

GE Signa, Optima, & Discovery MRI Family:

Optima 450W/750W, Discovery 450W/750W, Voyager, Architect, Artist, Signa Creator, Signa Explorer, Star, Aviator



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Introduction

The GE Optima 450W MRI Family course is an advanced MRI course centered on progressing both system knowledge and troubleshooting experience. This course builds on the knowledge acquired in RSTI's MRI Principles Training course.

The course teaches service engineers the advanced concepts of MRI system operations, GE System Software, System Hardware, System Connectivity, and Service Software (SUIF).

A strong emphasis will be placed on hands-on labs to support the presentation of advanced principles.

Prerequisites

To attend this course, the service professional must have completed MRI Principles or have equivalent experience.

Objectives

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

- Understand the advanced operations of GE MRIs.
- Utilize GE MRI trouble shooting tools & techniques.
- Explain magnet functionality & monitoring.
- Navigate the Capture Application and Service Desktop.
- Diagram various subsystems including RF Transmit and Receive, Gradients, Magnet and Cooling
- Perform replacement procedures for a variety of components.
- Diagnose and correct system failures

Course Outline

Day 1

- MRI Safety Review
- MRI System Review
 - GE System Types
 - RF Transmit Chain
 - RF Receive Chain
 - Gradient Chain
 - Magnet
 - Superconducting magnets
 - Cryogenics
 - Different Types
 - Cooling / Patient Handling
 - Image Quality / Artefacts
 - Specialty Coils
- Introduction to Scanning
- Daily QC and Functionality

Day 2

- System Documentation
 - Service Methods
 - Coil Manuals
- System Software
 - Global Operators Console (GOC)
 - Scanning Practice
 - Create a Patient
 - Daily QC
 - Scan Protocol Structure
- Service Software
 - Service Software Access
 - Event Log
 - Image Quality Checks (DAQA)
 - Utilities
 - System Bootup/Shutdown

Day 3

- System Identification
 - Root Login

- Guided Install
- Component Identification
 - System Differences
- Basic Scans
 - Spin Echo, Gradient Echo, Inversion Recovery
- RF Transmit Chain
 - CAM vs ICE Configurations
 - RF AMP
 - Exciter Board
 - Body Coil
 - Power Monitoring
- Components Replaced
 - RF AMP

Day 4

- RF Receive Chain
 - Coils and LPCA
 - RF Hub
 - Receiver Boards
 - VRE and ICNs
 - System Differences
- RF Diagnostics
 - Transmit & Receive
- Component Replacement
 - Receiver Cards
 - ICN

Day 5

- Gradient Chain
 - Gradient Chain Hardware
 - Signal Creation and Route
 - Gradient Amps and PS
 - Gradient Coils
 - Gradient Monitoring
- Gradient Diagnostics
- Component Replacement
 - Gradient Amp

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Day 6

- Patient Handling
 - Scan Room Interface
 - Patient Handling Power Supply
 - Patient Table
 - Covers
 - Component ID
 - PM Requirements
 - Cradle Removal
 - Coil Ports
 - Bridge
 - Dock
 - Patient Monitoring and Gating
- Component Replacement
 - PA Coil
 - Coil Ports

Day 7

- Magnet and Cooling
 - Magnet Overview
 - Cryogenics
 - Magnet Monitor
 - Laptop Connection
 - Cooling Values
 - Coldhead
 - Service Turret
 - Helium Compressor
 - Heat Exchange Cabinet (HEC)
 - Perform Deionization Procedure
 - Component ID
 - Cooling Specs

Day 8

- Coil Testing
 - Coil Setup
 - MCQA Testing
 - Coil and Connector cleaning and inspections.

- Advanced Scan Parameters
 - Comparing Scans
- Image Quality Troubleshooting
 - Spike Detection
 - White Noise
- Software Reload
 - LFC Procedure
 - Backup/Restore
 - Hard drive ghosting
 - VRE Reconfiguration

Day 9

- Preventative Maintenance (PM)
 - Perform PM Schedules A, B, C, D.
 - QC checks and Calibrations
 - Record Keeping
- General Troubleshooting
 - System Level Testing
 - Image Quality Issues

Day 10

- General Troubleshooting
 - High Failure Items
 - Error Logs
- Course Review
- Final Student Evaluation