

# 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.

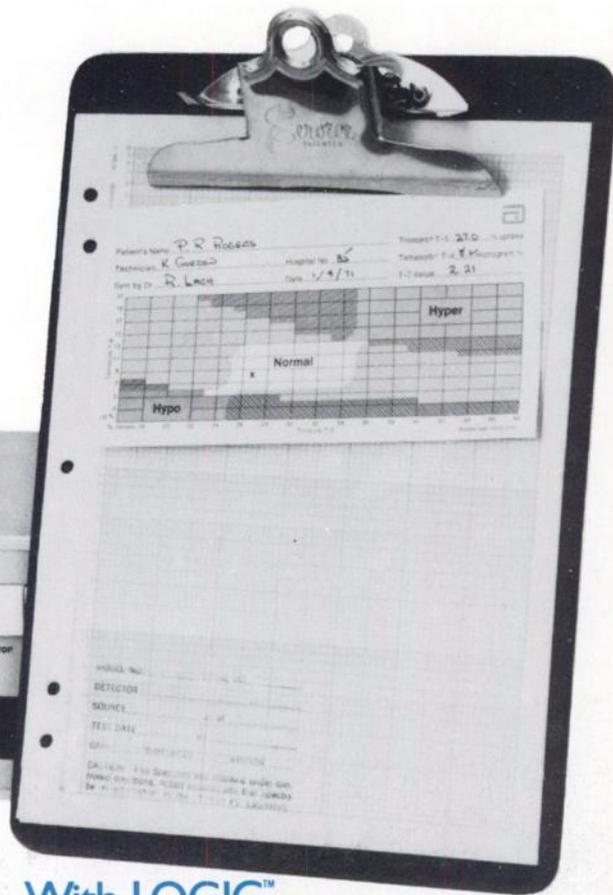


## The T-7 value completes the thyroid profile.

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.



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



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, 190 Willow Street, Waltham, Mass. 02154. Telephone: 617-899-5949.

In medical electronics . . . Raytheon makes things happen.

**RAYTHEON**

# Charge! Elute!



That's all. Using aseptic procedure, place the CHARGE vial in its well and the shielded ELUTE vial in its well. Elution proceeds automatically.

- Ready to use. No pre- or post-assembly of generator parts or accessories
- Evacuated 20ml or 5ml vials for standard or fractional elution
- Every generator shipped is tested for sterility, non-pyrogenicity, Molybdenum-99, aluminum,

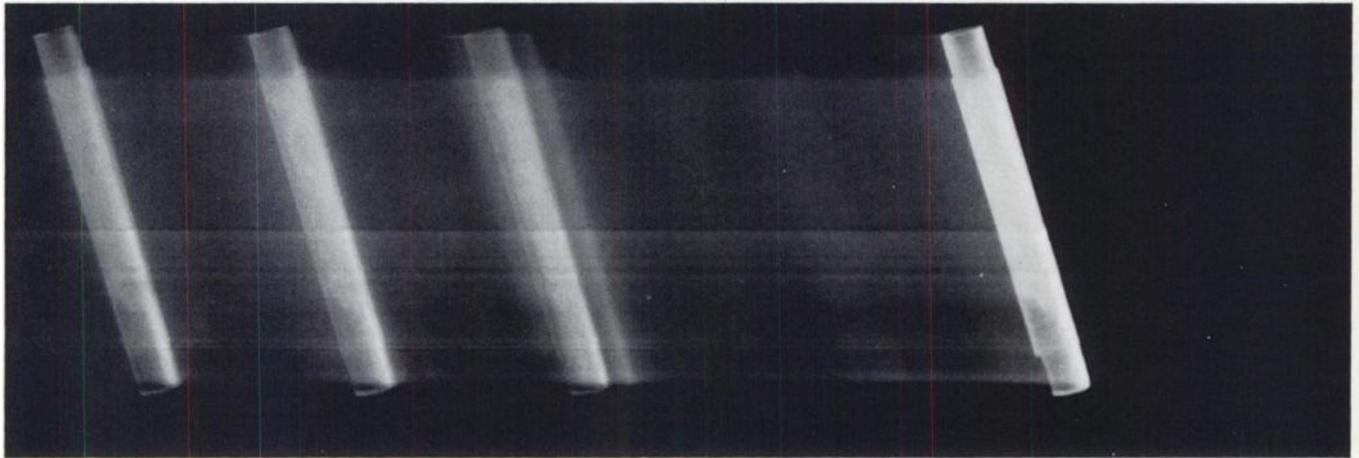
and alumina and other particulates

- MOLY-CODDLE™ radiation reducer available on request

**NEN** New England Nuclear

**Radiopharmaceutical Division**

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



**fast<sup>TM</sup>T<sub>3</sub>**

Reagent system for laboratory determination  
 of T<sub>3</sub> (TBG) uptake  
 as a measurement of thyroid function

**EASY?**

- 1 just add sample and water**
- 2 shake and allow to stand  
(10 minutes)**
- 3 centrifuge and count**

**gd** GENERAL DIAGNOSTICS, 201 Tabor Rd., Morris Plains, N.J. 07950

12 TEST VIALS \$20.00       STANDING ORDER BEGINNING Date \_\_\_\_\_  
 72 TEST VIALS \$85.00      (To be repeated monthly)  
 (Prices subject to service charge)     HAVE SALESMAN CALL

PURCHASE ORDER NUMBER \_\_\_\_\_

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

DEPARTMENT \_\_\_\_\_

INSTITUTION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

I am familiar with the AEC/State regulations governing my use, storage and disposal of radioactivity.

Signed \_\_\_\_\_ Date \_\_\_\_\_

**SURE!**

Now available from General Diagnostics  
 201 Tabor Rd., Morris Plains, N.J. 07950  
 (201) 285-3226



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**Mallinckrodt/Nuclear's  
NUCLEMATIC PROGRAM  
regularly supplies  
radiopharmaceuticals  
calibrated to your  
usage requirements**

With this new program your radiopharmaceutical needs are anticipated with a regular supply schedule, so you won't be caught short or left waiting. The Nuclematic Program is automatic.

It removes uncertainties, reduces supervision of detail, and saves you money because it eliminates extra shipping charges. Your radiopharmaceuticals arrive calibrated for use on a prearranged schedule which you specify.

Establish your program needs on the Nuclematic Program. If additional products are needed for special requirements, they can be supplied promptly from the Mallinckrodt local area laboratory nearest you.

Ask your salesman for complete information, or write the address below. Ask why "We Think Even One Day is Too Long to Make a Patient Wait."



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# MADE FOR EACH OTHER...

**SQUIBB**

## TESULOID™ Technetium 99m-Sul

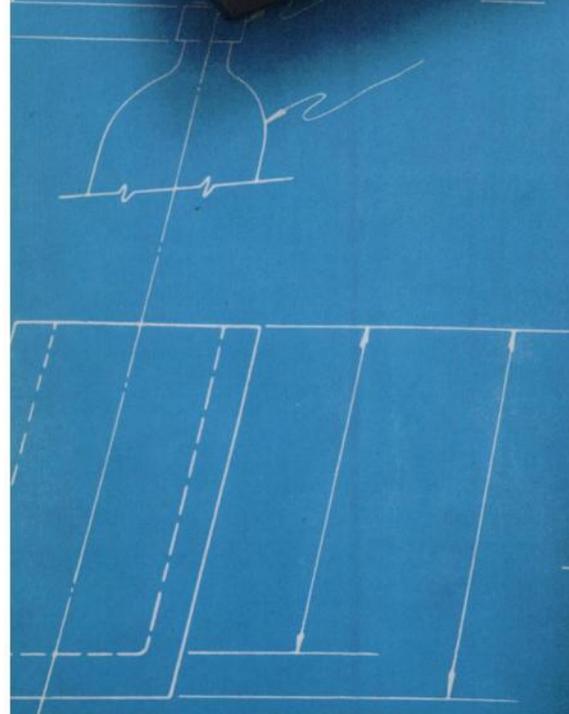
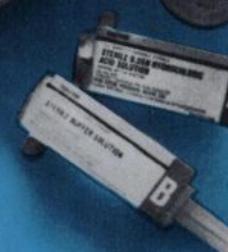
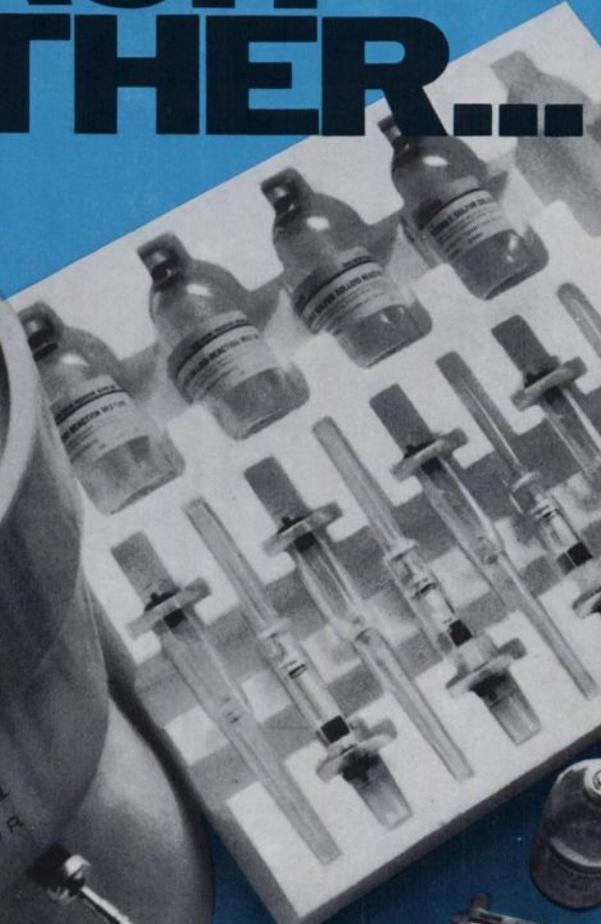
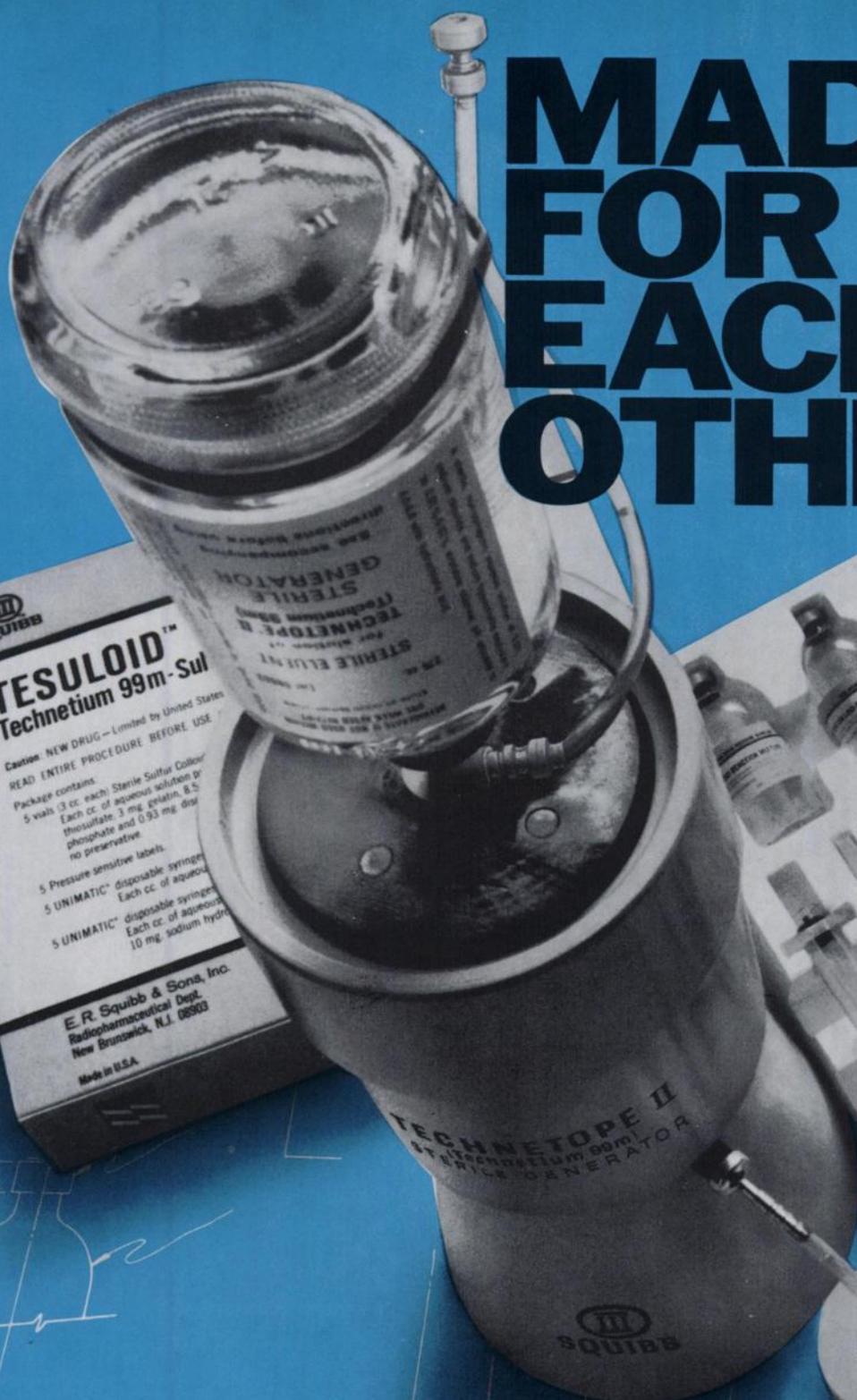
Caution: NEW DRUG—Limited by United States  
READ ENTIRE PROCEDURE BEFORE USE

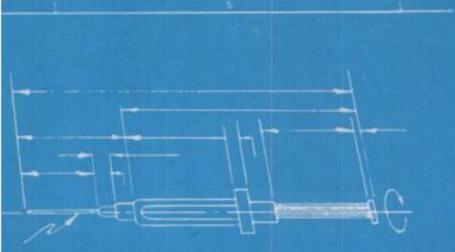
Package contains:  
5 vials (3 cc each) Sterile Sulfur Colloid  
Each cc of aqueous solution of  
thiosulfate, 3 mg; gelatin, 8.5 mg;  
phosphate and 0.93 mg. disodium  
no preservative.

5 Pressure sensitive labels.  
5 UNIMATIC™ disposable syringes  
Each cc. of aqueous solution.  
5 UNIMATIC™ disposable syringes  
Each cc. of aqueous solution.  
10 mg. sodium hydroxide.

**E.R. Squibb & Sons, Inc.**  
Radiopharmaceutical Dept.  
New Brunswick, N.J. 08903

Made in U.S.A.

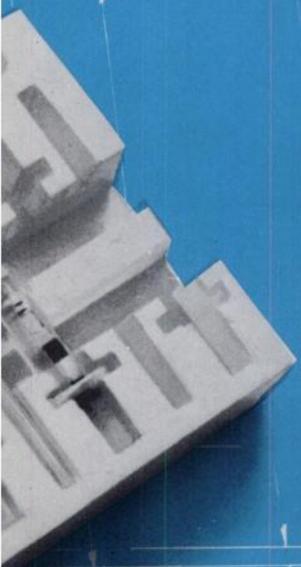




# **TECHNETOPE<sup>®</sup> II**

Technetium 99m  
**STERILE GENERATOR**

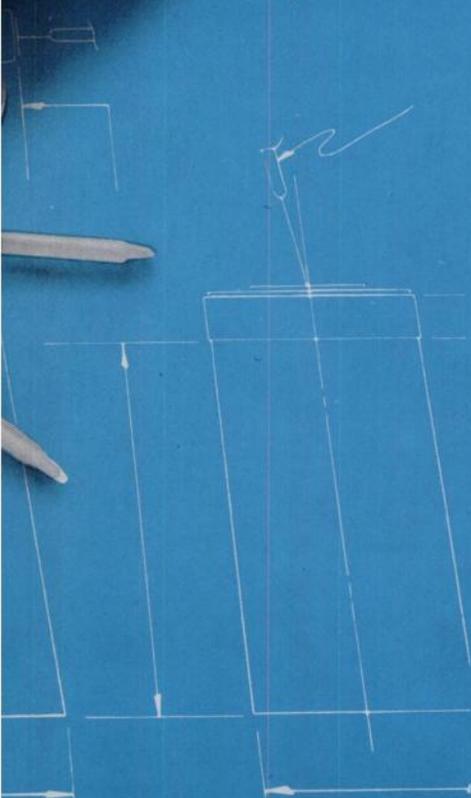
the generator for preparing  
a sterile, non-pyrogenic  
supply of technetium 99m



# **TESULOID<sup>™</sup>**

Technetium 99m-Sulfur Colloid  
**KIT**

the complete, easy-to-use kit for  
preparing technetium 99m-sulfur  
colloid in minutes, as you need it



**perfect combination for making  
<sup>99m</sup>Tc-S colloid "when you need it"  
for liver and spleen scanning**

Units designed to complement each other are more likely to produce a better end product. When the Technetope II eluate (with its low concentration of polyvalent cations) is utilized in the Tesuloid Kit, the result is a <sup>99m</sup>Tc-S colloid which is well suited for liver and spleen scanning.

Other sources of technetium having a higher concentration of polyvalent cations may produce an unsuitable non-colloid preparation, evidenced by a flocculent precipitate.

Thus, the Technetope II Generator and the Tesuloid Kit provide the perfect combination that gives reproducible results time after time.

See next page for brief summary.

# MADE FOR YOUR INDEPENDENCE

## now you can make your own $^{99m}\text{Tc}$ -sulfur colloid when you want it...

- utilize  $^{99m}\text{Tc}$  eluate from your Technetope II (Technetium 99m) Sterile Generator
- make as many doses as you want when you want

## with ease, convenience, and economy...

- keep dollar loss from product decay to a minimum
- store kit anywhere—it's not radioactive

## for liver and spleen scanning

- on the basis of 350 case reports from 11 investigators,<sup>1</sup> the technetium-sulfur colloid prepared in this manner was found to be highly satisfactory, and produced liver and spleen scans of good diagnostic value
- no side effects or adverse reactions occurred in any of the cases reported; there was no evidence of pyrogenic or other reactions

the colloid contains no dextran... no rhenium nor other added cation material

**Reference:** 1. Unpublished data on file at The Squibb Institute for Medical Research.

**TECHNETOPE II (TECHNETIUM 99m) STERILE GENERATOR** provides a means of obtaining a sterile, non-pyrogenic supply of Technetium 99m ( $^{99m}\text{Tc}$ ), a versatile scanning agent that can be administered intravenously or orally.  $^{99m}\text{Tc}$ , the short-lived daughter ( $T_{1/2} = 6$  hours) of Molybdenum 99 ( $^{99}\text{Mo}$ ,  $T_{1/2} = 67$  hours), is obtained from the generator by periodic elution. The amount (in millicuries) of  $^{99m}\text{Tc}$  obtained in the initial elution will depend on the original potency of the generator, while the activity obtained from subsequent elutions will depend on the time interval between elutions.

**Warning:** Proper radiation safety precautions should be maintained at all times. The column containing  $^{99}\text{Mo}$  need not be removed from the lead shield at any time. The radiation field surrounding an unshielded column is quite high. Solutions of  $^{99m}\text{Tc}$  withdrawn from the generator should always be adequately shielded. The early elutions from the generator are highly radioactive. For radiation protection, a lead shield for the collecting vial is included with Technetope II.

**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, the elution tube, the evacuated collecting vial, and both rubber closures in the generator column should be swabbed with a suitable germicide before entry. All entries into the generator column must be made aseptically. 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 the  $^{99m}\text{Tc}$  must be sterile.

Do not administer material eluted from the generator if there is any evidence of foreign matter.

**Contraindications:** Radiopharmaceuticals should not be administered to pregnant women or patients under 18 unless the indications are very exceptional. Since Technetium may be excreted in human milk, it should not be administered to nursing mothers.

**TESULOID (TECHNETIUM 99m-SULFUR COLLOID) KIT** contains 5 vials (3 cc. each) Sterile Sulfur Colloid Reaction Mixture, 5 Unimatic® Disposable Syringes (2 cc. each) containing Sterile 0.25N Hydrochloric Acid Solution (Syringe A), and 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile Buffer Solution (Syringe B). Each cc. of the Sterile Colloid Reaction Mixture provides 4 mg. sodium thiosulfate, 3 mg. gelatin, 8.5 mg. potassium phosphate, and 0.93 mg. disodium edetate. Each cc. in Syringe A provides 9 mg. hydrochloric acid. Each cc. in Syringe B provides 35 mg. sodium biphosphate and 10 mg. sodium hydroxide.

**Warnings:** The contents of the syringes (A and B) are intended only for use in the preparation of the  $^{99m}\text{Tc-S}$  colloid and are **NOT** to be directly injected into a patient.

As with all radiopharmaceuticals,  $^{99m}\text{Tc-S}$  colloid should not be administered to women who are pregnant or who may become pregnant, during lactation, or to patients under the age of 18 years unless the indications are exceptional and the need for the agent outweighs the possible potential risk from the radiation exposure involved. It should be noted that although radiopharmaceuticals are not generally used in individuals under 18, procedures using such agents are occasionally necessary in young patients. Because of the low internal radiation dosage of  $^{99m}\text{Tc-S}$  colloid, it should be used in preference to other agents when the liver or spleen scans are necessary.

Formula feeding should be substituted for breast feeding if the agent must be administered to the mother during lactation.

Radiopharmaceuticals should be used only by physicians who are qualified by specific training in the use and safe handling of radioisotopes and whose experience and training have been approved by an individual agency or institution already licensed in the use of radioisotopes.

**Note:** The Tesuloid Kit is not radioactive. However, after the eluted  $^{99m}\text{Tc}$  is added, adequate shielding of the resulting preparation should be maintained.

**Precautions:** As in the use of any other radioactive material, care should be taken to insure minimum radiation exposure to the patient as well as to all personnel directly or indirectly involved with the patient.

**Note:** The Tesuloid Kit was designed to be used with the sodium pertechnetate eluate obtained from a Technetope II (Technetium 99m) Sterile Generator. The low concentration of polyvalent cations in the Technetope II eluate results in a  $^{99m}\text{Tc-S}$  colloid which is suitable for liver-spleen scanning. Use of other sources of sodium pertechnetate having a higher concentration of polyvalent cations may produce an unsuitable  $^{99m}\text{Tc-S}$  preparation which is not a colloid; this is evidenced by the formation of a flocculent precipitate. If such a precipitate occurs, the preparation should not be used. It is, therefore, recommended that only Technetope II be used as the source of sodium pertechnetate with Tesuloid unless the user has demonstrated that other sources of  $^{99m}\text{Tc}$  are consistently compatible and meet the standards of Technetope II.

For further information, contact your Squibb Representative or the Manager of Customer Service, E. R. Squibb & Sons, Div. of Nuclear Med., Georges Rd., New Brunswick, New Jersey 08903.



Squibb Division of Nuclear Medicine  
New Brunswick, New Jersey 08903

# Important notice to all Dynacamera<sup>TM</sup> 2 owners.

(And anyone else interested in a scintillation camera.)

Whether you now have a Dynacamera 2—or just contemplate the purchase of a scintillation camera—we have news for you. And an offer.

The Dynacamera 2 is now being widely used for an impressive variety of both static and dynamic studies. Picker is working with many of the institutions using Dynacamera 2 and is assembling a collection of “application data sheets” showing the versatility and usefulness of this instrument. These data sheets outline in detail the techniques currently being used for many important studies including: static views of brain, lung, liver, thyroid, and kidney; dynamic function studies of brain, heart, lung, kidneys.

We want all Dynacamera 2 users to see what others are doing, and we also want all prospective scintillation camera owners to be fully familiar with the capabilities of this impressive device. Accordingly, fill in the coupon below so that we can fill you in. Or, write Picker Corporation, 333 State Street, North Haven, Connecticut 06473. Thank you.

Picker Corporation, 333 State Street, North Haven, Connecticut 06473

Please send the Dynacamera 2 applications data sheets.

Name \_\_\_\_\_

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Organization \_\_\_\_\_

Address \_\_\_\_\_

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NM

**PICKER**

# don't take our word for it!



Questions about scanner performance and service are best answered by asking someone who has one. Why not ask someone who has an Ohio Nuclear scanner?

Let him tell you how this new instrument has been improved. Let him tell you how we back it up with prompt service by our scanner specialists. Strategically located, all are company-employed and factory-trained.

So, don't just take **OUR** word for it, write us, or call and we'll be happy to give you the locations of our scanners in your area.

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CAPINTEC INC.



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Mount Vernon, N.Y. 10550  
(914) 664-6600

Speed Memo

To: *Journal Readers*

*We already know at least 100 applications for CISA-M in your hospital. What others can you find? Let's talk about it!*

*Capintec Inc.*

**"What is CISA-M?"**

It's Capintec's new precision DC linear isolation amplifier, for medical electronic applications, which isolates input and output circuits to provide optimum patient protection in your hospital.

**"How may CISA-M be used?"**

As an isolator; signal conditioner; an amplifier with user-specified gain as a line driver and about 100 other ways to substantially improve the effectiveness and safety of electronic medical and patient-care programs. The instrument can function as an isolated external drive for "pacemakers" or for other implanted or contact devices such as catheters, electrodes and cystoscopes... in fact any electrical equipment in contact with your patient.

**"Why is CISA-M a must for your hospital?"**

Because of its versatility, CISA-M is the first and only isolation amplifier capable of transmitting the widest range of voltage signals from minimum DC to 20kHz, providing the hospital with a new and wider range of performance. It offers high input impedance as well as high gain pre-amp.

**"Does CISA-M deliver any extraordinary capabilities?"**

Yes, in simultaneous signal amplification and patient isolation. Used for amplification, its output will drive up to 10 milliamperes at a full 5 volt swing, enabling the hospital to amplify low-level signals at the source and

assure accurate readings from all equipment. This amplification totally eliminates the possibility of distortion resulting from pickup, induced voltages and the like in the monitoring equipment. User-specified gain permits standardization of all signal levels.

Another major feature of CISA-M is the degree of isolation provided: a DC isolation resistance of  $10^{12}$  ohms combined with a stray capacitance of only 10pf between input and output sections. This guarantees a leakage current of less than one microamp under any combination of fault conditions.

**"Will CISA-M interface with our existing hospital equipment?"**

Yes; old or new equipment will take just minutes to adapt, following the custom engineering service provided by Capintec to your hospital. You need only to tell us your specific needs and requirements and the equipment you now have. Capintec will adapt your CISA-M to your equipment.



**CAPINTEC INC.**  
63 East Sanford Blvd.  
Mount Vernon, N.Y. 10550  
Telephone: (914) 664-6600.

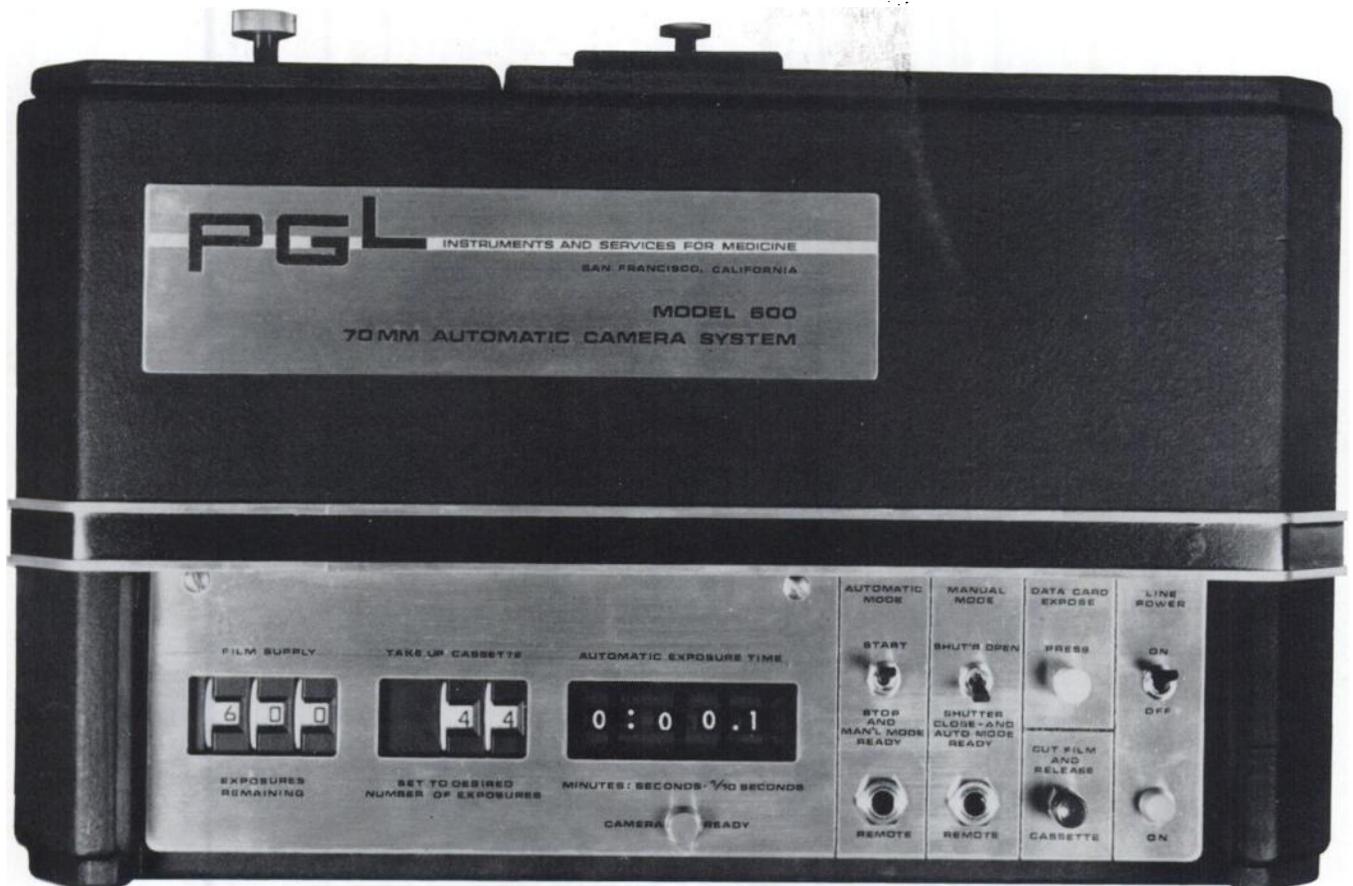
**Products for Safety,  
Security, Quality Control**

Instrument Isolators, Radiochemicals and Standards,  
Radiation Monitoring Equipment, Radiotherapy  
Equipment, Radioactive Waste Management,  
CAMAC Computer Interfacing Modules

# 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)

**We could have  
stopped here.**



**We could have  
stopped here.**



**...But we didn't!**



## System 75

We never stop exploring ways to make the operation of your hot lab safer and more convenient. Our latest endeavor is SYSTEM 75, a convenient and economical assembly of equipment and accessories:

The first item is our Technetium-99m Sterile Generator with its specially designed auxiliary shield which provides a total of 3 full inches of lead shielding. Then there's the Mediac® Dose

Calibrator which enables you to conveniently assay the technetium and to check for molybdenum. A radium standard is also included to check instrument function and to calibrate the instrument. Also included is a Portable Area Monitor that continually monitors the radiation level in your hot lab. All this for a low weekly service charge—not much more than the cost of the Tc-99m Generator alone.

An extra bonus: after approximately 2 years, all the components become yours! Your only expense after that is for your weekly Technetium Generator.

To get the complete story on the unique new SYSTEM 75, call us collect at 312-593-6300.

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An Activity of G. D. Searle & Co. and the Radiochemical Centre

2636 S. Clearbrook Drive  
Arlington Heights, Illinois 60005  
Telex. 28-2452

**OUR SPECIFIC ACTIVITY IS SERVICE**

# A small hospital just can't go into nuclear medicine.

(Pity that 700 of them didn't know that.)

Actually, 700 hospitals with fewer than 200 beds have already established Departments of Nuclear Medicine. And we have ample evidence—that we'll be pleased to share with you—that the gain justifies the effort.

What do you gain? How do small hospitals train their staffs for nuclear medicine? How do they go about getting AEC-licensed? Where in

the world do they find space in their institutions for new equipment? How can they possibly afford it? Isn't it really a tremendous bother?

If you clip the coupon, we'll try to answer those questions. If the coupon is missing, just write to Picker Corporation, 333 State Street, North Haven, Connecticut 06473 and ask for information on starting a Department of Nuclear Medicine.

## PICKER

Picker Corporation, 333 State Street, North Haven, Connecticut 06473

Although I don't wish to commit this institution to anything at this time, I would like to know more about: the advantages of nuclear medicine, the problems of getting into it and solutions that others have devised, the economics, and so forth. Accordingly, please have your representative call me

(or \_\_\_\_\_ ) for an appointment.

name & title

Please send relevant small hospital case histories and other information on starting a Department of Nuclear Medicine.

Name \_\_\_\_\_

Title \_\_\_\_\_

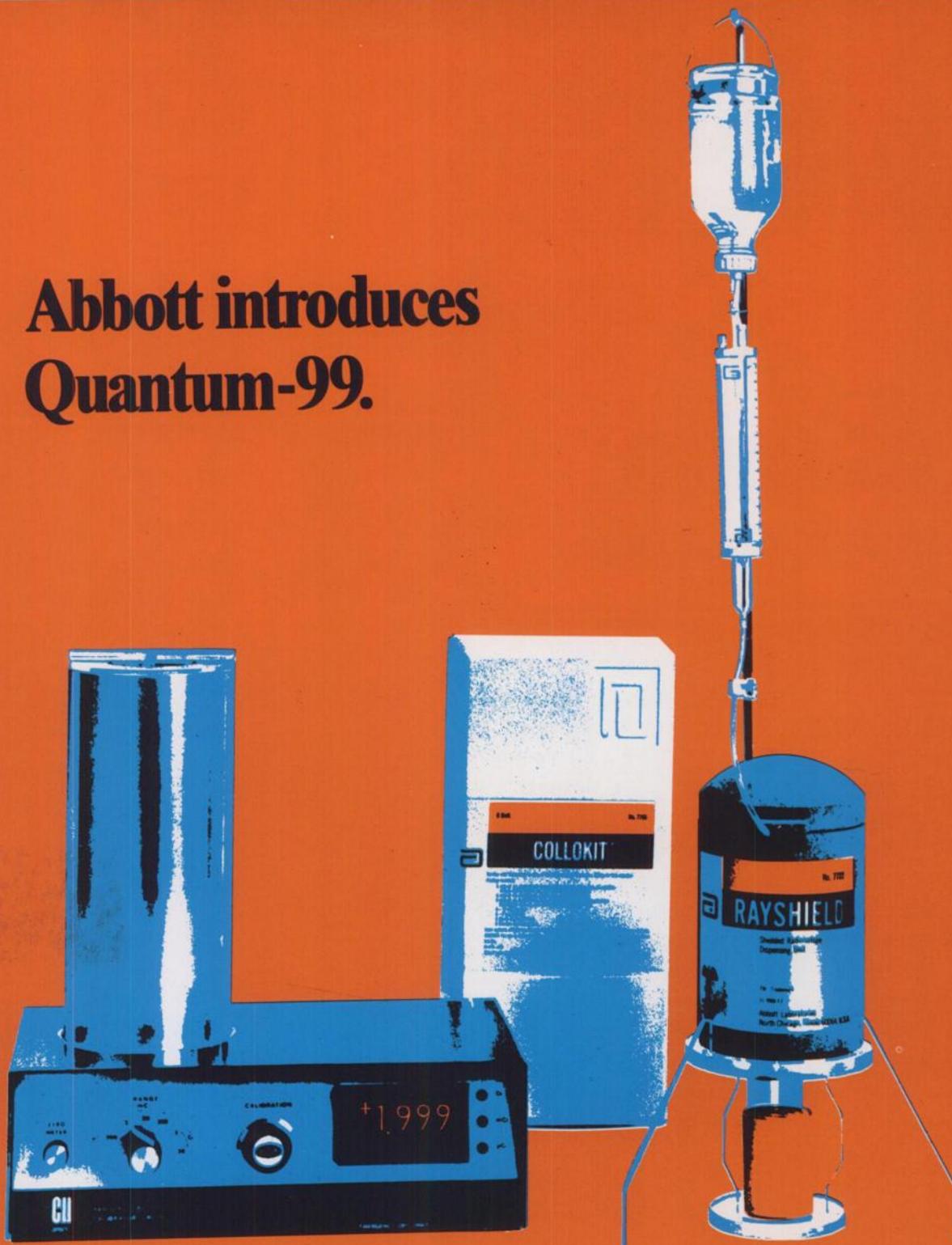
Institution \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

Phone \_\_\_\_\_

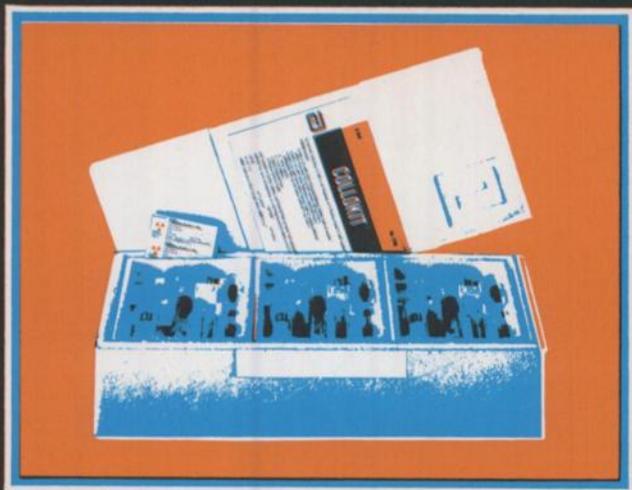
NM

# Abbott introduces Quantum-99.



The coordinated Tc-99m generator, Dose Calibrator, and Sulfur Colloid Kit that clears up any doubts you may have about contamination, proper dosage, and Alumina or Moly breakthrough.

With Collokit™ there's never any doubt - the suspension's clear.



Unlike other Sulfur Colloid Kits, Collokit™ produces a cloudy suspension only when Alumina breakthrough or other contamination occurs. There's never any doubt whether the suspension is good.

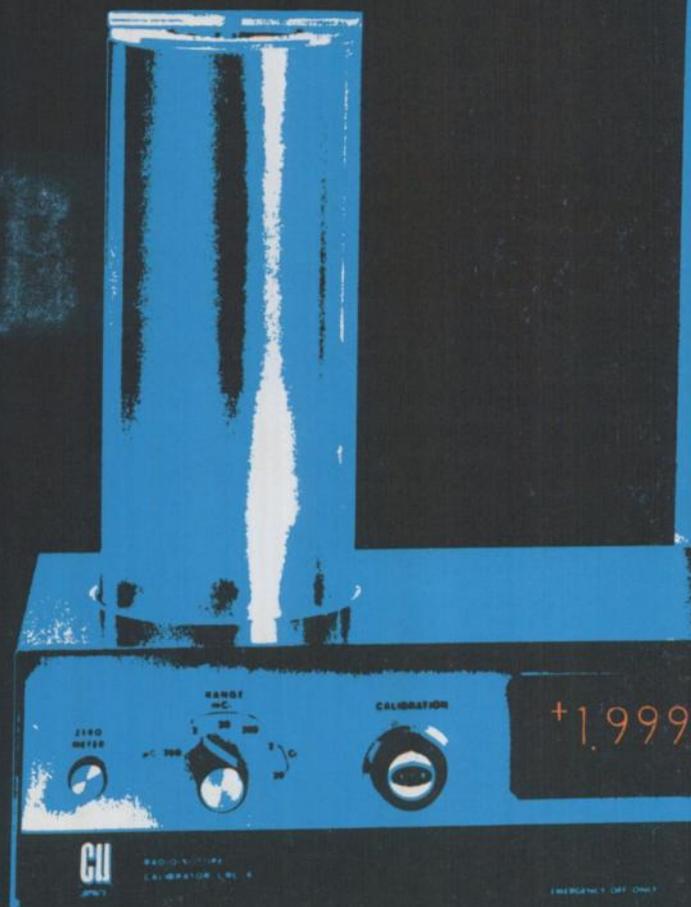
And Collokit™ offers other advantages. There are fewer entries into the reaction chamber than with competitive products and this means the procedure is safer. The suspension is not vented during the heating/cooling cycle, so no outside air is drawn in and the product remains sterile. Convenient, economical individual units contain the components needed for one day's use.

Collokit™ is not recommended for systems with eluates containing oxidizing agents such as sodium hypochlorite. It is intended for use with the PERTGEN®-99 Technetium Generator Kit.

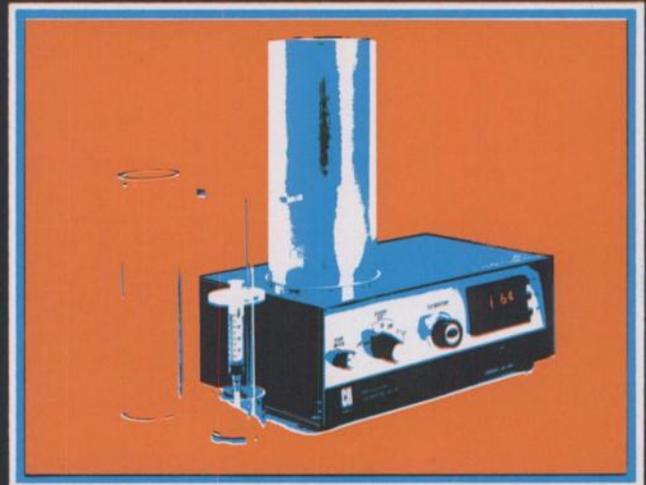


PERTGEN® is now shipped on Sunday and calibrated for the following Friday to give you all the activity you pay for, when you need it.

PERTGEN® is a "Think Thursday" program product, so you save duplicate shipping charges when you order it together with pre-filled, pre-calibrated in vivo "Think Thursday" diagnostic products.



# The Capintec CRC-4, the ultimate Dose Calibrator.



Like most Dose Calibrators, the Capintec CRC-4 eliminates the two most common problems, determination of Mo-99 breakthrough and accurate measurement of Tc-99m activity. The similarity ends there.

The CRC-4 offers more features than any previous Dose Calibrator to make it more accurate, more reliable, and easier to use. For instance, a ten turn digital readout potentiometer gives almost unlimited isotope capabilities.

The CRC-4 offers the most advanced Mo assay system currently available, and it handles whole vial assay.

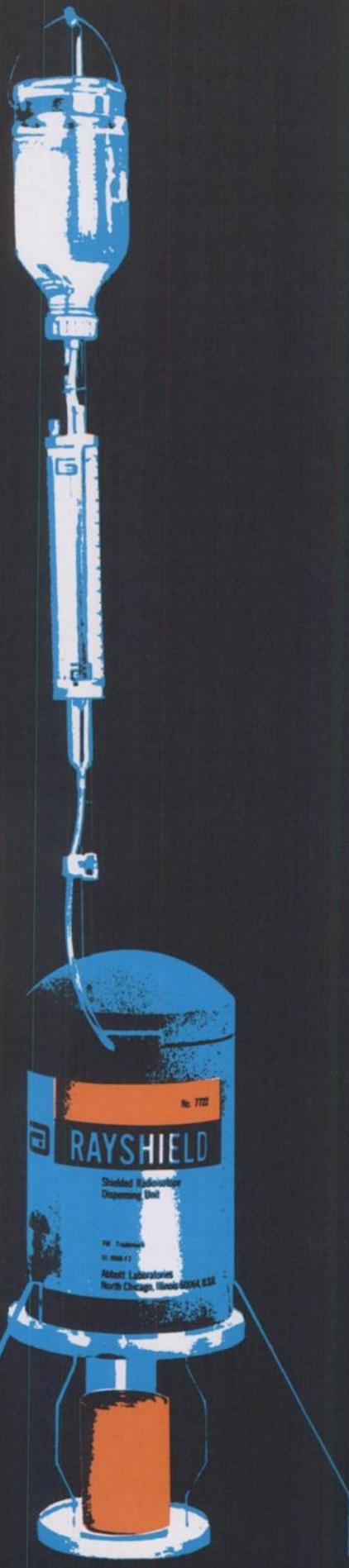
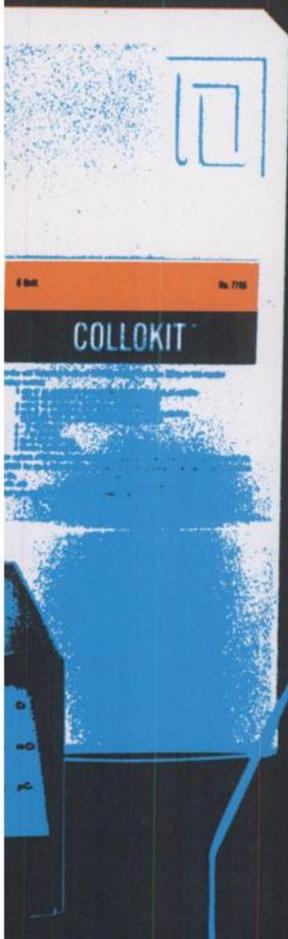
To make it more accurate, an individual background suppression control is built-in to allow you to eliminate background. And your results read out in microcuries, millicuries, or curies on an easy-to-read four digit display panel.

We've designed Quantum-99 to give you more accuracy, convenience and value than any other Tc-99m generator system available. If you want to clear up your doubts about contamination, dosage or breakthrough, talk to your Abbott representative about Quantum-99.



**ABBOTT LABORATORIES**  
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**RADIOPHARMACEUTICAL DIVISION**

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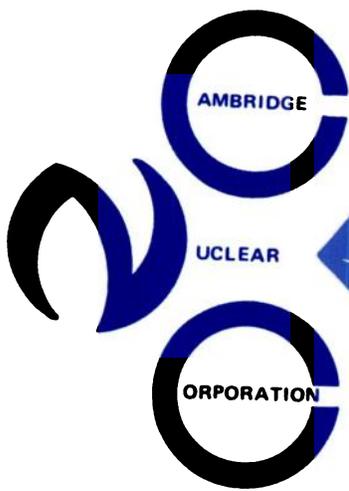
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**Nuclear Medicine**

**Second Edition**

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Edited by **William H. Bland**, Chief, Nuclear Medicine Service, Wadsworth General Hospital, Veterans Administration, Los Angeles; Professor of Medicine, UCLA School of Medicine. 1971. 864 pages (tent.), \$33.50 (05542).

Since the publication of the first edition of Nuclear Medicine approximately five years ago, there have been vast changes in the nuclear medicine field. Changes have occurred primarily in the areas of instrumentation and radiopharmaceutical development. These new developments have had a major impact on the practice of clinical medicine. *Nuclear medicine now plays a major role in patient management and has significantly expanded the physician's armamentarium.*

As in the previous edition of this book, the field of nuclear medicine has been presented as an integrated medical discipline. Various facets of the field are considered including fundamentals, clinical applications and new developments. All chapters have been written by acknowledged authorities and often by pioneers in the field. *Although the primary approach is clinical, major topics are presented in sufficient depth to be of interest and value to both the medical investigator and instructor.* Each chapter contains an extensive bibliography, so that the book also serves as a useful reference source.

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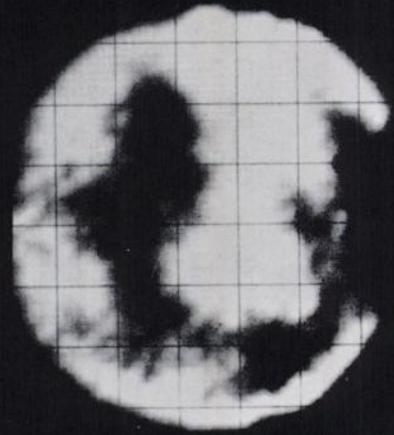
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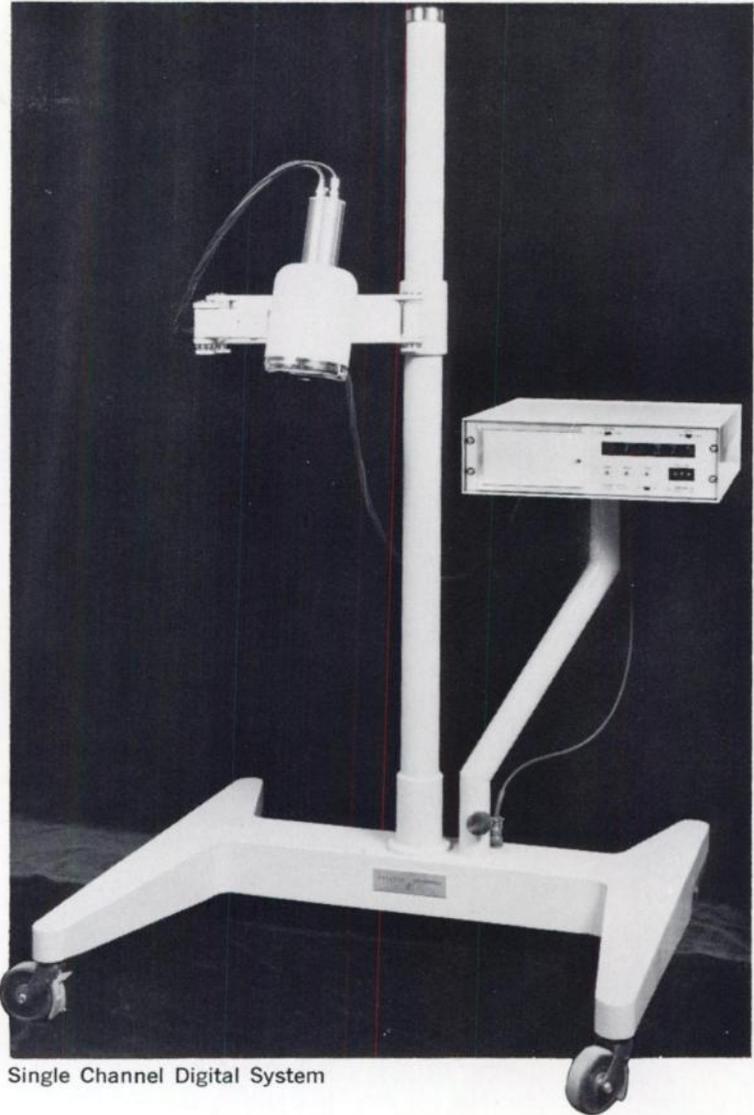
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FIGURE 1. SERIAL SCINTIPHOTOS. ANTERIOR VIEW.

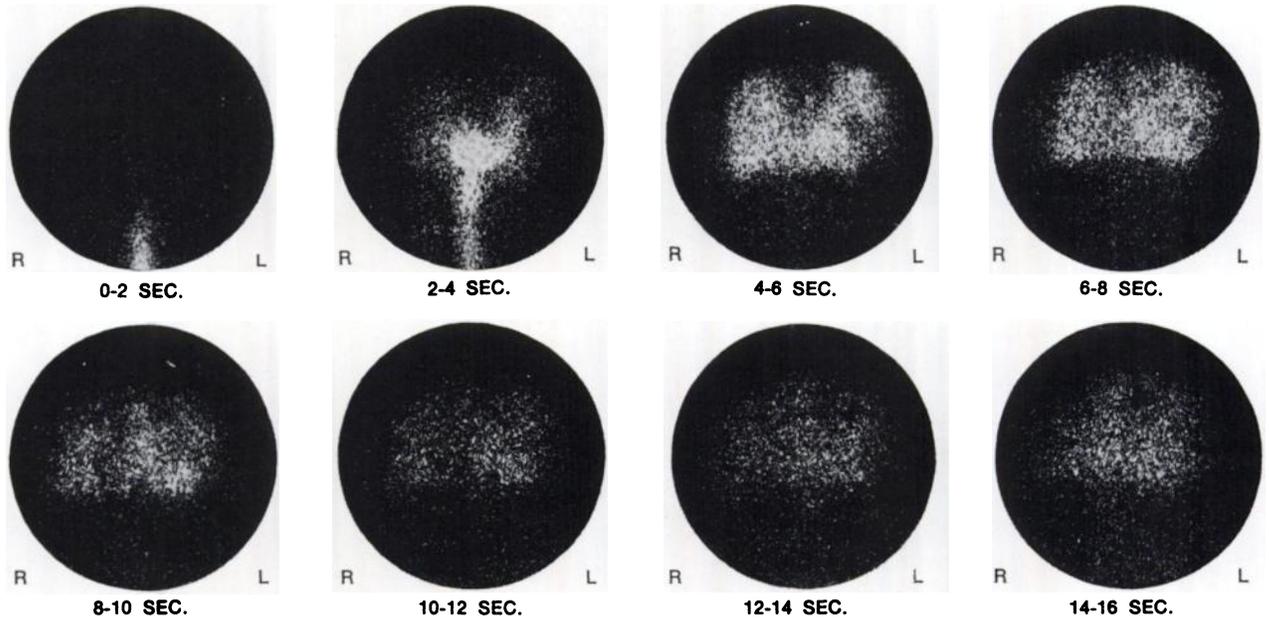


FIGURE 2. AREAS-OF-INTEREST. ANTERIOR VIEW.

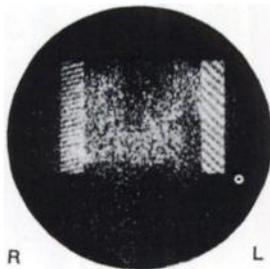


FIGURE 3. PULMONARY DILUTION CURVES, ABNORMAL.

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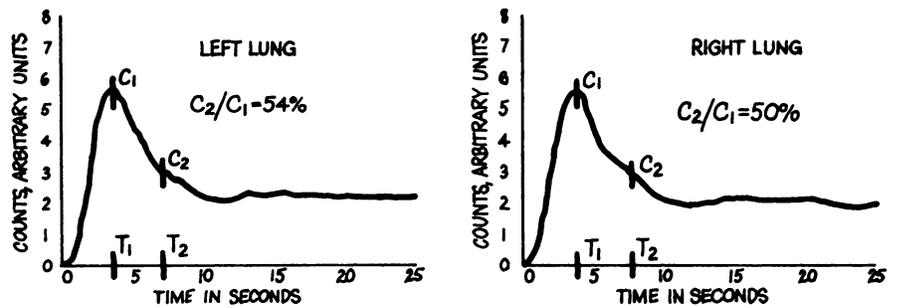
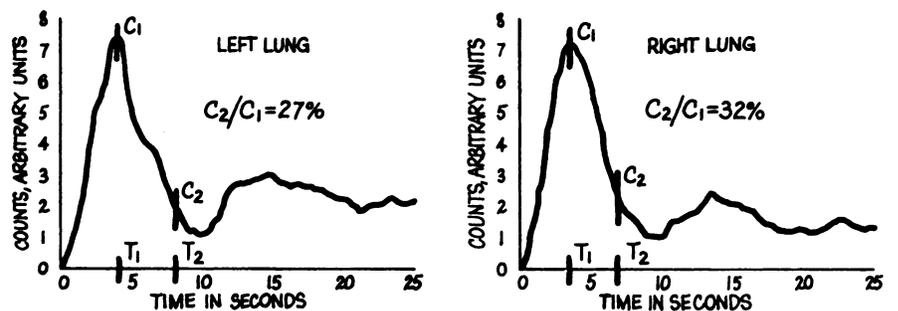


FIGURE 4. PULMONARY DILUTION CURVES, NORMAL.

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This study combines serial scintiphotos of the circulation of  $^{99m}\text{Tc}$  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  $^{99m}\text{Tc}$  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  $^{99m}\text{Tc}$  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  $^{99m}\text{Tc}$  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.

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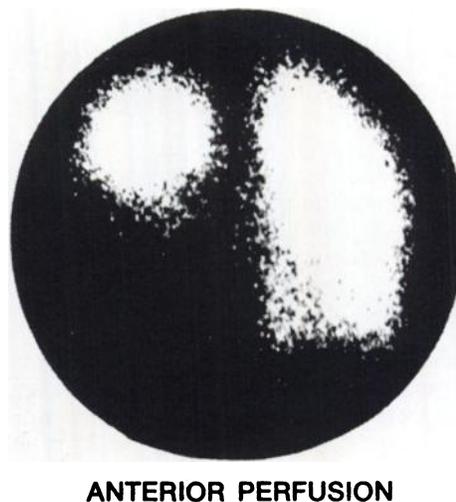
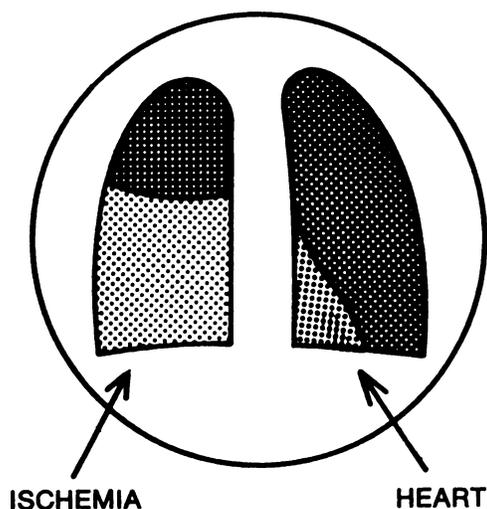
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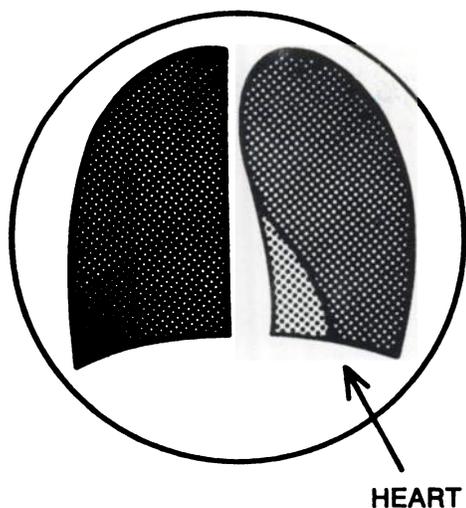
# Pulmonary Embolism?



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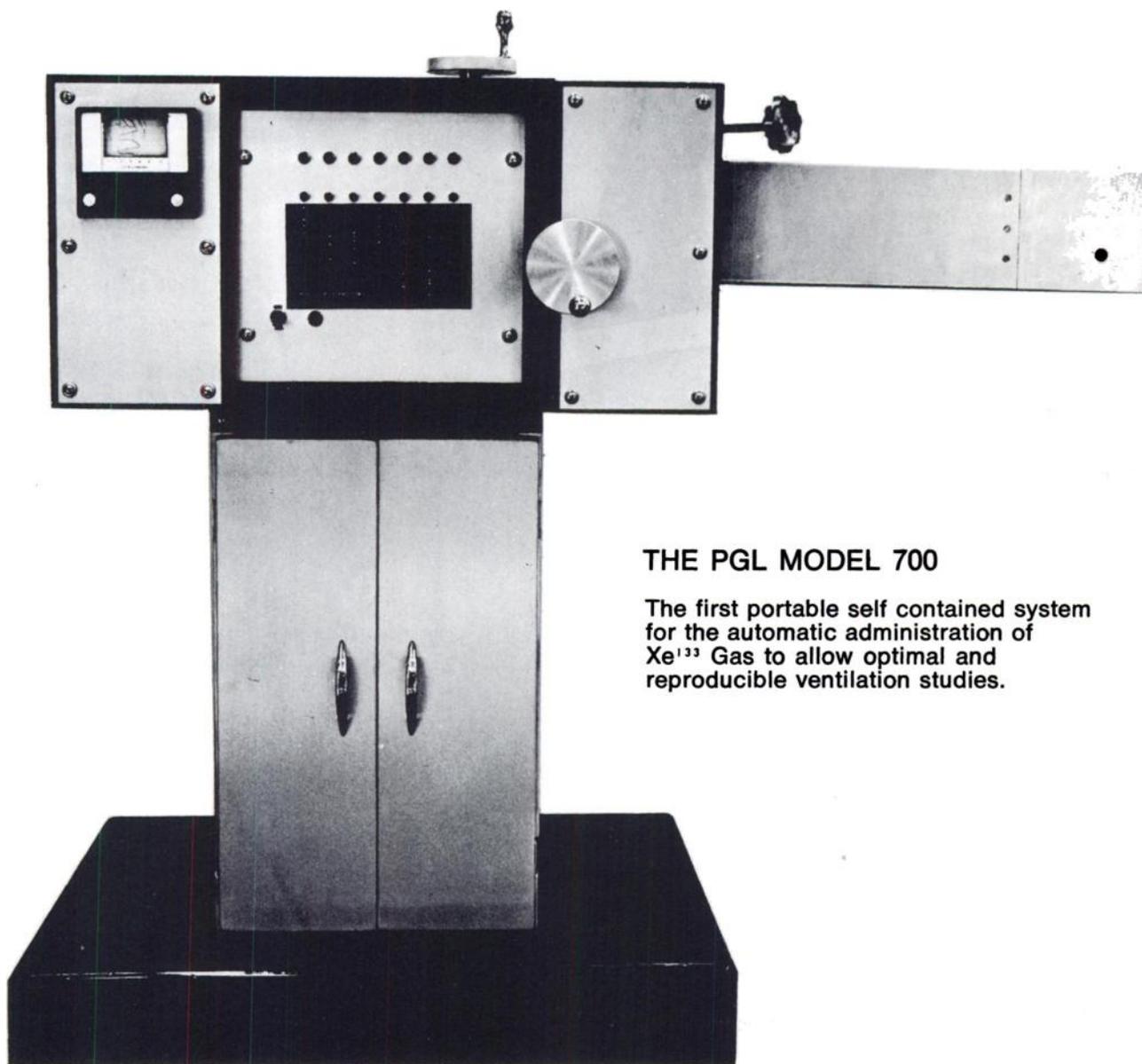
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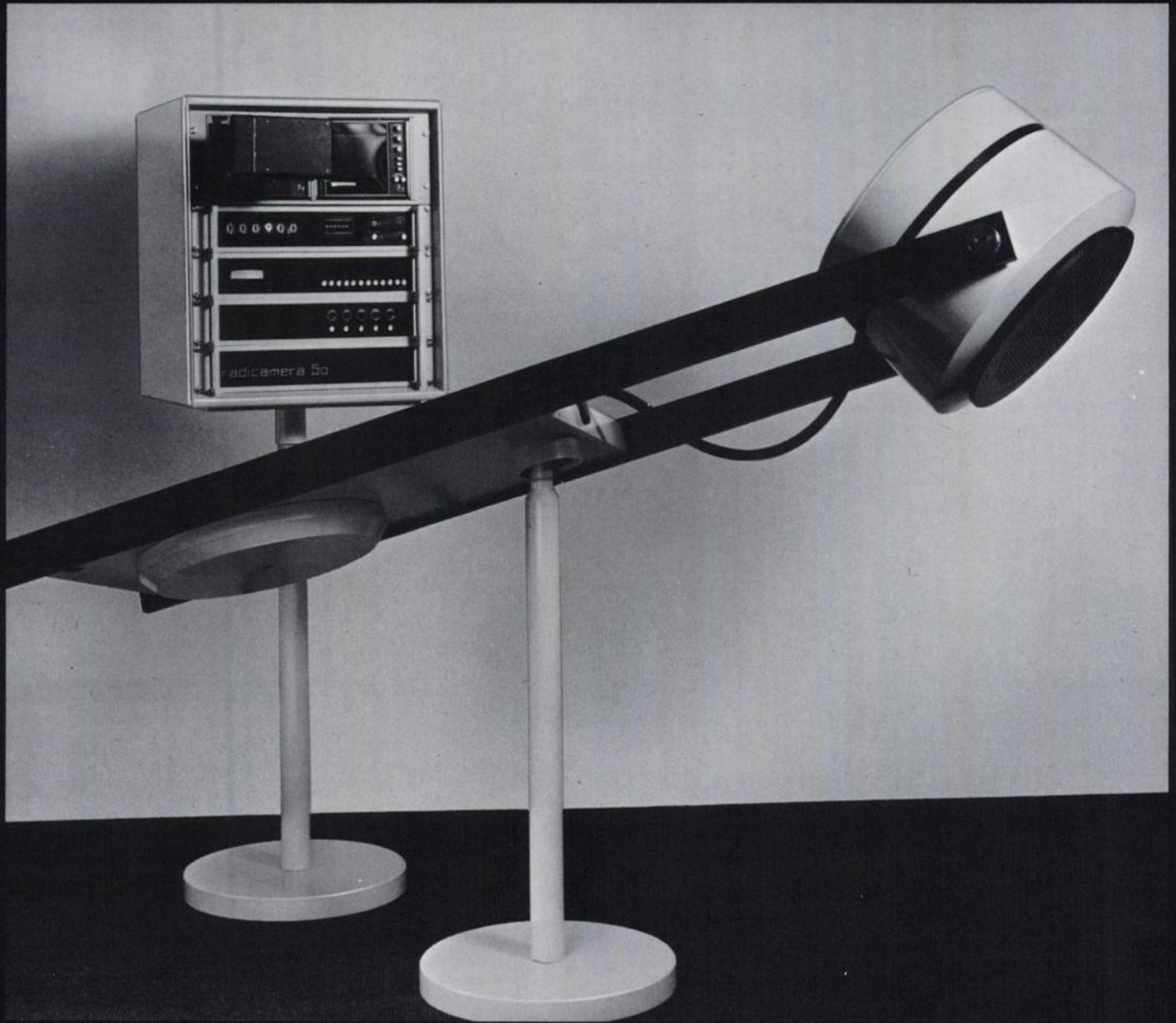
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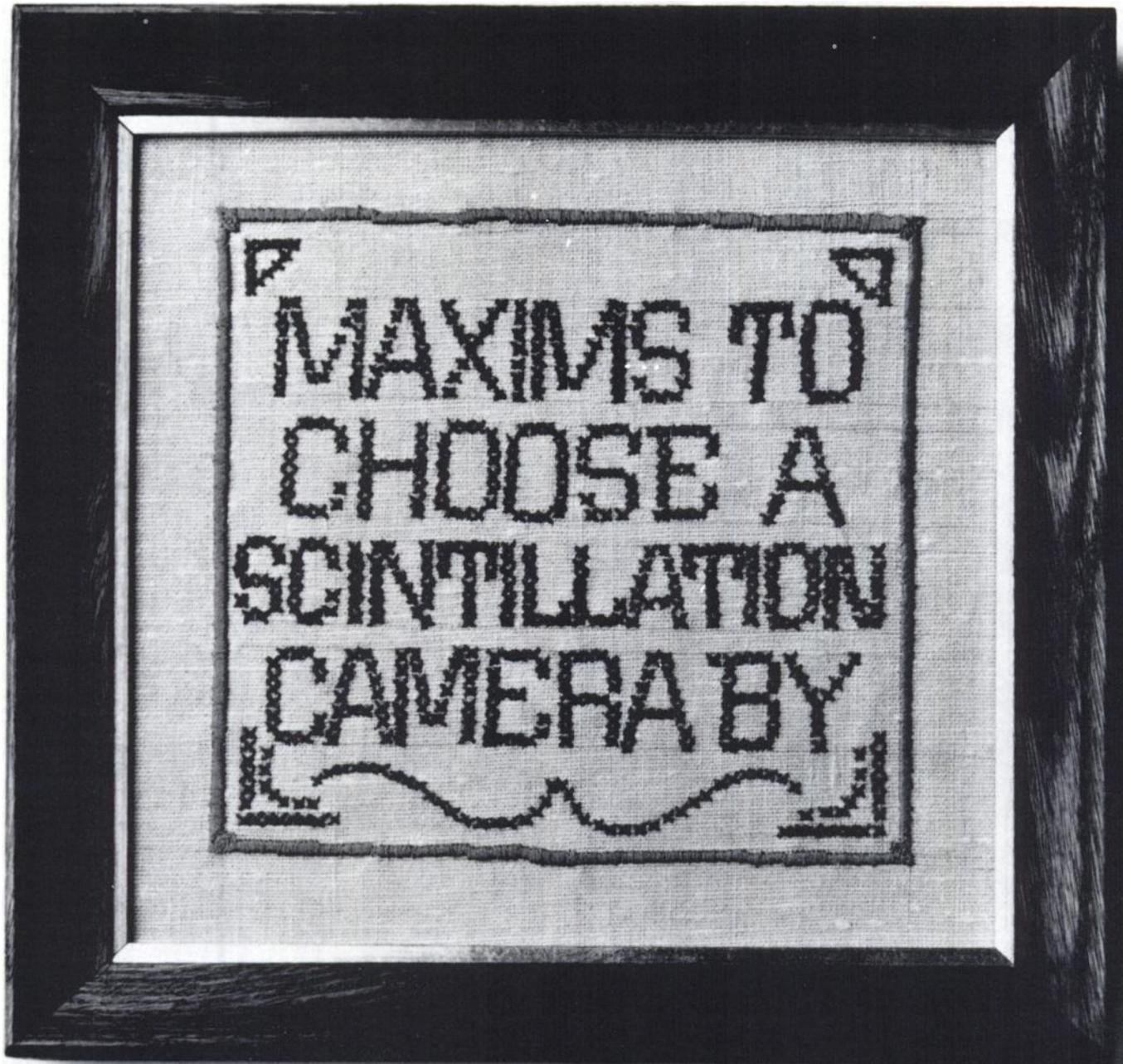
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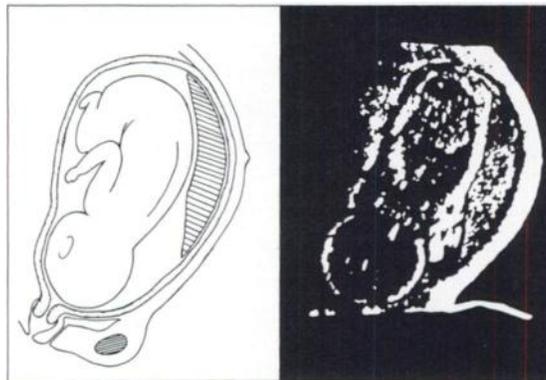
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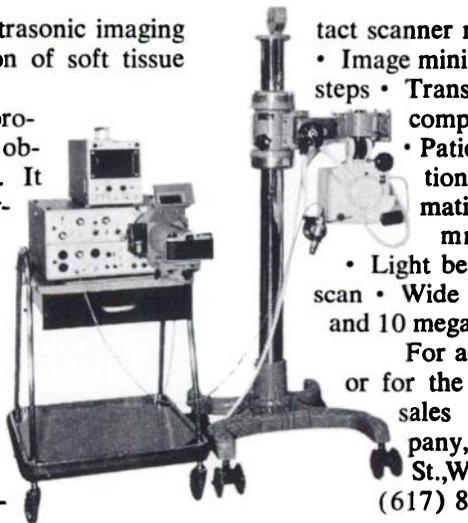


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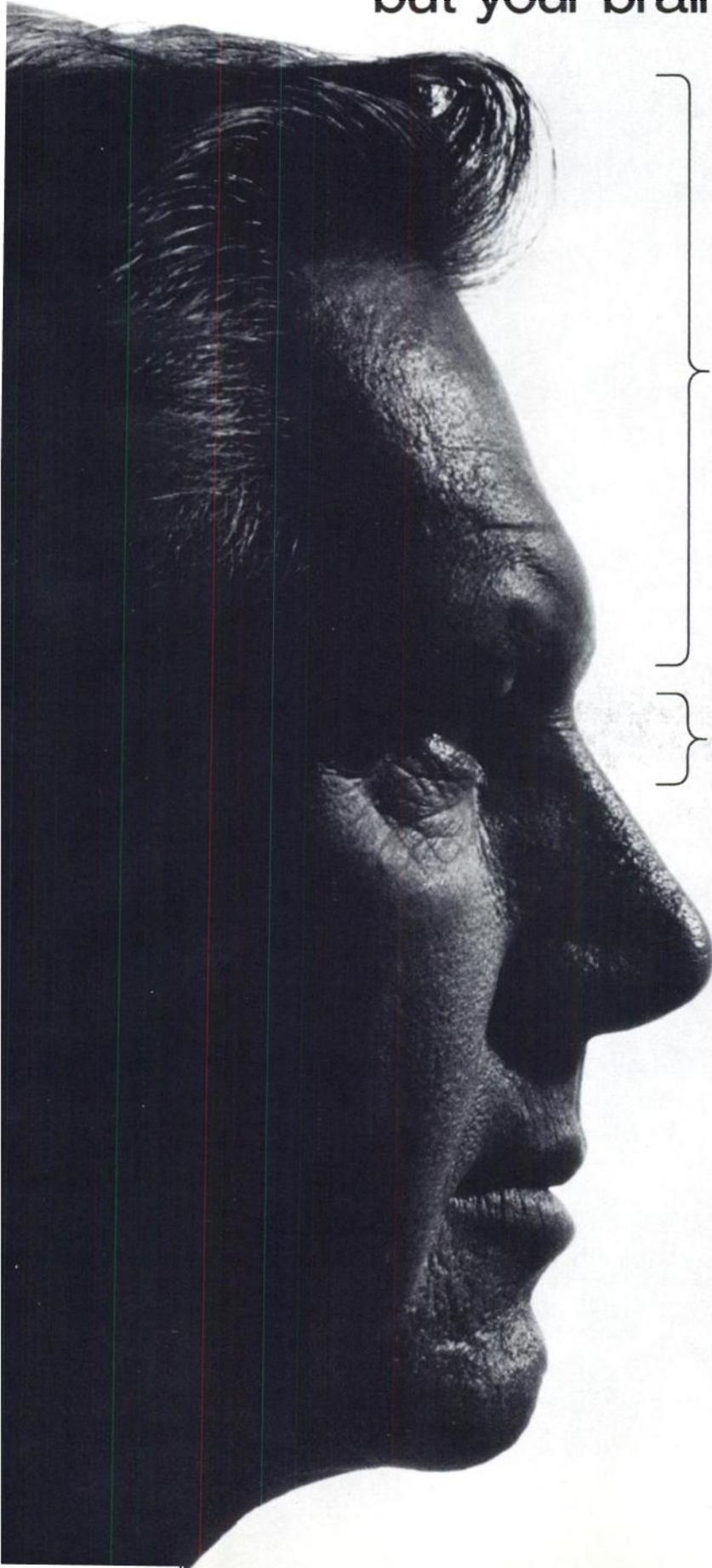
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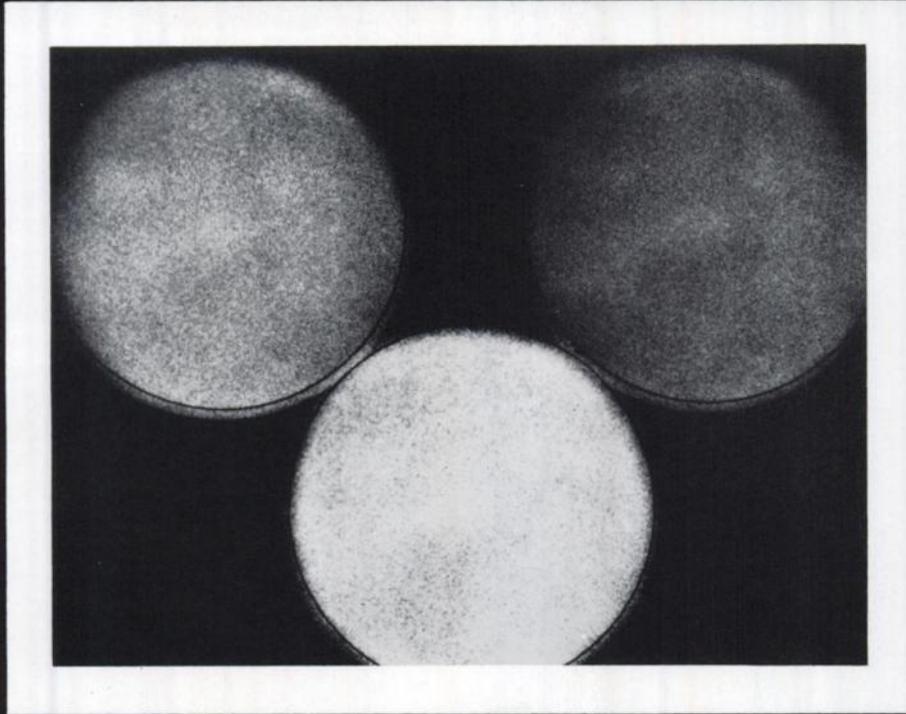
Finally, this is just one of many ways in which the Dynacamera 2 provides you with what you want most: *maximum diagnostic certainty*. What else, after all, is there?

Very valuable for looking at scintigrams. Except for the situations when one's eyes may be deceived.

Speak to your local Picker man or drop us a line. We'll forward detailed information on the Dynacamera 2 and a series of Dynacamera 2 "application data sheets." Picker Corporation, Dept. A12, 333 State Street, North Haven, Connecticut 06473.

**PICKER**

# Diagnosis: Diseased organ? Sick Camera?



The difference is critical. The image above shows the result of unbalanced photomultipliers which might necessitate a repeat scan. NEN flood sources provide a clean and efficient method of daily camera check which can easily be performed by a technician.

They are solid, flat, light discs, 13.5" in diameter – precision made to provide uniform radiation over the entire surface ( $\pm 5\%$  or better). The flood

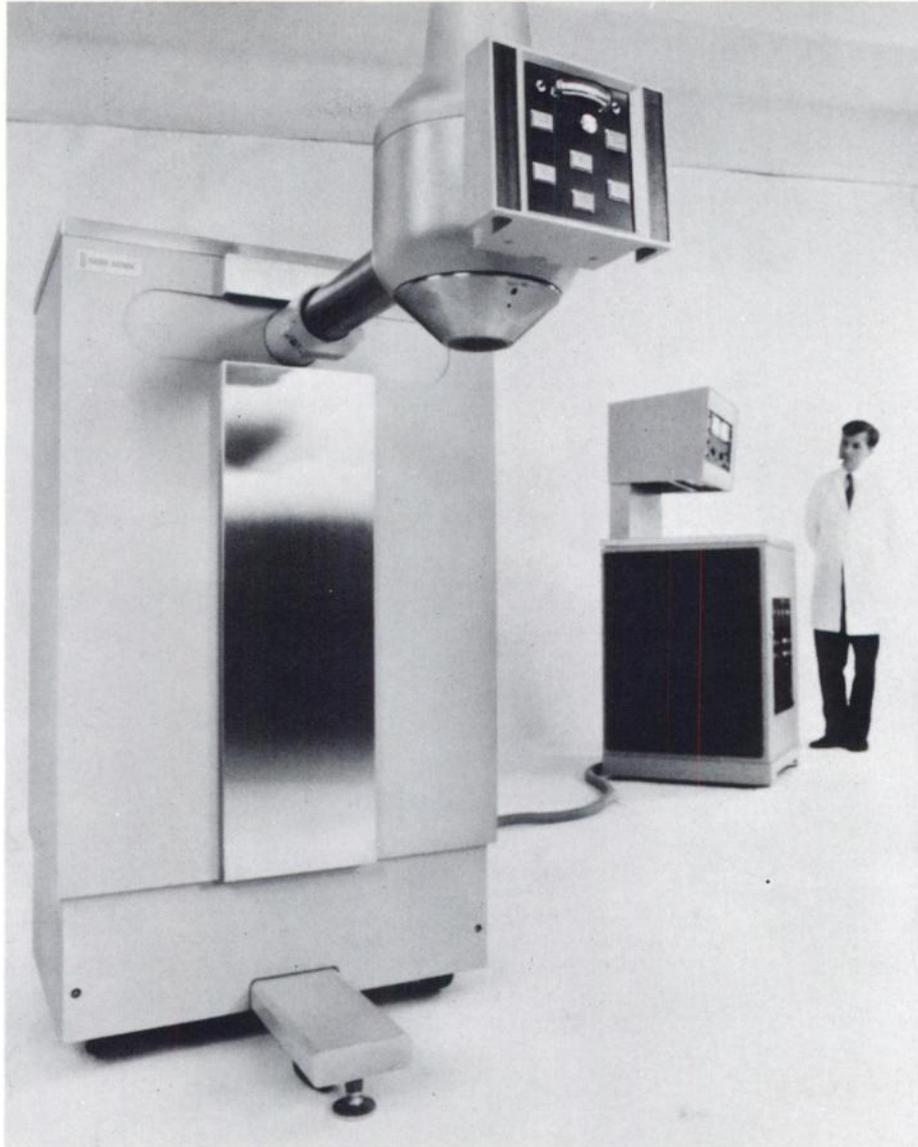
test is made with the camera collimator in place. No liquids to mix, spill, or dispose of.

The NEN flood source (1 mCi  $^{57}\text{Co}$ ) provides a radiation level that floods without saturation. Effective life of this source, two years.

New England Nuclear is the expert in calibration sources for nuclear medicine. Just ask, and we'll send you a comprehensive summary of our flood sources and other products for instrument calibration.

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Radiopharmaceutical Division

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**nms**

Nuclear Medical Systems, Inc.  
142 Mineola Avenue, Roslyn Heights, N.Y. 11577

Why stop with a scintigram  
when there's more information  
down the road?



The typical scintillation camera gives you a scintigram that helps indicate the presence of a lesion. And only that. But one camera (and only one) has a built-in system to help *characterize* the lesion.

By offering this built-in "lesion characterization capability," Dynacamera™ 2 yields more diagnostic information than any other camera.

And lesion characterization can be achieved at the same time the static study is being done.

This capability permits functional comparisons of one region vs. another. And the comparisons are quantitative. (Output includes histogram plots of both regions.)

The Dynacamera 2 also permits imaging of two different radiosotopes simultaneously. Plus quantitative data in the form of histograms.

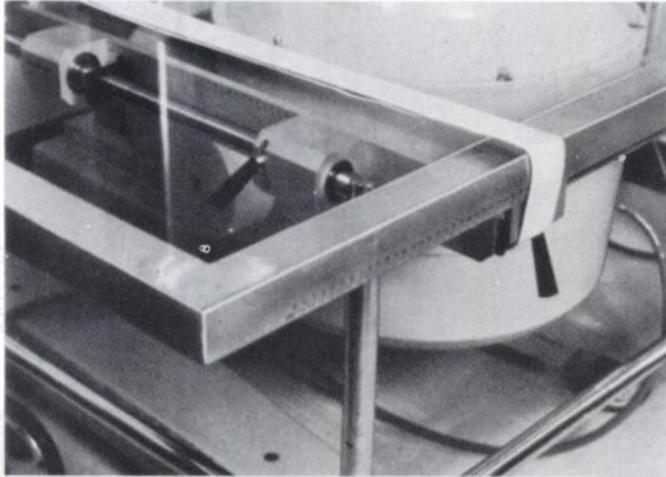
What we're saying is: why stop short of lesion characterization when the name of the game is *information*? Why, indeed?

For maximum diagnostic information, for maximum diagnostic confidence, nothing touches the Dynacamera 2.

For further information and a series of Dynacamera 2 "application data sheets," speak to your Picker man or write Picker Corporation, Dept. D12, 333 State Street, North Haven, Connecticut 06473.

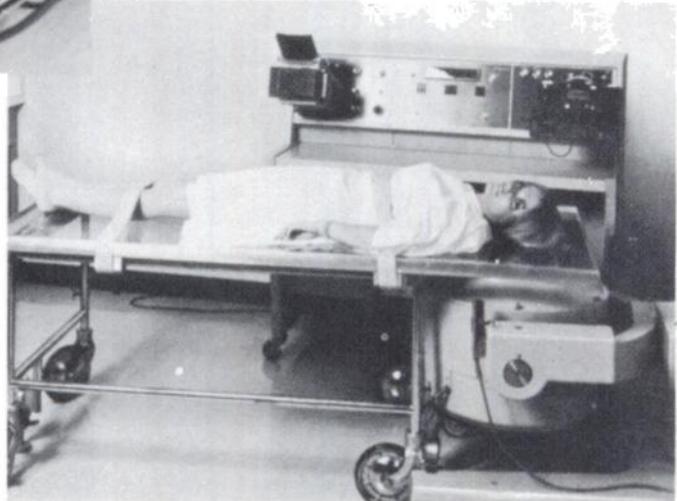
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Graduated calibration scale and positive cam locks assures reproducible positioning.

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# Which of these scintillation camera features are you willing to do without?

They all do one thing:  
increase your diagnostic certainty.

1. Lesion count vs. surrounding tissue count. (Such quantitation goes far beyond a mere picture by giving you "hard data" to work with.)

2. "Lesion characterization capability" that takes you to the next logical diagnostic step. (Such characterization goes far beyond mere identification by helping to determine the type of lesion you're confronting.)

3. Large field size achieved with a large crystal. (Avoids the image distortion typical of diverging collimators.)

4. Simple uniformity check, easily, anytime. (Provides assurance that what you see is of clinical significance and not a result of instrument malfunction.)

5. Isotope push-button selection. (More reproducible, more dependable, much faster.)

6. Image enhancement system option. (With contrast enhancement, background suppression, and readout in color—all of which simplify discernment of small lesions.)

If you're unwilling to forego any of these features that serve to improve your diagnostic certainty, look to Dynacamera™ 2. It is the only scintillation camera that puts your diagnostic needs above all other considerations. For further information and a series of "application data sheets," speak to your local Picker representative or write Picker Corporation, Dept. E12, 333 State Street, North Haven, Connecticut 06473.

**PICKER**

# Only One Scintillation Camera Data System Does Everything You Require (It Even Communicates in English)

## The ND Series 5000

**Totally New!** The dramatic result of ND's 3 years of growing clinical computer experience.

**Designed exclusively for the Nuclear-Medicine diagnostician.**

**Comes "pre-programmed" to record dynamic and static studies, to enhance obscure boundaries and contours, to produce dynamic function curves for up to eight areas-of-interest (simultaneously!), to produce profile histograms, to quantify area-of-interest data . . . and to perform several additional tasks which elaborate basic camera images and provide improved documentation for referring physicians.**

**Interfaces with all gamma cameras.**

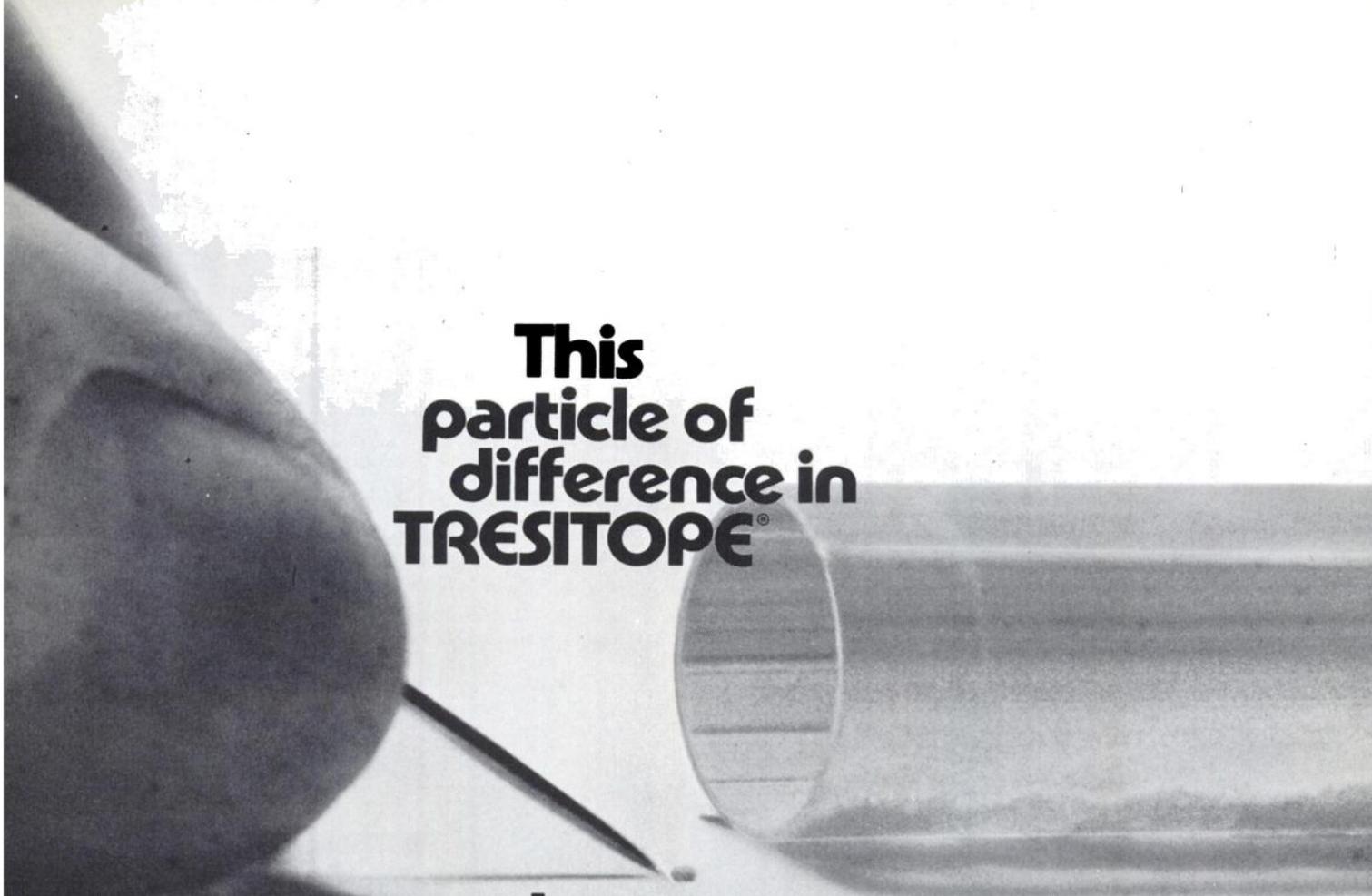
**Can be used "off-line" as an easily programmable (but very able) general purpose computer. With modest practice, the clinician can be developing his own programs to augment those supplied with the Series 5000 Data System.**

**Disc memory provides millisecond access to any given frame or frame sequence specified.**



To instruct the Series 5000 Data System, the clinician types two letter designators at the CRT control terminal shown. The full verbal equivalent of the two letter instruction appears automatically. If further data is required to complete the given command (for example: which frames specify the beginning and end of an area integration), then the verbal instruction appearing on the CRT terminal pauses to allow entry of required supplementary instructions at the appropriate points.

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POST OFFICE BOX 451, PALATINE, ILLINOIS 60067



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difference in  
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a big difference  
in your in vitro  
thyroid function  
tests\***



Magnification 10X

Now the resin powder is granulated for more reliable, reproducible results than ever before

The new resin particles in our Tresitope Diagnostic Kit provide a more effectual secondary binding site for the T<sub>3</sub> hormone.

The resin uptake powder uniformly absorbs the serum-buffer solution, facilitates simplicity of test procedures and is a key factor in yielding reliable, reproducible results.

**\*NOTE:** While the resin uptake test is a very useful aid in the evaluation of thyroid func-

**This portable  
survey meter  
is also an  
area monitor,  
and it's  
always ready!**



It's the double-duty Nuclear-Chicago LOG-SERIES survey meter. It stands in its charge/alarm base continuously monitoring radiation levels within your laboratory, instantly at hand for routine or emergency surveys.

Be prepared. In case of accidental spills, this single, two-part instrument is always ready with optimally charged batteries for any instantaneous monitoring need.

The ruggedized meter has an easy-to-read four-decade logarithmic scale. This log read-out prevents scale "searching" in rapid-change situations and greatly reduces the likelihood of reading errors. Operation is simple.

There are three LOG-SERIES models to choose from, depending on the kind of sensitivity you need. You also have a choice of charge/alarm bases. Clicker (one click for every radiation event detected) or warbler (pulsating alarm tone at the level you preselect, plus a red warning light).

And remember, our portable LOG-SERIES is also an area monitor. Very practical. Very efficient. And not very expensive. For complete details and specifications, write for our 9100 Series data sheet. 1-218



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ANP-316

**REVIEW FOR BOARD EXAMINATION  
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This symposium under the auspices of the Central Chapter of the Society of Nuclear Medicine will be held at Indiana University Medical Center, Indianapolis, Indiana, on Wednesday, Thursday, and Friday, September 15-17, 1971. The curriculum will stress the basic sciences including physical principles, instrumentation, radiobiology, and radiopharmaceuticals, as well as review the common therapeutic and diagnostic procedures with radio-nuclides. The fee for the course, which does not include housing, will be \$75.00 for physicians. Because of the general nature of the course, a limited number of technologists can be registered at a reduced fee. For further information contact:

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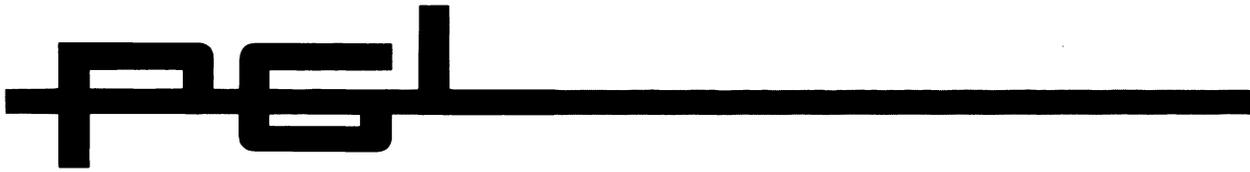
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#### IDEAL FOR ALL IMAGING SYSTEMS:

- 1) Scintillation & Positron Cameras (Pho/Gamma, Dyanacamera, etc.)
- 2) Single & Dual Headed Rectilinear scanners (Nuclear Chicago, Picker, Baird Atomic, Ohio Nuclear, Raytheon, etc.)
- 3) Multidetector Scanners (Dyna-pix, etc.)
- 4) Diagnostic X-Ray units.

#### UNIQUE FEATURES & CLINICAL BENEFITS

##### CONTINUOUS VERTICAL HEIGHT ADJUSTMENT

- Allows vertical height adjustment with patient on table — convenient & accurate patient positioning.

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- Transparent — detector head easily positioned below patient for posterior views. Strong—accommodates 400 lbs. and still raises & lowers smoothly. Low-Density—maximum transmission with low energy nuclides.

##### PHYSICAL SPECIFICATIONS

- Lucite Top: 72"x30"x $\frac{1}{2}$ "
- Vertical Height Adjustment: 24" to 36"
- Lower Frame: 64 $\frac{1}{2}$ " long, 28 $\frac{1}{2}$ " wide
- Wheels: 8" diameter chrome finish with conductive rubber tread.
- Finish: Brushed aluminum and chrome.
- Accessories provided: Restraining belt and polyurethane mattress with conductive vinyl cover.

##### UNOBSTRUCTED FRAME DESIGN

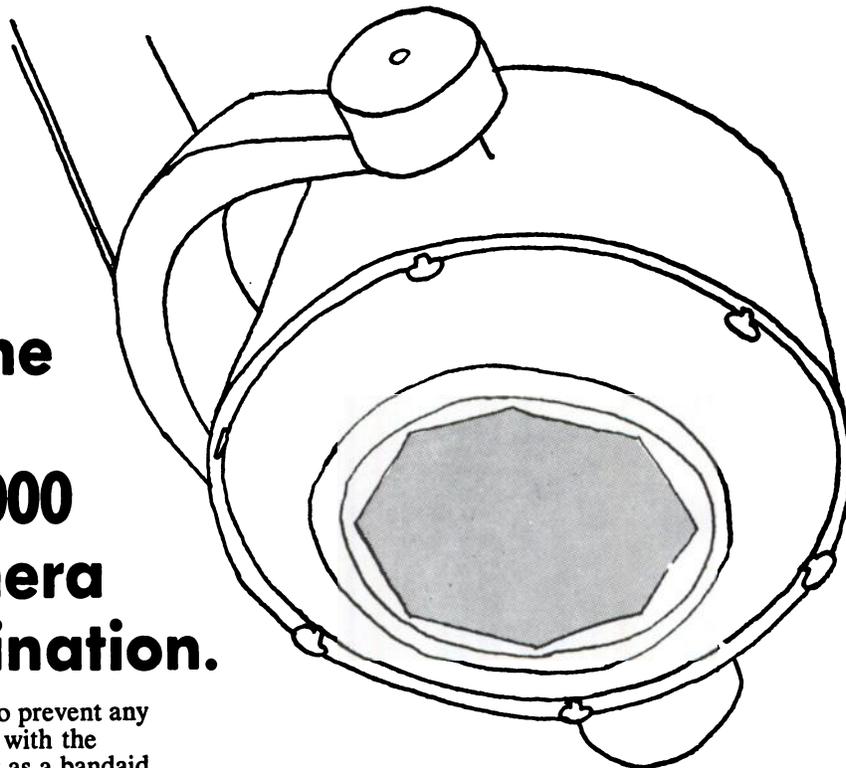
- No crossmembers or support bars to interfere with proper placement of probes, scanner heads, or camera detectors.

##### MOBILITY

- Large diameter casters to facilitate moving patients to and from department.

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# Forget that our scintillation camera is easy to operate.

## Remember something more important.

START

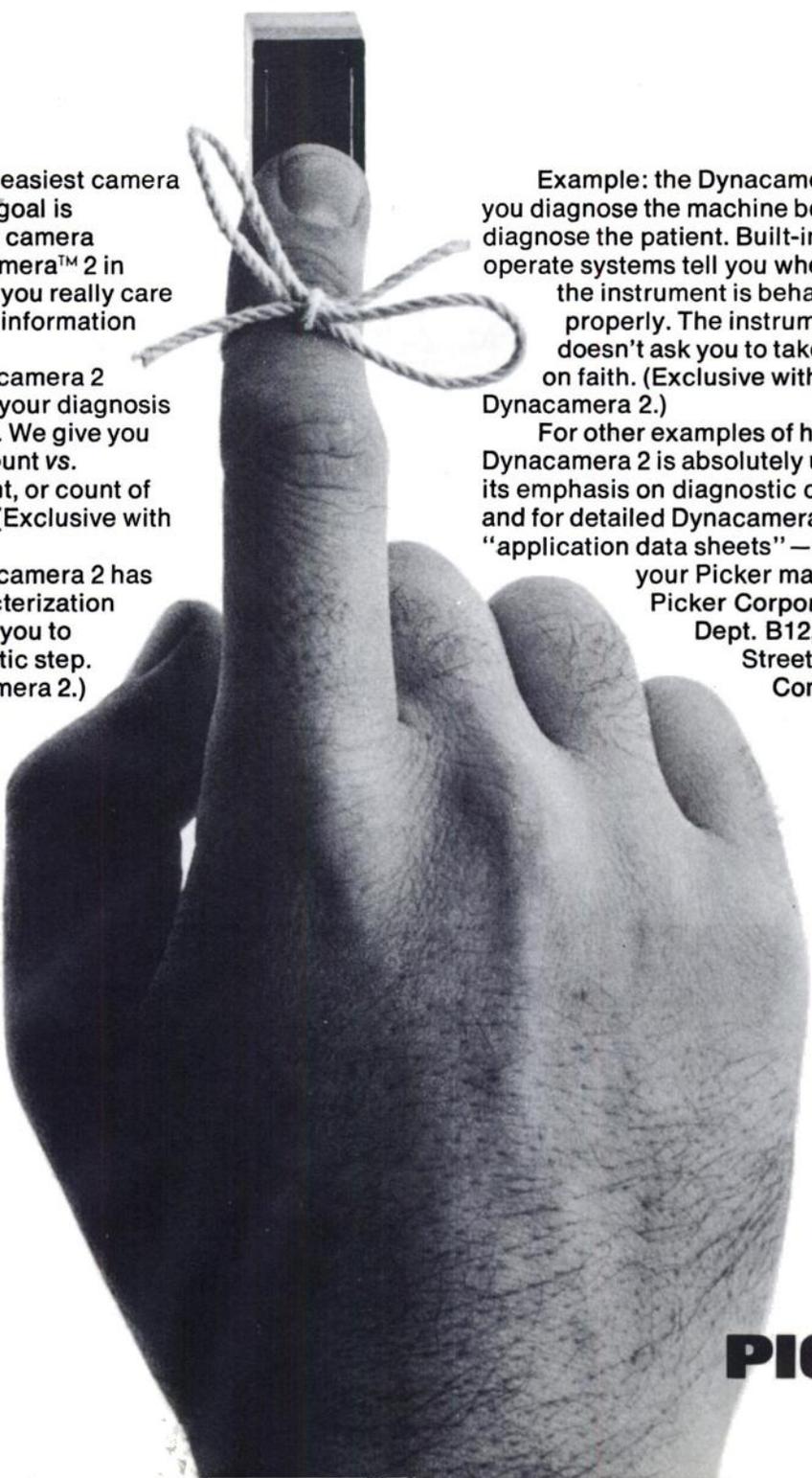
More important: it's the easiest camera to work with when your goal is diagnostic certainty. No camera approaches the Dynacamera™ 2 in providing the only thing you really care about: as much reliable information as possible.

Example: the Dynacamera 2 doesn't ask you to base your diagnosis exclusively on a picture. We give you hard numbers: lesion count vs. surrounding tissue count, or count of one region vs. another. (Exclusive with Dynacamera 2.)

Example: the Dynacamera 2 has a built-in "lesion characterization capability" which takes you to the next logical diagnostic step. (Exclusive with Dynacamera 2.)

Example: the Dynacamera 2 lets you diagnose the machine before you diagnose the patient. Built-in, easy-to-operate systems tell you whether the instrument is behaving properly. The instrument doesn't ask you to take anything on faith. (Exclusive with Dynacamera 2.)

For other examples of how the Dynacamera 2 is absolutely unique in its emphasis on diagnostic certainty and for detailed Dynacamera 2 "application data sheets" — speak to your Picker man. Or write Picker Corporation, Dept. B12, 333 State Street, North Haven, Connecticut 06473.



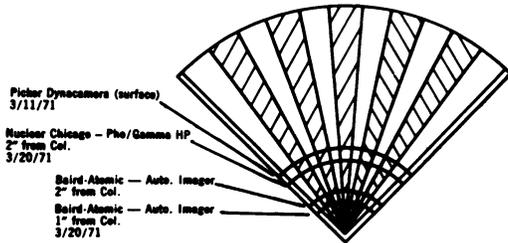
**PICKER**

# The Camera with the Scanner image.

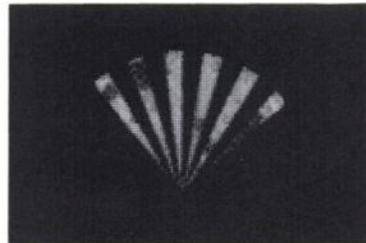
*A closer look at the old image surrounding Cameras, and at the new images being generated at Baird-Atomic.*

By Johan Govaert and Frank Troiani

## Star Phantom<sup>57</sup> Co 1 mc



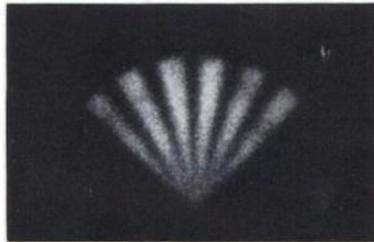
Drawing of Star Phantom (Separation of radiants imaged all the way down to the separation of 2 to 2.5mm by Autofluoroscope)



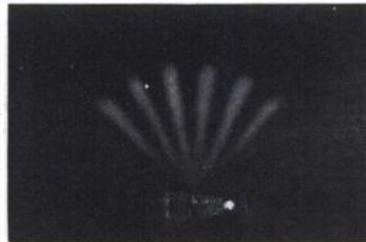
1. Model 5700 Autofluoroscope®  
140,000 counts, 80 seconds  
2 inches from Standard Collimator  
(All defects — bubbles — are accurately imaged. Separation of radiants imaged by Autofluoroscope at 2 to 2.5mm)



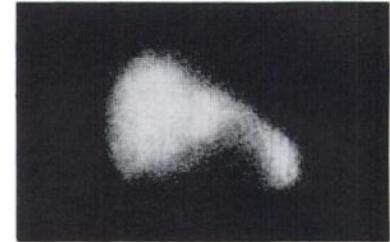
4. Model 5700 Autofluoroscope  
Positive Mode: lungs



2. Pho/Gamma-HP  
50,000 counts, 70 seconds  
2 inches from High Resolution Collimator

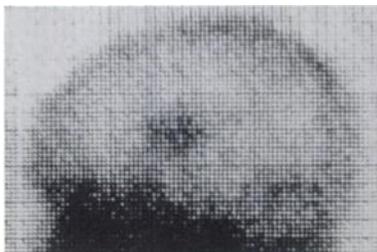


3. Dynacamera™  
On surface of Collimator



5. Model 5700 Autofluoroscope  
Positive Mode: liver/spleen

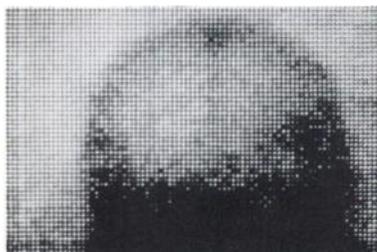
## Positive Brain Study



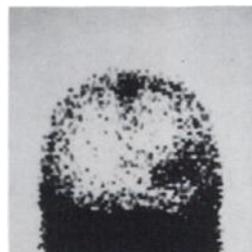
1. Model 5700 Autofluoroscope  
Left lateral 0% BS



3. 5 inch Rectilinear Scanner  
Left lateral



2. Model 5700 Autofluoroscope  
Anterior 0% BS



4. 5 inch Rectilinear Scanner  
Anterior

Patient: 66 year old male. CVA. Isotope: 10 mc <sup>99m</sup>Tc.

Traditionally, of course, Cameras have been valuable because of their through-put capabilities. That certainly is not an insignificant contribution to nuclear medicine. But one which we here at Baird (and no doubt elsewhere) have not been willing to leave alone. After all, there is a lot more to the picture — if you will — than that.

All of which has led B/A to several years of intensive and extensive work. Our Camera, the Autofluoroscope®, has always done a satisfactory job in the area of statics. But there, too, we were far from satisfied.

What we wanted was better image. Or, if possible, a whole new kind of image. We became determined to make our Camera produce images which were a significant order of magnitude better. We wanted images that could approach those obtainable by the Scanner.

*And as of now, we've got it.*

This comparative Star Phantom study shows that. Picture number 1 shows Baird's Model 5700 Autofluoroscope's image compared to those of the

Nuclear Chicago Pho/Gamma HP® and the Picker Dynacamera™ in pictures 2 and 3, respectively.

One thing which you'll notice right off is the accuracy with which the Auto-fluoroscope has imaged all defects — eg bubbles. And that the star radiants are imaged all the way down to the separation of 2 to 2.5mm.

Now take a look at pictures number 4 and 5. They show the Autofluoroscope's ability to image large organs — lungs and liver/spleen — in the positive mode.

All right. From there, let's pass on to a Positive Brain Study. This is of a 66 year old male, CVA. The isotope dosage is 10mc <sup>99m</sup>Tc. Pictures 1 and 2 are made by the Model 5700 Auto-fluoroscope. Pictures 3 and 4 are of the same man, same data, but made by the 5-inch Rectilinear Scanner.

Quite frankly, we never expected the Camera to come along quite this far. We're getting the imaging capability, the clarity, the resolution from the *Autofluoroscope* that you'd only expect from the Scanner. With none of the narrow-focus problems. None of the concern for missing a lesion by being at the wrong depth.

Study the definition. Especially in the posterior fossa area. See how the skull shows up.

Quality of image. Depth of image. All the way through the head. The implications are fantastic.

*But that's not all.*

Finally, let's look into serial imaging. We have proven capability in quantitative function studies. Now, as you can see, we also offer exceptional clarity visualization of dynamic events. This cardiac study pretty much speaks for itself. It's a radio isotopic angiogram, anterior view, of a normal subject.

It represents a Camera advance that's almost too good to be true. And, as a matter of fact, we could hardly believe it ourselves when we saw what we'd done.

But it is true.

What this means is that Baird-Atomic has taken the Autofluoroscope and compounded its value by giving it imaging capabilities like those of the Scanner. In both statics and dynamics.

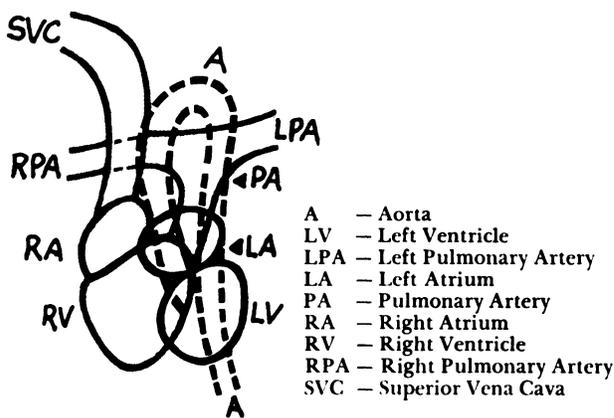
And the whole point is that, as of now, the Autofluoroscope isn't like any other Camera. It's virtually a new kind of instrument (incidentally, all the capabilities that we've talked about here can be readily installed in existing Autofluoroscopes).

Write us, or call us. Because there's a lot more to be said.

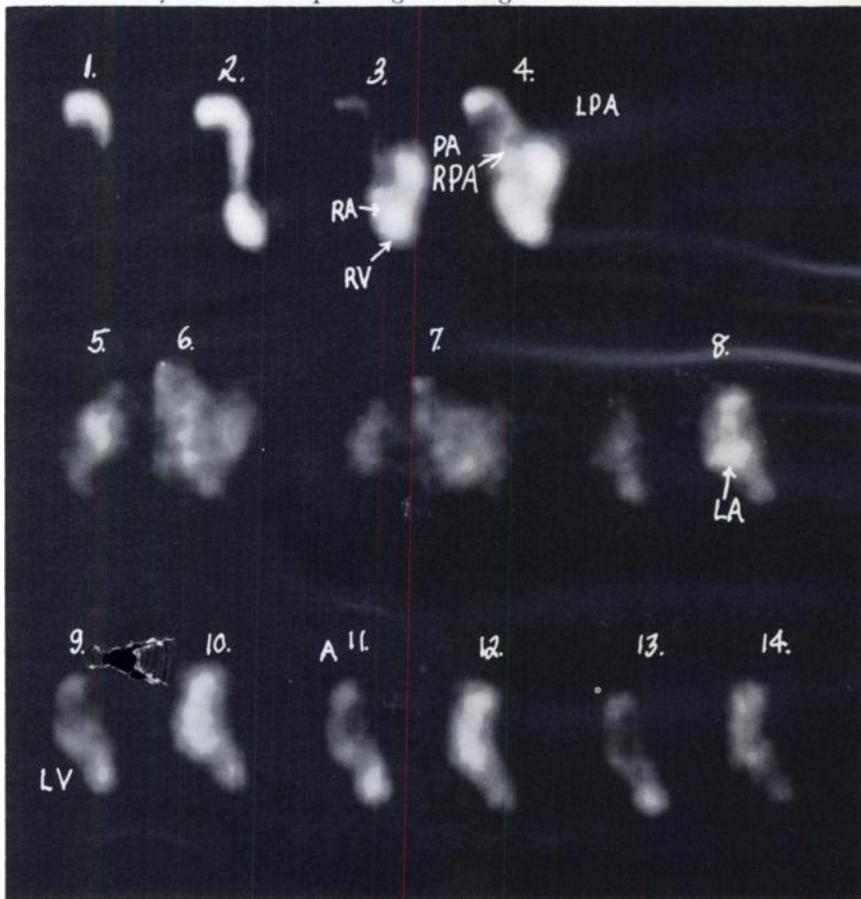


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Baird-Atomic Limited, Braintree, Essex,  
England. Baird-Atomic (Europe) N.V.,  
The Hague, The Netherlands.

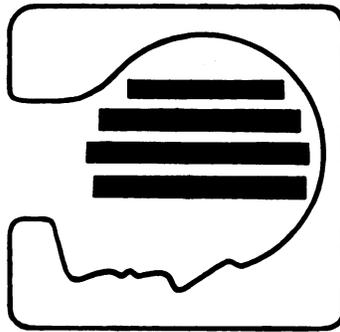


Cardiac Study. Radioisotopic Angiogram



1. Radioactive bolus enters superior vena cava. Frames 157-160, 0-0.8 secs. 2. Bolus continues onto right atrium and right ventricle. Frames 161-164, 0.8-1.6 secs. 3. Clear visualization, right atrium, right ventricle and main pulmonary artery. Frames 165-168, 1.6-2.4 secs. 4. Bolus branches into right and left pulmonary arteries. Frames 169-172, 2.4-3.2 secs. 5. & 6. Bolus completes passage from heart to lung. Frames 173-176, 3.2-4.0 secs; frames 177-180, 4.0-4.8 secs. 7. Bolus in the lung field. Frames 185-188, 5.6-6.4 secs. 8. Bolus, now strung out, enters left side of heart (left atrium) clearly visualized. Frames 193-196, 7.2-8.0 secs. 9. Bolus in left ventricle, and passing up aorta. Frames 197-200, 8.0-8.8 secs. 10, 11, 12, 13, 14. Continuing passage of the activity through left atrium, left ventricle and aorta. Increased activity in left ventricle (11 and 13) and corresponding activity-increase in aorta (10 and 12) suggest delineation of heart contractions. Frames 201-220, 8.8-12.8 secs.

Anterior view, normal subject. 12.4 mc <sup>99m</sup>Tc. I.V. Accumulation time .2 sec. per frame.



# Isotope tomography is here.

Here's what Nuclear-Chicago's Pho/Gamma<sup>®</sup> Tomocamera<sup>™</sup> 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.

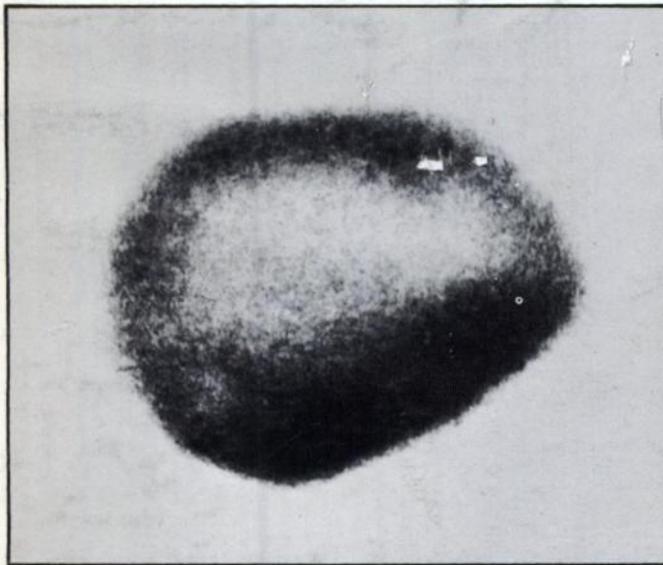
Distance from collimator to farthest focal plane is variable to 7-3/4 inches.

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

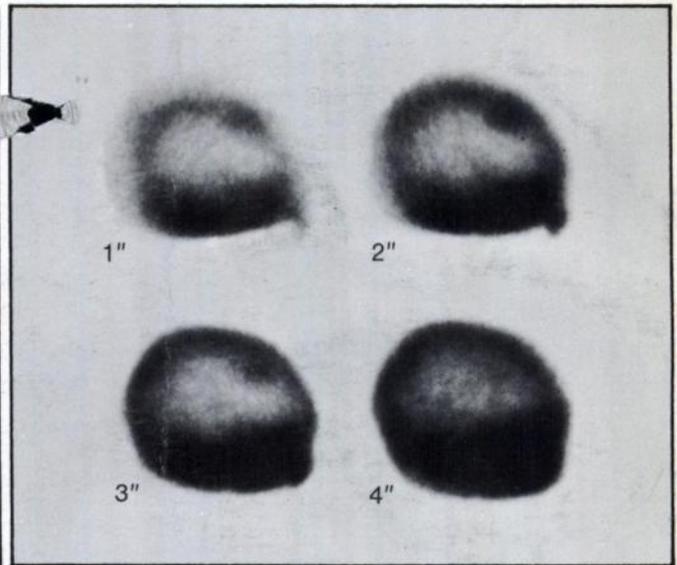
Obscuring events above and below each plane of focus are effectively "tuned out."

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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