

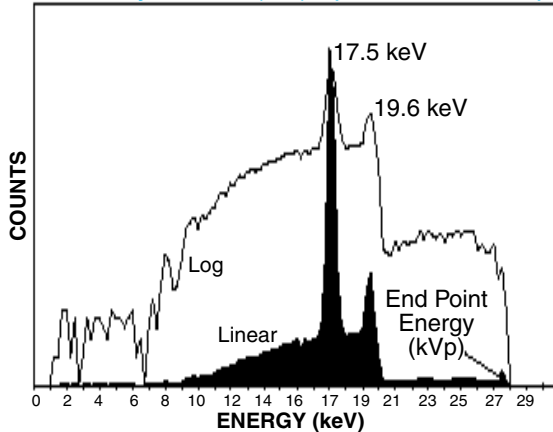
X-Ray Detector for Mammography and Radiology

XR-100T-CdTe
SPECIAL APPLICATION

Medical X-Ray Tube Spectra for Mammography and Radiology

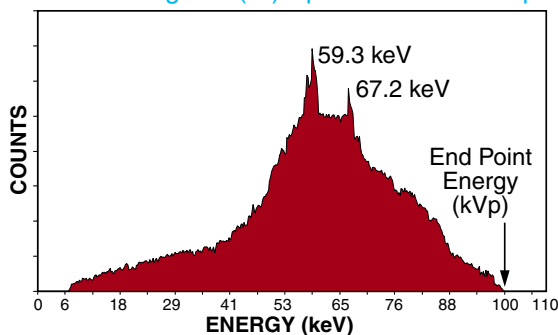
X-Ray Tube Monitor for Mammography Machines

Direct Molybdenum (Mo) Spectrum at 28 kVp



X-Ray Tube Monitor for Radiology Machines

Direct Tungsten (W) Spectrum at 100 kVp



*Spectra courtesy of Andrew Karellas, Ph.D.,
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Worcester, MA 01655 USA*

- **Direct Measurement Spectra**
- **End Point Energy (kVp)**
- **See what the patient gets**
NO Compton Spectra
Escape Peak Adjustment with XRF-FP Software
- **Self-Calibrating System**
- **Look straight at the X-Ray tube and record simultaneously both the spectrum and the peak potential (kVp)**
- **The technology that went to Mars on the Pathfinder Mission is now available to Radiology!**
- **A must detector for every Radiology Department**
- **For Quality Assurance in Radiographic and Fluoroscopic Systems**



No Liquid Nitrogen!!!

Design Objective

This detector system was designed with the objective of simultaneously measuring the X-Ray tube peak potential (kVp), and to characterize the mammographic X-Ray tube spectrum.

Significance of the Measurement

- * Both the tube spectrum and the peak potential (kVp) are important parameters affecting the image quality in film-screen and digital mammography.
- * Automatic selection of proper target/filter combination in modern mammography systems maybe affected by improper kVp.
- * In conventional devices, the user depends on central laboratory calibration and has no easy way to calibrate the instrument during use.

Medical X-Ray Tube Spectra for Mammography and Radiology

Complete System Includes:

- Detector - "XR-100T-CdTe"
- Digital Pulse Processor, Power Supply, Shaping Amplifier and MCA - "PX5"
- Collimator Kit - "Collimator Kit"
- Escape Peak Adjustment Software - XRF-FP



XR-100T-CdTe Gamma Ray and X-Ray Detector shown with Amptek PX5 Digital Pulse Processor

All Solid State Design - - - No Liquid Nitrogen!!!

System Description

The XR-100T-CdTe is a high performance X-Ray and Gamma Ray detector mounted on a thermoelectric cooler (Peltier type) together with the input FET to the preamplifier. Monitored by an integrated circuit, these components are kept at -30°C and are enclosed in a hermetic package with a vacuum tight, light tight Beryllium window. Power and signal processing to the detector is provided by the PX5 which ensures quick, stable operation in less than one minute from power turn-on. The PX5 is a power supply, digital pulse processor, and MCA. It connects via USB to a PC and is powered by a +5V AC power adapter.

Collimator Kit

Amptek has developed a "EXVC Collimator Kit" to collimate the primary X-ray beam. This system is comprised of the standard 1.5 inch extender box which slides inside a Collimator Housing. The Collimator Housing can accommodate up to two Tungsten collimator disks that are placed inside a bayonet holder in front of the detector. By selecting the appropriate Tungsten collimator disks, the user can reduce the incoming X-ray flux and allow the detector and electronics to process the X-ray spectrum. Seven different Tungsten collimator disks are provided with different size holes (ranging from 25 µm to 2,000 µm hole) in order to allow for a wide range of applications. The Collimator Housing is made out of stainless steel.

