

Hands-On

# T1/T3 Testing & Trouble Analysis CATV

(for Broadband CATV Companies)



## Course Description

This Hands-On 2-day course is designed to train Broadband (Cable TV) Technicians and their Supervisors in the fundamentals of installation and testing of T1 and T3 circuits. This course does not include the HFC facilities.

## Students Will Learn

- **Students will Perform Tests (Hands-on Exercises) on portable training labs**
- **consisting of a Central Office switch (simulator), Digital Cross-connect System**
- **(1/0 DCS), Facility and the Customer location, NIU, CSU and Channel Bank e/w**
- **FT1 and other channel units.**
- **Using BERT test sets (e.g. TTC/Acterna/JDSU 224/107A/209A, etc. for T1 and 2310 & 310 for T3 testing.**
- **Sunset T10/T3/STS-1 may also be employed.**
- **Measure Levels at the DSX-1/3 (using a BERT)**
- **Option a Channel Bank, CSUs & NIUs**
- **Loop and Stress test various network elements**
- **Perform Timing tests and clear troubles on circuits with various trouble cases**

## Target Audience

Field Installation / Maintenance personnel, Head End (Central Office) technicians and their supervisors. Anyone requiring the knowledge and the understanding of T1 and T3 circuits.

## Prerequisites

Basic electrical concepts.

## Course Outline

### 1. A brief overview of the DS1 (T1) signal

- a. Framing Patterns (D4 SF, ESF & SLC)
- b. Alarms (Red, Yellow & Blue)
- c. Line Codes (AMI & B8ZS)
- d. Levels at the DSX-1, CSUs & NIUs & Timing tests
- e. Errors: BPV, Logic/Bit/CRC & Framing
- f. Basic test set operation (Tx LBO, Timing, Rx settings)
- g. In-Band & Out-of-Band loop codes (NIU, CSU & Intelligent Repeaters)
- h. Purpose for Stress Patterns (AMI & B8ZS)

### 2. A brief overview of the DS3 (T3) signal

- a. Framing Patterns (M13, C-bit & Unframed)
- b. Alarms: Red, Yellow, Blue & Idle,
- c. Line Codes: AMI, B8ZS, B6ZS & B3ZS
- d. Levels at the DSX-3 and cable lengths
- e. Errors: BPV, Logical & Framing

### 3. Option Test Set (BERT) for Monitoring, Terminated Tests, Bridged tests & Drop/Inset testing.

## Delivery Method

Instructor-Led with numerous Hands-On labs and 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