Hands-On

Short-Haul Radio System Installation

Course Description

This course teaches installation and troubleshooting technicians the key elements needed for installing, testing, validating and troubleshooting short-haul links.

The course introduces the elementary principles of radio used in short-haul radio services. It teaches how to survey the location in order to position access points in the appropriate location and how to avoid interference with other services. The course identifies the problems with alignment of antenna systems as well as teaching what appropriate safety precautions need to be taken.

Students Will Learn

- **Recognize Different Classes Of Radio Equipment And Describe Their Uses**
- **Configure Appropriate Feeder Equipment**
- **Align And Validate Links**
- **Calculate Expected Signal Strengths And Measure Service Levels To Confirm**
- **Troubleshoot Link Problems**
- **And More...**

Target Audience

This course is geared for installation and troubleshooting technicians.

Prerequisites

This course assumes attendees already have basic knowledge of data communications, PCs and IP systems. No prior knowledge of radio or Wireless systems will be assumed.

Course Outline

Module I: Short-Haul Radio Link Services

Technologies and Terms

Classes and Frequencies

Key radio bands and their applications

Recognizing Short-Haul Plant

Power and Safety issues

Module II: Radio Principles

Radio Transmission Principles

Radio Propagation

Signal Power and Free Space Loss

Effective Radiated Power (ERP)

Polarization

Absorption

Diffraction

Reflection

Signal to Noise Ratio

Cell Based operation

Carrier interference noise

Interference effects and Fading

MiMo and SiSo

Modulation

Amplitude, Frequency and Phase Modulation

QAM

Multi-Access Systems

FDM, TDM, TDMA, FHSS, DSSS, OFDM, CDMA

Frequency use

Overlapping channels

Noise and signal strength

Operating Speed and multi-standard selection

Configuring Access Points

Module III: Short-Haul Antenna Systems

Classes of Antennas

Selecting the appropriate types

Point-to-point services

Area Coverage

Cellular coverage

Towers and Mountings

Static Mounts

Loading and support

Module IV: Radio Test Equipment

Inside antenna systems

Outside Antenna Systems

Connections

Long Range Connection Systems

Service requirements

Defining the Service requirements

Selecting Routers and Access Points

Links between buildings

Routing and Fire-walling

Monitoring and managing the service

Evaluation and Review

Delivery Method

Instructor-Led with numerous case-studies and Hands-On exercises.

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

2 Days