
Raleigh F. Johnson, Jr., Ph.D. (software)

The responding department operates the following data acquisition and processing equipment:

MDS:Data General Nova-2;Data General Nova-1200

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by full time engineer.

System descriptions:

System 1: MDS Nova 2/10 32K (16 bit) words of memory, 150 cps paper tape reader, Diablo fixed disks with 1.5 meg-w capacity, 2 Diablo removable disks with 3.0 meg-w capacity, 3 thermal printers, 9" X 11" and 4" X 5" CPT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Algol. Interfaced to 2 cameras, (64 X 64 25/second) frame mode, 400 byte max number of frames, 65K cts/ele at (64 X 64) word max number of counts, (128 X 128) byte list mode size with 2 X 10 to the sixth power max counts. Position, time, energy and physiological signals collected.

System 2: MDS Nova 1200 32K (16 bit) words of memory, 1 Diablo removable disc with 1.5 meg-w, 1 thermal printer, 4" X 5" CRT display with 16 greyscales and color. Languages used are FORTRAN, BASIC and Algol. Interfaced to 1 camera (64 X 64 25/second) frame mode, 400 byte max number of frames, 65K cts/ele at (64 X 64) word max number of counts, (128 X 128) byte list mode size with 2 X 10 to the sixth power max counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); Systems 1 and 2 used, Assembler language used, list and graph output, objective of study is numbers and curves
2. Renal; Systems 1 and 2 used, FORTRAN language used, list and graph output, objective of study is numbers and curves
3. Heart (Flow); Systems 1 and 2 used, Assembler language used, movie output, objective of study is images
4. Heart (Gated); Systems 1 and 2 used, Assembler language used, list and movie output, objective of study is ejection fractions and curves
5. Liver (Function); Systems 1 and 2 used, Assembler language used, graph output, objective of study is images and curves
6. Pancreas; System 1 used, Assembler language used, image output, objective of study is subtraction

<4350>

Installation: Foundation for Blood Research
 Address: 69 US Route 1
 Scarborough, Maine 04074
 USA

Phone: (207) 883-4362

Foundation for Blood Research is a Research, clinical and teaching institution.

For further information, contact:

Dr. George Knight (clinical)

Wilfred Torgecn (hardware)

Dwight Smith (software)

20 persons support the research performed in the department.

The institution operates a central computing facility containing PDP 11/40 and PDP 11/34 equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y wire 250 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40; DEC PDP-11/34; DEC LAB 8/3

Software development, mostly new analysis routines, is performed by full time programmer.

Hardware development is performed by consultant service.

System descriptions:

System 1: PDP 11/40 48K (16 bit) words of memory, 3 removable disks with 60 meg-w capacity, FBRNET (intercommunication network among computers), 6 video scopes, 2 decwriters, 1 line printer, 2 modems, CRT display capable of simultaneous collection and processing. Language used is MITS.

System 2: PDP 11/34 32K (16 bit) words of memory, 2 removable disks with 5 meg-w capacity, FBRNET (intercommunication network among computers), 1 video scope, 2 decwriters, 1 line printer, 2 Beckman rig counters, calcomp plotter, CRT display capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC, and Pocal.

System 3: PDP Iab 8/E 16K (12 bit) words of memory, 1 removable disk with .8 meg-w capacity, PBRNET (intercommunication system between computers), 1 decwriter, 2 AIP auto analyzers, CPT display capable of simultaneous collection and processing. Languages used are BASIC, Assembler, and Pal-8.

On the computers described above, the following studies are performed:

1. Blood; System 3 used, BASIC language used, PBRNET output, objective of study is numbers, 300 per week
2. Blood; System 2 used, BASIC language used, report forms output, objective of study is interpreted results, 300 per week

The responding department made the following comments concerning its operation:

See diagram

<4400>

Installation: University of Colorado Medical Center
 Address: 4200 East Ninth Avenue
 Denver, Colorado 80262
 USA

Phone: (303) 394-8065

University of Colorado Medical Center is a Research, clinical and teaching institution which has 400 beds. For further information, contact:

William C. Klingensmith, M.D. (clinical)

Victor M. Spitzer, Ph.D. (hardware)

Victor M. Spitzer, Ph.D. (software)

3 in department persons support the research performed in the department.

The institution operates a central computing facility containing CDC equipment. The responding department uses primarily Mag tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DPC PDP-11/34

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital Equipment 11/34 80K (16 bit) words of memory, 9 tr 800 bpi 45 ips tapes, 2 RL01 removable disks with 5 meg-w capacity, CRT display with 16 greyscales and color. Languages used are FORTRAN, BASIC, Pocal and Assembler. Interfaced to 2 cameras, (32 X 32 60/second) (64 X 64 15/second) frame mode, 512 max number of frames, 255 cts/ele at (128 X 182) max number of counts, (256 X 256) list mode size. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); FORTRAN language used, film and graph output, objective of study is curves and numbers, 5 per week
2. Renal; FORTRAN language used, film and graph output, objective of study is images, curves and numbers, 5 per week

3. Heart (Flow); FORTRAN language used, film and graph output, objective of study is images, 3 per week
4. Heart (Gated); FORTRAN language used, film and graph output, objective of study is images, curves and numbers, 3 per week
5. Heart (Effusion); FORTRAN language used, film and graph output
6. Heart (Output); FORTRAN language used, film and graph output, objective of study is numbers, 3 per week
7. Liver (Static); FORTRAN language used, film and graph output, objective of study is images, 20 per week
8. Liver (Function); FORTRAN language used, film and graph output, objective of study is curves and numbers, 20 per week
9. Spleen; FORTRAN language used, film and graph output, objective of study is images, 18 per week
10. Bone; FORTRAN language used, film and graph output, objective of study is curves, 88 per week

<4450>

Installation: Denver V. A. Hospital
Address: 1055 Clermont
Denver, Colorado 80220
USA

Phone: (303) 399-8020 Ext. 428 FTS 322-3322

Denver V. A. Hospital is a Research, clinical and teaching institution which has 450 beds.

For further information, contact:

William C. Klingensmith, M.D. (clinical)

Victor M. Spitzer, Ph.D. (hardware)

Victor M. Spitzer, Ph.D. (software)

5 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6400 equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; Ohio Nuclear VIP-450; Ohio Nuclear Series-75

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: Digital Equipment Y-11/34 48K (16 bit) words of memory, 9 tr 800 bpi 45 ips tapes, 2 RL01 removable disks with 5 meg-w capacity, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC, Assembler and Pocal. Interfaced to 2 cameras, (32 X 32 60/second) (64 X 64 15/second) frame mode, 512 max number of frames, 255 cts/ele at (128 X 128) max number of counts. Position, time, and physiological signals collected.

System 2: Ohio-Nuclear VIP-450 160K (8 bit) words of memory, 9 tr 800 bpi 75 ips tapes, cassette tapes, Diablo fixed disks with 5 meg-w capacity, Diablo removable disks with 5 meg-w capacity, 4 lens camera, video monitor. CRT display with 64 greyscales. Language used is BASIC.

Interfaced to 2 cameras, (64 X 64 33/second) (128 X 128 8/second) frame mode, 1200 max number of frames, 1203 cts/ele max number of counts at (256 X 256).

System 3: Ohio-Nuclear Series-75 128K (8 bit) words of memory, 9 tr 800 bpi 75 ips tapes. Interfaced to 1 camera, (256 X 256) list mode size. Position, time and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); system 2 used, film output, objective of study is images, 3 per week
2. Brain (Flow); systems 1 and 2 used, FORTRAN and BASIC languages used, film output, objective of study is curves and numbers, 3 per week
3. Renal; objective of study is images, curves and numbers, 4 per week
4. Heart (Flow); systems 2 and 3 used, film output, objective of study is images, 5 per week
5. Heart (Gated); systems 1 and 2 used, film output, objective of study is curves and images, 5 per week
6. Heart (Output); systems 1 and 2 used, objective of study is numbers, 5 per week
7. Liver (Static); system 2 used, film output, objective of study is images, 20 per week
8. Liver (Function); systems 1 and 2 used, FORTRAN and BASIC languages used, film output, objective of study is curves and numbers, 20 per week
9. Spleen; system 2 used, film output, objective of study is images, 10 per week
10. Heart (Tomography); systems 1 and 2 used, FORTRAN language used, film output, objective of study is images, 5 per week
11. Brain (Tomography); systems 1 and 2 used, FORTRAN language used, film output, objective of study is images, rarely done

Installation: St. Luke's Hospital Center (New York City)
Address: Amsterdam Avenue and 113th Street
New York City, New York 10025
USA

Phone: (212) 870-6143

St. Luke's Hospital Center (New York City) is a Clinical and teaching institution which has 768 beds.

For further information, contact:

R. W. Pierson, Jr., M.D. and Derek Enlander,
M.D. (clinical)

M. I. Friedman, Ph.D. (hardware)

M. I. Friedman, Ph.D. (software)

The institution operates a central computing facility containing IBM 360/95 equipment. The responding department uses primarily Mag tape and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by wire 750 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/10

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by full time engineer and by consultant service.

System descriptions:

System 1: DEC PDP 11/10 28K (16 bit) words of memory, 30 cps paper tape reader, 30 cps paper tape punch, 9 tr 800 bpi 45 ips tapes, 2440 removable disks with 5 meg-w capacity, 2440 fixed disks with 5 meg-w capacity, single density floppy, versatec, line printer/plotter, physiologic interl, Tektronix 4012 CRT display with 32 greyscales, Video CRT display with 16 greyscales. Languages used are FORTRAN and Assembler. Interfaced to 1 camera, (64 X 64 25/second) frame mode, 511 max number of frames, 65K cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 85K max counts/sec. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; FORTRAN language used, graph output, objective of study is curves, 2 per week
2. Lung (V/Q); FORTRAN language used, graph output, objective of study is images, curves and numbers, 1 per month
3. Heart (Flow); FORTRAN and Assembler language used,

video output, objective of study is images and curves, 15 per week

4. Heart (Gated); video output, objective of study is images, 15 per week

5. Heart (Output); FORTRAN language used, graph and list output, objective of study is curves and numbers, 15 per week

The responding department made the following comments concerning its operation:

Significant modifications of DFC's 9-11 hardware and software by the permanent staff.

Installation: V. A. Medical Center (Lexington)
Address: Cooper Drive
Lexington, Kentucky 40507
USA

Phone: (606) 233-4511 Ext. 540 FTS 355-2635

V. A. Medical Center (Lexington) is a Research and clinical institution which has 350 beds.

For further information, contact:

Guy H. Simmons, Ph.D. (clinical)

Guy H. Simmons, Ph.D. (hardware)

Guy H. Simmons, Ph.D. (software)

50 persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40; ADAC LSI-11

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC PDP-11/40 32K (16 bit) words of memory, paper tape reader, paper tape punch, 9 tr 800 bpi 45 ips incremental tapes, RK05 fixed disks with 2.5 meg-w capacity, RK05 removable disks with 1.2 meg-w capacity, LA 30, VSV01 CRT display with 16 greyscales and color capable of simultaneous collection and processing. Assembler, PORTPAM, BASIC and Focal languages used. Interfaced to 2 cameras and 1 scanner, (32 X 32 50/second) (64 X 64 12/second) frame mode, 512 max number of frames/study, 65K cts/ele at (64 X 64) max number of counts. Position and physiological signals collected.

System 2: ADAC LSI-11 64K (16 bit) words of memory, flexible (2 drives) removable disks with 0.4 meg-w/drive capacity, line printer, Video CRT display with 64 greyscales and color capable of simultaneous collection and processing. Assembler and PORTPAM languages used. Interfaced to 2 cameras, (32 X 32 50/second) (64 X 64 12/second) (128 X 128 3/second) frame mode, 512 max number of frames per study, 32K cts/ele at (64 X 64) max number of counts. Position and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow)
2. Renal
3. Lung (Perfusion)
4. Lung (Ventilation)

5. Lung (V/Q)
6. Lung (Gated)
7. Heart (Flow)
8. Heart (Gated)
9. Heart (Effusion)
10. Heart (Output)
11. Tumor Localization

Installation: University of Iowa Hospital
 Address: Iowa City, Iowa 52242
 USA

Phone: (319) 356-1911

University of Iowa Hospital is a Clinical, research, and teaching institution which has 1100 beds.

For further information, contact:

James C. Ehrhardt, Ph.D. (clinical)

James C. Ehrhardt, Ph.D. (hardware)

James C. Ehrhardt, Ph.D. (software)

The institution operates a central computing facility containing IBM 360/65 equipment. The responding department uses primarily Mag tape, punched cards and paper tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by It's not--it's analyzed on the spot.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-3; Data General Nova-1200

Software development, about 50/50, new and modification, is performed by part time programmer.

System descriptions:

System 1: MDS Nova 3 32K (16 bit) words of memory, 100 cps paper tape reader, 9 tr tapes, 2 removable disks with 1.2 meg-w capacity each, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN and Assembler. Interfaced to 2 cameras, (64 X 64 25/second) (128 X 128 10/second) frame mode, 600 max number of frames, 255 cts/ele at (128 X 128) max number of counts, (128 X 128) list mode size with 2 M max counts. Position, time, and physiological signals collected.

System 2: MDS Nova 1200 32K (16 bit) words of memory, 1 removable disk with 1.2 meg-w capacity, CRT display with 16 greyscales. Languages used are BASIC and Assembler. Interfaced to 1 camera, (64 X 64 25/second) (128 X 128 10/second) frame mode, 600 max counts, 255 cts/ele at (128 X 128) max number of counts, (128 X 128) list mode with 750K max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are

performed:

1. Brain (Flow); system 1 used, 1 per week
2. Renal; system 1 used, 1 per week
3. Heart (Flow); system 1 used, 8 per week
4. Heart (Gated); system 1 used, 30 per week

Installation: Royal Prince Alfred Hospital
 Department: Nuclear Medicine
 Address: Misserden Road
 Camperdown, NSW 2050
 Australia

Phone: 516-8011

Royal Prince Alfred Hospital is a Research, clinical and teaching institution which has 1200 beds.

For further information, contact:

Dr. R. F. Vern, Medical Specialist (clinical)

Mr. J. Cornack, Physicist (hardware)

Mr. B. F. Hutton, Physicist (software)

3 part time persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40; DEC PDP-11/34; DEC PDP-11/04

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by full time programmer.

Hardware development is performed by permanent staff along with other duties and by part time engineer.

System descriptions:

System 1: DEC PDP 11/40 32K (16 bit) words of memory, paper tape reader, paper tape punch, RK05P fixed disks with 2.4 meg-w capacity, RK05J removable disks with 1.2 meg-w capacity, WCI1A, LA 36 decwriter, PSE 20 VDU shared interface to Video cassette, Contrac V5V01 CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 6 cameras, (32 X 32 50/second) (64 X 64 12/second) frame mode, 512 max number of frames, 65535 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode with 1.2 M max counts. Position, time, and physiological signals collected.

System 2: DEC PDP 11/34 32K (16 bit) words of memory, RK05P fixed disks with 2.4 meg-w capacity, RK05J removable disks with 1.2 meg-w capacity, WCV11 gamma camera interface, LA 36, VT52 VDU, VT05 shared interface to video cassette, Contrac V5V01 CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 6 cameras, (32 X 32 50/second) (64 X 64 12/second) frame mode, 512 max number of frames, 65535 cts/ele at (64 X 64) max counts, (128 X 128) list mode size with 1.2 M max counts. Position, time, and physiological signals collected.

System 3: DEC PDP 11/04 32K (16 bit) words of memory, 9 tr 800 bpi 45 ips incremental tapes, RK95J removable disks with 1.2 meg-w capacity, LA 36, ADMBA VDU, microdot interface, Tektronix 611 VT01 CRT display with 8 greyscales. Languages used are FORTRAN, BASIC, and Assembler.

On the computers described above, the following studies are performed:

1. Brain (Flow); systems 1 and 2 used, FORTRAN language used, list, graph and functional images output, objective of study is flow curves, 15 per week
2. Renal; systems 1 and 2 used, FORTRAN language used, list, graph and functional images output, objective of study is differential renal function and transplant evaluation, 10 per week
3. Lung (Perfusion); systems 1 and 2 used, FORTRAN language used, list, graph and functional images output, objective of study is functional images
4. Lung (Ventilation); systems 1 and 2 used, FORTRAN language used, list, graph and functional images output, objective of study is functional images
5. Lung (V/Q); systems 1 and 2 used, FORTRAN language used, list, graph and functional images output, objective of study is images
6. Heart (Flow); systems 1 and 2 used, FORTRAN language used, list and graph output, objective of study is QP/QS, 5 per week
7. Heart (Gated); systems 1 and 2 used, FORTRAN language used, list and graph output, objective of study is cine and functional parameters, 20 per week
8. Heart (Effusion); systems 1 and 2 used, 2 per week
9. Heart (Thallium); system 3 used, FORTRAN language used, objective of study is processed images, 8 per week
10. Bone; systems 1 and 2 used, BASIC language used, numbers output, objective of study is ratios, 2 per week
11. Information Retrieval; system 3 used, FORTRAN language used, list output, objective is patient record keeping, 250-300 per week
12. Research; systems 1, 2 and 3 used, Assembler language used, display optimization output, objective is resolution recovery
13. Research; systems 1, 2 and 3 used, FORTRAN language used, quality control and clinical output

The responding department made the following comments concerning its operation:

The overall system is organized to allow flexible data collection, analysis and backup from six gamma cameras via a combination of hardware and software switches (See Diagram). System 3 is a utility system for program development, patient recordkeeping and backup with limited analysis capabilities. Plans are at present being made to utilize a microprocessor to monitor and control camera and terminal selection. The original system (11/60 only) was installed in 1975. All systems at present run under RT11 V38.

COMPUTER CONFIGURATION - NUCLEAR MEDICINE DEPT JAN 79
 ROYAL PRINCE ALFRED HOSPITAL
 SYDNEY

MAIN

<4700>

Installation: Mallinckrodt Institute of Radiology
Address: 510 S. Kings Highway Blvd.
St. Louis, Missouri 63110
USA

Phone: (314) 454-3566 FTS 277-3566

Mallinckrodt Institute of Radiology is a Research, clinical and teaching institution which has 1400 beds.

For further information, contact:

Harry A. Siegel, M.D. (clinical)

Mr. Sainpathkumaran (hardware)

Mr. Sainpathkumaran (software)

5 persons support the research performed in the department.

The institution operates a central computing facility containing PDP 11/40 and PDP 11/34 (MIR data base and billing system) equipment. The responding department uses primarily Modem (Terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y magnetic tape.

The responding department operates the following data acquisition and processing equipment:

Varian V77; Ohio Nuclear M6800

Software development, about 50/50, new and modification, is performed by full time programmer.

Hardware development is performed by part time engineer.

System descriptions:

System 1: VARIAN V77 32K (16 bit) words of memory, 200 cps paper tape reader, 9 tr 800 bpi 37.5 ips incremental tapes, CDC-HAWK fixed disks with 4.68 meg-w capacity, CDC-HAWK removable disks with 4.68 meg-w capacity, Hazaltine Mod-1, Ann Arbor Terminet, Statos 33, 256 X 256 CRT display with 16-18 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, Assembly and BCPL. Interfaced to 3 cameras, (64 X 64 10/second) (128 X 128 3/second) frame mode, 65534 cts/ele at (64 X 64) max number of counts, 8 M max counts in list mode. Position, time, energy and physiological signals collected.

System 2: Ohio Nuclear M6800 176K (10 bit) words of memory, 9 tr 800 bpi 37.5 ips incremental tapes, cassette reader, ECG, light pen, 256 X 256 CRT display with 64 greyscales. Language used is Basic. Interfaced to 1 camera, (64 X 64 10/second) (128 X 128 3/second) frame mode, 1023 cts/ele at (64 X 64) max number of counts.

On the computers described above, the following studies are performed:

1. Renal; system 1 used, FORTRAN and Assembly language used, graph output, objective of study is images, flow curves and numbers, 8 per week
2. Lung (V/Q); system 1 used, list output, objective of study is numbers, 4 per week
3. Heart (Flow); systems 1 and 2 used, Assembly language used, graph and list output, objective of study is images, 10 per week
4. Heart (Gated); system 2 used, Assembly language used, graph and list output, objective of study is curves and numbers, 10 per week
5. Bone; system 1 used, graph and list output, objective of study is numbers, 1 per week
6. Thallium; systems 1 and 2 used, Assembly language used, graph output, objective of study is images, 10 per week
7. Cardiac Shunt; systems 1 and 2 used, FORTRAN language used, graph and list output, objective of study is curves and numbers, 1 per week

Installation: Hinsdale Sanitarium and Hospital
Address: 120 W. Oak Street
Hinsdale, Illinois 60521
USA

Phone: (312) 887-2705

Hinsdale Sanitarium and Hospital is a Clinical institution which has 450 beds.

For further information, contact:

Wayne Bennett (clinical)

Wayne Bennett (hardware)

Wayne Bennett (software)

The responding department operates the following data acquisition and processing equipment:

MDS:Data General Nova-3

Software development, mostly new analysis routines, is performed by permanent staff along with other duties.

System descriptions:

System 1: Medical Data Systems Data General 32K (16 bit) words of memory, 30 cps paper tape reader, 9 tr 800 bpi 75 ips tapes, Diablo fixed disks with 24 million bit meg-w capacity, 2 Diablo removable disks with 24 million bit meg-w capacity, H-P Scope CPT display with 16 greyscales capable of simultaneous collection and processing, Conrac CPT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are PORTPAW and PASIC. Interfaced to 2 cameras, (32 X 32 10/second) (64 X 64 10/second) (128 X 128 10/second) frame mode, 299 max number of frames, 65000 cts/ele at (64 X 64) and 255 cts/ele at (128 X 128) max number of counts, (32 X 32) list mode size. Position, time, and physiological signals collected.

Installation: Kansas University Medical Center
Department: Radiology, Division of Nuclear Medicine
Address: 39th Street and Rainbow Avenue
Kansas City, Kansas 66103
USA

Phone: (913) 588-6881

Kansas University Medical Center is a Research, clinical and teaching institution which has 500 beds.

For further information, contact:

David P. Preston, B.D. (clinical)

Mr. D. Betz (hardware)

Mr. William P. Herrin (software)

1 persons support the research performed in the department.

The institution operates a central computing facility containing 370/150--Hospital PDP-15 with extensive peripherals--Departmental equipment. The responding department uses primarily Mag tape, punched cards, and modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by It's not--it's analyzed on the spot and by magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-15

Software development, mostly new analysis routines, is performed by permanent staff along with other duties. Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: USER PDP-15 96 word (18 bit) words of memory, 30 cps paper tape reader, 30 cps paper tape punch, 3 tr 800 bpi 45 ips tapes, 3 DEC tapes, RP fixed disks with .5 meg-w capacity, 2 RP02 removable disks with 25 meg-w capacity each, decwriter, 3 Bechwe terminals, Memorex 1280, MIPED display system, MIPED operator console, KSR-35 teletype, CRT display with 16 greyscales and color capable of simultaneous collection, processing and program development. Languages used are FORTRAN and Assembler. Interfaced to 4 cameras, (64 X 64 10/second) frame mode, max number of frames--can hold 10000 frames on disk, no study can be more than 93 frames, acquisition has various frame durations in a single study--131000 cts/ele at (64 X 64) max number of counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Static); FORTRAN and Assembler language used, image and CRT output, 10 per week
2. Brain (Flow); FORTRAN and Assembler language used, graph and CRT output, objective of study is T 1/2, graphs and numbers, 10 per week
3. Renal; FORTRAN and Assembler language used, objective of study is T 1/2, graphs, and numbers, 4 per week
4. Thyroid (Image); FORTRAN and Assembler language used
5. Thyroid (Uptake); FORTRAN and Assembler language used, objective of study is numbers
6. Lung (Perfusion); FORTRAN and Assembler language used, image output, 10 per week
7. Lung (Ventilation); FORTRAN and Assembler language used, image output, objective of study is xenon washout, 10 per week
8. Lung (V/Q); FORTRAN and Assembler language used, image output, objective of study is V/Q regional numbers, 10 per week
9. Heart (Flow); FORTRAN and Assembler language used, graph output, objective of study is graphs and T 1/2, 2 per week
10. Heart (Gated); Assembler and FORTRAN language used, graph output, objective of study is ejection fractions, 1 per week
11. Heart (Effusion); Assembler and FORTRAN language used, image output, 1 per week
12. Liver (Static); FORTRAN and Assembler languages used, image and CRT output, objective of study is impression of - or +, 10 per week
12. Liver (Function); FORTRAN and Assembler language used, graph output, objective of study is clearances, 1 per week
14. Spleen; FORTRAN and Assembler languages used, image and CRT output, 1 per week
15. Pancreas; FORTRAN and Assembler languages used, image and CRT output, 1 per week
16. Bone; FORTRAN and Assembler languages used, image and CRT output
17. Tumor Localization; FORTRAN and Assembler languages used, image and CRT output
18. Gastric Emptying; FORTRAN and Assembler languages used, image and CRT output, objective of study is clearance numbers, 5 per week
19. Dynamic Bone; FORTRAN and Assembler languages used, CRT and image output, objective of study is clearance numbers, 1 per week

The responding department made the following comments concerning its operation:

Hardware and software developed locally. Console with pushbutton operation to call programs. In clinical use for 4 years.

Installation: Milwaukee County Medical Complex
Department: Nuclear Medicine Division
Address: 8700 W. Wisconsin Avenue
Milwaukee, Wisconsin 53226
USA

Phone: (414) 257-5969

Milwaukee County Medical Complex is a Research, clinical and teaching institution which has 600 beds.

For further information, contact:

David W. Palmer, Ph.D. (clinical)
David W. Palmer, Ph.D. (hardware)
David W. Palmer, Ph.D. (software)

The institution operates a central computing facility containing Burroughs 6800 (not used yet) equipment. The responding department uses primarily Modem (terminal) for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by It's not--it's analyzed on the spot..

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34; Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC FDP 11/34 32K (16 bit) words of memory, paper tape reader, 9 tr 800 bpi incremental tapes, DEC RK05P fixed disks with 2.50 meg-w capacity, DEC RK05J removable disks with 1.25 meg-w capacity, Contrac CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN and BASIC. Interfaced to 3 cameras, 65K cts/ele at (64 X 64) word max number of counts, (128 X 128) list mode size with 1.25M max number of counts. Position, time, and physiological signals collected.

System 2: GE DG Nova 3 32K (16 bit) words of memory, removable disk with 1.25 meg-w capacity, CRT display with 16 greyscales. Interfaced to 1 camera, (64 X 64 byte 25/second) frame mode, 200 max number of frames, 65K cts/ele at (64 X 64) word max number of counts.

On the computers described above, the following studies are performed:

1. Renal, system 1 used, BASIC language used, graph

output, objective of study is numbers and curves, 10 per week

2. Heart (Gated); system 2 used, objective of study is volume curves and ejection fractions, 10 per week

3. Heart (Perfusion); system 2 used, photo output

Installation: Albert Einstein College of Medicine
 Department: Nuclear Medicine
 Address: 1300 Morris Park Avenue
 Bronx, New York 10461
 USA

Phone: (212) 430-4058

Albert Einstein College of Medicine is a Research, clinical and teaching institution which has 1400 beds.

For further information, contact:

Dr. John P. Wexler (clinical)
 Mr. Ari Rabinowitz (hardware)
 Mr. Ari Rabinowitz (software)

The institution operates a central computing facility containing VDS Sigma 6. Soon to be replaced by a DEC PDP 11/70 equipment. The responding department uses primarily Mag tape for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y wire 100 feet long.

The responding department operates the following data acquisition and processing equipment:

DEC Gamma-11/34; Elscint; Data General Nova-3

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by full time programmer.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC Gamma-11 11/34 64K (16 bit) words of memory, 9 tr 800 bpi 75 ips tapes, 2 RL01 removable disks with 5 meg-w capacity, CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 3 cameras, (32 X 32 80/second) (64 X 64 20/second) frame mode, 512 max number of frames, 255 or 65535 cts/ele at (32 X 32 and 64 X 64) max number of counts, (64 X 64) list mode size with 2M max counts. Position, time, and physiological signals collected.

System 2: Elscint-Dycom 80 DG Nova 3/12K (16 bit) words of memory, paper tape reader, 9 tr 800 bpi 75 ips tapes, fixed disks with 2.5 meg-w capacity, top load 5440 removable disks with 2.5 meg-w capacity, 110 cps printer, CRT display with 64 greyscales and 16 colors. Languages used are FORTRAN and Assembler. Interfaced to 3 cameras, (32 X 32 100/second) (64 X 64 20/second) frame mode, 770 max number of frames, 255 or 65535 cts/ele at (32 X 32, 64 X 64, and 128 X 128) max number of counts, (128 X 128) list

mode size with 2M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 2 used, FORTRAN language used, objective of study is curves and numbers, 5 per week
2. Heart (Flow); system 1 used, FORTRAN and BASIC languages used, objective of study is numbers, 4 per week
3. Heart (Gated); system 1 used, FORTRAN and BASIC languages used, objective of study is images and numbers, 25 per week
4. Flows (Angios) system 2 used, objective of study is images, 1-2 per week

The responding department made the following comments concerning its operation:

We also have a micro-processor controller probe for cardiac studies (LVFP). The systems described are currently installed at the Hospital of the Albert Einstein College of Medicine. Additional facilities are now, or will shortly be, in use at our other affiliated hospitals; Jacobi Hospital (Bronx Municipal Hospital Center) and Montifiore Hospital Medical Center. We also have an Elscint Dycomette computer system interfaced to a gamma camera in our animal facility.

Installation: Temple University
Address: 3401 N Broad
Philadelphia, Pennsylvania 19140
USA

Phone: (215) 221-3475

Temple University is a Research, clinical and teaching institution which has 540 beds.

The institution operates a central computing facility containing IBM 330--not easy to reach 10 blocks away equipment. The responding department uses primarily Punched cards for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y permanent staff along with other duties.

The responding department operates the following data acquisition and processing equipment:

MDS; Data General Nova-3; H-P 2100

System descriptions:

System 1: MDS Nova 3 32K (16 bit) words of memory, paper tape punch, paper tape reader, 1 fixed disk with 1.2 meg-w capacity, 1 removable disk with 1.2 meg-w capacity, CRT display with 16 greyscales and color capable of simultaneous collection and processing (except for Cardiac studies). Languages used are FORTRAN and BASIC. Interfaced to 2 cameras, 300 at (64 X 64) and 600 at (32 X 32) max number of frames, 255 cts/ele max number of counts at (128 X 128), (256 X 256) list mode size. Position, time, energy, and physiological signals collected.

System 2: Hewlett Packard 2100 16K (16 bit) words of memory, paper tape reader, 1 fixed disk with 1.2 meg-w capacity, 1 removable disk with 1.2 meg-w capacity, CRT display with 16 greyscales. Language used is BASIC. Interfaced to 1 camera, 320 max number of frames, (128 X 128) list mode size. Position, time, and energy signals collected.

On the computers described above, the following studies are performed:

1. Renal; system 2 used, BASIC language used, list output, objective of study is differential fraction, 1-2 per week
2. Lung (V/Q); system 2 used, BASIC language used, ratio output, objective of study is lung photos, 2 per month
3. Heart (Gated); system 1 used, Assembler language used, graph and number output, objective of study is numbers and

ejection fractions, 8 per week

The responding department made the following comments
concerning its operation:
MDS Simulation System. Hewlett Packard HP 5704.

<5000>

Installation: University of Kentucky Medical Center
 Department: Nuclear Medicine
 Address: 900 Rcse Street
 Lexington, Kentucky 40506
 USA

Phone: (606) 233-6585

University of Kentucky Medical Center is a Research, clinical and teaching institution which has 400 beds. For further information, contact:

Dr. Frank Deland (clinical)

Michael W. Vannier, M.D., Mallinckrodt

Institute (hardware)

Michael W. Vannier, M.D., Mallinckrodt

Institute (software)

5 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 370/165 equipment. The responding department uses primarily Mag tape for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/10; DEC PDP-11/55

Software development, mostly new analysis routines, is performed by consultant service.
 Hardware development is performed by consultant service.

System descriptions:

System 1: DEC FDP 11/10 28K (16 bit) words of memory, 2 removable disks with 2.5 meg-w capacity total, Gamma-11 NC-11A, ADC AR-11 (128 X 128) CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Macro-11. Interfaced to 1 camera, (32 X 32 500/second) (64 X 64 200/second) (128 X 128 100/second) frame mode, 100 max number of frames, 65000 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with (1 X 10 to the sixth power) max counts. Position, time, energy and physiological signals collected.

System 2: DEC PDP-11/55 124K (16 bit) words of memory, 9 tr 800/1600 bpi 75 ips tapes, 2 RK07 removable disks with 28 meg-w total, Gamma-11 NCV-11, Versatec D1200A printer/plotter, 3 terminals, ADC AR-11, (256 X 256) CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Macro-11. Interfaced to 2 cameras and 1 pho/con scanner, (32 X 32 500/second) (64 X 64 200/second) (128 X 128 100/second) frame mode, 1000 max number of

frames, 6500 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode with (10 X 10 to the sixth power) max counts. Position, time, energy and physiological signals collected. The Pho/Con scanner has 0.01 inch steps max resolution, (128 X 512) image size, and 10 to the seventh power max counts.

On the computers described above, the following studies are performed:

1. Brain (Static); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
2. Brain (Flow) system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
3. Renal; system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
4. Thyroid (Image); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
5. Thyroid (Uptake); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
6. Lung (Perfusion); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
7. Lung (Ventilation); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
8. Lung (V/Q); system 1 used, FORTRAN, BASIC and Macro-11 languages, used, image and graph output
9. Heart (Flow); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
10. Heart (Gated); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
11. Heart (Effusion); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
12. Heart (Output); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
13. Liver (Static); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
14. Liver (Function); system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
15. Spleen; system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
16. Pancreas; system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
17. Bone; system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output
18. Tumor Localization; system 1 used, FORTRAN, BASIC and Macro-11 languages used, image and graph output

The responding department made the following comments concerning its operation:

System 2 is newly installed (2/79) and is designated for use in acquisition, reconstruction, and deblurring of Pho/Con images.

Installation: Victoria Hospital
Address: South Street
London, Ontario M6A 4G5
Canada

Phone: (519) 432-5241 Ext. 572

Victoria Hospital is a Research and clinical institution which has 1035 beds.

For further information, contact:

A. A. Driedger(clinical)

T. D. Craddock(hardware)

T. D. Craddock(software)

4 part time persons support the research performed in the department.

The institution operates a central computing facility containing PDP 10 equipment. The responding department uses primarily we don't for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by RY Scintistore--not disc compatible.

The responding department operates the following data acquisition and processing equipment:

DEC Gamma-11/40

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC Gamma-11/40 28K (16 bit) words of memory, 300 cps paper tape reader, 30 cps paper tape punch, 9 tr 800 bpi 12 1/2 ips tapes, RK05/P fixed disks with 2.4 meg-w capacity, 2 RK05/J removable disks with 1.2 meg-w capacity each, Contrac video CPT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are Assembler, BASIC and FORTRAN. Interfaced to 4 cameras (1 mobile), (32 X 32 50/second) (64 X 64 12/second) frame mode, 512 max number of frames, 65535 cts/ele at (64 X 64) max number of counts, (128 X 128) list mode size with 1.2M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); Assembler language used, cine output, objective of studies is flow images, 28 per week
2. Renal: Assembler and BASIC languages used, graph output, objective of study is flow curves and images
3. Lung (V/Q); Assembler language used, image output, objective of study is functional, 1 per week
4. Heart (Flow); Assembler and BASIC languages used, cine

output, objective of study is curves, 4 per week

5. Heart (Gated); Assembler and BASIC languages used, print output, objective of study is ejection fractions, 16 per week

6. Heart (Effusion); Assembler and BASIC languages used, image output, objective of study is images, 2 per week

7. Heart (Output); Assembler and BASIC languages used, print output, objective of study is c of p, 4 per week

8. Pancreas; Assembler language used, image output, objective of study is subtraction, 1 per month

9. Bone; Assembler language used, image output, objective of study is subtraction, 2 per week

10. Tumor Localization; Assembler language used, image output, objective of study is subtraction, 1 per week

<5100>

Installation: Guy's Hospital
Address: St. Thomas's Street
London, SE1 9RT
United Kingdom

Phone: (01) 407-7600 Ext. 2583

Guy's Hospital is a Research, clinical, and teaching institution which has 900 beds.

For further information, contact:

A. J. W. Hilsen (software)

Large persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6600 and IBM 3601 equipment. The responding department uses primarily Rarely for data interchange with the central facility. Data are transmitted between the remote site and the central computing facility by 8y magnetic tape.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/40; REC PDP-11/34

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by part time engineer.

System descriptions:

System 1: DEC 11/40 32K (16 bit) words of memory, 2 PK05J removable disks with 5.4 meg-w capacity, VSV01 CRT display with color and capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 2 cameras, standard Gamma-11 camera collection.

System 2: DEC 11/34 32K (16 bit) words of memory, paper tape reader, paper tape punch, 9 tr tapes, 1 RK05? fixed disk with 5.4 meg-w capacity, 1 PK05J removable disk with 2.7 meg-w capacity, VSV01 CRT display with color and capable of simultaneous collection and processing. Languages used are FORTRAN, BASIC and Assembler. Interfaced to 4 cameras, standard Gamma-11 collection.

Installation: St. Peter's Hospital
 Address: 322 Rue Haute
 Brussels, B-1000
 Belgium

Phone: (02) 538-0000 Ext. 2596

St. Peter's Hospital is a Research and clinical institution which has 570 beds.

5 persons support the research performed in the department.

The institution operates a central computing facility containing CDC 6600 equipment. The responding department uses primarily Mag tape and punched cards for data interchange with the central facility.

The responding department operates the following data acquisition and processing equipment:

Informatek; Varian 620/L; Iolem Matek 1026

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties.

System descriptions:

System 1: Informatek Varian 620/L 16K (16 bit) words of memory, 7 tr 800 bpi 25 ips tapes, Pertec fixed disks with 1.5 meg-w capacity, Tektronix CPT display. Assembler language used. Interfaced to 1 camera, (64 X 64 .1/second) frame mode, 100 max number of frames, 32000 cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size with 2.5 M max counts. Position and time signals collected.

System 2: Iolem Matek 1026 24K (16 bit) words of memory, CDC fixed disks with 10 meg-w capacity, removable disks with 10 meg-w capacity, CRT display capable of simultaneous collection and processing. Assembler and FORTRAN languages used. Interfaced to 1 camera, (64 X 64 .1/second) frame mode, 300 max number of frames, 32000 cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size with 2.5M max counts. Position, time, and physiological signals collected.

System 3: Iolem Iolem 32K (16 bit) words of memory, 9 tr 900 bpi 25 ips tapes, CDC fixed disks with 10 meg-w capacity, removable disks with 10 meg-w capacity, CRT display with color and capable of simultaneous collection and processing. Assembler and FORTRAN languages used. Interfaced to 1 camera, (64 X 64 .1/second) frame mode, 300 max number of frames, 32000 cts/ele at (64 X 64) max number of counts, (256 X 256) list mode size with 2.5M max counts. Position, time, and physiological signals collected.

On the computers described above, the following studies are

performed:

1. Renal; systems 1 and 2 used, FORTRAN language used, graph and list output, objective of study is clearance transit time, 7 per week
2. Lung (Perfusion); system 2 used, Assembler language used, graph and list output, 2 per week
3. Lung (Ventilation); system 2 used, Assembler language used, graph and list output
4. Lung (V/Q); system 2 used, Assembler language used, graph and list output
5. Heart (Flow); system 3 used, company language used, display, graph and list output, objective of study is ejection fractions, 2 per week
6. Heart (Gated); system 3 used, company language used, display, graph and list output, objective of study is ejection fractions, 3 per week
7. Heart (Effusion); system 3 used, company language used, display, graph and list output, objective of study is ejection fractions, 3 per week
8. Heart (Output); system 3 used, company language used, display, graph and list output, objective of study is ejection fractions, 3 per week
9. Sal. Glands; systems 1 and 2 used, FORTRAN language used, graph output, objective of study is numbers, 5 per week
10. Gast. Deso. Ref.; systems 2 and 3 used, FORTRAN language used, graph output, objective of study is numbers, 5 per week

Installation: Alfred Hospital
Address: Commercial Road
Prahran, Victoria 3181
Australia

Phone: 03 5202432

Alfred Hospital is a Clinical institution which has #800 beds.

For further information, contact:

Bruce Van Every (clinical)

Bruce Van Every (hardware)

Bruce Van Every (software)

#50 total persons support the research performed in the department.

The responding department operates the following data acquisition and processing equipment:

DEC PDP-11/34

Software development, mostly modification of routines in use, is performed by permanent staff along with other duties.

Hardware development is performed by permanent staff along with other duties.

System descriptions:

System 1: DEC PDP 11/34 48K (16 bit) words of memory, 2 RK05 removable disks with 1.2 meg-w capacity, LA36 decwriter, VT52 terminal, Contrac RGB monitor CRT display with 16 greyscales and color capable of simultaneous collection and processing. Languages used are FORTRAN IV, BASIC and Macro. Interfaced to 2 cameras, (32 X 32 25/second) (64 X 64 6/second) frame mode, 511 max number of frames, 65535 cts/ele at (64 X 64) max number of counts, (64 X 64) list mode size with #1M counts. Position, time, energy, and physiological signals collected.

On the computers described above, the following studies are performed:

1. Brain (Flow); Macro language used, CRT output, objective of study is flow curves, 5 per week
2. Renal; Macro language used, CRT output, objective of study is images and flow curves, 1 per week
3. Lung (V/Q); Macro language used, CRT output, objective of study is functional images, 2 per month
4. Heart (Flow); BASIC and Macro languages used, CRT output, objective of study is functional images, 5 per week
5. Heart (Gated); BASIC and Macro languages used, CRT output, objective of study is functional images, 5 per week
6. Pancreas; Macro language used, CRT output, objective of study is images, 2 per week

Installation: Ochsner Medicine Institution
Address: 1514 Jefferson Highway
New Orleans, Louisiana 70121
USA

Phone: (504) 837-3000 Ext. 2216

Ochsner Medicine Institution is a research, clinical and teaching institution which has 550 beds. 40 persons support the research performed in the department.

The institution operates a central computing facility containing IBM 360/70--do not currently use equipment.

The responding department operates the following data acquisition and processing equipment:
DEC PDP-11/40; DEC PDP-11/30

Software development, about 50/50, new and modification, is performed by permanent staff along with other duties and by consultant service.

System descriptions:

System 1: DEC 1140 28K (16 bit) words of memory, high speed cps paper tape reader, high speed cps paper tape punch, 2 RK05 removable disks with 1.2 meg-w capacity, Versetec printer/plctter, tektronix terminal, light pen, CRT display with color and capable of simultaneous collection and processing. Languages used are FORTRAN and BASIC. Interfaced to 2 cameras. Camera collection is per Gamma-11.

System 2: DEC 1134 56K (16 bit) words of memory, RK05P (Dual disc) fixed disks with 1.2 meg-w each, 1 RK05J removable disk with 1.2 meg-w capacity, CRT display with color and capable of simultaneous collection and processing. Languages used are FORTRAN and BASIC. Interfaced to 2 cameras. Camera collection as per Gamma-11.

On the computers described above, the following studies are performed:

1. Brain (Flow); systems 1 and 2 used, image output, objective of study is images, 10-15 per week
2. Renal; system 1 used, image and physiological data output, objective of study is images and physical size, 25 per week
3. Lung (Ventilation); systems 1 and 2 used, image output, objective of study is images, 3-5 per week
4. Lung (V/Q); systems 1 and 2 used, objective of study is S/Q ranges, 1 per week
5. Heart (Flow); system 2 used, image output, objective

of study is images

6. Heart (Gated); system 2 used, image output, objective of study is physical size, under development

7. Bone; systems 1 and 2 used, objective of study is S 1 ratios

INSTALLATION INDEX

Academic Hospital of St. Rafael 1450	Hospital of the Albert Einstein College of Medicine 1200
Addington Hospital 3050	Institute of Medical and Veterinary Science 300
Albany Veterans Administration Medical Center 1150	Institute of Nuclear Medicine and Allied Sciences 2400
Albert Einstein College of Medicine 4900	Kaiser Hospital 850
Alfred Hospital 5200	Kansas University Medical Center 4800
Brookhaven National Laboratory 2150	Kent and Canterbury Hospital 1900, 3750
Cancer Foundation of Santa Barbara 250	Kettering Medical Center 1900
Charing Cross Hospital 150	Letterman Army Medical Center 3100
Citibank 550	Lloyd Nolan Hospital 3850
Cleveland Clinic Foundation 450	Long Island University Medical Center 650
Clinica Puerta De Hierro 2800	Los Angeles County Harbor--UCLA Medical Center 3150
Clinical Physiology Lab C.N.R. 1700	Lovola University Medical Center 2850
Denver V. A. Hospital 4450	Mallinckrodt Institute of Radiology 4700
Denver Veterans Administration Hospital 2350	Manchester Royal Infirmary 2100
Duke University Medical Center 400	Massachusetts General Hospital 750
Edward Hines VA Hospital 1000	Mayo Clinic 1100
Eisenhower Medical Center 50	Medical College of Pennsylvania 1400
Foundation for Blood Research 4350	Medical College of Virginia 4050
General Infirmary 2950	Milwaukee County Medical Complex 4850
George Washington University Medical Center 2450	Mount Sinai Medical Center (New York) 900
Georgetown University Hospital 2000	Mt. Sinai Hospital (Cleveland) 1250
Guy's Hospital 5100	National Institute of Radiological Sciences 2650
Hinsdale Sanitarium and Hospital 4750	
Hopital Maisonneuve-Posemont 3200	

INSTALLATION INDEX

National Institutes of Health 2200	Strong Memorial Hospital, University of Rochester 1200
Naval Submarine Medical Research Laboratory 3950	Sutter Memorial Hospital 1950
Nuclear Medicine Associates 350	Temple University 4950
Ochsner Medical Institutions 2900	Temple University Hospital 700
Ochsner Medicine Institution 5250	The University of Texas System Cancer Center 4000
Palmerston North Hospital 3800	U. S. Veterans Administration Medical Center (Wood) 3250
Presbyterian Hospital (New York) 1950	University College Hospital 1500
Providence Veterans Administration Hospital 200	University Hospital 3400
Queens Hospital Center 500	University Hospital (Knoxville) 4100
Radiation Medicine Centre, B.A.R.C. 1550	University of Colorado Medical Center 2300, 4400
Radiofysikaandelning 800	University of Iowa Hospital 600, 4600
Radiologische Universitätsklinik 1650	University of Kentucky Medical Center 5000
Ralph K. Davies Medical Center 2550	University of Miami School of Medicine/Jackson Memorial Hospital 950
Royal Prince Alfred Hospital 4650	University of Michigan Hospital 1750
Santa Clara Valley Medical Center 100	University of Minnesota Hospitals 3250
Scientific Data Systems Branch, E G and G Idaho, Inc. 2250	University of North Carolina/North Carolina Memorial Hospital 1250
St. Joseph Mercy Hospital 1050	University of Texas Health Science Center/Bexar County Hospital 3700
St. Joseph's Hospital (Ontario) 2750	University of Texas Medical Branch 4200
St. Louis V. A. Medical Center 4250	University of Virginia 3300
St. Luke's Hospital Center 2050	University of Washington Hospital 2700
St. Luke's Hospital Center (New York City) 4500	V. A. Hospital (Tampa) 1600
St. Paul Hospital 3550	
St. Peter's Hospital 5150	

INSTALLATION INDEX

V. A. Medical Center (Ray Pines)
4150

V. A. Medical Center (Lexington)
4550

V. A. Medical Center (Miami) 4200

V. A. Medical Center (Northport)
3000

V. A. Medical Center (Portland)
3600

V. A. Medical Center (Tucson) 3500

Vanderbilt University Medical
Center 3000

Veterans Administration Medical
Center (Indianapolis) 2600

Victoria Hospital 5050

Walsgrave Hospital 3650

White Memorial Medical Center 3450

William Beaumont Hospital 2500

USER SYSTEM INDEX

ACAC LSI-11 250, 1800, 2550, 3550, 4550	DEC PDP-11/20 1350
Baird Atomic Dec 116 3200	DEC PDP-11/24 200, 650, 850, 1250, 2350, 2750, 2900, 3300, 4000, 4350, 4400, 4450, 4650, 4850, 5100, 5200, 5250
Baird Atomic-77 900, 1600	
Baird Atomic-77 0116 400, 2750	DEC PDP-11/40 200, 1250, 1400, 2000, 2400, 2950, 4350, 4550, 4650, 5100, 5250
Data General Eclipse 2250	
Data General Nova 2250	DEC PDP-11/45 1500
Data General Nova-1200 600, 950, 1050, 1100, 4150, 4200, 4300, 4600	DEC PDP-11/55 3000, 5000
Data General Nova-1220 500, 3050	DEC PDP-12 2100, 3350
Data General Nova-2 1000, 1300, 1950, 2450, 3400, 4250, 4300	DEC PDP-12/40 1600
Data General Nova-214 2700	DEC PDP-15 2250, 3400, 4800
Data General Nova-3 500, 600, 1200, 1750, 1850, 2100, 2600, 2850, 3100, 3250, 3350, 3450, 3600, 3650, 3800, 4600, 4750, 4850, 4900, 4950	DEC PDP-15/76 450
Data General Nova-3D 1000	DEC PDP-8/I 3050, 3200
Data General Nova-2112 2700	DEC PDP-8e 1600, 1900, 2250, 3750
Data General Nova-312 750	DEC PDP-9 3000
DEC Gamma-11 4050	Elscint 1000, 3650, 4900
DEC Gamma-11/T55 300	Elscint Dycom-80 500, 1200
DEC Gamma-11/34 300, 1200, 4900	General Electric 420 2 1550, 2150
DEC Gamma-11/40 1150, 5050	General Electric WD 812 2600
DEC IAB 4/3 4350	General Electric 812 850
DEC MDA-11/03 1150	H-P 21 MK 1700
DEC PDP-11 2000	H-P 21 MT 2200
DEC PDP-11/03 1100, 1250	H-P 21 N1E 1650, 2200
DEC PDP-11/04 4650	H-P 21 N1M 1650
DEC PDP-11/05 2050, 3000	H-P 2100 700, 1650, 4950
DEC PDP-11/10 650, 800, 1500, 4500, 5000	H-P 2100A 2500
	H-P 2100B 1700
	H-P 2116B 2800
	H-P 5407 700
	H-P 5407-A 100

USER SYSTEM INDEX

H-P 5407A 3500, 3550	Varian V77 3700
Hitachi HITAC 1011/A 2650	Varian 620/L 3150, 5150
IBM 360/44 2400	Varian 620L-100 150
Infomatek 5150	Xerox Sigma 7 4050
Infomatek Jinn 3-3 3150	
Infomatek Sinis-3 3850	
Interdata 7/16 2150	
Intertechnique Multi-20 2800	
Telen Hateg 1026 5150	
IDS 600, 750, 950, 1100, 1300, 1850, 1950, 2450, 2850, 3250, 3300, 3350, 3400, 3450, 3600, 3700, 3900, 4150, 4250, 4300, 4600, 4750, 4950	
IDS-Trinary 1050, 1750, 2100, 4200	
Meditech 550	
Medcomp II/25 750	
Nuclear Chicago CDS 4100	
Nuclear Data NED 2 2100	
Nuclear Data NED 3 50	
Nuclear Data NED 4 50	
Nuclear Data 812 1550, 2100	
Nuclear Enterprises 3800	
Ohio Nuclear N6400 4700	
Ohio Nuclear Series-75 4450	
Ohio Nuclear VIP-450 750, 2300, 2350, 4450	
Tektronix 4051 3950	
Toshiba TDSBAC 3400/31 2650	
Varian Medical 620 1450	
Varian V-74 900	
Varian V72 3400	

STUDIES INDEX

Angiograms 1250, 4400	Compartmental Analysis 2400
Aortic Arch 3400	CSP Flow 3400
Blood 4350	EEG 650
Blood Flow Any Organ 3000	Flood Q/C 1350
Blood Flow IVC 1550	Gall Bladder 300
Blood Volume 1350, 3500	Gallium 1100
Bone 150, 200, 300, 950, 1000, 1150, 1250, 1300, 1450, 1500, 1650, 1900, 1950, 2100, 2150, 2300, 2650, 2750, 2800, 2900, 2950, 3100, 3200, 3350, 3400, 3450, 3550, 3600, 3750, 3800, 3900, 4150, 4250, 4400, 4650, 4700, 4800, 500, 5050, 5250	Gastric Emptying 3550, 4900, 5150
Bone Marrow 3400	Heart Images 1900, 2100, 2150, 2250
Bone-D 4400	Heart Imaging 2400, 3550
Brain Tomography 4450	Heart Tomography 2350, 4450
Brain-P 100, 150, 200, 300, 600, 650, 1000, 1050, 1100, 1150, 1250, 1300, 1350, 1400, 1450, 1500, 1550, 1750, 1800, 1850, 1950, 2000, 2100, 2150, 2300, 2350, 2450, 2500, 2550, 2700, 2750, 2800, 2850, 2900, 2950, 3050, 3100, 3200, 3250, 3350, 3400, 3450, 3550, 3600, 3650, 3800, 3850, 3900, 4000, 4050, 4150, 4250, 4300, 4400, 4450, 4550, 4600, 4650, 4700, 5000, 5050, 5200, 5250	Heart-P 400, 250, 850, 950, 1000, 1150, 1250, 1400, 1450, 1950, 2000, 2050, 2750, 2800, 2950, 3550, 3750, 3800, 3900, 4050, 4150, 4250, 4400, 4550, 4650, 4800, 5000, 5050, 5150
Brain-S 100, 150, 200, 1000, 1050, 1100, 1150, 1200, 1350, 1450, 1750, 1800, 1900, 2000, 2100, 2150, 2300, 2350, 2450, 2500, 2700, 2800, 2850, 2950, 3200, 3450, 3550, 3650, 3750, 3800, 3900, 4150, 4150, 4250, 4450, 5000	Heart-P 100, 200, 250, 300, 400, 450, 600, 850, 950, 1150, 1250, 1300, 1350, 1400, 1500, 1550, 1750, 1800, 1950, 1950, 2000, 2050, 2100, 2150, 2300, 2350, 2500, 2550, 2650, 2700, 2750, 2800, 2850, 2900, 3000, 3100, 3150, 3200, 3300, 3350, 3400, 3450, 3550, 3600, 3600, 3800, 3850, 3900, 4000, 4050, 4150, 4200, 4250, 4300, 4400, 4450, 4500, 4550, 4600, 4650, 4700, 4800, 4900, 5000, 5050, 5150, 5200, 5250
Cardiac Exercise 3900	Heart-G 150, 200, 250, 300, 450, 600, 350, 950, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1550, 1750, 1800, 1850, 1900, 1950, 2000, 2050, 2100, 2150, 2200, 2300, 2350, 2450, 2500, 2550, 2600, 2650, 2750, 2850, 2900, 2950, 3000, 3100, 3150, 3250, 3300, 3350, 3400, 3450, 3550, 3600, 3650, 3750, 3900, 4000, 4050, 4150, 4200, 4250, 4300, 4300, 4450, 4500, 4550, 4600, 4650, 4700, 4800, 4850, 4900, 4950, 5000, 5050, 5150, 5200, 5250
Cardiac Rest 3900	
Coded Aperture 1750	
Collimator Performance 2400	

STUDIES INDEX

Heart-O 250, 300, 450, 850, 950,
1250, 1400, 1850, 1950, 2000,
2050, 2100, 2500, 2650, 2750,
2800, 2950, 3100, 3150, 3200,
3250, 3350, 3500, 3600, 3800,
3850, 3900, 4050, 4150, 4400,
4450, 4500, 4550, 5000, 5050,
5150

Heart-P 450, 3500, 3600, 4850

Heart-S 1050

Heart-Shunt 850, 1100, 1850, 3400,
4700

In-Vitro Studies 2000, 3000

Labelled Radiopharmaceuticals 3800

Liver-P 100, 150, 1000, 1350,
1450, 1550, 1900, 1950, 2000,
2100, 2300, 2350, 2500, 2650,
2700, 2750, 2800, 3000, 3150,
3250, 3400, 3450, 3500, 3550,
3600, 3750, 3900, 4050, 4150,
4200, 4250, 4300, 4400, 4450,
4800, 5000

Liver-G 3550

Liver-S 100, 150, 200, 450, 800,
950, 1450, 1500, 1900, 1950,
2000, 2100, 2150, 2300, 2350,
2650, 2700, 2800, 2950, 3100,
3300, 3350, 3450, 3550, 3800,
3900, 4050, 4150, 4200, 4250,
4400, 4450, 4800, 5000

Lung 1000

Lung-G 2200, 2650, 3000, 3900,
4050, 4150, 4550

Lung-P 150, 200, 300, 450, 950,
1300, 1450, 1500, 1900, 2000,
2100, 2150, 2200, 2300, 2450,
2600, 2650, 2700, 2750, 2800,
2900, 2950, 3050, 3250, 3450,
3550, 3600, 3800, 3900, 4000,
4050, 4150, 4200, 4250, 4550,
4650, 4800, 5000, 5150

Lung-V 150, 200, 300, 950, 1050,
1150, 1250, 1350, 1450, 1500,
1550, 1950, 1900, 1950, 2000,
2100, 2150, 2200, 2300, 2450,
2500, 2600, 2650, 2700, 2750,

Lung-V 2400, 2950, 2900, 2950,
3050, 3100, 3250, 3400, 3450,
3550, 3600, 3650, 3900, 4000,
4050, 4150, 4200, 4250, 4550,
4650, 4800, 5000, 5150, 5250

Lung-V/Q 150, 200, 950, 1100,
1250, 1450, 1500, 1950, 1950,
2000, 2050, 2100, 2200, 2300,
2450, 2600, 2650, 2700, 2750,
2800, 2850, 2900, 3550, 3600,
3900, 4050, 4150, 4250, 4500,
4550, 4650, 4700, 4800, 5000,
5050, 5150, 5200, 5250

Meckels 3550

Myocardial Infarct 1950

Myocardial Perfusion 1950

Pancreas 300, 950, 1350, 1450,
1550, 1800, 1900, 1950, 2000,
2100, 2150, 2500, 2750, 2850,
2950, 3000, 3100, 3450, 3550,
3750, 3800, 3850, 3900, 4000,
4050, 4150, 4250, 4300, 4800,
5000, 5050, 5200

Parathyroid 300

Placenta 850

Prote Penography 2100

Radiation Dosimetry 2400

RBC Calculation 1150, 2550

Record Keeping 2550, 2900, 3400,
4650

Renal 150, 200, 300, 450, 600,
700, 850, 950, 1000, 1100, 1150,
1200, 1250, 1300, 1350, 1400,
1450, 1500, 1550, 1750, 1800,
1850, 1900, 1950, 2000, 2100,
2150, 2200, 2300, 2350, 2450,
2500, 2550, 2600, 2700, 2750,
2800, 2950, 2950, 3000, 3050,
3100, 3150, 3200, 3250, 3300,
3350, 3400, 3450, 3500, 3550,
3600, 3650, 3750, 3900, 3850,
3900, 4000, 4050, 4100, 4150,
4200, 4250, 4300, 4400, 4450,
4500, 4550, 4600, 4650, 4700,
4800, 4850, 4900, 4950, 5000,
5050, 5150, 5200, 5250

STUDIES INDEX

Research 700, 3800, 4650 Uniformity 1250
 Residual Urine 1250
 RIR 200, 1800, 1800, 2000, 2900,
 4200
 Salivary Glands 5150
 Schilling Calculation 1150
 Scrotal Scans 1850
 Shillings Test 3500
 Skin-P 3500
 Spleen 100, 150, 200, 450, 950,
 1450, 1950, 2100, 2150, 2300,
 2350, 2700, 2800, 2950, 3000,
 3450, 3550, 3650, 3800, 3900,
 4050, 4150, 4250, 4400, 4450,
 4800, 5000
 Statistical Analysis 2400
 Tc-99m Decay 1150
 Testicular 3550
 Thallium 1000, 1900, 3000, 3100,
 3200, 3350, 3850, 4650, 4700
 Thyroid 3750
 Thyroid X-ray Fluorescence 3000
 Thyroid-T 150, 1250, 1450, 1750,
 1900, 1900, 2150, 2200, 2500,
 2700, 2800, 3450, 3550, 3800,
 3900, 4050, 4100, 4150, 4250,
 4800, 5000
 Thyroid-U 1400, 1450, 1550, 1750,
 2000, 2200, 2500, 2600, 2800,
 3000, 3300, 3800, 3900, 4050,
 4150, 4900, 5000
 Tomographic 1750
 Tumor Localization 150, 1300,
 1500, 1900, 1950, 2100, 2150,
 2650, 2800, 2850, 3200, 3400,
 3450, 3550, 3600, 3900, 4050,
 4150, 4250, 4550, 4800, 5000,
 5050
 Ultrasonic Scanning 1500

CENTRAL COMPUTER INDEX

Andahl 470 1750	IBM 360/95 2050, 4500
B-2100 2500	IBM 3601 5100
B-4700 450, 3300	IBM 370 900, 1600, 2200, 2450
B-6900 4450	IBM 370/138 2900
CDC Cyber 3250, 3300, 4070	IBM 370/150 4900
CDC 3300 3250	IBM 370/155 800, 1350
CDC 6400 2350, 2700, 4450	IBM 370/158 1450, 1700
CDC 6600 1500, 2150, 2300, 3400, 5100, 5150	IBM 370/165 400
CDC 6800 1500	IBM 370/168 1700
CDC 7600 2150, 2250	IBM 370/158 1100
CDC 7650 1500	Informatek Simis-3 3950
DEC Gamma-11 2000	MDS-Trinary 3900
DEC PDP-11 2200	Prior 300 1400
DEC PDP-11/34 4350, 4700	Toshiba TOSBAC 3400/31 2650
DEC PDP-11/40 2000, 3800, 4350, 4700	Univac 1108 950, 3950
DEC PDP-11/45 400	Xerox Sigma 6 4900
DEC PDP-11/70 400	Xerox Sigma 7 3000, 4050
DEC PDP-15 4400	Xerox Sigma-6 150
DEC PDP-15/76 450	XEROX Sigma-6 1200
DECSystem 10 1400, 2700, 2750, 3000, 5050	
Honeywell 6000 4250	
HP-3000 3150	
IBM 330 4950	
IBM 360/165 5000	
IBM 360/44 2400	
IBM 360/55 600, 4600	
IBM 360/70 5250	
IBM 360/75 2250	

NUCLEAR MEDICINE LABORATORY PROFILE
(to be included in the Directory of Computer Users)

Please circle appropriate answer(s) or fill in blanks.

I. Institution Description

- A. Institution Name: _____
- B. Street Address: _____
- C. City: _____
- D. State and Zip Code: _____
- E. Country: _____
- F. Phone: (A.C. _____) _____ - _____ Ext. _____ FTS _____
- G. Type of Facility: Research _____ Clinical _____ Teaching _____
- H. Number of Beds: _____
- I. Number of Research Personnel: _____

II. Contacts

- A. Clinical: _____
- B. Hardware: _____
- C. Software: _____

III. General Site Information

- A. Do you have access to a large central computer? Y N
If so, what type/model? _____

How do you supply data to/from it?
Mag Tape Punched Cards
Modem (Terminal) Paper Tape
Other (describe): _____

- B. Do you collect data from remote sites, e.g., I.C.U. or Cardiac Cath. Labs? Y N
If so, how is the data returned to the your laboratory computer for analysis?
___ It's not--it's analyzed on the spot
___ By wire _____ feet long
___ By magnetic media
___ Tape
___ Disc cartridge
___ Floppy Disc

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C. Do you do any program development? Y N

- ☐ By permanent staff along with other duties
☐ By full time programmer
☐ By part time programmer
☐ By consultant service

D. Is your programming

- ☐ mostly new analysis routines
☐ mostly modification of routines in use
☐ about 50/50, new and modification

E. Do you do hardware development? Y N

- ☐ By permanent staff along with other duties
☐ By full time engineer
☐ By part time engineer
☐ By consultant service

	System 1	System 2	System 3
Vendor	_____	_____	_____
(Indicate "user" if not a commercial system model.)			
CPU Model	_____	_____	_____
Memory Size	_____ words	_____ words	_____ words
Word Size	_____ bits	_____ bits	_____ bits
Paper Tape			
Reader	Y N _____ cps	Y N _____ cps	Y N _____ cps
Punch	Y N _____ cps	Y N _____ cps	Y N _____ cps
Mag Tape			
Tracks	_____ tr	_____ tr	_____ tr
Density	_____ bpi	_____ bpi	_____ bpi
Speed	_____ ips	_____ ips	_____ ips
Incremental	Y N	Y N	Y N
Other Tapes	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Mag Disks			
Fixed (type)	_____	_____	_____
Capacity	_____ Meg-w	_____ Meg-w	_____ Meg-w
Removable	_____	_____	_____
Capacity	_____ Meg-w	_____ Meg-w	_____ Meg-w

Other Peripherals _____

CRT Display _____
 Greyscales _____
 Color Y N Y N Y N

Capable of simultaneous collection and processing?

Y N Y N Y N

Languages used: (FORTRAN, BASIC, Assembler, etc.)

Interfaced to _____ camera(s) _____ camera(s) _____ camera(s)
 _____ scanner(s) _____ scanner(s) _____ scanner(s)

Camera Collection

Frame mode

32 X 32 _____/second _____/second _____/second
 64 X 64 _____/second _____/second _____/second
 128 X 128 _____/second _____/second _____/second

Max number of Frames

_____ frames _____ frames _____ frames

Max number of Counts

_____ cts/ele _____ cts/ele _____ cts/ele
 at (____ x ____) (____ x ____) (____ x ____)

List Mode

size (____ x ____) (____ x ____) (____ x ____)
 Max counts _____ counts _____ counts _____ counts

Signals collected

Position Y N Y N Y N
 Time Y N Y N Y N
 Energy Y N Y N Y N

Physiological

Y N Y N Y N

Scanner Collection**Max resolution**

_____ in. steps _____ in. steps _____ in. steps

Image size

(____ x ____)

Max counts

_____ counts _____ counts _____ counts

IV. Comments regarding your systems or installation:

(Anything you wish to add to the survey data)

V. Studies Performed on Computer (Collection and/or processing)

Studies	System Used (1,2, etc.)	Language(s) Used (FTN, etc.)	Output Form (List, Graph, CBT, etc.)	Objective of study e.g. images flow curves numbers	Frequency (#/week)
A. Brain					
1. Static	_____	_____	_____	_____	_____
2. Flow	_____	_____	_____	_____	_____
B. Renal					
C. Thyroid					
1. Image	_____	_____	_____	_____	_____
2. Uptake	_____	_____	_____	_____	_____
D. Lung					
1. Perfusion	_____	_____	_____	_____	_____
2. Ventilation	_____	_____	_____	_____	_____
3. V/Q	_____	_____	_____	_____	_____
4. Gated	_____	_____	_____	_____	_____
E. Heart					
1. Flow	_____	_____	_____	_____	_____
2. Gated	_____	_____	_____	_____	_____
3. Effusion	_____	_____	_____	_____	_____
4. Output	_____	_____	_____	_____	_____
F. Liver					
1. Static	_____	_____	_____	_____	_____
2. Function	_____	_____	_____	_____	_____
G. Spleen					
H. Pancreas					
I. Bone					
J. Tumor					
Localization	_____	_____	_____	_____	_____
K. Others					
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____