

## On-Line Basic 2 Way Radio Technician Course

4 day class held on four consecutive days, Tuesday - Friday.

Cost \$1,295.00 (visit [www.phase4.org](http://www.phase4.org) for more information, or register)

### Synopsis

Over time the requirements for what a 2 Way Radio Technician does, have changed dramatically. 2 Way Radio is no longer defined as just working with antennas, transmitters and receivers. The level of IP Network integration and co-location with other various radio users has increased. The use of digital radios, multiple sites, trunking and encryption has changed how you interface with a base or repeater.

In the early '70s a 2 Way Technician would be taking care of a system that was "a base and 3 mobiles" or maybe a repeater. Today the same technician is faced with a multi-site trunked digital radio system that has an IP based dispatch console which uses both an IP connection and traditional 2175Hz Tone Signaling, via phone lines or microwave, to service their end users. The 2 Way Technician of today will likely have to deal with co-site, co-channel and shared RF system users. This often requires calculating intermodulation effects on existing users and taking extra steps to avoid interference.

This course is designed to touch on the most important aspects of what a modern 2 Way Radio Technician might be called upon to do. It is delivered as a live online class integrated with a printed training guide. The online environment is a 2-way interactive multimedia presentation with live video demonstrations, chat, white board and live audio/video. The class is presented in eight modules over four days. Each module is three hours in length with breaks and lunch. The classroom is open for an hour before start time and for an hour after class for Q & A.

Every student is entitled to attend a future "Basic 2 Way Radio" class as space allows. In addition we encourage follow-up questions via phone or email.

The following is a high level look at what we will cover in this course.

### Day 1

#### Module 1 – Electronic Theory

Voltage  
Current  
Resistance  
Measurements  
Working with formulas or Laws  
Wiring, Component connection and housing  
Power Source  
Schematics  
DC Circuit Analysis  
AC Circuit Analysis

#### Module 2 – 2-Way Radio Components

Batteries  
Power Supplies  
Amplifiers  
Loads  
Resonance  
Transmission Theory  
Types of Radios  
Modes of Operation  
Modulation  
TX/RX  
Feed Line  
Antennas

## On-Line Basic 2 Way Radio Training – Course Description

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### Day 2

#### Module 3 – Tools of the Trade

Tools  
Basics  
Crimp tools  
RF tools  
Test equip  
Audio alignment tools  
Power tools  
Electrical tools  
Network tools

#### Module 4 – System Operations

Filters  
Isolators/Circulators  
TX/RX Combiners  
Modes of Operation  
Conventional  
Digital  
Multi-Site  
Microwave  
RoIP  
FCC

### Day 3

#### Module 5 – Antennas, Towers and Sites

Location  
Gain  
Pattern  
Cut/adjust  
Propagation  
Grounding  
PIM  
DAS

#### Module 6 – System Design

Documentation  
Requirements  
People Involved  
Capacity  
Propagation Models and Variability  
Equipment  
Budget

### Day 4

#### Module 7 – Safety

Personal Safety  
Site Safety  
Tools  
RF Safety

#### Module 8 - Grounding and Lightning

Protection  
R-56 Grounding Standard

Phase 4 Design, Inc. is located in the Pacific Northwest, near Seattle, Washington. We have been providing solutions to complex technical problems since 1989. Over 40 years of combined experience in the areas of Two-way Radio / Public Safety / Paging, Telephony, LAN / WAN Network Design and Software System Design, makes Phase 4 Design, Inc. uniquely qualified to provide cross-discipline solutions and training.

For more information contact Dave Grant at [dave@phase4.org](mailto:dave@phase4.org) or call 425.402.7308x1. Visit our website at [www.phase4.org](http://www.phase4.org).