If you know
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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.
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.
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3. Read the percentage uptake directly from the NIXIE tubes.
   LOGIC™ provides direct ratio readout in percentage.
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Because it gets there on time – pre-tested at NEN for sterility, non-pyrogenicity, Molybdenum-99, aluminum, and alumina and other particulates.

Ready to use with no pre- or post-assembly problems . . . just charge and elute! And the other extras too. Fractional elution and assay kits and MOLY-CODDLE™ radiation reducer.

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ask the man who buys one
New from Duphar: labelaid™

Ferrous ascorbate can now be labelled with Tc99m in two steps only. Add sterile eluate to the vial with lyophilised ferrous ascorbate complex, and buffer. Ready for injection.
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Elscint 5" scanner with 26 new advantages!

We say the new 5" Elscint scanner has no competition because it cannot be compared with any existing scanners. It is not a "me too" approach, with minor improvements here and there. It is a major breakthrough in scanner design. There are at least 26 new performance advantages that simplify operation, improve scan quality and deliver better information for quicker, more accurate diagnoses.

Elscint advances range from the important benefit of closed-loop position control with optical encoders to the simple convenience of a warning signal when the dot printer's carbon ribbon has less than one full scan capacity left!

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You'll want to know what all the other Elscint advantages are — and the many spectacular new options available, including telephone transmission of scans to save your time and energy. Fill out the coupon and we'll provide details promptly. You can be using the 'no-competition' scanner in 90 days if you order right away!

Rush:
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- Videodisplay-processing unit details
- PhoneScan telephone scan transmission details
- Three-probe, whole-body scanner details

World's first direct electronic display and scan processing!

Scan reading and manipulation takes on an entirely new dimension! Digital count can be manipulated without scan loss for profiles, isocounts, areas of interest, hot and cold spots . . . all pushbutton operated! Get details with coupon.
Once again, we wouldn’t leave well enough alone!

We've added still another refinement to Albumotope-LS
Aggregated Radio-Iodinated\(^{131}\)I Albumin (Human)
for Lung Scanning

**10-day Sterility Test**
We now subject all our material to a 10-day sterility test, before shipping it to you. This is simply another of our ongoing efforts to assure you of optimum product performance and safety.

Since 1968, Squibb improvements in Albumotope-LS have included:

- **Reducing Protein Content**
  Squibb reduced the amount of protein by 50% while maintaining good lung scans.

- **Reducing Supernatant Activity**
  Squibb sharply reduced the amount of radioactivity in the supernatant, decreasing the possibility of liver interference with the lung scan.

- **Reducing Unbound Iodine**
  Squibb substantially reduced the amount of unbound iodine 131, effectively reducing the problem of blood background radioactivity.

**CONTRAINDICATIONS:**
Radiopharmaceuticals should not be administered to pregnant women or to persons under the age of 18 years unless the indications are very exceptional. Because iodide is excreted in human milk, aggregated radioalbumin should not be administered to nursing mothers.

**ADVERSE REACTIONS:**
Although the immunological properties of serum albumin are believed to be virtually unaltered by the iodination process, there is a possibility that hypersensitivity reactions may occur in patients receiving additional doses a number of weeks after an initial dose.

The hypothetical possibility that particles of large size might induce deleterious cardiovascular or cerebrovascular effects, postulated by some investigators, has not been borne out in extensive clinical use with Aggregated Radio-Iodinated \(^{131}\)I Albumin (Human).

For full prescribing information, see package insert.

**AVAILABLE:**
As a sterile, nonpyrogenic, aqueous suspension. Each cc. contains approximately 0.5 mg. aggregated human serum albumin labeled with iodine-131. Not less than 90% of the aggregates are between 10 and 90 microns and none are more than 150 microns in size. The preparation also contains 0.3% (w/v) benzyl alcohol as a preservative. The potency ranges from 250 to 450 microcuries per cc. on date of assay.

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Reagent system for laboratory determination of T3 (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

SURE!

Now available from General Diagnostics
201 Tabor Rd., Morris Plains, N.J. 07950
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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.

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Stercow 87m yields the strontium isotope for bone scanning which combines a low radiation dose with high count rates. Strontium 87m provides you with diagnostic information in a few hours.
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A technologic advance in T-4 testing
Elminates centrifuging, incubating and evaporating... cuts testing time significantly

TETRALUTE® is a T-4 test that takes fewer steps and less time than older methods. A technologist can do approximately 60 tests in only 2½ hours.

TETRALUTE measures total thyroxine (both free and bound T-4). It provides information comparable in value to PBI testing, but test results are not distorted by inorganic or organic iodine which so often renders PBI measurements invalid.

In a comparative study, results obtained with TETRALUTE showed a correlation coefficient of 0.95 with results obtained with the Murphy-Pattee T-4 method.* Compared to such T-4 tests, however, TETRALUTE eliminates three time-consuming steps and the need for laboratory equipment to perform them. TETRALUTE obviates the need for centrifugation of specimens, evaporation to dryness plus incubation and subsequent cooling.

For T-3 testing
TRILUTE® requires fewer manipulations than most other T-3 methods. No timing or incubation is required, and a complete test takes only 20 to 25 minutes, compared to one to two hours with older methods.

Certain clinical conditions and treatment with certain drugs can affect the results of thyroid tests so that a euthyroid patient may appear to be hyper- or hypothyroid. When interfering factors are suspected, a "free thyroxine index" which is more representative of true thyroid status, should be calculated from T-3 and T-4 results.

One of the easiest-to-use counting instruments

For added convenience and reliability, both TETRALUTE and TRILUTE may be used advantageously with THYRIMETER®—a self-calculating gamma counting instrument, which displays percent retention automatically and presets all adjustments.

This scan was impossible without Ga67

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

That is, you wouldn't want less than Picker's Image Enhancement System. This system, coupled to our Dynacamera™ 2, provides diagnostic information that just cannot be matched by any other nuclear medicine imaging system of any kind. Anywhere.

When the lesion is elusive, it is this system that provides the wherewithal for its confident visualization. What "couldn't quite be seen" with other gamma imaging systems, becomes discernible with this one. And certainly this is the ultimate challenge for any such system.
Picker’s Image Enhancement System.
How does it work?

Basically, by providing complete uniformity correction, contrast enhancement, background suppression, and color readout. These features, functioning in concert, provide the mechanism for differentiating the frequently too subtle gradations between normal and pathologic tissue and for eliminating the false positives caused by instrument artifacts.

In effect, this computerized system improves the “target-to-nontarget ratio.” Actually, by using two image views (e.g., AP and lateral), one achieves a form of electronic or “computer tomography.” The two views accurately locate the lesion and enhancement removes the interfering counts of nontarget tissue in order to permit clearer visualization of the target tissue. (It is worth noting that conventional tomographic techniques cannot suppress these superfluous counts and, hence, cannot improve the target-to-nontarget ratio.)

A word about the computer part of this system. This is fiddle-free computerization because we’ve done all of the programming work. The clinician spends his time diagnosing, not engineering. And this system can be plugged in and used immediately because all the required programming is supplied. Further, user entry of essential data is simple because the programming format involves a logical sequential dialogue between the user and the instrument.

Finally, we offer two intriguing accessories for this Image Enhancement System. One is a Pulmonary Analysis Accessory that actually computes and anatomically relates xenon ventilation/perfusion indices automatically. Other applications of this accessory include time-compressed storage and playback of gamma images. The second accessory that’s generating excitement is a Dynamic Function Study Accessory that achieves two things: it is the most flexible method for studying and quantitating organ dynamics; it also functions as an image bank capable of storing 2,000 images per tape (typically two months’ work).

These are the highpoints. The complete story is available from your local Picker representative. Or write to Picker, 333 State Street, North Haven, Connecticut 06473. Or complete the attached Reply Card.
Both models of the Radx isotope dosecalibrator, the Mark IV and the Mark V, offer you instantaneous pushbutton computation of the total vial assay and volume to be injected for a prescribed millicurie dose. That’s just one of the many unique features found in Radx instruments. Consider three more:

1. Instant adaptation to new radionuclides (your hedge against obsolescence)
2. Molybdenum breakthrough check (not available with any other dosecalibrator)
3. Your choice of analog or digital read-out (at overall costs 15% to 42% lower than competitive units — instruments which cannot offer all of the above features)

There’s still more. Check with us. We will send you a brochure and, if you like, make arrangements for a demonstration in your laboratory.
CASE STUDY NO. 1. CIRRHOSIS WITH FOCAL NECROSIS.
STATIC SCINTIPHOTOS.

ANTERIOR VIEW.

POSTERIOR VIEW.

LATERAL VIEWS.

RIGHT PELVIS.

CASE STUDY NO. 2. LEIOMYOSARCOMA METASTATIC TO LIVER.
STATIC SCINTIPHOTOS.

ANTERIOR VIEW.

POSTERIOR VIEW.

RIGHT ANTERIOR VIEW (WITH MARKER).

RIGHT LATERAL VIEW.
Evaluation of Reticuloendothelial System Labelling in the Liver with the Nuclear-Chicago Pho/Gamma® Scintillation Camera

Liver scintiphotography employing $^{99m}$technetium-sulfur colloid and the Pho/Gamma Scintillation Camera offers extremely high resolution images of reticuloendothelial-system distribution in the liver, spleen and bone marrow.

PRELIMINARY DISCUSSION. In the normal liver, the reticuloendothelial system is uniformly distributed, with areas of decreased labelling showing only in the region of the porta hepatitis, gall bladder fossa, and in intersegmental fissures.

Abnormal regional decreases of liver labelling may be recognized as either (1) irregular decrease of labelling in the whole liver or an area of it or (2) focal decreases of labelling with discrete margins and clear definition in comparable scintiphoto views.

SETTING-UP. Liver scintiphotography is usually best performed with the high-resolution, low-energy Pho/Gamma collimator appropriate for $^{99m}$Tc. The patient is positioned touching the collimator, and is examined in the recumbent position to reduce respiratory and other motions. In circumstances where the entire liver and spleen area are to be visualized in one view, the diverging collimator may be used.

ISOTOPE AND DOSE. An intravenous injection of 3 or 4 mCi of $^{99m}$Tc sulfur colloid is administered.

DATA ACCUMULATION. Twenty minutes after injection, a series of static scintiphotos of the liver, spleen and bone marrow is obtained. A non-enlarged spleen is best imaged in left posterior and oblique views. Useful marrow views include upper sternal area, and left pelvis, hip and femur.

Data densities of 500,000 counts for an anterior view of the liver are desirable. Preset exposure time is kept constant throughout examination of the liver and spleen so that exposure intensity will be comparable in all the scintiphotos of these organs. For marrow scintiphotos, increased dot density and 2-minute exposures are normally used.

CASE HISTORIES. Case Study No. 1: Male, 60 years old. Known cirrhosis probably due to chronic alcoholism. Admitted for evaluation of low-grade fever.

Case Study No. 2: Female, 62 years old. Admitted for evaluation of abdominal cramping and liver enlargement. Seven years earlier, partial gastrectomy yielded the diagnosis of "leiomyoma, ulcerated stomach." Two years prior to this admission, laparotomy had revealed leiomyosarcoma in the left lobe of the liver.

EVALUATION. The purpose of these Pho/Gamma liver studies is to evaluate (1) shape, position, and general outline of the liver as imaged on the scintiphotos and (2) the nature of any labelling decrease, whether uniform, irregular or focal. Labelling in the spleen and marrow is compared with liver labelling to assess the possibility of portal-systemic shunting (indicated by greater spleen and marrow labelling, relative to the liver) or hypertrophy of the bone marrow.

In the clinical scintiphotos shown at left, examples of uniform decreased labelling, irregular labelling, and focal defects of labelling are evident.

The patient with cirrhosis (Case Study No. 1) has generalized decrease and irregularity of labelling consistent with that disease. Furthermore, a focal defect of labelling exists in the left lobe of the liver and is best seen in the left lateral view. (This defect was subsequently found by local surgical biopsy to be the site of focal necrosis which had been responsible for the patient's low-grade fever of unknown origin.) Also typical of a cirrhotic are the bright labelling of the slightly enlarged spleen and bone marrow (with marrow extension into the right femur).

The patient with leiomyosarcoma (Case Study No. 2) is an excellent example of focal metastatic lesions causing some decrease of liver labelling, as well as enlargement of the liver that is so common with metastatic disease of the liver. Giant splenomegaly also exists on a congestive basis.

CONCLUSIONS. Liver scintiphotography with the Pho/Gamma Scintillation Camera and $^{99m}$Tc sulfur colloid appears to be a markedly improved liver-imaging technique and sensitive diagnostic test for liver disease.

This form of scintiphotography provides a large amount of specific information about liver structure and hemodynamics and is an accurate guide for the selection of biopsy sites. When combined with other special procedures, such as liver scintiphotography during rose-bengal excretion or liver-blood-flow evaluation, the Pho/Gamma liver study with $^{99m}$Tc sulfur colloid offers many other diagnostic possibilities.

An exchange of information on topics related to nuclear medicine sponsored by Nuclear-Chicago which has more than a passing interest in the field and the people who work in it.

Volume 12, Number 9
Why are NMS systems the best?

Because we offer these important features over other time-lapse photographic systems:

- Electronic Film Identification
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For further information contact: Nuclear Medical Systems, Inc.
142 Mineola Avenue, Roslyn Heights, N.Y. 11577
The Blood Flow Monitor/System 8 was developed largely to provide capabilities in blood flow and blood circulation monitoring which did not exist previously. However, the design of the System is such that it may be used as a "workhorse" for the Nuclear Medicine Department. The System 8 is easily adapted to provide instrumentation for renograms and thyroid uptake studies.

Thank You

The Eberline Instrument Corp. would like to express appreciation for the interest demonstrated by members and friends of the Nuclear Medicine Society at the recent introduction of the Blood Flow Monitor/System 8 at the 18th annual meeting of the Society.

For detailed information and price, contact:

EBERLINE INSTRUMENT CORPORATION
East:  P.O. Box 177  Springfield, Virginia  22150  Phone (703) 451-4641
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Simplicity... is the natural result of profound thought. — Hazlitt

So we started thinking.

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

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

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

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

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

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

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Scan speeds up to 500 cm/min. in steps of 10. New departures in collimation and minification bring portal to portal time – including 5 scans – down to that of a dual detector, but with no misleading artifacts. All views can be performed without reposi tioning the patient. Also available: vertical scanning.
Scanning controls are mounted right on the scanner head. So the technician never has to move. Dozens of B-A Scanners are proving their worth day in and day out . . . through speed and ease of set-up and operation, and the finest caliber performance. Ask a person who has one.

Or ask us. We’ll reply immediately with all the facts.
You might say we’ll bend over backward.

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The Baird-Atomic Scanner.
It bends over backward.
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.

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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.
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RADIOPHARMACIST WITH PH.D. DEGREE in bionucleons and at least two years post-doctoral experience in the clinical application of radiopharmaceuticals in nuclear medicine. Applicant should be particularly well qualified in the chemical and pharmacologic aspects of field; will be responsible for development of radiopharmaceuticals, radioimmunoassays, and teaching. Independent research will be encouraged. University faculty appointments available to qualified individuals. Send curriculum vitae to Box 901, Society of Nuclear Medicine, 211 East 43rd Street, New York, N.Y. 10017.

REGISTERED NUCLEAR MEDICAL Technologist, or one who is eligible to take the registry. Please contact Mr. James E. Spivey, R.T., Administrative Asst., Norfolk General Hospital, Department of Radiology, 600 Gresham Drive, Norfolk, Va. 23507.

CHICAGO'S LARGEST PRIVATE VOLUNTARY hospital located in the world's largest medical center has immediate openings for registered nuclear medicine technicians. To prepare for the opening of our medical school, several departments have been expanded. One of the initial areas affected by this expansion is our Department of Nuclear Medicine—in this area new positions have been budgeted, challenging assignments have been programmed. To those with the right background, we can offer an ideal salary, based on recent budget increases and many excellent benefits including four weeks paid vacation and tuition aid. Associate yourself with some of the finest personnel in the country by calling collect or writing: Mr. Jerry Olson (312) 733-5161, Presbyterian-St. Luke's Hospital, 1755 West Congress Parkway, Chicago, Ill. 60612.

POSITIONS WANTED

ARRT NUCLEAR MEDICINE TECHNOLOGIST desires to make change. Wishes position in Southern U.S. Graduate of Duke University School of Nuclear Medicine Technology plus two years working experience. Please reply Box 902, Society of Nuclear Medicine, 211 East 43rd Street, New York, N.Y. 10017.
Sigma 2. The only spectrometer that automatically computes statistical error.

Sigma 2, Model 200, automatically provides direct readout of net counts per minute...plus statistical error within a 95% confidence level.

The Model 200 is simple to operate, with upper and lower levels calibrated directly in KEV. Just pre-set any of six data accumulation periods from 0.1 to 20 minutes and background subtract in counts per minute. No manual calculations of counts per minute are required...accuracy of measurement is assured. An audible tone signals completion of the measurement.

Raytheon also offers the Model 210, which is similar to conventional spectrometers with one important difference: automatic calculation of 95% confidence error. Its six-decade scaler and 5-decade timer allow a direct percent ratio of sample to a standard.

Both the Model 200 and 210 mate with Raytheon's unique 3-way well counter that accommodates test tubes, syringes, and 1000 ML beakers.

For a free copy of the brochure describing Sigma 2 spectrometers and well counter, return the coupon to Raytheon Company, Medical Electronics, 190 Willow St., Waltham, Mass. 02154. Tel. (617) 899-5949.
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the generator for preparing
a sterile, non-pyrogenic
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colloid in minutes, as you need it

perfect combination for making
$^{99m}$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 $^{99m}$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 99mTc-sulfur colloid when you want it...

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with ease, convenience, and economy...

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for liver and spleen scanning

- on the basis of 350 case reports from 11 investigators, 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, nonpyrogenic supply of Technetium 99m (99mTc), a versatile scanning agent that can be administered intravenously or orally. 99mTc, the short-lived daughter of Molybdenum 99 (99Mo), T1/2 = 67 hours, is obtained from the generator by periodic elution. The amount (in millicuries) of 99mTc 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 99Mo need not be removed from the lead shield at any time. The radiation field surrounding an unshielded column is quite high. Solutions of 99mTc 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 99mTc 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 99mTc-S colloids and are NOT to be directly injected into a patient. As with all radiopharmaceuticals, 99mTc-S colloids 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 99mTc-S colloids, 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 99mTc 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 99mTc-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 99mTc-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 99mTc are consistently compatible and meet the standards of Technetope II.

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<table>
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<tr>
<th>Speed</th>
<th>Losses</th>
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<tbody>
<tr>
<td>3 3/4 ips</td>
<td>less than 1% at 100K CPM</td>
</tr>
<tr>
<td>7 1/2 ips</td>
<td>less than 1% at 200K CPM</td>
</tr>
<tr>
<td>15 ips</td>
<td>less than 1% at 400K CPM</td>
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With the MED II, you can record dynamic and static gamma camera images. You can enhance these images in accordance with several clinically tested protocols. You can generate time/activity histograms, and derive data, which cannot otherwise be visualized, from the resultant curves. In addition, you can correct for camera response non-uniformities, add and subtract either sequential or non-sequential images from each other; and perform several additional image manipulation routines which yield improved visualization and higher confidence levels.

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

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

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

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

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

**MED II as a fully programmable 16k computer**
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To enable you to establish additional programs, to modify existing ones, and to apply the ND812 in solving other data analysis problems, Nuclear Data has developed NUTRAN (a variant of FORTRAN). NUTRAN is a powerful programming language originated exclusively for nuclear medicine image data processing. It's designed to let you, the clinician, write your own programs, in English, using a minimum number of instruction steps.

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Progress in Nuclear Medicine — Vol. I

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Nuclear Medicine
Second Edition

Edited by William H. Blahd, 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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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$^{57}$ Co 1 mc

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 Autofluoroscope 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 99mTc. Pictures 1 and 2 are made by the Model 5700 Autofluoroscope. 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.

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But that's not all.

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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).

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