

What's New

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New Mobile Cameras

No less than four new mobile scintillation cameras were showcased in the exhibits portion of the Society's Annual Meeting in Dallas June 8-11. Offering most of the capabilities of their larger nonmovable cousins in addition to the great advantage of making intensive care and cardiac wards accessible to nuclear medicine diagnosis, the mobile cameras attracted an unusual amount of attention from Exhibit Hall browsers.

On display (in alphabetical order) were (1) Elscint's Mobile I, (2) Ohio Nuclear's Sigma Series 420, (3) Picker's Dyna[®] Mo, and (4) Searle Radiographics' Pho/Gamma[®] L.E.M. (Low Energy Mobile). Also available for comparison was the first—and until last year only—mobile unit, the General Electric Porta-Camera.

The mobiles vary in size, from 790 lb for Searle's "LEM" to 1,700 lb for the Elscint Mobile I. Some are moved manually and others are power-driven lawnmower style—one, the Picker Dyna Mo even boasts sports car styling "a la Bertone." But all can perform the basic tasks expected of a modern scintillation camera and have special application to the rapidly developing discipline of nuclear cardiology, the subject of much attention at scientific sessions of the Dallas meeting. The mobile scintillation camera in fact will become a useful tool in any diagnostic situation where movement of the patient is undesirable—from emergency and postoperative rooms to cardiac and orthopedic units. Some are even now being carted from clinic to clinic in vans in rural areas, bringing nuclear

medicine to patients hitherto inaccessible.

Among the drivable cameras is the Mobile I, latest addition to the line of Elscint, Inc. It is the largest of the mobile cameras in weight at 1,700 lb, but is compact at only 30 in. wide by 59 in. long. The Mobile I also offers



Elscint's Mobile I

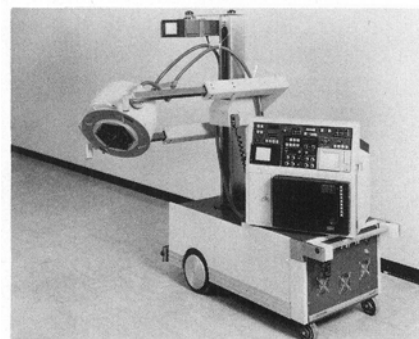
the widest field of view, 12 in. As is the case with most of the mobiles, the unit features a detector head mounted on a rotatable column. The head itself moves up and down the column vertically, driven by a motor operating at two speeds: 700 or 350 mm/sec. The yoke holding the head telescopes out so that the detector can be positioned correctly over the patient—this is a hand operation. The entire system moves about the hospital on battery power and there is a choice of three speeds forward as well as reverse—top speed is about 1.6 mph and 10% grades are passable. The unit has bumpers all around, two sets of brakes, and a rechargeable battery that will power the unit for as long as 3.5 hours. The battery maintains power to the detector head during transport.

Performance specifications are comparable to those of nonmobile units. Image information can be gathered at up to 200,000 counts/sec

and resolution of 3.0 mm is claimed. Uniformity over the 12-in. field of view is stated as $\pm 10\%$. The camera offers a selectable energy range of 10-600 keV and an energy window range of 0-600 keV. In addition to viewscreen and Polaroid imaging, the unit can add high-density disk recording of data.—*Elscint Inc., P.O. Box 832, 138-160 Johnson Ave., Hackensack, NJ 07602.*

Another motor-driven model is Ohio Nuclear's Sigma 420, an updated version of the Series 120 system first introduced last year at the SNM Philadelphia meeting. What makes the Sigma 420 really new is the addition of a built-in microprocessor unit (MPC), which, according to the system designers, improves uniformity across the field of view: image uniformity is stated as $\pm 5\%$, the lowest claimed by any of the mobiles. The MPC, a subminiaturized computer system, has been designed so that it can be retrofitted to any Ohio Nuclear system now being used, thereby improving uniformity and resolution of existing cameras in the company's line.

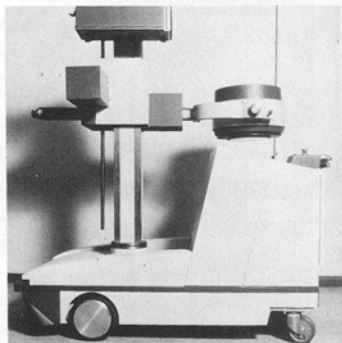
The Sigma 420 is somewhat lighter than the Mobile I at 1350 lb but has a narrower field of view: 9.75 in. Overall dimensions are 30 in. wide by 78 in. long. Like the Mobile I, it



Ohio Nuclear's Sigma 420

has the detector head positioned on a rotating column, with two-speed motorized vertical motion and telescoping horizontal movement. The entire system is battery driven, with a choice of two speeds forward plus reverse; 10% inclines are manageable under power. Electromechanical brakes are provided and voltage to the detector head is maintained during transport. A data recording/processing system can be added.—*Ohio Nuclear, Inc., 6000 Cochran Rd., Solon, OH 44139.*

Sportiest in appearance of all the mobiles is the scoop-nosed Dyna Mo



Picker Dyna Mo

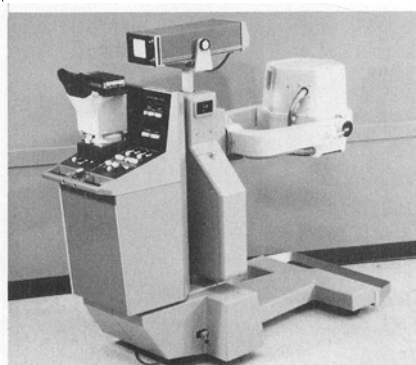
from Picker Corporation, the only other model of those shown to offer fully motorized transport. It is the lightest of the self-propelled units at 1200 lb., is slightly wider at 32 in., and is also slightly longer than the Mobile I at 65 in. In addition to battery drive, with continuous speed control up to 2 mph, the Dyna Mo can be driven off a line chord in case of battery failure. As with the Mobile I and Sigma 420, voltage to the detector head is maintained during transport under battery power. The vehicle has a spring suspension to stabilize the system while moving, a special benefit when traveling over uneven surfaces, such as door frames. Braking is by electromechanical disks and ample bumpers are provided on all sides. Slopes of 10% can be negotiated.

The scoop-nosed design of the DynaMo allows the unit to fit under most hospital beds, in which position a 38-in. reach over the bed is possible. A column-yoke detector head mount similar to that of the other mobiles completes the design and two-speed up-and-down motorized

movement is built in. Intrinsic resolution of 2.1 mm is claimed along with a field uniformity of $\pm 10\%$ and count rate capability of 200,000/sec. Other features include built-in storage space for additional collimators and options for 8 x 10 film image formatting, ECG gates, and magnetic tape recording. The system is compatible with Picker's Clinical Analyzer and Gamma 11 units.—*Picker Corporation, 12 Clintonville Rd., Northford, CT 06472.*

Lightest of all the mobiles is the Pho/Gamma® L.E.M., from Searle Radiographics. The 790-lb "LEM" is 31 in. wide, 73 in. long, and is light enough to be wheeled by hand. The unit, while not fully motorized, has a battery power assist to make transport easier and move the system up 10% inclines. A choice of four collimator types is available for the 10.1-in. field-of-view detector head and the LEM can be gated for systolic or diastolic studies in heart imaging. Detector positioning mechanics are similar to those of the other mobiles, except that the detector column does not rotate: the LEM is designed so that the "foot" of the unit fits under the hospital bed—exact positioning is accomplished by combining movement of the entire unit with vertical movement of the head and rotary motion of the yoke.

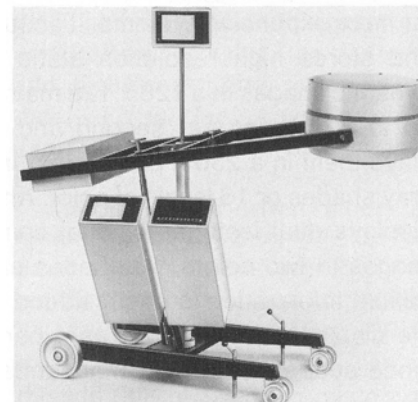
Searle claims performance specifications for its lightweight approximating those of its Pho/Gamma stationary line. The LEM is capable of count rates up to 200,000/sec and has six factory pre-set isotope windows. Window width can be set independently on two analyzers for dual-peak isotopes and special



Searle's LEM

studies. Photographic display is a 12-image multi-imager on 5 x 7 film and data recording is possible with a computer-compatible disk system operated as a separate unit.—*Searle Radiographics Inc., 2000 Nuclear Drive, Des Plaines, IL 60018.*

Most venerable and now cheapest of the moveable scintillation cameras is General Electric's PortaCamera™, first introduced by Nuclear Data in 1973 at SNM's San Diego meeting. The latest version of this system was also on display among the Dallas exhibits and is dubbed PortaCamera II. The up-



G.E. PortaCamera II

dated model offers automatic locking and better intrinsic resolution (3.0 mm) than its predecessor.

The PortaCamera must be manually transported (pushed), but its careful counterbalancing and relatively light weight (about 1000 lb) make this a fairly easy task. Movement of the detector head is also largely a manual operation, but, according to its designers, positioning is at least as fast as with motorized head movements and less subject to breakdowns. The manufacturer stresses durability for the unit's delicate parts, too, noting that of some 20 PortaCameras transported from clinic to clinic in vans during the past year and a half, none have suffered crystal damage. The PortaCamera is only 22 in. wide by 76 in. long and offers a detector head with a 10.4-in. field of view. Uniformity of $\pm 10\%$ is claimed as is a count rate of 200,000 counts/sec.—*General Electric Medical Systems Division, 4855 Electric Avenue, Milwaukee, WI 53201.*

Three CT Scanners

The proliferation of computerized axial tomography scanning instrumentation continues. Three new systems have come along in recent months.

Featured at the Society's Dallas Meeting was Elscint's new Scan-EX, a high-speed whole-body system capable of performing a scan in 10 seconds and reconstructing the image 10 seconds later. A short scan period minimizes image distortion from patient motion and reduces patient fatigue and anxiety. Savings for both hospital and patient should result, company literature explains, from the time-saving in image construction—as many as eight "slices" can be examined in 4 minutes. The unit's viewing screen commands a spectral range of 16 colors and 32 grey levels. Screen images can be "fine tuned" for clarity, and results can be stored on disk or magnetic tape. The first commercial Scan-EX system will be in operation this November. —*Elscint Inc., P.O. Box 832, 138-160 Johnson Ave., Hackensack, NJ 07602.*

General Electric, keeping up with developments in the CT scanning field, has been taking orders for its CT whole-body scanner, the first unit of which is headed for the University of California Medical Center in San Francisco. The system is described as being able to make a complete scan in only 4.8 seconds. In the GE approach, an x-ray tube is pulsed 288 times as it is rotated around the patient's body. During each pulse, a fan beam of radiation 30 deg wide passes through the body cross section to be collected by an array of 320 detector elements in a high-pressure xenon chamber. During a single 4.8-second scan, some 90,000 detector readings are organized by a high-speed minicomputer to reconstruct the cross-sectional image. The pulsed system results in less x-ray exposure for the subject than that produced by continuous-beam systems, according to the developers. The screen image can be

fine tuned and a variety of data-recording means are available. General Electric expects to have shipped 120 units before the end of 1977. —*General Electric Medical Systems Division, 4855 Electric Avenue, Milwaukee, WI 53201.*

From Artronix comes the Neuro-CAT™ Scanner system, a unit specifically designed for brain studies. The Neuro-CAT completes each head scan in 9 seconds, the image being assembled from 128 data points, acquired simultaneously 256 times per revolution. Operators have the option of selecting various cross-sectional thicknesses—from 3 to 15 mm—for viewing. The system designers claim to have achieved procedural efficiency great enough to allow "throughput" of up to 30 patient examinations per 8-hour day in an area of less than 400 square feet.

The unit boasts automatic patient positioning with computerized start position and has an "open" design to eliminate patient claustrophobia. Viewing screen imaging offers a zoom magnification feature of up to four times. On-line disk data storage is built in. —*Artronix Inc., 1314 Hanley Industrial Court, St. Louis, MO 63144.*

16.5-in. Wide Field Camera

Among the many products unveiled at the exhibits portion of the Society's 23rd Annual Meeting in Dallas was Raytheon's widest-field-of-view scintillation camera, the Cameray™ XL-91. The new system makes use of 91 photomultiplier tubes, providing, its developers say, image resolution equal to that of current smaller-field cameras. The 91-tube design makes use of straight-bore rather than diverging collimators, making possible higher resolution without distortion. The 16.5-in. field of view is felt to insure complete single-view whole body or organ images, helping to achieve faster patient diagnosis. The XL-91 head

assembly has also been designed to interface with the manufacturer's existing 10-in. Cameray II model, owners of which now have the option of conversion to wide field of view. Conversion may be done on site. The camera (less collimator) weighs in at 2,000 lb and is 78 in. high. Uniformity of 10% is claimed, with count rate capability of 200,000/sec. —*Raytheon Company, PO Box 397, Fourth Ave., Burlington, MA 01803.*

Video Image Processor

New from Ohio Nuclear is a memory-based data acquisition and display device with multiformating capability and interactive video display. The unit, called VIP (Video Image Processor), features a high-resolution image matrix (256 × 256) for static image display, as well as a special whole-body format with a 128 × 512 matrix display. Other features of the system include a digitally controlled ECG gate, cine display, and digital persistence mode. —*Ohio Nuclear, Inc., 6000 Cochran Road, Solon, OH 44139.*

Radioimmunoassay

Anti-DNA and Estriol Kits

Two more RIA kits are being added to the Amersham/Searle line.

The first, stated by the manufacturer to be the first standardized kit for DNA binding in serum, provides a quantitative method for establishing anti-DNA binding activity over the approximate concentration range of 0-100 units/ml in human serum. The product is expected to find application in the diagnosis and monitoring of systemic lupus erythematosus. It will be packaged in batches of 42 single determinations per kit.

The second is a ¹²⁵I-labeled kit for the immunoassay of total estriol in pregnancy, using serum or plasma.

The kit is intended for use during the second half of pregnancy and obviates the need for 24-hour urine collection. Kit reagents measure estriol concentrations over the range 0-350 ng estriol/ml. Each kit will contain materials for 60 single determinations. — *Amersham/Searle, 2636 South Clearbrook Drive, Arlington Heights, IL 60005.*

Plasma Controls

Ortho Diagnostics has announced the availability of two companion plasma controls offering assays at two levels for plasma renin activity (angiotensin I generation), aldosterone, and adrenocorticotrophic hormone (ACTH). According to the manufacturer, assays are provided for each of the constituents by one or more commercially available reagent kits. The product is packaged freeze-dried, in 3-ml vials, five vials per box. — *Ortho Diagnostics, Inc., Chemistry Product Division, Raritan, NJ 08869.*

Data Sheet

Beckman Instruments has published a six-page foldout data sheet describing applications of its Automatic Percent Bound Accessory for scintillation counters. The data sheet explains how the accessory can be used to replace hand calculation and improve accuracy of results. According to the data sheet, when the accessory is used with a scintillation counter, a technologist can automatically obtain a percent-bound or percent-free value for RIA analyses. This value is simultaneously printed with the count rate on a teletype printer. Samples of printouts are shown on the data sheet. — *Beckman Instruments, Inc., Technical Information Section, PO Box C-19600, Campus Drive at Jambooree Blvd., Irvine, CA 92613.*

Scintillation Counter

RIA 300, a table-top 300-sample scintillation counter will be marketed by Searle Analytic, Inc. The unit can be mounted on a mobile floor stand and uses plug-in modules to make counts on a variety of isotopes. It will accept commonly used test tubes and provides user-selected background subtraction, preset time, and preset count termination. An optional dose-level calculation feature is offered to eliminate manual calculation. — *Searle Analytic Inc., 2000 Nuclear Drive, Des Plaines, IL 60018.*

¹²³I-Sodium Iodide

Used for several years in clinical trials, ¹²³I-sodium iodide is now being prepared commercially for diagnosis of thyroid function and thyroid imaging. Medi-Physics, Inc., has introduced ¹²³I-sodium iodide capsules and solution for oral administration. The ¹²³I package is claimed to be superior to ¹³¹I compounds in exposing the patient to relatively low radiation doses while still emitting 159-keV gamma rays at levels sufficient to provide high-resolution images with existing instrumentation. The half-life of ¹²³I is 13.2 hours, permitting patients to be retested safely within 72 hours if necessary. — *Medi-Physics, Inc., 5801 Christie Ave., P.O. Box 8684, Emeryville, CA 94608.*

Ytterbium DTPA

The 3M Company has announced that its ytterbium (¹⁶⁹Yb) DTPA product, indicated for use in cisternography, has been cleared for routine use in nuclear medicine assays. 3M claims the isotope's long physical half-life of 32 days permits the

CSF to be accurately followed for 96 hours. The chelate DTPA allows rapid biological clearance from spinal fluid and vascular system. The radiopharmaceutical is supplied in 2.5-mCi vials that can be stocked up to six weeks. — *3M Company, Bldg. 223-2S, 3M Center, St. Paul, MN 55101.*

¹²⁵I-Fibrinogen

A new ¹²⁵I-labeled fibrinogen (human) in vivo test, Sensor®, is now available from Abbott Laboratories. The test offers a means for early detection of deep vein thrombosis (DVT) and is designed for use with lightweight portable scintillation counters to detect localized radioactivity sites up to 10 days after a single injection. Use of the ¹²⁵I label, with its soft gamma radiation, is also aimed at utilizing mobile detection equipment. With a half-life of 60.2 days, ¹²⁵I has a longer shelf life than ¹³¹I and exposes patients to less total body radiation. Sensor® is packaged in single-dose (1 ml) vials. A slide/tape presentation on the new test is available from the manufacturer. — *Abbott Laboratories, Diagnostic Division, North Chicago, IL 60064.*