

U.S. Department of  
Homeland Security



IT "C" School

United States  
Coast Guard

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# Unit 2 - Adding Analog and Digital Phones

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*Analog Phone Programming – Digital Phone Programming – Moving, Changing,  
and Removing Phones*

STUDENT GUIDE



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**Notice to Students**

Purpose: This course will provide training on Nortel CS1000E installation, programming, troubleshooting and maintenance. The graduate of this course will possess the skills necessary to install and maintain a CallPilot Voice Processing System.

**IMPORTANT NOTE:** This text has been compiled for TRAINING ONLY. It should NOT be used in place of official directives or publications. The text information is current according to the references listed. You should, however, remember information available for your rating.

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## Lesson 1

# ANALOG PHONES

## Overview

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### Overview

In this lesson, you will be introduced to how to program analog phones. This lesson is designed to provide you with the key performance elements to assist you in adding analog phones. This lesson begins with an overview of analog phones. You will go over the process for adding phones which starts with gathering appropriate documentation. This will be followed by learning how to find available TNs and DNS. You will then program your new phone and verify the programming. Next, you will cross-connect the phones. This will be followed by a practice activity where you will verify the new service and document the installation. There will be a performance activity at the end of this lesson to test comprehension of the key performance elements that you'll need to perform for upcoming tasks.

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### Performance Objectives

Upon successful completion of this lesson, you will be able to:

- 2.1 **INSTALL** an analog phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.1.1 **REVIEW** manufacturer's documentation
    - 2.1.2 **REVIEW** applicable security policies
    - 2.1.3 **PERFORM** function check
    - 2.1.4 **COMPLETE** unit documentation
- 

### Performance Evaluations

The performance evaluations for these tasks are scheduled immediately following this lesson. These performance evaluations will be in delivered via a work order. These work orders will test the performance objective you have just completed in this lesson. These work orders will build in complexity based on previous tasks from previous lessons. These performance evaluations will be in a separate workbook from your student guide. Your instructor will hand out these workbooks out in class. Please do not complete these work orders prior to the instructor assigning them to you. You will work in your booth with your partner as a class. Your instructor will sign off these performance evaluations as you complete each tasks.

## Lesson Content: Overview, continued

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### References

We will be referring to the following Northern Telecom Publications (NTPs) as we go through this unit of instruction.

| Document   | Document #  |
|--|-------------|
| <i>Nortel Communication Server 1000 Installation and Commissioning</i>               | NN43041-310 |
| <i>Communication Server 1000 Software Input Output - Administration</i>              | NN43001-611 |
| <i>Communication Server 1000 Software Input Output - Maintenance</i>                 | NN43001-711 |
| <i>Communication Server 1000 Features and Services Fundamentals - Books 1 thru 6</i> | NN43001-106 |
| <i>Element Manager System Reference – Administration</i>                             | NN43001-632 |

### Tools and Equipment

The tools and equipment used for this lesson are:

- Three analog phones
- Standard IT tool kit

### Job Aids

The job aids for this lesson are:

- How to Add a New Phone
- How to Locate Available TNs
- How to Locate Available DNs
- How to Program a New Phone
- How to Verify and Document Service

### Handouts

There are no handouts for this lesson.

### Key Terms

Review the following key terms before you begin the reading assignment:

| Term | Definitions  |
|------|--|
| DN   | This is the physical location number of the card and unit. |
| TN   | This is the logical number assigned to the card.           |

### Pre-Lesson Work

There is no pre-lesson work for the lessons in this unit.

## Lesson Content: Overview, continued

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### Introduction

As an IT, one of your main duties is to ensure your customers have the proper equipment to perform their jobs. Telephone service is vital for communications, and is used in everyday work throughout the Coast Guard. A common task you will be required to complete is to add telephones to an existing system. It is essential that you are able to do this job quickly and efficiently to minimize customer inconvenience.

You've already learned how to physically install telephones which includes all necessary cabling and cross-connect. In this module, you learn how to program the PBX software when adding analog phones.

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### Digital versus Analog

These two types of phones are very different from each other, but they perform many of the same functions.

Digital phones are proprietary to the phone system that is being used. For the Nortel CS1000E, the phones that are used are the "Meridian 1"-style phones. These phones have keys that can be programmed with features that simplify the user's ability to access them.

Any phone that is not a digital phone is considered an analog phone; they can also be cordless phones or phones with special digital features that are provided by the phone itself.

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### Overlay Programs

When adding new phones to the Call Server, use the *Software Communication Server 1000 Software Input Output Administration*. There are two overlays within the CS1000E used for programming phones.

| Type of Phone     | Load  |
|-------------------|-------|
| 500/2500 (Analog) | LD 10 |
| Digital           | LD 11 |

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## Lesson Content: Overview, continued

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### Entering Responses

As you go through the prompts and responses in the *Communication Server 1000 Software Input Output Administration*, you will notice that some of them will not show up as you program the information into the database. This is because certain responses to prompts will enable and disable others, allowing only necessary entries to be made based on your input.

Becoming familiar with what prompts are necessary to build a new phone takes time, and we will be covering only the basic ones needed.

Where a value is shown in parentheses ( ) in the instructions, that is the default value. Hitting enter will select the default.

If an invalid response is entered, an error message will show on the screen, such as "SCH6400." An explanation of these can be found in the *Communication Server 1000 Software Input Output Reference - System Messages* document or by using the ERR command in OVLY000.

| Prompt | Response | Notes  |
|--------|----------|--|
| LD     | 10       | Enter LD 10                                      |
| REQ    | PRT      | Enter PRT  |
| TYPE   | 500      | Analog phone                                     |
| TN     | 0 0 4 0  | Location of circuit<br>(Loop Shelf Card<br>Unit) |
| DATE   | <cr>     |  |
| PAGE   | <cr>     |  |

In this example, the user requested to print an analog phone; the system accessed LD 20 from LD 10 and used the PRT command to display the programmed information for a 500 type telephone on TN 0 0 4 0 in LD 10.

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### Linked Loads

As of release 19, LD10, 11, 20 and 32 are linked together allowing you to access each load from another, meaning that you don't have to exit one program before entering another.

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## Lesson Content: Phone Features Overview

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### Introduction

In this unit you will learn to identify the features available to your customers on the Nortel CS1000E. The features of the CS1000E are similar to those of many PBX systems.

### Where to Find Information on Features

NTP NN43001-106-B1-6 *Communication Server 1000 Features and Services Fundamentals - Book 1 thru 6* are the main source for information about Nortel CS1000E system options and features. This document library can be found on each computer workstation in the classroom.

### Categories of Features

Below is a description of different feature categories:

| Feature Category                            | Description  |
|---|--|
| Flexible ringing and answering arrangements | Relate to calling and answering of telephone calls.  |
| Abbreviated dialing features                | Allow users to place calls by dialing fewer digits.  |
| Call coverage features                      | Provide telephone coverage when: <ul style="list-style-type: none"> <li>• User is unavailable or already on a call.</li> <li>• Caller must be routed to another destination for answering or assistance.</li> <li>• Called party must hold or conference the caller to obtain additional information.</li> </ul> |

### Accessing Features

How the customers access the features depends on the type of telephone set they use.

| Type of set          | How to Access Features  |
|----------------------|---|
| Analog 500/2500 sets | By using Special Prefix (SPRE) or Flexible Feature Codes (FFC) assigned to the features. A list of SPRE codes can be found in the Telephone and Console Fundamentals guide under the Operation chapter. |
| Digital sets         | Features can be assigned to keys on the set or the user can use SPRE or FFC codes.  |

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## Lesson Content: Access Restrictions

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### Class of Service (CLS)

Levels of access are important in the managing of users in a PBX. They provide you with a simple guide to follow whenever you add a new phone to the system. The levels relate to different options and features available to a particular phone and let the programmer know key information about a phone's role in the PBX. This also simplifies the information they need to gather about the particular phone they are adding.

The class of service access restriction is the first response listed by the CLS prompt when viewing a phone printout. When a user initiates a call, the system first examines the type of access restriction assigned to the telephone to determine whether to allow or deny the call.

The default class of service for a telephone is Conditionally Toll Denied (CTD). With a CTD class of service, the user has access to toll (long distance) calls through Basic Alternate Route Selection (BARS), a software feature that routes outgoing calls over the most cost-effective trunk facility available at the time of the call. This sophisticated routing feature ensures calls follow the most economical and efficient routes, which is known as least cost routing. In this environment, a CTD class of service tells the system to look at the set's Network Class of Service (NCOS) to determine call eligibility.

CTD is a commonly used class of service, however you can change the CLS to be more or less restrictive. For example, you might assign a more restrictive CLS to a hallway phone, while assigning a less restrictive CLS to the COMCEN.

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### Class of Service (CLS)

#### Fully Restricted Service:

- FRE: Allowed to originate and receive internal calls. Allowed access to TIE networks and from exchange network using call modification from an unrestricted phone. Access is denied through dialing to and from the exchange network.
- FR1: Allowed to originate and receive internal calls. Allowed access to TIE networks. Denied access to and from exchange network.
- FR2: Allowed to originate and receive internal calls. Denied access to TIE networks and to the exchange network.

**SRE - Semi-Restricted:** Allowed to receive calls from the exchange network. Restricted from dial access to the exchange network but allowed access to TIE trunks. Allowed to access the exchange network through an unrestricted phone.

**TLD - Toll Denied:** Allowed to receive calls from the exchange network and to dial local exchanges. Calling privileges of toll-denied telephones can be modified through additional features.

**CUN - Conditionally Unrestricted:** Allowed to receive calls from the exchange network. Toll-denied for calls placed using direct access to trunks, but unrestricted for toll calls placed through Automatic Number Identification (ANI). This class of service is no longer applicable as of 1995, with the update of the North American Numbering Plan (NANP).

## Lesson Content: Access Restrictions, continued

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**Class of Service (CLS)**     **CTD - Conditionally Toll Denied:** Allowed to receive calls from the exchange network. Toll-denied for calls placed using direct access to the Central Office (CO), Foreign Exchange (FEX), and two-way Direct Inward Dial (DID) trunks, but unrestricted for toll calls placed through Basic Automatic Route Selection (BARS) using Network Class of Service (NCOS). CTD is most effective when used in conjunction with Trunk Group Access Restrictions (TGAR).

**UNR - Unrestricted:** Users have no restrictions.

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| Class of Service Access Restrictions |     |                                   |                                  |  |   |     |     |
|--------------------------------------|-----|-----------------------------------|----------------------------------|--|---|-----|-----|
|                                      | UNR | CTD/CUN                           | TLD                              | SRE  | FRE   | FR1 | FR2 |
| <b>Incoming Trunk Calls</b>          | Yes | Yes                               | Yes                              | Yes  | Yes via call modification.<br>No Direct Access. | No  | No  |
| <b>Outgoing Non-Toll Calls</b>       | Yes | Yes                               | Yes                              | Yes via ATT or UNR set.<br>No Direct Access. | Yes via UNR set.<br>No Direct Access.           | No  | No  |
| <b>Outgoing Toll Calls (0 or 1+)</b> | Yes | Yes via BARS.<br>No Direct Access | Yes via ATT.<br>No Direct Access | Yes via ATT or UNR set.<br>No Direct Access. | No  | No  | No  |
| <b>To/From TIE Trunk</b>             | Yes | Yes                               | Yes                              | Yes  | Yes   | Yes | No  |
| <b>To/From Internal</b>              | Yes | Yes                               | Yes                              | Yes  | Yes   | Yes | Yes |

Figure 2.1.1: Class of Service Access Restriction

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## Lesson Content: Access Restrictions, continued

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### TGAR and TARG Relationships

Trunk Group Access Restrictions (TGAR) is a value assigned to a phone allowing you to "group" phones with like restrictions. This value is programmed in LD 10, LD 11.

Trunk Access Restriction Group (TARG) is a value assigned to the trunk route, allowing you to let the system know which phones will be restricted from accessing that trunk. This value is programmed in LD 16.

If the TGAR on the telephone matches the TARG on the route, the telephone is denied access. The TGAR and TARG both default to (1). TGAR 0 cannot block a caller from trunk access because the RDB does not recognize 0 as a restricted code. Therefore, TGAR 0 is considered unrestricted.

### TARG Chart

To keep track of the possible trunk and extension associations, we will build a chart. This chart will provide us with the necessary values to input all the TARG and TGAR values, allowing us to block trunk access to unnecessary users as well as allow it to those who need it.

|              | C | F    | P    | T | T | (LD 10,11,14) |
|--------------|---|------|------|---|---|---------------|
|              | O | T    | A    | I | G |               |
|              | T | S    | G    | E | A |               |
|              |   |      | E    |   | R |               |
| Barracks     | 1 | 1    | 1    | 1 | 1 |               |
| Shop         | 2 | 2    | 2    | 2 | 2 |               |
| Office       | 3 | 3    | 3    | 3 | 3 |               |
| TARG (LD 16) | 1 | 1, 2 | 1, 3 | 0 |   |               |

**Figure 2.1.2: TARG Chart**

In order to make these restrictions happen, you need to modify the TARG settings in the telephone programming.

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## **Lesson Content: Access Restrictions, continued**

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### **Network Class of Service**

Network Class of Service (NCOS) works with the class of service and TGAR features. NCOS applies to systems configured with alternate routing features, such as BARS.

The NCOS feature divides your users into different groups, each with its own eligibility criteria for making outgoing calls; for example, trunks the group can access and queuing during a trunk busy situation.

The response to the NCOS corresponds with a programming value called the Facility Restriction Level (FRL) to determine the telephone's degree of access to and from the exchange network for the NCOS group. The FRL ranges from 0 (low-privilege) to 7 (high-privilege). The default value is 0. This subject will be covered in more depth during the BARS portion of the course.

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## Lesson Content: Analog Phone Programming

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### Process for Adding a New Phone

The following steps are a part of the process to add a new analog phone to an existing PBX:

| How to Add a New Phone |   |
|------------------------|---|
| Step                   | Action  |
| 1                      | Gather information about the installation.                  |
| 2                      | Program the phone into the PBX.                             |
| 3                      | Cross connect and cable the phone to the customer location. |
| 4                      | Verify the installation is correct and complete.            |
| 5                      | <u>Document</u> all programming and cabling information.    |
| End of procedure       |   |

### Gather Information

In order to program the phone you need to get some information to ensure you understand everything you need to make this installation a success.

| If performing this task           | Gather this information       |
|-----------------------------------|-------------------------------|
| Programming the phone in the PBX  | Type of phone installing      |
| Programming and cabling the phone | Connectivity points           |
| Programming the phone             | Features the customer wants   |
| Programming the phone             | Extension number of the phone |
| Programming the phone             | Type of access for this phone |

**NOTE:** This information may sometimes be in the form of a conversation with the customer or it may be directed by your supervisor. Typically it is provided on the work order you receive when you are assigned the task of installing a new phone.

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## Lesson Content: Analog Phone Programming, continued

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### Locate Available TN

In order to program a new phone in the PBX you need to find an available port or Terminal Number (TN) to assign it to.

| How to Locate Available TNs |   |
|-----------------------------|---|
| Step                        | Action  |
| 1                           | Open the equipment cover.   |
| 2                           | Locate the Analog Message Waiting Line Card.  |
| 3                           | Identify the slot number where it is installed.<br><br><b>NOTE:</b> The slot number is the first part of the TN you use to program the phone. |
| 4                           | Log into the Call Server.   |
| 5                           | Enter <b>LD 10</b> .  |
| 6                           | At <b>REQ:</b> prompt enter <b>STAT</b> and the Loop Shelf Card # you identified (Stat L S C)   |
| 7                           | From the status printout, locate the first available unit on the card that is assigned as <b>UNEQ</b> .                                       |
| 8                           | Use this number (TN = L S C U) as the TN to program your new phone on.  |
| End of procedure            |   |

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## Lesson Content: Analog Phone Programming, continued

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### Locating Available TN

The following is an alternate method for locating an available TN:

| How to Locate Available TN (alternate method) |  |
|---|--|
| Step  | Action   |
| 1   | Log into the Call Server.  |
| 2   | Enter LD 20.   |
| 3   | REQ: LUVU.   |
| 4   | TYPE: 500.   |
| 5   | DATE: <CR>.  |
| 6   | TIME: <CR>.  |
|   | Note: The LUVU command will not work with cards that are considered Unequipped. There must be at least 1 programmed location for the card to be listed as available. |
| End of procedure                              |  |

### Locating Available DNs

Use the following procedure to locate available DNs:

| How to Locate Available DNs |  |
|-----------------------------|--|
| Step                        | Action                                 |
| 1                           | Log into the Call Server.              |
| 2                           | Enter LD 20.                           |
| 3                           | REQ: PRT.                              |
| 4                           | TYPE: LUDN.                            |
| 5                           | DN: Leave blank for all available DNs. |
| 6                           | DATE: <CR>.                            |
| 7                           | TIME: <CR>.                            |
| End of procedure            |  |

## Lesson Content: Analog Phone Programming, continued

### Explanation of Prompts and Responses

LD 10 has many different prompts that can be used when adding analog phones, but we will only go over the ones you will use to meet the needs of the requests defined in the work order used in class.

The notes below will guide you in using the guide for the first time. Refer to the *Communication Server 1000 Software Input Output Administration Guide* as you review these explanations.

| Prompt              | Response   | Notes   |
|---------------------|--|---|
| REQ                 | NEW  | We will be using the NEW prompt to build a new phone.   |
| TYPE                | 500  | The type of phone you are installing. All analog phones are Type 500.                                 |
| TN                  | L S C U (Loop # Shelf # Card Slot # and Unit #) values | Terminal number (TN) refers to the hardware or physical location of a circuit in your switch.         |
| CUST                | 0  | In class we will be using Customer 0 for all data block entries.                                      |
| DN                  | xxxx   | Directory Number (DN) assigned. This is the actual extension number that is called to ring the phone. |
| CPND                | NEW  | Call Party Name Display. Enter NEW at this prompt to program a name on the phone.                     |
| --NAME              | Barracks Desk  | What you are going to name the phone.   |
| HUNT                |  | DN to transfer calls to when this one is busy.  |
| TGAR                | Leave at default for now.                              | Trunk Group Access Restriction, This allows or denies this phone's access to trunks.                  |
| RNPG                | 1  | Pick up group assignment.   |
| Continued next page |  |   |

## Lesson Content: Analog Phone Programming, continued

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### Explanation of Prompts and Responses, contd.

| Prompt | Response                            | Notes  |
|--------|-------------------------------------|--|
| CLS    | Allow or Deny Features and Services | Class of Service options the phone will have. Use the <i>Communication Server 1000 Software Input Output Administration</i> and the <i>Software Feature Guides</i> .                     |
| LNRS   | <cr>                                | Last Number Redial Size. This is the maximum number of digits that can be stored in redial. Leave this at the default value (16 digits).   |
| FTR    |                                     | Features you want to assign to this phone. Use online <i>Software Feature Guides</i> along with the <i>Communication Server 1000 Software Input Output Administration</i> to assist you. |
| FTR    |                                     |  |

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## Lesson Content: Practice Activity—LD10: Analog Phone Worksheet

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### Directions

Now that you know where you will be programming your new phone, let's go over the necessary prompts and responses you will be using on the **LD 10—Analog Phones worksheet**. As your instructor goes over this worksheet, fill it out using one of the phones on the work order provided.

### LD 10 – Analog Phone Worksheet

| Prompt   | Response Phone #1 | Response Phone #2 | Response Phone #3 |
|----------|-------------------|-------------------|-------------------|
| REQ      |                   |                   |                   |
| TYPE     |                   |                   |                   |
| TN       |                   |                   |                   |
| DES      |                   |                   |                   |
| CUST     |                   |                   |                   |
| DN       |                   |                   |                   |
| -CPND    |                   |                   |                   |
| - - NAME |                   |                   |                   |
| HUNT     |                   |                   |                   |
| TGAR     |                   |                   |                   |
| NCOS     |                   |                   |                   |
| RNPG     |                   |                   |                   |
| CLS      |                   |                   |                   |
| LNRS     |                   |                   |                   |
| FTR      |                   |                   |                   |

## Practice Activity: Analog Phone Programming

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### Practice

Utilizing Work Order 01C complete **LD10—Analog Phones Worksheet**, and program the phone into the system.

Once the phone is programmed, test its features.

---

### Verify Programming

Once you entered the programming for your phone, use the procedure below to print to the screen verification that the phone was programmed correctly.

| How to Verify Programming |   |
|---------------------------|---|
| Step                      | Action  |
| 1                         | At the main overlay <b>OVL000</b> , enter <b>LD 20</b> .  |
| 2                         | At the <b>REQ:</b> prompt, enter <b>PRT</b> .   |
| 3                         | At the <b>TYPE:</b> prompt, enter <b>500</b> .  |
| 4                         | At the <b>TN:</b> prompt, enter the terminal number of the phone you want to print.                           |
| 5                         | Press the <b>Return</b> key for the rest of the prompts, until the terminal prints out the phone information. |
| End of procedure          |   |

---

## Practice Activity: Analog Phone Installation

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### Connecting the Phone Service

Once you have programmed your phone, you need to wire it to the proper work area outlet in order for it to be used by your customer. Your work order will provide you with the information you need to complete this installation. To cross connect the phone you will need to:

- Locate the TN termination point.
  - Locate the work area outlet.
  - Cross connect the phone.
- 

### Locate TN Service

TNs are based on the slot location within the PBX and the unit number used on the card in that slot. There is a cable that connects to that slot and runs to the termination field providing you an interface point to cross connect your circuits.

Use Installation and Commissioning Guide and site documentation to locate the cross-connect points you need to connect your phone.

---

### Locate Phone Cabling

You need to locate the cabling that goes to the work area outlet you will provide the new phone service to.

This path may include extra cross-connect point and patch panels, which will connect the work area outlet connection to the Telecommunications Closet (TC). Information for this can be found in your run sheets and cable pathway documentation.

---

### Cross-Connect the Phone Service

Once you find the cable path, cross connect to the programmed TN. This brings the phone service from the phone system out to the desired customer work area.

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### Function Check

Perform a functional check on each newly-installed phone, and ensure you document all programming and cross-connect terminations.

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## Summary

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### Lesson Summary

In this lesson, you programmed an analog phone. Upon completion of this student guide and after the lesson presentation and practice exercises, you should be able to:

- 2.1 **INSTALL** an analog phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.1.1 **REVIEW** manufacturer's documentation
    - 2.1.2 **REVIEW** applicable security policies
    - 2.1.3 **PERFORM** function check
    - 2.1.4 **COMPLETE** unit documentation
-

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## Lesson 2

### DIGITAL PHONES

#### Overview

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##### Overview

In this lesson you will be introduced to how to add digital phones. This lesson is designed to provide you with the key performance elements to assist you in adding digital phones. This lesson begins with an overview of digital phones. The process for adding analog phones is the same for adding digital phones. You will then program your new phone and verify the programming. Next, you will cross-connect the phones. This will be followed by a practice activity where you will verify the new service and document the installation as you did in the previous lesson. There will be a performance activity at the end of this lesson to test comprehension of the key performance elements that you'll need to perform for upcoming tasks.

---

##### Performance Objectives

Upon successful completion of this lesson, you will be able to:

- 2.2 **INSTALL** a digital phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.2.1 **REVIEW** manufacturer's documentation
    - 2.2.2 **REVIEW** applicable security policies
    - 2.2.3 **PERFORM** function check
    - 2.2.4 **COMPLETE** unit documentation
- 

##### Performance Evaluations

The performance evaluations for these tasks are scheduled immediately following lesson. These performance evaluations will be in delivered via a work order. These work orders will test the performance objective you have just completed in this lesson. These work orders will build in complexity based on previous tasks from previous lessons. These performance evaluations will be in a separate workbook from your student guide. Your instructor will hand out these workbooks out in class. Please do not complete these work orders prior to the instructor assigning them to you. You will work in your booth with your partner as a class. Your instructor will sign off these performance evaluations as you complete each tasks.

---

## Lesson Content: Overview, continued

---

### References

We will be referring to the following Northern Telecom Publications (NTPs) as we go through this unit of instruction.

| Document   | Document #  |
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| <i>Nortel Communication Server 1000 Installation and Commissioning</i>               | NN43041-310 |
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| <i>Communication Server 1000 Software Input Output - Maintenance</i>                 | NN43001-711 |
| <i>Communication Server 1000 Features and Services Fundamentals - Books 1 thru 6</i> | NN43001-106 |
| <i>Element Manager System Reference – Administration</i>                             | NN43001-632 |

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### Tools and Equipment

The tools and equipment used for this lesson are:

- Nortel CS1000E
  - Standard IT tool kit
- 

### Job Aids

The job aids for this lesson are:

- How to locate available TNs
  - How to locate available DNs
  - How to program a digital phone
  - How to verify and document service
- 

### Handouts

There are no handouts for this lesson.

---

### Pre-Lesson Work

There is no pre-lesson work for the lessons in this unit.

---

## Lesson Content: Digital Phone Programming

---

### Introduction

This unit covers programming digital phones. A digital phone is a phone that is proprietary to the Nortel CS1000 system. For Nortel, these are referred to as "Meridian 1" phones.

Digital phones typically use keys to access features, and must be programmed individually.

---

### Voice vs. Data Telephones

Digital phones in the CS1000E have the ability to support data ports, which are used to connect computers through the PBX. *We will not be adding data telephones in this course.*

In this unit, you will be adding a voice telephone.

---

### Using LD11

The process for adding a digital phone is similar to programming analog phones. LD 11, rather than LD 10, is used to program digital phones.

**NOTE:** LD 10 and LD 11 are linked, so you do not need to get out of LD 10 in order to enter an LD 11 command.

---

### Default Keys

Some digital telephone sets have keys that are preconfigured in the Call Server database. The default key configuration allows for expedited phone installation and configuration. Listed below are the default key assignments for a M3904:

| Key        | Feature                     |
|------------|-----------------------------|
| Key 0      | Primary DN                  |
| Keys 1-11  | Secondary DN or Feature     |
| Keys 12-15 | Blocked                     |
| Key 16*    | Message Waiting             |
| Key 17     | Call Transfer (TRN)         |
| Key 18     | Conference (AO6)/AO3        |
| Key 19     | Call Forward (CFW)          |
| Key 20     | Ring Again (RGA)            |
| Key 21     | Call Park (PRK)             |
| Key 22     | Ringing Number Pickup (RNP) |
| Key 23*    | Speed Call                  |
| Key 24     | Privacy Release (PRS)       |
| Key 25     | Charge Account (CHG)        |
| Key 26     | Calling Party Number (CPN)  |
| Key 27     | Callers List                |
| Key 28     | Redial List                 |
| Keys 29-31 | NUL                         |

\*These Keys require additional programming data

---

## Lesson Content: Digital Phone Programming, continued

---

### Adding a New Phone Process

The following steps are a part of the process to add a new digital phone to an existing Call Server:

- Gather information about the installation.
- Program the phone.
- Cross connect and cable the phone to the customer location.
- Verify the installation is correct and complete.
- Document all programming and cabling information.

### Locate Available TN

Just like adding an analog phone to the Call Server, you will need to find an available port or Terminal Number (TN) to assign the new digital phone to.

| How to Locate available TNs |  |
|-----------------------------|--|
| Step                        | Action   |
| 1                           | Open the equipment cover.  |
| 2                           | Locate the Digital Line Card.  |
| 3                           | Identify the slot where it is installed.<br><br><b>NOTE:</b> The card location is the first part of the TN you use to program the phone. |
| 4                           | Log into the Call Server.  |
| 5                           | Enter <b>LD 11</b> .   |
| 6                           | At the <b>REQ:</b> prompt, enter <b>STAT</b> plus the Loop Shelf Card # you identified in Step 3.  |
| 7                           | From the status printout, locate the next available unit on the card that is assigned as <b>UNEQ</b> .                                   |
| 8                           | Use this number (TN = L S C U) as the TN to program your new phone on.   |
| End of procedure            |  |

---

## Lesson Content: Digital Phone Programming, continued

---

### Locating Available TN

The following is an alternate method for locating an available TN:

| How to locate available TNs – alternate method |  |
|--|--|
| Step   | Action   |
| 1  | Log into the Call Server.  |
| 2  | Enter LD 20.   |
| 3  | REQ: LUVU.   |
| 4  | TYPE: 2616/3904.   |
| 5  | DATE: <CR>.  |
| 6  | TIME: <CR>.  |
|  | Note: The LUVU command will not work with cards that are considered Unequipped. There must be at least 1 programmed location for the card to be listed as available. |
| End of procedure                               |  |

### Locating Available DNs

Use the following procedure to locate available DNs:

| How to locate available DNs |  |
|-----------------------------|--|
| Step                        | Action                                 |
| 1                           | Log into the Call Server.              |
| 2                           | Enter LD 20.                           |
| 3                           | REQ: PRT.                              |
| 4                           | TYPE: LUDN.                            |
| 5                           | DN: Leave blank for all available DNs. |
| 6                           | DATE: <CR>.                            |
| 7                           | TIME: <CR>.                            |
| 8                           | SELECT DN.                             |
| End of procedure            |  |

## Lesson Content: Digital Phone Programming, continued

---

### Explanation of Prompts and Responses

The notes below will assist you in using the guide for the first time. Refer to the *Communication Server 1000 Software Input Output Administration Guide* as you review these explanations.

| Topic               | Pages                               | Notes  |
|---------------------|-------------------------------------|--|
| REQ                 | NEW                                 | We will be using the NEW prompt to build a new phone.  |
| TYPE                |                                     | The type of digital phone you are installing. This should be labeled on the bottom of the phone.   |
| TN                  |                                     | Terminal number (TN) refers to the hardware or physical location of a circuit in your switch.  |
| CUST                | 0                                   | In class we will be using Customer 0 for all data block entries.   |
| FDN                 |                                     | The DN that you will use for Flexible Call Forward No Answer.  |
| TGAR                | <cr>                                | Trunk Group Access Restriction. This allows or denys this phone access to trunks. Leave this at default at this point. We will come back to it in a later module.    |
| RNPG                | 1                                   | Pick up group assignment.  |
| CLS                 | Allow or Deny Features and Services | Class of Service options the phone will have. Use the <i>Communication Server 1000 Software Input Output Administration</i> and the <i>Software Feature Guides</i> . |
| HUNT                |                                     | The DN to transfer calls to when this one is busy.   |
| Continued next page |                                     |  |

---

## Lesson Content: Digital Phone Programming, continued

---

**Explanation of Prompts and Responses, contd.**

| Topic  | Pages | Notes  |
|--------|-------|--|
| KEY 0  |       | Typically KEY 0 is reserved for the Prime DN for a telephone. That means it is the primary directory number listed for that phone, its extension.  |
| -CPND  | NEW   | Call Party Name Display. Enter NEW at this prompt to program a name on the DN.   |
| --NAME |       | Features and options that needed SPRE or FFC codes in the analog phones to access can be assigned to these keys, allowing the user one button access to them. Implementation of the features and options are in the <i>Software Features Guide</i> . |
| KEY 1  |       |  |
| -CPND  | NEW   |  |
| --NAME |       |  |
| KEY 2  |       |  |
| KEY 3  |       |  |
| KEY 4  |       |  |
| KEY 5  |       |  |
| KEY 6  |       |  |
| KEY 7  |       |  |
| KEY 8  |       |  |
| KEY 9  |       |  |
| KEY 10 |       |  |
| KEY 11 |       |  |
| KEY 12 |       |  |
| KEY 13 |       |  |
| KEY 14 |       |  |
| KEY 15 |       |  |

## Practice Activity: LD 11 Digital Phones Worksheet

---

### Directions

Now that you know where you will be programming your new phone, let's go over the necessary prompts and responses you will be using on the **LD 11—Digital Phones worksheet**. As your instructor goes over this worksheet, fill it out by using one of the phones on Work Order 02C.

### LD 11: Digital Phones Worksheet

| Prompt       | Response #1 | Response #2 |
|--------------|-------------|-------------|
| REQ          |             |             |
| TYPE         |             |             |
| TN           |             |             |
| CUST         |             |             |
| DES          |             |             |
| FDN          |             |             |
| TGAR         |             |             |
| NCOS         |             |             |
| RNPG         |             |             |
| CLS          |             |             |
| HUNT         |             |             |
| LHK          |             |             |
| <b>KEY 0</b> |             |             |
| -CPND        |             |             |
| - -NAME      |             |             |
| <b>KEY 1</b> |             |             |
| -CPND        |             |             |
| - -NAME      |             |             |
| KEY 2        |             |             |
| KEY 3        |             |             |
| KEY 4        |             |             |
| KEY 5        |             |             |
| KEY 6        |             |             |
| KEY 7        |             |             |
| KEY 8        |             |             |
| KEY 9        |             |             |
| KEY 10       |             |             |
| KEY 11       |             |             |
| KEY 12       |             |             |
| KEY 13       |             |             |
| KEY 14       |             |             |
| KEY 15       |             |             |

---

## Practice Activity: Program Digital Phones

---

### Practice

Utilizing Work Order 02C complete **LD11—Digital Phones Worksheet**, and program the phones into the system.

---

### Verify Programming

To verify the programming for your phone, print it using LD 20.

| How to Verify Programming |   |
|---------------------------|---|
| Step                      | Action  |
| 1                         | At the main overlay <b>OVL000</b> , enter <b>LD 20</b> .  |
| 2                         | At the <b>REQ:</b> prompt, enter <b>PRT</b> .   |
| 3                         | At the <b>TYPE:</b> prompt, enter the type of digital phone you wish to print.                              |
| 4                         | At the <b>TN:</b> prompt, enter the terminal number of the phone you want to print.                         |
| 5                         | Press the <b>Return</b> key at the rest of the prompts until the terminal prints out the phone information. |
| End of procedure          |   |

---

## Lesson Content: Digital Phone Installation

---

### Connecting the Phone Service

Once you have programmed your phone, you need to wire it to the proper work area outlet in order for it to be used by your customer. Your work order will provide you with the information you need to complete this installation. To cross connect the phone you will need to:

- Locate the TN termination point.
  - Locate the work area outlet.
  - Cross connect the phone.
- 

### Locate TN Service

TNs are based on the slot location within the PBX and the unit number used on the card in that slot. There is a cable that connects to that slot and runs to the termination field providing you an interface point to cross connect your circuits.

Use Installation and Commissioning Guide and site documentation to locate the cross-connect points you need to connect your phone.

---

### Locate Phone Cabling

You need to locate the cabling that goes to the work area outlet you will provide the new phone service to.

This path may include extra cross-connect point and patch panels, which will connect the work area outlet connection to the Telecommunications Closet (TC). Information for this can be found in your run sheets and cable pathway documentation.

---

### Cross-Connect the Phone Service

Once you find the cable path, cross connect to the programmed TN. This brings the phone service from the phone system out to the desired customer work area.

Keep in mind when wiring digital sets that they are polarity-sensitive and that polarity mismatch may result in inoperative telephone service.

---

### Function Check

Perform a functional check on each newly-installed phone, and ensure you document all programming and cross-connect terminations.

---

## Summary

---

### Lesson Summary

In this lesson, you programmed a digital phone. Upon completion of this student guide and after the lesson presentation and practice exercises, you should be able to:

- 2.2 INSTALL** a digital phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.2.1 REVIEW** manufacturer's documentation
    - 2.2.2 REVIEW** applicable security policies
    - 2.2.3 PERFORM** function check
    - 2.2.4 COMPLETE** unit documentation
-

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## Lesson 3

### ADDING PHONES WITH ELEMENT MANAGER

#### Overview

---

##### Overview

In this lesson you will be introduced to how to add phones using Element Manger. This lesson is designed to provide you with the key performance elements to assist you in adding phones with Element Manager. This lesson begins with an overview of the phones menu in Element Manager. The process for adding phone templates will follow. You will then program your new phone and verify the programming. This will be followed by a practice activity where you will verify the new service and document the installation as you did in the previous lesson. There will be a performance activity at the end of this lesson to test comprehension of the key performance elements that you'll need to perform for upcoming tasks.

---

##### Performance Objectives

Upon successful completion of this lesson, you will be able to:

- 2.1 **INSTALL** an analog phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.1.1 **REVIEW** manufacturer's documentation
    - 2.1.2 **REVIEW** applicable security policies
    - 2.1.3 **PERFORM** function check
    - 2.1.4 **COMPLETE** unit documentation
  - 2.2 **INSTALL** a digital phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.2.1 **REVIEW** manufacturer's documentation
    - 2.2.2 **REVIEW** applicable security policies
    - 2.2.3 **PERFORM** function check
    - 2.2.4 **COMPLETE** unit documentation
- 

##### Performance Evaluations

The performance evaluations for these tasks are scheduled immediately following this lesson. These performance evaluations will be in delivered via a work order. These work orders will test the performance objective you have just completed in this lesson. These work orders will build in complexity based on previous tasks from previous lessons. These performance evaluations will be in a separate workbook from your student guide. Your instructor will hand out these workbooks out in class. Please do not complete these work orders prior to the instructor assigning them to you. You will work in your booth with your partner as a class. Your instructor will sign off these performance evaluations as you complete each tasks.

---

## Lesson Content: Overview, continued

---

### References

We will be referring to the following Northern Telecom Publications (NTPs) as we go through this unit of instruction.

| Document  | Document #  |
|---|-------------|
| <i>Communication Server 1000 Software Input Output - Administration</i> | NN43001-611 |
| <i>Communication Server 1000 Software Input Output - Maintenance</i>    | NN43001-711 |
| <i>Communication Server 1000E Maintenance Guide</i>                     | NN43041-700 |
| <i>Element Manager System Reference – Administration</i>                | NN43001-632 |

---

### Tools and Equipment

There are no tools needed for this lesson.

---

### Job Aids

There are no job aids for this lesson.

---

### Handouts

There are no handouts for this lesson.

---

### Key Terms

There are no key terms for this lesson.

---

### Pre-Lesson Work

There is no pre-lesson work for the lessons in this unit.

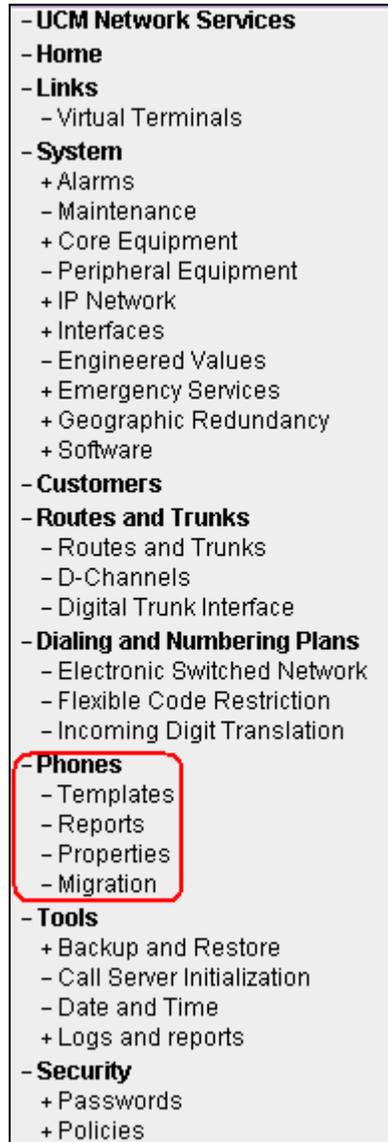
---

## Lesson Content: Phone Programming (Element Manager)

---

### Introduction

Element Manager (EM) Phone Provisioning functionality provides an interface to provision phones on CS 1000 systems. You access Phone Provisioning through the Phones branch of the Element Manager navigator as shown in the following figure.



**Figure 2.3.1**

Use Element Manager to configure phones for the Call Server. The configuration information described in this chapter corresponds to the Command Line Interface (CLI) prompts and responses for Telephone Administration traditionally configured in LD 10 and LD 11. Additional information is retrieved from the Call Server for validation purposes corresponds to Print Routines traditionally performed in LD 20, LD 21, and LD 22.

---

**Continued on next page**

---

## Lesson Content: Phone Programming (EM), continued

### Templates

Use Element Manager to access Templates that contain attributes common to a CS1000 phone type. After you create a template, use it to apply common attributes to a group of telephones, without having to repetitively define the same value for each telephone. In general, using a template is a more efficient method of adding large number of telephones than individually maintaining each telephone.

The administration pages for Templates are organized as a link named **Templates** inside the **Phones** section of EM navigator.

Click the **Templates** link to open the **Templates Web page**. The **Templates Web page** lists all available templates by name, the telephone type to which they apply, and the time and date of the last update. The action bar has buttons to add, export, import, and delete templates.

Managing: [EM on pecm1100\(172.16.100.2\)](#)  
[Phones](#) > [Templates](#)

---

### Templates

| <input type="checkbox"/>              | Template Name▲                         | Phone Type | Last Updated        |
|---------------------------------------|--|------------|---------------------|
| 1 <input checked="" type="checkbox"/> | <a href="#">2500 Digitone Standard</a> | 2500       | 2009-03-82 13:34:22 |
| 2 <input type="checkbox"/>            | <a href="#">M2006</a>                  | M2006      | 2009-03-82 14:02:57 |

Figure 2.3.2

---

**Continued on next page**

---

## Lesson Content: Phone Programming (EM), continued

### Creating Templates

To add a template, click **Add** on the **Templates Web page**. The **Template Details Web page** appears as shown below. Select the telephone type to use for the Template.

Managing: CS1000E Node5 (192.167.100.3)  
 Phones > Templates > Template Details

### Template Details

General Properties | Features | Keys

#### General Properties

Template name:

Telephone type:

Designation:

Directory number:

CLID entry:

#### Features

| Feature | Description                             | Value                               |
|---------|---|-------------------------------------|
| AACD    | Meridian Link Associated ACD Agent      | <input type="text" value="No"/>     |
| ABDA    | CDR on Abandoned Calls                  | <input type="text" value="Denied"/> |
| ADAY    | Alternate Redirection by Day Option     | <input type="text" value="0"/>      |
| AGRA    | Agent Greeting                          | <input type="text" value="Denied"/> |
| AGTA    | ACD Agent Analog Telephone              | <input type="text" value="Denied"/> |
| AHOL    | Alternate Redirection by Holiday Option | <input type="text" value="0"/>      |

#### Single Line Features

| Feature | Value   |
|---------|---|
| FTR CFW | <input type="text" value="NUL - Unassigned"/> |
| FTR SCU | <input type="text" value="NUL - Unassigned"/> |
| FTR SCC | <input type="text" value="NUL - Unassigned"/> |

Save Cancel

Figure 2.3.3

Continued on next page

## Lesson Content: Phone Programming (EM), continued

---

### Creating Templates, continued

The Template name identifies the template. If a template exists with the same name as specified, then an error message, "Template name already in use. Please specify another Template name." appears when you try to save the new template.

The templates are not system-specific; therefore, all the phone features and keys applicable to the selected phone type are available for configuration in the **Template Details Web page**. The available features and key features change based on the selected phone type.

Configure all required parameters, and click **Save** to save the template and return to the **Templates Web page**. The view refreshes to display the newly-added template.

After you create a template, you can use it to add telephones to the system. When you use a template to add a telephone, only those keys and features that are valid for the system in context appear in the **Phone Details Web page**.

---

You can define a new template from an existing telephone configuration. Select a telephone to convert to a phone template and view the new template in the **Template Details Web page**.

#### Save a phone as template

| Step  | Action   |
|---|--|
| 1   | To open the Search for Phones Web page, click the <b>Phones</b> branch of the Element Manager navigator.   |
| 2   | Select the telephone to save as a template from the Search Result section of the <b>Search for Phones</b> Web page.  |
| <b>Note:</b> You can create a template only from one telephone. An error message appears if you select multiple phones for creating a template. |  |
| 3   | Select <b>Save As Template</b> from the <b>More Actions</b> list as shown in the figures on the follow page.   |
| 4   | Enter a template name in the <b>Template name field</b> .  |
| <b>Note:</b> The Template name must be unique. If you enter an existing template name that an error message appears.                            |  |
| 5   | Click <b>Save</b> to save the template. <b>Search for Phones</b> Web page appears. The information of selected phone is converted into a telephone template. |

---

--End--

---

## Lesson Content: Phone Programming (EM), continued

### Creating Templates, continued

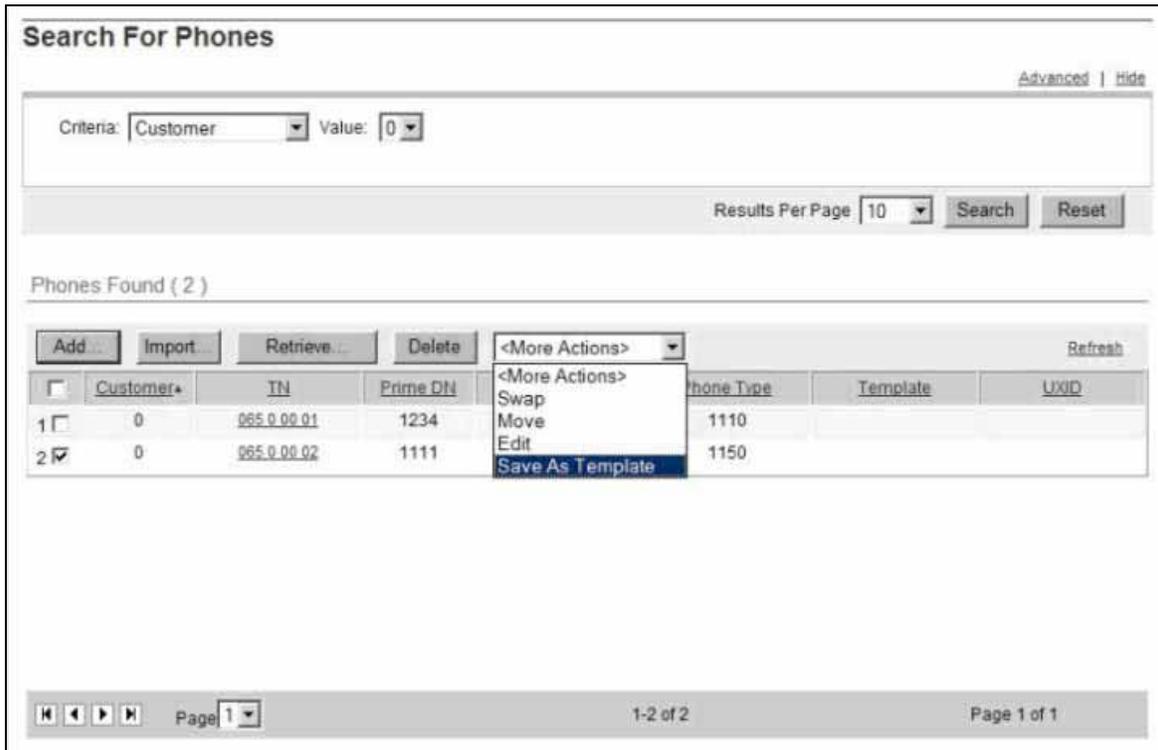


Figure 2.3.4

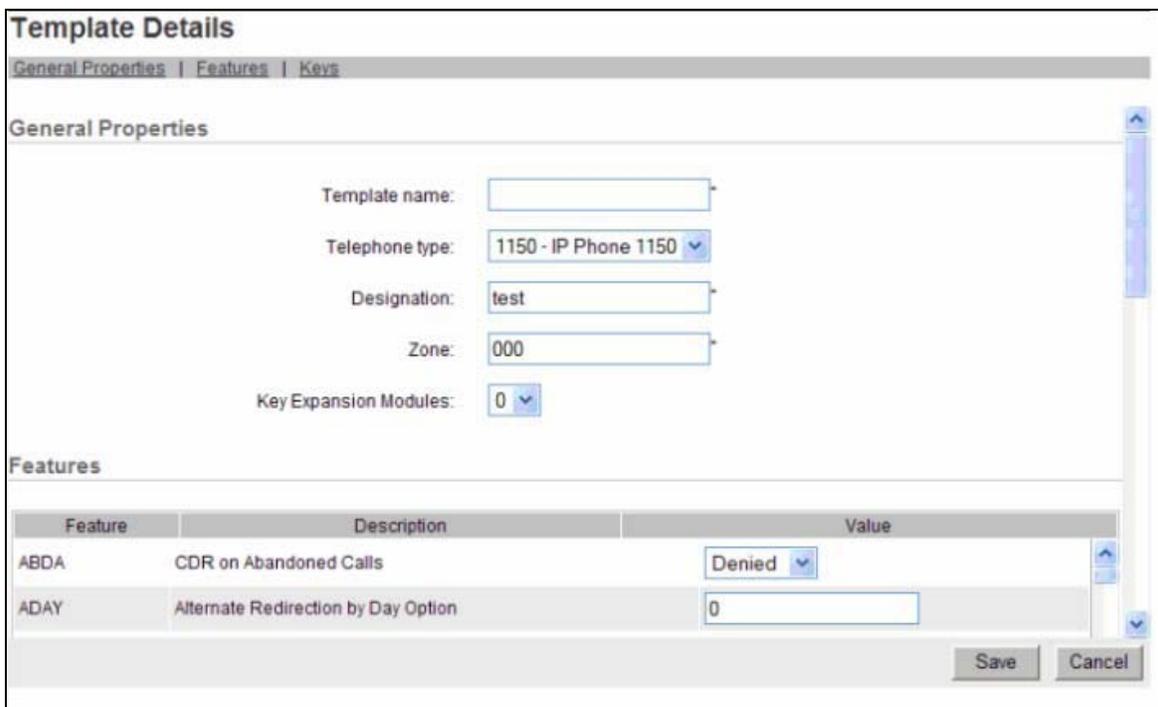


Figure 2.3.5

## Lesson Content: Phone Programming (EM), continued

---

### Searching for a Phone

Access the Phones functions in Element Manager from the **Search for Phones Web** page. Search for phones based on the following criteria:

- Prime DN
- Phone Type
- Terminal Number
- Designation
- Customer
- Template
- UXID

For example, to search for a telephone type, select Phone Type as the criteria and a telephone type from the Value list.

#### Search for phones

| Step  | Action  |
|---|---|
| 1   | Click the <b>Phones</b> branch of the Element Manager navigator to open the <b>Search for Phones Web</b> page, as shown on the following page.        |
| 2   | Select Template as the criteria from the Criteria list.   |
| <b>Note:</b> If you select no template as the criteria then the search returns all phones not associated to a template. |   |
| 3   | Enter a Value for the template to search for.   |
| 4   | Click <b>Search</b> . The <b>Search for Phones Web</b> page displays the telephones that match the specified Template as shown on the following page. |

---

--End--

---

## Lesson Content: Phone Programming (EM), continued

### Searching for a Phone, continued

Managing: CS1008E\_Node5 (192.167.109.3)  
Search for Phones

### Search for Phones

[Advanced](#) | [Hide](#)

Criteria: Template Value: No Template

Prime DN  
 Phone Type  
 Terminal Number  
 Designation  
 Customer  
 **Template**  
 LXID

Results per page: 20 Search Reset

Add... Import... Retrieve... Delete <more actions> Refresh

Select your search criteria, enter or select the desired value and click Search.

New Phones may also be added or retrieved.

Figure 2.3.6

### Search for Phones

[Advanced](#) | [Hide](#)

Criteria: Template Value: ABDA

Results per page: 20 Search Reset

Phones Found ( 28 )

Add... Import... Retrieve... Delete <more actions> Refresh

| <input type="checkbox"/>   | Customer | TN          | Prime DN | Designation | Phone Type | Template * | LXID |
|----------------------------|----------|-------------|----------|-------------|------------|------------|------|
| 1 <input type="checkbox"/> | 0        | 000.1.08.00 | 4502     | A1          | M2008      | ABDA       |      |
| 2 <input type="checkbox"/> | 0        | 000.1.08.01 | 4504     | A2          | M2008      | ABDA       |      |
| 3 <input type="checkbox"/> | 0        | 000.1.08.02 | 4506     | A3          | M2008      | ABDA       |      |
| 4 <input type="checkbox"/> | 0        | 100.0.02.04 | 4753     | DL          | 2050PC     | ABDA       |      |
| 5 <input type="checkbox"/> | 0        | 100.0.02.05 | 4754     | DL          | 2050PC     | ABDA       |      |
| 6 <input type="checkbox"/> | 0        | 100.0.02.06 | 7000     | IP1230      | 1230       | ABDA       |      |
| 7 <input type="checkbox"/> | 0        | 100.0.02.07 | 1002     | ABDA        | 2004P1     | ABDA       |      |
| 8 <input type="checkbox"/> | 0        | 100.0.02.08 | 1003     | ABDA        | 2004P1     | ABDA       |      |
| 9 <input type="checkbox"/> | 0        | 100.0.02.09 | 1004     | ABDA        | 2004P2     | ABDA       |      |

Page 1 1 - 20 of 28 Page 1 of 2

Figure 2.3.7

## Lesson Content: Phone Programming (EM), continued

### Adding Phones

#### To add phones

| Step | Action |
|------|--------|
|------|--------|

- 1 Click the **Phones** branch of the Element Manager navigator to open the **Search for Phones Web** page, as shown below.
- 2 Click the **Add** button to open the **New Phones web page**.
- 3 Select **Phone Type** from the drop down menu.
- 4 Click **Preview**. The **Phone Details** web page displays the configuration section for the phone type selected.
- 5 Enter phone configuration values.
- 6 Click **Finish**.

--End--

The screenshot shows the 'General Properties' configuration page in the CS 1000 Element Manager. The page includes the following fields and options:

- Customer Number: 0
- Terminal Number: 0 0 4 0
- Designation: Phone1
- Directory Number: 5000
- CLID entry:
- ANE entry:
- Map:
- First Name: Test
- Last Name: Phone1
- Display Format: First, Last
- Language: Roman

Below the 'General Properties' section is a 'Features' table:

| Feature | Description                        | Value |
|---------|------------------------------------|-------|
| AACD    | Meridian Link Associated ACD Agent | No    |

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**Figure 2.3.8**

**Note:** The configuration information described in this chapter corresponds to the Command Line Interface (CLI) prompts and responses for Telephone Administration traditionally configured in LD 10 and LD 11.

## Summary

---

### Lesson Summary

In this lesson, you programmed phones using Element Manager. Upon completion of this student guide and after the lesson presentation and practice exercises, you should be able to:

- 2.1 INSTALL** an analog phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.1.1 REVIEW** manufacturer's documentation
    - 2.1.2 REVIEW** applicable security policies
    - 2.1.3 PERFORM** function check
    - 2.1.4 COMPLETE** unit documentation
  - 2.2 INSTALL** a digital phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.2.1 REVIEW** manufacturer's documentation
    - 2.2.2 REVIEW** applicable security policies
    - 2.2.3 PERFORM** function check
    - 2.2.4 COMPLETE** unit documentation
-

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## Lesson 4

# PHONE MAINTENANCE

### Overview

---

#### Overview

In this lesson, you will be introduced to performing phone maintenance. This lesson is designed to provide you with the key performance elements to assist you in maintaining phones. This lesson begins with an overview of maintenance loads. This will be followed by a practice activity where you perform common maintenance functions. There will be a performance activity at the end of this lesson to test comprehension of the key performance elements that you'll need to perform for upcoming tasks.

---

#### Performance Objectives

Upon successful completion of this lesson, you will be able to:

**2.3 PERFORM** maintenance on a phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.

**2.3.1 REVIEW** manufacturer's documentation

**2.3.2 PERFORM** function check

---

#### Performance Evaluations

The performance evaluations for these tasks are scheduled immediately following this lesson. These performance evaluations will be in delivered via a work order. These work orders will test the performance objective you have just completed in this lesson. These work orders will build in complexity based on previous tasks from previous lessons. These performance evaluations will be in a separate workbook from your student guide. Your instructor will hand out these workbooks out in class. Please do not complete these work orders prior to the instructor assigning them to you. You will work in your booth with your partner as a class. Your instructor will sign off these performance evaluations as you complete each tasks.

## Lesson Content: Overview, continued

---

### References

We will be referring to the following Northern Telecom Publications (NTPs) as we go through this unit of instruction.

| Document  | Document #  |
|---|-------------|
| <i>Communication Server 1000 Software Input Output - Administration</i> | NN43001-611 |
| <i>Communication Server 1000 Software Input Output - Maintenance</i>    | NN43001-711 |
| <i>Communication Server 1000E Maintenance Guide</i>                     | NN43041-700 |
| <i>Element Manager System Reference – Administration</i>                | NN43001-632 |

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### Tools and Equipment

There are no tools needed for this lesson.

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### Job Aids

There are no job aids for this lesson.

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### Handouts

There are no handouts for this lesson.

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### Key Terms

There are no key terms for this lesson.

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### Pre-Lesson Work

There is no pre-lesson work for the lessons in this unit.

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## Lesson Content: Maintenance

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### Introduction

Performing maintenance on a line can be a regular activity on a CS1000 system. Maintenance functionalities allow administrators to check line status, disable, and enable card/unit level items in addition to many other options. These tasks may also serve an important role in the diagnoses of hardware faults.

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LD 32 performs checks and maintenance functions on network and Peripheral Signaling equipment. LD 32 will allow commands to be used for TDM cards.

On a CS1000E, this program can be used to:

- get the status of peripheral equipment cards and units
  - enable and disable peripheral equipment cards and units
  - initiate or cancel flash downloads for M39xx units
  - query and print the firmware versions currently on M39xx units
  - test message waiting lamps on 500/2500 telephone sets
  - print set and card IDs
- 

### Overlay 32 Linkage

Overlay programs 10, 11, 20 and 32 are linked, thus eliminating the need to exit one Overlay and enter another. Once one of the aforementioned Overlays has been loaded, it is possible to add, print and obtain the status of a set without having to exit one Overlay and load another.

Input processing has also been enhanced. Prompts ending with a colon (:) allow the user to enter either:

1. a question mark (?) followed by a carriage return (<CR>)

This entry will present you with a list of valid responses to that prompt.

2. an abbreviated response

The system responds to this entry with the nearest match. If there is more than one possible match, the system responds with SCH0099, the input followed by a question mark, and a list of possible responses.

The user can then enter a valid response.

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## Lesson Content: Maintenance, continued

### Common Maintenance Commands

The following table contains some of the most often used commands within LD 32.

| Action               | Command      |
|----------------------|--------------|
| Card Status          | STAT L S C   |
| Circuit Status       | STAT L S C U |
| Enable Card          | ENLC L S C   |
| Enable Circuit/Unit  | ENLU L S C U |
| Disable Card         | DISC L S C   |
| Disable Circuit/Unit | DISU L S C U |

### Maintenance Commands in Element Manger

When the user clicks the **Maintenance** link in the **System** branch of the Element Manager navigator, the **Maintenance** Web page appears. The user can choose how the options are presented. If the user chooses **Select by Functionality**, the diagnostic tool options are presented by functionality. The default view of **Select by Overlay** is shown below.

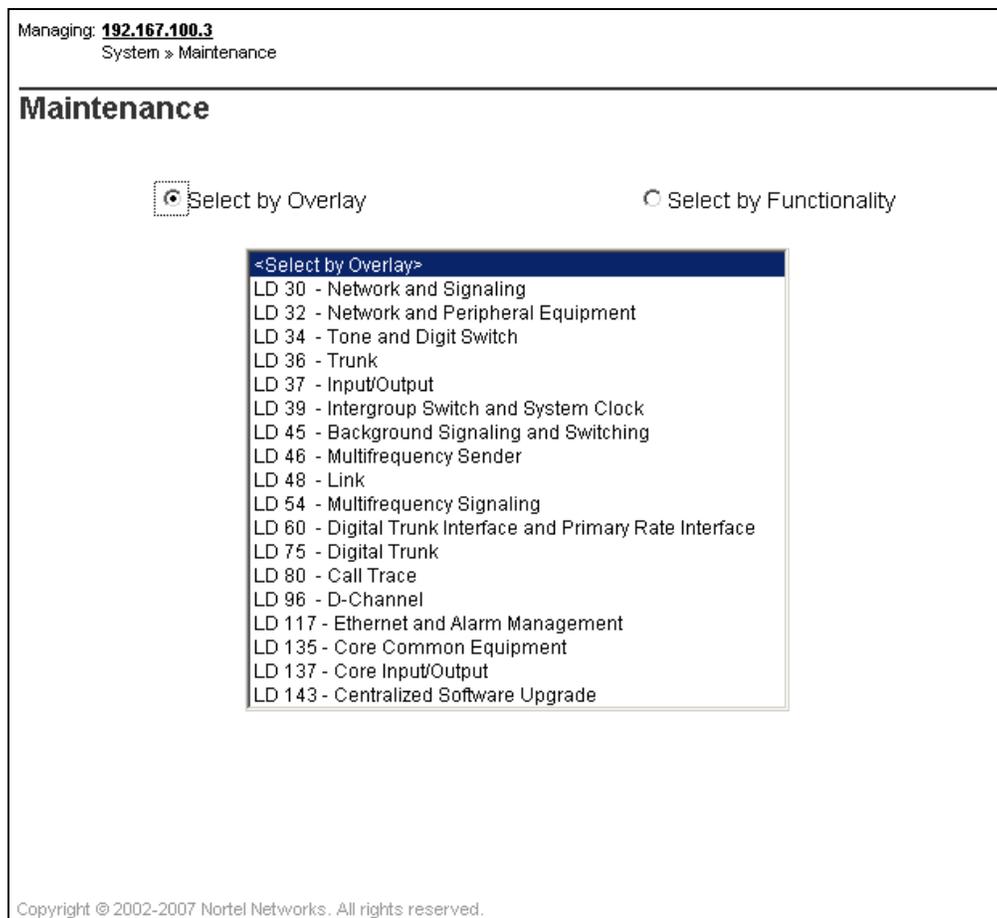


Figure 2.4.1

Continued on next page

## Lesson Content: Maintenance, continued

### Network and Peripheral Equipment

Click the **Network and Peripheral Equipment Diagnostics** link in the list of **Maintenance** diagnostic tools to open the **Network & Peripheral Diagnostics** Web page as shown below.

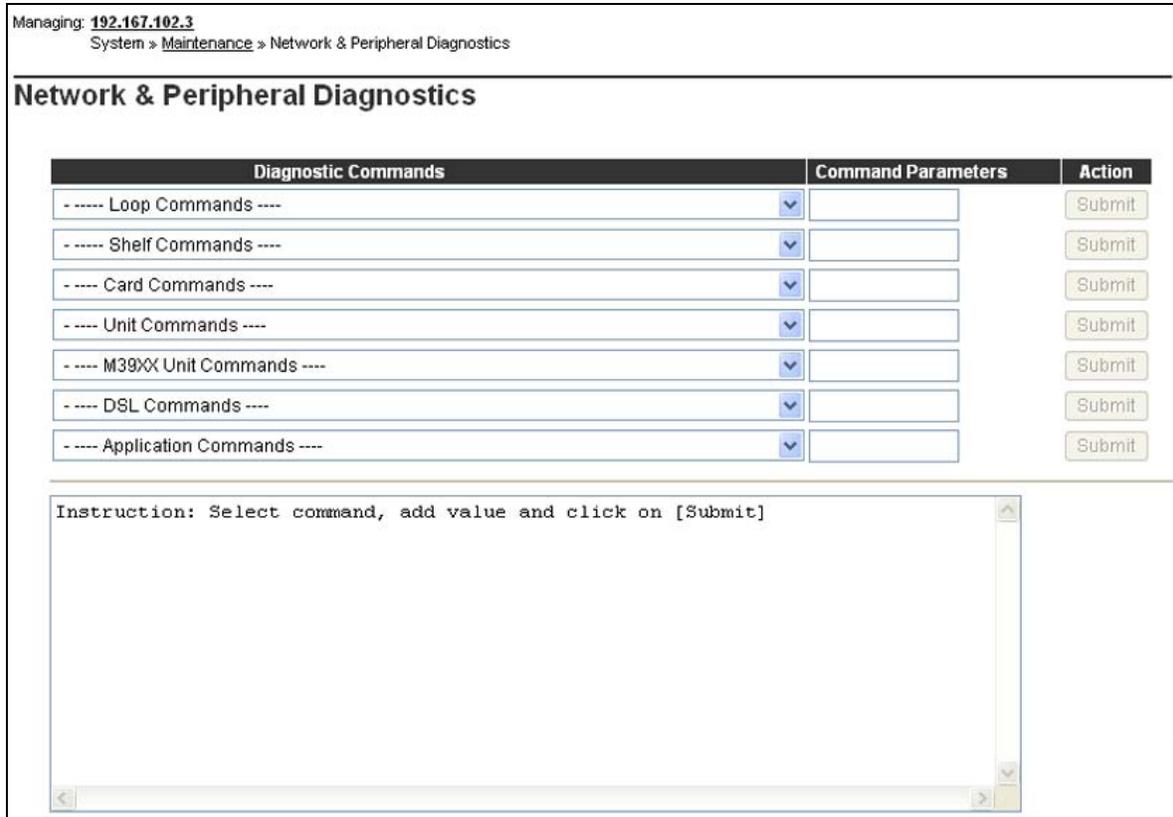


Figure 2.4.2

This Web page is used to test and maintain network and peripheral equipment. The commands available from this Web page correspond to the data traditionally maintained by using the LD 32 - Network and Peripheral Equipment Diagnostic.

|  |  |
|--|--|
| <p><b><u>Loop Commands</u></b></p> <ul style="list-style-type: none"> <li>• Network Loop                     <ul style="list-style-type: none"> <li>ENLL - Enable network loop</li> <li>DISL - Disable network loop</li> </ul> </li> <li>• Super Loop                     <ul style="list-style-type: none"> <li>STAT - Get status of Superloop</li> <li>SUPL - Print data for Superloops</li> <li>ENLL - Enable specified Superloop</li> </ul> </li> </ul> <p><b><u>Shelf Commands</u></b></p> <ul style="list-style-type: none"> <li>• DISS - Disable the shelf</li> <li>• ENLS - Enable specified shelf</li> <li>• LBSY - List TNs of all busy units</li> <li>• LDIS - List TNs of all disabled units</li> <li>• LIDL - List TNs of all idle units</li> <li>• LMNT - List TNs of all maint. busy units</li> </ul> | <p><b><u>Card Commands</u></b></p> <ul style="list-style-type: none"> <li>• General Card Commands                     <ul style="list-style-type: none"> <li>STAT - Get card status</li> <li>ENLC - Enable and reset card</li> <li>DISC - Disable peripheral card</li> <li>IDC - Print card ID for PE card</li> </ul> </li> </ul> <p><b><u>Unit Commands</u></b></p> <ul style="list-style-type: none"> <li>• General Unit Commands                     <ul style="list-style-type: none"> <li>STAT - Get unit status</li> <li>ENLU - Enable unit</li> <li>IDU - Print set ID</li> <li>DISU - Disable unit</li> </ul> </li> </ul> <p><b><u>M39XX Unit Commands</u></b></p> <ul style="list-style-type: none"> <li>• FDLC - Cancel/stop flash download</li> <li>• FDLU - Conditional download to one set</li> <li>• FWVU - Print firmware versions</li> <li>• FSUM - Print firmware versions</li> </ul> |
|--|--|

## Summary

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### Lesson Summary

In this lesson, you performed maintenance on a phone. Upon completion of this student guide and after the lesson presentation and practice exercises, you should be able to:

**2.3 PERFORM** maintenance on a phone using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.

**2.3.1 REVIEW** manufacturer's documentation

**2.3.2 PERFORM** function check

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## Lesson 5

# MOVES, ADDS, AND CHANGES

## Overview

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### Overview

In this lesson, you will be introduced to performing Moves, Adds, and Changes (MACs) on a phone. This lesson is designed to provide you with the key performance elements to assist you performing MACs. This will be followed by a practice activity where you perform common MAC services. There will be a performance activity at the end of this lesson to test comprehension of the key performance elements that you'll need to perform for upcoming tasks.

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### Performance Objectives

Upon successful completion of this lesson, you will be able to:

- 2.4 **PERFORM** a telephone Move, Add, Change (MAC) using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.4.1 **REVIEW** manufacturer's documentation
    - 2.4.2 **PERFORM** function check
    - 2.4.3 **COMPLETE** unit documentation
- 

### Performance Evaluations

The performance evaluations for these tasks are scheduled immediately following this lesson. These performance evaluations will be in delivered via a work order. These work orders will test the performance objective you have just completed in this lesson. These work orders will build in complexity based on previous tasks from previous lessons. These performance evaluations will be in a separate workbook from your student guide. Your instructor will hand out these workbooks out in class. Please do not complete these work orders prior to the instructor assigning them to you. You will work in your booth with your partner as a class. Your instructor will sign off these performance evaluations as you complete each tasks.

## Lesson Content: Overview, continued

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### References

We will be referring to the following Northern Telecom Publications (NTPs) as we go through this unit of instruction.

| Document  | Document #  |
|---|-------------|
| <i>Communication Server 1000 Software Input Output - Administration</i> | NN43001-611 |
| <i>Communication Server 1000 Software Input Output - Maintenance</i>    | NN43001-711 |
| <i>Communication Server 1000E Maintenance Guide</i>                     | NN43041-700 |
| <i>Element Manager System Reference – Administration</i>                | NN43001-632 |

### Tools and Equipment

There are no tools needed for this lesson.

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### Job Aids

There are no job aids for this lesson.

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### Handouts

There are no handouts for this lesson.

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### Key Terms

There are no key terms for this lesson.

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### Pre-Lesson Work

There is no pre-lesson work for the lessons in this unit.

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## Lesson Content: Moving, Adding and Changing Phones

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### Introduction

In order to provide the best service possible to your customer there are times it will be necessary to make modifications to previous installations. These routine modifications are typically called **MACs**, which stands for Moves, Adds, and Changes.

Previously you learned how to program a new phone into the PBX. Now you will learn how to modify and move these phones to suit the customer's needs.

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### Analog Phones

In **LD 10** you will be performing the following tasks for analog phones:

- Easy change
- Remove a telephone
- Copy a telephone
- Move a telephone

\* Refer to the *Communication Server 1000 Software Input Output Administration Guide* for additional information.

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### Digital Phones

In **LD 11** you will be performing the following tasks for digital phones:

- Easy change
- Move a telephone
- Copy a telephone
- Remove a telephone

\* Refer to the *Communication Server 1000 Software Input Output Administration Guide* for additional information.

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## Lesson Content: Moving, Adding and Changing Phones, continued

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### Making Changes

Use the steps below to help you make changes to an existing phone:

| How to Make a Move, Add, or Change |   |
|------------------------------------|---|
| Step                               | Action  |
| 1                                  | Log into the PBX.   |
| 2                                  | Enter the LD associated with the type of phone you are making changes to (LD 10—analogue, LD 11—digital).               |
| 3                                  | At the <b>REQ:</b> prompt, enter what task you are performing ( <b>CHG</b> , <b>OUT</b> , <b>CPY</b> , or <b>MOV</b> ). |
| 4                                  | At the <b>TYPE:</b> prompt, the type of phone you are making changes to.  |
| 5                                  | At the <b>TN:</b> prompt, enter the TN of the phone you are making changes to.  |
| 6                                  | Program the changes in Work Order 3C.   |
| 7                                  | <u>Document any changes</u> , and notify the customer.  |
| End of the procedure               |   |

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## Lesson Content: Moving, Adding and Changing Phones, continued

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### Explanation of Prompts and Responses

You will be given Work Order 03C to perform a move, change, or removal of some phones.

The following chart lists all the prompts required to complete these tasks:

| Prompts | Response                   | Notes  |
|---------|----------------------------|--|
| REQ     |                            | We will be using the CHG, MOV, CPU, and OUT responses.   |
| TYPE    |                            | The type of phone to make changes to.  |
| TN      |                            | Terminal Number  |
| ECHG    | <b>(No) Yes</b>            | Easy Change. Input a YES to enter easy change mode (only prompted when REQ=CHG).                                   |
| ITEM    | <b>Item Name and Value</b> | What item do you wish to change? This is where you place the prompt you are changing (only prompted when REQ=CHG). |
| TOTN    |                            | Destination TN to move your phone to (only prompted when REQ=MOV).   |

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## Summary

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### Lesson Summary

In this lesson, you programmed a digital phone. Upon completion of this student guide and after the lesson presentation and practice exercises, you should be able to:

- 2.4 PERFORM** a telephone Move, Add, Change (MAC) using both Command Line Interface (CLI) and Element Manager (EM) with 100 % accuracy as evidenced by a positive function check.
    - 2.4.1 REVIEW** manufacturer's documentation
    - 2.4.2 PERFORM** function check
    - 2.4.3 COMPLETE** unit documentation
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