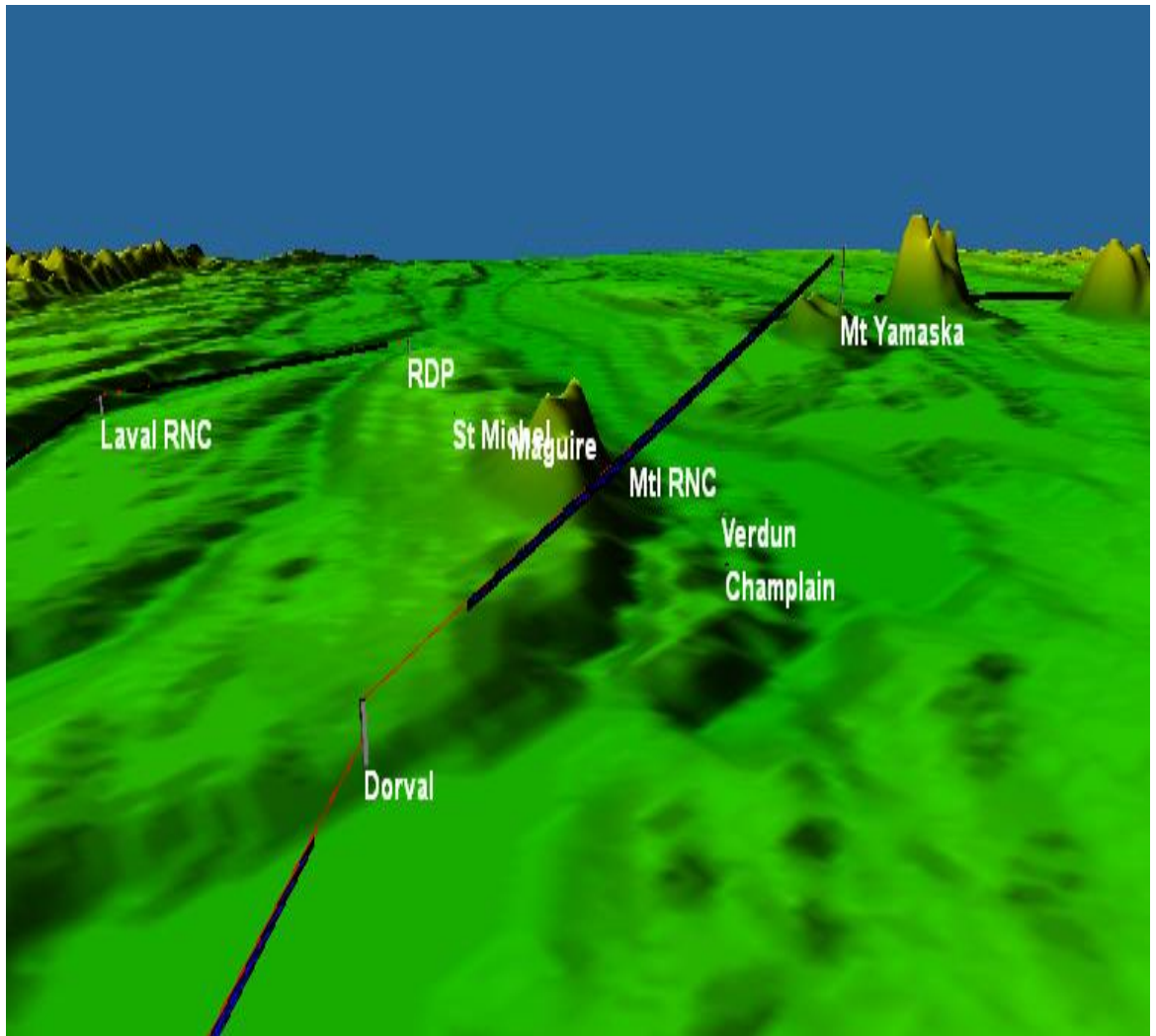


# Pathloss 5 Training



**MICROWAVE THEORY AND COMPLETE  
POINT-TO-POINT (PTP) SOFTWARE OPERATION  
(PL5-01)**

**4 Day Training**

**FOR MORE  
INFORMATION**

Yves R. Hamel et Associés Inc.  
102-424 Guy Street  
Montreal (QC) Canada  
H3J 1S6

Tel.: 514-934-3024  
Fax: (514) 934-2245  
Email: [telecom@yrh.com](mailto:telecom@yrh.com)



## PATHLOSS

Microwave communication network design can be a complex and sometimes daunting task. Fortunately, engineers and technicians working on MW network planning can use software tools such as Pathloss to ensure a methodical and thorough approach to their task.

The Pathloss program is a state-of-the-art comprehensive path design tool for radio links operating in the frequency range from 30 MHz to 100 GHz.

Designed for use throughout the world with diverse equipment and wide-ranging atmospheric conditions, Pathloss uses a variety of terrain and clutter databases, equipment files and local weather files.

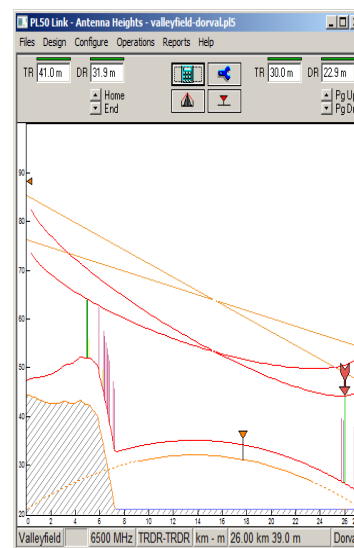
The program is organized into modules, covering all aspects of microwave communication network design. These include five path design modules. The network module, which integrates the radio paths and several operations that can be performed on a given network including: interference analysis, automatic link generation and design, local and area coverage studies.

## OBJECTIVES

Our training session has a two-fold objective. First, it aims at creating a solid background of knowledge in the field of microwave theory and second, it builds on that knowledge with the specifics of microwave design using the Pathloss software. The new version of Pathloss has improved significantly; changing the way we work with it. Therefore, a specific course has been developed in order to help MW designers learn the concepts and develop a methodology for the Pathloss 5 software.

Microwave theory covers topics such as the basics of microwave communications systems, propagation, RF design methods and procedures.

Software operation section of the training covers a variety of topics, ranging from software installation and upgrade to a module-by-module study and network designs and operations.



## TARGET AUDIENCE

Although Pathloss is a comprehensive step-by-step design tool, this YRH Pathloss training is specifically targeted to microwave engineers and experienced microwave technicians having some basic notions of microwave propagation.

## PRE-REQUISITES

Basic knowledge of microwave communication networks required.

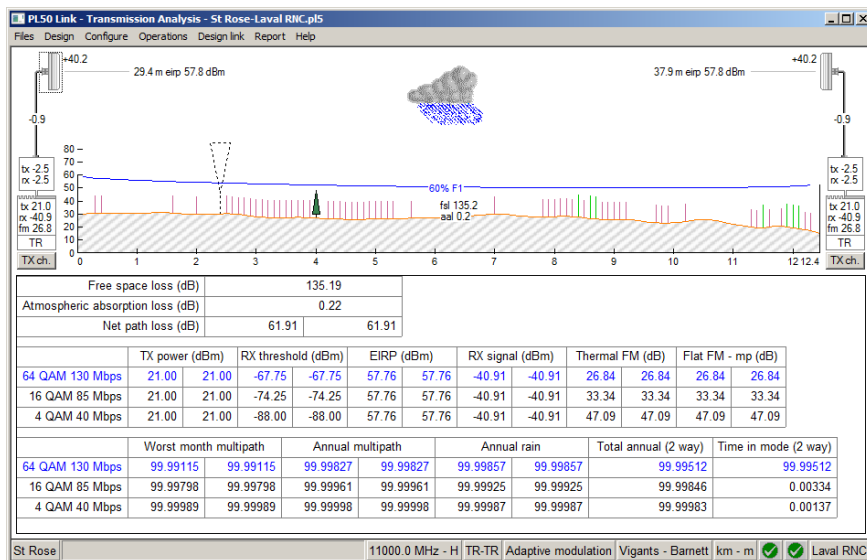
## ADDITIONAL PATHLOSS 5 TRAINING PACKAGES

- ☞ Pathloss 5 - 3 days: Complete Point-to-Point (PTP) software operation (PL5-02)
- ☞ Pathloss 5 - 2 days: For experienced PL4 users (PL5-03)
- ☞ Pathloss 5 - 3 days: Point-to-Multipoint (PTMP) and coverage software operation (PL5-04)
- ☞ Pathloss 5 - 5 days: Full Pathloss 5 operation including microwave theory, PTP, PTMP and coverage applications (PL5-05)

## SCHEDULE AND FEES

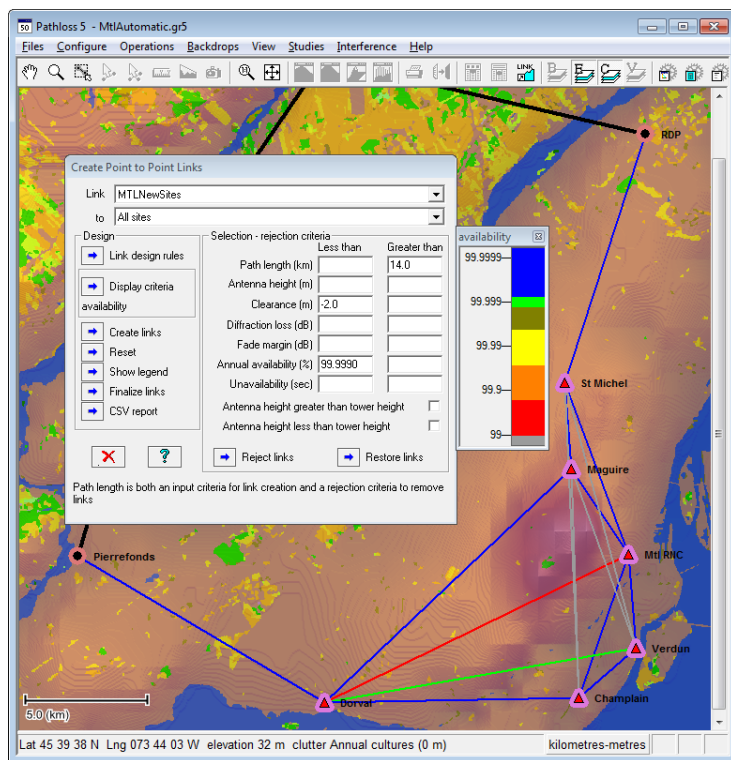
For more information about our Pathloss training program, please e-mail us at [telecom@YRH.com](mailto:telecom@YRH.com) or call at +1 514.934.3024.

## PATHLOSS 5 FEATURES



*Adaptive modulation calculations*

*Automatic link planning tools*



# COURSE CONTENTS

## DAY 1

- **Overview of microwave communications theory**
  - + Systems and components
  - + Propagation
  - + Reliability calculations and objectives
- **Software installation and maintenance updates**
- **Overview of software files**

## DAY 2

- **Network Options and Settings**
  - + Site and link data entry
  - + Group Manager
  - + GIS setup
  - + Network display options

Exercise:

  - *Create a Network consisting of existing links and new sites*
- **Link Options and Settings**
  - + Default calculation methods and algorithms
  - + Program Options

Exercises:

  - *Setting default calculation and diffraction loss methods and algorithms*
  - *Setting default clearance criteria*
- **Equipment Files Formats and Setup**
  - + Setting Equipment databases and Frequency Plans
  - + AntRad Program: Creating and editing radio and antenna files

Exercises:

  - *How to configure equipment database and Frequency Plans*
  - *How to create Adaptive Modulation Radio files using the AntRad program*

– **Terrain Data Module**

- + Generating terrain profile between two sites
- + Inserting and editing Clutter and structures

Exercises:

- *How to generate a terrain profile*
- *How to input obstacles manually or using clutter files*

– **Antenna Heights Module**

- + Setting antenna heights to meet clearance criteria for different antenna configurations

Exercises:

- *How to verify and/or modify clearance criteria for a given path*
- *How to set antenna heights for main and diversity antenna configurations*

## DAY 3

– **Diffraction Loss Module**

- + Calculating diffraction loss
- + Analyzing the Automatic and Manual Diffraction Algorithms

Exercise:

- *Calculate and compare diffraction loss from manual and automatic methods*

– **Multipath and Reflection Module**

- + Variable and Constant Gradient Ray Trace
- + Reflective Plane and Ray Tracing Reflection Analysis
- + Optimal Space Diversity antenna heights

Exercises:

- *Display the reflective characteristics of a path using constant and variable gradient*
- *Perform a reflection analysis and set optimal main and diversity antenna heights*

– **Transmission Analysis Module**

- + Different ways of entering equipment parameters
- + Setting parameters for all applications: Microwave, Adaptive Modulation, Land Mobile
- + Selecting calculation methods and algorithms

Exercises:

- *Analyze a path using ITU Multipath fading algorithms*
- *Analyze a path using Vigants-Barnett Multipath fading algorithms*
- *Analyze a path using the Adaptive Modulation application*

## DAY 4

### – Automatic Link Generation and Design

- + Network design
- + Link Design Rules
- + Create PTP links
- + Design and modify PTP links
- + Frequency assignment

#### Exercises:

- Determine LOS and connectivity between new sites and existing network
- Automatically design new PTP links
- Assign frequencies on a network level

### – Interference

- + Setting Intra-System Interference Parameters
- + Correlation options
- + Reading and analyzing Interference reports

#### Exercises:

- How to perform an intra-system interference calculation
- How to solve potential cases of interference using several methods

### – Network Batch Reports

- + Batch and performance reports
- + Export to csv, Google Earth and MapInfo

### – Question period and review of modules of particular interest

### – Overview of additional possibilities

- + Local and Area Studies (Coverage)
- + PTMP
- + Land Mobile
- + Passive repeaters