If you know get to know

Triosorb®-I25 T-3 Diagnostic Kit*

The in vitro test unmatched for reproducibility, convenience and accuracy.

Reproducible. Over 15 million tests conducted over the past eight years have made Triosorb® the standard of T-3 tests.

Convenient. The disposable Triosorb® Kit is ready for immediate use at room temperature making it one of the simplest, most convenient thyroid function tests available.

Accurate. Approximately 15 drugs and conditions produce misleading Triosorb®-T-3 test results, compared with over 200 factors which affect PBI.

* Also available as Triosorb®-131.

Tetrasorb®-I25 T-4 Diagnostic Kit

An improved, simplified method for measuring total *serum* thyroxine with diagnostic accuracy equal to or better than any currently used measures of thyroid function. Unlike other tests, exogenous iodines don't affect Tetrasorb® results.

one of these, them all.

The T-7 value completes the thyroid profile.

It's the Abbott method for determining the in vitro free thyroxine index.

T-7 is not a test but a numerical value derived from the multiplication of T-3 and T-4 test values. Because it is a product of two other numbers, the *T-7 value* will *move* only when both the T-3 and T-4 values move in the *same direction.* There are *only* two physiological conditions which cause this to occur, *hypothyroidism* and *hyperthyroidism.* With the exception of those patients receiving liothyronine or d-thyroxine therapy, all other factors which affect thyroid function tests will cause the T-3 and T-4 values to move in opposite directions, and the T-7 value to remain in the normal range.

When you provide the Abbott T-3, T-4 and T-7 values you furnish a complete thyroid profile with unparalleled clinical accuracy.

With LOGIC™ your final step is as easy as 1,2,3.

1. Establish a baseline.
   Pre-set count for 10,000; read the required time from the NIXIE tubes.
2. Take a post-wash reading.
   Pre-set *timer* for the baseline established in step 1.
3. ***Read the percentage uptake*** directly from the NIXIE tubes.
   LOGIC™ provides direct ratio readout in percentage.

   No conversions or calculations needed.
   Minimal chance for error.

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World's Leading Supplier of Radio-Pharmaceuticals
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With every shipment of a Raytheon isotope scanner, you get a free Mike Bono.

Mike is our customer assurance specialist. And wherever our isotope scanning equipment goes, so goes Mike.

Not a salesman, not a serviceman, he's something more. A bonus for you, really. It's his job to insure that every Raytheon nuclear scanner is operating at peak efficiency in its new environment. That includes supervising the installation, training the staff, even running response curves and grey scales if need be. In short, Mike is the link between our equipment's arrival and your acceptance.

His credentials? Over ten years' experience in nuclear medicine, including the teaching of various aspects of the science. Now if all this sounds like our equipment needs the help, it's just not so. The truth is though you didn't order Mike, and you may not even need him at all, we just thought you deserved the extra assurance.

Raytheon Company, Medical Electronics,
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Telephone: 617-899-5949.

RAYTHEON

In medical electronics . . . Raytheon makes things happen.

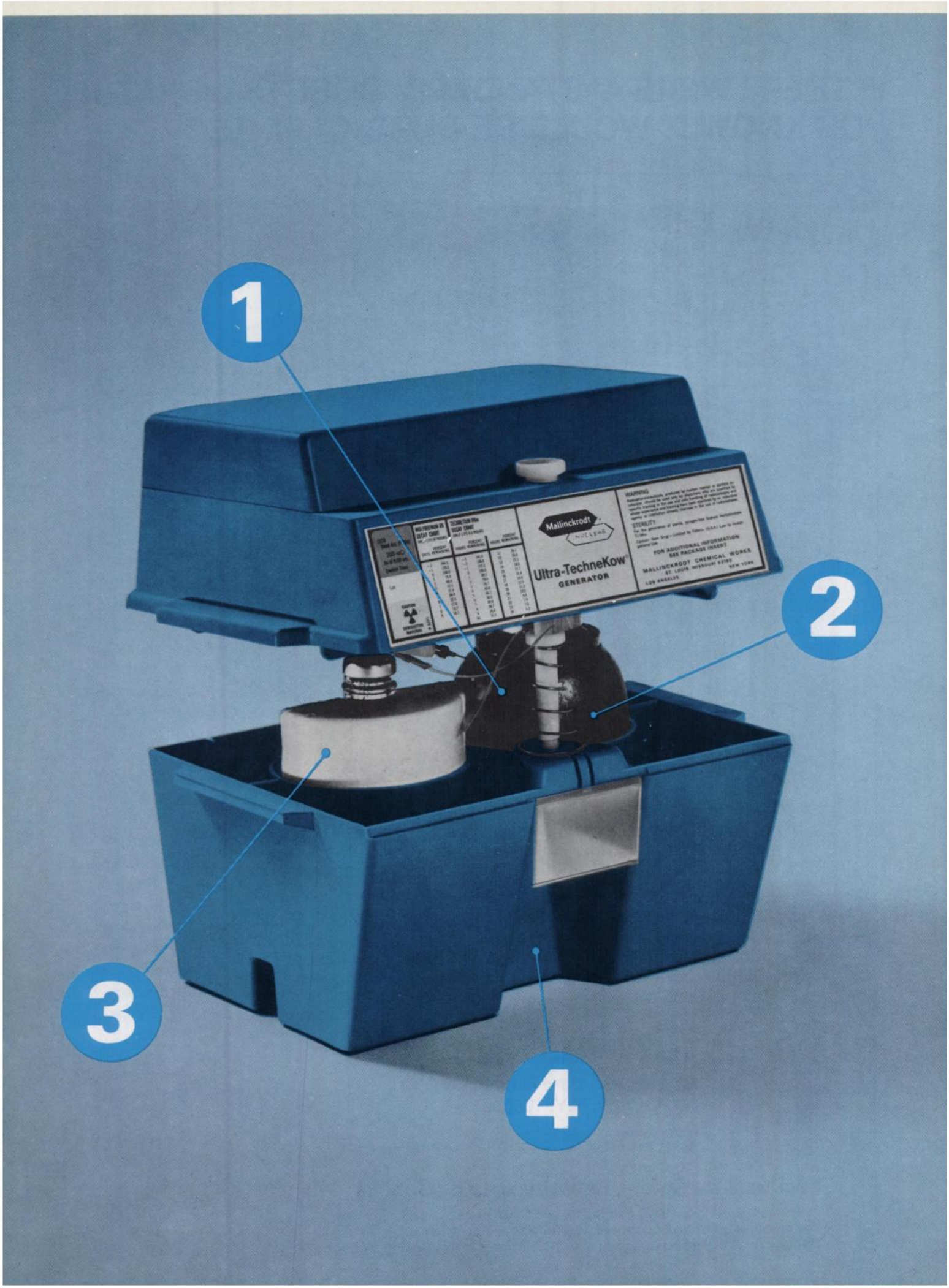
all this...and a generator too.

What you want is Technetium-99m. What you get from New England Nuclear is that and a lot more.

The can opener we supply for example. Other extras are more important. Like the fractional elution and assay kits and the MOLY-CODDLE™ radiation reducer.

Then there are things you don't see, like our testing of *every* generator we ship for sterility, non-pyrogenicity, Molybdenum-99, aluminum, and alumina and other particulates. And perhaps most important, the people at NEN, who are dedicated to getting your generator to you when you want it, and who are there when you need them.

New England Nuclear
Radiopharmaceutical Division
Atomlight Place, North Billerica, Mass. 01862
Telephone (617) 667-9531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with 4 New Features

1. **New enlarged lead shield reduces radiation** exposure to the operator. With at least 1½ inches of lead all around the generator column this is one of the best shielded generators available today.

2. **New "Ion Control" Process** (patent applied for) reduces aluminum level to a point where it is virtually undetectable by normal laboratory test methods. The eluate may be used with any of the currently available sulfur colloid kits or with other tagging procedures requiring low aluminum levels.

3. **New 500-ml saline supply** allows as many as 15 or 16 elutions per week. The saline supply is built in and factory sealed, an exclusive feature of the new **Ultra-TechneKow.**

4. **New self-aligning milking station** makes the elution process simpler than ever. When the "Sight Glass" elution shield with evacuated vial is placed into the milking station, the needle is automatically centered over the evacuated vial. Press plunger down, turn slightly to lock into position, and elution proceeds automatically.

It's the most advanced concept in technetium-99m generators.

This all-new, redesigned version of our **Ultra-TechneKow** series is carefully engineered into an attractive, pre-assembled, completely self-contained unit. This model is the culmination of seven years of experience making technetium-99m generators. The **Ultra-TechneKow** Generator is shipped each week complete with evacuated elution vials, needle pack with labels, molybdenum-99 and technetium-99m reference tables, needle guard for operator safety, convenient carrying handles, and package insert with complete information.

Contact your Mallinckrodt/Nuclear representative now for detailed information on this unique new product of Mallinckrodt/Nuclear research.

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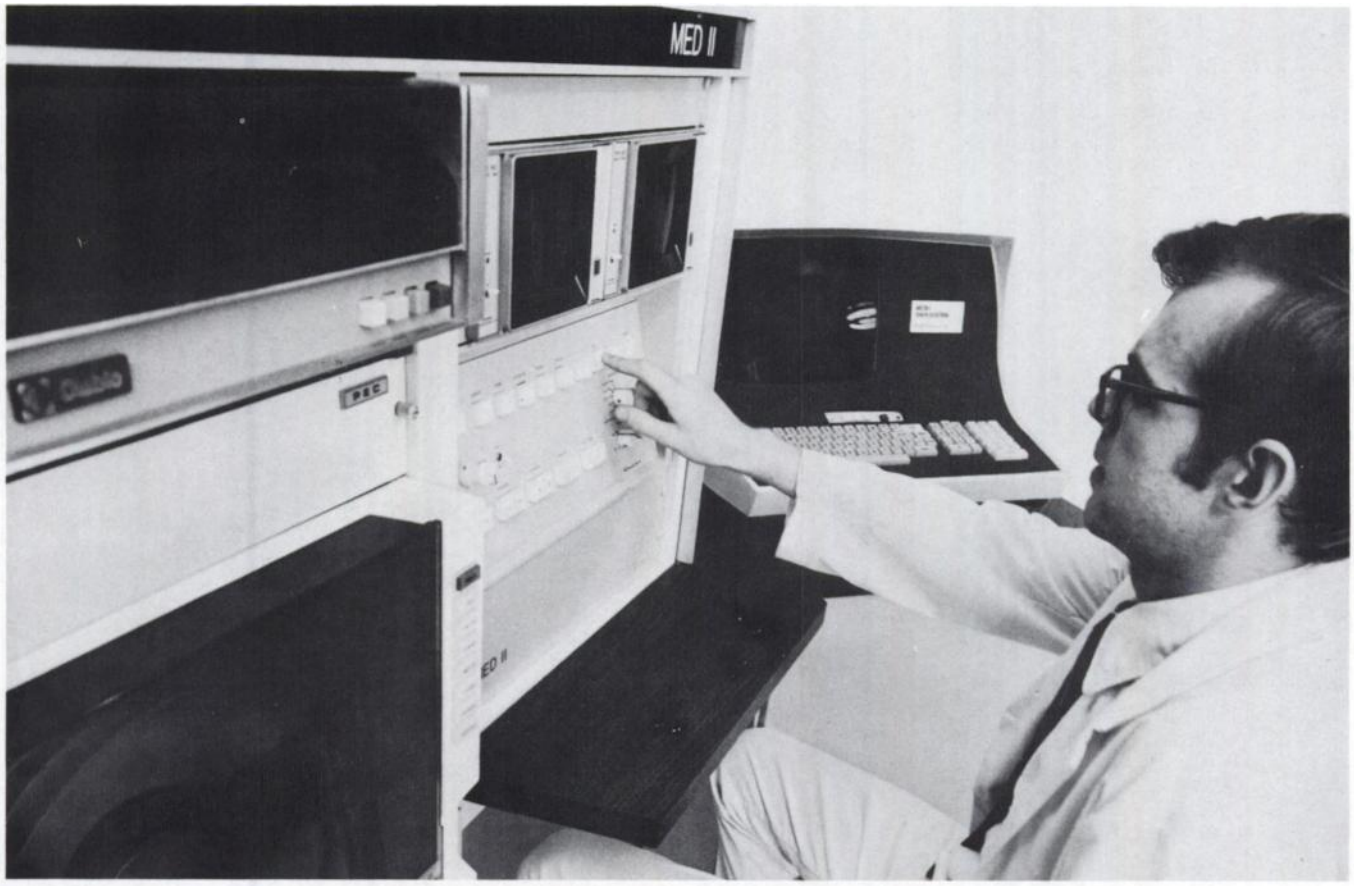
RADIOPHARMACEUTICALS
Mallinckrodt Chemical Works
St. Louis, Missouri 63160

MED II has all the clinical capabilities you expect from a computerized image processing system.



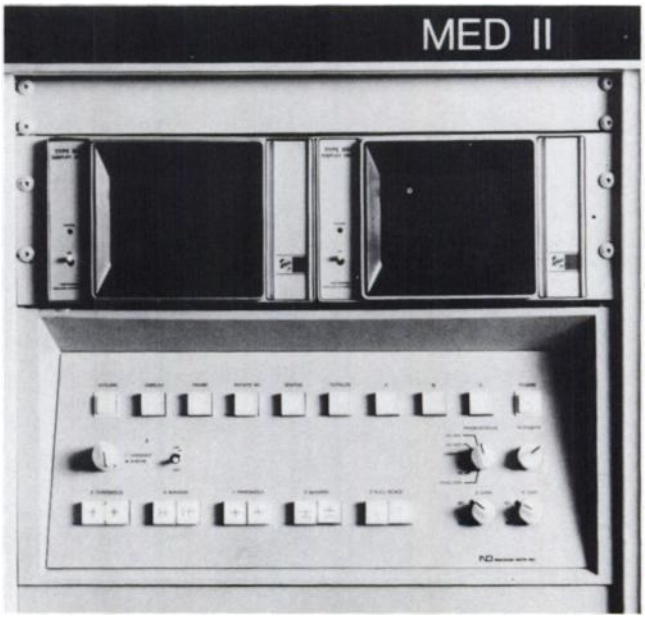
But you don't have to be a computer man to use it.

MED II: what it is
MED II is a data acquisition, storage and playback system. But it is also much more. MED II is a diagnostic image enhancer, a clinical data processor, plus a curve analyzer and a fully programmable 16k computer.

MED II and you
With tne MED II, you can record dynamic and static gamma camera images. You can enhance these images in accordance with several clinically tested protocols. You can generate time/activity histograms, and derive data, which cannot otherwise be visualized, from the resultant curves. In addition, you can correct for camera response non-uniformities, add and subtract either sequential or non-sequential images from each other; and perform several additional image manipulation routines which yield improved visualization and higher confidence levels.

MED II: its different
First, the MED II is pre-programmed. To execute a complex clinical protocol, the operator has only to type in the appropriate two letter command.

Second, image enhancement has been vastly simplified. For example, contrast manipulation is now achieved with continuous action pushbuttons.

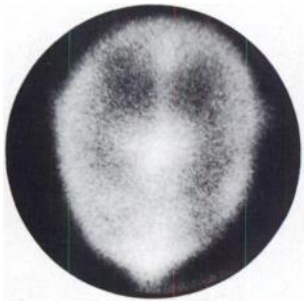


Third, the image data are now recorded on a high-speed disc. After a given frame or frame sequence is specified, it can be displayed within milliseconds. And magnetic tape continues to be available for bulk storage.

Fourth, the comprehensive image data analysis capability available in Nuclear Data's earlier systems has been extended still further with the MED II. Extraction of exponentials, normalization, curve smoothing and the many additional data analysis routines available with MED II are more refined than ever. And they are easier to execute.

MED II as a storage retrieval system
As a storage device, the MED II records complete studies on a rapid access disc. While acquiring data, frame rates of up to 8 frames-per-second may be specified. If desired, the frame rate may be more rapid during some intervals of the study than others. For example, in a renal function study, it may be desirable to have a rapid frame rate during the first few minutes, and a slower rate during the more gradually changing excretory phase. Another important feature: with the MED II, a recorded frame or frame sequence can be accessed for replay in a matter of milliseconds.

MED II as a static image processor
MED II can be considered a "perception extender." Image enhancement, for instance, allows one to elaborate subtle differences in displayed activity to the point where they can be discerned. Improved delineation of organ contours, lesion boundaries, and other abnormalities are prominant advantages to be gained with the MED II.



Initial analog scintigraph

Same data processed by MED II

MED II as a dynamic image data processor
As a dynamic processor, the MED II brings a wide range of data quantification and enhancement into the clinician's repertoire.

Renograms, cerebral blood transit, cardiac and pulmonary function studies are all included among the major dynamic study applications of the MED II. For example, separate areas-of-interest within a recorded renal execretion study may be specified by the clinician. These areas-of-interest may be assigned to correspond only to the right and left renal contours, or to regions within the kidneys. Then, after appropriate brief instructions, complete right and left renograms appear on the MED II oscilloscope. Since the renograms represent activity only within the defined areas-of-interest, distorting background data, as well as activity within the ureters and bladder, do not mask renal activity. And in pulmonary function analyses, the ability of the MED II to generate dynamic function curves for up to twelve areas-of-interest means that right versus left lung activity comparisons can be made for six different regions simultaneously. Dynamic activity curves for comparing comparable regions within the cerebral hemispheres and right versus left carotid blood transit can also be available for your evaluation within seconds.

MED II as a fully programmable 16k computer
Nuclear Data has incorporated its own fully programmable ND812 minicomputer into the MED II System. As a result, you can program the MED II to include new protocols.

To enable you to establish additional programs, to modify existing ones, and to apply the ND812 in solving other data analysis problems, Nuclear Data has developed NUTRAN (a variant of FORTRAN). NUTRAN is a powerful programming language originated exclusively for nuclear medicine image data processing. It's designed to let you, the clinician, write your own programs, in English, using a minimum number of instruction steps.

And more!
New technics for obtaining increased diagnostic clinical data through image enhancement and analysis are constantly being developed by ND Data System users. And, with their help, ND has found several ways to make the communication between diagnostician and olinical computer a productive and rewarding interaction.

Write, or call:

NUCLEAR DATA INC.

Post Office Box 451
Palatine, Illinois 60067
Tel: 312/529-4600

Nuclear Data Inc. (U.K.)
Rose Industrial Estate
Cores End Road
Bourne End, Bucks., England

Nuclear Data, GmbH
Mainzerlandstrasse 29
6 Frankfurt/M, Germany

Nuclear Data Scandinavia
Hammerves 3
2970 Horsholm, Denmark

Nuclear Data Scandinavia
Eriksbergsvagen 9
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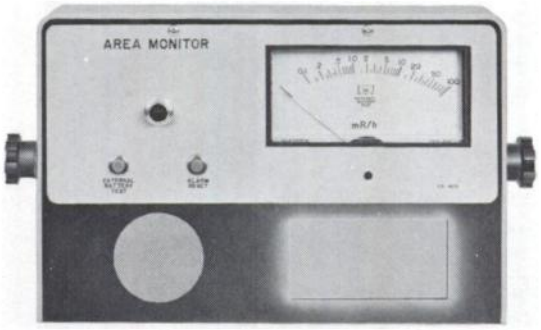
WHAT YOUR NUCLEAR MEDICINE LABORATORY SHOULD HAVE...

RADIATION AREA ALARM MONITOR

Is your nuclear laboratory area being thoroughly monitored at all times for hazardous gamma radiation? If a radioactive source were exposed accidentally, would you be alerted immediately?

With the Radiation Area Alarm Monitor, personnel are assured that they will be alerted instantly to changes in gamma levels. It features 3-way audio/visual indication: a loud 2-tone alarm, a flashing red light, and a panel meter. Solid state, jam-proof circuitry and GM tube withstand high radiation levels. Three-decade log scale—0.1 to 100 mR/hr. Alarm trip scale is adjustable over full scale. Remote warning lamp... and many other features.

05-425 Radiation Area Alarm Monitor.....$620.00



Radiation Area Alarm Monitor

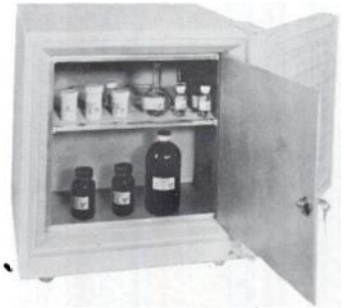

Remote Warning Lamp

LEAD LINED REFRIGERATORS

For radiopharmaceuticals, tagged biological and other radioactive materials requiring low-temperature storage. Completely lead-lined, 1/8" thick. Key-lock prevents unauthorized access.

53-350 Lead-Lined Refrigerator, 2 cubic ft. Only 20" high x 20" wide x 23" deep. Compact enough to fit on or below a lab bench..... $475.00*

53-375 Lead-Lined Refrigerator, 5 cubic ft., with 1/3 cu. ft. freezer compartment. 34" high x 19" wide x 23" deep.....$595.00*


53-350 Lead-Lined Refrigerator


53-375 Lead-Lined Refrigerator

PROTECTIVE LEAD BARRIER

Eliminate radiation to your body or face while milking a Tc-99m generator or handling any other radioactive material. Most generators provide enough shielding for the generated activity but not for the setting-up process (e.g., energetic Mo-99 gamma radiation to the face, at 3 feet from a generator, can be as high as 35 mR/hr). All exposure is stopped by a 12" x 12" x 1/2" lead shield and a 12"x24" lead-glass sheet (4.8 gm/cc).

56-600 Protective Lead Barrier.....$275.00*

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56-600 Protective Lead Barrier

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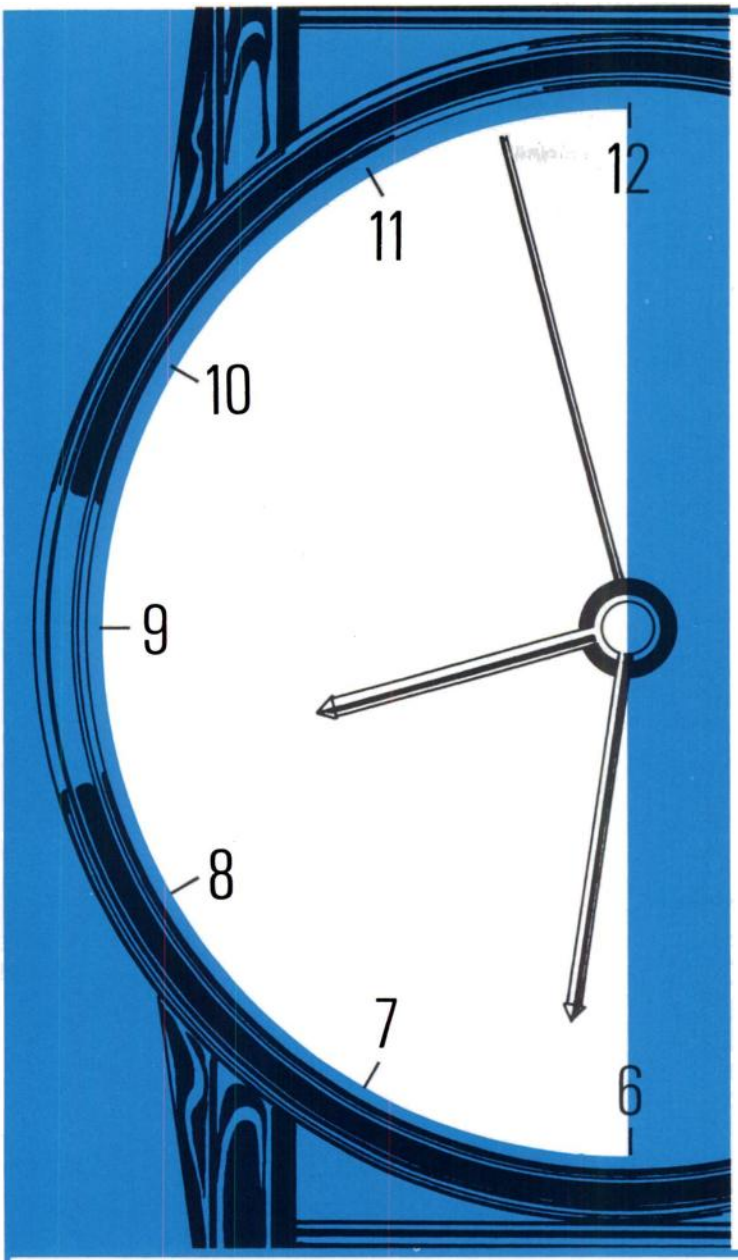
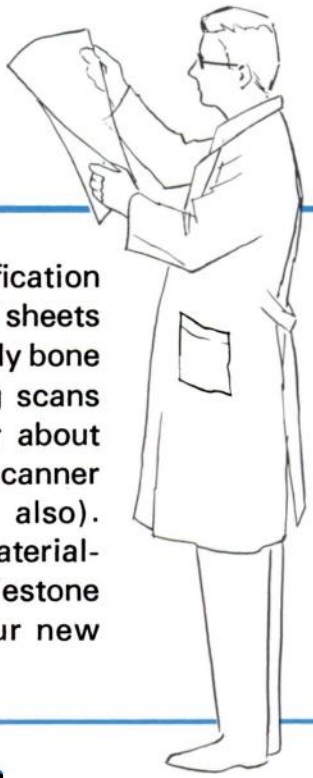


make whole-body bone scans in 30 minutes... with scan-minification



We put it all together in our 5:1 scan minification option. It gives you two complete 14" x 17" sheets of film (AP and PA views) with a whole-body bone scan in 30 minutes. If you're not getting scans that fast now, maybe you'd like to hear about Ohio-Nuclear's Model 84. It's the *only* scanner with 5:1 minification (has 1:1 and 2:1 also). Exclusive, versatile, proven, time and material-saving. Write for "Scan Minification, milestone in nuclear medicine technology," our new brochure.

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7700 St. Clair Ave., Mentor, Ohio 44060.
Phone: (216) 951-0900

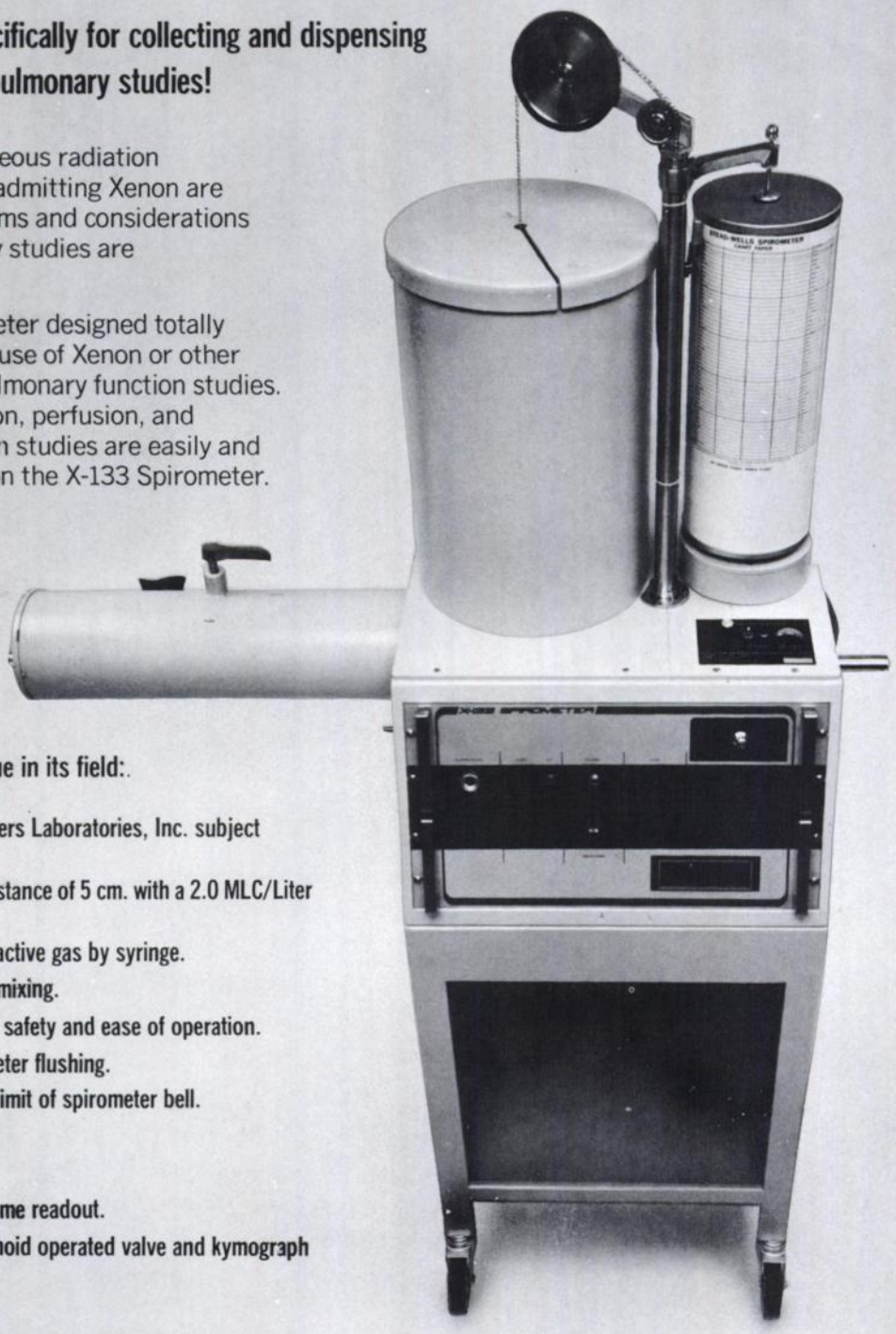
From... the Innovators

X-133 SPIROMETER

A Spirometer designed specifically for collecting and dispensing radioactive gases used in pulmonary studies!

Operator safety, extraneous radiation recording, and ease of admitting Xenon are just a few of the problems and considerations when Xenon pulmonary studies are contemplated.

Collins offers a Spirometer designed totally and specifically for the use of Xenon or other radioactive gases in pulmonary function studies. Single Breath ventilation, perfusion, and Steady State ventilation studies are easily and accurately performed on the X-133 Spirometer.



A combination of important safety and operational features make the X-133 Spirometer unique in its field:.

- Lead shielding to Underwriters Laboratories, Inc. subject 544 requirements.
- Less than .2 MLR/Hr at a distance of 5 cm. with a 2.0 MLC/Liter concentration.
- Petcock for admitting radioactive gas by syringe.
- Motor blower for complete mixing.
- Solenoid operated valve for safety and ease of operation.
- Permits patient and spirometer flushing.
- Safety alarm signals upper limit of spirometer bell.
- Easy to clean and sterilize.
- CO_2 Absorber.
- Optional digital display volume readout.
- Foot controls for both solenoid operated valve and kymograph operation.
- 7 liter capacity spirometer.
- Internally occluded for minimum gas requirements.

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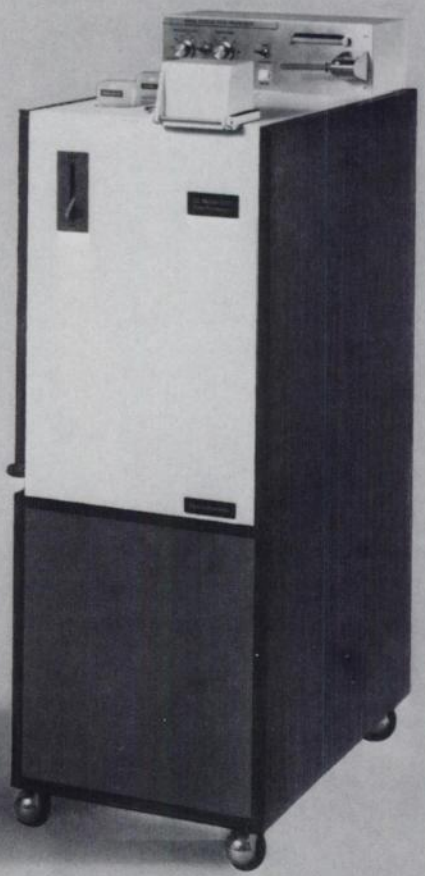
The new DI 650 Automatic Film Processor: Clearly, an inside design job.

Nuclear Medicine is why the DI 650 exists. It's the only film processor conceived and dedicated to serving the specific needs of nuclear medicine. That makes the DI 650 unique. Because its design was an "inside" job. Only those intimately acquainted with your needs could understand the importance of daylight loading. (No more dark-room problems.) Or the flexibility and convenience of being used either as a desk model or a portable "on-the-floor." Or the fact that the DI 650 needs no plumbing hook-up. It may, but need not, be batched. This processor has its own built-in heater. It's also self-cleaning. With the DI 650 you will not have to depend on the developing facilities of other departments. All these DI 650 attributes point up to a new capability: you can choose the proper developer, regulate its temperature, and optimize film travel speed for maximum image quality. Clearly, the DI 650 Automatic Film Processor is an inside design job.

Dunn Instruments

1335 Columbus Avenue, San Francisco, Ca. 94133 / Phone (415) 776-7033



Feel free to answer the phone.

Your T3 tubes are incubating nicely. Only 30 seconds to go. Then... someone calls you to the telephone! It could be one of a hundred important sorts of message. And if the T3 test you are using is time and temperature dependent, you may have to spend valuable time in making mathematical calculations to allow for the interruption.

With Thyopac-3 you avoid that risk no time/temperature correction is needed. Yet there is no loss of accuracy and reliability.

Thyopac-3 makes savings in other ways too: only 0.1 ml of serum is required for each test; no filtration or washing is required; all the materials needed for the test–12 vials of adsorbent granules in T3-I 125 buffer and 1 bottle of desiccated standard serum are presented in a kit designed to act as a test tube stand. So the whole kit is very simple and easy to use. With just a little practice you could do ten tests in 45 minutes!

If you think this all sounds too good to be true–just ask some of your colleagues who use Thyopac-3. Or write to the Radiochemical Centre for full information. In the meantime we promise not to telephone you.

Use Thyopac*-3 for T3 testing.

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The Radiochemical Centre, Amersham, Bucks
Available in USA, Canada and S. America from Amersham/Searle
2636 S. Clearbrook Drive, Arlington Heights, Illinois 6005, USA

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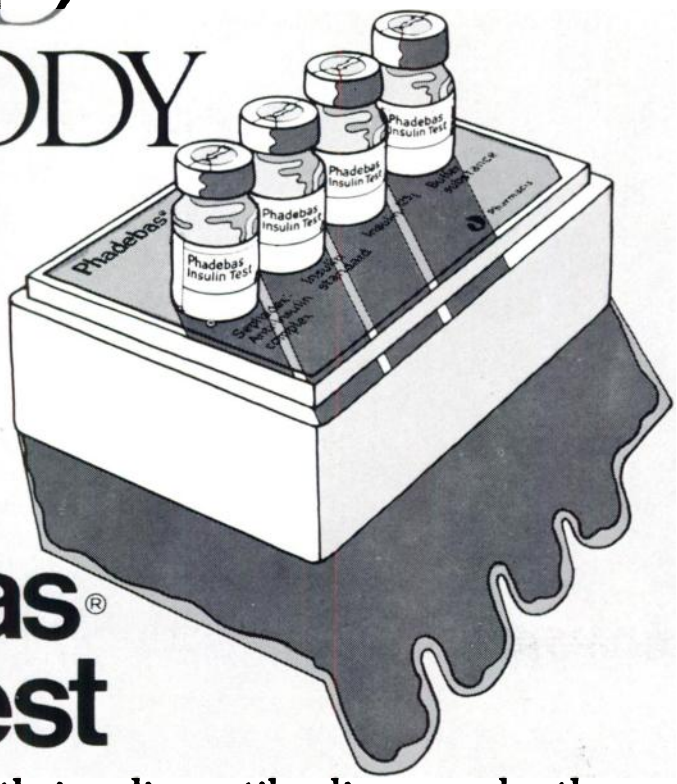
INTRODUCING THE FIRST INSULIN TEST WITH A BUILT-IN SECOND ANTIBODY

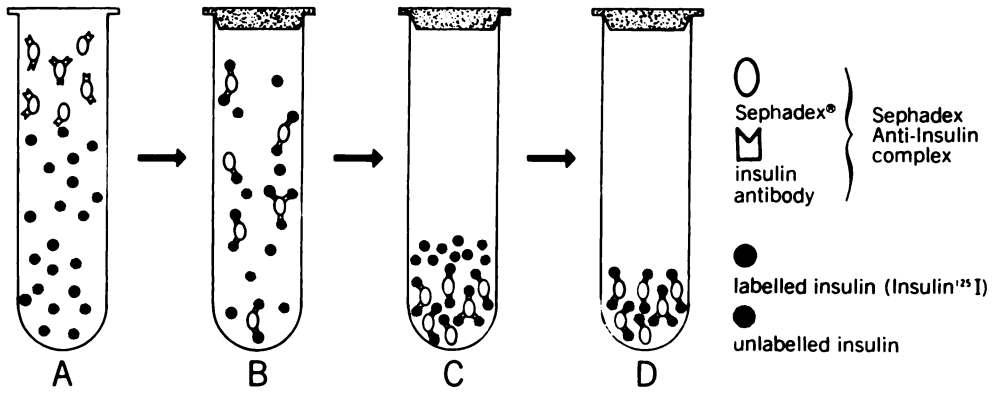


Phadebas® Insulin Test

Radioimmunoassay with insulin antibodies covalently coupled to Sephadex® as the solid phase support.

Makes small- and large-scale insulin testing of serum and other body fluids simpler, faster and more convenient than ever before possible.

The solid phase principle at work in insulin testing



A. Sephadex Anti-Insulin complex and labelled insulin are mixed with insulin standard or unknown sample.

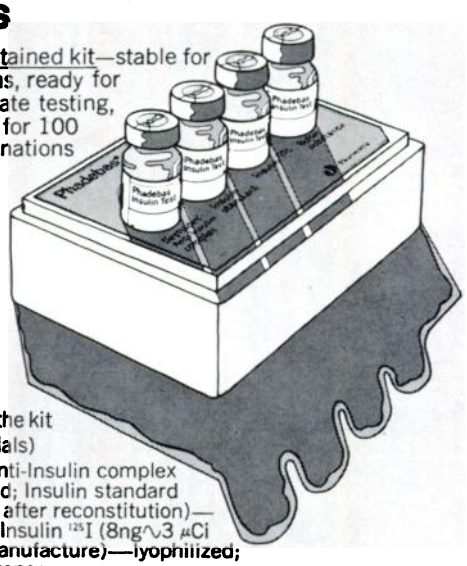
B. Mixture is incubated for a minimum of three hours or overnight. Insulin in the serum competes with the added radioactive insulin for a place on the Sephadex Anti-Insulin complex.

C. Solid particles are centrifuged and washed.

D. Radioactivity measured. Standard curve is prepared and insulin levels "read".

New Phadebas® Insulin Test for faster, more accurate results

- eliminates time-consuming procedures of conventional double-antibody methods—no refrigeration, microfiltration, buffer preparations
- room temperature testing and incubation—with shorter incubation time—three hours or overnight
- meets rigid clinical standards—specific, sensitive and reproducible. Covers wide range of serum levels from 3 μU/ml to 320 μU/ml
- self-contained kit—stable for 4 months, ready for immediate testing, enough for 100 determinations



Contents of the kit
(4 x 10 ml vials)
Sephadex Anti-Insulin complex —lyophilized; Insulin standard (320 μU/ml after reconstitution)—lyophilized; Insulin ^{125}I (8ng∿3 μCi at date of manufacture)—lyophilized; Buffer substance

If you would like to see the Pharmacia Representative for more complete details, simply mail in the coupon below to:

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Pharmacia Laboratories Inc.
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Piscataway, New Jersey 08854

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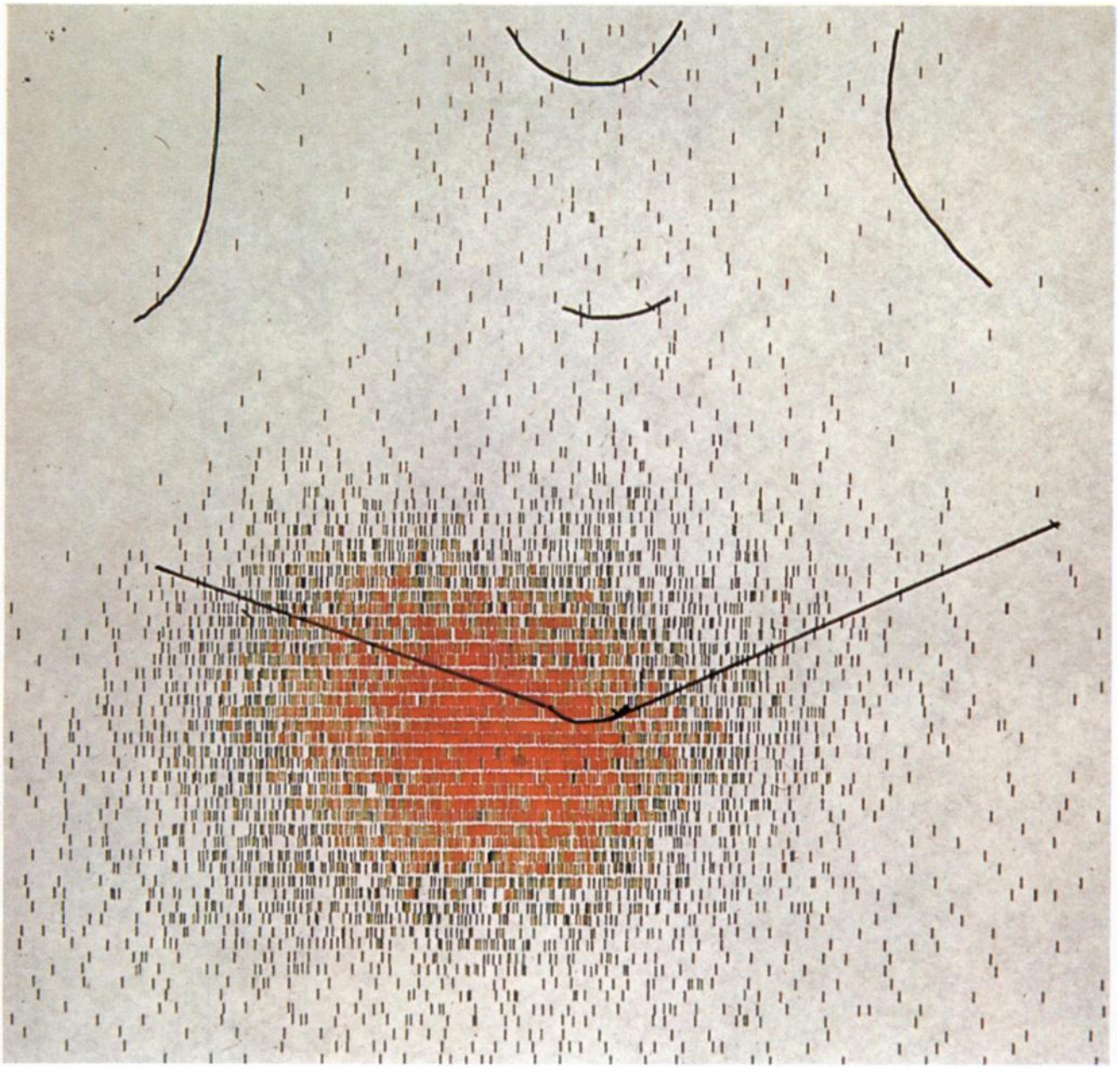
PHARMACIA LABORATORIES INC.
800 Centennial Avenue, Piscataway, N.J. 08854
Pharmacia (Canada) Ltd., 110 Place Crémazie, Suite 412, Montreal 11, P.Q.

Pharmacia

See " ^{67}Gallium for Tumor Scanning," *Journal of Nuclear Medicine*, January 1972, pp. 25-30.



This scan was impossible without Ga67

Of course Ga67 is not the single criterion but it represents a valuable contribution to the diagnosis of bronchial carcinoma, thyroid tumours and systemic (R.H.S.) diseases. By its tumour cell affinity Ga67 produces a high tumour to non tumour ratio. It gives optimal scanning with gamma energies of 92, 185 and 296 keV. Supply is no problem - it is available weekly from Duphar.

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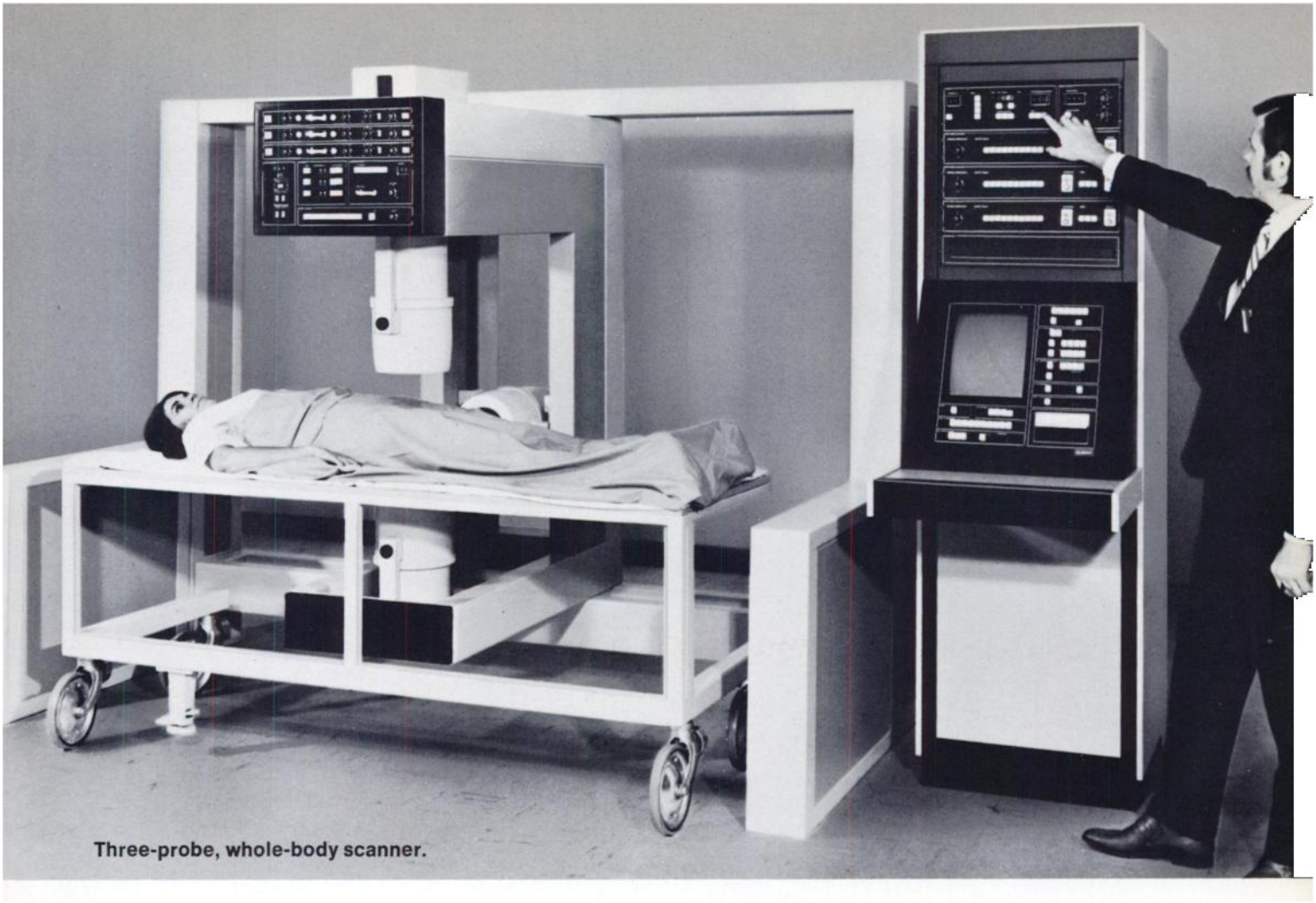
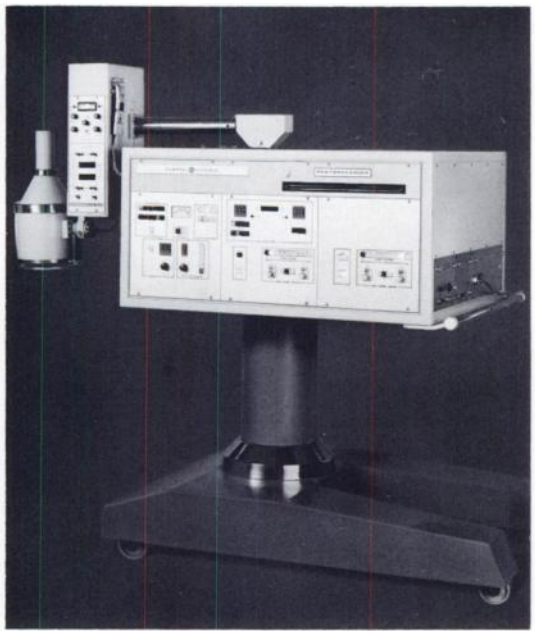


Three-probe, whole-body scanner.

Now General Electric brings the automatic touch to digital scanning



Single-probe scanner.

The touch of a button. And, turn of a dial.

That's how the General Electric digital scanner's combination of automatic features makes more diagnostic information easier to get. With less chance of technic error.

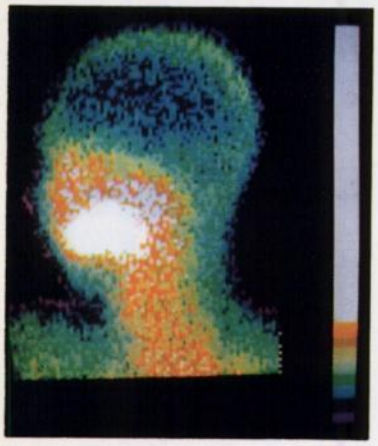
Automatic selection of scanning speed is one example. Just set the desired line spacing and information density, then find the hot spot. That's all. No calculations.

Also automatic: line spacing adjustments that prevent overlaps and gaps; scalloping corrections to align the photoscan display; and, photorecording density settings, between pre-set minimum/maximum values.

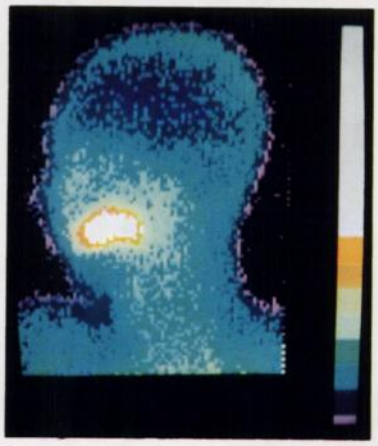
To these and other automatic touches, GE adds: whole-body scanning capability with the three-probe unit; a built-in scaler; push button probe positioning; easy-to-read, light-emitting diode displays for the scaler and probe position readouts; four collimators as standard equipment on the single-probe instrument; choice of image displays; and more.

Together, they're a combination of features that brings new information capability to digital scanning.

Turn page for details about color Videodisplay of scans . . .



If tumors were suspected at the base of the brain, this setting would bring them out.



Mouth shown in detail never before seen. In some patients, saliva flow is plainly visible.

View scans in full-count, fully-functional color

Videodisplay/Processor extends the diagnostic value of any scanner

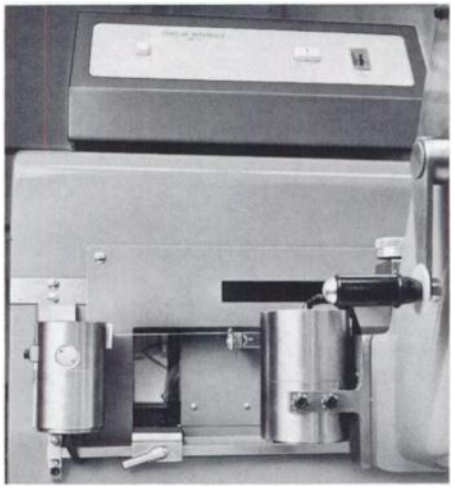
Unlimited image/information configurations with every scan. Now you can add this data versatility to any scanner with the General Electric Videodisplay and Processing Unit.

The Videodisplay's true electronic visualization lets you see—in eight vivid, fully-functional colors—the accurate patient count data recorded at every point of the scan. Each color represents a specific number of counts.

And, you can instantly manipulate scan data in the unit's memory to enhance desired details for easier, more accurate interpretation and diagnosis. Just press the push button controls. Eliminate colors to display isocount areas. Change from color to shades of gray. Determine the count at any point or within rectangular areas of interest. Read the profile count along any X or Y line. You can also subtract the background as desired. And more. Every manipulation, except memory erase, remains fully and immediately recoverable. And, for each image or area of interest displayed, a continuous readout of counts is shown at the scaler.

For added diagnostic flexibility: scans can be minified or magnified; can be recorded on cassette tape or photographed; even transmitted over regular telephone lines to other Videodisplay units.

Let the GE Videodisplay add new information potential to your digital scanning procedures. Your Medical Systems representative has details. General Electric Medical Systems, Milwaukee, Toronto, Liege.



Interface the Videodisplay with any scanner in good electrical and mechanical condition. Result: modern videoscanning capability. An easy, economical way to extend the diagnostic information available to you.

Photographically record any scan image on the monitor, using either a Polaroid or standard 35 mm camera. Applications include: for patient records, reproduction, study, scan comparisons, teaching and training.

GENERAL ELECTRIC

Bone Scintigraphy Using Fluorine-18

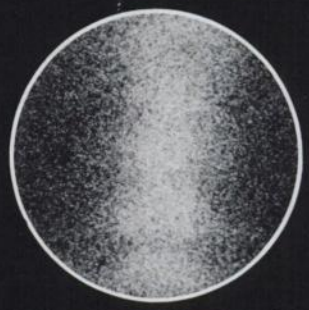
Pinhole Collimator-
Scintillation Camera Images

Whole Body Survey
Anterior View

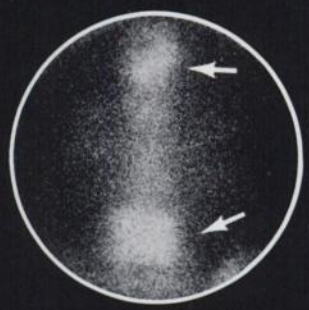
Normal

Metastatic
Breast Ca.

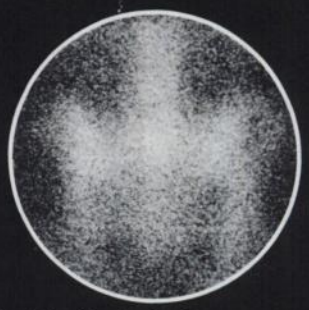
Close Up Images



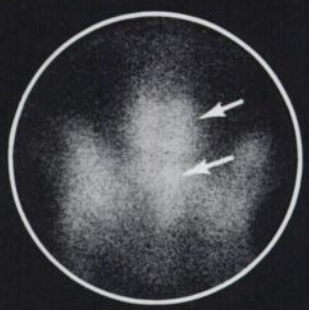
Lumbar Spine (Posterior)
Normal



Lumbar Spine (Posterior)
Ca. Breast

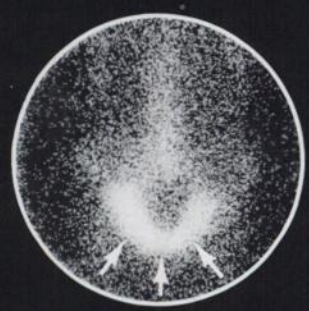


Pelvis (Posterior)
Normal



Pelvis (Posterior)
Ca. Breast

Pelvis (Anterior)
Normal



Pelvis (Anterior)
Ca. Prostate

Lesions are commonly found in the axial skeleton and a complete skeletal survey should include imaging of limbs as well as trunk.[5]

Scintillation camera images 2 to 4 hours after I.V. administration of 2 to 4 mCi of ^{18}F required 3 to 10 min. exposures each.

Rectilinear Scanner Images (5 inch crystal)

Metastatic Renal Cell Ca. (Anterior)

Paget's Disease (Posterior)

Dual probe rectilinear whole body imaging 2 hours after I.V. administration of 1 to 2 mCi of ^{18}F required 30 min. exposure. (Negative image of original shown to compare with camera images.)

References
1. Bachman & Sproul, Bull. N.Y. Acad. Med. 31:146 (1955)
2. Edelstyn et al. Clin. Radiol. 18:158 (1967)
3. Sklaroff & Charkes, J.A.M.A. 188:1 (1964)
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Radioisotopic Imaging of Bone in Clinical Medicine

Review

Various radioisotopes are known to preferentially accumulate in both malignant and benign lesions of bone. When such radioisotope accumulation is detected and imaged, using suitable instrumentation, clinically useful information is frequently obtained which cannot be readily acquired using other methods. Examples of this are the detection of primary and metastatic tumors in bone. Tumors metastatic to bone most commonly spread to spongy (trabecular) bone. Such lesions can be visualized by X-ray examination only when they are greater than 1.5 cm in diameter and 50% to 75% of the local calcium is lost.[1,2] Localization of radioisotopes in the region of metastases has been shown to be an earlier and more sensitive indicator of the presence of bony metastases than that provided by conventional radiographic techniques.[3] While Strontium-85 was the radioisotope most commonly used in initial studies, subsequent evaluations have shown fluorine-18 to be a superior radioisotope since its use results in both improved image quality and markedly lower radiation dose to the patient.[4,5,6,7]

Indications

The suspicion of malignant neoplastic involvement of bone, either primary or metastatic, is the principal indication for performance of a radioisotopic study of bone. Such a possibility should be considered in the primary evaluation of patients with a diagnosis of malignant tumors of the breast, lung, stomach, prostate gland, thyroid gland, and other carcinomas which commonly spread to bone, and in evaluating the extent of involvement of primary bone tumors, multiple myeloma, etc. Such studies should be particularly useful in patients in whom extensive surgery is proposed for the possibility of total extirpation of neoplastic tissue, since demonstration of a previously unrecognized metastasis may influence the proposed therapy. Lymphomas, such as Hodgkin's disease, frequently involve bone, and it has been recommended that patients with these disorders have radioisotopic skeletal surveys as a part of their initial staging.[8] Subsequent to initial evaluation of patients with various carcinomas and sarcomas, periodic radioisotopic skeletal surveys may be useful in demonstrating presence and extent of bone lesions. A large number of nonmalignant conditions can result in abnormal deposition of radioisotopes in bone (arthritis, fractures, osteomyelitis, Paget's disease, etc.). Whether sufficient beneficial information can be obtained from the performance of a radioisotopic bone study in patients with these non-neoplastic diseases to warrant the performance of such a study remains to be established.

Hazards

There are no reported cases of adverse reaction to the administration of carrier-free fluorine-18 in isotonic saline solution. The radiation dose received by the patient in association with a typical fluorine-18 bone study is considered comparable to that which he would receive from similar X-ray studies.

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medi+physics

The Pediatric Renal Study

Simplifying Difficult Renogram-Renal Scintiphoto Studies with the Nuclear-Chicago Pho/Gamma® Scintillation Camera Data-Store/Playback System

The methodology for simultaneously producing renograms and renal scintiphotos with ^{131}I hippuran has been well described. Occasionally the upper urinary tracts may be in proximity to the bladder or an ilial conduit. Positioning with the split-crystal technique then becomes difficult. This is particularly so in infants, or in patients with ilial conduits, cutaneous ureterostomies, or transplanted kidneys. An answer to these problems, however, exists in the area-of-interest specification capabilities of the Nuclear-Chicago Pho/Gamma Data-Store/Playback System. Data may be collected and stored on magnetic tape and then graphically recorded from selected regions of interest to exclude activity from unwanted regions in the resultant renograms.

SETTING UP. The camera is positioned so that the organ of interest is closest to the collimator face. Thus, in renal studies, the detector head would normally be located posteriorly. In renal transplants, however, the detector head may be placed anteriorly. The field of view when using the Data-Store/Playback System may include not only the upper urinary tracts but also the bladder or ilial conduit.

ISOTOPE AND DOSE. For renal transplant evaluation, the vascular phase is recorded with ^{99m}Tc pertechnetate administered in a bolus of 125 μCi/lb.

For the renogram-renal scintiphoto study, ^{131}I hippuran (50-100 μCi for children and 100-250 μCi for adults) is given intravenously after blocking the thyroid with a single dose of Lugol's solution.

DATA ACCUMULATION. In the renal transplant evaluation, pertechnetate transit through the transplant is recorded within the first two minutes following injection. After this time, background activity may prohibit adequate delineation of the kidney. This phase of the examination is recorded on magnetic tape which is subsequently played back to make Polaroid scintiphotos.

In the renogram-renal scintiphoto study, data is also recorded on the Data-Store/Playback System. While recording patient data, activity within the kidney can be simultaneously monitored on the system's Persistence Scope and recorded on Polaroid film from the "A"-scope of the Pho/Gamma. The recording is terminated when the majority of the radionuclide has been excreted or there is obvious retention of the radionuclide within the renal collecting system.

Areas of interest are chosen to encompass the kidney or kidneys and to exclude the ureters or urinary bladder. The relative count rates within these defined areas of interest can then be graphically displayed by using the Dual-Pen/Chart Recording System.

CASE HISTORIES. Case Study No. 1: A four-month-old male infant was admitted with a severe electrolyte imbalance following prolonged diarrhea. A cardiac arrest occurred and, subsequently, diminished renal function and a urinary tract infection were documented. While renal function was gradually returning to normal, an intravenous urogram was unsuccessful due to the collecting system being obscured by overlying gastrointestinal debris and gas. A radionuclide renogram was therefore requested.

The proximity of activity within the upper urinary tracts to that within the bladder is illustrated in Figure 1. Split-crystal technique yielded the renogram shown in Figure 2. The irregularity of the tracing is due in part to patient motion. The flatness of the excretion curve results from activity within the bladder. The study was simultaneously recorded on the Nuclear-Chicago Data-Store/Playback System for later evaluation. Electronically selected areas of interest were then positioned over the image of the upper urinary tracts in order to exclude the bladder area (Figure 3). The renogram was then recorded (Figure 4) and a definite excretion pattern is recognized.

Case Study No. 2: This 12-year-old female with chronic pyelonephritis experienced renal failure necessitating hemodialysis. Renal transplant was subsequently performed. During the initial post-operative evaluation of the transplant, the integrity of the vascular anastomosis is demonstrated with a ^{99m}Tc pertechnetate transit study. The kidney is well outlined during the vascular phase (Figure 5).

The ^{131}I hippuran study of the transplant was recorded with the Data-Store/Playback System and

then reproduced through a chart recorder. The defined area of interest (Figure 6) resulted in a satisfactory post-transplant renal-function renogram (Figure 7). There is some retention, however, within the slightly dilated ureter. Routine positioning with the split-crystal technique would have led to recording of activity not only from within the kidney, but also from a portion of the dilated ureter (in spite of exclusion of the bladder by oblique positioning of the patient) and an unnecessary artifact would have thus been introduced into the renogram.

DISCUSSION. The technique of simultaneous recording of renograms and renal scintiphotos with the Pho/Gamma has proven to be a versatile method for examining the kidneys. With conventional split-crystal techniques, the existence of data from the bladder presents difficult positioning problems when making renograms. This is also the case with infants within whom the upper urinary tracts are relatively close to the bladder; in ectopically located kidneys, whether congenital or iatrogenic; or when collecting devices such as cutaneous ureterostomies or ilial conduits make routine positioning impossible. However, the Data-Store/Playback System, with its area-of-interest analysis capabilities, provides a means of obviating such positioning difficulties. Only data from pertinent, selected areas are displayed in the renograms.

The transit study through a transplanted kidney has proven of use in the immediate post-operative period. It permits evaluation of the vascular integrity of the renal transplant. In instances where a normal renal outline is not visualized, contrast arteriography should be performed for further evaluation. In addition to vascular obstructions, acute rejection phenomena may slow circulation within the kidney sufficiently to prevent a normal vascular appearance with the radionuclide transit study, regardless of intact vascularity.

CONCLUSIONS. The Data-Store/Playback System minimizes positioning considerations when recording renograms and renal scintiphotos. Areas of interest can be selected to exclude unnecessary and distorting data, thus providing a more significant study for interpretation. 1-215

CASE STUDY NO. 1. SIMULTANEOUS RENOGRAM-RENAL SCINTIPHOTO STUDY.

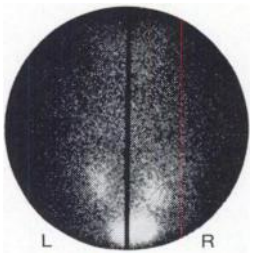

FIGURE 1.
^{131}I SCINTIPHOTO.
POSTERIOR VIEW.

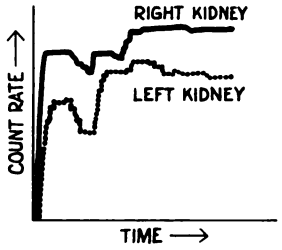

FIGURE 2.
SPLIT-CRYSTAL
RENOGRAM.

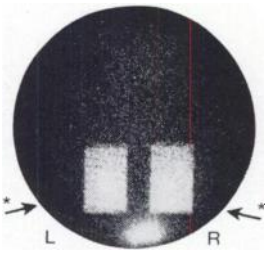

FIGURE 3.
AREA-OF-INTEREST
SCINTIPHOTO.
POSTERIOR VIEW.

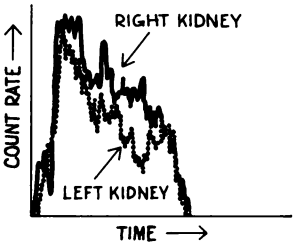

FIGURE 4.
AREA-OF-INTEREST
PLAYBACK
RENOGRAM.

CASE STUDY NO. 2.
RENAL TRANSPLANT EVALUATION.

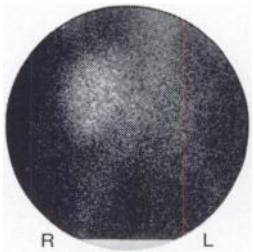

FIGURE 5.
^{99m}Tc SCINTIPHOTO.
ANTERIOR VIEW.

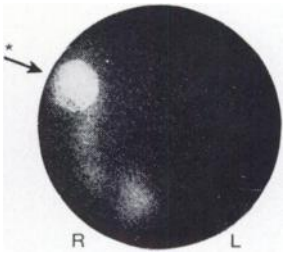

FIGURE 6.
AREA-OF-INTEREST
^{131}I SCINTIPHOTO.
ANTERIOR VIEW.

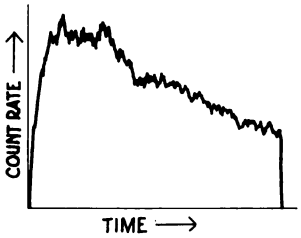

FIGURE 7.
AREA-OF-INTEREST RENOGRAM.
FULL-CRYSTAL PLAYBACK.

*Arrows indicate the electronically generated areas of interest. Note varied sizes and shapes.

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3) React—heat in water bath.
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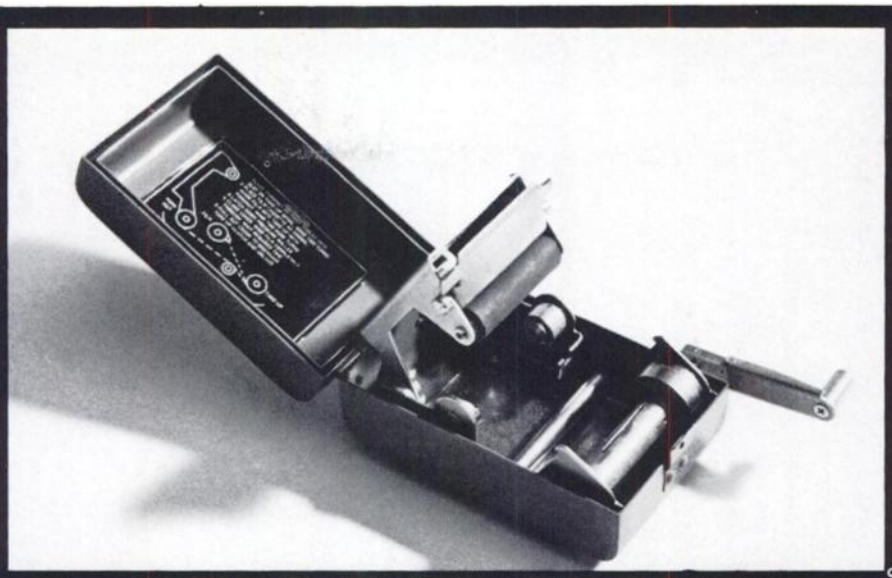

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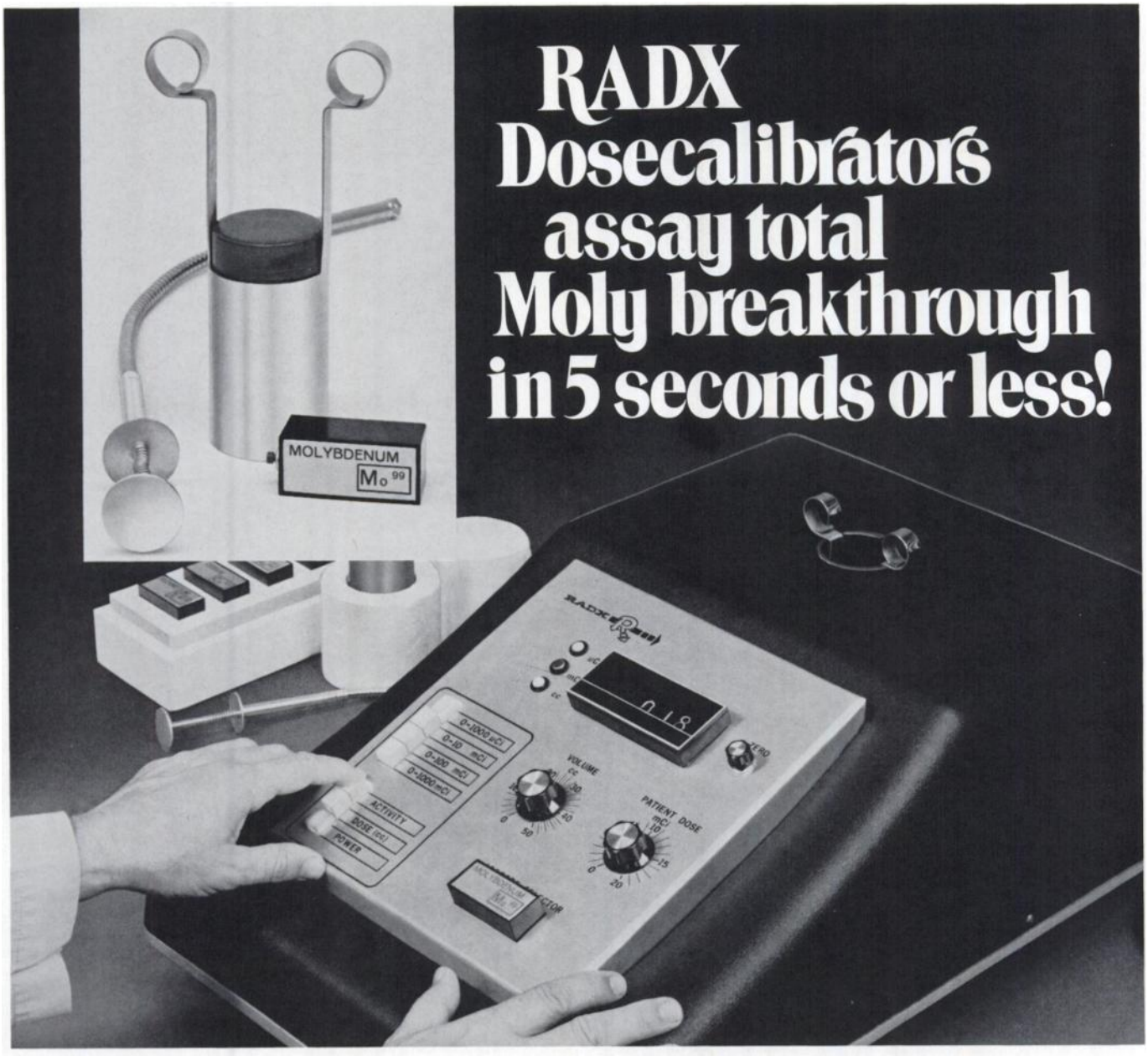

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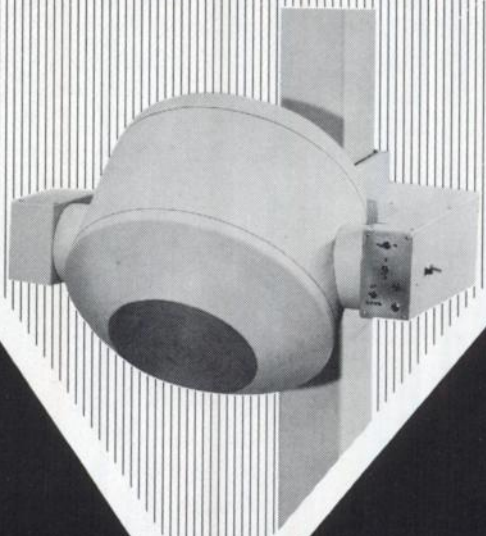

INTRODUCING

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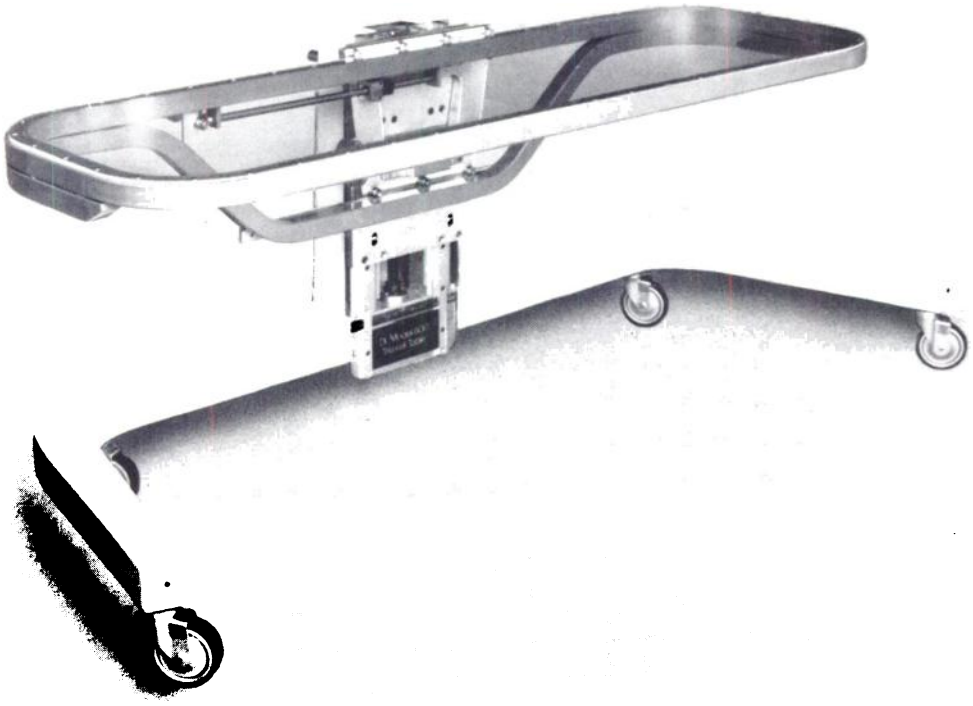

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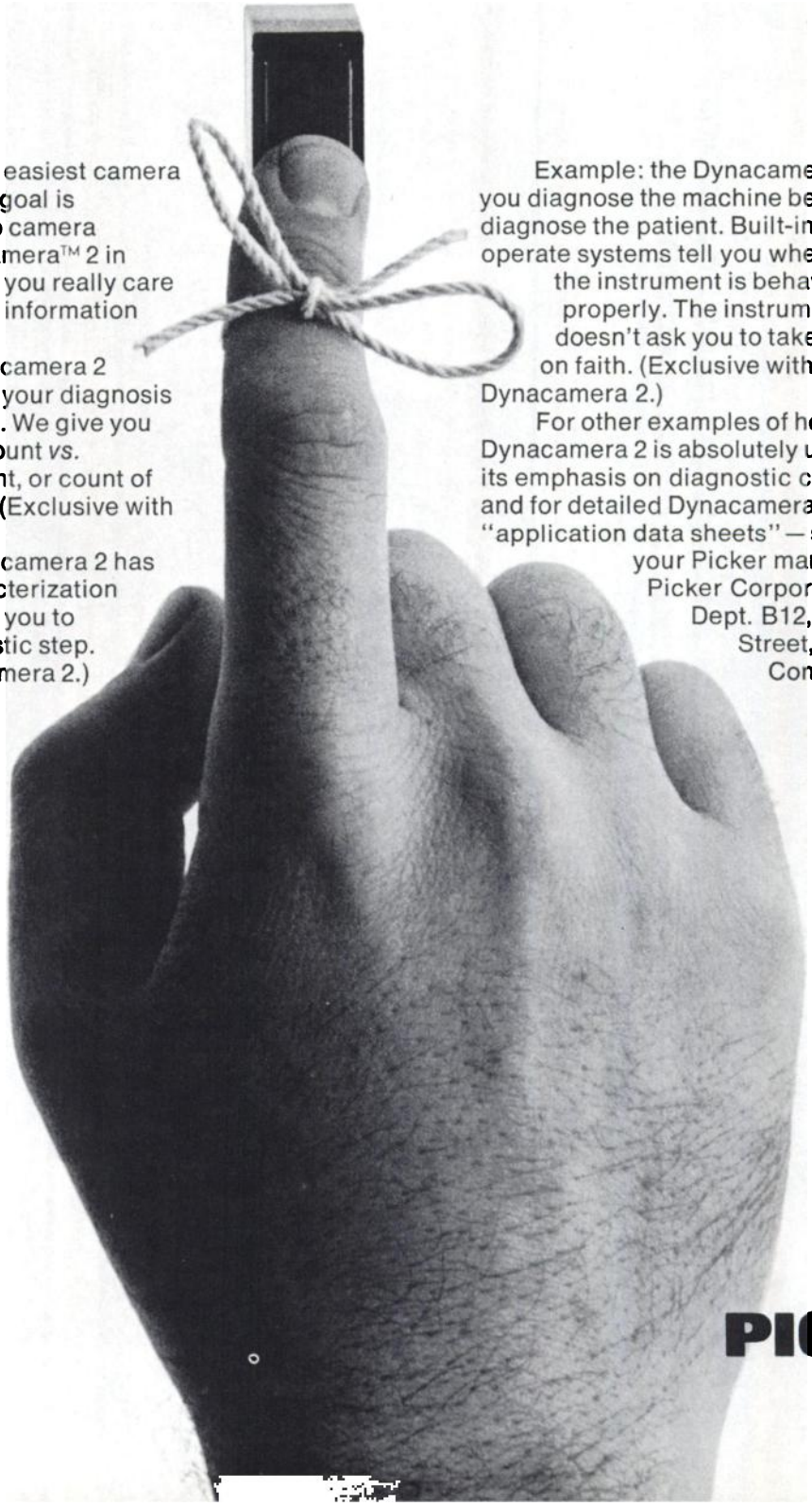
START



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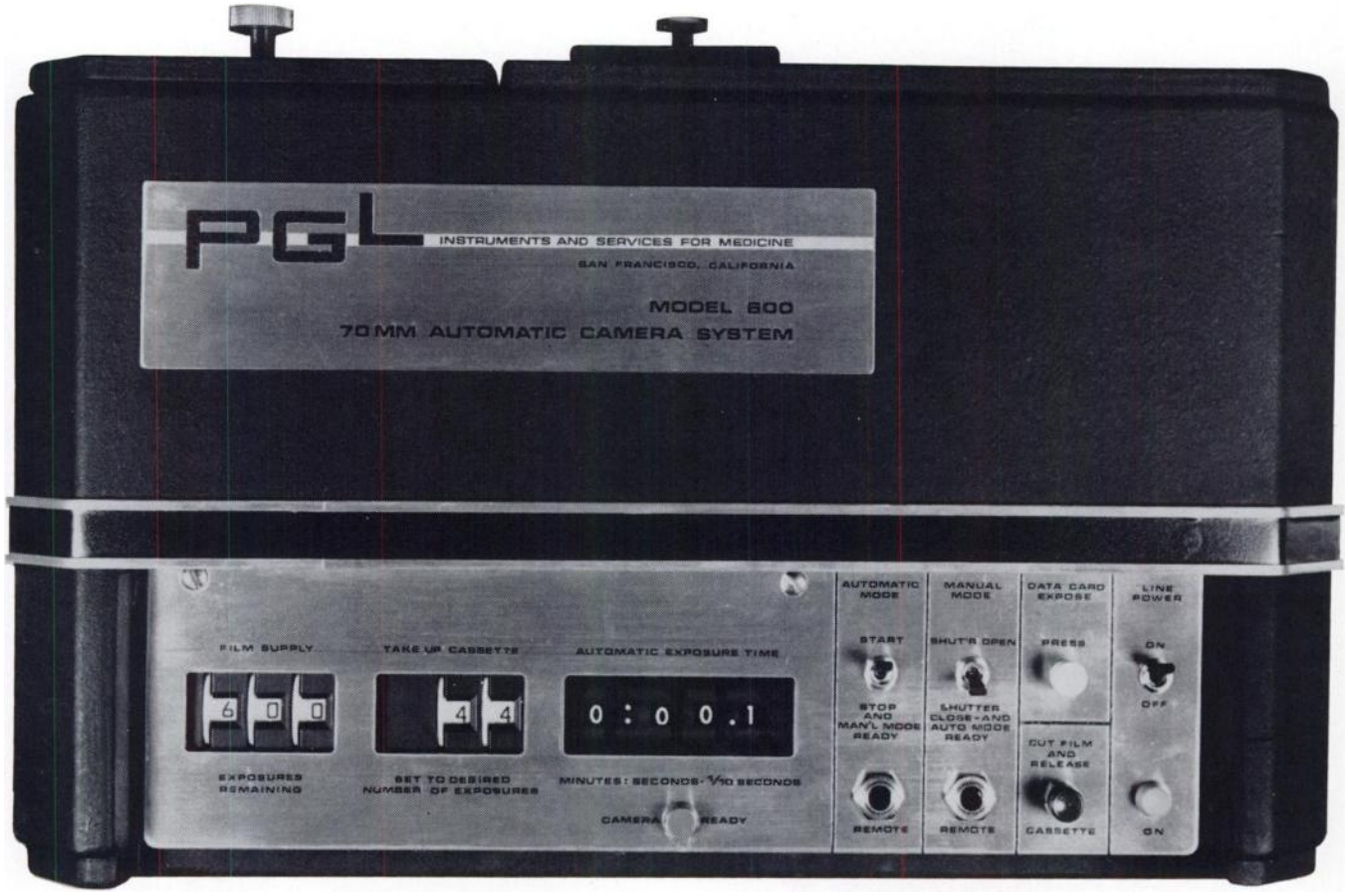
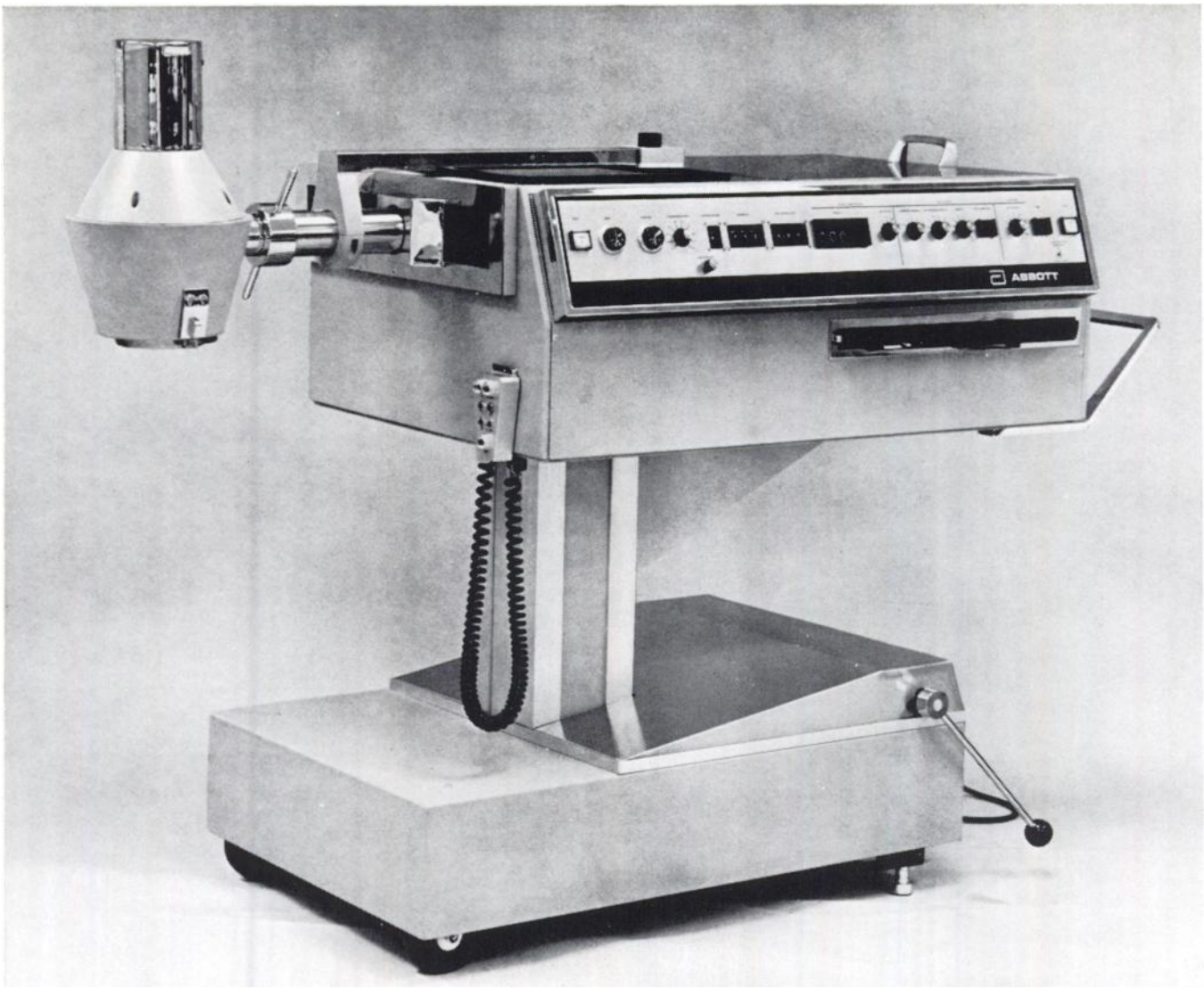
The classified placement service section in the Journal of Nuclear Medicine contains "Positions Open" and "Positions Wanted." Nondisplay insertions by members of the Society are charged at 20¢/word for each insertion with no minimum rate. Nondisplay insertions by employers or nonmembers are charged at 50¢/word with a minimum of $15. Display advertisements are accepted at $35 for ⅛ page, $65 for ¼ page, $115 for ½ page and $210 for a full page. The closing date for each issue is the 15th of the second month preceding publication month. Agency commissions and cash discounts are allowed on display ads only. Box numbers are available for those who wish them.

PGL Model 600: A Modest Revolution

If we told you that the PGL Model 600 was specifically designed for Nuclear Medicine, each component from inception specifically designed to fulfill the exact requirements of clinical scintiphotography by combining camera, lens, timer, power supply and bezel mount in one integral unit, would you call this a modest revolution? How about daylight loading of 70 mm film, 150 feet of it, 720 exposures, automatic threading —advancing—cutting—releasing, up to 10 exposures per second, film advance and shutter time of 30 milliseconds, two exposure counters? Are we reaching you? How about direct viewing of 70 mm film without a projector, or the view port for direct viewing of CRT, or the data card for on-film recording of patient information? The high speed film transport is 10 times faster than the 35 mm Nikon, 25 times faster than the 70 mm Hasselblad. Modest revolution? If we're reaching you, reach us at PGL.



Write to PGL, 1280 Columbus, San Francisco, Ca 94133, Phone (415-474-6338)



Here are the four questions you should ask before buying a rectilinear scanner:

1. Is the manufacturer a full-line supplier?

Abbott Laboratories is the *first* and *only full-line supplier* of *nuclear instruments and radio-pharmaceuticals*. Our continuing interest in your business assures you of prompt, reliable servicing of all your needs.

2. Does the control panel follow the set-up sequence in a logical left to right pattern?

GRAPHIC™ does, and the detector head has a built-in ratemeter to make positioning easier and more accurate.

3. Does it offer a choice of digital mode scanning or *selectable* fixed levels of film density, contrast enhancement and background erase?

GRAPHIC™ does, plus scan speeds of 10 to 750 cm./min. and a choice of positions for a 14″ x 17″ film. This allows you to scan 17″ across the chest or lengthwise along the body.

4. Is there a collimator locking system to make changing or removing collimators easier and to guard against dropping?

GRAPHIC™ has one. It was designed with patient and operator safety in mind. A remote handset with a deadman switch positions the detector head while protecting against accidental movement.

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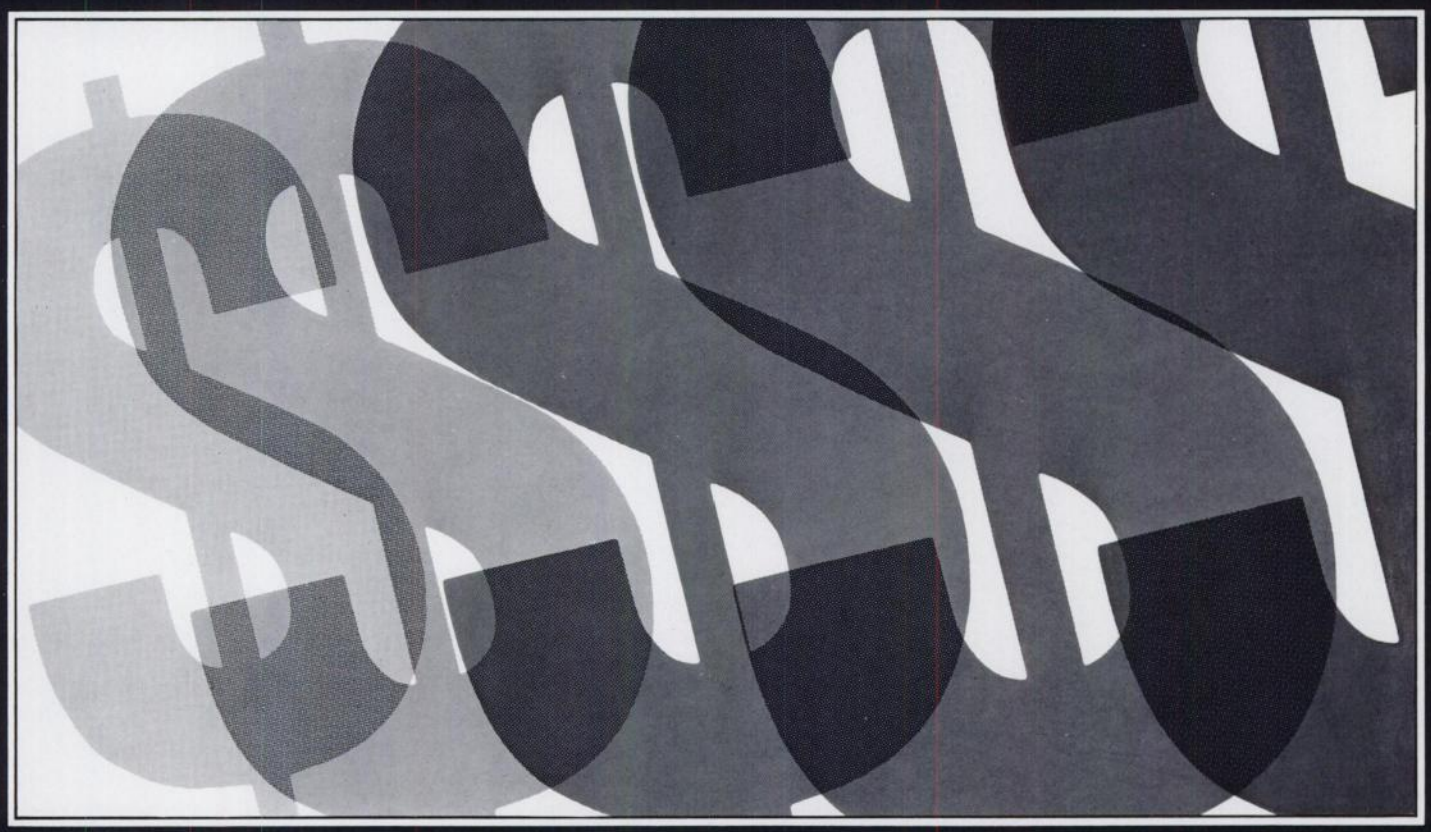
If someone offers you lower lease rates than Telco, ask some tough questions.



Like this:
Q: What can I do with my used equipment?
And this:
Q: How can you protect me against obsolescence?
Because, while the rates in medical leasing are very sharply competitive, the services aren't.
We've become the biggest medical leasing specialist in the business—competing directly with banks, leasing companies and everyone else. So we bid hard.
But we also answer well.
And not with promises, but with proven performance, like:
A: Telco will help you trade in used equipment through Labex,™ our Laboratory Instrument Exchange.
A: Telco can help you un-lease your equipment when you need to grow, through Lease/Exchange,™ another exclusive service of ours.
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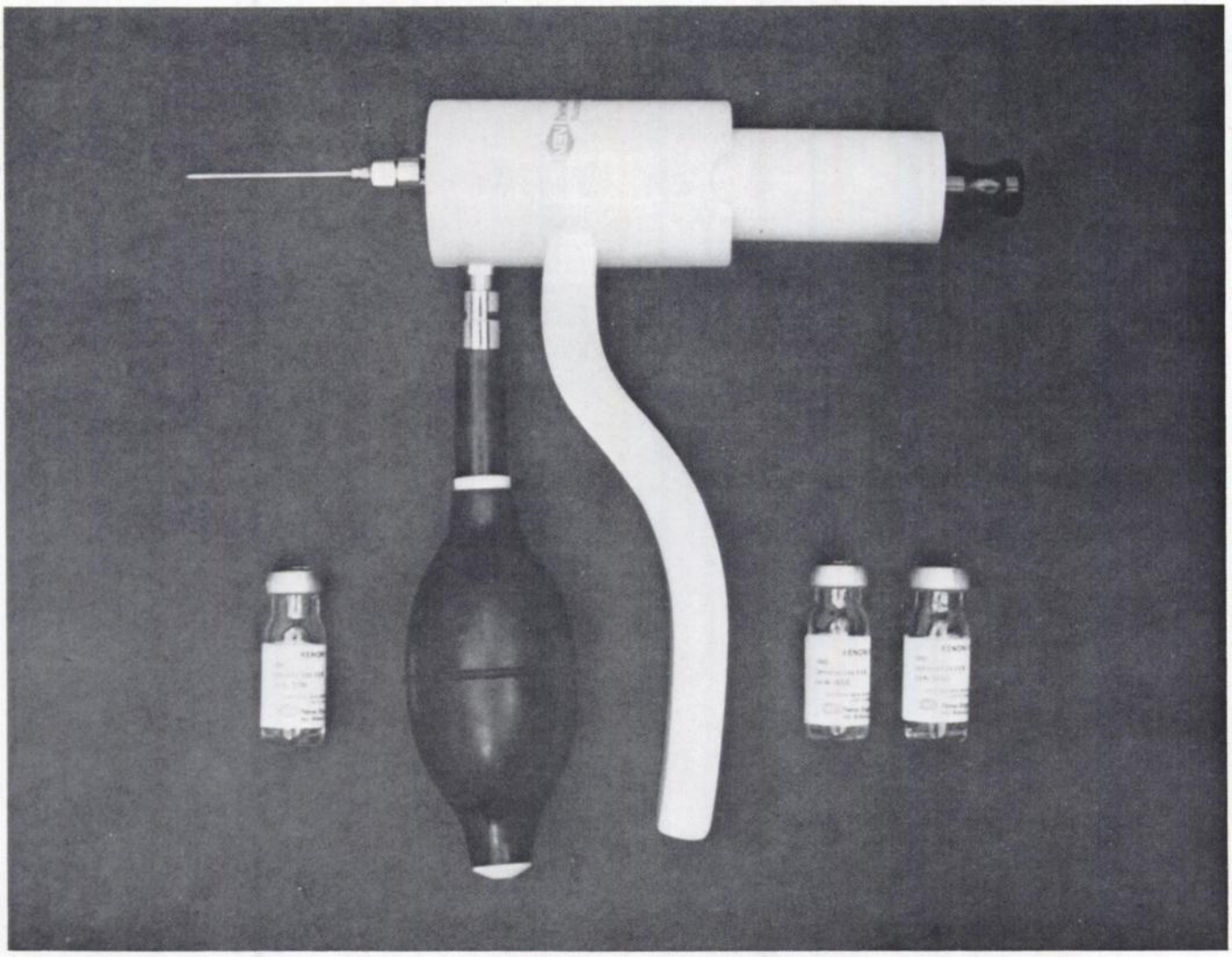
New convenience in Xenon-133 dispensing.



Just slide a pre-calibrated vial of Xenon-133 gas from the lead storage tube into the shielded gun, push the plunger to break the seal, and squeeze.

Fast, trouble-free handling. Precise dose, pre-calibrated at rated strength (10-100mCi) as of Wednesday noon in your facility. And we let you have the dispenser free for as long as you use our new Xenon-133 system. Call us.

New England Nuclear
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Atomlight Place, North Billerica, Mass. 01862
Telephone (617) 667-9531

WHAT'S NEW IN PATIENT POSITIONERS AND IMMOBILIZERS? PLENTY.

WHOLE-BODY (Half-Body and Head) IMMOBILIZERS

This new approach features a lightweight (6 lb.) polystyrene-filled plastic mattress that restrains the patient quickly, firmly and comfortably, in any position... and is re-usable. Operation is easy. The limp mattress is molded gently around the body (or any part). As its air is pump-evacuated, the mattress solidifies into a rock-hard mold that is precisely contoured to the body.

Since it holds the patient rigidly, it prevents the addition of artifacts to photoscans. Half-body size is available for pediatric work and for restraining the head or other parts of the body. Made of radio-transparent, low-density materials. Ideal for use with all rectilinear scanners and gamma-imaging instruments.

Whole-Body Immobilizer

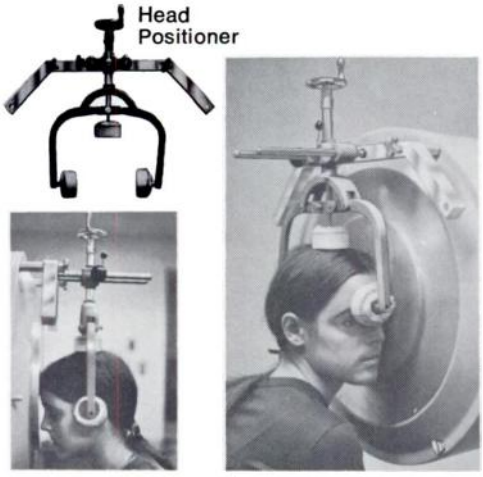
Mattress can be molded around any portion of body

Half-Body Immobilizer holds the head rigidly

HEAD POSITIONER For Nuclear-Chicago and Picker SCINTILLATION CAMERAS

Assures positive head immobilization and the precise placement of the skull during brain scanning. Motion artifacts are eliminated without patient discomfort. Adjusts to all head sizes and permits lateral, AP and PA views. Includes all hardware for mounting on Pho/Gamma and Dynacamera.

Operation is simple. The hand-wheel opens and closes the padded jaws in unison. Jaws rotate through 360° but will index parallel to the camera face. The distance from the patient's head to the camera face is adjustable, as is the position of the jaws with respect to the collimator.



Head Positioner in use with Nuclear-Chicago PhoGamma camera. Also compatible with Picker Dynacamera.

NUCLI-FOAM HEAD POSITIONERS

For positive, comfortable immobilizing. Made of washable polyurethane foam. Lighter and easier to use than other cumbersome devices. Two instant-adjust straps hold patient's head and block of foam snugly against an aluminum base. Set of 4 Positioners includes adult and child sizes (one each for lateral and A.P. positions).

Nucli-Foam Head Positioners

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Subsidiary of RADIATION-MEDICAL PRODUCTS CORP.
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For more details, ask for Bulletin 792-B

New Nuclear Medicine Catalog also available on request.


adicamera 5o

WHAT'S NEW IN PATIENT POSITIONERS AND IMMOBILIZERS? PLENTY.

WHOLE-BODY (Half-Body and Head) IMMOBILIZERS

This new approach features a lightweight (6 lb.) polystyrene-filled plastic mattress that restrains the patient quickly, firmly and comfortably, in any position... and is re-usable. Operation is easy. The limp mattress is molded gently around the body (or any part). As its air is pump-evacuated, the mattress solidifies into a rock-hard mold that is precisely contoured to the body.

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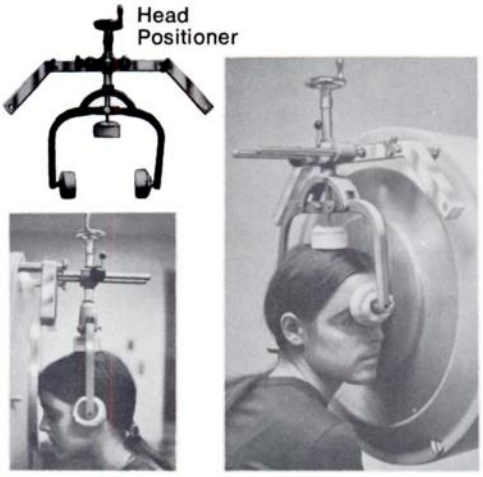

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For more details, ask for Bulletin 792-B

New Nuclear Medicine Catalog also available on request.

Meet the new fast scanners from Picker.

Why new scanners?
We asked hundreds of people what they liked about scanners. "Resolution," they said. And what didn't they like? "Too slow." Okay, here are two new *fast* scanners from Picker: the *fast* Magnascanner® and the *fast* Dual Magnascanner®. They're improved in other ways, too, as you'll soon see.

What's been changed?
These new Magnascanners are fast instruments because they're computerized. The implication of this is that the entire setting-up procedure has been radically simplified and speeded. These machines respond to your commands by making many of the decisions (consistent with the desired output, of course) automatically. Since most of the calculations and adjustments are eliminated, the calibration is virtually instantaneous: these Magnascanners can actually be set up for use in a matter of seconds.

Does the computer limit the user's options?
Suppose that you wish to set the scan parameters individually for a specific application. Simple. An alternative manual control overrides the computer and provides maximum flexibility.

What else?
Here are some of the other major user benefits inherent in these new digital Magnascanners.
Consistent scans: with the scan parameters automatically optimized, overall scan quality and consistency are superior and interpretation is improved.
Repeats minimized: automatic calibration provides more consistently usable scans and, hence, minimizes the

annoyance, time, and cost of retakes for you and your patients.

Productivity improved: rapidity of set-up, coupled with the reduction in the need for retakes, significantly reduces total study time.

Training simplified: another obvious advantage of automatic calibration.

Color printer improved: the new color dot scans are simply the highest quality color scans obtainable at any scanning speed. And color ranges are set up automatically.

How about the new, *fast* Dual Magnascanner?

All of the improvements described above are shared by both the new Magnascanner and the new Dual Magnascanner. In addition to these, the Dual Magnascanner also features: dual isotope and subtraction, improved uniformity, and matching of scans between the lower and upper probes.

How do I learn more?

Call your local Picker representative, or write Picker, 333 State Street, North Haven, Connecticut 06473, or complete the coupon. Thank you.

Picker Corporation
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Please forward information on Picker's new:

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ISOCLEAN CONCENTRATE®

The Recognized Radio-Decontaminant

Fully proven daily in hundreds of isotope laboratories.

Safely Solubilizes Nuclidic Radioactivity

Safely and efficiently removes nuclidic radioactivity from all types of isotope labware and laboratory surfaces.
Potent combination of eight synergistic surfactants, diluted for use, is effective for all isotopes—whether inorganic or organic; in ionic or non-ionic form.

FOR GLASSWARE: Permits reuse of scintillation sample tubes and counting vials, beakers, pipettes, syringes, etc.
FOR METAL OBJECTS: Isoclean decontaminates syringe needles, forceps, shielded containers, and stainless steel trays.
FOR PLASTIC COMPOSITIONS: Isocleaned benchtops, floors, utensils, and rubber gloves are wipe-test activity-free.

Available from offices of Amersham-Searl, Nuclear Associates, Picker Corporation, or directly from Isolab.

Request Isoclean product data folder.

ISOLAB INCORPORATED
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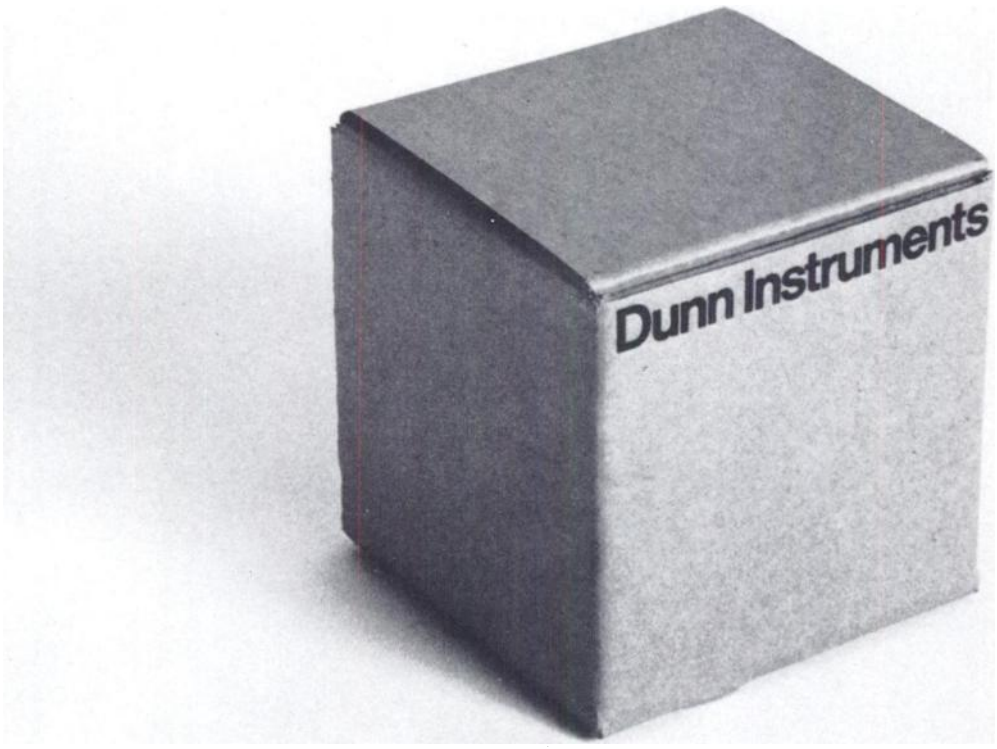
Dunn Instruments is shipping Dunn Instruments

Shipments have started. We're moving out our new DI 650 Automatic Film Processors and DI 800 Triaxial Tables. Reception by the profession to these two products has been enthusiastic; their technical excellence is immediately apparent. Now, what do we do for an encore?
We will soon introduce our new DI 900 Modular Xenon Gas Delivery System. The DI 900 is modular because of the varying needs of each clinician. It will be expandable from a single breath system up to a sophisticated re-breathing device with dual spirometers, automatic oxygen replenishment, carbon dioxide removal, xenon exhaust trapping and many more advanced features.
Will the DI 900 solve your needs? We think so because, like the DI 650 and 800, its design was an "inside" job. This system is yet another example of how Dunn Instruments is applying technology of the seventies to meet the growing demands of today's NM clinician.

Dunn Instruments

1335 Columbus Avenue, San Francisco, CA 94133 / Phone (415) 776-7033

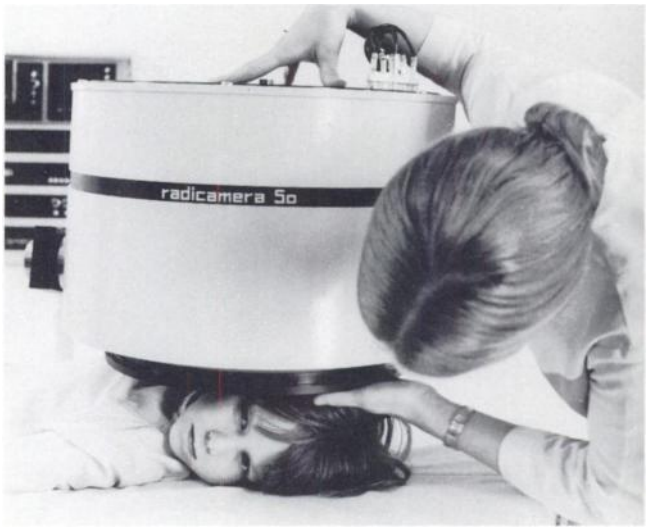



adicamera 50

Simplicity... is the natural result of profound thought. —Hazlitt

So we started thinking.

First, we thought about positioning. How could we simplify it: The solution, we decided, was to design a counterbalanced detector assembly. One which a 90 pound female technologist can push around with her finger. And one which doesn't make you wait for motors and gears to bring the detector into place. You merely position it where you want it, when you want it there.



We also thought about the patient. Which is another reason the counterbalanced detector head came into existence. It's quiet. With the Radicamera, your patients remain unperturbed and relaxed during study set-up.

And we designed the detector housing with more in mind than just housing the detector. We wanted to be certain that it wouldn't interfere with the patient's shoulder during lateral brain studies. So we made it more compact. But we still left room for a larger-than-usual 13-inch crystal. (After all, increased field-of-view and uniformity are important too.)

Then we constructed the detector stand so that plenty of room existed under and around it. That simplified patient table positioning.

We were also able to think about controls and circuitry. During the design phase, the Radicamera was free from the inertia of precedent. Consequently, we took full advantage of the technological developments and expertise of the Seventies. The results include easy, error free operation, reliable electronics, and a small space conserving console.

The Radicamera has eliminated many of the complexities of its generic predecessors. At the same time, significant advances have been made in all important clinical performance parameters.

Discover the refreshing simplicity of the Radicamera 50 for yourself.

Write, or call:

NUCLEAR DATA INC.

Post Office Box 451
Palatine, Illinois 60067
Tel: 312/529-4600

Nuclear Data Inc. (U.K.)
Rose Industrial Estate
Cores End Road
Bourne End, Bucks., England

Nuclear Data, GmbH
Mainzerlandstrasse 29
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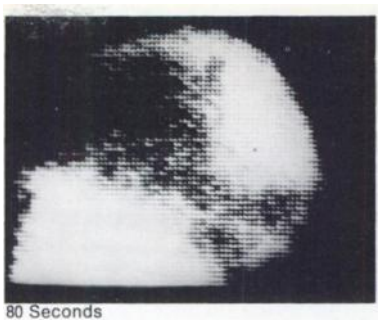
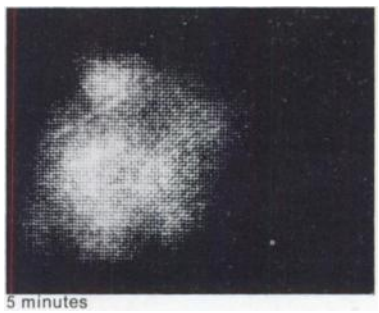


80 Seconds

Typical Brain Scan
This is a six-year-old white male with a recurrent astrocytoma on the left side. Left lateral delineating the major portion of the recurrent tumor – ^{99m}Tc pertechnetate-5.0mCi. (The comparable scan took 5 minutes.)



5 minutes

Typical Liver Scan
This shows polycystic disease of the liver in a 45-year-old male. Note that the individual cysts are well-defined on the autofluorogram. Anterior view of liver with comparison studies – ^{99m}Tc sulfur colloid-1.0mCi. (The comparable scan took 25 minutes.)

If you had 4704 eyes, you'd see a lot better too.

The Baird-Atomic IMAGER 5700, with 4704 "eyes", delivers an image resolution better than any other.

What's the secret? Our detector!

Housed just above the multi-holed collimator on the Imager, the detector is a unique matrix of 294 NaI (Tl) crystals. Each crystal is a sensor, sending each detected event, on its own, to the magnetic core memory. Combine this imaging with the computerized bed that's programmed to index 16 times – 2.78mm per move – and you have our secret . . . a matrix of 4704 individual detectors or "eyes".

As a result, you see better . . . with an image of superior integrity. With no interference from events in adjacent crystals. No "ghosts" to tune out. And no mispositioning at high count rates.

With Baird-Atomic's IMAGER 5700 you get a scintillation camera that can be used as a scanner and still be capable of rapid imaging as well. Many of our customers perform both Statics and Dynamics, with one patient set-up.

The IMAGER 5700 performs at 3 to 4 mm resolution . . . routinely. And you know what this can mean.

In addition, its fast Dynamics allow the physician to interpret rather than interpolate. And you know what that means, too.

Baird-Atomic has worked with physicians and pharmaceutical manufacturers as a team to do a better job of taking care of people . . . for faster diagnosis and quicker treatment. That's why we've been a leader in nuclear medical research and other analytical instrumentation for 35 years.

For further information, call or write today. Let us show you the way to see 4704 times better with the IMAGER 5700 . . . and its unique detector.

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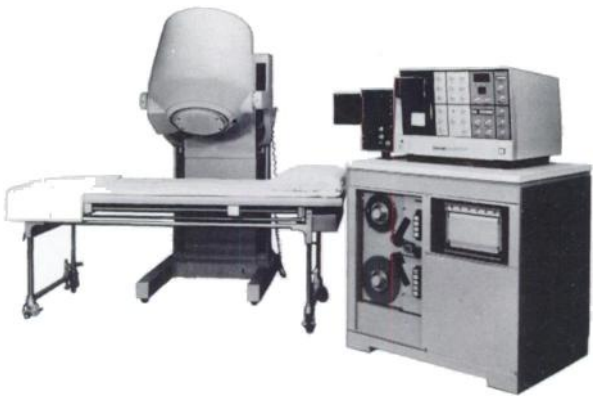
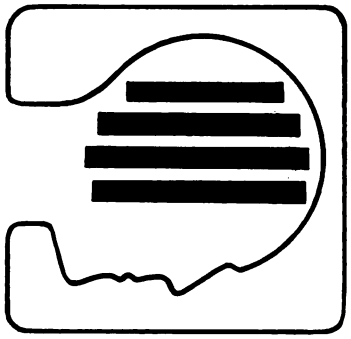
Nuclear Division, 125 Middlesex Turnpike, Bedford, Mass. 01730, 617/276-6000, Telex: 923491, Cable: BAIRDCOBFRD



Send for our new descriptive brochure on the IMAGER 5700 system. It's mailed without obligation.



Isotope tomography is here.

Here's what Nuclear-Chicago's Pho/Gamma® Tomocamera™ System offers you (in addition to full, conventional capabilities of the Pho/Gamma Scintillation Camera):

Four equally spaced, in-focus planes simultaneously displayed.

Variable spacing of equally separated focal planes—from 1/2 to 1-1/2 inches.

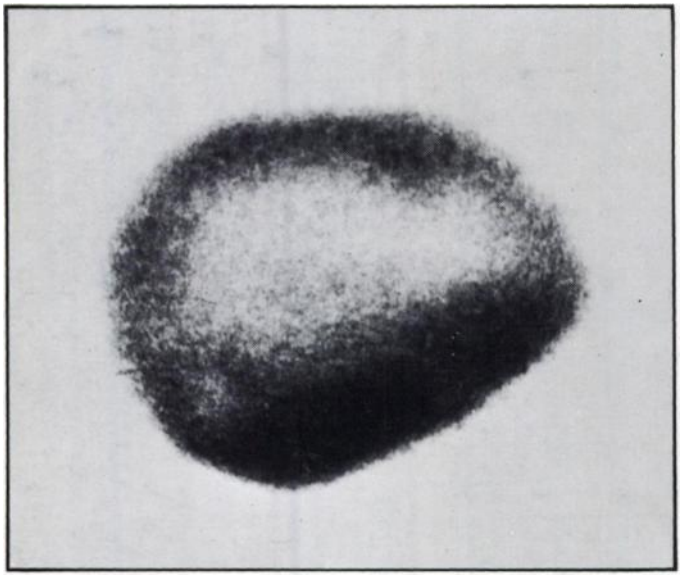
Distance from collimator to farthest focal plane is variable to 7-3/4 inches.

Pho/Gamma tomographic images can be recorded, replayed, and analyzed with the Pho/Gamma Data-Store/Playback System.

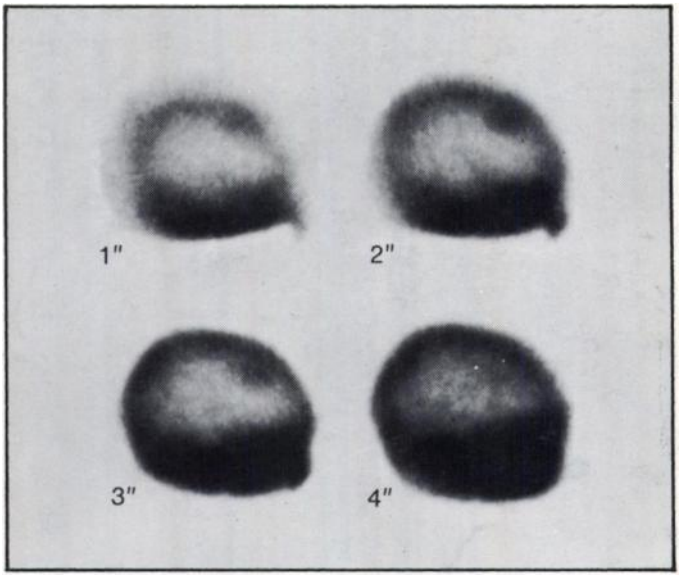
Obscuring events above and below each plane of focus are effectively "tuned out."

And much more.

Your Nuclear-Chicago Sales Engineer has all the details. Or write us. 0-240



Brain, right lateral view. Standard scintiphoto.



Brain, right lateral views presented simultaneously in a single tomographic scintiphoto. Lesion in right frontal region is delineated best at 2- and 3-inch depths. Surgery revealed well differentiated adenocarcinoma.

NUCLEAR-CHICAGO

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