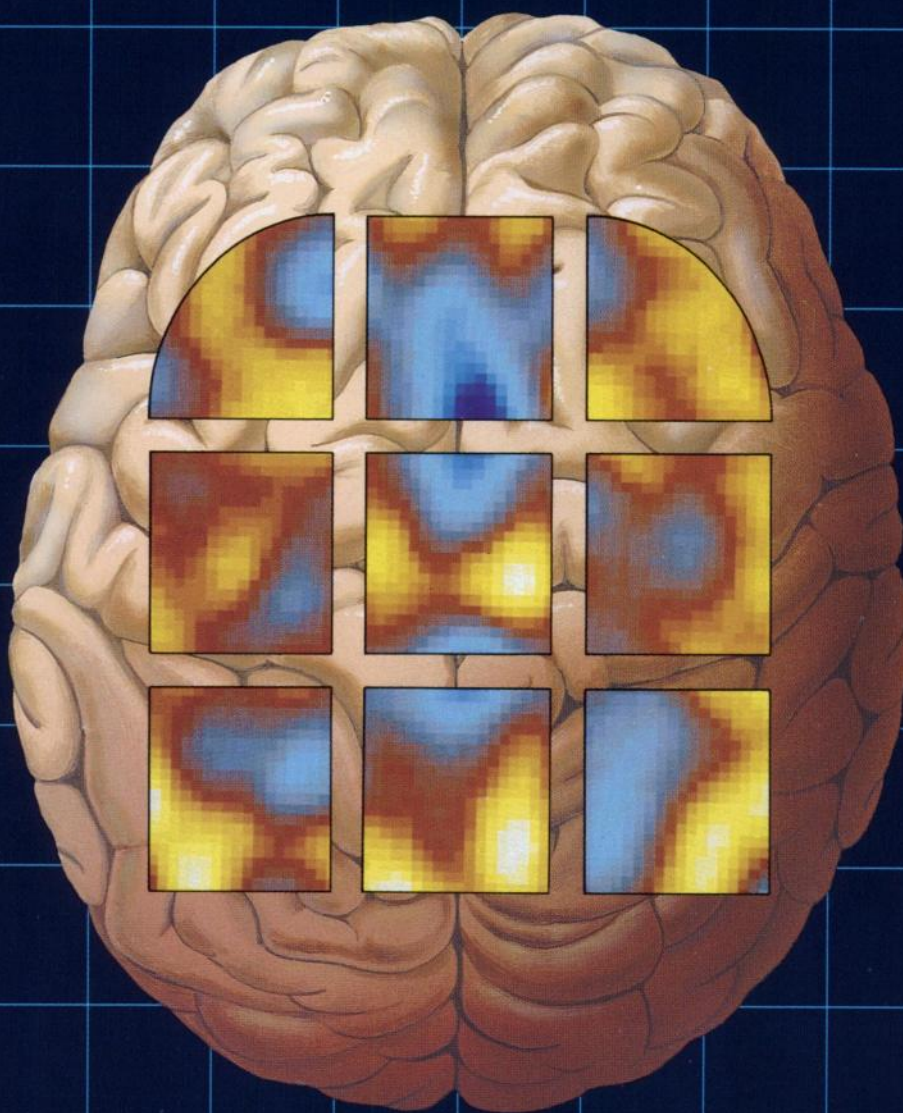


In the evaluation of stroke

SPECTamine[®]

Iofetamine HCl I 123 Injection

**opens a window into
the living brain**



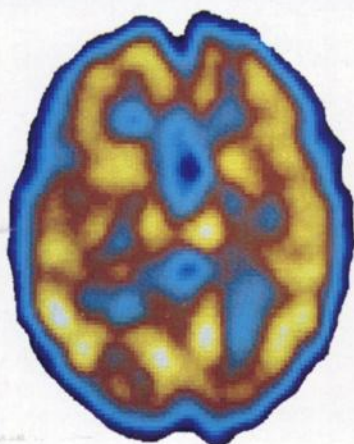
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Please see adjacent page for brief summary of prescribing information.

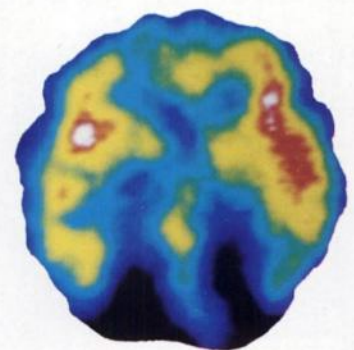
SPECTamine[®]

Iofetamine HCl I 123 Injection

- A neurotransmitter analog crosses the intact blood-brain barrier
- Concentrates in metabolically active brain cells—predominantly in the gray matter
- Provides PET-like functional brain images at a fraction of the cost



Normal brain (top left) displays relatively symmetric SPECTamine uptake by metabolically active neurons.



SPECTamine study (bottom left) demonstrates bilaterally posterior cerebral artery infarction, confirming diagnosis.

Images courtesy of New England Deaconess Hospital, Boston, Mass. Images acquired with SME 810 dedicated head unit, Strichman Medical, Equipment, Inc., Medfield, Mass.

For more information contact your Medi-Physics Territory Manager, Roche Professional Service Center or call 1-800-451-7732.

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Medi-Physics, Inc.
140 East Ridgewood Avenue
Paramus, NJ 07652

SPECTamine[®]

Iofetamine HCl I 123 Injection

For complete product information, consult package insert, a brief summary of which follows:

DIAGNOSTIC—FOR INTRAVENOUS USE

DESCRIPTION: SPECTAMINE[®] (Iofetamine HCl I 123 Injection) is supplied as a sterile, apyrogenic, aqueous, isotonic sodium chloride solution for intravenous administration. Each milliliter of the solution contains 37 megabecquerels (1 millicurie) of Iofetamine HCl I 123 at calibration time, 0.15 milligram Iofetamine HCl, 0.017 millimole sodium phosphate, and 8.0 milligrams sodium chloride for isotonicity. The pH is adjusted to 4.5–6.0 with sodium hydroxide or hydrochloric acid. SPECTAMINE contains no bacteriostatic preservative and is packaged in single dose vials. The radionuclidic composition at calibration time is not less than 98.0 percent I 123, not more than 1.9 percent I 125, and not more than 0.1 percent all others (I 126 and Te 121). The radionuclidic composition at the 12-hour expiration time is not less than 96.3 percent I 123, not more than 3.5 percent I 125, and not more than 0.2 percent all others.

INDICATIONS AND USAGE: SPECTAMINE (Iofetamine HCl I 123 Injection) is recommended for use as a lipid-soluble brain-imaging agent. It has been shown to be useful in the evaluation of nonlacunar stroke especially when used within 96 hours of onset of focal neurological deficit. The rates of agreement between abnormal images and the neurological examination suggestive of ischemic cerebrovascular insufficiency appear to increase with the severity of symptoms. Its usefulness for the measurement of cerebral blood flow has not been established.

CONTRAINDICATIONS: None known.

WARNINGS: SPECTAMINE (Iofetamine HCl I 123 Injection) should not be administered to individuals with known hypersensitivity to sympathomimetic amines or to those individuals taking monoamine oxidase inhibitors.

PRECAUTIONS:

General

Some primate (*Macaca fascicularis*) studies have shown marked eye uptake of Iofetamine HCl I 123. Localization has not been studied in the isolated human eye although *in vivo* images suggest the concentration of Iofetamine HCl I 123 is below the limit of detection. Individual human variations in pharmacokinetics of this drug and the long-term effect on the eye have not been elucidated. The contents of the vial are radioactive. Adequate shielding of the preparation must be maintained at all times.

Do not use after the expiration time and date (12 hours after calibration time) stated on the label.

Potassium Iodide Oral Solution should be administered before the examination to minimize thyroid uptake of Iodine 123.

The prescribed Iofetamine HCl I 123 dose should be administered as soon as practical from the time of receipt of the product (i.e., as close to calibration time or before, if possible), in order to minimize the fraction of radiation exposure due to relative increase of radionuclidic contaminants with time.

To minimize radiation dose to the bladder, the patient should be encouraged to drink fluids and void frequently.

SPECTAMINE, as well as other radioactive drugs, must be handled with care. Appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to the patient consistent with proper patient management.

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radionuclides, and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

Drug Interactions

There has been a single report of elevated diastolic hypertension (about 30 mm Hg) occurring 18 hours after administration of SPECTAMINE in a patient maintained on therapeutic doses of valproic acid.

Concurrent use of monoamine oxidase (MAO) inhibitors and compounds containing the amphetamine structure has been known to result in hypertensive crisis. Caution, therefore, should be exercised when administering SPECTAMINE (Iofetamine HCl I 123 Injection) to individuals taking medications known to potentiate the effects of sympathomimetic amines. It is recommended that SPECTAMINE not be administered during or within 14 days following administration of MAO inhibitors.

Sympathomimetic amines may affect the biodistribution of SPECTAMINE and, thus, may influence the image quality and diagnostic utility of the image.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential, mutagenic potential or effects on fertility in male or female animals. The Ames test was negative for mutagenic effects.

Pregnancy Category C

Animal reproduction studies have not been conducted with SPECTAMINE. It is also not known whether SPECTAMINE can cause fetal harm when administered to a man or a pregnant woman or can affect reproduction capacity. SPECTAMINE should be given to a pregnant woman only if clearly needed.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, in women of childbearing capability, should be performed during the first few (approximately ten) days following the onset of menses.

Nursing Mothers

Since Iodine I 123 is excreted in human milk, formula feeding should be substituted for breast feeding if the agent must be administered to the mother during lactation.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: In a clinical study in 93 patients with sudden onset of focal neurological deficit, e.g., cerebral infarction, 7 patients died within 2 to 55 days after administration. The deaths were considered to be a result of the disease state. Although there was no concurrent control group, statistics from historical controls support this evaluation.

There is evidence suggesting that the administration of 1 to 2 milligrams of Iofetamine HCl, the carrier in SPECTAMINE, may increase systolic blood pressure by about 10 mm Hg. In a patient with a history of hypertension, there has been a single report of sudden onset of hypertension and dizziness with transient chest tightness which occurred 5–10 minutes after administration of SPECTAMINE. One case of transient unilateral hearing loss also was reported several hours after the use of SPECTAMINE in a patient with a coincidental upper respiratory infection.

As with all organic-iodine-containing compounds, the possibility of allergic reactions must be considered.

HOW SUPPLIED: SPECTAMINE is supplied in nominal 3.5 ml vials as a sterile, apyrogenic, aqueous, isotonic sodium chloride solution for intravenous injection. Each milliliter contains 37 megabecquerels (1 mCi) of Iofetamine HCl I 123 at calibration time.

It is available in individual vials containing 111 megabecquerels (3 mCi) of Iofetamine HCl I 123 at calibration time in a volume of 3 ml.

Single use vials are packaged in individual lead shields with plastic outer container.

THIS PRODUCT INFORMATION ISSUED AUGUST 1988

Medi-Physics, Inc.

140 East Ridgewood Avenue, Paramus, NJ 07652

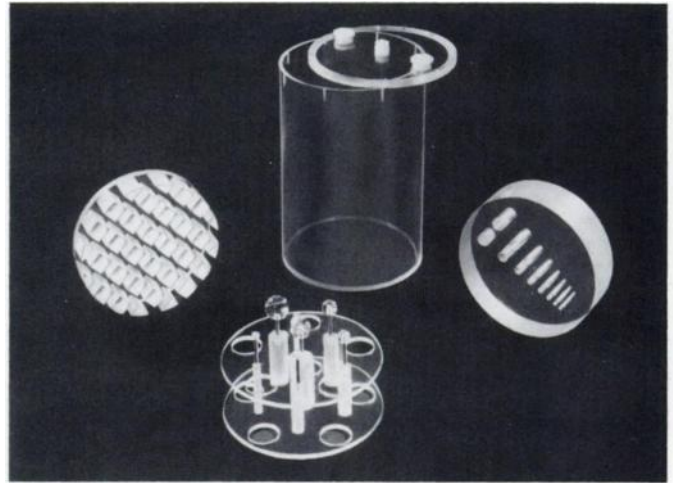
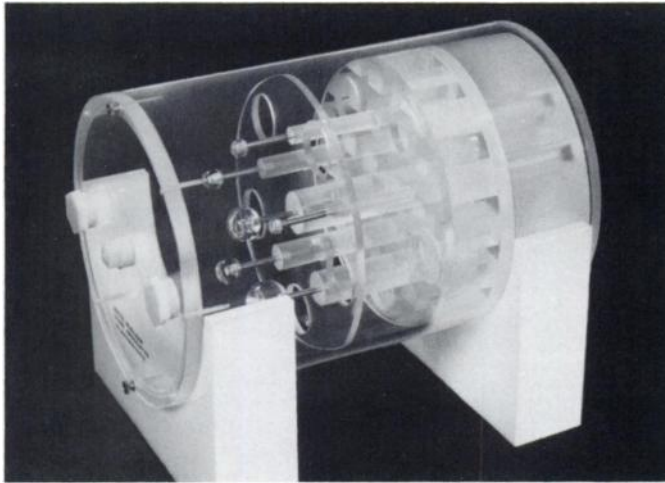
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Easy to Use...Easy to Interpret

PET/SPECT Performance Phantom*

For Testing Photon Emission CT Systems



- **Measures resolution, linearity and uniformity.**
- **Provides "hot" and "cold" simulated lesions.**

Photon emission computed tomography (PET/SPECT) systems, like any imaging apparatus, require periodic performance testing. This modular phantom is designed to provide the data for such evaluations. It offers a single system for measuring resolution, linearity and uniformity. All components of the phantom fit into an optional, clear-

acrylic source tank which can be filled with a ^{99m}Tc -and-water solution similar to that used for routine flood uniformity testing.

The set of three inserts includes two for resolution (one with "cold" lesions in a "hot" field and one with "hot" lesions in a "cold" field) and one for linearity/uniformity measurements. The visibility of all lesions can be varied by adjusting the concentration of radioisotope in the tank.

*Designed and developed by Ray A. Carlson, Hutzel Hospital, Detroit, MI, and Jeffrey T. Colvin, St. Joseph Mercy Hospital, Ann Arbor, MI.

SPECT System

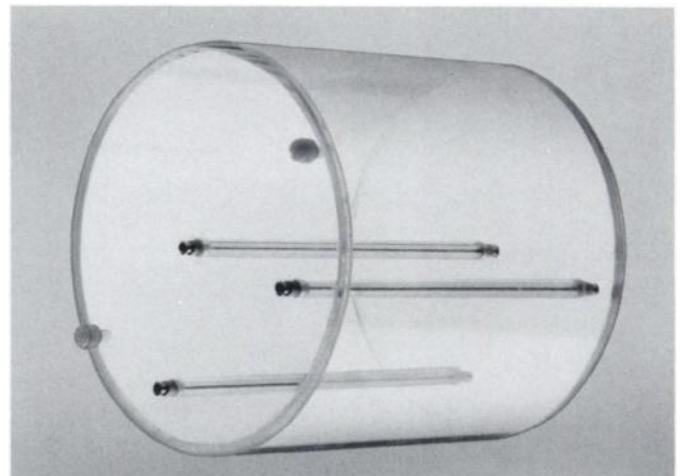
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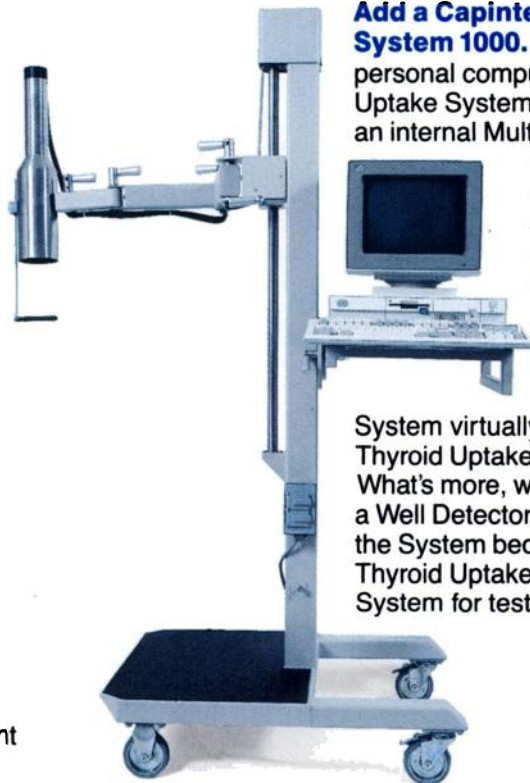
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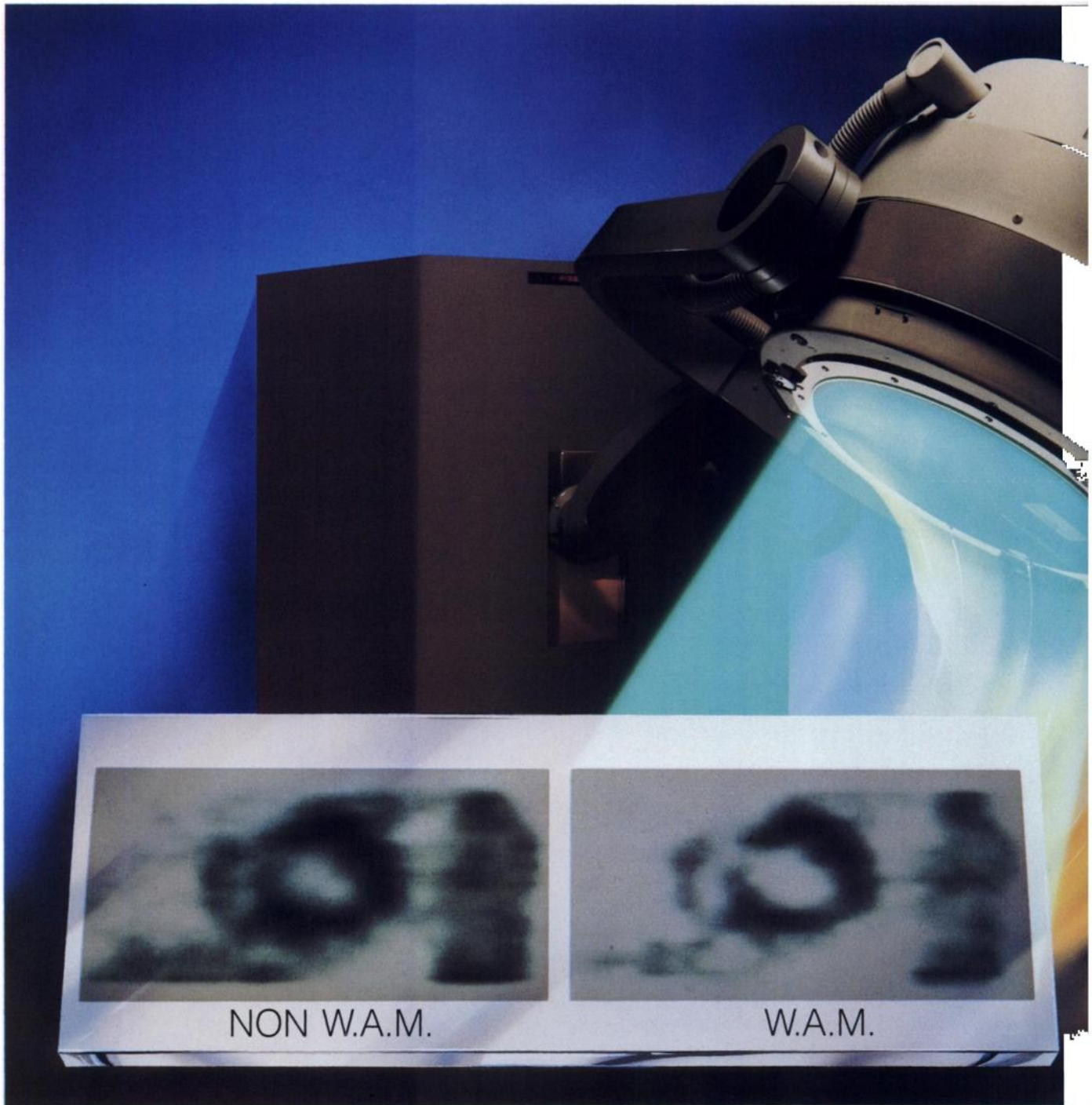
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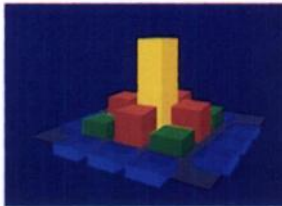
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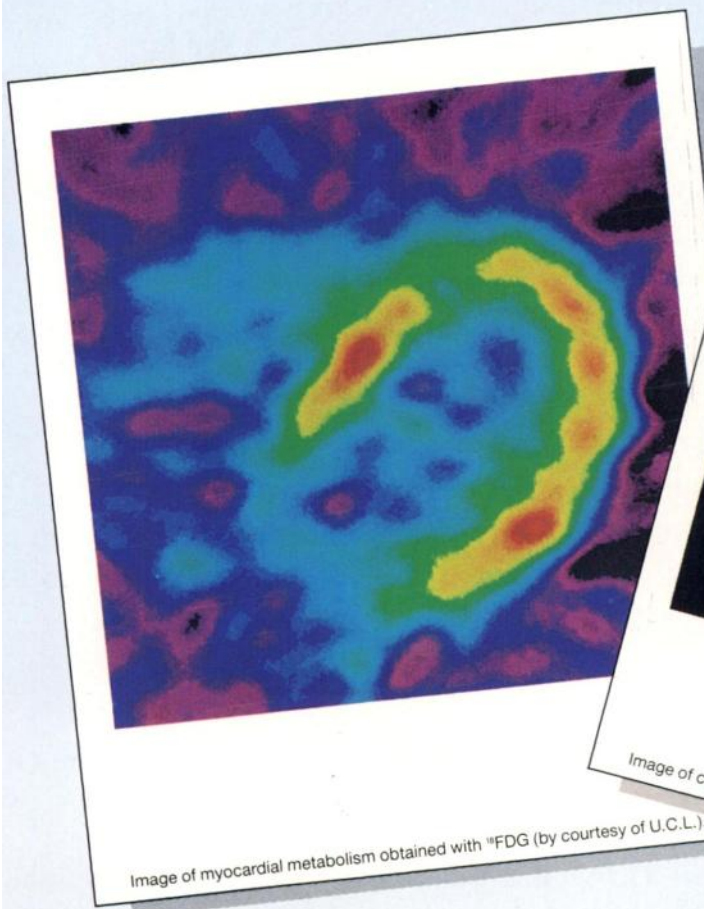


Image of myocardial metabolism obtained with ^{18}F FDG (by courtesy of U.C.L.).

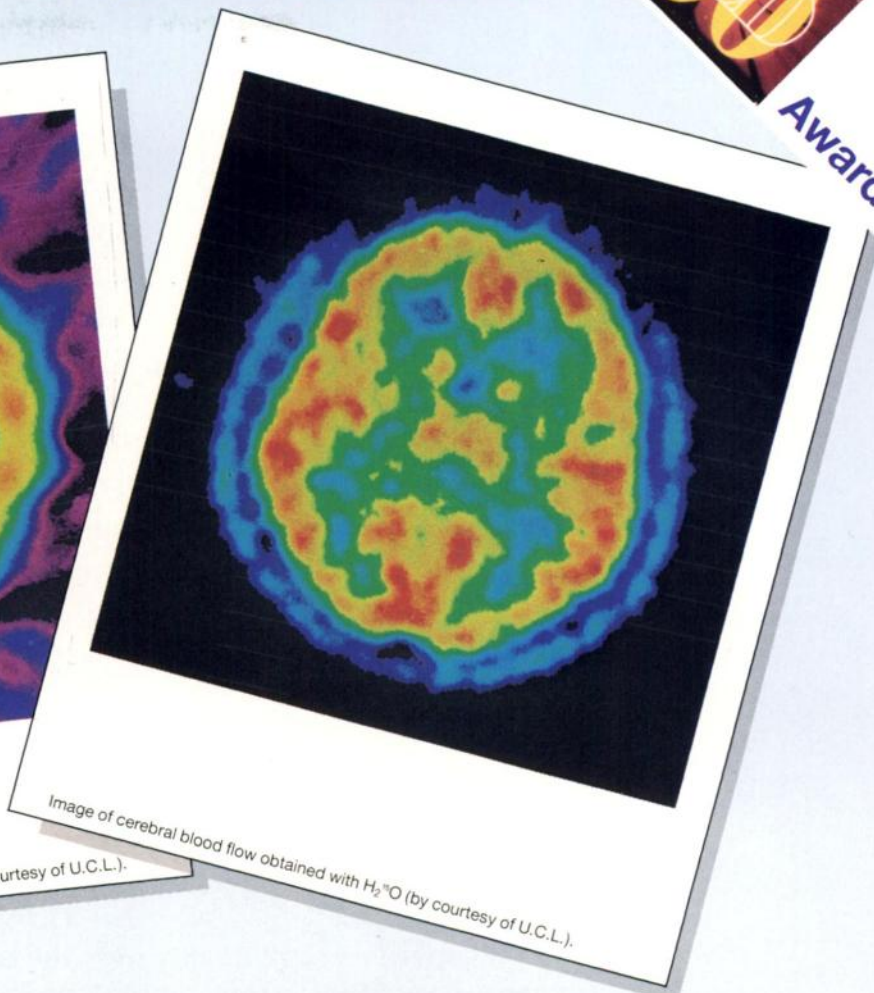


Image of cerebral blood flow obtained with H_2^{15}O (by courtesy of U.C.L.).

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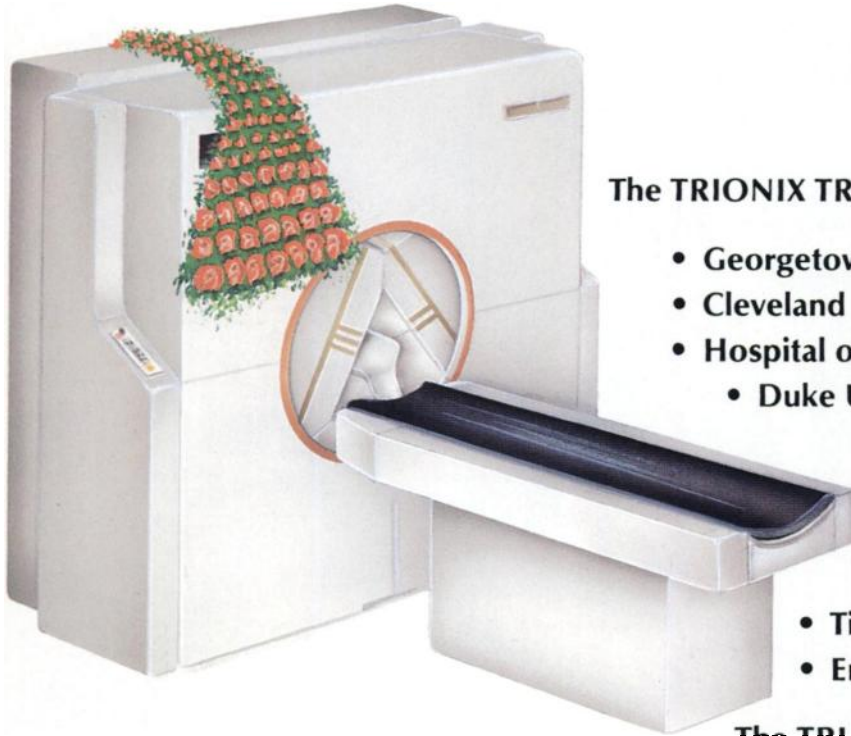
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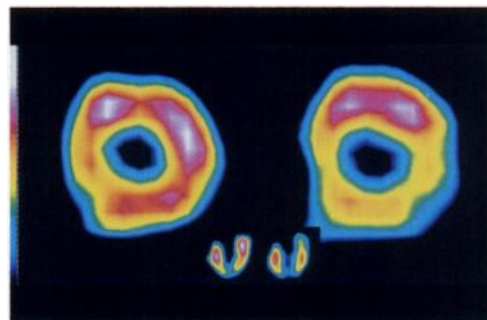
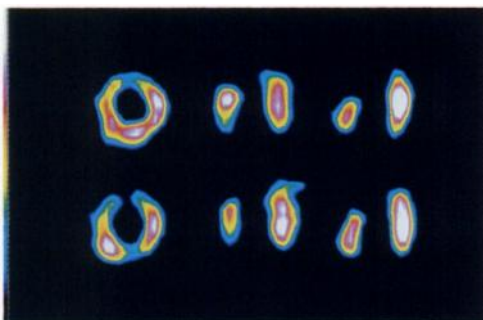
The TRIONIX TRIAD is off and running at ten institutions:

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- Cleveland Clinic Foundation, Cleveland, OH
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 - Duke University Medical Center, Durham, NC
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- Emanuel Hospital, Portland, OR

The TRIAD has gained a reputation for combining fast acquisition with superior image quality over the broad spectrum of SPECT studies. As examples, three important SPECT study types - cardiac, brain and bone - are displayed.

TL-201 CARDIAC STUDY

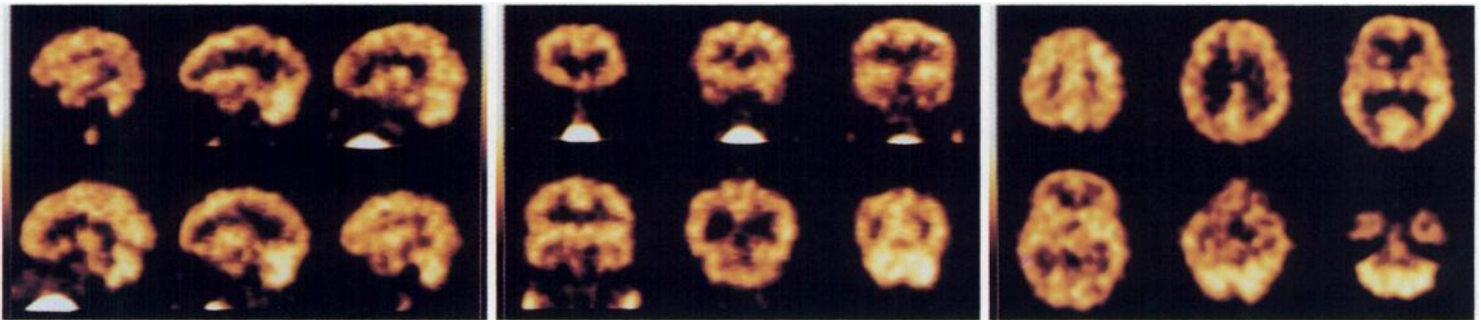
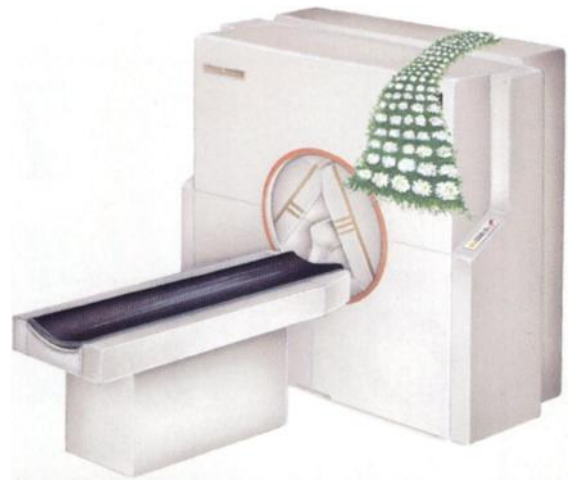
At The Cleveland Clinic and the Hospital of St. Raphael, typical TL-201 acquisition time is 8 to 12 minutes. But the TRIAD offers more than fast acquisition. Easy system set up reduces total "patient-in to patient-out" time to 15 minutes. This allows TRIAD owners to perform three to four TL-201 studies per hour. However, the TRIAD does not sacrifice quality for speed. As shown below, excellent image resolution is typically obtained from an 8 minute acquisition.



Images courtesy of the Hospital of St. Raphael. Dosage 2.5 mCi TL-201, imaging time 8 minutes. Images to the left are stress and rest studies. To the right, stress and rest studies are displayed using Dual Tomo. Dual Tomo allows axial body alignment and side-by-side display of any two studies.

HMPAO BRAIN STUDY

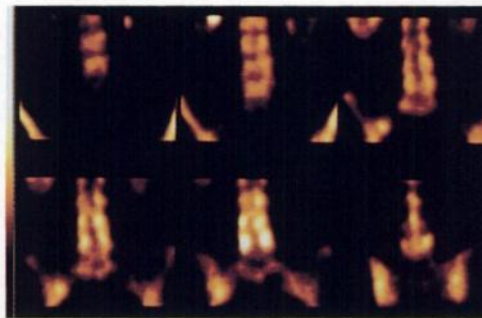
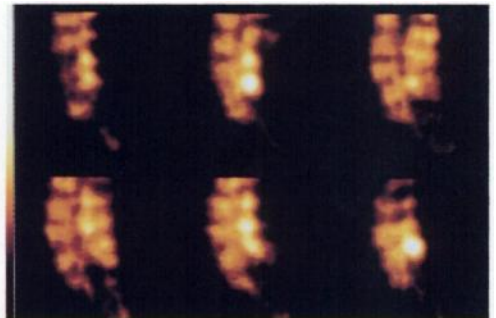
Due to its unique detector geometry, the TRIAD also produces exceptional brain images while reducing imaging time. A tight detector triangle and fanbeam collimators, can increase system sensitivity 5 times over that of a one-camera system. Balancing sensitivity and imaging time can produce outstanding clinical results as shown below.



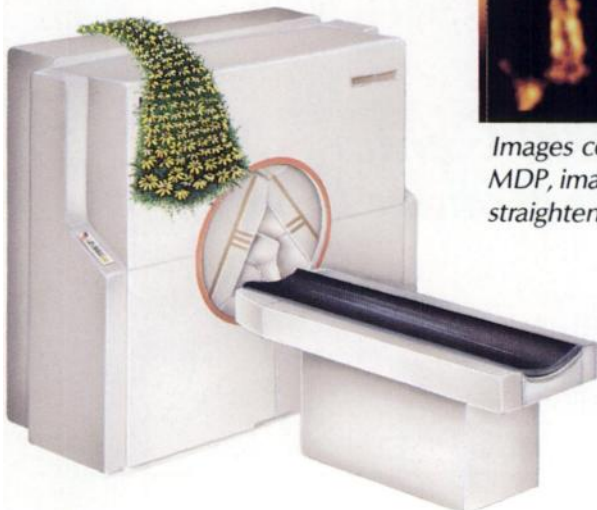
Images courtesy of Georgetown University Hospital. Dosage 15 mCi Tc-99m, HMPAO, imaging time 26 minutes. Sagittal, coronal and transverse slices displayed.

LUMBAR SPINE STUDY

For any torso study - cardiac, liver, or spine - a body-contoured, non-circular orbit is used. Three detectors and close, body-contoured imaging means improved image resolution and better image quality, as seen in this scan.



Images courtesy of Georgetown University Hospital. Dosage 25 mCi Tc-99m, MDP, imaging time 26 minutes. Lower right images display the TRIAD'S spine straightening software.



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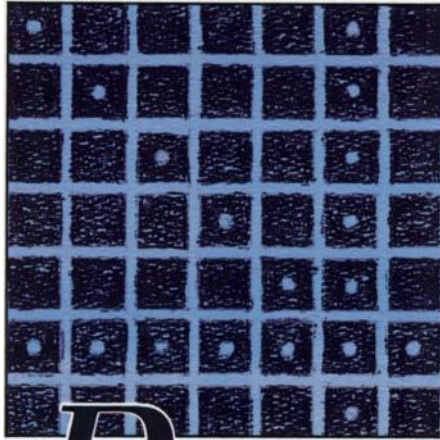
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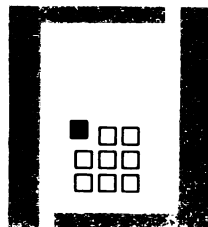
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significant advances.**

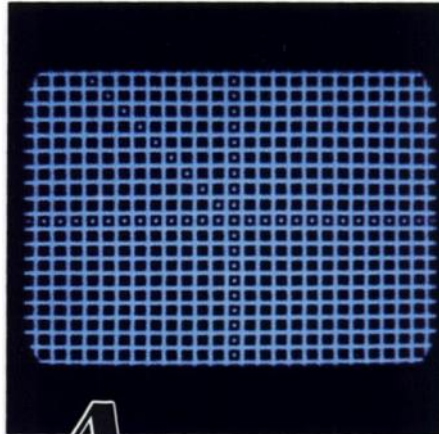
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sophycamera DS7



Phantom Image, DSX camera
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New sophycamera DSX



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Prepare to raise your expectations.

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The DS7 delivers the highest intrinsic linearity and uniformity available, with excellent resolution and high count rate. How? Earlier, more precise 12-bit digitizing.

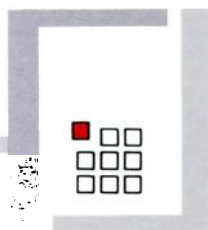
Energy-independent event location. And 16,384-point spectral, linearity, and uniformity correction.

What that means for you is a real improvement in data accuracy and consistency. You can depend on the DS7 to give you better diagnostic information, day after day.

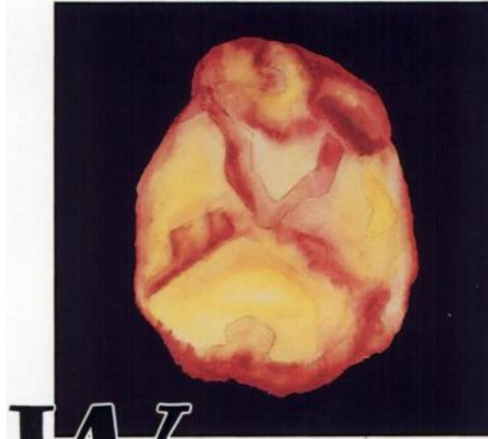
Introducing the DSX.

The new sophycamera DSX uses the same digital detector technology as the DS7, and delivers the same outstanding accuracy and consistency. But the DSX also features a large 21.2" x 15.75" rectangular UFOV. And 94 PMTs. Making it the premier system for whole-body and SPECT studies.

Together, the DS7 and DSX comprise the sophycamera family. Their unparalleled digital accuracy will change your sense of what's possible in detector technology.

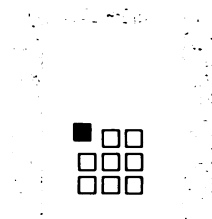


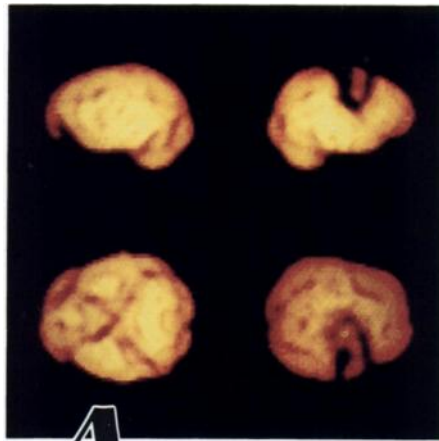
s o p h a m e d i c a l



With the new
**32-bit processors,
manufacturers have
found the secret
to optimum
clinical performance.**

True?





*Brain 3D Surface Map Display
Front: Rendered in Watercolor
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In 1984, sophia medical introduced 32-bit computing to nuclear medicine. We knew the effect on clinical performance—and on our own growth—would be revolutionary. In the time since, we've perfected the technology. And the rest of the industry has begun to appreciate our original innovation.

Beyond 32 bits.

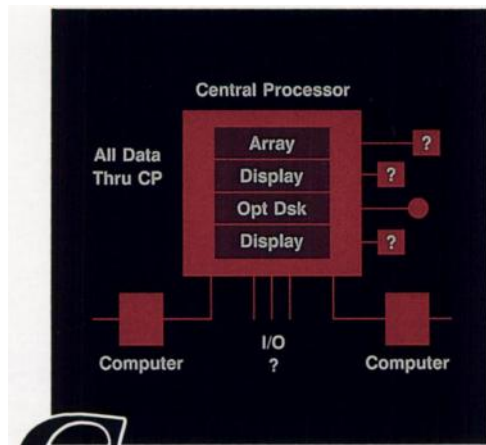
A 32-bit processor, by itself, is not magical. For our sophycamera and sophy computer systems, we've developed a comprehensive 32-bit computing architecture. It provides one 32-bit chip for imaging, another for acquisition. Full scale 32-bit parallel data buses. Ample high-speed memory. And an open format for ready dialogue with the outside world. But even that's not magical.

How do you define "performance"?

The magic is software. sophia has pioneered the use of FORTH, an extremely sophisticated language that lets us channel our computing power efficiently and effectively. With FORTH, sophycamera and sophy computer systems can process even 3D surface maps in less than one minute. And offer the highest degree of clinically correlated protocol automation. The broadest networking capabilities. And the fastest development cycle for new applications and technologies. That's why, in another five years, sophia performance will still be revolutionary.

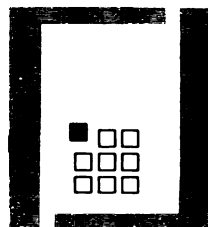


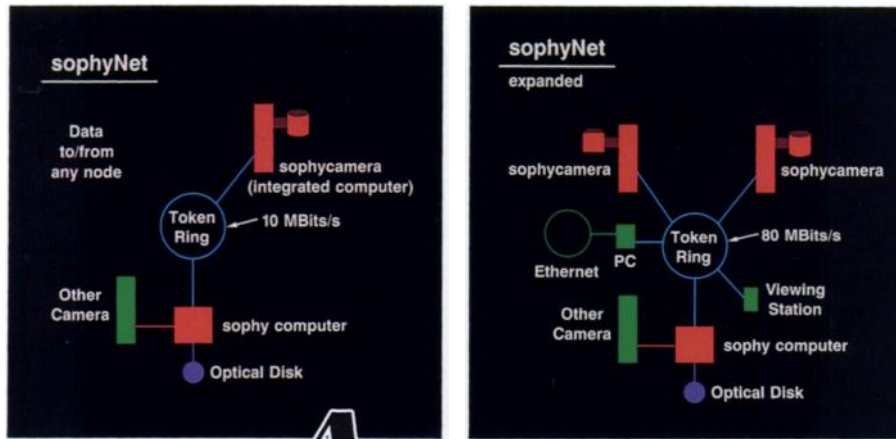
s o p h i a m e d i c a l



Conventional
networks are
easily configured
to meet the
needs of most
nuclear medicine
departments.

True?





At sophia we see things differently.

The conventional wisdom.

Competition is the basic premise of the conventional network. You set up a central processor with extensive functions—communication, display, archiving, hard copy—and let the units on the network compete for the processor's services. This arrangement has serious drawbacks. Processor components are expensive, and you buy them all, whatever your actual needs. As the network grows, increased competition makes the processor less efficient. And if it fails, so does the network.

A network of two . . .

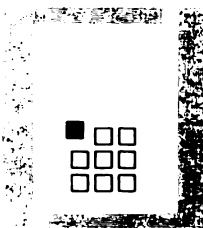
sophyNet™ networks eliminate the central processor—and its high cost, its risk of failure, and the barrier it offers to growth. Every sophycamera and sophy computer system has the power to manage network communications. And to drive archiving devices. That enables sophyNet, in its simplest form, to consist solely of a sophisticated “token ring” with speeds from 10 up to 80 megabits/second.

This basic configuration makes sophyNet feasible even for networks of . . . two.

. . . Or fifty-two.

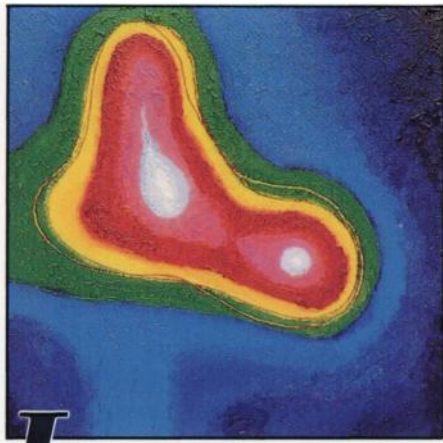
It's easy and cost-effective to configure sophyNet to your exact requirements. The token ring supports over fifty sophy computers and sophycamera systems at full performance. And you can add a dedicated network manager. Large central archiving, PC-compatible processors. Display systems. Hard copy devices. And gateways to major networks, such as DECnet™ and Ethernet™, with coaxial, infrared, microwave, and fiber optic media.

So instead of forcing your department to fit the capabilities of a conventional network, with sophyNet you can build a network that addresses your actual needs cost-effectively, as they develop.



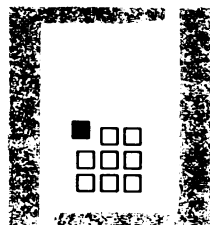
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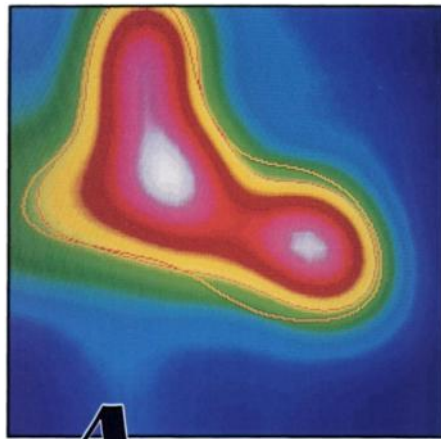
s o p h a m e d i c a l



**In the future,
multi-modality
imaging companies
will continue
to dominate
nuclear medicine.**

True?





*First Pass Cardiac Image
Front: Rendered in Acrylics
Back: Reproduced Photographically*

At **sopha** **we see things** **differently.**

sopha: the power of new ideas.

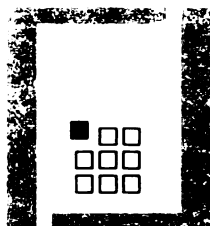
sopha medical has started a Clinical Performance Revolution. With the most advanced digital detector technology. High-efficiency processing. And important new developments in automation, networking, and rectangular cameras. The result? A shift in nuclear medicine's competitive balance. In favor of innovation.

sopha: the difference accessibility makes.

sopha medical believes in "open architecture." Not only as a way to take advantage of new technologies. But as a corporate philosophy. That's why it's easier to reach our top decision makers. And why our support capabilities are growing so rapidly.

sopha: the value of 100% commitment.

sopha medical's sales have quadrupled over each of the past two years. And are well on their way to tripling this year. That's because we invest all of our resources, expertise, and experience in one specialty. The same one you do.



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The birth of ^{99m}Tc brain-perfusion imaging...

CeretecTM
(Technetium Tc99m
Exametazime Injection)

...and a new diagnostic universe
for nuclear medicine.

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Patent # 4789736, December 6, 1989

Please see following page for a brief summary of prescribing information.

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Island 113

Circle Reader Service No. 81

Code N.159Z

Ceretek™ kit for the preparation of Technetium Tc99m Exametazime Injection

See package insert for full prescribing information.

DESCRIPTION

The Amersham Ceretek™ kit is supplied as packs of 5 single dose vial units for use in the preparation of a technetium Tc99m exametazime intravenous injection as a diagnostic radiopharmaceutical for use as an adjunct in the detection of altered regional cerebral perfusion. Each single dose vial unit contains a pre-dispensed sterile, non-pyrogenic, lyophilized mixture of 0.5 mg exametazime, 7.6 µg stannous chloride dihydrate (minimum stannous tin 0.6 µg; maximum total stannous and stannic tin 4.0 µg per vial) and 4.5 mg sodium chloride, sealed under nitrogen atmosphere with a rubber closure. The product contains no antimicrobial preservative.

Caution: Federal (U.S.A.) Law prohibits dispensing without a prescription.

When sterile pyrogen-free sodium pertechnetate Tc99m in isotonic saline is added to the vial, a Tc99m complex of exametazime is formed.

Administration is by intravenous injection for diagnostic use.

INDICATIONS AND USAGE

Technetium Tc99m exametazime scintigraphy may be useful as an adjunct in the detection of altered regional cerebral perfusion in stroke.

CONTRAINDICATIONS

None known.

PRECAUTIONS

The contents of the Ceretek vial are not radioactive. However, after the sodium pertechnetate Tc99m is added, adequate shielding of the final preparation must be maintained.

The contents of the Ceretek vial are intended only for use in preparation of technetium Tc99m exametazime injection and are NOT to be administered directly to the patient.

A thorough knowledge of the normal distribution of intravenously administered technetium Tc99m exametazime injection is essential in order to interpret pathologic studies accurately.

The technetium Tc99m labeling reaction involved in preparing technetium Tc99m exametazime injection depends on maintaining tin in the divalent (reduced) state. Any oxidant present in the sodium pertechnetate Tc99m employed may adversely affect the quality of the preparation. Sodium pertechnetate Tc99m containing oxidants should not be used for the preparation of the labeled product. To meet the last requirement, a generator must be eluted within 24 hours prior to obtaining any eluate for reconstitution with the Ceretek kit.

Sodium Chloride Injection, USP must be used as the diluent. Do not use bacteriostatic sodium chloride as a diluent for sodium pertechnetate Tc99m injection because it will increase the oxidation products and adversely affect the biological distribution of Ceretek.

GENERAL

The contents of the Ceretek vial are sterile and pyrogen free. The vial contains no bacteriostatic preservative. It is essential that the user follow the directions carefully and adhere to strict aseptic procedures during preparation of the radiopharmaceutical.

Technetium Tc99m exametazime injection, like other radioactive drugs, must be handled with care and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to the patient consistent with proper patient management.

Radiopharmaceuticals should be used only by or under the control of physicians who are qualified by training and experience in the safe use and handling of radionuclides and whose experience and training have been approved by the appropriate governmental agency authorized to license the use of radionuclides.

To minimize radiation dose to the bladder, the patient should be encouraged to void when the examination is completed and as often thereafter as possible. Adequate hydration should be encouraged to permit frequent voiding.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long term animal studies have been performed to evaluate carcinogenic potential or whether technetium Tc99m exametazime affects fertility in males or females. Studies in rats did not demonstrate mutagenic potential following intraperitoneal administration at doses of 70, 140 and 280 mg/kg.

Pregnancy Category C

Since adequate reproduction studies with technetium Tc99m exametazime have not been performed in animals to determine whether this drug affects fertility in males and females, has teratogenic potential, or has other adverse effects on the fetus, this radiopharmaceutical preparation should not be administered to pregnant or nursing women unless it is considered that the benefits to be gained outweigh the potential hazards.

Ideally, examinations using radiopharmaceuticals, especially those which are elective in nature, in women of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

Nursing Mothers

Technetium Tc99m is excreted in human milk during lactation. It is not known whether exametazime is excreted in human milk. Therefore, formula feedings should be substituted for breast feeding.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Rash with generalized erythema, facial edema, and fever has been reported. A transient increase in blood pressure was seen in 8% of patients.

DOSAGE AND ADMINISTRATION

The user should wear waterproof gloves and use shielding at all times when handling the vial and syringes.

The recommended dose range for i.v. administration, after reconstitution with sodium pertechnetate Tc99m, to be used in the average adult (70 kg) is 370-740 MBq (10-20 mCi).

Do not use the final radiopharmaceutical preparation more than 30 minutes after time of reconstitution. Discard any unused material.

Dynamic imaging may be performed between 0 to 10 minutes following injection. Static imaging may be performed from 15 minutes up to 6 hours after injection.

Although gross abnormalities of regional cerebral perfusion may be visualized by planar imaging, it is strongly recommended that SPECT imaging is carried out to maximize the value of the study.

HOW SUPPLIED

The kit comprises five individual vials of sterile, non-pyrogenic, freeze-dried mixture of exametazime stannous chloride dihydrate and sodium chloride, five radiation labels, five sterile alcohol swabs, five radiochemical purity worksheets, and one package insert. The vial and contents are sealed under a nitrogen atmosphere with a rubber stopper.

Manufactured by: Amersham International plc
Amersham England

Amersham
Amersham Corporation
2636 S. Clearbrook Dr., Arlington Heights, IL 60005
1-312-593-6300 or 1-800-323-0668 (Toll Free)
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Its high visibility lead glass offers the radiation protection of solid lead.



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Used extensively by hospitals world-wide, their anti-roll, no-leak patented design reduces radiation exposure of 99mTc by a factor of 6 HVL. Models for 1cc, 3cc, 5cc, and 10cc syringes with or without Luer Locks are available. All use VIOX Corporation's unique Hi-D® lead glass.

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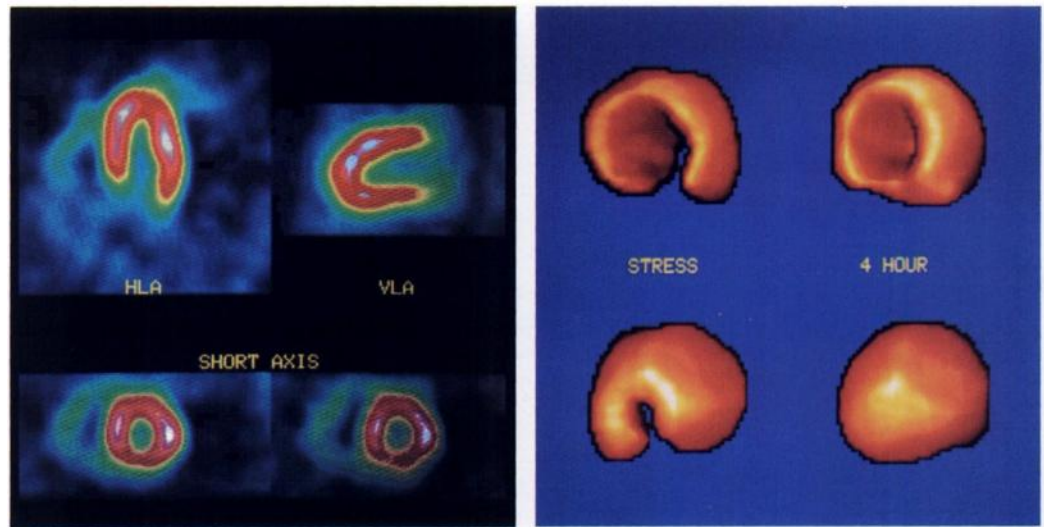
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Gated SPECT: Myocardial perfusion using $^{99m}\text{Tc-RP-30A}$.*

Apex Speed: 10 min
(2 hours with 16-bit system)

3D Display: Myocardial perfusion of Thallium-201 (^{201}Tl) stress/redistribution.

Apex Speed: 15 sec per view.
(2 minutes with 16-bit system)

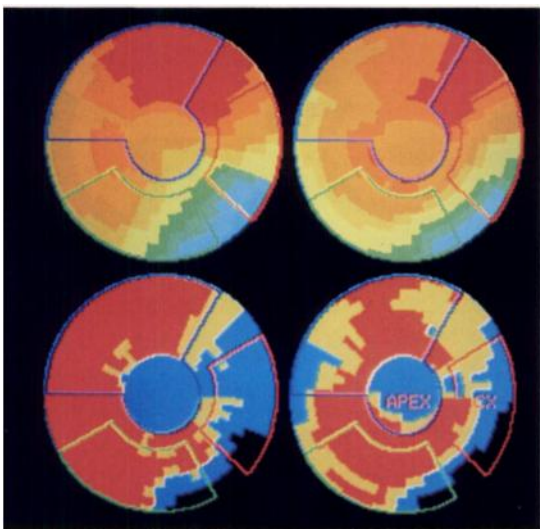
Elscont proudly announces the 32-bit Apex SP-4 and SP-6 digital gamma cameras.

The cameras of the 90's on display at SNM'89.

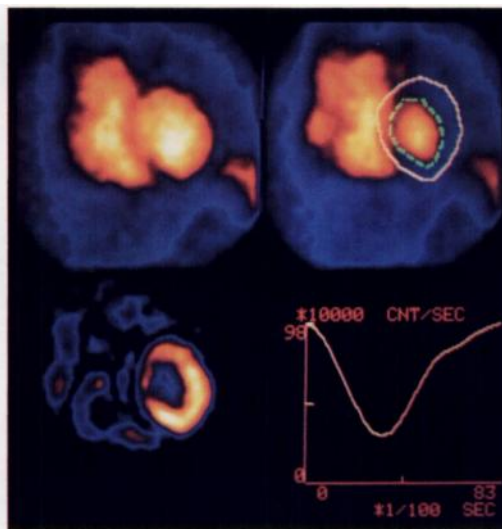
Continuity. Compatibility. Connectivity. Elscont design engineers have created the Apex SP Series to be fully operational with existing Apex systems and established software. Standard protocols are still standard—except they can be processed much faster. And procedures that have been considered impractical will now be routine.

*Registered trade name of E. I. DuPont Co.
†Registered trade name of Mallinckrodt, Inc.

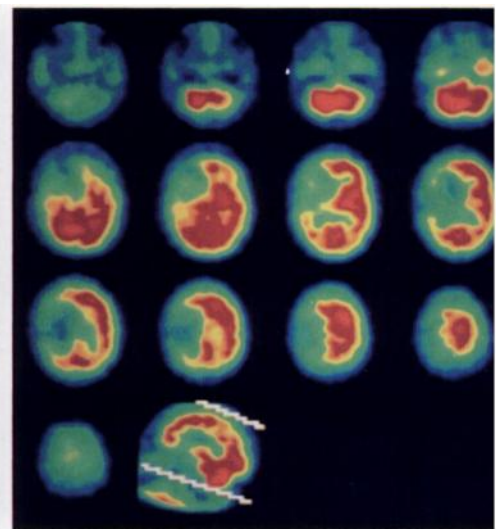
nuclear camera? speed? validated over 10 years?



Bullseye: SPECT Thallium-201 (^{201}Tl) stress/redistribution using *Cedars Sinai* Polar Mapping.
Apex Speed: 1 min
(5 minutes with 16-bit system)



Multi-Gated Processing.
Apex Speed: 30 sec
(4 minutes with 16-bit system)



Transverse slices: Brain SPECT using HM-PAO.†
Apex Speed: 0.8 sec
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The Apex SP Series: Only from Elscint.

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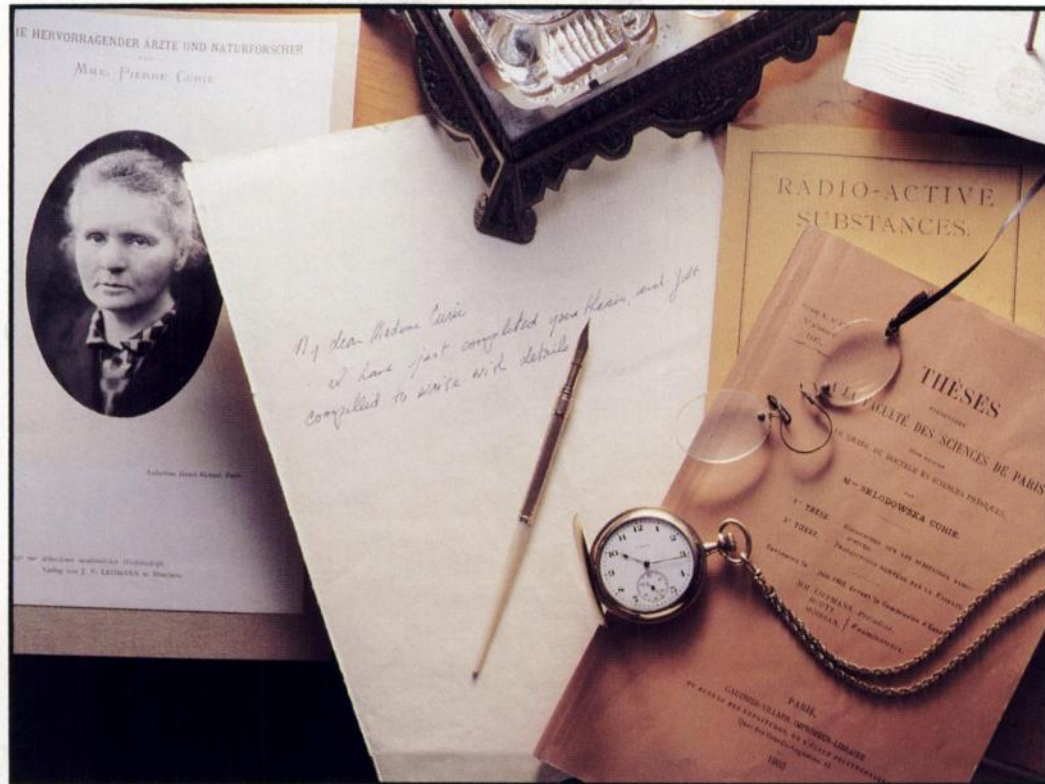
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1903 WAS THE YEAR, THE

MEDICAL WORLD WAS A DIFFERENT PLACE. FOLLOWING HENRI BECQUEREL'S STUDIES, THE RESOLUTE MARIE CURIE ISOLATED RADIUM. THE SUBSEQUENT PUBLICATION OF HER THESIS FOR LA FACULTE' DES SCIENCES DE PARIS, FORMED THE BASIS OF TODAY'S NUCLEAR MEDICINE. ♣ ADAC LABS IS PROUD TO SALUTE THE BREAKTHROUGHS OF HENRI BECQUEREL AND MADAME CURIE. AT ADAC, WE LOOK FOR INNOVATION AT ALL LEVELS OF TECHNOLOGY, SERVICE AND PERFORMANCE. ♣ AT THE UPCOMING SNM MEETING WE URGE YOU TO TAKE A CLOSER LOOK AT OUR INNOVATIVE SOLUTIONS FOR DIAGNOSTIC IMAGING. WE WILL BE DISPLAYING AT BOOTH #723. ♣ ADAC LABS, BUILDING UPON THE PAST, FOR THE NEEDS OF TODAY, WITH THE VISION FOR TOMORROW. ♣

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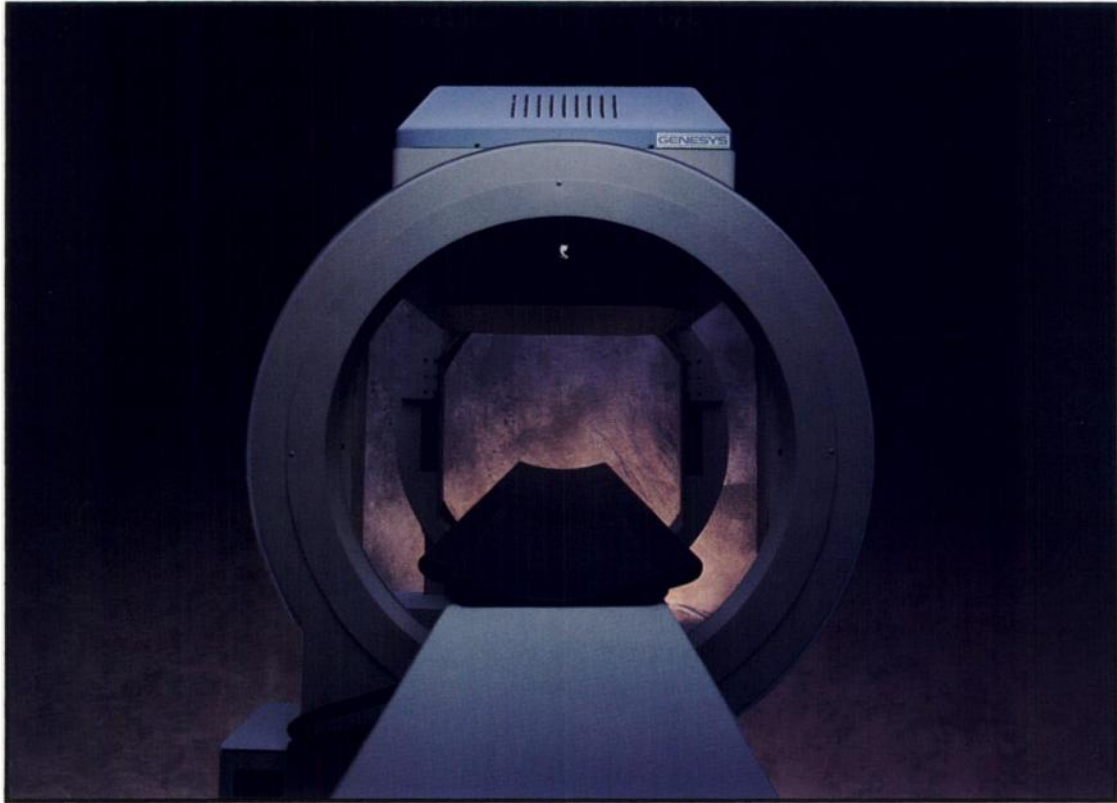
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Internal Radiation Dosimetry

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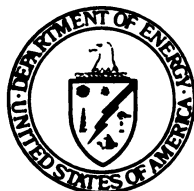
**S. James Adelstein,
M.D., Ph.D.**

Co-Chairman:

**Amin I. Kassis,
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September 21 & 22, 1989

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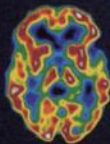


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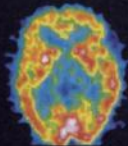
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TOMOMATIC – the most sensitive brain-imager ever seen.



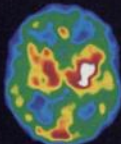
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– Spatial resolution of 9 mm within a five-minute acquisition time. Excellent in clinical environments.



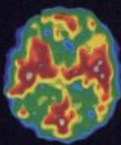
I-123 TOMOMATIC SPECT

– Resolution of 6 mm regardless of the dosimetric limitations.



Xe-133 TOMOMATIC SPECT

– Quantitative blood flow images with four-minute acquisition time.

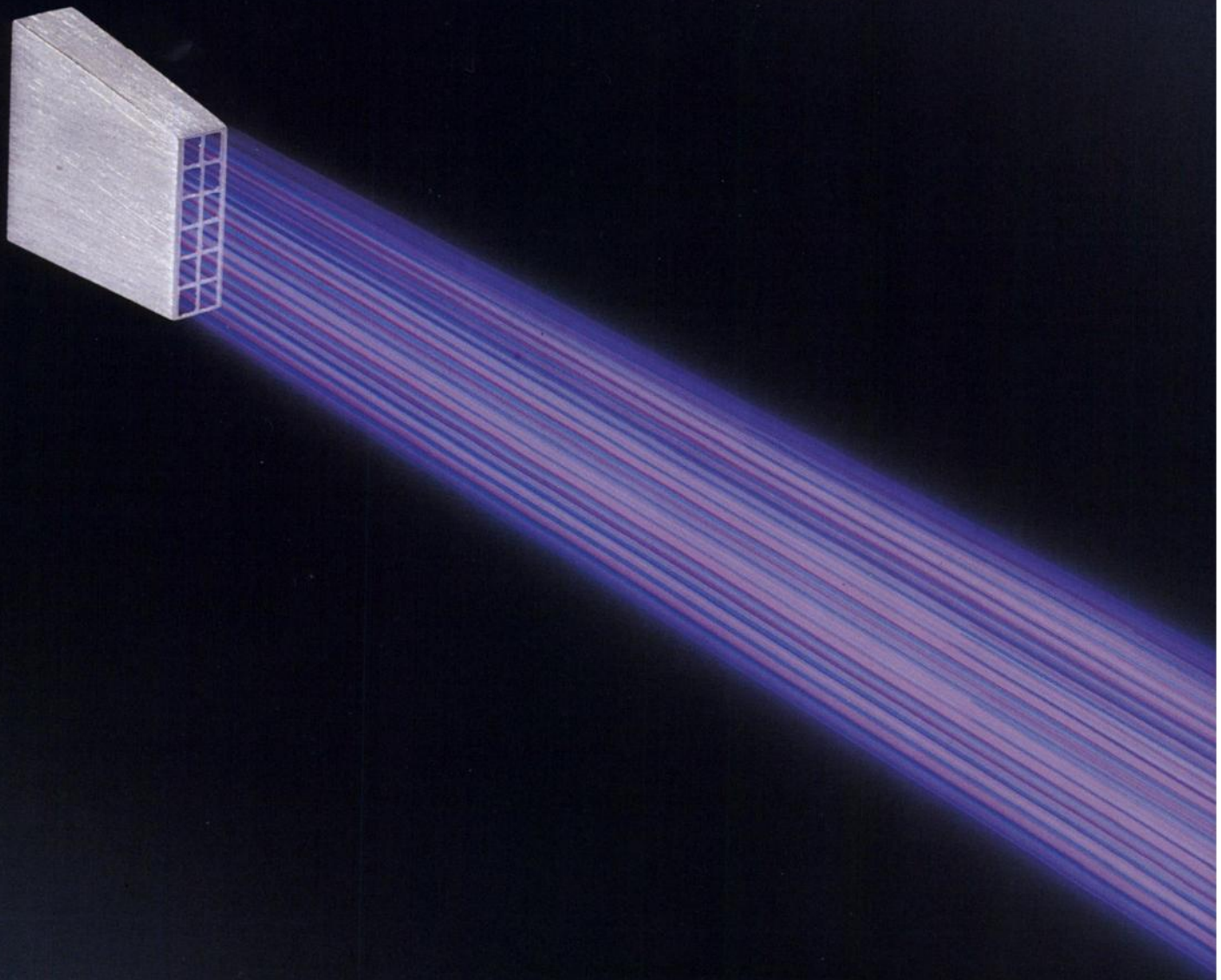


Xe-127 TOMOMATIC SPECT

– Quantitative blood flow images with high resolution and four-minute acquisition time. Low patient exposure.

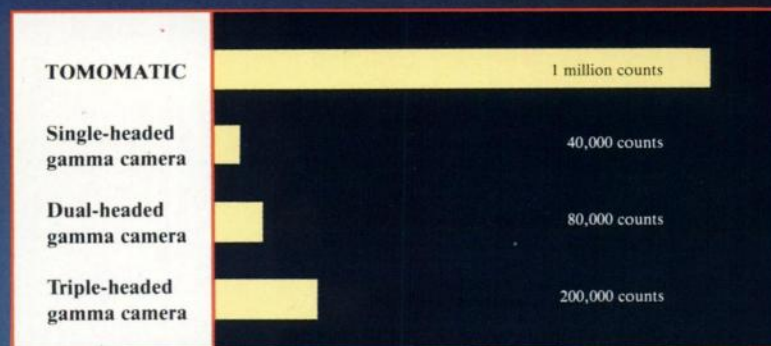
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Leader in Brain SPECT



**All TOMOMATIC multiple-slice
brain-dedicated SPECT systems offer more
sensitivity than any other multiple-head camera.**

Brain-slice sensitivity where spatial resolution and thickness are equal in all systems



Even a triad of gamma cameras can't compete with
the sensitivity of a TOMOMATIC!

TOMOMATIC – the ultimate in brain-dedicated SPECT.

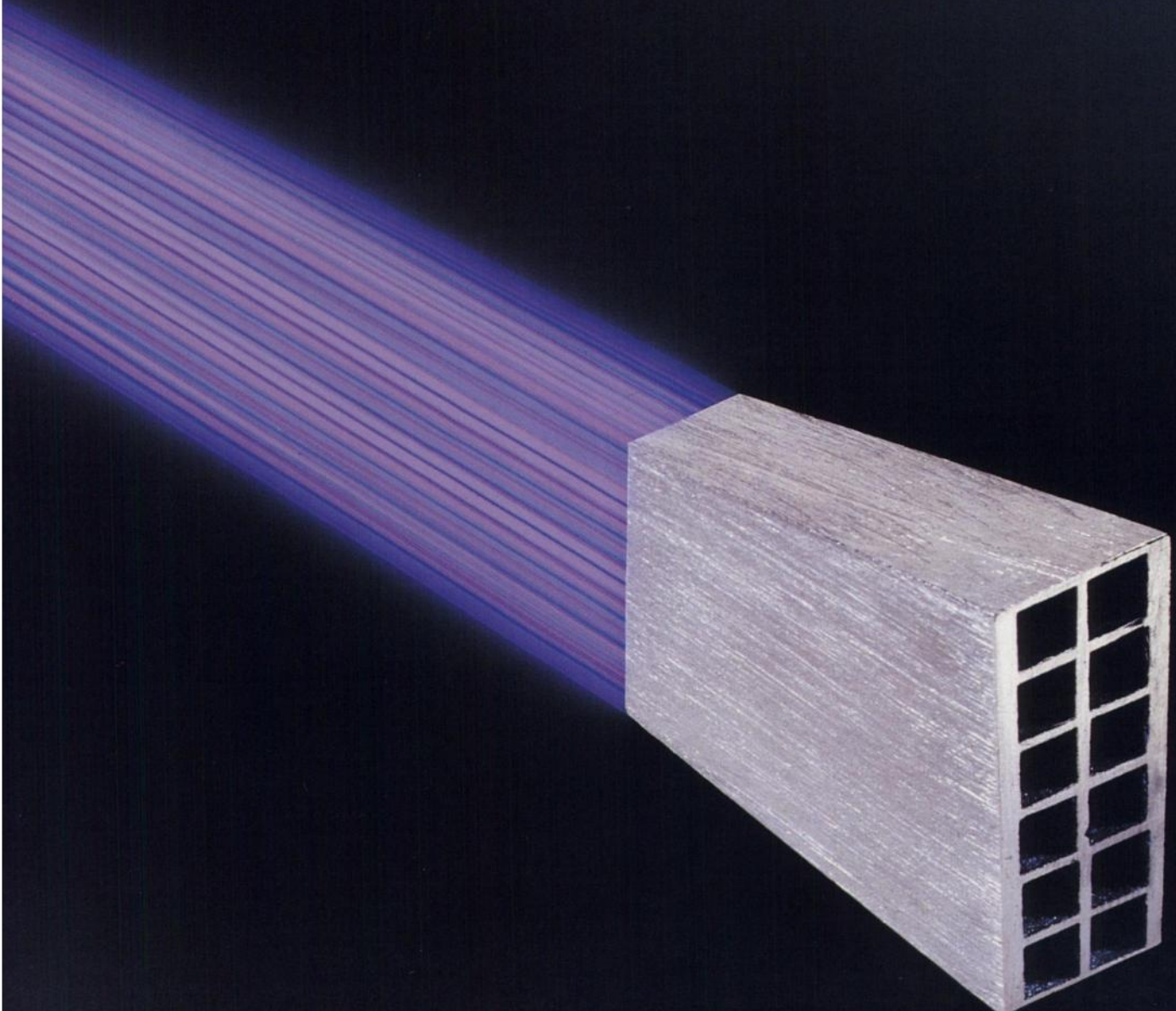
The sensitivity of the brain-dedicated dynamic TOMOMATIC SPECT is impressive and 25 times better than a conventional rotating general purpose gamma camera.

TOMOMATIC offers:

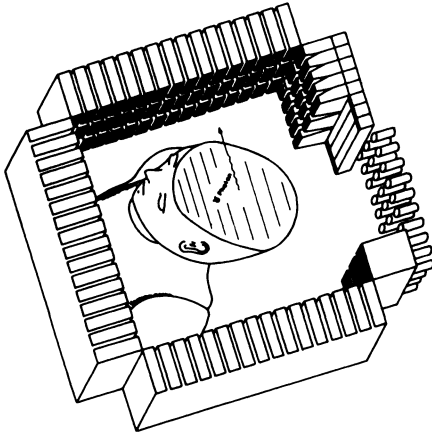
- ★ Resolution of 6 mm;
four slices of 9 mm thickness imaged simultaneously.
- ★ Resolution of 9 mm;
four slices of 9 mm thickness imaged simultaneously.
- ★ Resolution of 12 mm;
five slices of 19 mm thickness imaged simultaneously.

=====**medimatic**=====

Leader in Brain SPECT



Tremendous sensitivity gives TOMOMATIC outstanding performance



Description

The state-of-the-art TOMOMATIC dynamic SPECT (DSPECT) systems are optimized for high sensitivity and, consequently, high resolution. The multi-slice detector system consists of four (4) cameras located in a square close to the object with 64 sodium iodide crystals in each slice. It also has a variety of collimators, which are all built as narrow, double focussing arrangements to ensure uniform spatial resolution and high sensitivity. DSPECT requires high sensitivity in a short imaging time. The TOMOMATIC SPECT systems use continuous rotation and can acquire a 360° image with an acquisition time of only five seconds. No other commercial SPECT system has been able to show higher resolution in clinical use. The TOMOMATIC is superior as a result of its fast rotation and high sensitivity. In fact, because it has continuous rotation speed and has no lateral moveable detector parts during data acquisition, the TOMOMATIC gantry is very simple and reliable. Plus, it requires no adjustment or performance checks. Light positioning makes patient repositioning easy and very reliable.

Performance

The ultimate goal of the TOMOMATIC brain SPECT is to provide the highest resolution picture necessary for diagnosis. Without high sensitivity, high resolution is not possible in clinical use. The narrow double focussing collimators provide nearly uniform spatial resolution throughout the field of view, which is necessary if subcortical regions are of interest. The easily exchangeable collimators of the TOMOMATIC SPECT systems are designed so that the trade-off between sensitivity and resolution is optimized for all commercially available radiopharmaceuticals for brain SPECT studies.

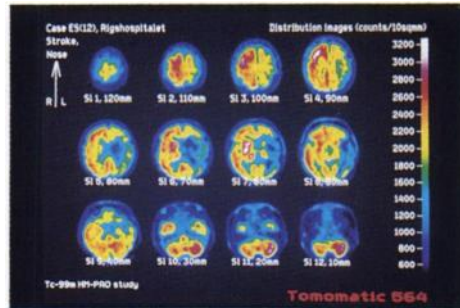
Each of the camera heads can be moved radially so that the spatial sampling distance can be reduced by a factor of up to four. As a result a better spatial resolution can be achieved.

Spatial resolution with different collimators:

	Spatial resolution (FWHM, mm)	Slice thickness (FWHM, mm)	Distance between slices (mm)
High sensitivity collimator:	17	19	0
Medium-high sensitivity collimator:	12	19	0
High resolution collimator:	9	10	10
Ultra-high resolution collimator:	6	10	10

Performance characteristics

Maximum resolution	6 mm FWHM
Maximum sensitivity	190 kcps/mCi/l
Count rate	900,000 count/sec, loss 20%
Minimum scan time	5 seconds
Number of slices	Up to 5 simultaneously
Field of view	21.8 cm
Number of NaI crystals	64
Crystal size	160 × 13 × 25 mm



Computer System

At the heart of every SPECT system is the computer and its software system capabilities. TOMOMATIC's state-of-the-art DEC Micro-Vax computer is easy to use, simple to upgrade and adaptable to network use. It is designed to keep pace with the latest developments in nuclear medicine. The software system consists of (1) a multi-user operating system (VMS) that controls the peripheral devices and (2) a collection of basic functions. The comprehensive set of basic functions is necessary for calibration, data collection, sorting and sensitivity correction, filtering and reconstruction, quantitative rCBF flow calculation, and display functions.

In addition to the basic functions, there are statistical functions: patient data base, region of interest (ROI) capabilities, and special macro capabilities, where inexperienced users can operate the system and write their own application programs.

TOMOMATIC Software

- VAX/VMS multiuser operating system
- Filtered back-projection (FBP) and Maximum Entropy (ME) reconstruction
- Parametrized back-projection filters
- Patient data base
- Regions of interest
- Mean value and standard deviation in regions of interest
- Image filtering
- Camera controller and camera diagnostics
- MCL (Medimatic Command Language) macro-language for easy user applications.

Applications

Neuropsychological stimulated repetitive Xenon flow (quantitative) Xenon 133 and Xenon 127 enter and leave the brain within a few seconds. Therefore, a high sensitivity SPECT system allowing rapid imaging should be used. This type of study is non-invasive, fast and convenient for the patient who is connected to a respiratory system. During a four-minute period, four consecutive one-minute acquisitions are performed and the quantitative (ml/100 g/min) data are calculated according to the algorithm developed by Kanno and Lassen.

Multiple quantitative flow studies can be performed with intervals of only 10 minutes, which makes performance activation tests (i.e. Wisconsin cart sort) very easy and convenient for both the hospital staff and the patient.

TOMOMATIC is using the commercially available SPECT system proven to be capable of using every single photon emitter available for brain imaging (i.e. Xe-133, Xe-127, Tc-99, I-123, In-111).

With the TOMOMATIC SPECT, various diseases can be diagnosed at a time when treatment is still helpful, not when the tissue has changed irreversibly.

A few clinical cases where TOMOMATIC SPECT studies can prove invaluable to be performed:

- Stroke patients requiring scans in order to interpret the extent of the damage and luxury perfusion of infarct.
- Head trauma patients requiring scan from a prognostic standpoint in order to assess more accurately rehabilitative potential.
- Dementia patients imaged in an effort to interpret the cause of dementia, i.e. multi-infarct dementia versus Alzheimer's disease.
- Epileptic patients with focal recurring seizures imaged for therapeutic purposes including neurological surgery.
- Miscellaneous neurological patients such as migraine patients or other cerebrovascular diseases.

Selected TOMOMATIC users



Daniel Weinberger, M.D., National Institutes of Health, Washington, D.C., USA. TOMOMATIC 564. Uses TOMOMATIC with high resolution quantitative Xe-127 and high resolution I-123 QNB on patients with psychiatric disorders.



David Ingvar, M.D. University of Lund, Lund, Sweden. TOMOMATIC 564. Uses the quantitative TOMOMATIC rCBF procedure for research in the area of specific brain activation (multiple activation studies) and clinical evaluation of neurological diseases.



Niels A. Lassen, M.D., Bispebjerg Hospital, and Olaf Paulson, M.D., University Hospital, Copenhagen, Denmark. TOMOMATIC 232 and TOMOMATIC 64. Developed the quantitative flow algorithm. Use TOMOMATIC for clinical evaluation before surgery and for cerebrovascular diseases in general.



H. Kanaya, M.D., Iwate Medical University, Morioka, Japan. TOMOMATIC 64. Uses TOMOMATIC SPECT for evaluating quantitative rCBF in connection with hypertension and flow before surgery.



Claude Raynaud, M.D., Hôpital d'Orsay, Paris, France. TOMOMATIC 564. Determined that the similarity between quantitative TOMOMATIC rCBF and quantitative PET is excellent. Uses TOMOMATIC for quantitative rCBF evaluation in infants.



C.M. Kirch, M.D., Ludwig-Maximilians University, Munich, W. Germany. TOMOMATIC 64. Uses the quantitative procedure for evaluation before surgery. Compares regions of interest using special isolevel areas.

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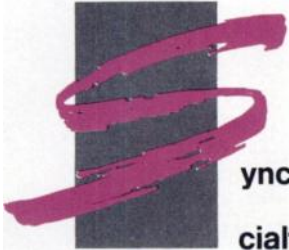
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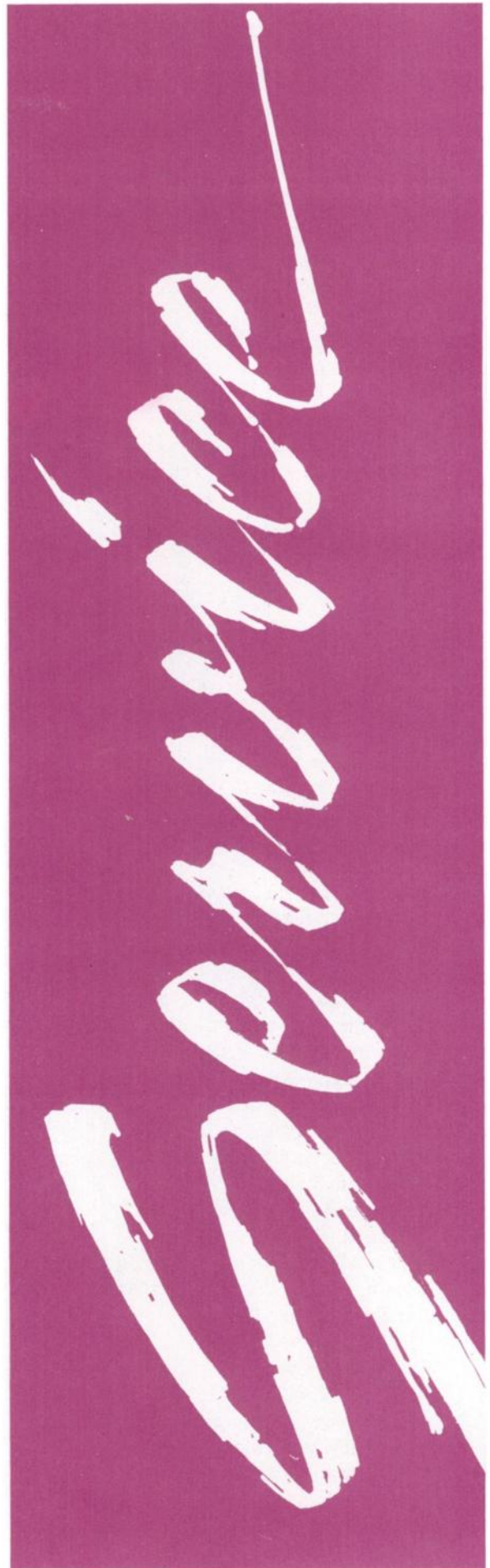


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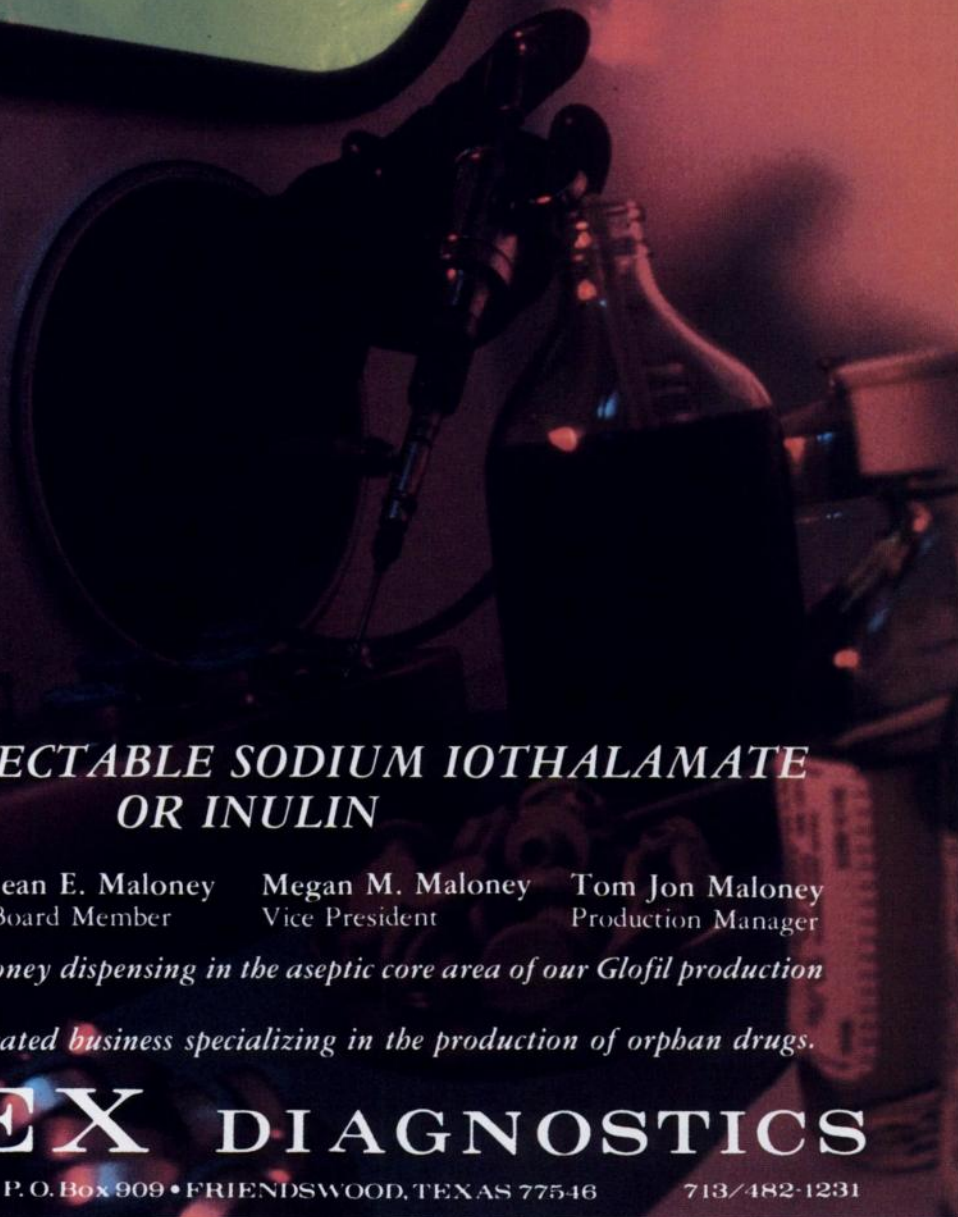
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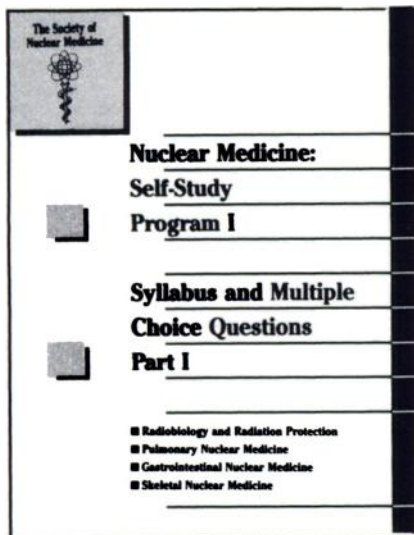
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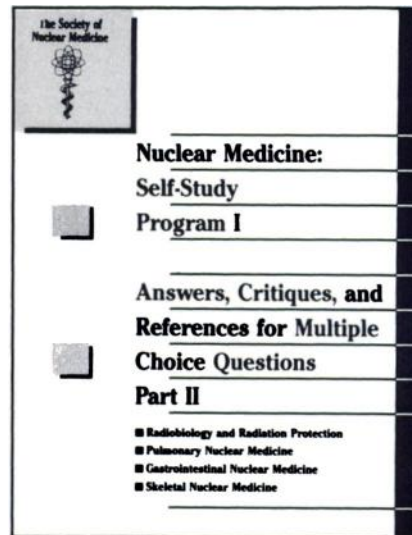
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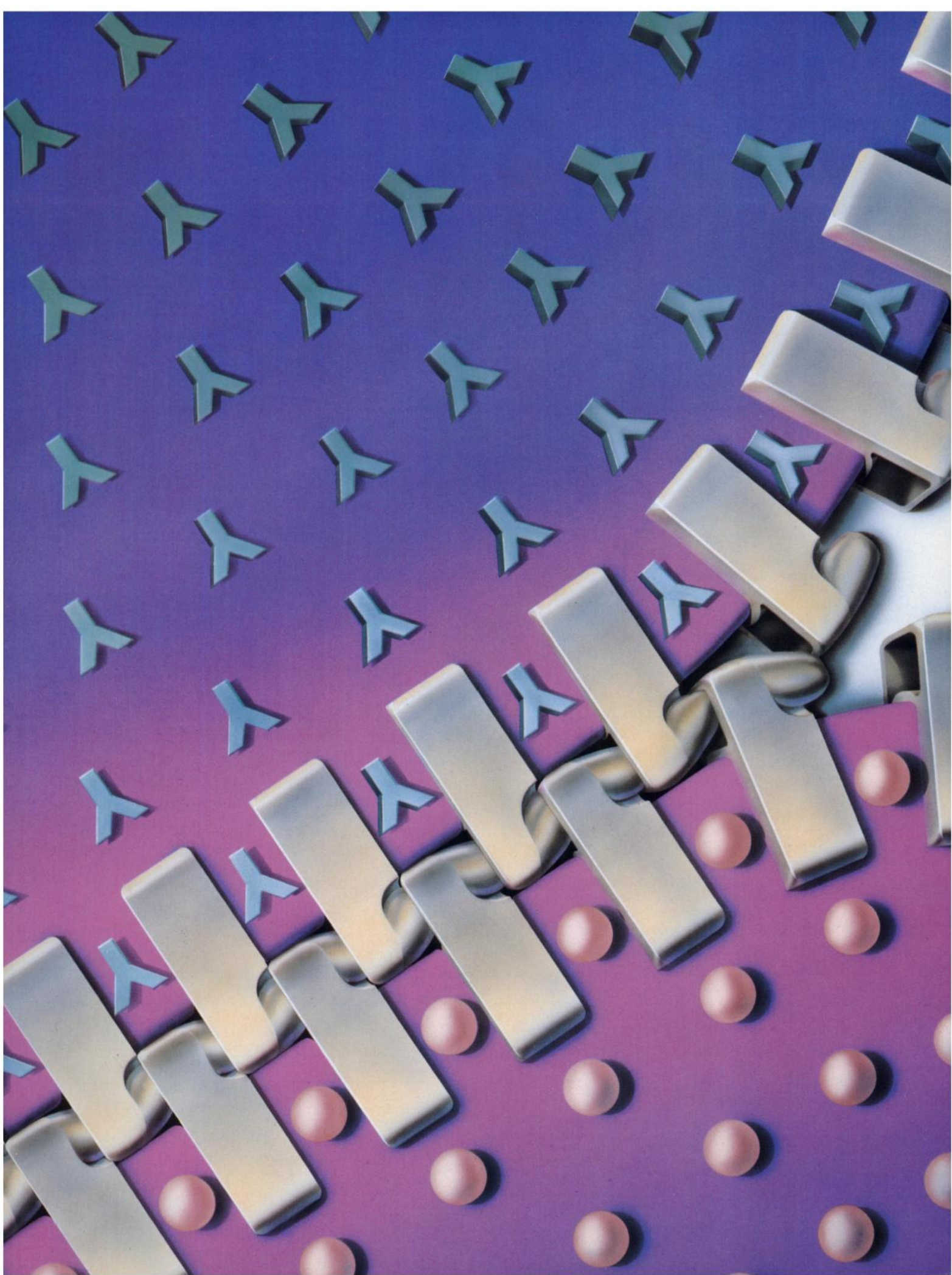
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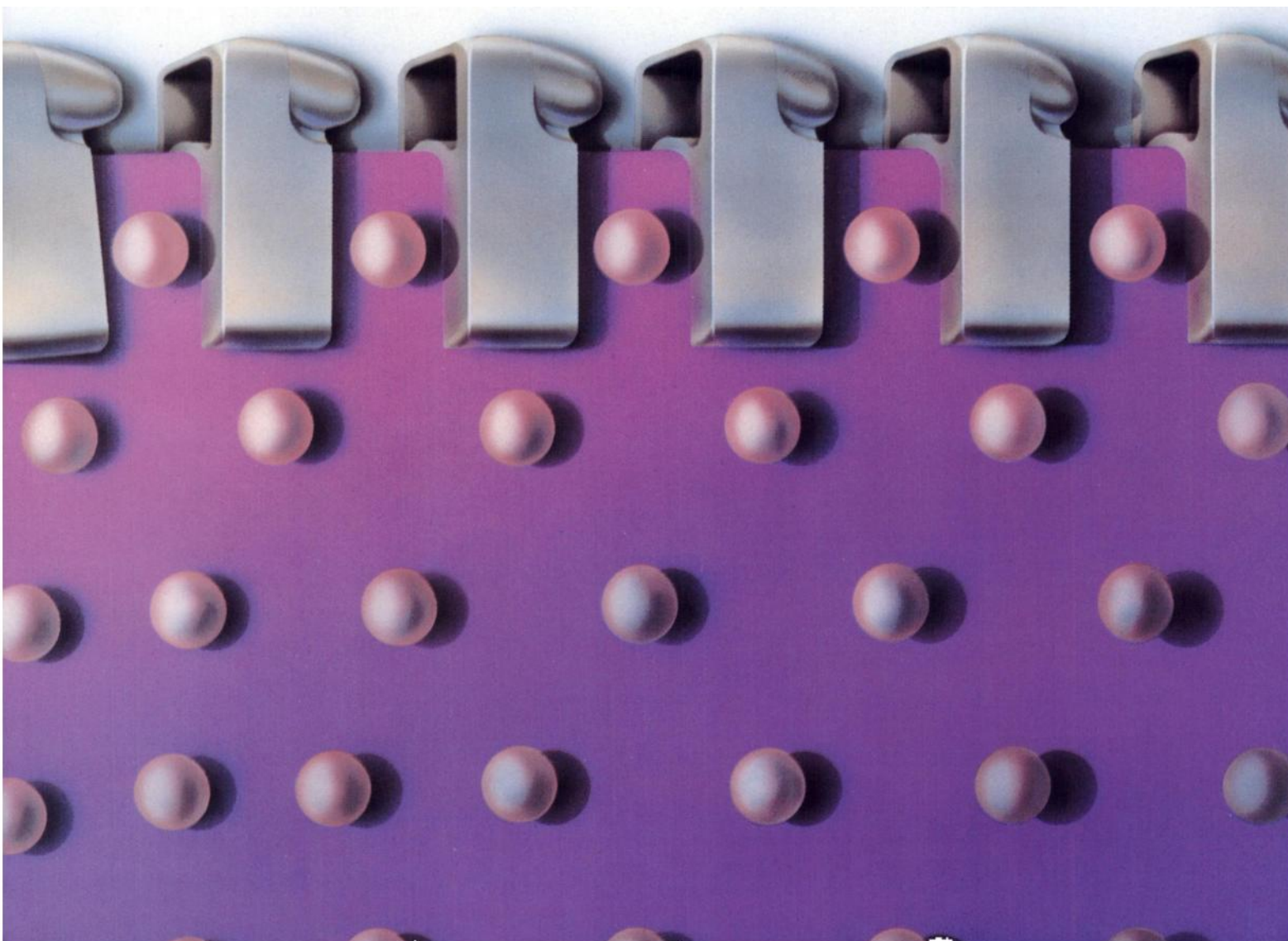


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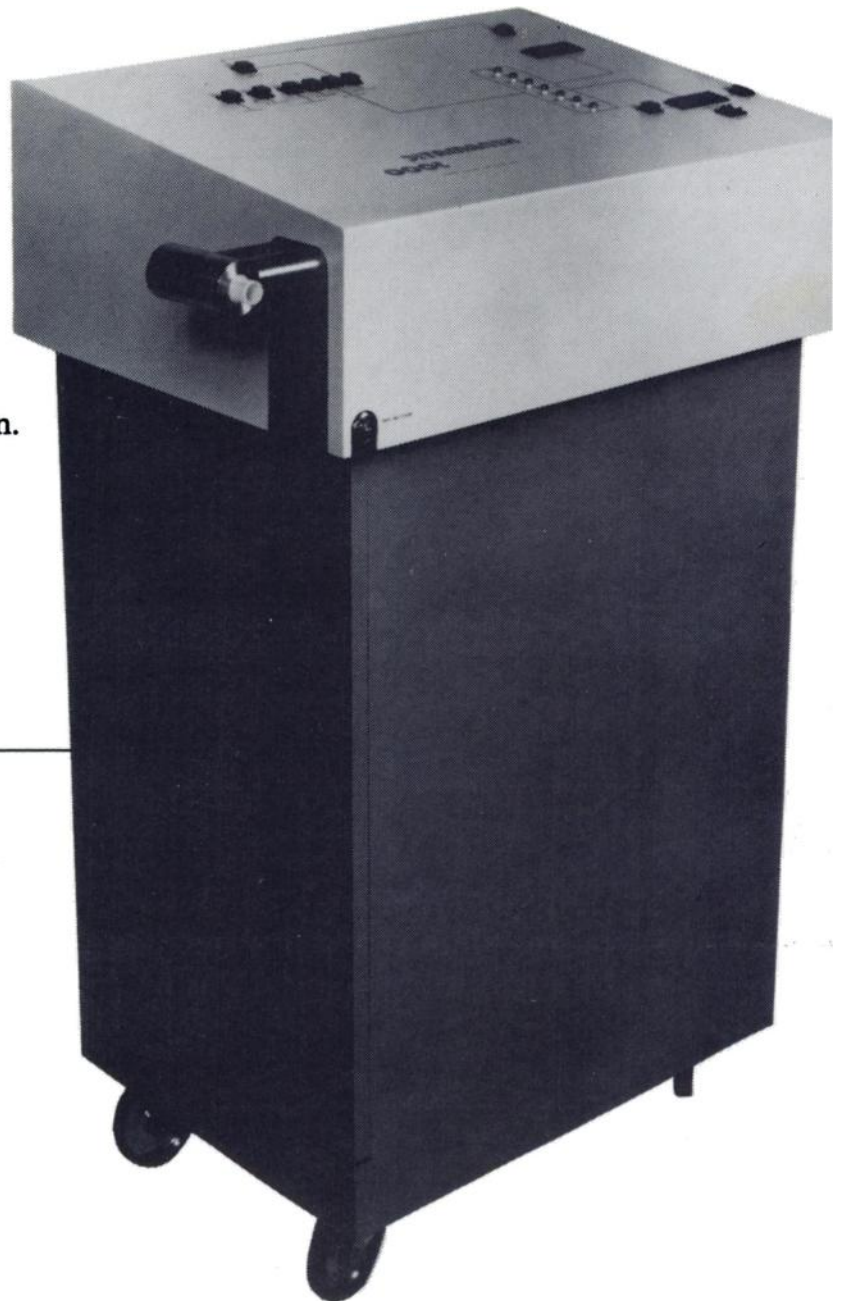
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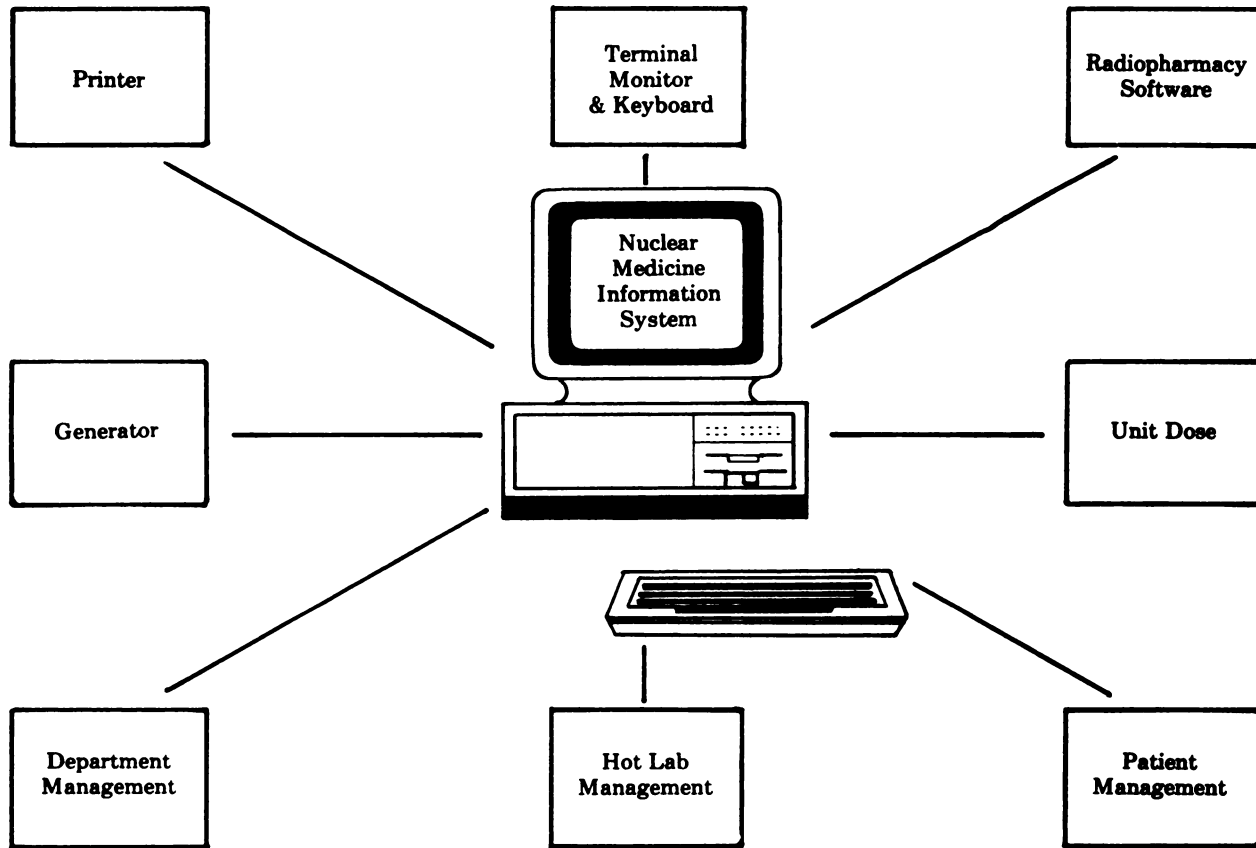


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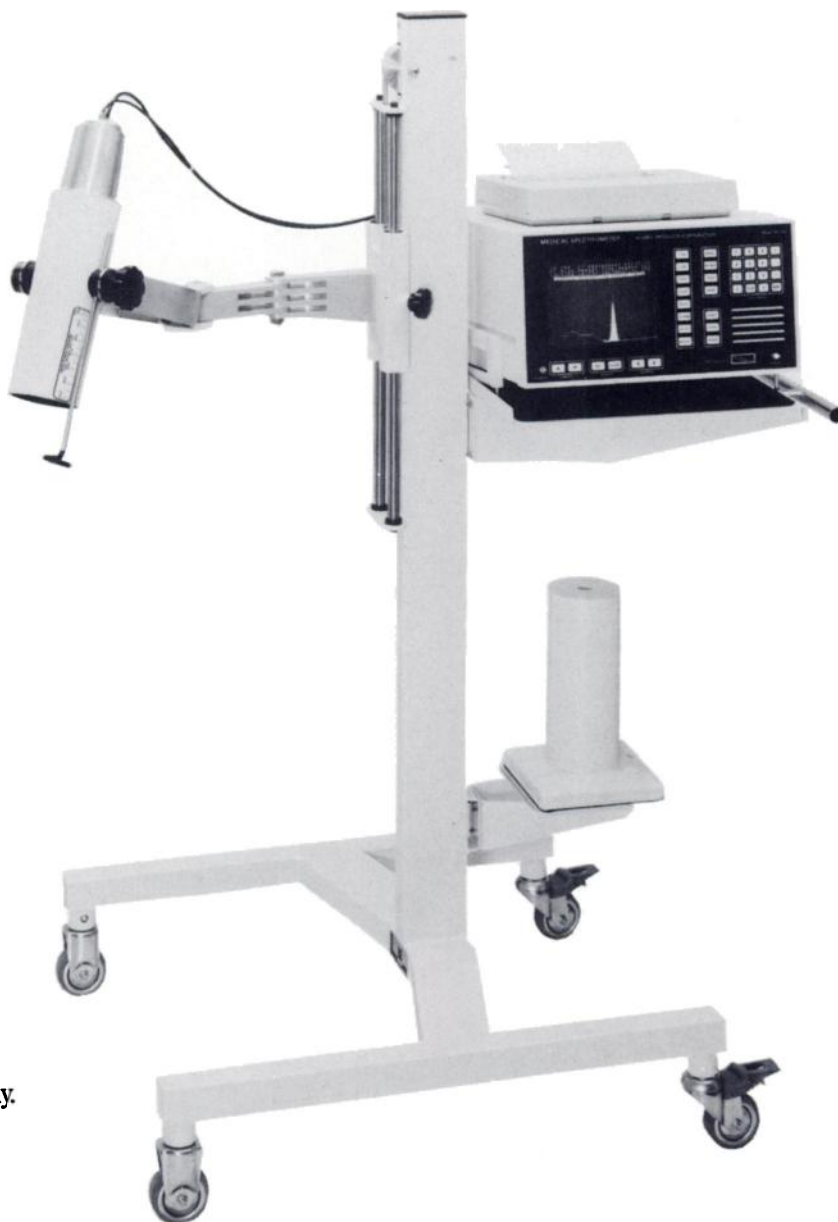
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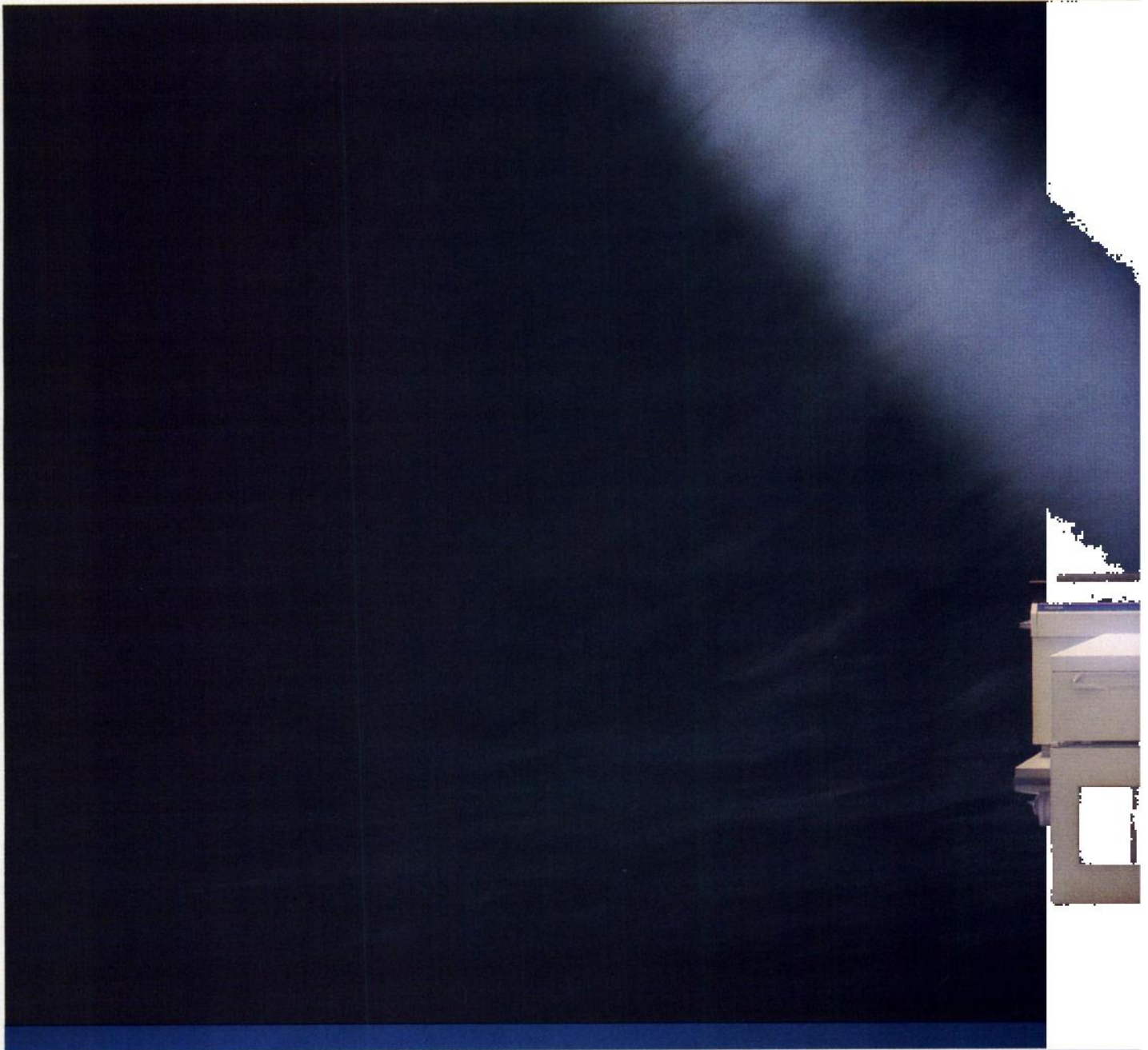
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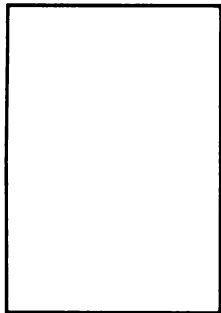
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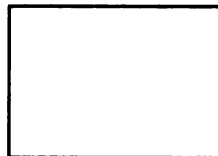
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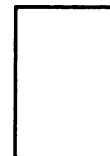
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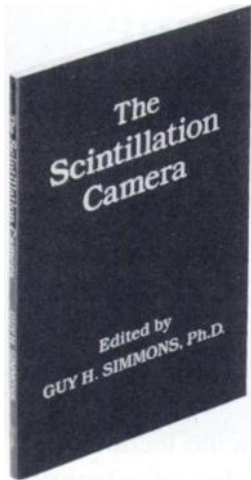
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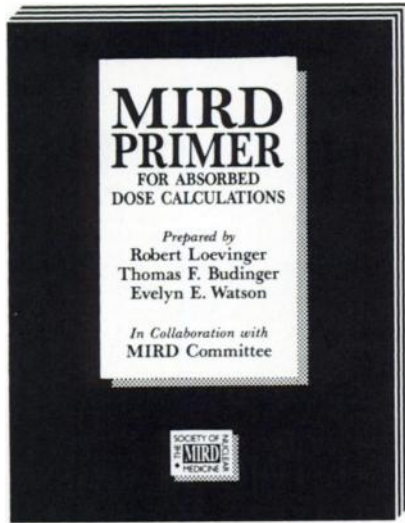
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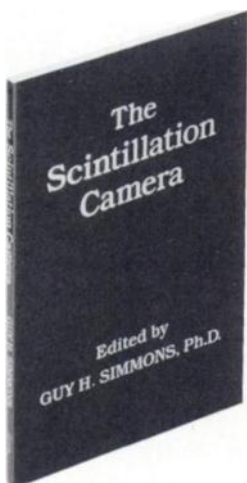
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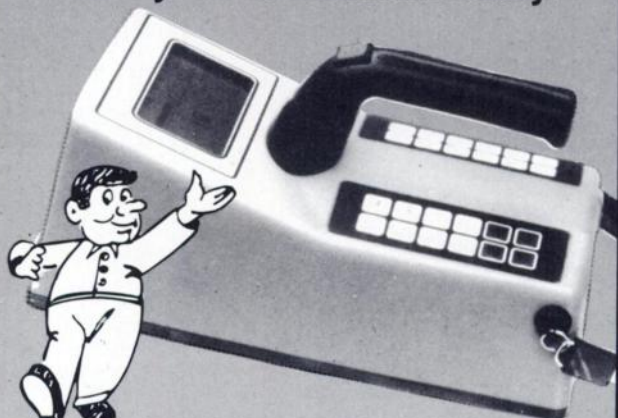
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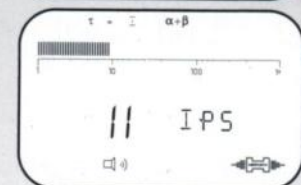
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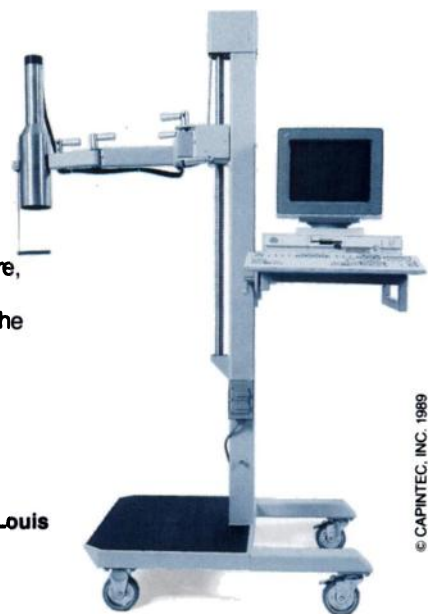
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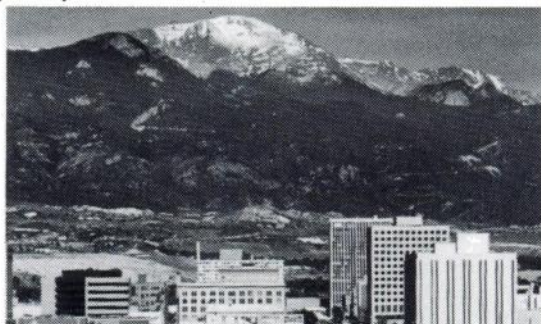
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NUCLEAR MEDICINE TECHNOLOGIST. Full-time position + on call every 4-5 weeks, at the University of Washington Medical Center in Seattle, a 360-bed tertiary hospital with an active nuclear medicine residency program. Position requires certification. GE Starcam experience is useful. Position includes computer protocol design and implementation, daily clinical nuclear medicine, and participation in professional and scientific meetings. The only thing better than vacationing in the Northwest is living here. Call or send resume to: Ray Thomas, Nuclear Medicine, RC-70, University of Washington Medical Center, 1959 NE Pacific Ave., Seattle, WA. 98195. (206) 548-4240. EOE

Naval Hospital, Portsmouth, VA is currently contracting to hire **NUCLEAR MEDICINE TECHNICIANS.** For additional information call: (804) 389-5808.

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M.D. Anderson Cancer Center, one of the nation's leading cancer institutions, is seeking candidates in Nuclear Medicine to work in our fully computerized and highly automated Division of Diagnostic Imaging.

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Applicants should have training in medicine, radiology or other clinical specialty and should be board eligible in nuclear medicine. The position will provide special training opportunities in nuclear medicine. The fellow will be expected to participate in one or more PET research projects. Applicants must be eligible to obtain a license to practice medicine in the state of Tennessee. The salary will be commensurate with the applicant's training and experience.

Send application letter and curriculum vitae to: K.F. Hubner, M.D., Director, Nuclear Medicine.



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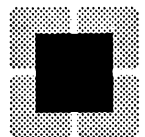
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Cleveland Clinic Florida, a multi-specialty group practice, located in Fort Lauderdale, Florida, is currently seeking a Nuclear Medicine Technologist to join our progressive and innovative Radiology Department. This is a full-time, day position.

To qualify, you must be an ARRT/CNMT with a minimum of 2 years experience with SPECT. Experience with Siemens equipment would be a plus.

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QUALIFICATIONS: Master's degree (Doctorate preferred) in health science or related field; four years of experience in the field of Nuclear Medicine; knowledge and understanding of SPECT Imaging and computer application; previous teaching experience and background in Health Physics are desirable.

SALARY: Rank and salary commensurate with qualifications. Tenure track position, contingent on funding.

APPLICATION: Applications will be accepted until position is filled, with a review of applications beginning June 1, 1989. Position commences September 1989. Submit current vitae with the names and addresses of three current professional letters of reference to: Art Meyers, Chair, Search Committee, Department of Radiological Sciences, University of Nevada, Las Vegas, 4505 Maryland Parkway, Las Vegas, Nevada 89154-3017. The University of Nevada, Las Vegas is an equal opportunity/affirmative action employer and employs only U.S. citizens and aliens authorized to work in the U.S.

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We pay interviewing expenses for qualified applicants. For more details, please call collect or write: Kathy S. Svoboda, Professional Recruiter, Regional Medical Center, Hospital Drive, Madisonville, KY 42431. (502)825-5244 EOE/M/F

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Applicants must be certified nuclear medicine technologists with experience in nuclear medicine technology education. Experience in clinical research is desirable. The position will include teaching responsibilities in the nuclear medicine technology school and will provide special training opportunities in clinical PET technology. The salary will be commensurate with the applicant's training and experience.

Send application letter and curriculum vitae to: K.F. Hubner, MD or Jeff Collman, PhD, Nuclear Medicine, UTMCK, 1924 Alcoa Highway, Knoxville, TN 37920.

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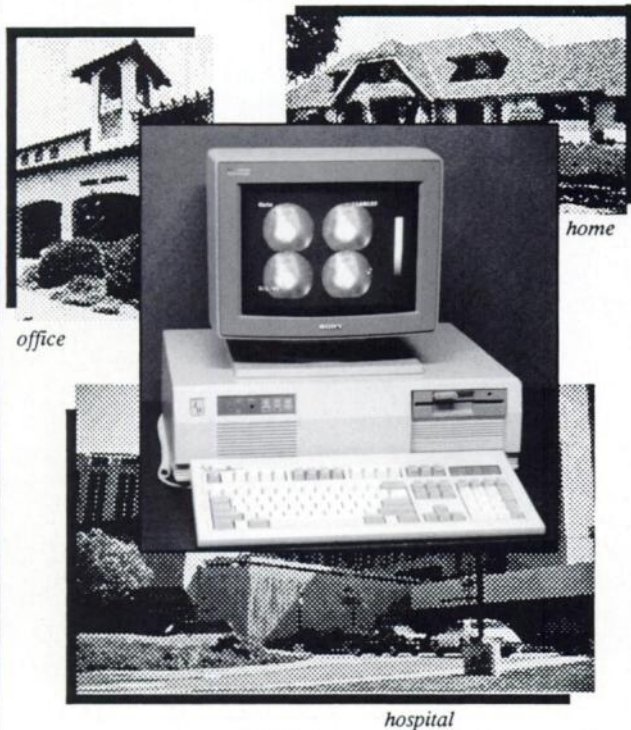
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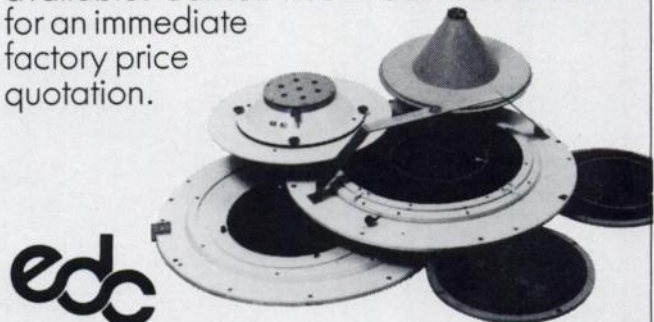
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Micro Channel Bus

Canberra Industries announces a new version of the popular System 100 PV/MCA board for use with IBM's Micro Channel Bus. The new board is compatible with IBM PS/2 Models 50, 50Z, 60, 70, and 80 running under DOS V3.3. All functionality of the System 100 board remains the same. As with the original PC-Bus board, the new version operates under Microsoft Windows 286 or Windows 386. With 16K data channels, an on-board 16-bit micro-processor, and full-featured MCA display software, the System 100 is one of the most flexible MCA boards available. Contact Canberra for a complete listing of System 100 products which include traditional PC-Bus boards, conveniently packaged signal processing units, and software packages. **Canberra Industries, Inc., One State St., Meriden, CT 06450. Attn. Michela Hirnak. (203)238-2351.**

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The Starlight 1000 viewing station from GE Medical Systems can provide a high-quality, low-cost alternative to conventional film viewing of nuclear medicine images. It can receive data from any acquisition or processing system on the GE Starlink local area network, for high resolution and remote presentation of patient data. Starlight image quality features include: 728 × 588-pixel, monochrome display monitor; multi-image display capability; independently adjustable window/leveling. Efficiency and easy to use features include: 40-megabyte disk for temporary image storage; optical mouse for quick selection functions; window buttons for frequently used functions; automatic program flow operation, for fast selection of images from display lists.

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For more information on the Starlight 1000, Star 2000, and Star 3000, contact: **GE Medical Systems, PO Box 414, Mail-code W-412, Milwaukee, WI 53201. (800)624-5692.**



PC-Based Optical Archiver

AVP Concord introduces a new, low-cost, easy to use PC-based optical archiver. The Librarian is a remote digitize and image archive station that can hold up to 9000 digital images on each 5¼-in removable optical disk with no loss of spatial resolution or grey scale. It can be attached to any modality for immediate storage of images as they are processed; acquisition and archive can be accomplished at one station, by one operator. Employing AVP's easy to use software, its archiving procedure is reduced to entry of patient identification and

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Circle Reader Service No. 103

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Improvement in processing capabilities and speed make GE's new Star 2000 nuclear medicine computer system a cost-effective way to enhance department productivity. System components include: 16-bit CPU; 16-bit co-processor; 84-megabyte Winchester disk; 2-megabyte image memory. The system can be dedicated to acquisition and data processing, or used as a data processing station. The Star 2000 offers advanced processing capabilities including broad SPECT analysis, such as motion correction and multigated tomography.

GE's Star 3000 nuclear medicine computer system features an advanced computer architecture designed to help

minimize processing delays for high throughput. The system employs powerful processing capabilities, including: 32-bit host CPU, 32-bit co-processor; 32-bit graphics processor; 350-megabyte Winchester disk drive; 8-megabyte image memory. The system can be dedicated to acquisition and data processing, or used as a data processing system. The system offers extensive processing capabilities including multigated tomography, which allows up to 32 frames of data to be acquired or processed, mathematics registers, and motion correction during SPECT exams.

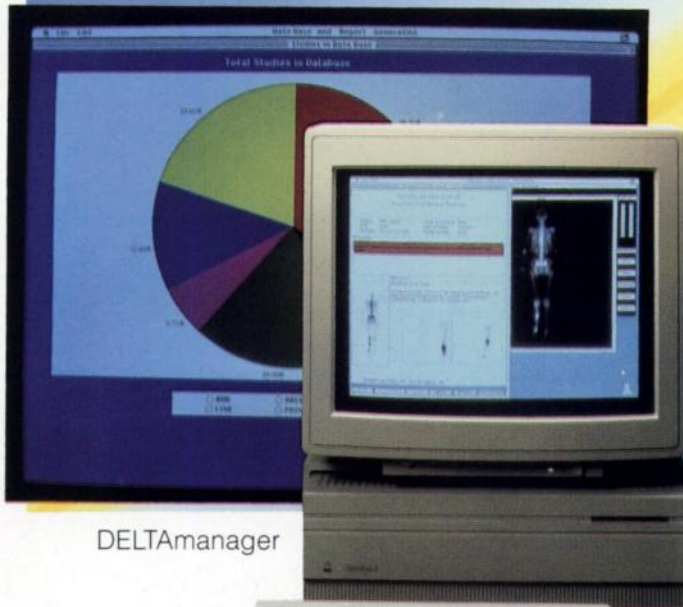
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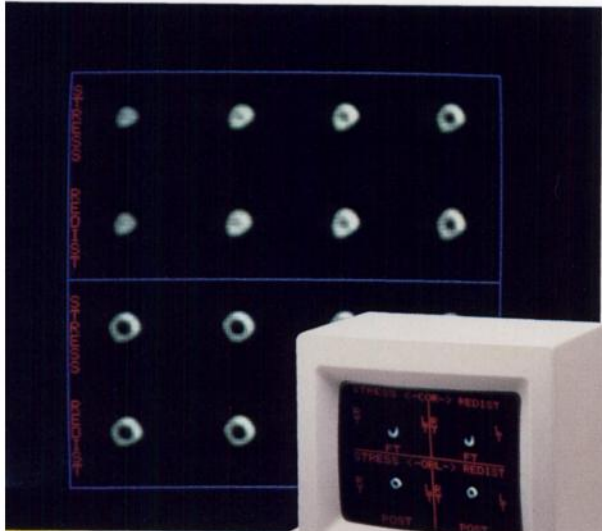


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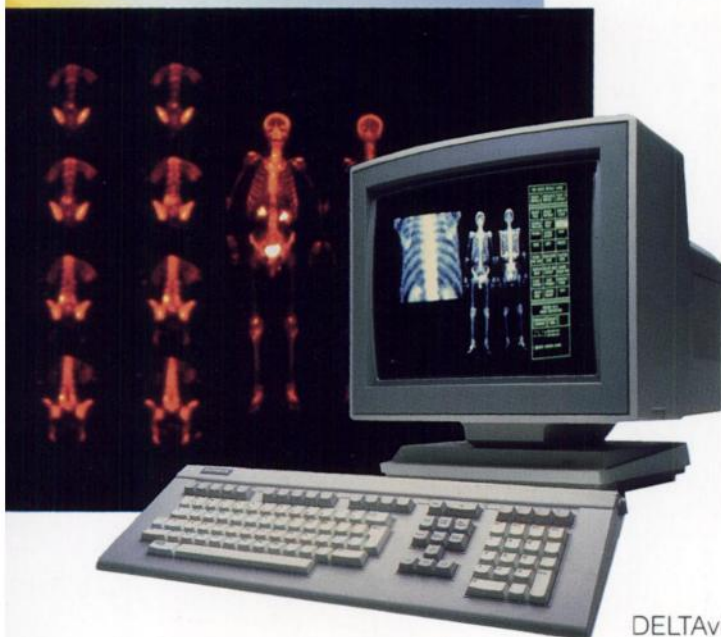
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