FLUKE®
Biomedical

Nuclear Associates 76-890

(UB) Gamma Camera Test Pattern

Users Manual

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Section 1
General Description

1.1 University at Buffalo (UB) Gamma Test Pattern

The University at Buffalo (UB) Gamma Camera Test Pattern is a plastic plate with precisely machined parallel lines, filled with a high-density eutectic metal. The 20” x 20” x 3/8” pattern consists of machined sets of equally spaced parallel lines in an “L-shaped” configuration in each quadrant of the unit. Each quadrant contains four equally spaced parallel line frequencies: 1/10”, 5/32”, 3/16”, and 1/4“. This pattern allows the visual evaluation of spatial resolution and linearity for routine quality control testing using only one camera image acquisition. The UB Test Pattern provides the same information as a 90º bar quadrant pattern but at a quarter of the imaging time.

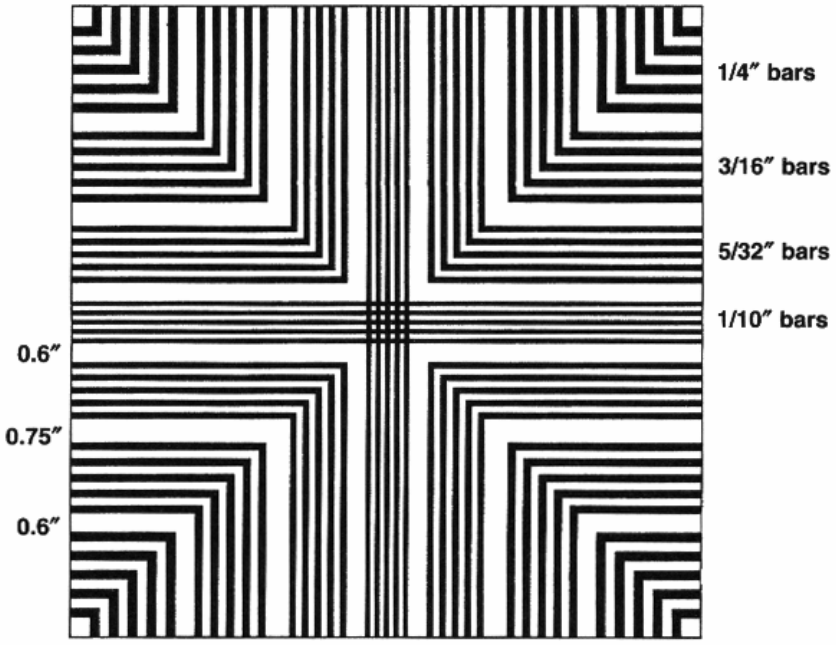

Figure 1-1. UB Gamma Test Pattern

1.2 Imaging the UB Test Pattern

1.2.1 Extrinsic (System) Images Using a Co-57 Flood Source

1. Peak and tune the gamma camera for Co-57. Typically the imaging analyzer is set to 122 keV with a 20% energy window.
2. Install the most frequently used low-energy collimator on the camera. Set the detector head so that the collimator is facing the ceiling.
3. Place the UB Test Pattern on the collimator and the Co-57 flood source on the UB Test Pattern.
4. Acquire at least a 3 million count analog or digital image. Use the largest available digital acquisition matrix to assure the best image quality (i.e., 256 matrix or larger).
5. Process the analog film image or display the digital image for QC review and record keeping.

1.2.2 Extrinsic (System) Images Using a Tc-99m Flood Phantom (Fill Type) Source

1. Peak and tune the gamma camera for Tc-99m. Typically the imaging analyzer is set to 140 keV with a 20% energy window.
2. Install the most frequently used low-energy collimator on the camera. Set the detector head so that the collimator is facing the ceiling.
3. Place the UB Test Pattern on the collimator and the Tc-99m flood source on the UB Test Pattern.
4. Acquire at least a 3 million count analog or digital image. Use the largest available digital acquisition matrix to assure the best image quality (i.e., 256 matrix or larger).
5. Process the analog film image or display the digital image for QC review and record keeping.

1.2.3 Intrinsic Images Using a Tc-99m “Point” Source

1. Peak and tune the gamma camera for Tc-99m. Typically the imaging analyzer is set to 140 keV with a 20% energy window.
2. Set the detector head so that the crystal is facing the ceiling.
3. Place the UB pattern on the detector surface. Prepare a syringe of Tc-99m containing 1 to 2 mCi (37 to 74 MBq) in a volume less than 1 milliliter. Place Tc-99m point source at least 3 useful fields of view (5 UFOV is preferred) away from the center of the detector.
4. Acquire at least a 3 million count analog or digital image. Use the largest available digital acquisition matrix to assure the best image quality (i.e., 256 matrix or larger).
5. Process the analog film image or display the digital image for QC review and record keeping.

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