

TRI-CARB® RAM 7500 Radioactivity Monitor

For homogeneous counting Packard offers
a complete range of prepared scintillation solutions.
PICOFLUOR 15, PICOFLUOR 30, INSTAGEL and DIMILUME.

The solutions are designed for
highest detection efficiency with
the various solvents used in HPLC systems.



**UNITED
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PACKARD**

THE WORLD LEADER IN LIQUID SCINTILLATION COUNTING

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HPLC/7500/481/15M

A HPLC detection system for dynamic real time measurement of ^3H and ^{14}C

INSTANT RESULTS

The RAM 7500 Radioactivity Monitor provides a dynamic real-time measurement of radioactive column effluent from a HPLC system, thus increasing the value and extending the use of your chromatographic equipment.

By monitoring the radioactivity as it leaves the column, the RAM 7500 produces instant results of the chromatogram analysis, allowing more rapid decisions to be made and better use of your equipment.

No longer is it necessary to collect fractions for measurement in a liquid scintillation counter, a method which is labor intensive, expensive in the use of scintillation solutions, and doesn't produce results when you need them.

The heart of the system is the high sensitivity flow cell mounted between two quality detectors. Different cell configurations are offered to optimize performance to satisfy the various operating modes of the HPLC.

MODULAR CONSTRUCTION

The TRI-CARB RAM 7500 consists of the detector for radioactive events and a monitor to analyze these events. The design permits these modules to be mounted next to one another or separated if bench space is a consideration.

The detector module houses two high performance photomultiplier tubes (PMTs) and the flow cell. High sensitivity to radioactivity is obtained by surrounding this assembly with lead shielding. The cells are easily interchangeable and the cell holder is readily inserted into the detection chamber.

An interlock feature protects the PMTs whenever the cell holder is removed. A drain system allows liquids to escape should leakage or breakage of a cell occur. Minimum volume stainless steel tubing (0.010 inch I.D.) with zero "dead volume" connectors couple the HPLC effluent to the detector. This is to prevent band spreading and retain the high resolution qualities of the HPLC column.

DATA ANALYSIS

The detected radioactivity is analyzed by the monitor to provide an output to a recorder for plotting a radiochromatogram. All the controls you need are provided including the recorder range setting which automatically determines the appropriate time constants. In addition, a separate control allows you to define time constants. Switch settings select the appropriate counting windows for the detection of different radionuclides.

UNATTENDED OPERATION

Microprocessor control plus data reduction allows the system to be operated unattended and present you with a complete analysis of your radiochromatogram. A simple conversation with a minicomputer enters the parameters of the experiment. This advanced technique in automation can be started manually or by a signal from the auto-injector of the HPLC system and can also control your fraction collector. Fraction Collector control can separate the radioactive components in the HPLC effluent and, thereby, minimize the disposal costs.

The parameters of a program include: — an update time, as the interval for accumulating counts to provide a print-out — the HPLC run time — a selection of the histogram full scale range — the background count during the update time and a 1, 2 or 3 sigma of the background which combined with the background provides a threshold for integration — a time delay to index a fraction collector and a control valve in the waste line for the purpose of collecting peak material.

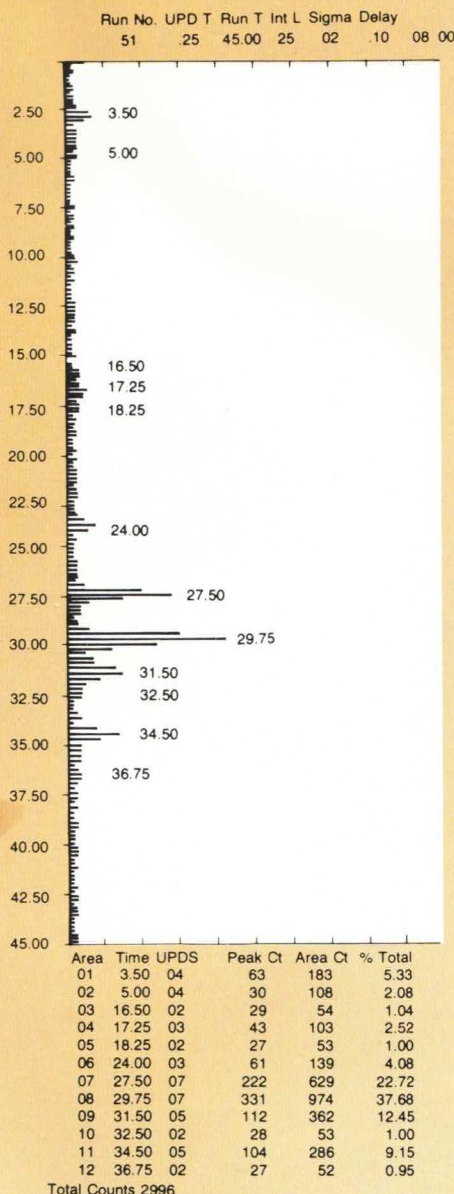
PRESENTATION OF DATA

As a run commences, all the parameters of the program are printed by the printer. The counts accumulated during each update interval are presented as a bar of the radio-histogram. In addition to printing run time intervals, the retention time at the maximum of each radioactive peak is shown for identification. At the end of the run, the minicomputer analyzes the detected radioactivity for up to fifteen different peaks.

The illustration shows how each peak is identified by a number and the retention time. Peak width, maximum peak counts and peak area counts are clearly listed and presented with the percentage of total counts in each component peak. Results are available without the labor, and without the waiting.



Radiochromatogram Plot Obtained With Digital System Configuration of TRI-CARB RAM 7500



SPECIFICATIONS

RAM 751 Detector

Self contained module consisting of 2 PMTs and reflector, surrounded by lead shielding includes a packed cell. H. V. Interlock to protect PMTs and a system drain.

RAM 752 Monitor

Consisting of pulse height analysis of detected events, preset ^3H and ^{14}C counting conditions, analog output to recorder (10 mV). Recorder range switch 100-100,000 counts with automatic time constant determined by range setting.

RAM 753 Monitor

Same features as the RAM 752 but, in addition, incorporates microprocessor control and minicomputer to analyze radioactivity data and provide histogram on printer. Complete analysis of data (see photograph of actual readout).

RAM 755 Effluent/Scintillation Mixer

Includes precision needle control valve to adjust splitting ratio, adjustable delivery scintillation pump, and one flow cell.

Optional Cells

Various cell sizes are available. Consult Packard for the cells best suited for your analysis.

Supplies

For homogeneous counting Packard offers a complete range of prepared scintillation solutions. PICOFLUOR 15, PICOFLUOR 30, INSTAGEL and DIMILUME. The solutions are designed for highest detection efficiency with the various solvents used in HPLC systems.

Dimensions

Detector	Length 53.7 cms
	Width 25 cms
	Height 27.2 cms
Monitor	Length 51 cms
	Width 21 cms
	Height 23 cms

HETEROGENEOUS AND HOMOGENEOUS OPERATION

The unique cell design combined with low background counts offers maximum sensitivity for radioactivity detection. Two types of cells are available, heterogeneous and homogeneous.

The heterogeneous cell is a glass tube packed with scintillation beads. The beads detect the radioactivity as the column effluent flows through the cell. The beads are compatible with the solvents most commonly used in HPLC, including hexane, acetonitrile, methanol, methylene chloride, water and mild acid solutions. These cells require only a short period of dark adaption, thus cells can

be exchanged and are ready to use in a matter of minutes.

Due to the unique cell design, memory is not a problem and effluents which adhere to the beads are easily and quickly removed by flushing the cell with a cleaning solution containing SOLUENE.

Homogeneous cells offer increased sensitivity for H-3 and other low energy radionuclides because the liquid scintillation method of detection is used. Part of the HPLC column effluent is mixed with a liquid scintillation solution and the mixture pumped through the cell. Precision needle control valve regulates the effluent split ratio and an adjustable pump delivers a measured flow of scintillation solution to maximize counting efficiency.



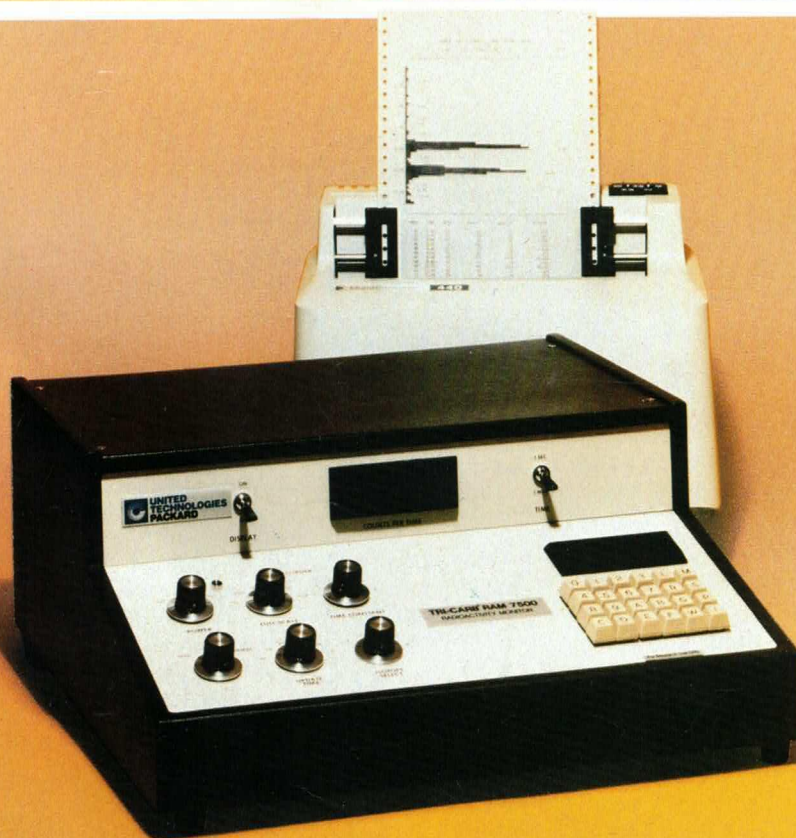
THE WORLD LEADER IN LIQUID SCINTILLATION COUNTING

A HPLC detection system for dynamic real time measurement of ^3H and ^{14}C

Packard, acknowledged as the world leader in liquid scintillation counting, has combined its knowledge and experience to produce a high quality radioactivity flow monitor.

Primarily intended for the detection of radioactivity in the effluents from HPLC, the instrument is equally effective in measuring radioactivity for other liquid flow analysis.

TRI-CARB[®] RAM 7500 Radioactivity Monitor



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