

ACR ACCREDITATION AND SERVICING THE LORAD MIV PLATINUM™

Introduction

Mammography may be the most dynamic of all of today's imaging modalities. With the new regulatory and accreditation procedures, and advancements in technology, the service professional is becoming more involved in maintaining the quality of the mammographic images produced. This course is designed to give the service professional the insight to evaluate image quality problems, determine if the mammographic unit is the source of the image problem and take the appropriate steps to correct the deficiency. Given today's regulatory environment, maintaining the system at peak performance is of the utmost importance.

Prerequisites

To attend this course, the service professional must possess fundamental knowledge and understanding of the principles of X-ray and basic electronics.

Objectives

- Describe the current mammographic imaging regulatory environment
- Describe the factors that affect mammographic image quality
- Describe how those factors are optimized to produce the highest quality mammographic images
- Describe the basic components of the LORAD MIV Platinum™ mammographic units
- Demonstrate an understanding of the accreditation process
- Demonstrate an understanding of the Mammographic Quality Standards Act
- Demonstrate an understanding of the installation procedures associated with the MIV Platinum™
- Perform the necessary mammographic performance monitoring and quality assurance procedures utilizing the LORAD MIV Platinum™
- Perform the necessary tests to reproduce the results of the physicist's report to confirm corrective action
- Perform all system calibrations and adjustments to maintain the highest quality images and compliance with MQSA requirements
- Evaluate circuit functions to facilitate troubleshooting

Course Outline

DAY 1

- I. Mammography process overview
- II. Basic terminology
- III. Positioning and technique
- IV. Screening vs clinical

Lab Activities

- I. Dark room conditions
- II. Sensitometric properties
- III. Photographic density
- IV. Characteristic curves
- V. Screen considerations
- VI. Processing

DAY 2

- I. Factors affecting image quality
- II. ACR mammography accreditation program
- III. Quality assurance in mammography

Lab Activities

- I. Collimation
- II. Compression devices
- III. Bucky/grid devices
- IV. AEC tracking
- V. Focal spot geometry
- VI. Phantom images

DAY 3

- I. Troubleshooting image quality problems
- II. Mammography quality control, beyond the basic
- III. 1999 Mammography Quality Standards Act (MQSA)

Lab Activities

- I. kVp
- II. HVL
- III. Linearity
- IV. Reproducibility
- V. Glandular dose
- VI. Radiation safety

DAY 4

- I. Introduction to the LORAD MIV Platinum™ system
- II. System specifications
- III. Site planning and installation
- IV. Operation
- V. System controls
- VI. Physical layout
- VII. Using LORAD documentation

Lab Activities

- I. Component location
 - A. Schematic location
 - B. Physical location
 - C. Connector locations
 - D. Fuse location/identification
- II. Cover removal procedures
- III. Locating ID/compliance labels
- IV. Parts identification

DAY 5

- I. Turn-on circuits
- II. Power distribution
 - A. AC supplies/distribution
 - B. DC supplies/distribution
- III. System block diagrams

Lab Activities

- I. Input AC voltage adaptation
- II. Power supply verification
 - A. AC supplies
 - B. DC supplies

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DAY 6

- I. kV control
 - A. Manual kV
 - B. Auto kV
- II. HV secondary
 - A. Feedback circuits
 - B. Safety circuits
 - C. Overload detect
- III. mA control
 - A. Manual kV
 - B. Auto kV
- IV. Filament drive circuits
 - A. Filament control
 - B. Filament protect
 - C. Grid bias

Lab Activities

- I. kV measurement
 - A. Invasive
 - B. Non-invasive
- II. Safety/overload circuits
- III. Waveform analysis
- IV. kV calibration
 - A. Manual kV
 - B. Auto kV
- V. mA/mAS measurement
- VI. Filament drive waveform analysis
- VII. mA waveform analysis
- VIII. mA calibration
 - A. Manual kV
 - B. Auto kV
 - C. Grid bias calibration

DAY 7

- I. Rotor control
 - A. Inverter drive
 - B. Rotor status checks
- II. Exposure control
 - A. Manual
 - B. AEC
 - 1. AEC detect
 - 2. Auto time
 - 3. Auto kV
 - 4. Auto filter
- III. Patient data system
- IV. Monitor

Lab Activities

- I. AEC calibrations
 - A. Optical density
 - B. Thickness compensation
 - C. HTC™ compensation
 - D. Grid compensation
 - E. kV tracking
- II. Rotor control programming
- III. Rotor verification
- IV. Rotor waveform analysis

DAY 8

- I. Electromechanical systems
 - A. Tube support area
 - B. Gantry drive area
 - C. Film support area

Lab Activities

- I. Auto-filter threshold
- II. Compression force calibration
- III. Filter calibration
- IV. Rotation zero calibration
- V. Rotation velocity calibration
- VI. Vertical velocity calibration
- VII. Stereoloc rotation velocity calibration
- VIII. HTC™ thickness threshold

DAY 9

- I. Stereoloc
 - A. Motor drive
 - B. Camera interface
 - C. Angle drive
 - D. System interface
 - E. Feedback
- II. Accessory interfacing
- III. Tube replacement
- IV. Mechanical adjustments

Lab Activities

- I. Accessory interface verification
- II. Tube type programming
- III. Collimator calibration
- IV. Mirror calibration
- V. System troubleshooting

DAY 10

- I. Course review
- II. Course evaluation
- III. Final exam

Note: Due to copyright laws, students are required to purchase and bring to class the following manuals:

- Operations : man-00223 rev 004
- Service: man-00340 rev 005
- Schematics 9-500-0277 rev 4