

# Hands-On DMS-10 System Translations, Routing, Trunking along with Troubleshooting Techniques



## Course Description

This Hands-On course will provide the skills necessary to perform day-to-day Translations and Routing including methods of Trunking. Determine how to troubleshoot translation failures which cause major service-affecting faults, lost and failed calls. Develop non-intrusive exercises to equip the students to conduct translation and routing procedures. Students will also cover various types of documentation including Helmsman , which will help greatly assist the operator working with the switch.



Widely recognized as the worlds 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 .The DMS-10 Switch

Translation Course will focus on providing the student with a detailed system description. Table development and modifying of translation tables created from office routing configurations. System architecture is discussed, with diagrams showing functional blocks, card level call processing, and all main modules including the various peripherals, including remotes typically used in Host/Remote configurations.

The switching network is also discussed in relation to call traffic carrying capacity, describing DS-30 PELP links, and the various types of line and trunk types they connected to specific peripherals for a given system. Miscellaneous Equipment is also discussed, including connections to CCS7, ANA (announcement systems). The DMS-10s command line interface, including System Level commands and menu Overlays are also demonstrated in detail.

Many practical examples such administration of MO system images, line testing, trunk testing, and alarm interrogation are shown. Training may include any topics of particular interest to the student, or to a given region, and may also include optional subjects like alarm descriptions, scan and signal distributor points, network management, Traffic details and external alarming. Finally, the Helmsman documentation viewer and NTPs (Series 602) are covered in detail, with an emphasis on the documents used for data modification, translations and output message systems .

## Students Will Learn

- **Switching Fundamentals (Introduction)**
- **Theory of Operation - DMS-10 Topology**
- **The primary equipment bays and modules used in a DMS-10 switching system, including the different types**

of remotes, plus key system features.

- **How to use the Command Interpreter, and the various types of commands**
- **Terminal Access - TTY**
- **Various types of documentation, Helmsman, NTPs, and installation drawings**
- **All translation Tables with emphasis on New and Change**
- **How to trace call progression through translation queries.**
- **How to query directory numbers, trunk groups, and other databases**
- **Where to find Emergency Procedures documentation such as recovery from system failures.**
- **How to use day to day translations (Operations)**

## Target Audience

Clerical and Technical staff such as personnel responsible for Central Office Translation, Routing, Trunking, Provisioning as well as CO Technicians, NOCSCC (Network Ops Center), management personnel, and those seeking cross-training on system interoperability. Technicians who are responsible for the maintenance and troubleshooting of Central Office systems, plus NOC personnel who respond to alarms, etc. No previous switching background is required, although some familiarity with CO equipment will be beneficial, providing a greater understanding of the resources needed to maintain and operate the system, and want a better understanding of translations and their crucial role in maintaining the switch.

## Prerequisites

A basic understanding of telecommunications and switching principles is helpful due to the accelerated nature of the course. Our BTS Telephony for TeleCom Techs or our TDM Switching 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

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 DS-30, DS-512  
Transport: AMI, B8ZS, OC-x, STS-x  
Stored Program Control (SPC)  
Time-Space-Time

## **Module 2: DMS-10 Theory of Operation - DMS-10 Topology**

Functional Block Diagram  
Time Stage/Peripherals - Space Stage/Network incl. different matrix varieties  
Hardware Modules (400, 500 and 600 series): CPU - 3T98, memory options, SDI/terminals IOI/GPIO: MO, 8T90 disk drive units, tape Network (Classic, CNI), MLI Interface, DS-x/PELP links Alarm, Ring Monitoring ME-CCS CE/PE Equipment (line, trunk incl. PSHF, DCM, etc.) LCM/LCME (various types), LCA, Drawers  
RLCM, RSC, OPM, ESA Option, etc.  
End-to-End Call - SS7 Network Routing

## **Module 3: Terminal DEVICES**

TTY 0 & 1, EIO, SMDI  
System Passwords  
Login, Logout  
Resident Commands Sample RES Commands  
Overlays, Sample OVLY Types Examples  
Basic Command Structure  
Telnet (SHEL), RTOS UNIX shell N  
TP 297-3601-300 - Input/Output System

## **Module 4: Commands**

Logi, Password, #####, ?, \*\*\*\*, Logo - Resident (RES) Level: LOGI, DEBUG, OVLY, QUE, TIME, MSG, STAT, etc. - OVLY: ALO, CED, CKT, DED, DN, IOD, PED, etc. - CKT - LIST, STAT, BUSY, RTS, etc. - CED - CLK, CORE, XTDR, etc.  
Critical, Major, Minor indicators  
NTP 297-3601-903 - Output Message Manual

## **Module 5: Documentation**

Helmsman v4.x  
CD-ROM, Server, Virtual Machine  
Nortel Technical Publications (NTP)  
297 Series (issues may vary) 297-3601-100  
General Description 297-3601-150  
Equipment Identification 297-3601-311  
Data Modification Manual 297-3601-316  
DIP Switch Settings 297-3601-511

Maintenance and Test 297-3601-902  
Output Message Manual 298-3601-903 P1&P2  
Job Site Documentation  
Equipment Assembly  
IS - Interconnect Schematic  
SD - Schematic Diagram

### **Module 6: Maintenance (Overview)**

Using the LIST Command: LKOT, FALT, BUSY, etc.  
Lines: PE (2T0x) LCE (6X17) HAZ  
Trunks: PE (6X30/31/32) CE (6X50)  
Locating Cards: QUE Examples - Replacing Line Pack: 6X17  
Replacing Ring Card: 3T59 vs. 6X30  
Test: PE (2T14, 2T19, 2T72) RA (2T85) OVLY TLT: Line Testing, LIT  
System Images: DUMP MO  
Translations: OVLY CPK NEW LPK (DEL) OVLYDN NEW STN (DEL, CHG, QUE) OVLY ROUT OVLY ALRM & Alarm Points - Exercises

### **Module 7: Troubleshooting**

NOC/SCC Interaction  
ESD Precautions  
Examples: TTY0 Connectivity, DSDI MO0 Card Change, Format HD Card Change, BKUP  
Alarm Investigation: LIST ALM ALPK LIST ALL STAT - CLK: STAT SYNC  
OVLY SHEL ARP, Ping, TELN - Emergency Procedures (EP): Cold Start Example  
Student Examples

### **Module 8: Translations (FUNCTIONAL)**

Lines/DNs Service Order Commands (ACT, ADO, DEL, DLO, MOV, NEW, etc.) Create a Line Pack  
Trunks  
OVLY TG (INC) (OGT) (2WAY)  
OVLY TRK, OVLY DTRK  
QUE TRK  
Tracing Translation Tools and Tables OVLY CLI OVLY TRAC  
TRVR, OVLY QTRN  
OVLY TRNS (ADDR) (PRFX) (SCRN) (CNFG)  
OVLY THGP  
CREATE OFFICE ROUTING MAP  
Create System High Level Overview

## **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