

# Troubleshooting a Fiber Optic Link

W-6D-141 • ISBN 978-0-9754542-3-7 • 90 minutes • Released in March 2005



## Quickly identify, locate and resolve system problems

Technicians must have the necessary skills, knowledge and equipment to efficiently troubleshoot the problems that arise during the installation, termination, splicing and operation of fiber optic links. The ability to quickly identify these problems and their locations and implement a proper, cost-effective solution is essential.

This DVD focuses on these issues from two distinct perspectives. First, it examines the topic from the viewpoint of a technician during the installation and testing process. It then looks at the role of the maintenance technician who is responsible for the link after the network is operational.

Multimode and singlemode systems are addressed in four chapters that allow the viewer to select not only the fiber category they work with, but also the role that best applies to their job.

Common installation problems are examined, as well as problems that may appear as the network ages. We detail the steps required to isolate and resolve these and keep a fiber network operating in a reliable manner. The background and key features of various types of test and inspection equipment and the roles in which they are used are also discussed.

The DVD closes with a chapter titled *System Related Problems* that focuses on local area networks, troubleshooting data systems, CATV analog transmission of video signals and telephone companies using digital transmission of voice signals.



## Chapter Selections

### Introduction – 3:13

Troubleshooting a fiber span requires familiarity with different approaches and techniques. This chapter introduces typical singlemode and multimode issues, along with the roles of installation and maintenance technicians in a troubleshooting scenario.

### Identify, Locate and Resolve – 4:43

Learn how to apply the “identify, locate and resolve” philosophy to your troubleshooting discipline. Efficient isolation of the malfunction is the primary goal. Correct application of knowledge and equipment will simplify testing and troubleshooting.

### Connection Faults – 5:24

Connection points are the most frequent location of faults for both singlemode and multimode terminations. Learn how contamination, damage and other connector issues can degrade network performance, along with the equipment used to locate and resolve them.

### Span Faults – 9:23

Singlemode spans tend to be long with heavy outside plant exposure, while multimode spans tend to be shorter and generally found in campus

or building environments. Examine frequent trouble spots for both fiber types and methods for their quick identification.

### Faults at Splice Locations – 7:10

Splices occur frequently in singlemode installations. The marriage of the cable, closure and splice in the outside plant, as well as the use of pigtails, needs to be understood. The limitations of OTDRs in accurately distinguishing the cause are also discussed.

### Singlemode Acceptance Testing – 18:10

The installer’s role is to verify that both components and the span meet specifications. Standards provide us benchmark values; proper understanding and application of the concepts involved provides us with the means to achieve and maintain those values.

### Singlemode Troubleshooting – 15:00

Correctly applying troubleshooting skills and techniques is critical when a network is down or having intermittent problems. This chapter focuses on the identification and isolation of a variety of problems that a technician will encounter.

### Multimode Acceptance Testing – 9:51

This chapter focuses on how the OTDR and OLTS can be used to recognize fibers that do not meet specification. A variety of potential trouble spots are identified to familiarize the viewer and aid in deciding the best course for resolution.

### Multimode Troubleshooting – 8:19

This chapter focuses on examples of common and uncommon problems that technicians will encounter in fiber-optic systems. It expands on techniques and the roles of different test equipment, as well as the best methods for isolating and confirming the cause.

### System Related Problems – 8:01

This chapter provides an overview of problems that are not fiber-specific, but still affect the operation of a fiber optic link. Analog CATV, digital telephony and local area network applications are included, along with common optical transmitter and receiver issues.

### Bonus Materials

Comprehensive multimode and singlemode troubleshooting flow charts are included in addition to the instructor and student quizzes.

**Bonus Materials** – Troubleshooting flow charts, quiz in Word format with both student and instructor versions.