

SERVICING DIAGNOSTIC ULTRASOUND: ACUSON SEQUOIA, HP 5500, AND ATL HDI 5000

Course Length: 2 weeks
CEUs Awarded: 8

Introduction

This course covers the principles of ultrasound with specific focus on the maintenance of the Acuson Sequoia, HP 5500 and ATL HDI 5000.

Objectives

At the completion of this course, participants will be able to:

- Demonstrate an understanding of the physics of sound
- Demonstrate an understanding of basic ultrasound theory
- Identify the characteristics of acoustic waves
- Describe the parts of a basic ultrasound scanner
- Identify signal flow and label system block diagrams
- Understand image quality as it pertains to ultrasound
- Perform QA checks
- Demonstrate the operations of the HP 5500, ATL 5000 and Acuson Sequoia
- Understand theory of operation of the HP 5500, ATL 5000 and Acuson Sequoia
- Perform PM checks on various ultrasound machines
- Perform networking and DICOM setup
- Troubleshoot an ultrasound scanner
- Identify probes and their uses

Course Outline

DAY 1

- I. Introduction to ultrasound
 - A. Overview of ultrasound in medicine
 - B. History
- II. Physics of sound
 - A. Sound waves
 - B. Interactions of sound waves and matter
 - C. Wave motion
- III. Transducers
 - A. Construction
 - B. Uses

IV. Modes of operation

- A. 2D-mode
- B. M-mode
- C. Doppler
 1. Color
 2. Spectral

V. Applications

- A. Radiology
- B. Cardiology
- C. Vascular
- D. OB/GYN

DAY 2

- I. Basic ultrasound scanner and controls
 - A. System block diagram
 1. Beamformer
 2. Transmitter
 3. Receiver
 4. Scan conversion
 5. Output
 6. Power
 - B. Basic scanning of the body
 - C. Image Quality
 1. Axial resolution
 2. Lateral resolution
 3. Dynamic range

DAY 3

- I. Introduction to the HP 5500, ATL 5000 and Acuson Sequoia
 - A. Theory of operation
 - B. Controls
 - C. System architecture

Lab Activities

- I. Operation and functional checks

DAY 4

- I. Block diagrams
 - A. Signal flow
 - B. 2 D/M modes
 - C. Doppler (spectral)
 - D. Doppler (color)

Lab Activities

- I. Scanning session

DAY 5

Lab Activities

- I. Disassembly, parts location and identification and reassembly

DAY 6

- I. Power supplies analysis
 - A. Theory
 - B. Block diagrams

Lab Activities

- I. Power supply checks and test points

DAY 7

- I. Diagnostic tools and menus
 - A. LEDs and test points
 - B. Laptop connections

DAY 8

- I. DICOM and Networking
 - A. Conformance statement basics
 - B. Networking basics
 - C. DICOM basics

Lab Activities

- I. Perform networking setup and verify operations
- II. Perform DICOM setup and verify operations

DAY 9

- I. PM procedures
- II. QA procedures

Lab Activities

- I. Perform a PM on each system
- II. Perform a phantom QA for each system

DAY 10

- I. Review
- II. Final Exam and review