

Servicing the Shimadzu MobileArt & MobileDart Evolution Portable X-Ray Systems



RADIOLOGICAL SERVICE TRAINING INSTITUTE

Introduction

Portable X-ray units are found in most radiological/diagnostic imaging departments. They are typically exposed to a higher abuse level due to elevator openings, tight room entrances, limited patient access, and lack of space for maneuverability. This constant abuse will cause premature mechanical failure if not properly identified and corrected early. The trained service professional will be taught the skills necessary for mechanical, electromechanical, and electronic maintenance of the Shimadzu MobileArt Evolution and the MobileDart Evolution. Each sub-system of the mechanical unit and the generator is thoroughly analyzed.

Models Covered

This course will cover the following MobileArt & MobileDart models:

- MobileArt Evolution (MUX200)
- MobileDart Evolution (MUX200D)

Note: Pending equipment availability at the time of training, the following systems may also be available during the training:

- MobileArt (MUX100)
- MobileDart (MUX200)

System maintenance and generator calibrations are included for the above models. Detector and digital system calibrations will be covered for the MobileDart (MUX200D).

Prerequisites

To attend this course, the service professional must have a good understanding of the principles gained through attending Phase II, or four years equivalent experience. The service professional must also possess a good mechanical aptitude.

Objectives

At the conclusion of this course participants will be able to:

- Evaluate overall system performance
- Troubleshoot mechanical and electronic problems on all components of the unit
- Perform a complete and thorough preventive maintenance inspection on each portable unit
- Follow circuit operations of system detail block diagrams
- Calibrate the digital detector (MUX200D)

Course Outline

Day 1

- Introduction
 - Basic operations
 - Knobology
 - Terminology
 - Specifications
- Models & unit comparison
 - Mechanical
 - Electronic
 - Documentation
- MobileArt system diagrams
- Lab Activities

- Basic operation
- Circuit identification and location

Day 2

- MUX-Charge Unit
 - Batteries
- MUX-Inverter Unit
 - Tube stator
 - Filament control circuits
 - Collimator lamp circuits
- Lab Activities
 - Charger calibration
 - Filament calibration
 - Battery maintenance
 - Battery change

Day 3

- MUX-Power
 - Inverter driver circuits
 - Inverter circuits
- Logic circuit
 - Safety circuits
 - Exposure start/stop circuits
- Lab Activities
 - kV calibration
 - Timer calibration
 - Timer waveform analysis

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Day 4

- Drive circuits
 - o Speed control
 - o Braking system
- MobileArt block diagram
 - o Filament control circuits
 - o kV control circuits
 - o Charger control circuits
- Digital detector
 - o Detector firmware flashing
 - o Detector pairing
 - o Detector calibration
 - o Digital Image Quality Checks
- Lab Activities
 - o Drive control circuits
 - o Major component disassembly
 - Tube replacement
 - Extension column
 - Vertical column
 - High voltage transformer
 - Flash digital detector
 - Pair digital detector
 - Calibrate digital detector
 - Perform Image Quality checks on digital detector

Day 5

- System troubleshooting
 - o Mechanical
 - o Electronic
- Overall system review
- Final exam
- Course evaluation