

Hands-On Genband (Nortel) DMS-10 Maintenance and Troubleshooting Course



Course Description

Widely recognized as the world's first all-digital switching system, the Nortel DMS-10 is one of the most popular digital switches ever produced, and still remains in widespread use today due to its high reliability and low-latency for voice circuits.

The Genband (Nortel) DMS-10 Switch Maintenance and Troubleshooting course presents a detailed description of the system, and provides the skills necessary to maintain and troubleshoot the switch and its related peripherals. General system architecture is discussed, with diagrams showing functional blocks, card-level call processing, and all the main modules including the NT3T98 CPU, clock, disk, TTY, and both the original "Classic" and Enhanced CNI networks. Links to the Network are also discussed in detail, describing both MLI and DS-30A PELP links, and the various types of line and trunk peripherals to which they connect. Specific peripherals for a given system can be emphasized as needed, such as PE, CE, LCE, DCM, DSI, etc. Miscellaneous Equipment is also discussed, including connections to the CCS7 network, announcement systems, etc.

The DMS-10's command line interface, including system level RES commands and menu Overlays are also demonstrated in detail. Many practical examples are used, such as an MO system image with faults, line testing, trunk testing, and alarm interrogation. Previous faults are also presented as exercises, where the student will determine the needed course of action. Their conclusions are then compared with the answers of what was actually done to correct these previous faults, providing an extremely effective learning method with zero impact to the network. Basic translations including new station numbers, TRVR and CNAM examples are shown. Training may also include any topic of particular interest to the student, or to a given region.

Finally, the Helmsman documentation viewer and NTPs (Series 400, 500, or 600) are covered in detail, with an emphasis on the documents & methodology used for maintenance and alarm clearing.

Students Will Learn

- **Switching Fundamentals**
- **DMS-10 System Architecture**
- **Theory of Operation**
- **Different Network configurations**
- **Bay Recognition and Pack Location**
- **How to use RES & OVLY commands**
- **Use and understand NTP documents**
- **Basic provisioning of station numbers and TRVR**
- **How to find the physical location of a fault**
- **How to change cards**
- **How to back-up the switch to disk**
- **Troubleshooting by previous examples**

- **And much more...**

Target Audience

Technical staff such as Central Office Technicians, NOC/SCC, certain management personnel, and those seeking cross-training or system interoperability with the DMS-10 switch.

Prerequisites

A basic understanding of telecommunications and switching principles is helpful due to the accelerated nature of the course. The Telephony Fundamentals Course is available for students with little or no previous telecom background.

Course Outline

Module 1 : Switching Fundamentals

- T&R, E&M, 2/4/8 Wire Circuits
- Supervision & Signaling
 - Negative Talk Battery
- AC & DC Superposition
- Decibels
log scale
copper, optical
 - Digital: A/D & D/A Conversion
- Nyquist Theorem
- Multiplexing Samples
- PCM bit depth - 8 bit, 10 bit
- Binary & Hexadecimal overview
 - Time Division Multiplexing (TDM)
- Pulse Code Modulation (PCM)
- Line Coding
- DS0/1/3
- MLI, DS-30A, DS-60, DS-256
- Transport: AMI, B8ZS, OC-x, STS-x
- Stored Program Control (SPC)
- Time-Space-Time
- PSTN & CCS7
- Why PSTN Support?

Module 2 : DMS-10 Theory of Operation

- DMS-10 Topology
- PELP & Di-Loops

- Functional Block Diagram
- Time Stage Peripherals
- Space Stage/Network incl. different matrix varieties
- Hardware Modules (400, 500 and 600 series):
- CPU: 3T98, MTI, "RTIF"
- IOI/GPIO: MO, 8T90 DDU, Tape
- Network: Classic & EN/CNI, IFPK, MLI & DS-x/PELP links
- Alarm: ALPT, Ring Monitoring
- Misc: CCS7 LAN, Modems, Announcers, etc.
- Trunk Peripherals: PE & CE, PSHF, DCM, DSI, etc.
- Line Peripherals: PE & LCE, PSHF, Drawers, ISDN
- Remotes
- RSC, RLCM, RLSE, RSLM
- RLCM family (OPM, OPAC, Star Hub) incl. HIE, RMM, & ESA
- SCM Packages (TR-8, GR-303, DMS-1U)
- Cluster Concept
- HSC-SSO
- LCC-SSO
- End-to-End Call

Module 3 : Terminal Access - TTY

- MTI: TTY0 & 1, SDI, DSDI
- Other TTYs, RS-232C, LAN & IP connections
- Starting Commands:
- Logi, Password, ####, ?, ****, Logo
- Resident Commands
- Sample RES Commands
- Overlays
- Why Overlays?
- Sample OVLY Types
- Examples
- Telnet (SHEL), RTOS UNIX shell
- NTP 297-3601-300 - Input/Output System

Module 4 : Commands

- Resident (RES) Commands
- Time, Date, TMAD, LIST TRB, CSEL, MON, ACC, OVLY, etc.
- OVLY Commands
- CKT
- CPK
- PED
- DED
- NED
- DN
- ODQ
- TRK
- LIT
- ALO

Notes

This course can be combined with other courses such as the DMS-10 Support Course for a customized curriculum.

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

5 Days