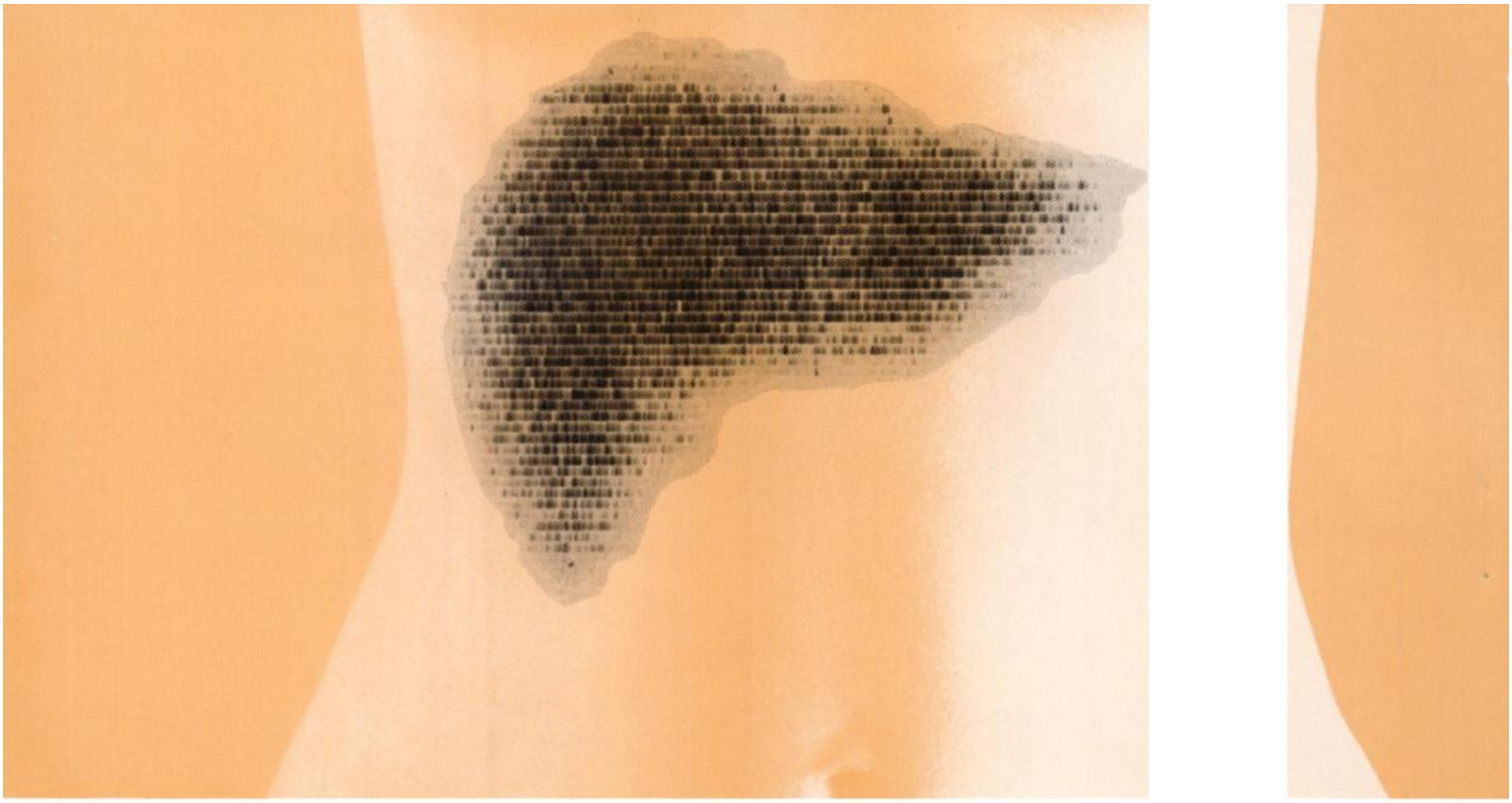

when you want to "see" the liver!

TECHNETIUM SULFIDE Tc 99m

Indications: For direct visualization of the liver and spleen.

Warnings: Radio-pharmaceutical agents should not be administered to pregnant or lactating women, or to persons less than 18 years old, unless the information to be gained outweighs the hazards. Radio-pharmaceuticals should be used only by physicians who are qualified by specific training approved by an individual agency or institution already licensed in the use of radioisotopes.

Precautions: Care should be taken to ensure minimum radiation exposure to the patient as well as to all personnel. Although there have been no untoward reactions reported from the use of mannitol stabilized colloid, physicians administering this agent should be prepared to institute emergency resuscitation in the event of an anaphylactoid reaction. The absence of a lesion in the scan does not necessarily rule out its existence.

COLLOKIT
(KIT FOR TECHNETIUM SULFIDE Tc 99M)

How Supplied: Package of 6 units, each containing:

Vial 1: Sterile Thiosulfate—Mannitol Solution, 1 ml. Each ml. contains Mannitol 100 mg. and sodium thiosulfate 2.0 mg.

Vial 2: Sterile Hydrochloric Acid 0.25 N, 1 ml.

Vial 3: Sterile Buffer Solution, 2 ml. Each ml. contains potassium biphosphate 40.8 mg., sodium hydroxide 5 mg., and disodium edetate 1 mg. And accessory equipment.

PERTGEN-99m
(TECHNETIUM Tc 99M GENERATOR KIT)

How Supplied: 50, 100, or 200 millicurie generators, and accessory equipment.

007221

ABBOTT LABORATORIES
North Chicago, Illinois 60064
World's Leading Supplier of Radio-Pharmaceuticals
Vertretung für Europa: Labor-Service GmbH, Abt. Radiopharmazeutika, 6236 Eschborn/Ts, Germany, Postfach 1245

NEW! This is the pair to see

Announcing COLLOKIT™

KIT FOR TECHNETIUM SULFIDE Tc 99m

Collokit is a "cold" kit that can be stored without refrigeration until you're ready to use it. Then, following directions, it takes just minutes to prepare a sterile, non-pyrogenic colloidal solution of Technetium Sulfide Tc 99m. Collokit offers many advantages:

- **Simplicity** (ease of handling)
- **Mannitol stabilizer** (patent pending)
- **Economy** (less cost than ready-made products)
- **Convenience** (individual units, each with all of the components for a day's use)

Collokit is specifically designed for use with Pertgen-99m. It is not recommended for systems with eluates containing oxidizing agents (such as sodium hypochlorite).

PERTGEN®-99m TECHNETIUM Tc 99M GENERATOR KIT

Fractional elutions – the exclusive Abbott Metering Unit permits fractional elutions of the Pertgen-99m Generator allowing the preparation of high assay material using Collokit.

Safety – the protection afforded by the unique Rayshield™ (shown underneath the Pertgen-99m Generator), means that Pertgen-99m can be used on the lab bench –there's no need to hide this system behind the bricks!

Choice of calibration – to best fit your needs, you can now order Pertgen-99m shipped on the weekend calibrated for Wednesday or Pertgen-99m shipped on Thursday calibrated for Tuesday.

Collokit and the consistent and high yields of Pertgen-99 eluates provide an unbeatable combination!

TM—Trademark.

Thyroid dysfunction? Pregnant? On the "pill"?

She's pregnant.

But if her doctor wasn't aware of it, and he scheduled a thyroid test, he could get the wrong answer.

In a study* of 166 consecutively seen pregnant women, almost all of the euthyroid patients showed up as either hypothyroid or hyperthyroid, depending on the test used.

That's because pregnancy, like oral contraceptives and estrogens, can produce misleading results if only one test is used to determine thyroid function.

What's more, patients may knowingly or unknowingly give a false history. To prevent this, schedule both a T-3 test (Triosorb) and a T-4 test (Tetrasorb), which supplies the T-7 Value (T-3 x T-4)—a highly reliable result:

- When both test values are decreased, the patient is usually hypothyroid.
- When both test values are increased, the patient is usually hyperthyroid.
- When both test values are normal, the patient is usually euthyroid.
- When a patient is on oral contraceptives or is pregnant, the test values move in opposite directions.

Both Triosorb and Tetrasorb are *in vitro* tests providing accuracy, speed and convenience. They are available in disposable kits ready for use.

By multiplying the results of both tests, you arrive at the T-7 Value—a new level of confidence in thyroid diagnosis. In Godwin's study*, when both T-3 and T-4 tests were given so that a T-7 Value could be determined, all of the euthyroid women appeared in the normal range. 010250

*Godwin, Ira D., Scientific Exhibit, 17th Annual Meeting, Society of Nuclear Medicine, Washington, D.C., July 6-12, 1970.

The T-7™ Value minimizes misleading test results for thyroid activity. (T-3 x T-4 = T-7 Value)

TRIOSORB®-131 or TRIOSORB-125

T-3 Diagnostic Kit

TETRASORB®-125

T-4 Diagnostic Kit

TM—Trademark

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CHARCOAT T-3. No fuss, no muss, no multiple pipetting or rinsing.

You don't even have to throw in a sponge. □ *What's more,* ***CHARCOAT T-3*** *tests take only thirty minutes — start to finish — without complicated setups. You do everything in one little two-part vial.* □ *Merely pipette 0.5 ml of patient serum into each test vial, invert, incubate, centrifuge, and count the supernatant.* □ *But don't take our word for how simple and economical* ***CHARCOAT T-3*** *kits are. Put one to the test. A standard kit (13 test vials) is only $20, and just a phone call away. Moreover, the extra long shelf-life of the* ***CHARCOAT T-3*** *test kit makes quantity discount purchases practical.* □ *Ask about our Automatic T-3 Computer. Easy to use—no calculations. $1680 sale or lease.*

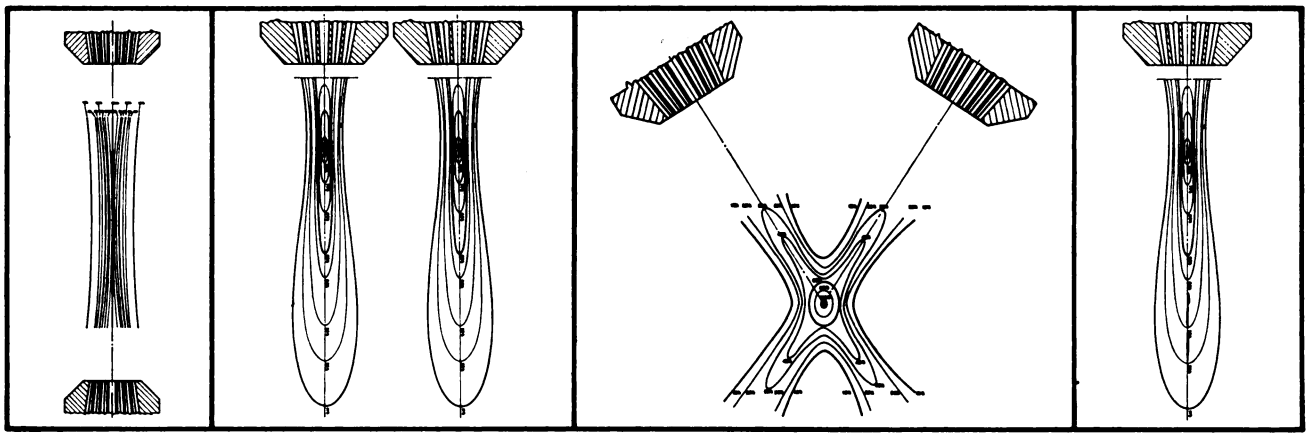
NEN

New England Nuclear Corp.

NEN Pharmaceutical Division
575 Albany Street, Boston, Mass. 02118
Telephone (617) 426-7311 Telex 094-6582

How many dual-headed nuclear scanners can be positioned in all these ways?

Just one.



The new Raytheon family of digital scanners provides the ultimate in head placement flexibility. Tomograms, oblique scans of normally masked crania base lesions, and parallel headed scanning of large areas are just some of the clinical possibilities. Of course, Raytheon scanners can operate in the conventional opposed detector position with data subtraction, addition and independent detector operation.

Versatility just begins in detector head placement. Raytheon scanners feature digital data acquisition and manipulation. Four data display channels are available for photorecord and 9-color dot recording, with or without data blending.

Scan set up is simplicity itself – insert the automatic energy selector plug, search for the hot spot, and select a scan speed (up to 600 cm/min) and line spacing, which automatically changes the dimensions of the light aperture. Then you can read out information density and film contrast on a single easy-to-read meter. Raw scan data can be fed to a magnetic tape recorder for subsequent set-up correction – or for that matter, data enhancement or reduction at speeds up to four times as fast as the original.

What's more, Raytheon scanners can adapt to meet your changing clinical requirements. A single 3″ scanner can be hospital converted to a dual 3″, single 5″, or dual 5″.

For more information on the new Raytheon family of nuclear scanners, contact Raytheon Company, Medical Electronics, 190 Willow Street, Waltham, Massachusetts 02154. Tel: (617) 899-5949.

In medical electronics . . . Raytheon makes things happen.

RAYTHEON

A "Goliath" we're not ...you might call us a "David"

We aim for the highest attainable quality in all our radiopharmaceuticals. Orders are accepted 24 hours a day. Emergency orders are filled immediately at no extra charge.

Come to think of it, you might call us a "Goliath" after all.

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WHEN THE PILL OR PREGNANCY DISTORTS THYROID TESTS

Res-O-Mat™ Free Thyroxine (FT4) Index— easiest way to a more reliable determination of thyroid function

The Res-O-Mat FT4 Index comes closest to being the most reliable assessment of thyroid function with the easiest procedure. The combined use of Mallinckrodt's Res-O-Mat T3 and Res-O-Mat T4 Tests gives an FT4 Index that compensates for conditions of pregnancy, estrogen medication, and other factors affecting this measurement.

It is so much easier and time-saving because the Res-O-Mat T3 and T4 strips simplify procedures. In the T3 measurement the strip eliminates all pipetting except initial transfer of serum to the vial. There is no washing, no critical temperature control, and the T4 procedure requires no evaporation or ice bath. There are fewer counting steps. Merely rotate the vials, remove the strips, and count the serum directly.

The Res-O-Mat FT4 Index is the ratio of Res-O-Mat T4 and T3 values. The FT4 index has been shown to have a high degree of correlation with the blood level of free thyroxine.* And this simple Res-O-Mat FT4 method makes this determination a routine laboratory procedure.

Send for complete information on the Res-O-Mat FT4 Index, or contact your Mallinckrodt sales representative.

*F. Clark and D. B. Horn, Journal of Clinical Endocrinology, 25:39-45, Jan. 1965.

Mallinckrodt NUCLEAR

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What's the difference between a Tc99m generator...

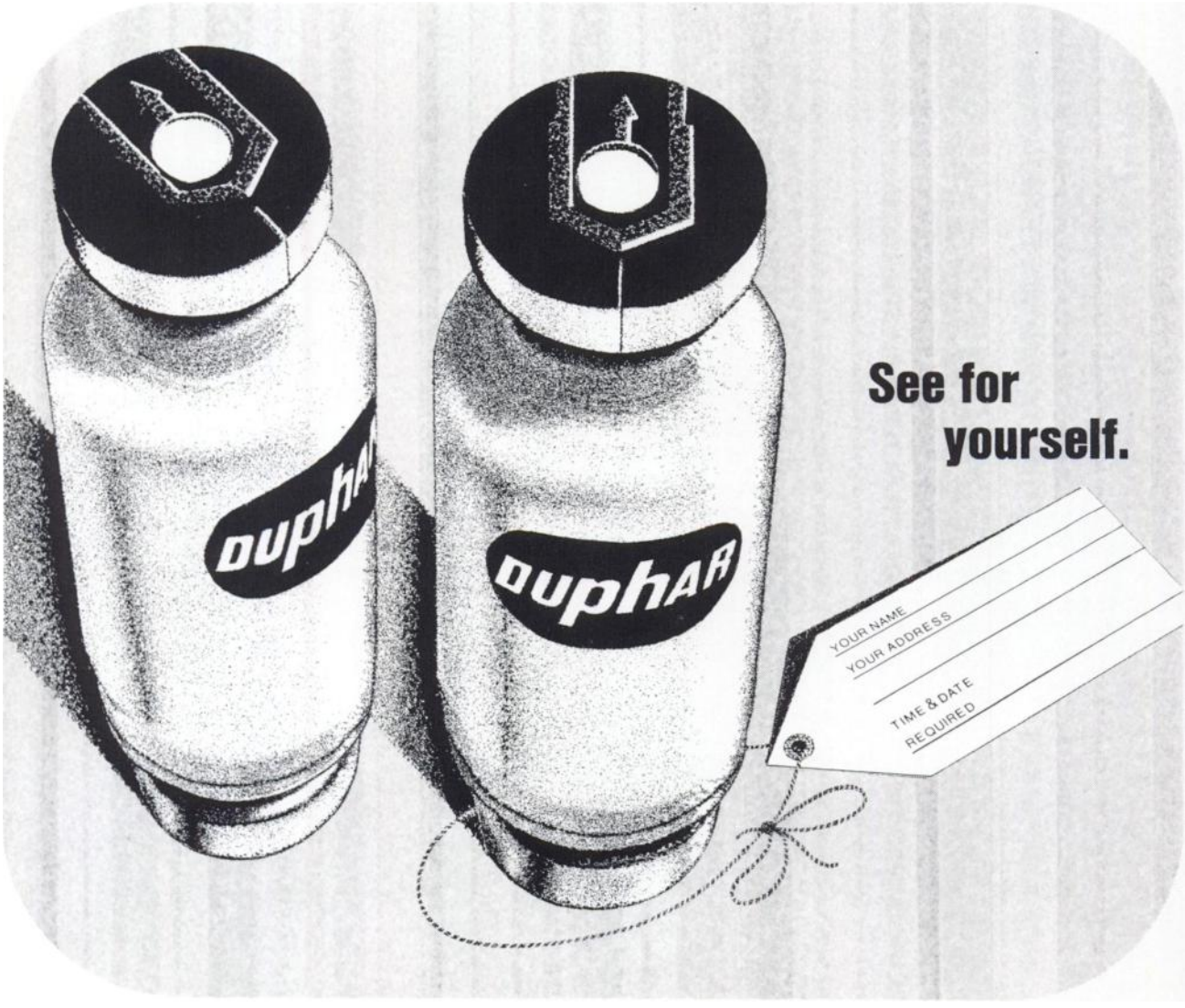
A Tc99m generator provides a handy means of producing a short-half-life isotope useful in certain diagnostic scans of the brain, liver, spleen, thyroid, kidneys, and other organs.
A Tc99m service provides this highly perishable isotope whenever and wherever you need it... safely and simply. That's the difference. Duphar are in the "service business".
What is the Duphar Tc99m service? It starts with highly efficient STERCOW 99m designed to produce a maximum concentration of sterile, pyrogen-free Technetium-99m eluate from its Molybdenum-99 parent. It goes on to include a safe, simple, sterile system of milking a fixed volume from the generator into an evacuated sterile vial.
But that's only the beginning. Every Monday (or every second Monday if you wish) you receive a fresh STERCOW 99m generator complete with enough saline solution, tubing disinfectant tissues, evacuated sterile vials, needles and labels to last until the next delivery. Generator activity is pre-calibrated for the first day of use... usually Monday at 18.00 hrs M.E.T. Every day a sufficient supply of Tc99m is milked from the system. Every week a fresh generator and accessories kit is delivered to your door... anywhere in the world.
There is a difference, isn't there? To see it for yourself, phone or write us... or your representative... today.

Your first order is free!

N.V. Philips-Duphar
Cyclotron and Isotope Laboratories
Petten, The Netherlands

DUPHAR

...and a Tc99m service?



modular II, it's great nuclear news

Right now, Nuclear Technology Corporation has a logical, economical system for radiopharmaceutical handling and storage.

A system to meet your immediate requirements.

A system programmed for an increasing capability through simple addition.

You lose no dollars on equipment replacement or overpurchase, and the first module you buy will still be working in the entire facility you'll be working with in the future.

The basic component of the system is a counter storage module. Self contained and shielded with an inch of lead, it is in itself a small capacity storage facility.

Which may be exactly what you need.

On the other hand, we also have available different size sink modules, storage modules and refrigeration modules, all of which interface in standardized frames.

So you can design exactly what you need.

To demonstrate the concept we've designed a communicator along with a brochure. They are available from: Mr. F. L. Nunziata, sales and product development, at the address below.

Or we would welcome a telephone call, at our expense of course.

Thank you.

Nuclear Technology Corp.
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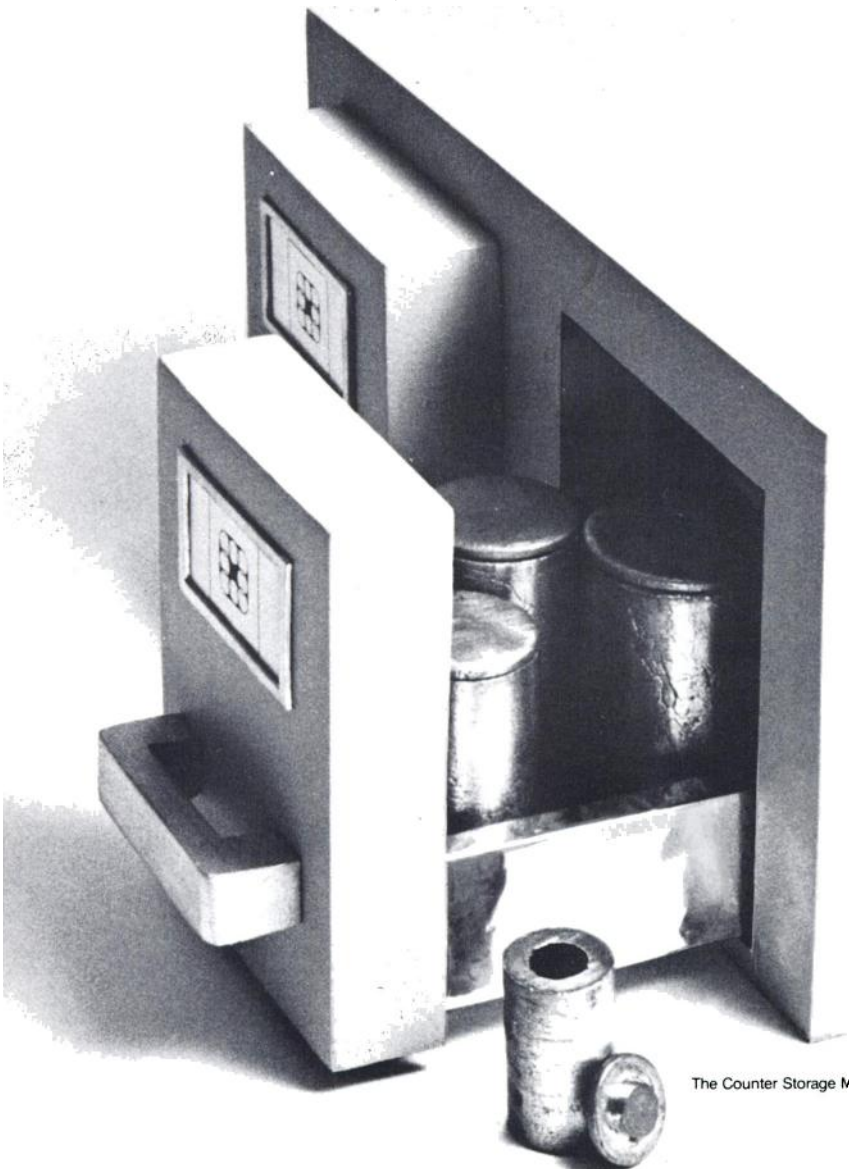
914 949-5660

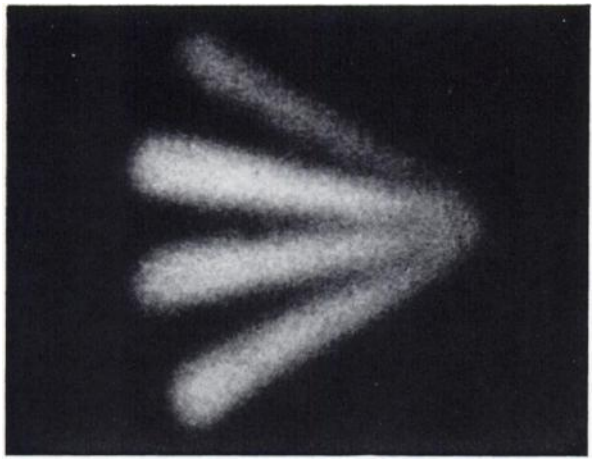


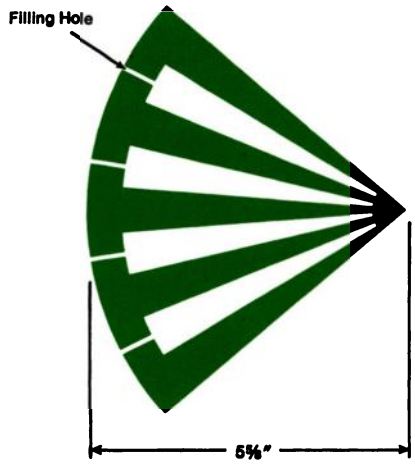
The Counter Storage Module. overall dimensions approximately: 8" D x 6" H x 12" W.

The Picker Dynacamera 2:

The scintillation camera with both high resolution and a large *undistorted* field of view:

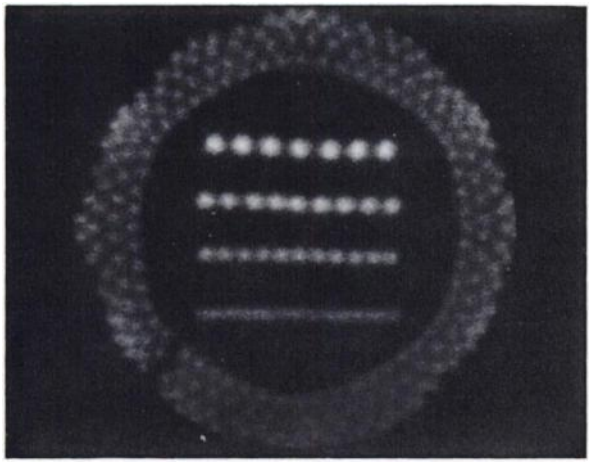
Resolution

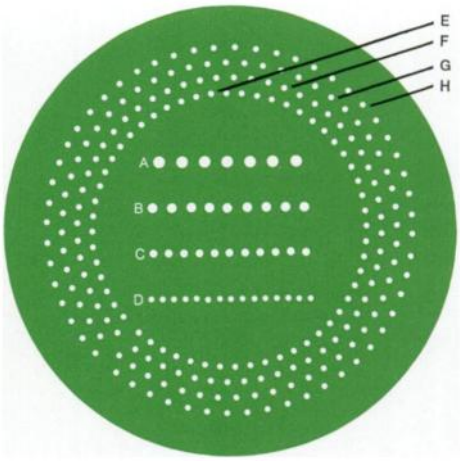




Phantom description: 3/8″ thick lucite with four 1/8″ thick radiating voids filled with activity.

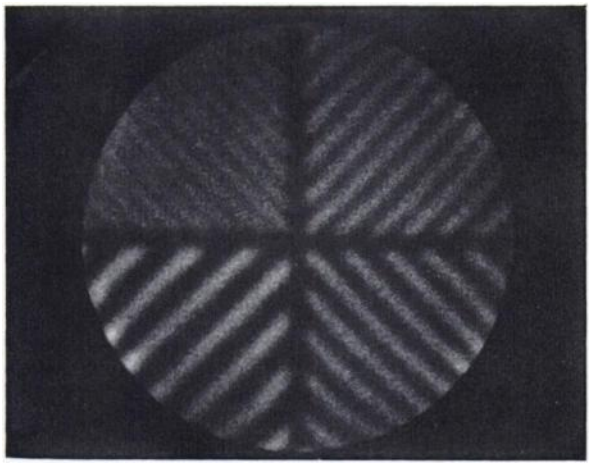
Resolution and large undistorted field of view

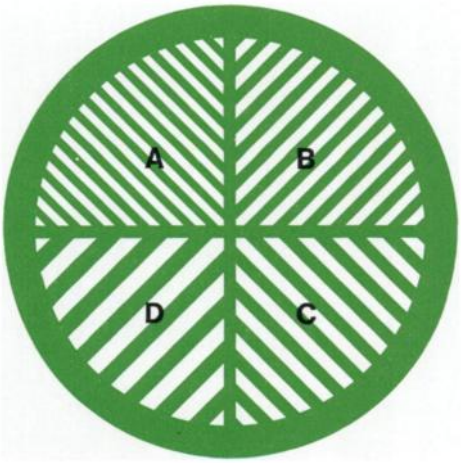




Phantom description: 1/8″ thick by 15″ dia. lead circle mounted between two circular pieces of 1/8″ thick lucite.
A. 3/8″ dia. 3/8″ space
B. 5/16″ dia., 5/16″ space
C. 1/4″ dia., 1/4″ space
D. 3/16″ dia., 3/16″ space
E. 3/16″ dia. holes with centers on 9″ dia. circle.
F. 3/16″ dia. holes with centers on 10″ dia. circle.
G. 3/16″ dia. holes with centers on 11″ dia. circle.
H. 3/16″ dia. holes with centers on 12″ dia. circle.

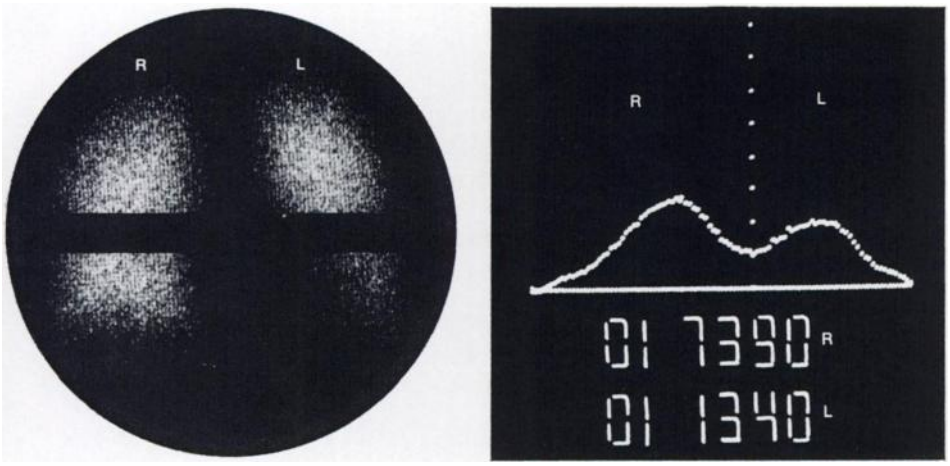
Resolution and large undistorted field of view



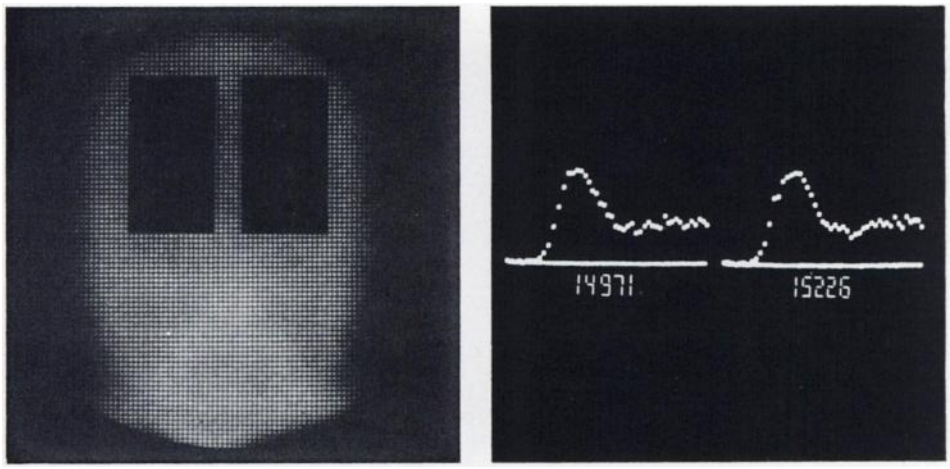


Phantom description: 1/8″ thick lead bars mounted between two circular pieces of 1/8″ thick lucite. A 14″ outside diameter, 1″ wide, lead ring surrounds the bars.
A. 1/4″ bars, 1/4″ spaces
B. 5/16″ bars, 5/16″ spaces
C. 3/8″ bars, 3/8″ spaces
D. 1/2″ bars, 1/2″ spaces

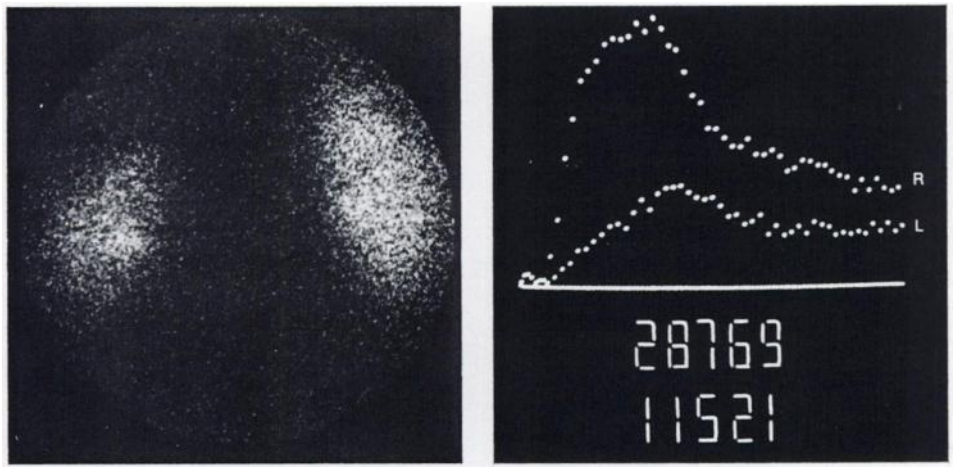
The scintillation camera with more clinically useful and proven capabilities:



Quantification of static studies
(a built-in capability)
Dynacamera 2 is the scintillation camera that provides both Scintigrams and the total count in a organ or any portion of it.



Quantitative regions of interest
(a built-in capability)
Dynacamera 2 permits the selection of two regions of interest and simultaneously displays both count rate vs. time and total integrated counts in both regions.



Quantitative dynamic studies
(a built-in capability)
Dynacamera 2 performs quantitative dynamic function studies in selected regions without the need for modifications, accessory systems, o extra cost and produces digital histograms simultaneously for quantification of each discrete phas

Please call your local Picker technical specialist for information about other Dynacamera 2 features or to learn about Dynacamera 3, the scintillation camera with a built-in image enhancement system. Or write Picker Medical Products Division, Dept. N, 595 Miner Road, Cleveland, Ohio 44143.

PICKER

The "single source responsibility" company

Lung scanning?

All macroaggregated serum albumins are not the same. Macroscan-131 offers all 5 of these benefits:

- **Uniformity** of particle **size** distribution
- **Minimal free iodide**
- **Superior manufacturing technique** (supernatant is removed in the manufacturing process)
- **Safety** (no recorded reactions to date in thousands of scans)
- **Cost** (lowest of the 3 leading products)

Macroscan-131 is aseptically prepared and nonpyrogenic. It is ready to use and should not be heated prior to use.

INDICATIONS: For scintillation scanning of the lungs to evaluate total, unilateral, and regional arterial perfusion of the lungs.

WARNINGS: Radio-pharmaceutical agents should not be administered to pregnant or lactating women, or to persons less than 18 years old, unless the information to be gained outweighs the hazards. There is a theoretical hazard in acute cor pulmonale, because of the temporary small additional mechanical impediment to pulmonary blood flow. The possibility of an immunological response to albumin should be kept in mind when serial scans are performed. If blood is withdrawn into a syringe containing the drug, the injection should be made without delay to avoid possible clot formation.

PRECAUTIONS, ADVERSE REACTIONS: Care should be taken to administer the minimum dose consistent with patient safety and validity of data. The thyroid gland should be protected by prophylactic administration of concentrated iodide solution. Urticaria and acute cor pulmonate, possibly related to the drug, have occurred.

009249

MACROSCAN®-131 AGGREGATED RADIO-IODINATED (I^{131}) ALBUMIN (HUMAN)

Each milliliter contains 1 to 3 mg. aggregated human serum albumin labeled with iodine 131, with benzyl alcohol, 0.9%, as preservative. Radioactivity is usually between 800 and 1300 microcuries per ml. on first day of shipment. For full prescribing information, see package insert.

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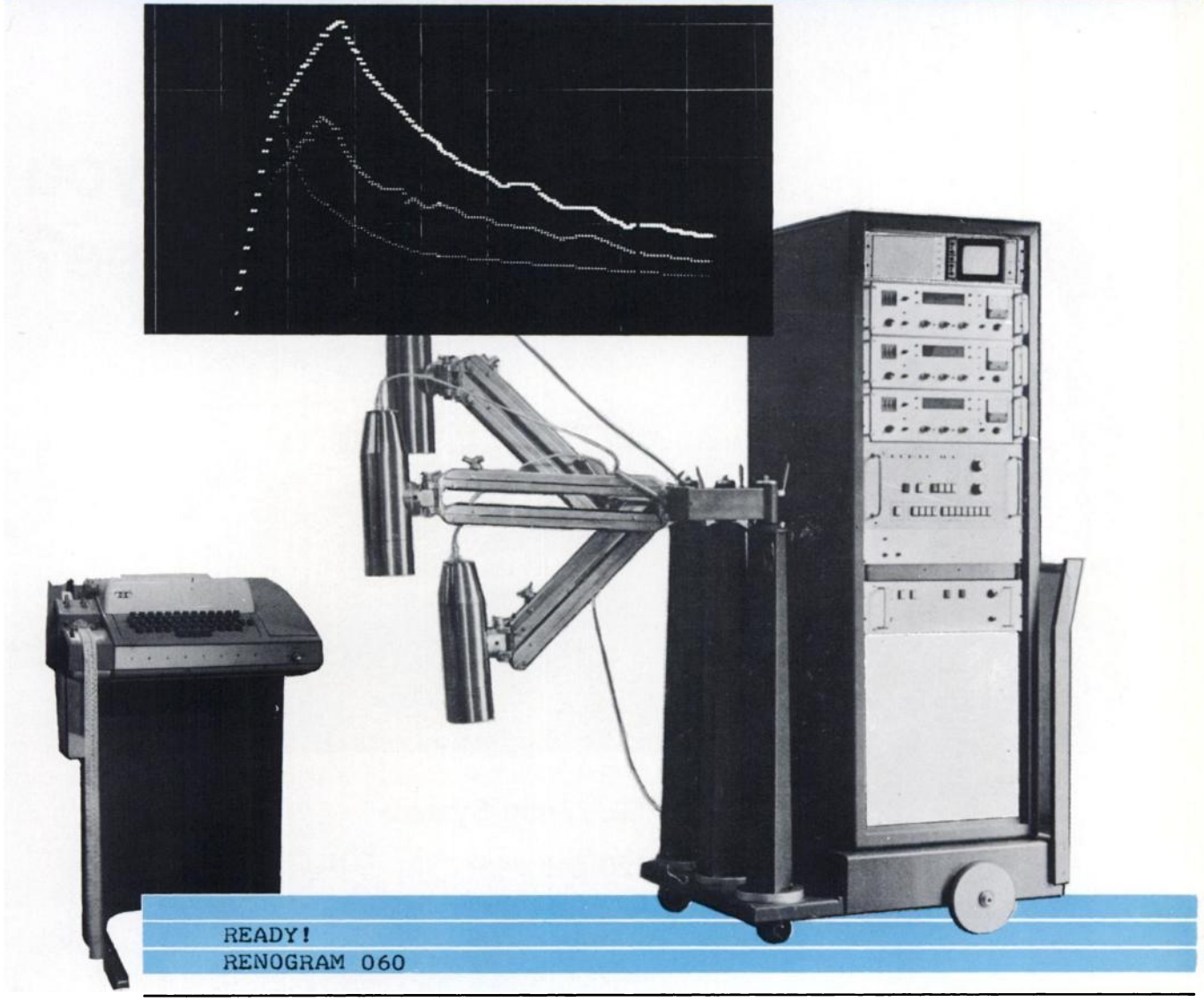

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1/MIN	S2	000•259	000•200	001•295
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MIN••	T(M)	002•496	002•895	000•861
MIN••	**T(S)**	**001•597**	**001•997**	**000•799**
MIN••	T(C)	001•597	002•296	000•695
MIN••	T1/2	002•596	003•395	000•764
CPM••	Y(M)			000•661
CPM••	Y(C)			000•647
1/MIN	C	000•327	000•246	001•333
1/MIN	**E**	**000•327**	**000•212**	**001•542**
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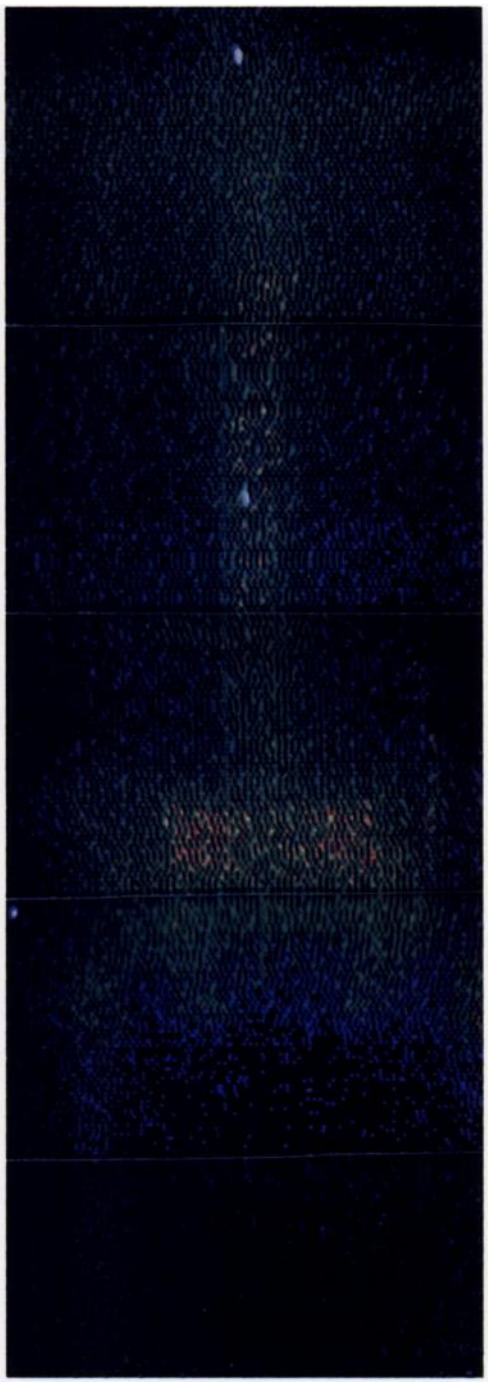
When high in-depth resolution is required but scanner speed is too slow, what then? (Simply consider the Picker Colorpix™ 2.)



Whole body bone study, AP view.
Time: Approximately 4 minutes per view, 30-45 minutes for the entire study. Isotope: F 18. Dose: 1 mCi.

Users of nuclear medical equipment are accustomed to compromise. To get, you give. High in-depth resolution? (Okay, but at slow speed.) High speed? (Yes, but...)

Until now. With the development of the Colorpix 2 even institutions with heavy static-imaging loads can enjoy maximum diagnostic information. And more.

We show herewith a sampling of typical Colorpix 2 scans. And we list below—in the briefest of forms—the outstanding Colorpix 2 features. Finally, we've also included a Business Reply Card to simplify your request for the detailed Colorpix 2 booklet. (Now it's no longer a question of speed *versus* resolution.)

Colorpix 2 Features

(1) Superb in-depth resolution (uses focusing collimators).

(2) High speed (complete organ views in 2 or 3 minutes).

(3) Color scans to enhance perception of small count variations.

(4) Image enhancement capabilities.

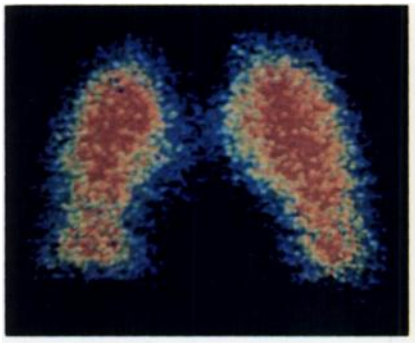
(5) High counting efficiency for low dose studies.

(6) Ability to handle high energy gamma emitters (like strontium 85 for bone studies).

(7) Dynamic function study capability (e.g., renal uptake studies).

(8) Field large enough to do lungs or liver in a single view.

(9) Tape recorder available to record and replay for optimizing enhancement and background suppression levels.



AP. Count: 144,771
Abnormal lung study. Bilateral perfusion defects are noted in this patient who had multiple pulmonary emboli secondary to a deep thrombophlebitis of the leg. Isotope: I 131 Macroaggregated Albumin. Dose: 350 μCi.

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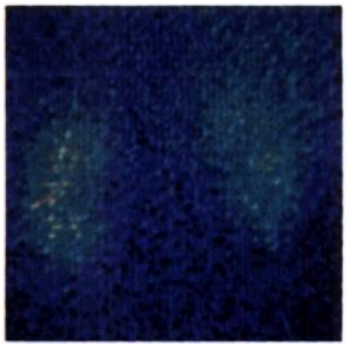
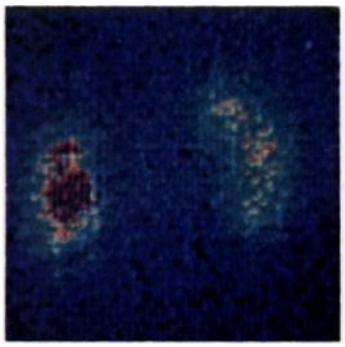
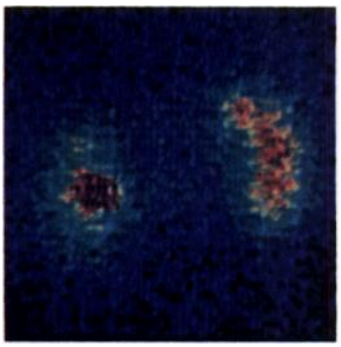
Picker Colorpix 2 typical scans.



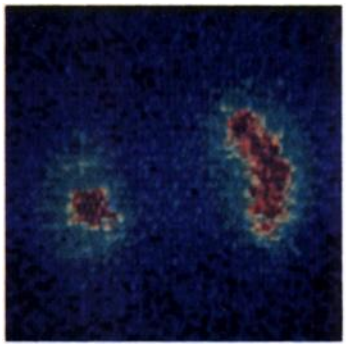
1. 0-2 minutes. Count: 50,531



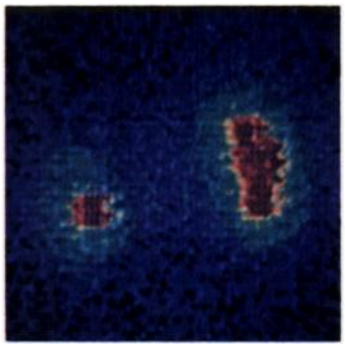
2. 4-6 minutes. Count: 61,179



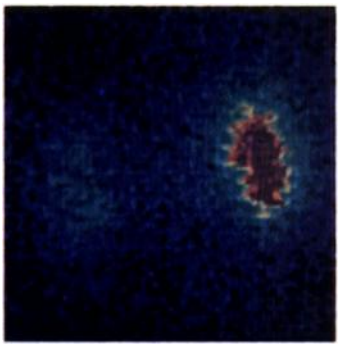
3. 8-10 minutes. Count: 58,696



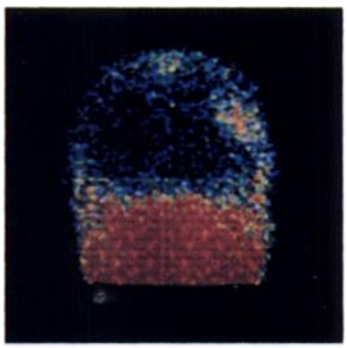
4. 12-14 minutes. Count 55,836



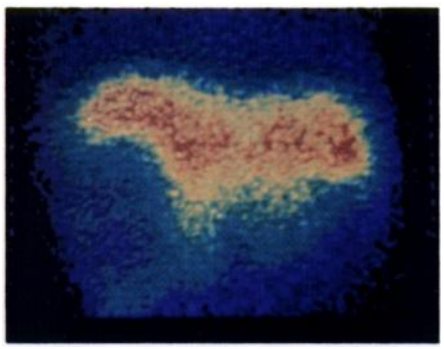
5. 16-18 minutes. Count 53,907



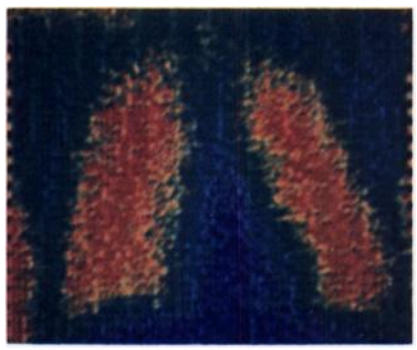
6. 20-22 minutes. Count 41,196



7. AP. Count: 175,227



8. AP View.



9. AP. Transmission Scan

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1-6. Sequential PA scans of abnormal renal function. Widespread adenocarcinoma. Isotope: I 131 Hippuran. Dose: 700 μCi.

7. Abnormal brain study. 62-year-old male patient recovering from an acute myocardial infarction when he sustained an acute CVA with right-sided hemiplegia. Time: Approximately 10 minutes. Isotope: $Tc99^{m}$. Dose: 15 mCi.

8. Abnormal liver study, 27-year-old female. Metastatic carcinoma of the rectum. Scanning time: 4-5 minutes. Isotope: $Tc99^{m}$ Sulphur Colloid. Dose: 4 mCi.

9. Transmission scan of normal lungs. Isotope: $Tc99^{m}$. Dose: 15 mCi.

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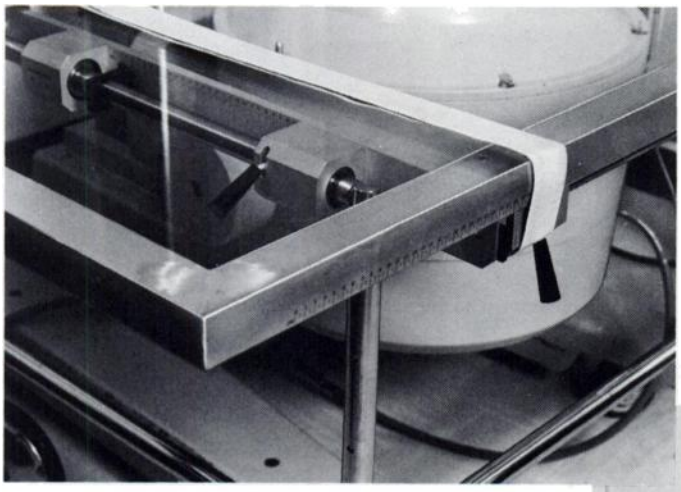

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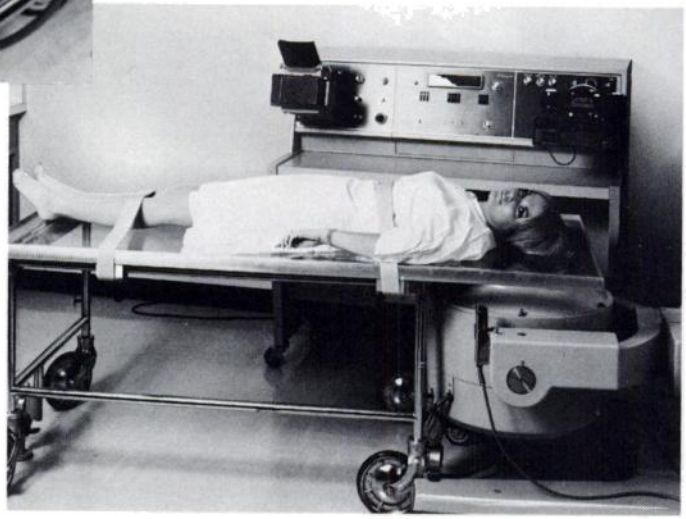

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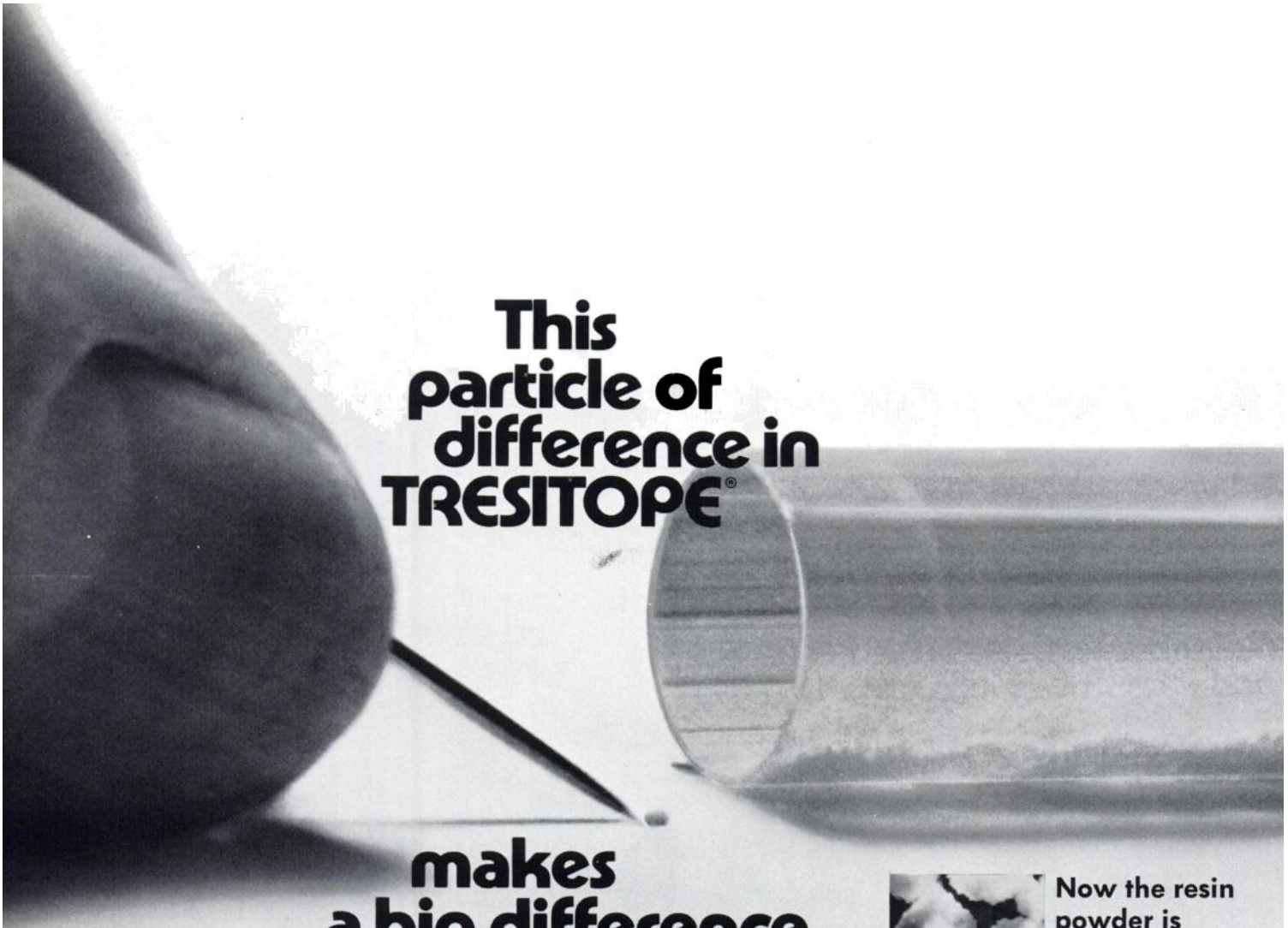

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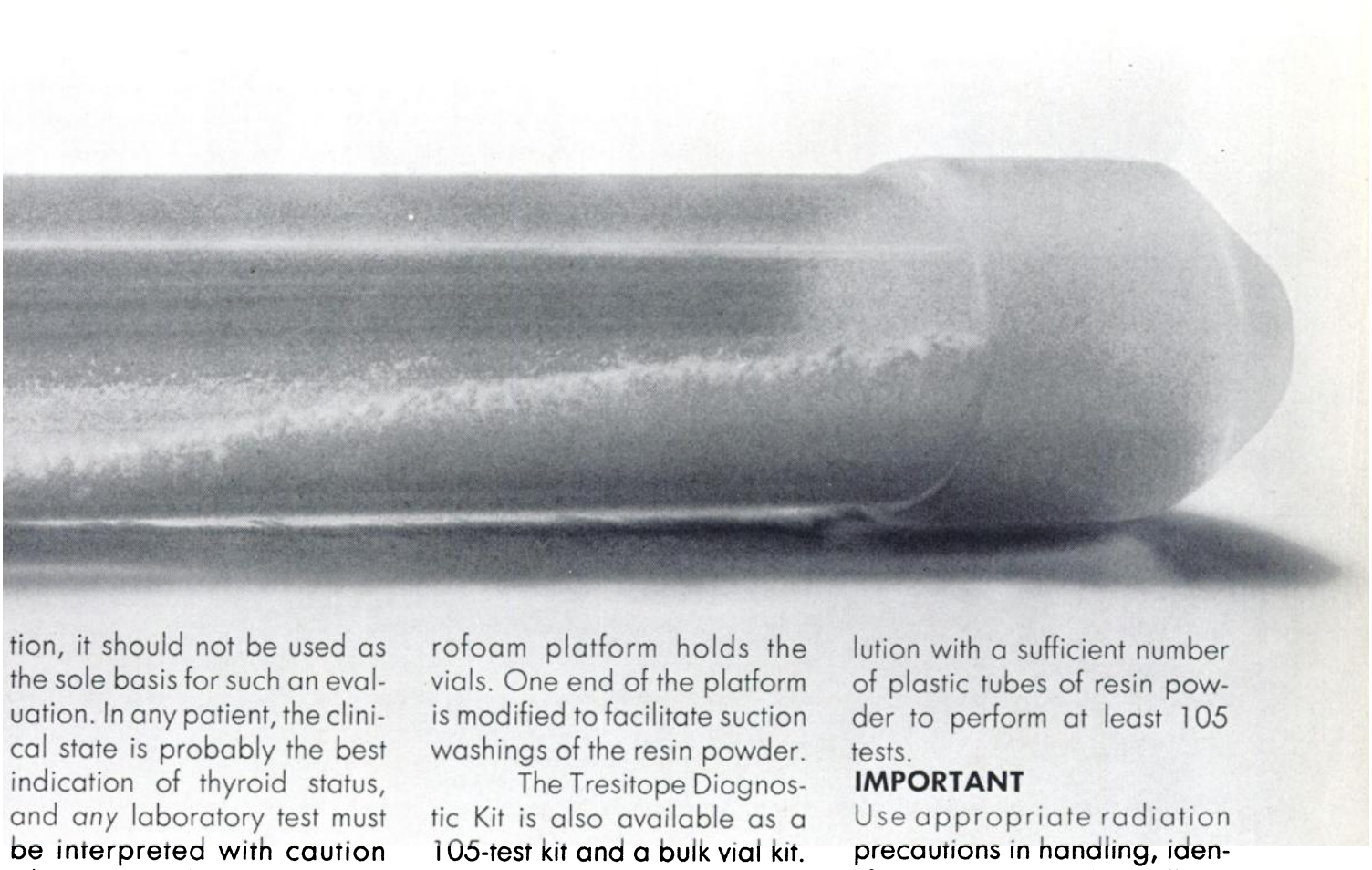

tion, it should not be used as the sole basis for such an evaluation. In any patient, the clinical state is probably the best indication of thyroid status, and *any* laboratory test must be interpreted with caution when test results do not agree with clinical evidence.

There is a Tresitope Diagnostic Kit to meet your needs. The 12-test kit containing 10 light-resistant (amber) vials of solution for serum testing, plus 2 vials for use with reference samples, is designed to save refrigerator space. The vials of radioactive test solution are packaged separately and are the only parts requiring refrigeration. A handy styrofoam platform holds the vials. One end of the platform is modified to facilitate suction washings of the resin powder.

The Tresitope Diagnostic Kit is also available as a 105-test kit and a bulk vial kit. The 105-test kit contains 100 light-resistant (amber) vials of solution for serum testing, plus 5 vials for use with reference samples. The vials of radioactive test solution are packaged separately with these two kits and are the only parts requiring refrigeration. Included is a sufficient supply of tubes of resin powder and individual droppers for each test.

The bulk vial kit contains a 60 ml. bottle of test solution with a sufficient number of plastic tubes of resin powder to perform at least 105 tests.

IMPORTANT

Use appropriate radiation precautions in handling, identifying and discarding all radioactive material. Remember that minute amounts of radioactivity remain on components used in the test, including the styrofoam platform when it is used in performing the test, and particularly when the Tresitope Suction Method is used for a number of tests.

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FIGURE 1. SERIAL SCINTIPHOTOS. ANTERIOR VIEW.

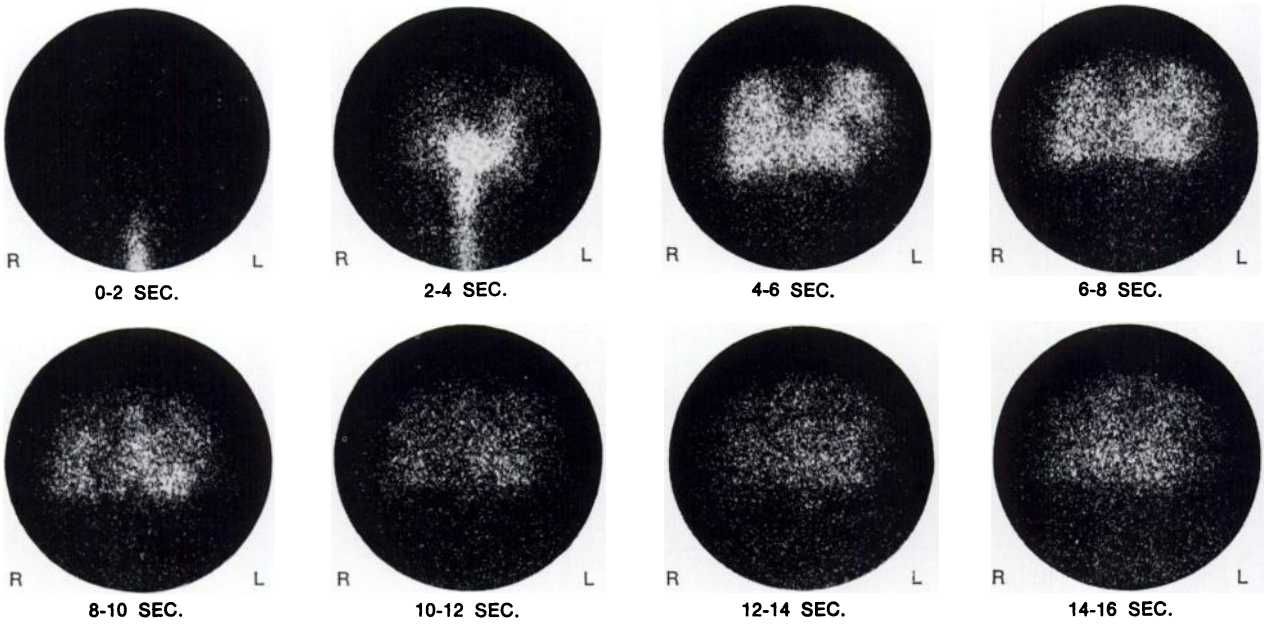

FIGURE 2.
AREAS-OF-INTEREST.
ANTERIOR VIEW.

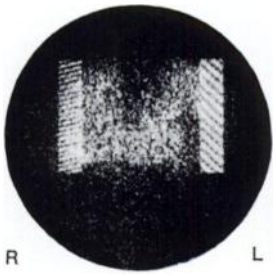

FIGURE 3. PULMONARY DILUTION CURVES, ABNORMAL.
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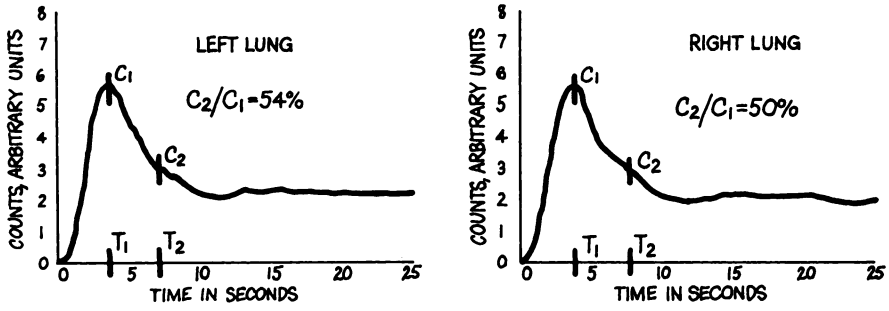

FIGURE 4. PULMONARY DILUTION CURVES, NORMAL.
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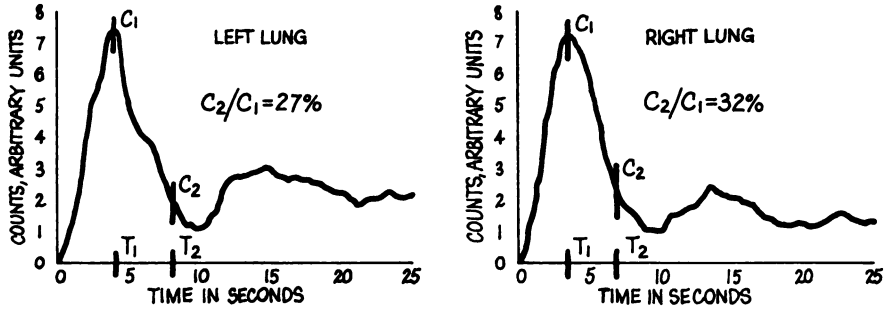

The Cardiac Dynamic Study

A Dynamic Technique Using the Nuclear-Chicago Pho/Gamma® Scintillation Camera and Data-Store/Playback System

This study combines serial scintiphotos of the circulation of ^{99m}technetium pertechnetate through the heart and lungs, photographed from the Pho/Gamma Scintillation Camera, with a time-concentration curve of the pulmonary circulatory dynamics using the Data-Store/Playback Accessory and a dual-channel ratemeter/dual-pen chart recorder.

SETTING UP. The patient is positioned beneath the Pho/Gamma detector so that the heart and lungs are included within the field of view. For adults, a central venous catheter is inserted and the tip is advanced to the superior vena cava. For children, a percutaneous femoral venous puncture is performed.

ISOTOPE AND DOSE. 50 microcuries/lb. of ^{99m}Tc pertechnetate are injected as a bolus. This is followed by a sterile saline "flush." It is imperative that the tracer be administered as a bolus for proper interpretation of the pulmonary dilution curve.

DATA ACCUMULATION. Since the ^{99m}Tc pertechnetate is injected so close to the heart, serial hand-pulled scintiphotos are started immediately. Each exposure is for 1-2 seconds and no more than eight films are necessary. Alternatively, the automatic-sequencing 35mm camera may be used to obtain precisely timed sequential images.

The Data-Store/Playback Accessory plays an important role in the examination. The entire sequence is recorded in a high-resolution digital format (256 x 256 matrix) on the magnetic tape recording system. Subsequent replay of the tape allows reconstitution of the serial images at any desired frame rate and permits correction of film exposure factors to provide excellent scintiphotos. The study may be viewed on the system's variable-persistence oscilloscope during both original recording and upon tape replay.

The pulmonary dilution curves are obtained by choosing two separate areas-of-interest, one corresponding to the right lung field, the other to the left lung field. With this system's variable controls, these areas-of-interest may be rectangular or oval in shape. It is important, however, that these areas-of-interest correspond only to the lung fields, and no portion of the heart or great vessels should be included. Time-activity curves are generated with the dual ratemeter/recorder with a time constant of 0.5 seconds and a chart speed of 12 inches/minute.

CASE HISTORY. The clinical study on the opposite page is that of a seven-year-old child suspected of having a small left-to-right intercardiac shunt based on the characteristics of a systolic murmur. The child was not cyanotic. Following the diagnostic nuclear-medicine procedure, the patient was catheterized. A ventricular septal defect with a 1.2-to-1 left-to-right shunt was revealed as determined by standard dye dilution curves. In addition, there was a supervalvular obstruction of the pulmonary artery. Systemic pressures were observed in the right ventricle suggesting the diagnosis of an "Acyanotic Tetralogy of Fallot."

EVALUATION. The serial two-second images (Fig. 1) were produced upon replay of the Data-Store/Playback Accessory. The bolus of ^{99m}Tc pertechnetate is clearly seen in the inferior vena cava (0-2 sec.), having been injected into the right femoral vein. The tracer, thereafter, flows into the right atrium (2-4 sec.), then into the right ventricle and out through the pulmonary artery into both lung fields (4-6 sec.). Later frames show the return of the tracer to the left atrium, the left ventricle, and then out the aorta.

The pulmonary dilution curves were produced by adjusting the area-of-interest controls of the Data-Store/Playback Accessory, causing the areas-of-interest to correspond to the right and left lungs as indicated by the intensified areas seen on the representative scintiphoto (Fig. 2). The resulting pulmonary dilution curves (Fig. 3) show a rapid rise in count rate to a peak count rate C_1 at time T_1. $T_1 - T_0$ is the interval from time of rise onset to time of peak activity. At time T_2 ($T_2 - T_1 = T_1 - T_0$), count rate C_2 is determined from the curve. As shown, C_2 is 50 - 54% (C_2/C_1) of count rate C_1. These curves are abnormal and suggest the possibility of a left-to-right shunt. Normally, C_2/C_1 is less than 40% as shown by normal curves (Fig. 4).

CONCLUSIONS. The diagnosis of a left-to-right shunt was confirmed in this case, both at cardiac catheterization and at surgery.

An abnormal pulmonary dilution curve, it should be noted, does not indicate the anatomical location of the defect, nor does it indicate the severity of the left-to-right shunt. This cardiac dynamic study should be considered only as a screening procedure. In the event of an abnormal radionuclide pulmonary dilution curve, further diagnostic procedures are indicated.

O-241

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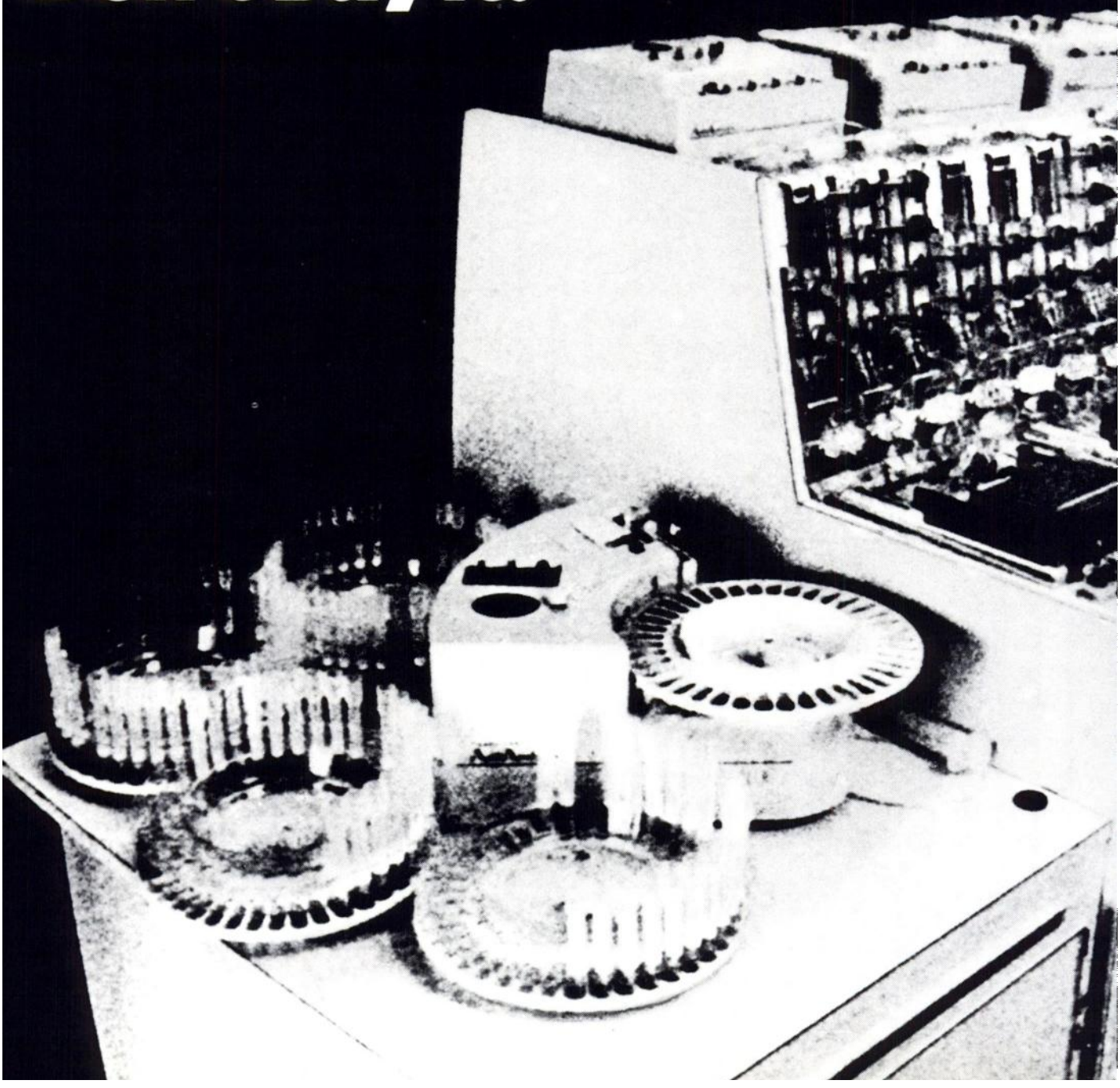

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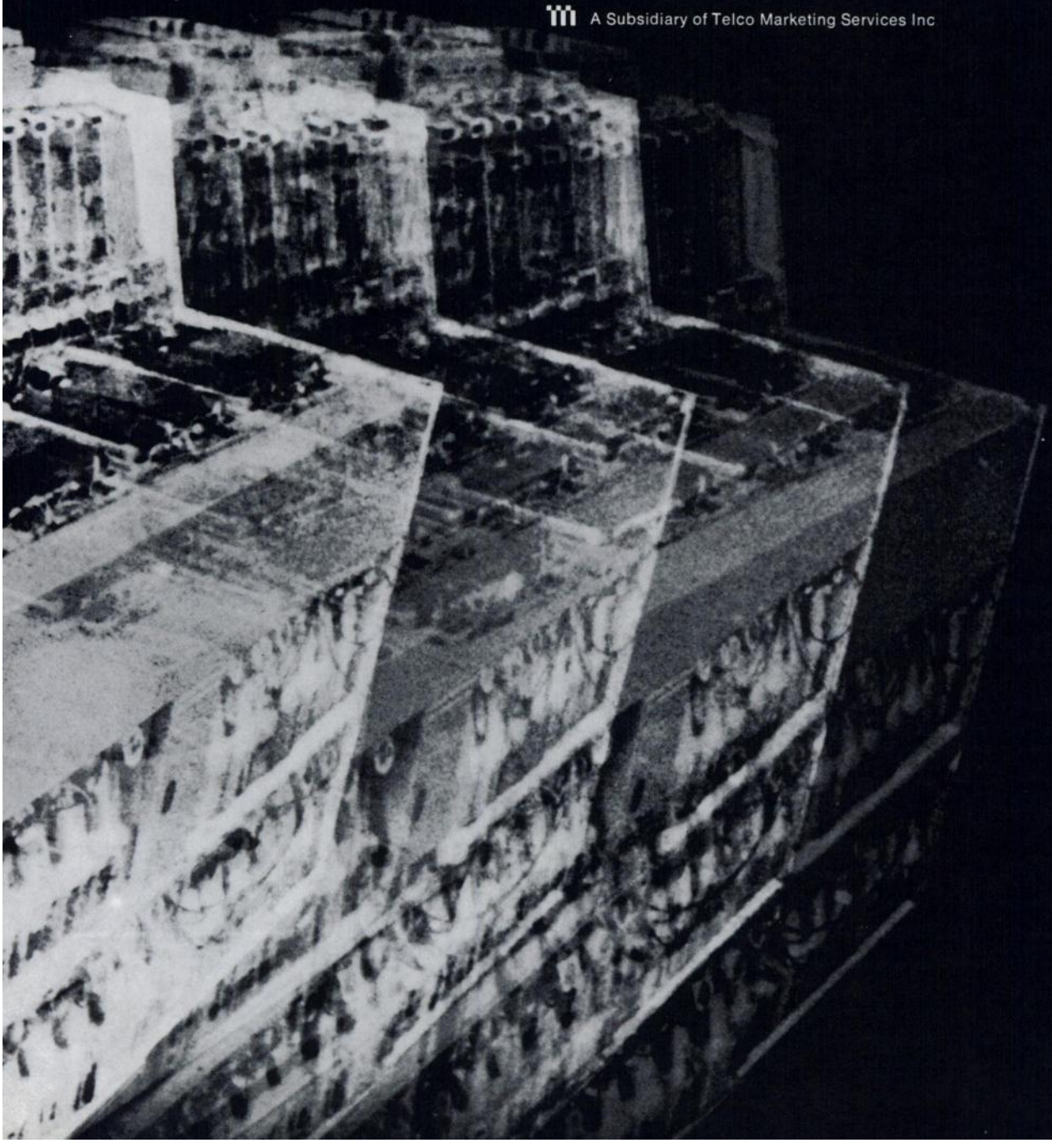

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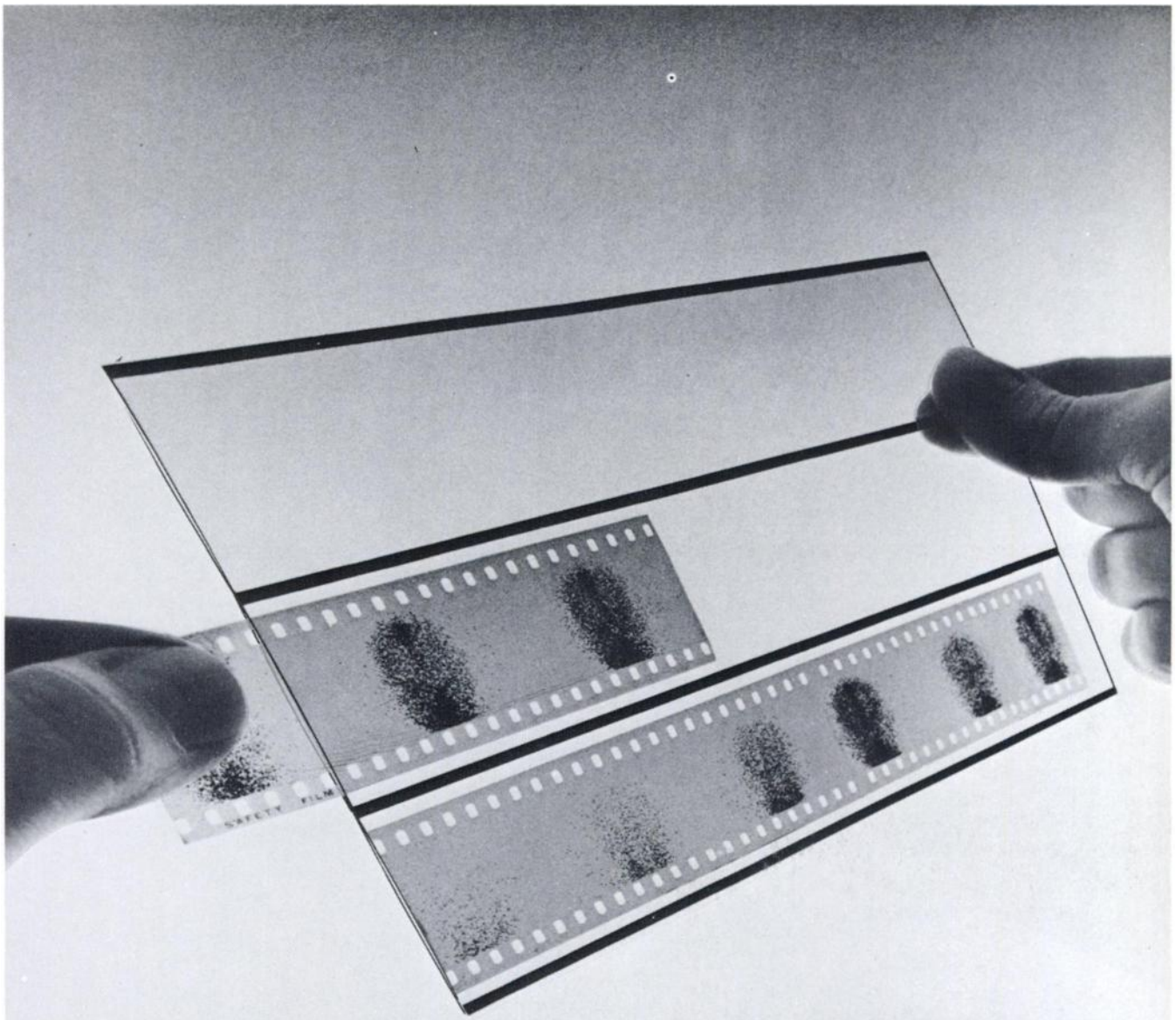

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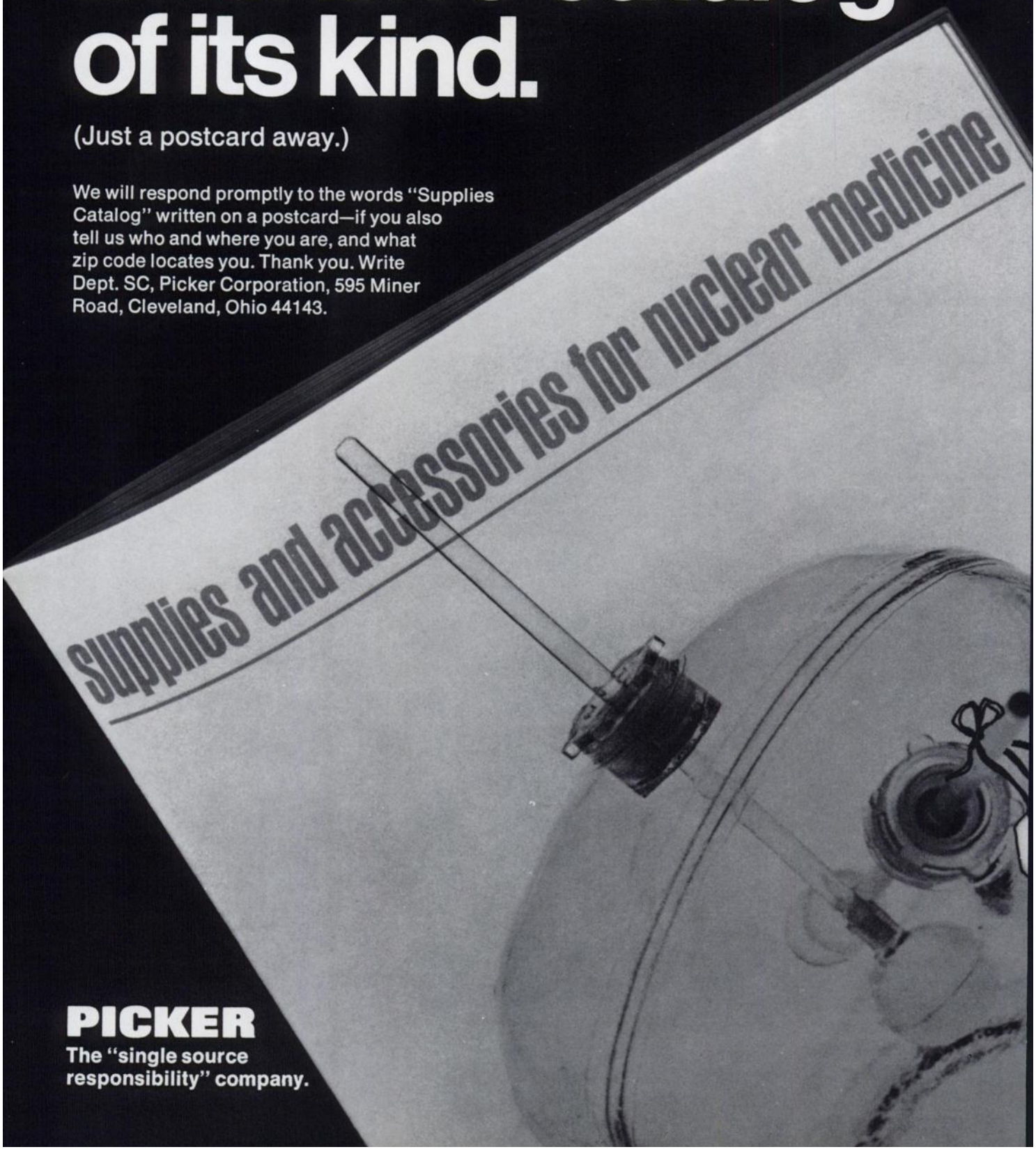

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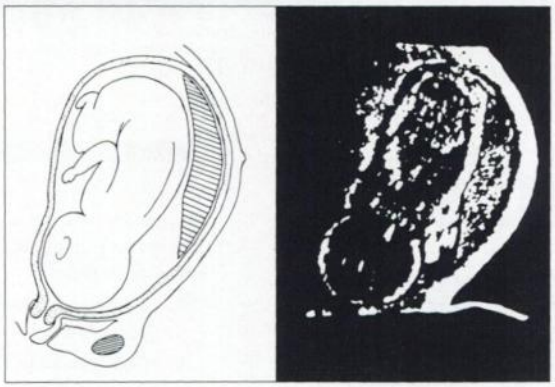

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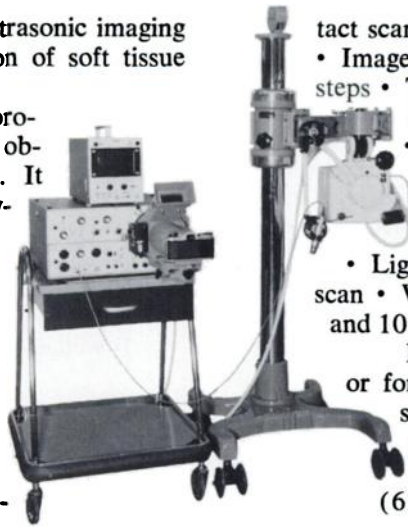

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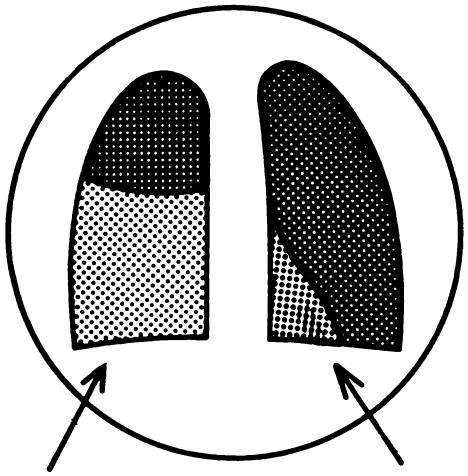
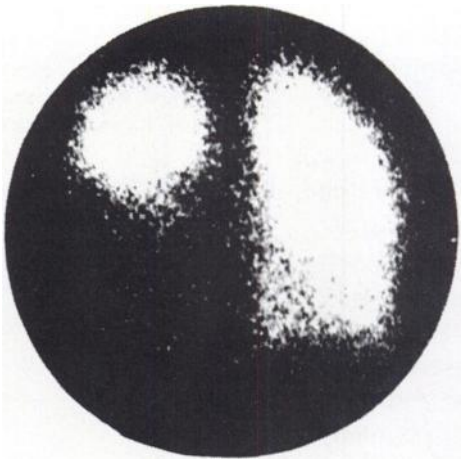
Pulmonary Embolism?

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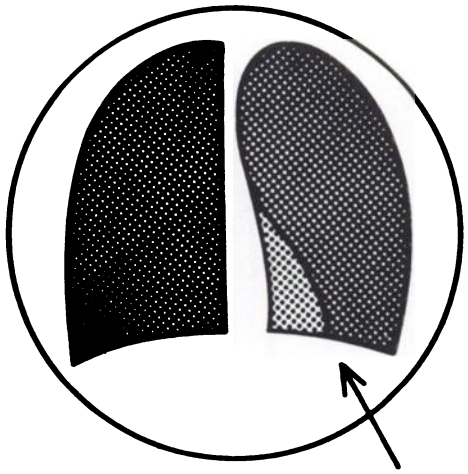
"Although perfusion lung scanning has proved clinically useful in the diagnosis of pulmonary embolism, many other disorders that affect ventilation can produce abnormalities of regional pulmonary blood flow. Therefore, some additional test is required for a specific diagnosis of pulmonary embolism." ①

There's one way to be sure....

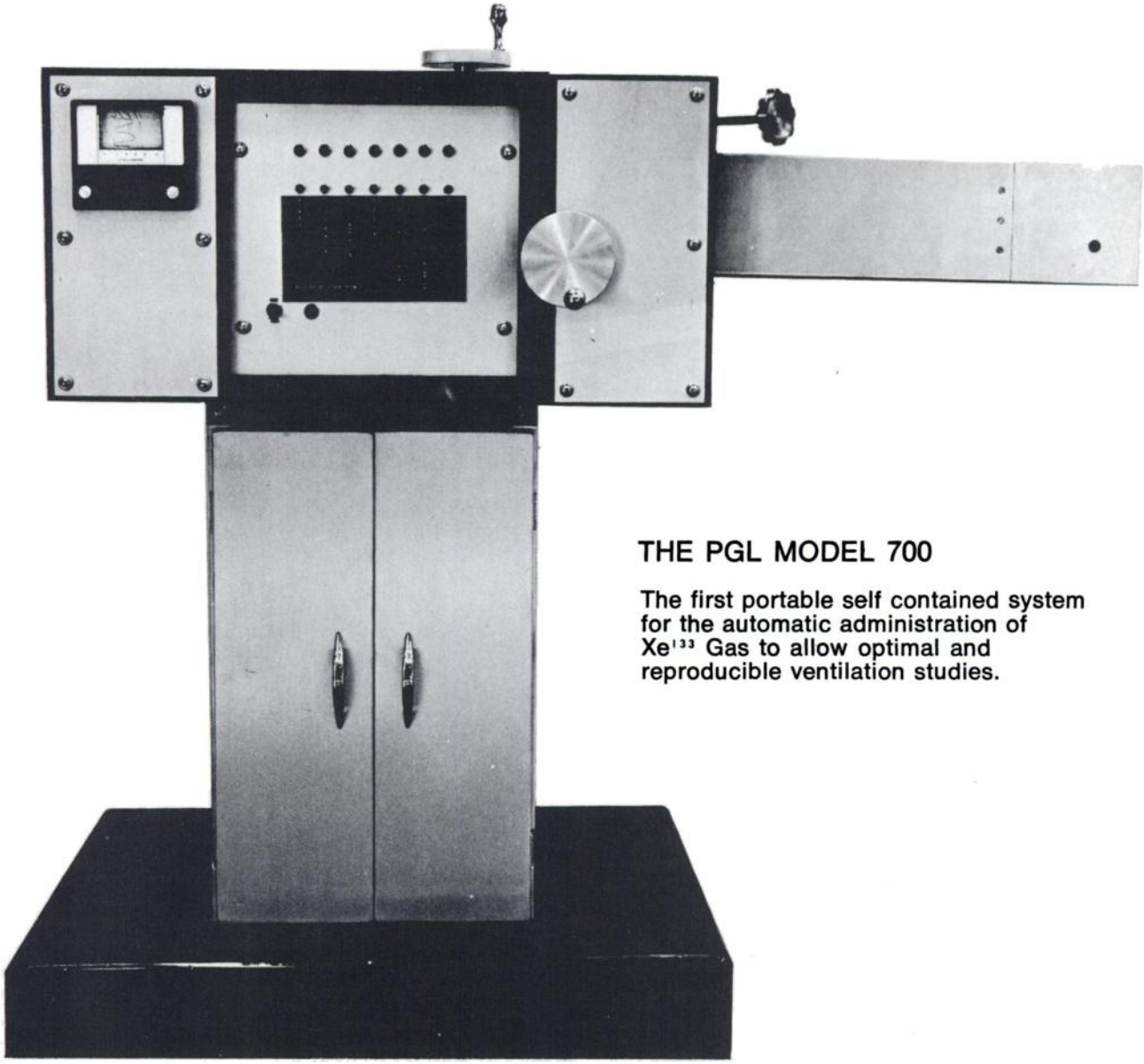



ANTERIOR VENTILATION

"The Xe^{133} ventilatory lung scan is a simple and sensitive method of distinguishing pulmonary embolism from other causes of perfusion abnormality. In embolism without infarction, the embolic area of the lung appears underperfused but well aerated. This is reflected on lung scans by relatively normal ventilation in association with appreciable perfusion abnormalities. In other pulmonary diseases, the ischemic regions are also poorly ventilated." ②

DE NARDO G.L., et al: THE VENTILATORY LUNG SCAN IN THE DIAGNOSIS OF PULMONARY EMBOLISM. NEW ENG J MED 282:1334-1336 (JUNE) 1970

But how do you administer Xe^{133} Gas accurately, safely and conveniently?



THE PGL MODEL 700

The first portable self contained system for the automatic administration of Xe^{133} Gas to allow optimal and reproducible ventilation studies.

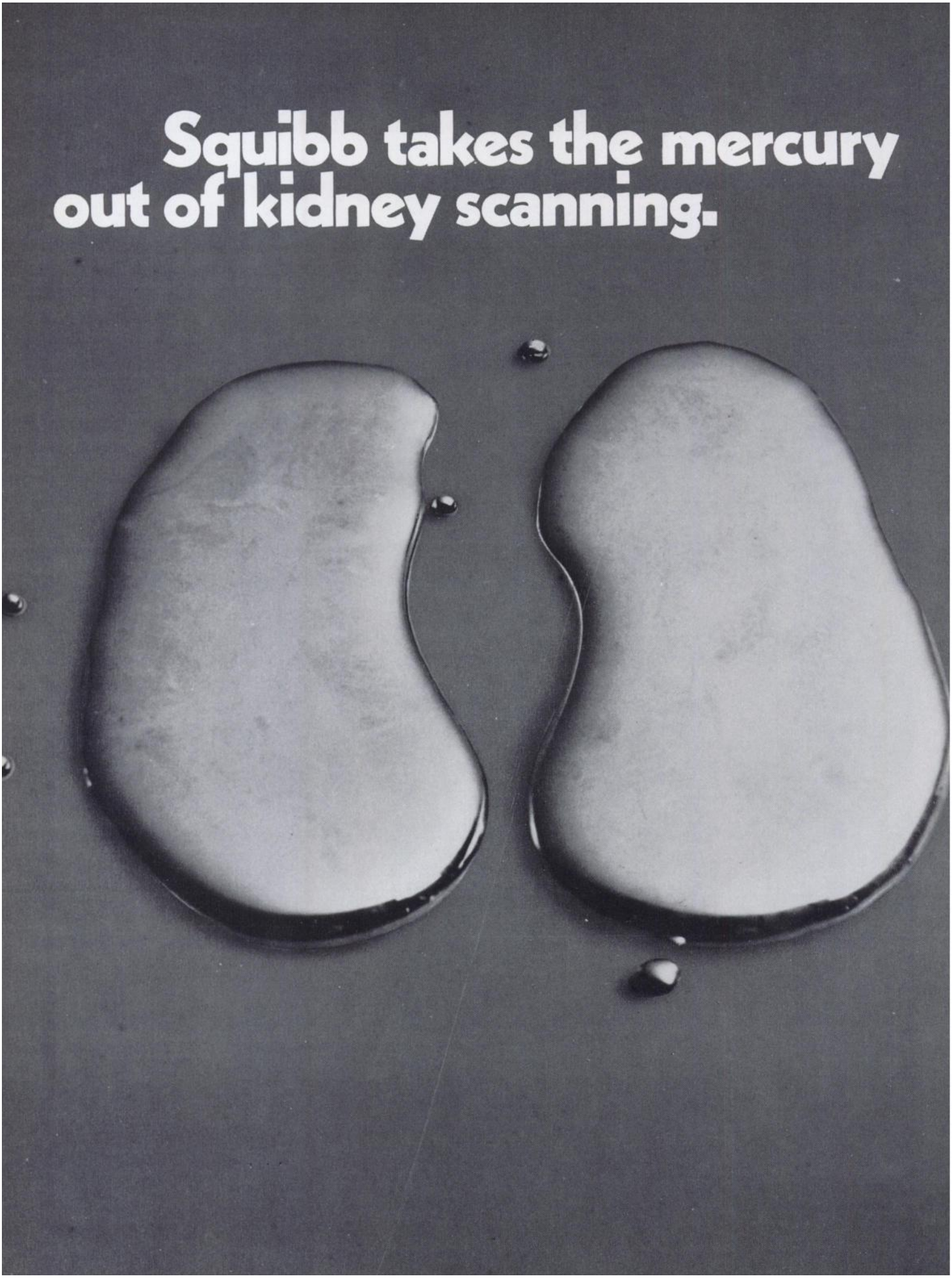
Unique clinical features:

- Automated to assure the precise control of Xe^{133} Gas administered.
- Designed for single technician operation.
- Versatility in programming allows you to vary the clinical regimen (for example, tidal volume inspiration, maximum inspiration, rebreathing, etc.)
- Adaptable to any patient position (seated, supine etc.)

PGL

For complete specifications and ordering information contact:
PGL, 1280 Columbus Avenue, San Francisco, Ca. 94133 (415) 474-6338

Squibb takes the mercury out of kidney scanning.



The new Renotec™ Kit.

(Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA])

The Non-Mercurial Renal Scan

A convenient, easy-to-use kit for preparing technetium 99m-DTPA—a renal scanning compound that gives you *all* these advantages:

- low radiation exposure to the kidney
- sustained activity in the kidney for conventional rectilinear scans
- doses prepared in minutes, utilizing ^{99m}Tc eluate from your Squibb generator.

After intravenous injection, ^{99m}Tc-DTPA is rapidly cleared by the normal kidney. Sufficient activity remains in the kidney, however, to permit conventional scans at two hours after injection.

Unlike radiomercurial compounds for renal scanning, the much shorter physical half-life of technetium 99m (only six hours) greatly reduces the radiation exposure to the kidney. Toxicity due to DTPA is not a major problem with the dose of chelate administered in subjects with either normal or depressed renal function.

With Renotec, doses can be prepared in minutes, as you need them, utilizing the ^{99m}Tc eluate from your Technetope® II (Technetium 99m) Sterile Generator.

New Versatility For Your Squibb Generator

The Technetope II (Technetium 99m) Sterile Generator provides a means of obtaining a sterile, non-pyrogenic supply of technetium 99m for use with *two different Squibb diagnostic kits:* the new Renotec (Technetium 99m-DTPA) Kit *and* the Tesuloid® (Technetium 99m-Sulfur Colloid) Kit (an easy-to-use kit for preparing technetium 99m-sulfur colloid solution for liver and spleen scanning).

See next page for brief summary.

New Renotec™ Kit
(Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA])
The non-mercurial renal scan.

The RENOTEC (Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA]) Kit includes: 1) 5 vials (2 cc. each) of Sterile Reaction Solution providing 5 mg. ferric chloride per cc. and 2.5 to 5 mg. ascorbic acid per cc.; 2) 5 Unimatic® Disposable Syringes (2 cc. each) containing Sterile 0.07N Sodium Hydroxide Solution providing 2.8 mg. sodium hydroxide per cc.; and 3) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile DTPA Solution providing 2.5 mg. diethylenetriamine pentaacetic acid per cc.

The TESULOID (Technetium 99m-Sulfur Colloid) Kit includes: 1) 5 vials (3 cc. each) of Sterile Sulfur Colloid Reaction Mixture providing 4 mg. sodium thiosulfate, 3 mg. gelatin, 8.5 mg. potassium phosphate, and 0.93 mg. disodium edetate per cc.; 2) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile 0.25N Hydrochloric Acid Solution providing 9 mg. hydrochloric acid per cc.; and 3) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile Buffer Solution providing 35 mg. sodium biphosphate and 10 mg. sodium hydroxide per cc.

TECHNETOPE II (Technetium 99m) Sterile Generator provides a means of obtaining a sterile, non-pyrogenic supply of technetium 99m as sodium pertechnetate.

Warnings: The contents of the syringes in the Renotec Kit and the Tesuloid Kit should **not** be injected directly into a patient.

Usage in pregnancy—These agents should not be administered to women who are pregnant or who may become pregnant and during lactation unless the indications are exceptional and the need for the agent outweighs the possible potential risk from the radiation exposure involved.

Since sodium pertechnetate ^{99m}Tc may be taken up by the fetus and excreted in human milk, administration of the preparation during pregnancy and lactation is not recommended.

Formula feedings should be substituted for breast feedings if these agents must be administered to the mother during lactation.

^{99m}Tc-DTPA, ^{99m}Tc-S colloid, and sodium pertechnetate ^{99m}Tc should not be administered to persons less than 18 years of age unless the expected benefit outweighs the hazards. It should be noted that although radiopharmaceuticals are not generally used in individuals under 18, procedures using ^{99m}Tc-DTPA or ^{99m}Tc-S colloid are occasionally necessary in such patients. The low internal radiation dosage of ^{99m}Tc-DTPA makes it a very satisfactory agent when scans of the kidney, brain, or blood vessels are necessary in young patients. The low internal radiation dosage of ^{99m}Tc-S colloid makes it a very satisfactory agent when liver or spleen scans are necessary in young patients.

Radiopharmaceuticals, produced by nuclear reactor or cyclotron, should be used only by physicians who are qualified by specific training in the safe use and safe handling of radioisotopes and whose experience and training have been approved by the appropriate federal or state agency authorized to license the use of radioisotopes.

When obtaining elutions from Technetope II (Technetium 99m) Sterile Generator, proper radiation safety precautions should be maintained at all times. The column containing ^{99}Mo need not be removed from the lead shield at any time. There is a high radiation field surrounding an unshielded column. Solutions of sodium pertechnetate ^{99m}Tc withdrawn from the generator should always be adequately shielded. The early elutions from the generator are highly radioactive. **Important:** Since material obtained from the generator may be intended for intravenous administration, aseptic technique must be strictly observed in all handling. The stoppers of the eluent bottle, of the elution tube, and of the collecting vial, as well as both rubber closures in the generator column, should be swabbed with a suitable germicide before each entry. All entries into the generator column must be made aseptically with sterile needles. Only the eluent provided should be used to elute the generator. Use a fresh milking tube and collecting vial for each elution; sufficient equipment is provided for this purpose. All equipment used to collect or administer sodium pertechnetate ^{99m}Tc must be sterile. Do not administer material eluted from the generator if there is any evidence of foreign matter. NOTE: The Renotec Kit and the Tesuloid Kit are not radioactive. However, after the eluted ^{99m}Tc is added, adequate shielding of the resulting preparation should be maintained.

Precautions: When using radioactive material, care should be taken to insure minimum radiation exposure to the patient (*i.e.*, by using the smallest dose of radioactivity consistent with safety and validity of data) as well as to all personnel directly or indirectly involved with the patient. Before a test is repeated in the same patient, the need should be carefully evaluated; this is especially true in younger patients.

Each elution from Technetope II (Technetium 99m) Sterile Generator should be assayed before use for ^{99m}Tc activity and for the possible presence of ^{99}Mo. Material containing more than 5 microcuries of ^{99}Mo per dose of ^{99m}Tc pertechnetate exceeds Atomic Energy Commission limits and should not be administered. Poor gastrointestinal absorption of an oral dose of pertechnetate and resultant low blood radioactivity levels have been observed in the postprandial state, in seriously ill patients, and in a small number of normal, fasting individuals. Since pertechnetate is concentrated by the gastric mucosa and the salivary glands, secretions of the digestive tract are radioactive and may cause artifacts on the cranial scan. Therefore, all possible care should be taken to avoid extracranial contamination, not only for the protection of patients and of hospital personnel but also to avoid obtaining a falsely positive scan due to extracranial radiation. Any condition which alters the blood-brain barrier or the normal cranial vasculature may cause abnormal areas of increased radioactivity. The brain scan with sodium pertechnetate ^{99m}Tc is therefore likely to be abnormal in patients with scalp contusions or acute head injuries. Following a craniotomy, uptake of radioactivity is increased throughout the operative field, usually for only a few weeks but in some instances for prolonged periods. Since cerebral radiographic techniques temporarily affect the blood-brain barrier, brain scanning with sodium pertechnetate ^{99m}Tc should precede cerebral angiography when possible, or should be postponed for several days thereafter. A negative brain scan does not rule out the possibility of a lesion and should therefore never be considered diagnostically conclusive. Because the normal vascular structures are more apparent on a ^{99m}Tc pertechnetate scan than on a radiochlormerodrin scan, and because the choroid plexus may be visible, it is particularly important to recognize the appearance of a normal brain scan when ^{99m}Tc pertechnetate is used, in order to avoid incorrect interpretation.

NOTE: The Renotec Kit and the Tesuloid Kit were designed for use with the sodium pertechnetate eluate obtained from a Technetope II Sterile Generator. It is recommended that only Technetope II be used as the source of sodium pertechnetate with the Renotec Kit and the Tesuloid Kit unless the user has demonstrated that other sources of ^{99m}Tc are consistently compatible and meet the standards of Technetope II.

SQUIBB
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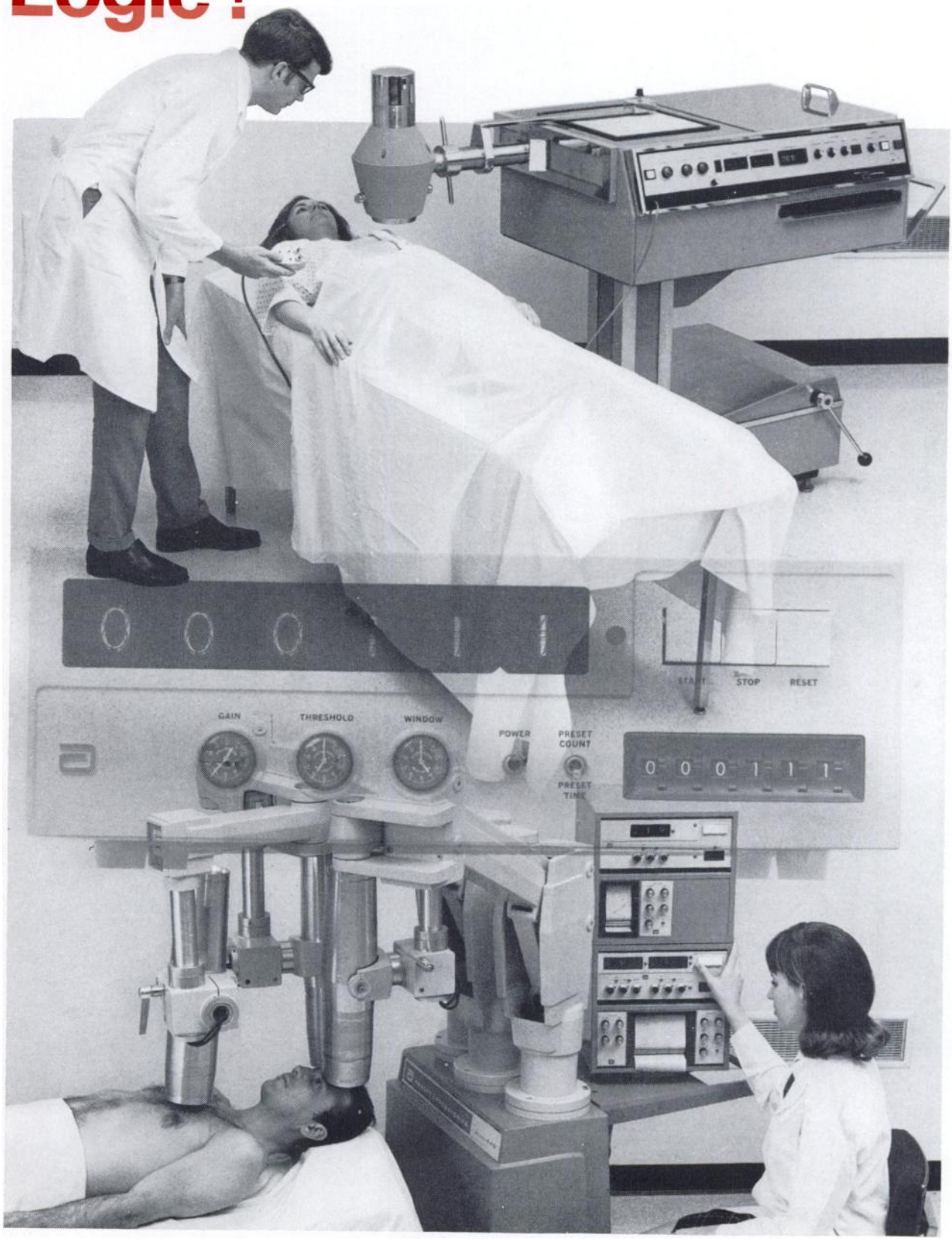
Medcotope™

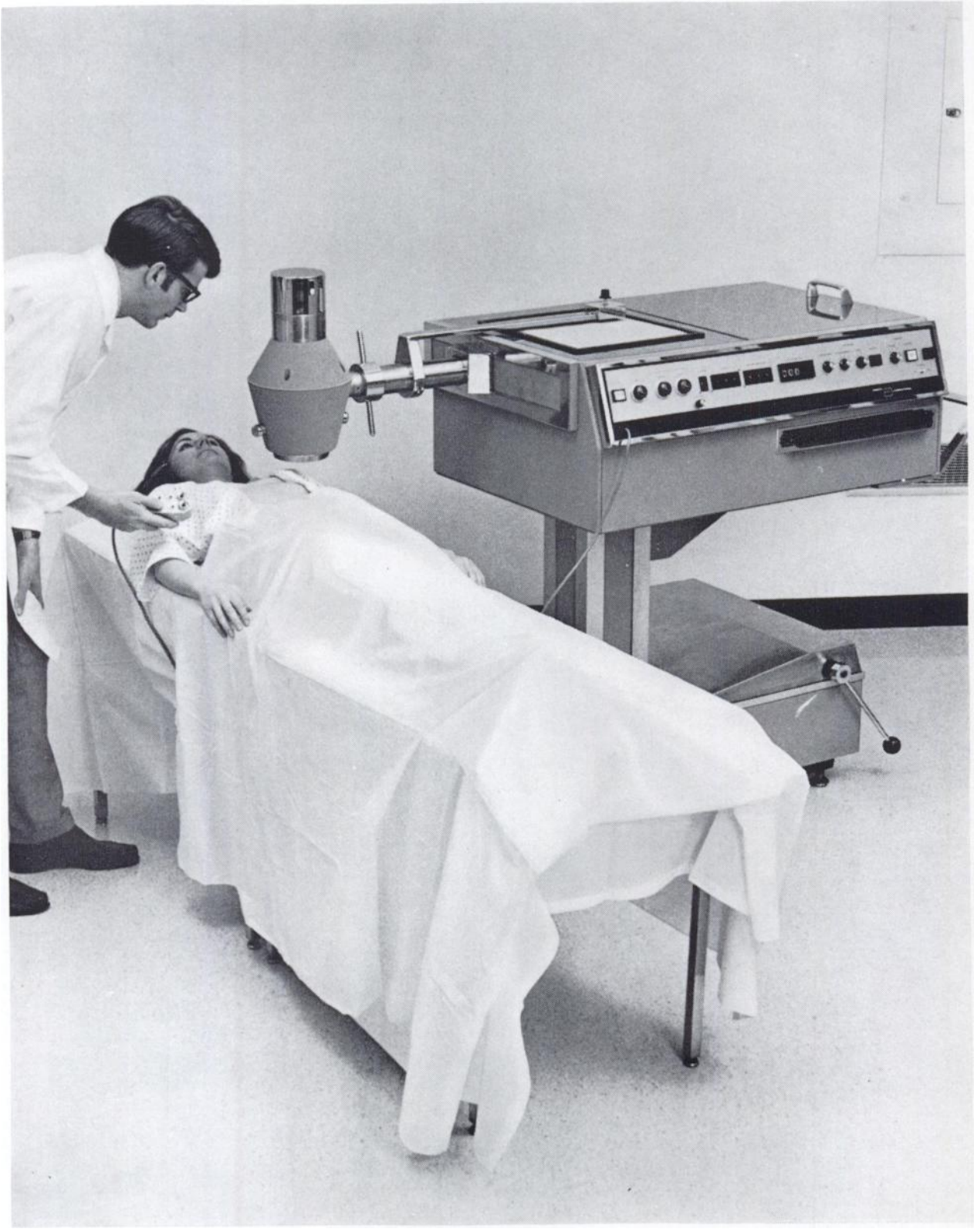
Graphic™! Dynamic™! Logic™!

To test, to "see" and to learn what goes on inside the patient!



Announcing

Graphic...



...a new concept in scanners!

Speed!
Portability!
Simplicity of Operation!

Scan speed ranges to 1,000 cm./min.

. . . variable from 10 to 1,000 cm./minute with appropriate fixed index level. 1,000 cm. minute makes it the fastest scanner available. Portal to portal patient time may be less with some studies than with camera devices.

Portable

. . . system is readily portable and can be easily moved on its 5″ casters. Will fit through any standard door opening. It is the only scanner that can easily be taken right to the patient in his hospital bed.

Simple to operate

. . . technician can master scanner operation within 30 minutes. Remote control for detector positioning. Detector angle may be adjusted 360°.

Scan area 17″ either way

. . . 17″ x 14″ in either direction. Allows for easier patient set-up to scan large lung fields, liver, spleen, etc. Can scan 17″ laterally or horizontally (important in obese patients). Uses standard 14″ x 17″ x-ray film.

Convertible

. . . the Graphic is available with either a 3″ or a 5″ detector head. Can be converted easily in the hospital from a 3″ to a 5″ scanner.

Versatile

. . . five levels of contrast enhancement including digital mode and six levels of background erase.

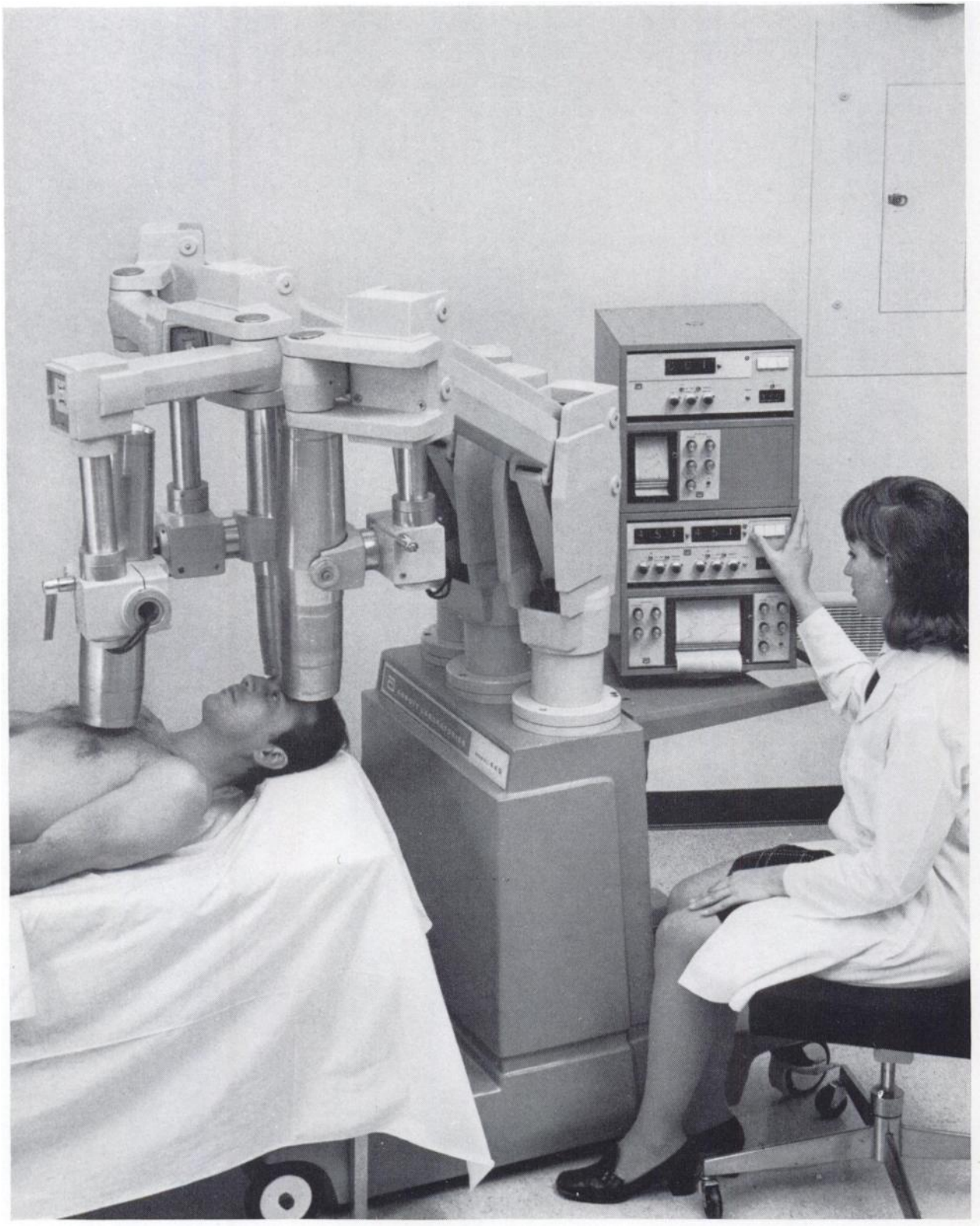
Integrated circuitry

. . . allows fast, reliable photoscans in the shortest possible time with less instrument down time.

Ask about Abbott's unique service concept!

Announcing

Dynamic...



...to study the life systems!

Four chart speeds

. . . 0.1 millimeter/second, 1.0 millimeter/second, 10 millimeters/second, and 20 millimeters/second which are keyed to the circulation times relating to dynamic function studies of the important organs of the body. Included are the brain, lungs, heart, and kidneys.

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. . . the Dynamic system is entirely digital in operation.

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. . . this unique feature of the strip chart recorder assures you that no data will be lost. A Dynamic exclusive.

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. . . of one, two, and three detector systems. 1.5 x 1.5 inch sodium iodide detectors mounted on electrically operated arms. This modular concept allows you to add on as your needs expand.

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...for in vitro and in vivo tests!

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. . . including T-3, T-4, thyroid uptake*, hepatic uptake*, plasma volume, fecal Rose Bengal excretion, iron binding, fat absorption, and placenta localization*.

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. . . count and display in excess of 15,000,000 counts per minute.

Solid state integrated circuitry

. . . assures higher reliability; less down time.

Simple to operate

. . . minimum of controls with Direct Ratio Readout in %.

Choice of 3 models

. . . 101 and 111 have spectrometer and well in one instrument. The 121 has an external well.

Fast service

. . . with easy-to-use service manual; replacement boards in 24 hours. There's no waiting for servicemen.

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. . . with built-in versatility. Protect your investment by adding components as the need arises.

*May be done by adding medical stand, external probe (shield and collimator).

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Nuclear Instruments You Can Count On

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007228

Ohio-Nuclear's Model 84 radioisotope scanner provides you with the shortest TOTAL SCAN PROCEDURE TIME available—contributing to patient comfort while improving department efficiency.

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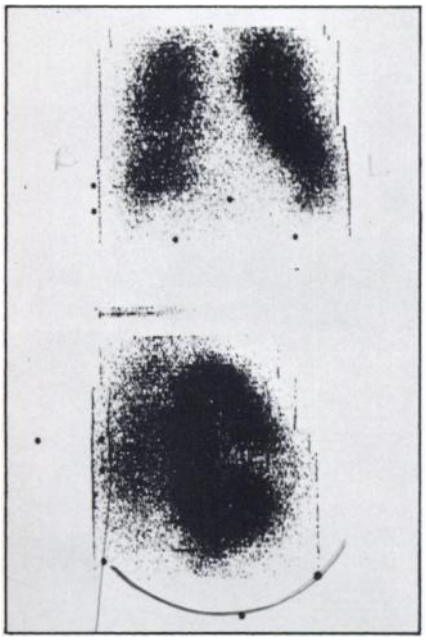
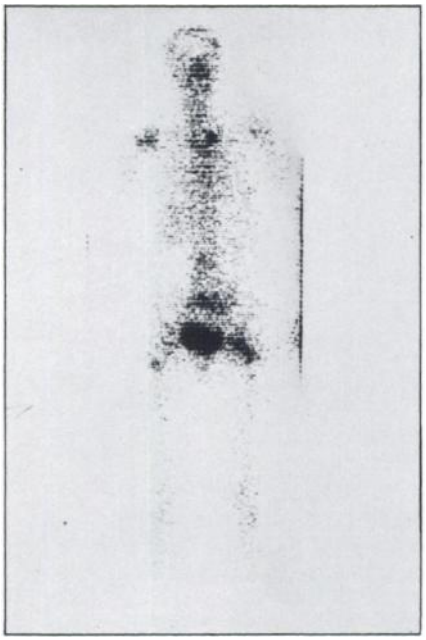
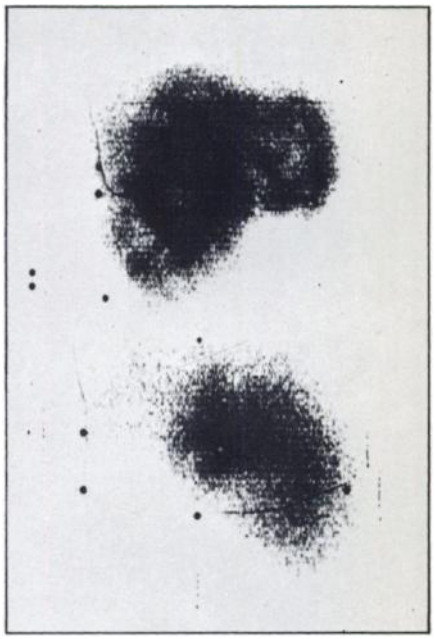
think scan speed



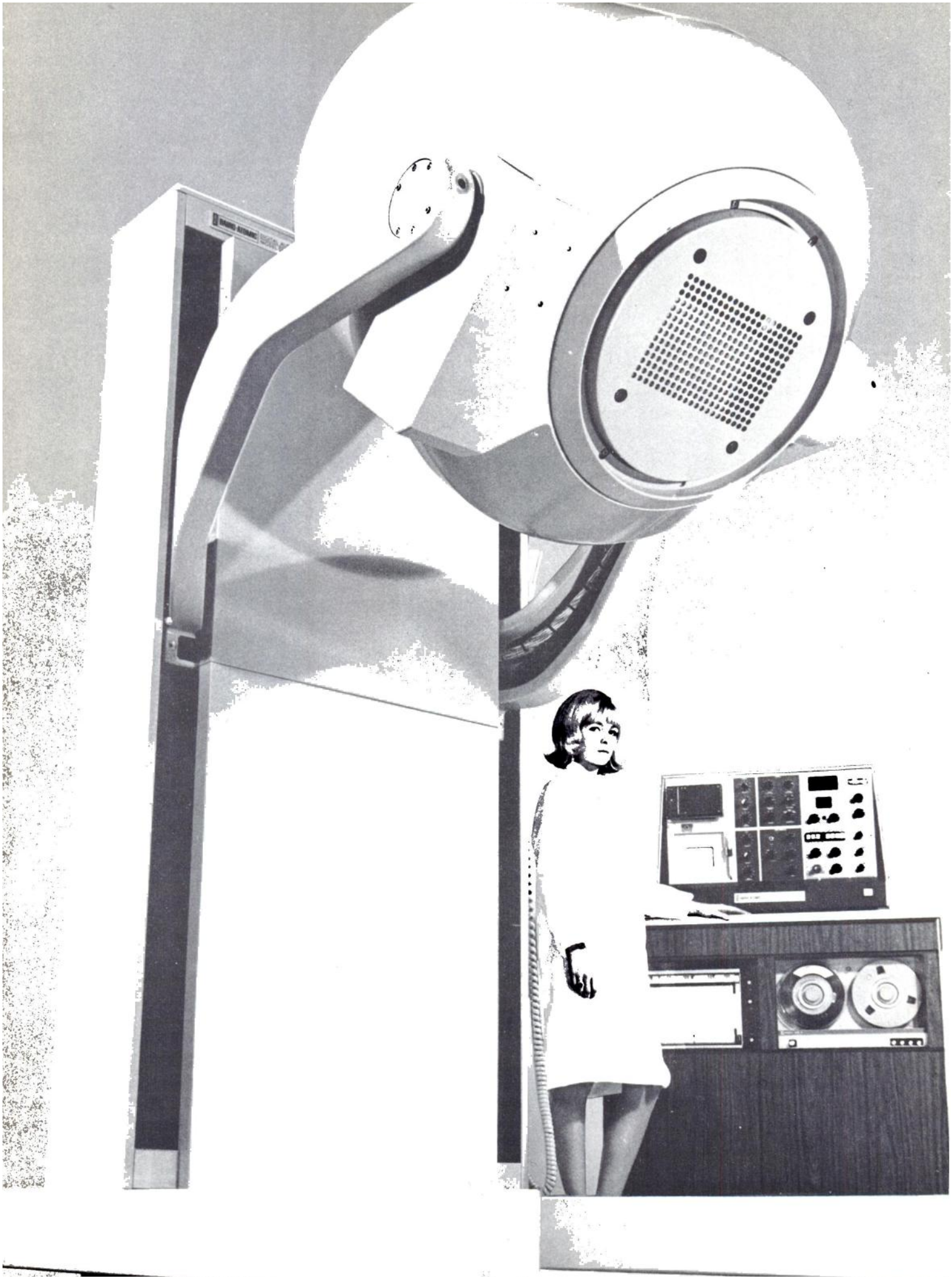
AP & Right Lateral **84FD**
(opposing views done simultaneously not shown)
Minified 2:1 Lung Scan
Dose: 300μCi Radionuclide: ^{131}I (MAA)
Scan Speed: AP—PA 380 cm./min.
RL—LL 285 cm./min.
TOTAL SCAN PROCEDURE TIME:
25 min. (4 views)
Courtesy of Ernest G. Smith, Jr., M.D.
Crawford W. Long Hospital, Atlanta, Ga.



AP **84HD**
(opposing view done simultaneously not shown)
Minified 5:1 Whole Body Bone Scan
Dose: 3 mCi Radionuclide: ^{87m}Sr
Post Injection Time: 4 hrs.
Scan Speed: 750 cm./min.
TOTAL SCAN PROCEDURE TIME:
25 min. (2 views)
Courtesy of Univ. of Iowa, Dept. of Radiology
Section of Nuclear Medicine, Iowa City, Iowa



AP & Right Lateral **84FD**
Minified 2:1 Liver Scan
Dose: 1.5 mCi Radionuclide: ^{99m}Tc (SC)
Scan Speed: 300 cm./min.
TOTAL SCAN PROCEDURE TIME:
10 min. (2 views)
Courtesy of Ernest G. Smith, Jr., M.D.
Crawford W. Long Hospital, Atlanta, Ga.



What is the ~~secret~~ Success behind the Baird-Atomic Scintillation Camera

The Autofluoroscope® has been perfected. Its ~~secret~~ success lies in the detector. Small individual crystals forming a rectangular 294 element matrix are positioned to collect data from that part of the patient's body opposite each crystal. Each crystal is tied electronically to its own magnetic core memory in the computer console, consequently it is the only scintillation camera specifically designed for quantitative imaging where discreet picture elements are collected and stored and may be manipulated for both visual observation and quantitative assessment at will. Send for Brochure. 125 Middlesex Turnpike, Bedford, Massachusetts 01730, Telephone: (617) 276-6200. Baird-Atomic Limited, Braintree, Essex, England Baird-Atomic (Europe) N.V., The Hague, The Netherlands.

BA BAIRD-ATOMIC

The image bank

...becomes an essential part of scintiphotography. Behind it all—the Model 3122 Data-Store/Playback Accessory for the Pho/Gamma® Scintillation Camera.

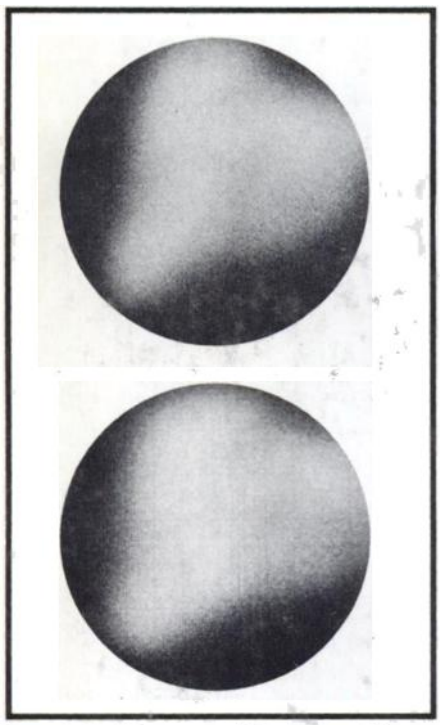
With the 3122, you make data deposits—on magnetic tape, in real time—in a high-resolution (256 x 256) digital matrix. You get a high-speed image-data-storage rate for unprecedentedly low data "drop out" and resultant high-resolution digital recordings. Analog-to-digital image fidelity remains excellent, even at count rates exceeding 20,000 cps. Pulse-pair resolving time for the Data-Store and Pho/Gamma Systems combined is unparalleled—*only 10 μsec.*

The benefits? An even greater diagnostic capability for all Pho/Gamma studies, particularly dynamic studies such as cardiovascular transit time and regional renograms.

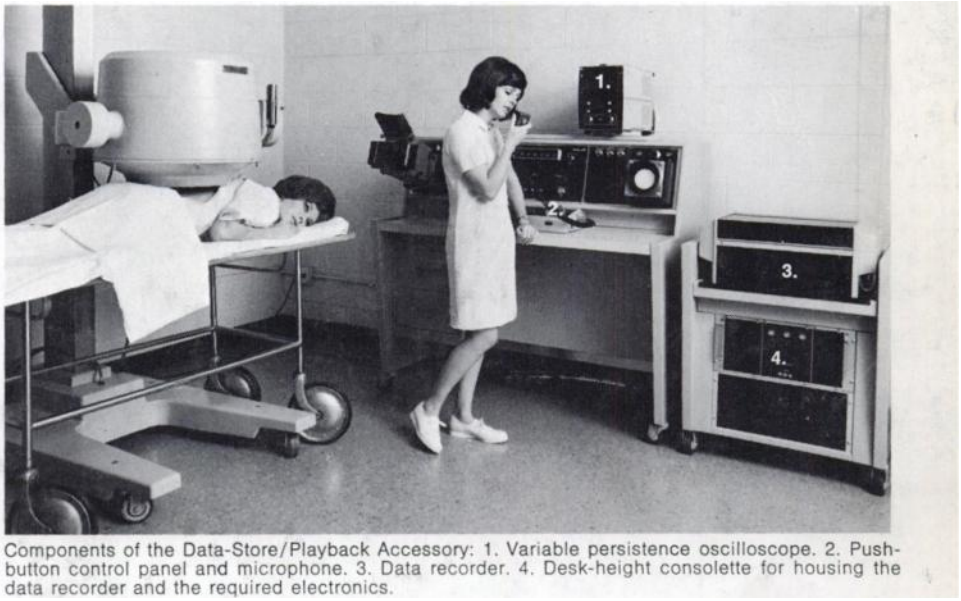
Real-time, digital image recording also means you can make data withdrawals anytime. Never a worry about improper set-ups, recording errors, defective film. Always plenty of time for thoughtful replaying and incisive analysis of the data.

Focus your interest on virtually any definable area. You control height, width, *and* shape. You analyze paired organs, region by region.

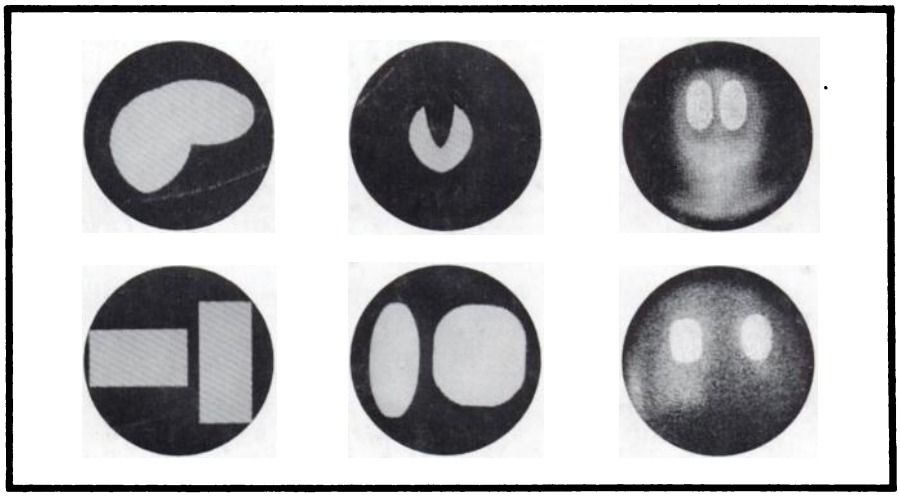
The possibilities are limited only by your inspiration. And the Model 3122 Data-Store/Playback Accessory is compatible with *all* Pho/Gammas. Call your Nuclear-Chicago sales engineer or write for complete details.



Normal Pho/Gamma analog display of image data (top). High-resolution recorded digital image played-back (bottom) demonstrates minimal raster artifact.



Components of the Data-Store/Playback Accessory: 1. Variable persistence oscilloscope. 2. Push-button control panel and microphone. 3. Data recorder. 4. Desk-height consolette for housing the data recorder and the required electronics.



Variety of selectable areas of interest processed from recorded data by Data-Store/Playback Accessory. Note total control of size, position, and shape of region of interest areas. O-238

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