

Radiation Detection and Measurement Solutions from CANBERRA

- ▶ ***Contamination Monitoring***
- ▶ ***In Vivo Measurements***
- ▶ ***Health Physics Instrumentation***
- ▶ ***On-Site Radiological Counting Labs***
- ▶ ***Environmental and Radiation Monitoring Systems***
- ▶ ***Radioactive Waste Management***
- ▶ ***Military Products***
- ▶ ***Software Developments***

GEM-5 – γ Exit/Entrance Contamination Monitor



- ▶ **8 identical large plastic scintillators providing "best in the industry" sensitivity**
- ▶ **25 mm lead shielding on each side**
- ▶ **Color LCD screen and annunciator lights allow for the optimum communication to both the user and the RP staff**
- ▶ **Multi-language voice prompts to give verbal instructions**
- ▶ **Monitor has bi-directional operation (i.e., approach from either direction)**
- ▶ **Continuous automatic background subtraction**

Argos-5AB/PB – α/β Contamination Monitors



- ▶ **Gas flow as well as gasless Thin Plastic Scintillator detector systems are available**
- ▶ **Simultaneous monitoring of both sides of the hand with movable detectors for enhanced alpha capability**
- ▶ **Color LCD screen to give visual commands/information and multi-language voice prompts to give verbal instructions**
- ▶ **Easy detector exchange**
- ▶ **Automatic Rn rejection feature**
- ▶ **Automatic/ manual head detector**
- ▶ **Optional plastic scintillator for γ detection**
- ▶ **Optional doors and barriers**

Cronos – γ Object/Tool Monitors



- ▶ **Cronos-4 counting chamber volume 128,5 L**
- ▶ **Cronos-11 counting chamber volume 340 L**
- ▶ **Six 50 mm thick plastic scintillator detectors**
- ▶ **Six sides of removable 25 mm thick lead ingot shielding standard, optional 50 mm**
- ▶ **Single or dual door operation**
- ▶ **Alarms/messages provided audibly and visually from built-in color LCD display**
- ▶ **Built-in keyboard/trackball combo with LAN capabilities, USB and Compact Flash support**

Sirius-5 Hand, Foot & Cuff Monitors



- ▶ **Gas Flow Proportional or Scintillator detectors**
- ▶ **Best in class (low background, good uniformity or response, high efficiency)**
- ▶ **Uses the same detectors as Argos-3/-5 monitors**
- ▶ **One Step Monitoring**
- ▶ **Built-in computer running Windows® XP Embedded operating system with LAN capabilities, USB and parallel printer ports for easy system management**

Full range of products

- ▶ **Fixed HP contamination monitor family (GEM-5, Sirius-5, Argos-3/-5 and Cronos-4/-11)**
- ▶ **Network via CRemote Centralized Remote Control & Data Access Software**





Actinide Lung Counter



Actinide Lung and Scanning Whole Body Counter

- ▶ ***CANBERRA's Actinide Lung Counter is designed to identify and quantify actinides such as U, Am, Th, and Ac in the lungs***
- ▶ ***CANBERRA's combination Actinide Lung and Scanning Whole Body Counter is designed to monitor actinides in the lungs and fission and activation product in the whole body***
- ▶ ***Both of these systems require a total enclosure or 4 π shield in order to reduce the ambient background sufficiently to monitor for the low energy, low activity and low gamma abundance actinides***



CANBERRA's Whole Body and Critical Organ Counting Systems

- ▶ *These devices are designed to monitor for uptakes of fission and activations products*
- ▶ *All of these products include a low background steel shadow shields to reduce background for improved sensitivity and accuracy*
- ▶ *All are designed to provide a linear detector-to-source geometry to minimize measurement errors due to size variations in the personnel being monitored*

UltraRadiac™ – Personal Radiation Monitor

▶ Rugged

- ◆ Survives extreme conditions (shocks, temperature, water, EMI pulses,...)

▶ Fast

- ◆ Does not wait for 99% statistic to display dose-rate

▶ Small

- ◆ Wear it and forget it

▶ Simple

- ◆ Always available

▶ Alarming

- ◆ Visible, audible, vibrating

▶ Wide range

- ◆ Detect from low level and quantify at very high level with one detector only (Time To Count patent)



MCB2 – Contamination Survey Meter

- ▶ **Identification of contamination presence**
- ▶ **Measurement of α , β & γ contamination**
- ▶ **GM detector with entrance window**
 - ◆ *2 mg/cm² thin mica window*
 - ◆ *15 cm² detection area*
- ▶ **Display**
 - ◆ *c/s*
 - ◆ *Bq*
 - ◆ *cpm*
- ▶ **Chirper (audio) always on**
- ▶ **2 buttons operation**
 - ◆ *Backlight and On/Off*
 - ◆ *Simple to use*
- ▶ **Comfortable to use**
- ▶ **Low cost**





» MIP10 Digital

» Avior

» Radiagem

» Colibri

» CSPA test & Calibration software

» CSP-PL programation software

» CSP Monitors & Survey Meters



» Handles

» Audio-R

» PNK-R

» CSP Pole / Tele STTC

» CSP COM Modules

» CSP Accessoires



» SG 1R

» SA/SB 20

» SABG 15+

» SPAB 15

» STTC

» SG 2R

» SA/SB/SAB/SABG 100

» SX 2R

» SN-S

» SA32

» TELE-STTC

» STHF-R

» CSP Probes

Hand-held Radionuclide Identifiers: InSpector™ 1000

- ▶ **High sensitivity stabilized 2x2" or 3x3" NaI probe or LaBr probe or CzTe**
- ▶ **Gamma Locator Mode**
- ▶ **Audible warning and alarm limits for gamma dose rate**
- ▶ **Real time isotope identification with activity and dose by isotope calculation**
- ▶ **Hand-held, battery operated instrument with high resolution color LCD – visible day and night**



Hand-held Radionuclide Identifiers: HPGe Based - Falcon 5000



- ▶ **Flexible Battery Configurations**
 - ◆ **6-8 hours with Internal Batteries**
- ▶ **Electric Pulse Tube Cooler**
 - ◆ **Low Noise Operation**
 - ◆ **3 hour Cool Down**
- ▶ **Windows Tablet PC**
 - ◆ **High Resolution Display**
 - ◆ **Remote Operation**
 - ◆ **Full Genie 2000**
 - ◆ **Wireless comm. between detector and control tablet**
- ▶ **Built in GPS**
- ▶ **20 % BeGe Detector (60 x 30 mm)**
- ▶ **GM Tube included, optional He-3 detector**
- ▶ **Tungsten Collimator optional**

Gross Alpha/Beta Counting Traditional Gas Flow α/β Systems

▶ Automatic Systems

- ◆ Series 5 XLB
- ◆ Series 5 LB5500
- ◆ Series 5 E



▶ Manual Multi-Detector System

- ◆ LB4100
 - 1 – 4 Drawers
 - 1 – 4 Detectors each



Gross Alpha/Beta Counting New PIPS α/β Systems



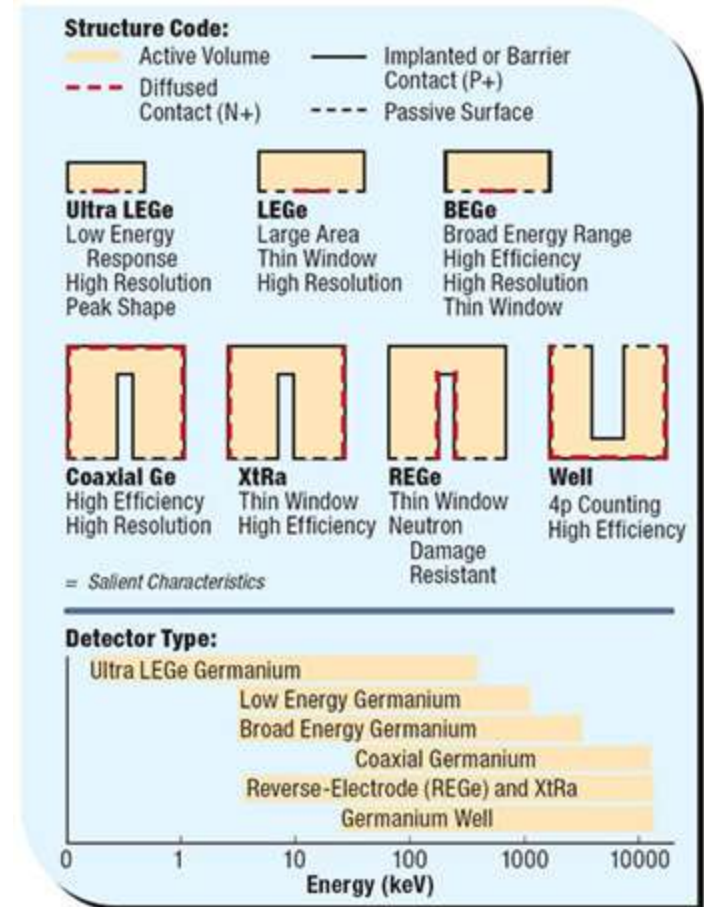
***iMatic™ – Automatic
System***



***iSolo® –
Manual System***

Gamma Spectroscopy HPGe Detector

- ▶ **Wide variety of High Purity Germanium Detector types and efficiencies are available:**
 - **P-type Standard Coaxial (SEGe)**
 - **N-type Reverse Electrode (REGe)**
 - **Extended Range (XtRa)**
 - **Broad Energy (BEGe)**
 - **Low Energy (LEGe)**
 - **Ultra Low Energy (Ultra-LEGe)**
- ▶ **Wide range of efficiencies**
- ▶ **High resolution – good peak shape**



Gamma Spectroscopy HPGe Detector

- ▶ **Conventional liquid nitrogen Cryostats:**
 - Laboratory – vertical or horizontal 30 liter or smaller Dewars
 - Portable – All-attitude MAC, Big MAC Cryostats
- ▶ **Electronically-Cooled Cryostats**



Electronically-Cooled Cryostats

Cryo-Pulse 5



▶ To gain time

- ◆ LN2 free
- ◆ Low power consumption (UPS !)
- ◆ No resolution degradation
- ◆ Fast start up (3-6 hrs)

▶ To save money

- ◆ No LN2 related risks and costs
- ◆ Quick and easy installation

▶ Freedom in operation

- ◆ No flex lines or gas connectors
- ◆ Small footprint and weight
- ◆ Compatible with nearly any front end

▶ Safe and quiet

- ◆ No LN2, no flammable gas.
- ◆ Low audible noise (< 60dB)



Electronically-Cooled Cryostats Cryo-Cycle



- ▶ **To save money**
 - ◆ Refill once in 1 – 2 years
 - ◆ No oil filters, no metal to metal wear.
- ▶ **To gain time**
 - ◆ Few refills.
 - ◆ Runs on LN2 in case of power failure
- ▶ **Freedom of operation**
 - ◆ Same footprint as standard Dewar
 - ◆ Accepts dipsticks and exists now in integral version.
- ▶ **Where safety counts**
 - ◆ Nitrogen gas refill possible
 - ◆ Cooling gas is He



Gamma Spectroscopy Digital Signal Analyzer Lynx™



- ▶ **Complete signal processing system including:**
 - ▶ **Digital signal processor with 32K of spectral memory and advanced shapers for superior performance across detector technologies!**
 - ▶ **Multiple counting modes: PHA, MCS, Time-stamped List and Multi-spectral Scaling**
 - ▶ **Advanced Auto Pole/Zero, Base Line Restorer and Digital Stabilizer controls**
 - ▶ **Three High Voltage Power Supplies to support a wide variety of detectors without compromising performance**
- ▶ **Multiple computer interfaces with routable TCP/IP and DHCP network support:**
 - ▶ **10/100 Base-TX Ethernet for fast network connections over longer distances**
 - ▶ **USB 2.0 and Wi-Fi for fast, convenient local connections**
 - ▶ **RS-232 for local monitoring**

Gamma Spectroscopy Digital MCA Tube Base: Osprey™

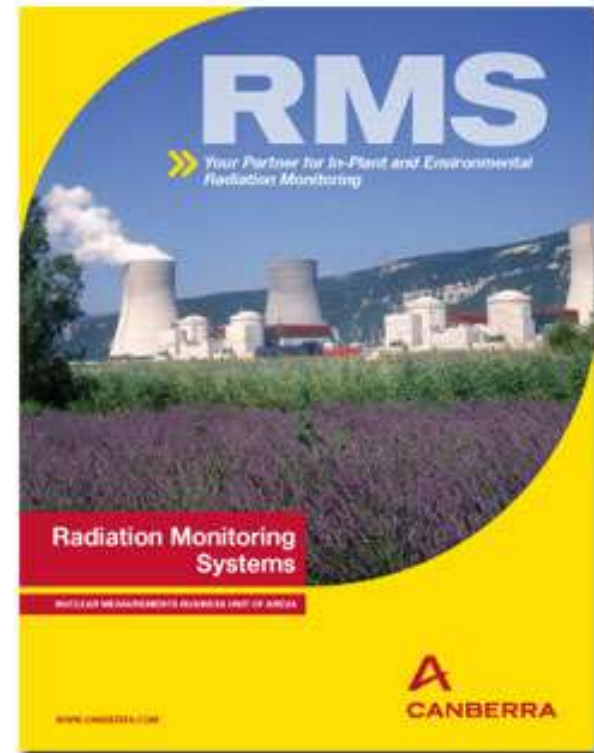


- ▶ **All-in-one HVPS, preamplifier, and digital MCA for Scintillation Spectrometry**
- ▶ **Compatible with all standard 14-pin scintillation detectors, including NaI(Tl) and LaBr₃ (Ce)**
- ▶ **Optional temperature stabilized NaI probe**
- ▶ **USB 2.0 and Ethernet 10/100T (PoE) connection**
- ▶ **PHA, MCS, SCA, MSS, List and Time-stamped List modes**
- ▶ **Supported by Genie-2000 software and a software development kit (SDK) with examples**

Environmental and Radiation Monitoring Systems



Click the image below or the button above to download the brochure



Environmental and Radiation Monitoring Systems

Continuous Air Monitors: Particle, Iodine, Noble Gas

CAM300

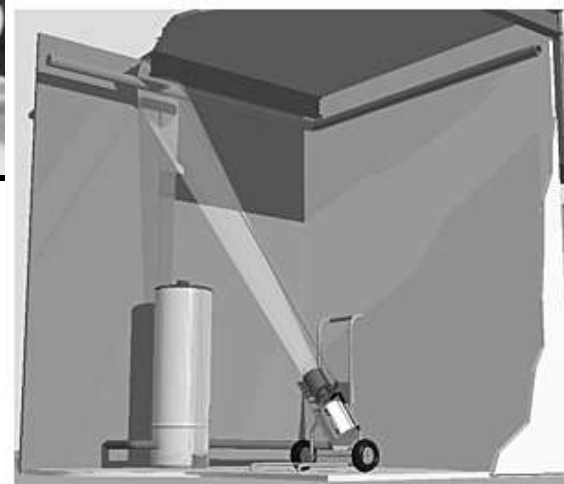


CAM110



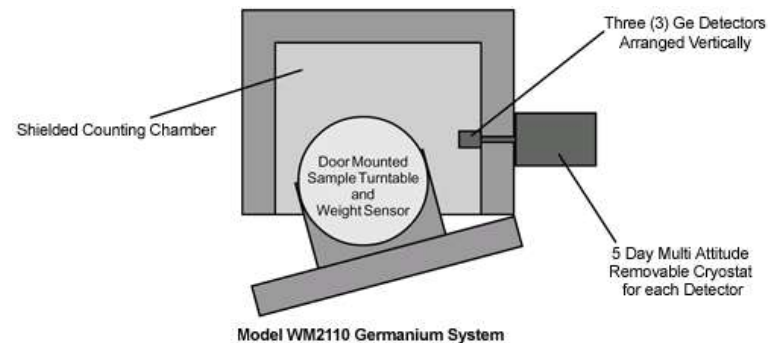
ISOCS – In Situ Object Counting System

- ▶ *Immediate, accurate, nuclide specific results for field measurement of any object or surface*
- ▶ *Sourceless detector specific calibrations generated by software as the sample is being counted – simply enter source/collimator/detector position dimensions*
- ▶ *Calibrations generated for any object/surface that can be approximated by plane, cylinder, box, sphere, well/Marinelli or pipe*
- ▶ *Mobile detector positioning device includes 25 mm and 50 mm collimators and backshields, and accommodates any detector orientation*



Q2 – Waste Assay System

- ▶ **Provides qualitative and quantitative gamma assays for waste in 208 L (55 gal) drums**
- ▶ **Sensitivity better than 370 Bq (10 nCi) for 208 liter (55 gal) drums**
- ▶ **Factory calibrated for turnkey operation, and includes QA check source and holder**
- ▶ **Low background 10 cm steel shield**
- ▶ **Automatic weighing system for matrix attenuation corrections due to sample density**
- ▶ **PC-based control and analysis system featuring the user-friendly CANBERRA NDA-2000 Waste Assay Software package**



WM 2200 – Segmented Gamma Scanner

- ▶ **Complete quantitative gamma analysis for fission products or TRU (α) radionuclides**
- ▶ **Modular design permits system to be optimized for customer's measurement application**
- ▶ **Non-Destructive Assay Software (NDA-2000) provides extensive setup analysis, calibration, and QA capabilities**
- ▶ **PLC based electromechanical control system**
- ▶ **Many optional capabilities available including**
 - ◆ **Automatic weighing system**
 - ◆ **Surface dose rate measurement**
 - ◆ **Inline automated conveyor system**



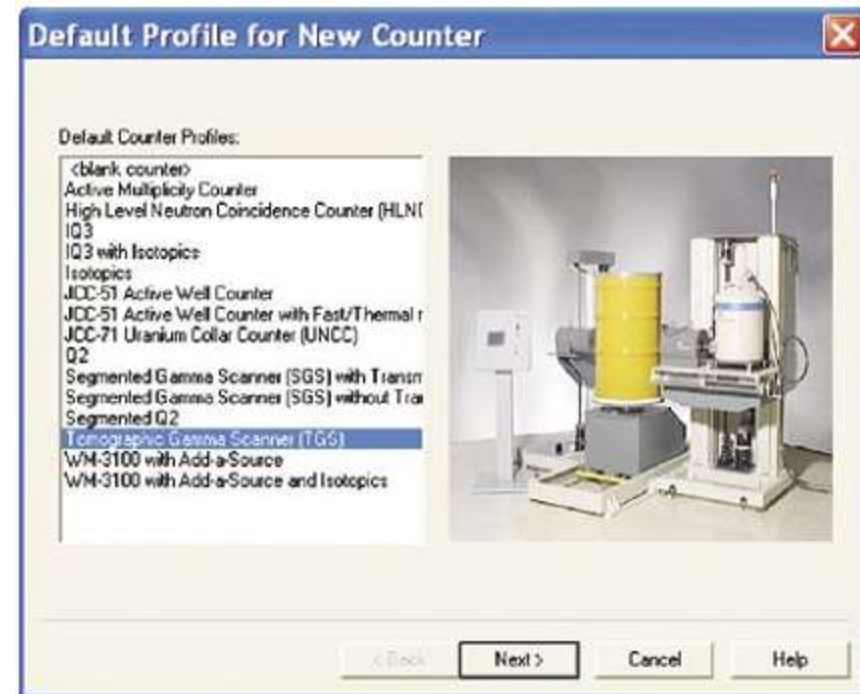
WM 2900 – Tomographic Gamma Scanner

- ▶ **Complete quantitative gamma analysis for fission/activation products or TRU (α) radionuclides**
- ▶ **Modular design permits system to be optimized for customer's measurement application**
- ▶ **Non-Destructive Assay Software (NDA 2000) provides extensive setup analysis, calibration, and QA capabilities**
- ▶ **MGA/MGAU U-Pu isotopics software**
- ▶ **PLC-based electromechanical control system**
- ▶ **Many optional capabilities available including**
 - ◆ **Automatic weighing system**
 - ◆ **Surface dose rate measurement**
 - ◆ **In-line automated conveyor system**



NDA 2000 – Non-Destructive Assay Software

- ▶ **Supports all CANBERRA safeguards and waste assay systems**
- ▶ **Supports neutron and gamma-ray assay systems**
- ▶ **Based on the CANBERRA's Genie™ 2000 platform**
- ▶ **Provides full control of data acquisition electronics**
- ▶ **Controls automated assay system operation**
- ▶ **Customer editable report formats**



Instrumentation for the soldier

AN/UDR-13/14

▶ AN/UDR-13

AN/UDR-13 is a small **robust combat instrument** with the capability to measure **Neutron and Gamma prompt radiation**. It was developed for the US Army in accordance with Military Requirements.

- » GM TUBE – Residual Gamma
- » PIN DIODE – Prompt Neutrons
- » PMOS-FET – Prompt Gamma



AN/UDR13

▶ AN/UDR-14

Same simple to operate, rugged and lightweight equipment as the AN/UDR-13.

Offer a **higher sensibility** for lower dose detection.



Instrumentation for the NBC team/ Navy AN/VDR-2, AN/PDR-77, RDS-100, RPO Kit

- ▶ *For the equipment of specially trained units capable of responding to any accident/incident involving exposure.*
- ▶ *Multipurpose kits for Alpha, Beta, Gamma and X-Ray radiation detection with a wide range of applications such as: weapon surveillance, Nuclear Accident Incident Response and Assistance (NAIRA) and routine monitoring for health and safety.*



▶ AN/VDR-2



▶ AN/PDR-77, RPO Kit



▶ RDS100



▶ NASRAMS

► Units and probes

- ◆ Main unit
- ◆ Beta-gamma probe
- ◆ Pancake probe
- ◆ Alpha probe
- ◆ X-ray probe
- ◆ Micro R probe

► Example of combination

- ◆ AN/VDR2= Main+ Beta-gamma
- ◆ AN/PDR77= Main+ Beta-gamma probe + X-ray probe + Alpha probe
- ◆ RDS100= Main+ Beta-gamma probe + Alpha probe+ Pancake probe
- ◆ RPO Kit= Main+ Beta-gamma probe + Alpha probe+ Pancake probe + Micro R+ X-Ray probe



AN/PDR77

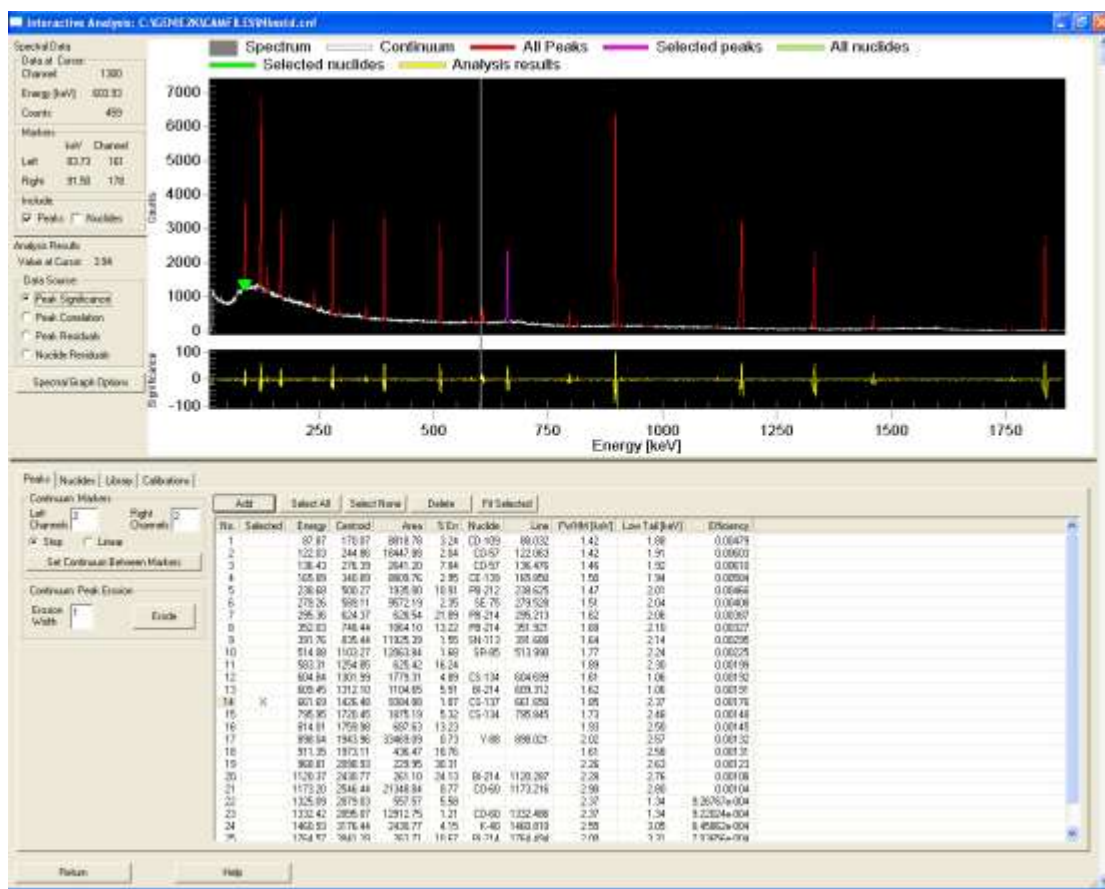


AN/VDR2

Numerous options and configurations are available

Genie 2000 Basic Spectroscopy Software
V3.0, V3.1 and V3.2
New Features





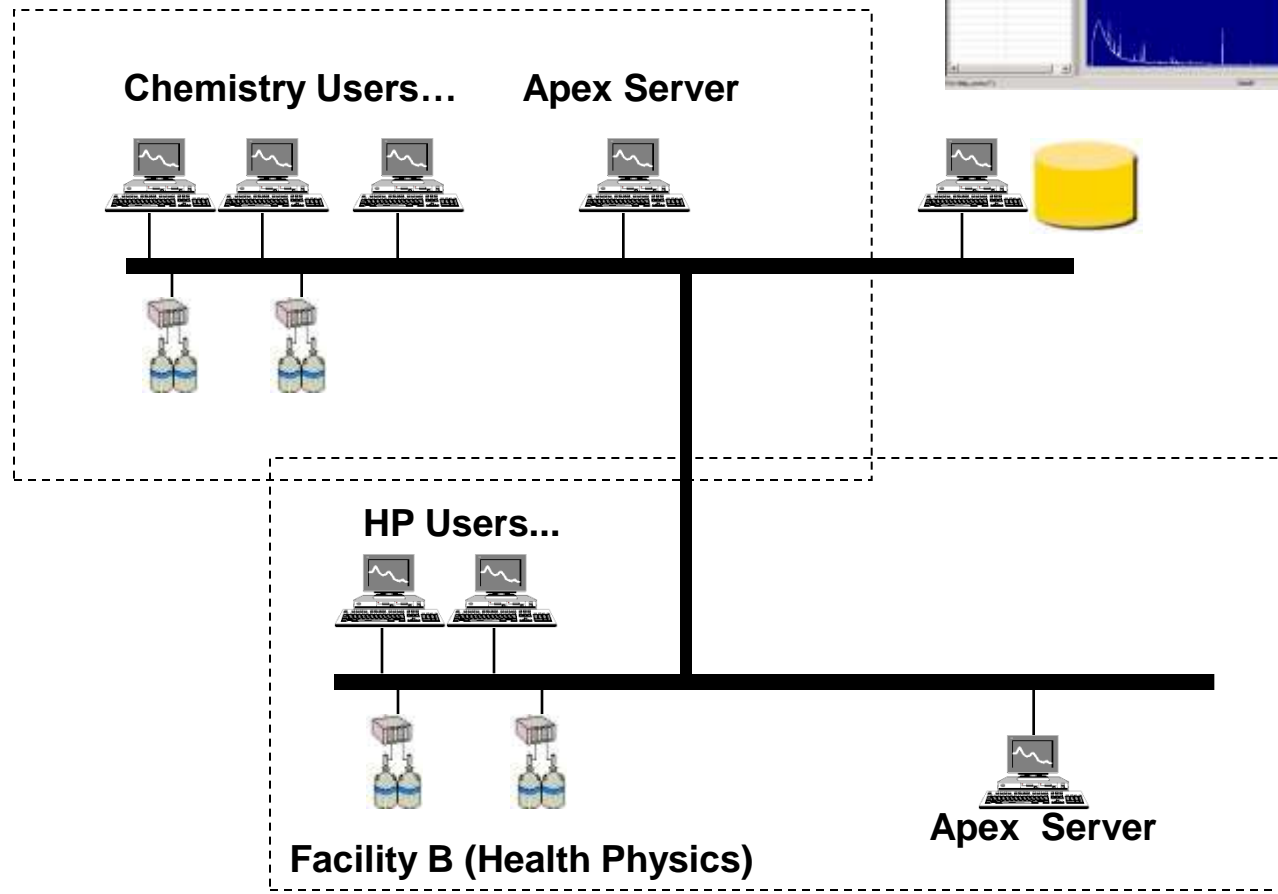
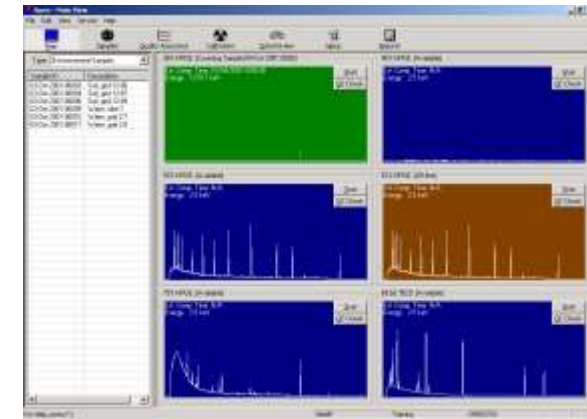
► **Include all Analysis Steps**

- ◆ **Continuum**
- ◆ **Locate**
- ◆ **Peak Fit**
- ◆ **NID**

► **Expand-Box Variable Display**

► **Simultaneous Interactive Results Lists**

► **Tabbed Modal Control Panel**





Alpha Spectroscopy Made Easier!

Announcing the release of CANBERRA's Apex-Alpha...

Apex-Alpha is the first Alpha Spectroscopy software package designed to place all needed information and data acquisition/analysis controls at the user's finger tips. Plus, results are automatically stored in a Microsoft™ SQL Server database for ease of data reporting, archival/retrieval and interface to external LIMS systems.

With the new Apex-Alpha Suite you get:

- Comprehensive operation and management software for the production-oriented alpha spectroscopy lab
- Complete computer control of CANBERRA's Alpha Analyst Alpha Spectrometers as well as manual spectrometers interfaced via compatible CANBERRA MCA's
- Distributed multi-user functionality for access and control of the system from any client workstation
- A sample database that tracks batches of samples through log-in, counting and final data review/ approval processes
- Intuitive tools for easy creation of sample batches with associated counting and analysis procedures
- Flexible and automated energy and efficiency calibration facilities – load sources in the counting chambers and let Apex-Alpha do the rest
- Extensive quality assurance capability for scheduling of QA checks, failure identification & response and data trending
- Single screen data review and advanced reanalysis facilities for routine and non-routine evaluation of assay results.

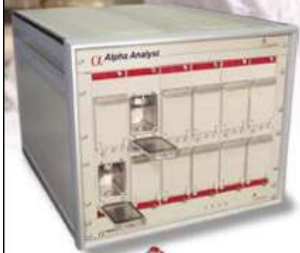
This is one package you've got to see to believe. For more information call, write, fax or visit our web site today!

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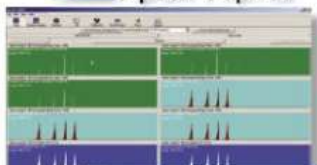
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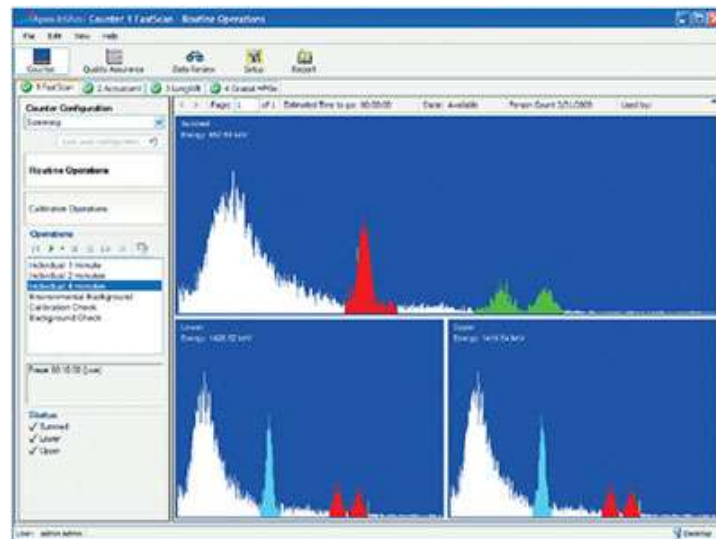
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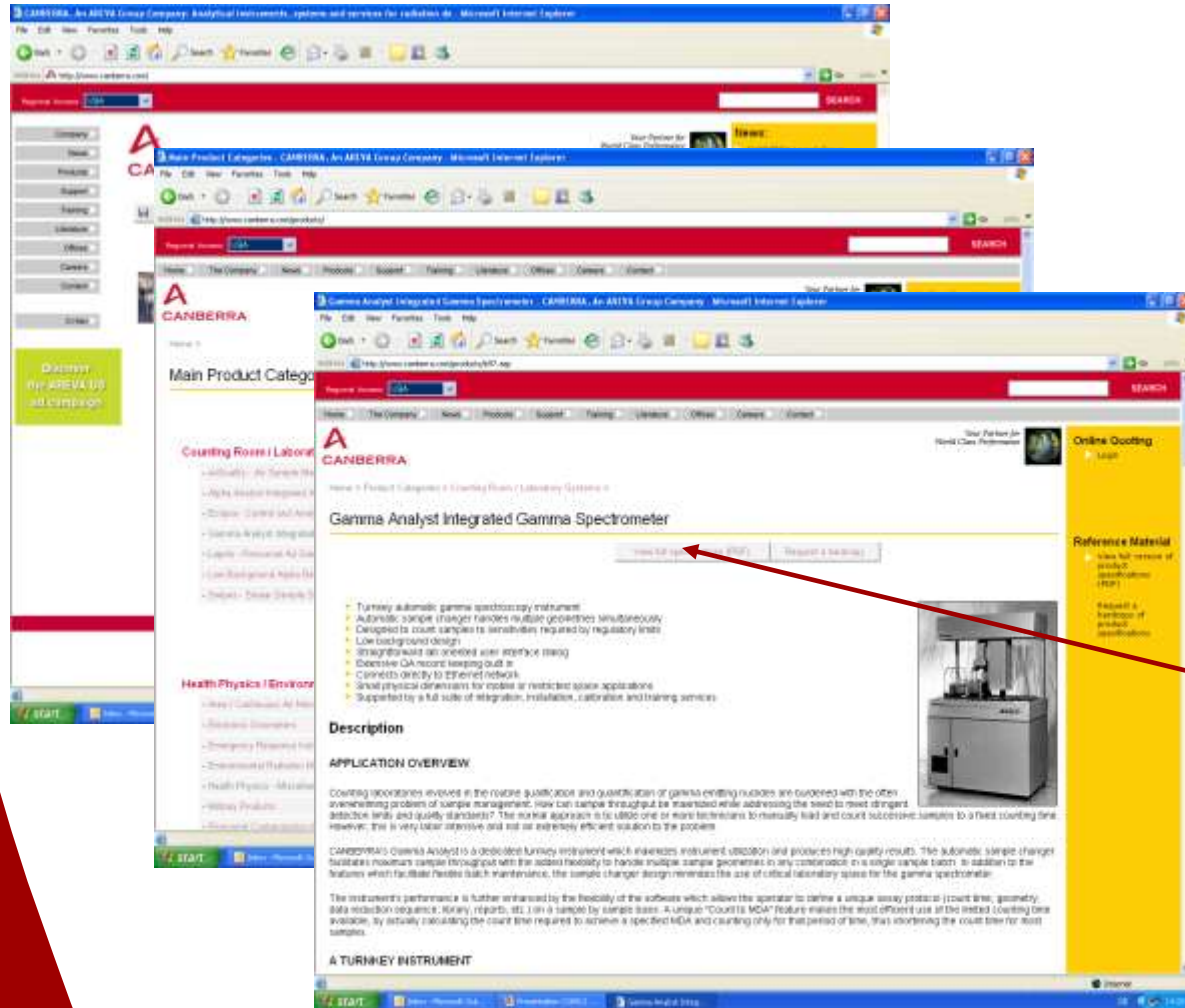
Apex-Alpha



Apex-Alpha™ Apex-Alpha/Beta™ Apex-In Vivo™



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PDF Data Sheet