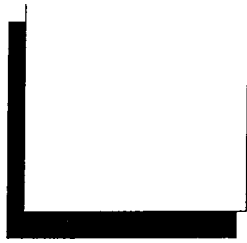


# Correspondence

## ***DXP***

# Training Manual

**COMDIAL**



# Contents

---

<u>Section</u>	<u>Page Number</u>
<b>Chapter One: Introducing The DXP .....</b>	<b>1-1</b>
1.1 Introducing This Course.....	1-1
1.2 Using The Video Series .....	1-2
1.3 Introducing The DXP Hardware .....	1-3
1.4 Introducing The DXP Main Cabinet .....	1-4
1.5 Using The DXP Modem .....	1-5
1.6 Using The Battery Backup .....	1-5
1.7 Identifying The Mandatory DXP Boards .....	1-6
1.8 Identifying The Station Boards .....	1-9
1.9 Identifying The Line Boards .....	1-11
1.10 Using The Auxiliary Board and Add-On Cards .....	1-14
1.11 Using The Conference Board.....	1-16
1.12 Introducing The Expansion Cabinet .....	1-16
1.13 Concluding Chapter Three .....	1-17
Chapter One Review Questions .....	1-18

<b>Section Number</b>	<b>Page Number</b>
<b>Chapter Two: Planning An Installation .....</b>	<b>2-1</b>
2.1 Introducing Chapter Two .....	2-1
2.2 Ordering The Right Equipment .....	2-2
2.3 Evaluating The Installation Site .....	2-3
2.4 Planning The Dedicated Equipment Room.....	2-3
2.5 Using The Right <b>Tools</b> .....	2-4
2.6 Preparing An MDF Diagram.....	2-5
2.7 Checking The Hardware .....	2-6
2.8 Testing The Stations .....	2-8
2.9 Concluding Chapter Two .....	2-8
Chapter Two Review Questions .....	2-9
<b>Chapter Three: Installing The DXP .....</b>	<b>3-1</b>
3.1 Introducing Chapter Three .....	3-1
3.2 Mounting The Main Cabinet .....	3-2
3.3 Mounting The Expansion Cabinet .....	3-3
3.4 Grounding The System .....	3-3
3.5 Installing The Power Supply .....	3-4
3.6 Connecting A Battery Backup .....	3-6
3.7 Installing The Boards .....	3-7
3.8 Connecting The Lines .....	3-10
3.9 Connecting The Stations .....	3-1 1
3.10 Testing The Stations .....	3-12
3.11 Connecting An External Paging Device .....	3-13
3.12 Connecting A Modem.....	3-14
3.13 Connecting A Music Source .....	3-15
3.14 Installing The Ring Generator.....	3-15
3.15 Connecting The PC Attendant .....	3-16
3.16 Connecting A Printer .....	3-17
3.17 Concluding Chapter Three .....	3-18
Chapter Three Review Questions.. .....	3-1 9

<b>Section</b>	<b>Page Number</b>
<b>Chapter Four: Programming The DXP .....</b>	<b>4-1</b>
4.1 Introducing Programming.. .....	.4-1
4.2 Using Other publications .....	.4-2
4.3 Two ways to Program .....	.4-3
4.4 Connecting Data Devices.. .....	.4-4
4.5 Using A Modem.....	4-5
4.6 Using The DXP Menus .....	4-6
4.7 Accessing the Main Menu.. .....	.4-7
4.8 Understanding The Main Menu .....	4-8
Chapter Four Review Questions .....	4-9
<b>Chapter Five: System Programming .....</b>	<b>5-1</b>
5.1 Introducing System Programming .....	.5-1
5.2 Master Clearing The System .....	5-2
5.3 Setting The System Defaults .....	5-4
5.4 Terminal Setup.. .....	.5-7
5.5 LCD Messages .....	5-8
5.6 Save/Restore Database .....	5-10
5.7 Serial Ports .....	5-12
5.8 SOHVA Table Programming.. .....	5-15
5.9 Speed Dial Programming .....	5-17
5.10 Time and Date (System Clock) .....	5-19
5.11 System Timing .....	5-20
5.12 System Parameters .....	5-26
5.13 Paging Zones.. .....	5-32
5.14 Change Password .....	5-34
5.15 Feature Renumbering .....	5-36
5.16 Programming The T1 Parameters .....	5-38
5.17 Major Alarm Reporting.....	5-38
Chapter Five Review Questions.. .....	5-39

Section	Page Number
<b>Chapter Six: Station COS Programming .....</b>	<b>6-1</b>
6.1 Introducing Station COS Programming.. .....	6-1
6.2 Account Codes .....	6-2
6.3 Automatic Hold .....	6-2
6.4 Background Music .....	6-3
6.5 Call Cost Display ( <i>Display Of Calls</i> ) .....	6-3
6.6 Call Forward .....	6-4
6.7 Call Park.. .....	6-6
6.8 Call Pick-Up .....	6-6
6.9 Call Waiting (Tone) .....	6-7
6.10 Camp-On Programming.. .....	6-8
6.11 Do Not Disturb Programming.. .....	6-9
6.12 Exclusive Hold .....	6-9
6.13 Executive Override Programming .....	6-9
6.14 Idle Line Programming .....	6-10
6.15 IST Distinctive Ringing .....	6-10
6.16 LCD Messaging .....	6-10
6.17 Meet Me Answer Page.....	6-11
6.18 Message Deposit ( <i>Response Messaging</i> ) .....	6-11
6.19 Message Wait Originate (Message Waiting) .....	6-11
6.20 Music Or Tone On Hold .....	6-12
6.21 Paging Receive .....	6-12
6.22 Paging Transmit .....	6-13
6.23 Ringing Preference (Ringing Line Preference) .....	6-13
6.24 Day Route Access/Night Route Access .....	6-14
6.25 Day Restriction Level/Night Restriction Level.....	6-15
6.26 System Speed Dial Groups .....	6-16
6.27 Directed Station Hold .....	6-16
6.28 Remote Station Disable .....	6-16
6.29 Station Monitoring .....	6-17
6.30 Line Answer.....	6-18

<b>Section</b>	<b>Page Number</b>
6.31 Line Originate .....	6-18
6.32 Periodic Line Tone.. .....	6-19
6.33 Maximum Call Duration .....	6-19
6.34 Line Group Access .....	6-19
6.35 Line Group Queue .....	6-20
6.36 Line-To-Line Transfer <b>(Unsupervised Conference)</b> .....	<b>6-20</b>
6.37 Voice Announce Block .....	6-20
6.38 Internal IST Flash.....	6-21
6.39 Forced Account Codes.. .....	6-22
6.40 Allow Busy Display <b>(Display Of Busy Status)</b> .....	6-22
6.41 Clear Major Alarm Ring .....	6-22
6.42 Handset Volume On Impact Telephones .....	6-23
6.43 Restrict ARS Hookflash .....	6-23
6.44 Quick Transfer .....	6-24
6.45 Enhanced LCD Display .....	6-24
Chapter Six Review Questions .....	6-25
<b>Chapter Seven: Station Programming .....</b>	<b>7-1</b>
7.1 Introducing Station Programming .....	7-1
7.2 Personal Intercom Number .....	7-2
7.3 Station Name .....	7-2
7.4 Class Of Service .....	7-2
7.5 Speed Dial Sets .....	7-3
7.6 Idle Line Priority .....	7-3
7.7 Intercom Hunt List .....	7-3
7.8 Group Intercom Access.....	7-4
7.9 Prime Line Programming.. .....	7-4
7.10 Tone Or Voice Signaling (Tone First) .....	7-5
7.11 Call Announce Beeps (Call Announce Tone Bursts).....	7-5
7.12 Default Forward Type .....	7-6
7.13 Forward RNA Ring Busy (Enhanced Call Forwarding) .....	7-7
7.14 Flexible Ringing Assignments .....	7-7

<b>Section</b>	<b>Page Number</b>
7.15 Personalized Ringing Tone .....	7-9
7.16 LCD Contrast .....	7-9
7.17 Service Observing .....	7-10
7.18 Day Exception Number/Night Exception Number .....	7-11
7.19 SOHVA Beeps (SOHVA Tone Bursts)SOHVA Groups.. .....	7-11
7.20 Busy On SOHVA.....	7-11
7.21 Pick-Up Groups .....	7-11
7.22 Through Dialing (Thru-Dialing) .....	7-12
7.23 Single Line Proprietary Telephone TAP Button.....	7-12
7.24 Ringing On Busy (Enhanced Subdued Ringing) .....	7-12
7.25 Allow Ringer Off (Ringer Volume Off) .....	7-13
7.26 Station Disable .....	7-14
7.27 DSS/BLF Consoles Installed .....	7-14
7.28 Programming Port (Database Programming Station). .....	7-15
7.29 Automatic Voice Mail Transfer On Busy .....	7-15
7.30 Headset .....	7-15
7.31 Attendant Position (Alternate, Overflow) .....	7-16
7.32 Extended DTMF Dialing .....	7-16
7.33 Interactive Button Support (Softkeys Setup) .....	7-17
7.34 IST Hold Confirmation .....	7-18
7.35 Transfer Ring Cadence .....	7-18
7.36 Ring Back On Busy .....	7-19
7.38 Telephone Types (Phone Types) .....	7-21
7.39 Copy Model Programming.. .....	7-22
Chapter Seven Review Questions .....	7-23
<b>Chapter Eight: Programming The Lines .....</b>	<b>8-1</b>
8.1 Introducing Line Programming.....	8-1
8.2 Line Name.....	8-2
8.3 Line Type .....	8-2
8.4 Line Disable .....	8-4
8.5 Music Or Tone On Hold .....	8-4

<b>Section</b>	<b>Page Number</b>
8.6 Automatic Privacy ( <i>Privacy Release</i> ) .....	8-5
8.7 SMDR .....	8-5
8.8 Cost Incoming .....	8-5
8.9 Pad Level-Transmit, Receive .....	8-6
8.10 Dialing Mode .....	8-7
8.11 Abandon Hold Release .....	8-8
8.12 Positive Disconnect Time .....	8-8
8.13 Toll Groups .....	8-9
8.14 DTMF Level .....	8-9
8.15 Busy Lead Detection.....	8-10
8.16 Disconnect Supervision.....	8-10
8.17 Caller ID Active .....	8-10
8.18 Voice Mail ID .....	8-1 1
8.19 DISA and DISA Voice Options .....	8-1 1
8.20 Line Group Programming .....	8-12
8.21 Copy Model Line .....	8-12
8.22 Direct Inward Dialing (DID) Support.. ..	8-1 3
8.23 DID Options .....	8-14
8.24 DID/DNIS Translation Tables .....	8-17
8.25 Direct Inward System Access (DISA) .....	8-18
8.26 Enabling Or Disabling DISA Lines .....	8-1 9
Chapter Eight Review Questions .....	8-20
<b>Chapter Nine: Intercom Numbers .....</b>	<b>9-1</b>
9.1 Introducing Intercom Programming .....	9-1
9.2 Modifying Intercom Numbers .....	9-2
9.3 Adding Intercom Numbers.....	9-3
9.4 Removing Intercom Numbers .....	9-3
9.5 Renumbering Intercom Numbers .....	9-4
Chapter Nine Review Questions .....	9-5



<b>Section</b>	<b>Page Number</b>
<b>Chapter Ten: SMDA/SMDR .....</b>	<b>10-1</b>
10.1 Introducing SMDA/SMDR Programming .....	10-1
10.2 SMDA/SMDR Parameters .....	10-2
10.3 Account Code (System Parameters).....	10-5
10.4 Emergency Numbers.....	10-7
10.5 Authorization Code .....	10-7
Chapter Ten Review Questions.. .....	10-8
<b>Chapter Eleven: Toll Restriction .....</b>	<b>11-1</b>
11.1 Introducing Toll Restriction.....	11-1
11.2 Restriction Levels .....	11-2
11.3 Toll Groups .....	11-3
11.4 Restricted Numbers .....	11-3
11.5 Exception Numbers .....	11-4
Chapter Eleven Review Questions.. .....	11-5
<b>Chapter Twelve: Automatic Route Selection .....</b>	<b>12-1</b>
12.1 Introducing Automatic Route Selection .....	12-1
12.2 ARS Enable.. .....	12-2
12.3 Line Groups for ARS .....	12-2
12.4 Route Tables (ARS) .....	12-3
12.5 Costing Information (ARS).....	12-6
12.6 Automatic Route Selection for Speed Dial Numbers.. .....	12-7
Chapter Twelve Review Questions.. .....	12-8
<b>Chapter Thirteen: System Printouts .....</b>	<b>13-1</b>
13.1 Introducing System Printouts.....	13-1
13.2 Identifying System Printouts .....	13-2
Chapter Thirteen Review Questions .....	13-3

<b>Section</b>	<b>Page Number</b>
<b>Chapter Fourteen: Diagnostics .....</b>	<b>14-1</b>
14.1 Introducing Diagnostics .....	14-1
14.2 Initialize Diagnostic Data .....	14-2
14.3 ROM Checksum Verification .....	14-2
14.4 Scratch RAM Test .....	14-2
14.5 Non Volatile RAM test .....	14-2
14.6 Time Switch Memory Test .....	14-3
14.7 Main CPU DTMF Receiver Test .....	14-3
14.8 AUX Board DTMF Receiver Test.. .....	14-3
14.9 Speaker Coefficients .....	14-4
14.10 CPU Board and DIP Switches .....	14-4
Chapter Fourteen Review Questions.. .....	14-5
<b>Chapter Fifteen: Peripherals .....</b>	<b>15-1</b>
15.1 Introducing the DXP Peripheral Equipment .....	15-1
15.2 Caller ID Programming.. .....	15-2
15.3 Tracker Paging System Programming .....	15-4
15.4 Digital Voice Announce Programming.. .....	15-6
15.5 PC Attendant Position Programming .....	15-12
15.6 Voice Mail Programming .....	15-14
15.7 Modem Setup .....	15-19
Chapter Fifteen Review Questions.. .....	15-20


 1

# Introducing The DXP

---

<b>Introducing The DXP.....</b>	<b>1-1</b>
1.1 Introducing This Course .....	1-1
1.2 Using The Video Series .....	1-2
1.3 Introducing The DXP Hardware .....	1-3
The DXP's modular design.....	1-3
1.4 Introducing The DXP Main Cabinet .....	1-4
1.5 Using The DXP Modem .....	1-5
1.6 Using The Battery Backup .....	1-5
1.7 Identifying The Mandatory DXP Boards .....	1-6
Interface Boards .....	1-6
Services Board .....	1-7
CPU Assembly .....	1-7
RAM Card.. .....	1-8
Software Card .....	1-8
1.8 Identifying The Station Boards .....	1-9
Analog Station Board.. .....	1-9
Digital Station Board .....	1-9
Industry Standard Telephone Board.....	1-10
Wiring The Stations .....	1-10
1.9 Identifying The Line Boards .....	1-11
Loop start line board .....	1-12
Multipurpose line board.. .....	1-12
TI board.. .....	1-13
DID board .....	1-13'

1.10	Using The Auxiliary Board and Add-On Cards .....	1-14
	DTMF Tone Card .....	1-14
	Communications Card.....	1-15
	Synchronization Card.....	1-15
1.11	Using The Conference Board .....	1-16
1.12	Introducing The Expansion Cabinet .....	1-16
1.13	Concluding Chapter One .....	1-17
	Chapter One Review Questions .....	1-18

# 1

## Introducing The DXP

### 1.1 Introducing This Course

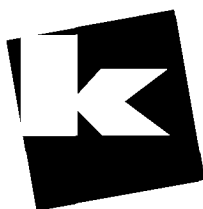
This book is part one of Comdial Corporation's three-part DXP Certification process. *You must pass all three portions* of the training to become an authorized DXP installer.

Once you complete the correspondence course, you can enroll in the Basic DXP course—a three-day class that introduces you to the fundamentals of DXP installation, programming, and operation. The final stage of your certification is the two-day Advanced DXP course, which covers some of the advanced features and peripherals, like the T1, Digital Voice Announce (DVA), and DID for example.

In addition to your correspondence manual, you should have received a series of training videotapes and the DXP System Manual. If you study all of these materials carefully, completing this correspondence course is fairly simple. You will find study questions at the end of each chapter in this manual; the answers to these questions are in the back of the book.

Keep in mind that the purpose of this course is to provide you with a *basic* overview of the DXP system and to prepare you for the classroom portion of the training.

For more information about the DXP, or for additional training materials, call Comdial's Inside Sales Department at 1-800-347-1432.



**A to Z KELLATRONICS, INC.**

**tel: 800.766.3425**

**fax: 800.720.1172**

**818.773.8888**

**818.773.8899**

**www.kellatronics.com**

**info@kellatronics.com**

## 1.2 Using The Video Series

The following list details the purpose of each of the videos in this series.

- When you have finished Part One, **Introducing The DXP**, you should be acquainted with the DXP hardware and printed-wire-boards, and you'll be ready to move on to Part Two, Planning an Installation.
- Part Two, **Planning an Installation**, evaluates the preliminary considerations for installation and programming. In Part Two, we'll survey the installation site and show you some of the pre-installation steps.
- Part Three, **Installing The DXP**, takes you step-by-step through the DXP installation, including hardware, software, wiring, and optional peripherals.
- In Part Four, **Programming The DXP**, we'll be programming the system, and we'll explain the features and applications that we use on that system; Any additional DXP features will be covered in the classroom portion of the training.
- Part Five, **Operating The Telephones**, gives you an overview of the DigiTech II, Impact, and Industry-standard telephones and explains how they operate through the DXP. The video also discusses individual station programming that the end-user can perform.
- Part Six, **Advanced DXP Features**, discusses a few of DXP's more advanced features.

When you have finished with all of this manual and have watched all of the correspondence training tapes, you should be familiar with the following:

- The versatility of the DXP system and how to best utilize the features and applications to meet your customer's needs;
- The DXP components-including system hardware, software, printed-wire boards, and telephones;
- Installation, wiring, and system checkout;
- Programming of a DXP system and stations,
- and finally, using the various telephones with the DXP.

By watching the training tapes and completing this correspondence course, you will be prepared to move on to the DXP classroom training. At the beginning of the in-class training, you will be given a pre-test based on the videos and correspondence course.

## **1.3 Introducing The DXP Hardware**

The DXP has a modular design with all of the system's switching circuitry housed on printed-wire-boards that simply slide in and out of the cabinets. Installing the DXP is quick and easy, and the variety of boards makes the system versatile enough to meet virtually any business's needs. The DXP is comprised of two cabinets, the main cabinet and the expansion cabinet.

### **The DXP's Modular Design**

One of the benefits of the DXP is its flexibility, and that flexibility comes from its modular design.

The term "Modular design" means that the system's electronic components are housed in a series of self-contained printed wire boards that can be arranged quickly and easily into a variety of configurations.

By changing the printed wire boards, you can find the right combination of features and telephone capacities to suit the needs of your particular client.

For example, if a client desires maximum line capacity, you can configure a fully-equipped DXP main cabinet and expansion cabinet for a total of 120 lines on 16 telephones. If a client wants maximum telephone capacity, you can configure the system to provide 32 lines on 192 telephones.

The number and type of boards that you install determines the DXP's line and telephone capacities. You can also update the DXP's software card to enhance the features and capabilities of the DXP.

The DXP allows you to make many of these modifications without disrupting the client's normal telephone service.

## 1.4 Introducing The DXP Main Cabinet

The main cabinet (DXCBM) contains the main power supply and up to 12 printed-wire-boards. The cabinet is 26 inches wide, 19 inches high, and twelve inches deep, and it's comprised of the following components:

- an external, ventilated sheet-metal housing with detachable front cover,
- the card cage-the metal frame into which you insert the printed-wire-boards,
- and the backplane-a large printed-wire-board that provides the circuitry to connect the individual boards together.

When you first open the main cabinet, you will see an empty space where the **power supply** is to be mounted. The power supply provides DC operating power for the DXP printed-wire boards and also for the individual digital stations as well. The power supply is shipped separately, and we'll cover it later in this manual.

The space directly above the power supply is reserved for **the ring generator**. Industry-standard telephones require voltage to enable ringing and to turn on the message-waiting lights; the ring generator supplies the required voltage to all of the IST stations on the DXP. You must have a ring generator if you are going to use IST stations, and you must have a ring generator in **each** cabinet that supports IST stations. It's a good idea, therefore, to plan on configuring all of your IST stations through one of the cabinets.

Moving from left to right in the main cabinet, the slots for the 12 boards are as follows:

- Interface board
- Services board
- CPU Board (RAM Card/Software Card)
- Universal 1 / Auxiliary Board
- Universal 2 / Auxiliary Board
- Universal slots 3, 4, 5
- Line slots 4, 3, 2, 1.

For more information on the DXP main cabinet, see GCA40-069 and IMI66-085.



**1.5**  
***Using The DXP  
Modem***

The space directly below the interface board (slot one) is reserved for the DXP modem, DXMDM. The modem allows you to service and program the DXP from a remote location. The modem runs at a maximum of 2400 baud, and it receives its power from the DXP power supply. Please note that this is a proprietary modem. For more information on the modem, see IMI89-139.

**1.6**  
***Using The  
Battery Backup***

You can install a battery backup (BBLDX) that provides a minimum of one hour of operation should the DXP lose power. The DXP supports a maximum of two battery backups. If you are using an expansion cabinet, you need two battery backups to guarantee at least an hour of backup operation. You can, however, use two battery backups without an expansion cabinet in order to provide even longer backup time. For more information on using the battery backup, see IMI89-074.

## 1.7 Identifying The Mandatory DXP Boards

The card cage of the main cabinet has grooves on the top and bottom racks to ensure that each printed-wire-board only fits into the correct slot. On the backplane are **pinouts** that match the **pinouts** on each board. These connections provide the contact points for the bus connectors that are edge-mounted on the printed-wire-boards. A horizontal metal bar runs along the backplane to provide structural support for the backplane; it also provides mechanical keying of the boards to the backplane to prevent you from accidentally inserting a board into the wrong slot. The front of the cabinet also has a printed label that designates which printed-wire-board fits into which slot.

Keep in mind that some of the DXP's boards are mandatory for system operation and some of them are optional.

### Interface Boards

The first slot in the cabinet, moving from left to right, is for the Interface 1 board (DXINM). The interface 1 board buffers the signals sent from the main cabinet to the expansion cabinet; it makes sure there is no integrity loss in the digital signal between the two cabinets. So, you'll only need an interface board if you're going to use an expansion cabinet (for information on the expansion cabinet's interface board, see section 1.9, *Introducing The Expansion Cabinet*). The slot for the interface 1 board is smaller than any of the other card-cage slots. The interface board is the only half-sized board that inserts directly into the backplane. Both interface boards, the one for the main cabinet and the one for the expansion cabinet, are shipped with the expansion cabinet. For more information on the interface boards, see IMI66-086.

## Services Board

The second slot is reserved for the Services board (DXSRV). The services board houses all of the following: the master timing and synchronization circuits for voice and data paths, the conferencing circuitry (the DXP has twenty-six time slots dedicated for conferencing) the digital pad for controlling audio on a per-channel basis, and the voice and data time switches. The services board also provides a 6-pin modular jack that serves as an input for music-on-hold and background music as well as an output for an external paging amplifier. The status light on the front of the board stays on-steady to indicate normal system operation. The light goes off or flashes to indicate system malfunction. For more information on the Services board, see IMI66-085.

## CPU Board Assembly

The central processing unit, or CPU, board belongs in the third slot (DXCPU-68K). The CPU board is actually an assembly containing the main board and two additional cards. The CPU board holds the primary processing and control circuits for the DXP system; it also contains the master processor, the interface connector for the system memory, two DTMF receivers, and the system calendar and clock. The CPU board has four 6-pin modular jacks that provide the interface for two serial data devices and four relay contacts. Just as with the services board, the status light is on-steady to indicate normal system operation. The CPU light, however, flashes to indicate system malfunction and is steady-off to indicate a loss of power.

Along with the printed-wire-boards that slide into the backplane, the DXP has smaller circuit cards that mount directly onto certain full-sized boards. We don't use the terms "card" and "board" interchangeably; boards mount directly into the DXP, while cards mount onto boards. Two of these additional cards, the RAM and Software cards, mount onto the CPU board and make up the assembly. For more information on the CPU board, see IMI66-085.

## Ram Card

The random access memory, or RAM, card holds the memory required to support the system's software package and database. The RAM card attaches directly to the CPU board, and its circuitry is connected to the CPU board through a 64-pin dual in-line connector. The RAM card is available in two forms: the standard RAM card, DXRAM-STD68K, and the expanded RAM, DXRAM-EXP68K. Both boards have a super capacitor that retains system programming for a minimum of 60 hours if the DXP loses power. The main difference between the two boards is that the standard RAM card provides approximately 200 Station Message Detail Records (SMDRs); the expanded RAM provides approximately 12,200 SMDRs. The expanded RAM also allows on-board software upgrade; a feature that increases the speed of upgrading the DXP software.

While the RAM card attaches directly to the CPU board the system software card attaches onto the RAM card. For more information on the Ram card, see IMI66-085, and IMI89-095.

## Software Card

The software card (DXPSW-xxx) houses the erasable, programmable, read-only memory, or EPROM, that stores the operating controls of the DXP telephone system. The software card attaches to the RAM card, and, like the RAM card, signals pass between these cards through a 64-pin dual in-line connector. Chapter Three details how to connect these cards. There are several different versions of software available for the DXP; the different software versions determine which telephones and features the system supports. For more information on the Software card, see IMI66-085, and IMI89-095.

## 1.8 Identifying The Station Boards

Station boards provide the interface for connecting the cables from telephone stations to the DXP. You can use a station board in Universal slots 1 through 5 in the main cabinet and universal slots 6 through 11 in the expansion cabinet. The DXP accepts digital, analog, and industry standard telephones. In order to use these different types of stations, you must install the correct station board. The following list explains each station board.

The stations are labeled on the front of the cabinet; note that the station designations go from the left to the right.

For more information on the Station boards, see **IMI66-085**.

### Analog Station Board

The analog station board provides support for Comdial's proprietary analog telephones (such as the various **ExecuTech** models). Each board supports either 8 or 16 stations and uses either one or two 25-pair **amphenol** connectors to go from the station board to the station punch-down block. A precharge port is provided for board removal or insertion without system power-down. The light on the front of the station board indicates the board's status of operation. If the light is steady-off with a five-second blink rate, all of the station ports are idle; if the light is steady-on with a five-second blink rate, at least one station port is busy. Both steady-on and steady-off indicate a board malfunction, and a rapid flash indicates a malfunctioning micro-processor.

### Digital Station Board

The digital station board provides support for Comdial's proprietary digital telephones (such as the **Impact** and **DigiTech**). Each board supports either 8 or 16 stations and uses either one or two 25-pair **amphenol** connectors to go from the station board to the station punch-down block. A precharge port is provided for board removal or insertion without system power-down. The light on the front of the station board indicates the board's status of operation. If the light is steady-off with a five-second blink rate, all of the station ports are idle; if the light is steady-on with a five-second blink rate, at least one station port is busy. Both steady-on and steady-off indicate a board malfunction, and a rapid flash indicates a malfunctioning micro-processor.

### Industry Standard Telephone Board

The industry-standard station board provides support for industry-standard telephones. Each board supports either 8 or 16 stations and uses either one or two 25-pair amphenol connectors to go from the station board to the station punch-down block. A precharge port is provided for board removal or insertion without system power-down. The light on the front of the station board indicates the board's status of operation. If the light is steady-off with a five-second blink rate, all of the station ports are idle; if the light is steady-on with a five-second blink rate, at least one station port is busy. Both steady-on and steady-off indicate a board malfunction, and a rapid flash indicates a malfunctioning micro-processor.

*NOTE: Remember that you will need a ring generator for each cabinet that has any IST stations. You also will need a DTMF receiver card if your site requires more than two simultaneous dialing paths.*

### Wiring The Stations

The following chart details the wiring requirements for all of the different stations.

Station Type	Wire Gauge		
	20 AWG	22 AWG	24 AWG
Digital Telephone	2500 Feet	2000 Feet	1500 Feet
Analog Multiline Telephone	2500 Feet	2000 Feet	1500 Feet
Analog Single-Line Proprietary Telephone	4000 Feet	3500 Feet	3000 Feet
Industry-Standard Telephone	4000 Feet	3500 Feet	3000 Feet

## 1.9 Identifying The Line Boards

Line boards provide the interface for connecting the central office, or CO, lines to the DXP. You can use a station board in Universal slots 1 through 5 in the main cabinet, universal slots 6 through 11 in the expansion cabinet, and line slots 1 through 4 in the main cabinet (you can only install a T1 board in the second line slot or the fifth universal slot of the main cabinet, or in universal slot 8 or 12 in the expansion cabinet). While line boards are optional, it's rare that you will have an application that won't require CO lines. The DXP supports several different types of line boards,

- **Loop start,**
- **Multipurpose,**
- **Direct Inward Dialing, or DID,**
- **and T1.**

Make sure that the lines coming from the CO match the line boards that you install in the DXP. Having a T1 board does not mean you have T1 lines, for example. Be sure to coordinate with your CO before you plan your line configurations. Special software may be required to support certain line boards. Your class instructor will give you further details on software requirements when you take the classroom portion of the training.

Like the station boards, each line board has a pre-power jack that allows a technician to service the board while the DXP still has AC power.

The status light on each line board indicates when a line is in use: off with a five-second blink rate on indicates that all lines are idle; on with a five-second blink rate off indicates at least one busy line. A rapid flash indicates a malfunctioning microprocessor on the line board. All line boards provide secondary surge protection; Chapter Three discusses secondary and primary surge protection.

### **Line Boards-Loop-start Line Board**

The loop-start line board (DXPCO-LP8, LP4) supports loop start lines, and it is available in either a four- or eight-port capacity. Each loop-start line board has modular jacks that provide connections for either four or eight lines. You can connect an industry-standard telephone to the bottom jack to serve as a power-failure telephone. If the DXP should lose power, the power-fail telephone will continue to operate. The LED on the front of the board indicates when a line is in use: off with a five-second blink rate on indicates that all lines are idle; on with a five-second blink rate off indicates at least one busy line. A rapid flash indicates a malfunctioning microprocessor on the line board. Each loop-start board also has a power fail and auxiliary interface. For more information on the loop start board, see [IMI66-085](#).

### **Line Boards-Multipurpose Line Board**

The multipurpose line board (DXPCO-GD8, GD4) supports loop start lines, ground start lines, or E and M tie lines. Like the loop start board, the multipurpose board also is available in either a four- or eight-port capacity, and you can use any combination of the three line types. However, ports three and four on each multipurpose board are the only ports that support E and M tie lines. The LED on the front of the multipurpose board functions exactly like that on the loop start board; each multipurpose board also has a power fail and auxiliary interface. For more information on the multipurpose board, see [IMI89-097](#).



## Line Boards-T1 Board

The T1 board (DXPT1) provides 8, 16, or 24 channels of voice transmissions over a single four-wire cable using multiplexing techniques. You can install a maximum of four T1 boards, two in each cabinet, but you can only install a T1 board in the second line slot or the fifth universal slot of the main cabinet, or in universal slot 8 or 12 in the expansion cabinet. You can configure the T1 board with a combination of loopstart, ground start, DID, and E & M Tie lines. When you take the DXP classroom training, you'll get a more in-depth overview of the T1 board. For more information on the T1 board, see IMI89-141.

## Line Boards-DID Board

The DID board (DXPCO-DD8, DD4) lets stations have their own telephone number without having a separate line dedicated to that station. The basic idea of DID is this: the central office sends digits to the DXP, which interprets the digits and routes the call to the appropriate station. For example, you can have fifty stations and only ten DID lines, and each station can still have its own published telephone number. However, only ten of the stations can be on calls at one time. DID lines are incoming only, so if you need outward dialing, you'll need more than just DID lines. Like T1, DID will be covered more deeply in the classroom portion of this training. For more information on the DID board, see IMI89-103.

## 1.10 Using The Auxiliary Board and Add-On Cards

The auxiliary board is an all-purpose “mother board” that accommodates up to four smaller option cards. You can install two auxiliary boards in the DXP, but you can only install them in the Universal / Auxiliary slots of the main cabinet. The option cards include the DTMF Tone card, DXOPT-TON, the communications card, DXOPT-COM, and the T1 sync. card, DXOPT-SYN. These cards mount onto the auxiliary board, much like the RAM and software cards mount onto the CPU board.

While you can install a station, line, conference, or auxiliary board into either universal / auxiliary slot (first two slots next to the CPU board), we recommend that you try to leave at least one of these slots for an auxiliary board, even if you don’t need an auxiliary board now, you may want to expand the system later. Remember, these are the only two slots in the entire system that will accept an auxiliary board. Use the line slots and universal slots for line and station boards before you use a universal / auxiliary slot.

### DTMF Tone Card

The DTMF tone card expands the DXP’s industry-standard dialing capability: without a tone card, only two industry-standard telephones can dial out of the DXP simultaneously. Each DXOPT-TON card provides four more IST dialing paths. So if you are going to have several IST telephones, it’s a good idea to install a tone card to make sure that more than two of them can dial-out simultaneously. You can install four tone cards on each auxiliary board (see IMI89-078, *IST Installation Instructions*, for more information).

## Communications Card

The auxiliary board also supports the communications card (DXOPT-COM); the DXP has two serial data ports on the CPU board. Each communications card provides four additional serial data ports; you may need these ports for additional PC Attendants or printers, for example. Keep in mind that the two serial ports on the CPU board are the only two true-high-speed ports. Depending upon system traffic, the serial ports on the comm. card may not operate at a true 9600 baud rate. You can install up to two comm-cards on each auxiliary board, but you *must* install them on the bottom two slots of the auxiliary board. For more information on the Comm. card, see IMI89-124.

## Synchronization Card

Finally, the DXOPT-SYN, or sync. card, adjusts the DXP T1 transmit frequency to match the frequency received from the central office or master DXP. You only need a sync. card if you are using the T1 board, and you can only install one sync. card into the DXP. If your T1 board is connected to the C.O., you must have a sync. card. If you have two DXPs connected together with the T1 configured as E & M tie lines, only one DXP must have a sync. card. For more information on the sync. card, see IMI89-141.

## **1.11 Using The Conference Board**

The DXP services board provides for a limited amount of conferencing. If additional conferencing is required, you may need to install a conference board (DXCNF). Each conference board provides five additional three-way conferencing circuits. You can install a conference board in any universal or universal / auxiliary slot, and you can install multiple conference boards. For more information on the Conference board, see IMI66-085.

## **1.12 In trocucing The Expansion Cabinet**

The expansion cabinet is very similar in design and function to the main cabinet. The main cabinet holds 12 boards, and the expansion cabinet holds up to eight additional boards. As its name indicates, the expansion cabinet simply increases the number of stations and lines that you can have on the DXP system.

The far left of the cabinet houses the expansion-cabinet power supply; this power supply is designed specifically for the expansion cabinet. Chapter three discusses the power supply in more detail. The backplane and card cage are very similar to those in the main cabinet. This first slot holds the interface 2 board. The interface 2 board connects to the interface 1 board to secure the integrity of the digital signals between the two cabinets. You must have an interface 2 board if you are going to use an expansion cabinet. The remaining slots in the expansion cabinet, universal slots 6 - 12, each can hold either a line, conference, or station board. You cannot use an auxiliary board in the expansion cabinet. For more information on the expansion cabinet, see IMI66-086.

**1.13**  
***Concluding  
Chapter One***

The DXP is comprised of a series of mandatory and optional printed-wire boards: the power supply, CPU and Services boards are mandatory for system operation, as are the Software and RAM cards. The line boards, station boards, auxiliary boards, and conference boards are optional depending upon your application.

Before you go any further in this series complete the study at the end of this chapter. By now, you should have a general understanding of the function and capabilities of the DXP hardware, printed-wire boards, and expansion cabinet; if you aren't secure in your knowledge of any of these, rewind Tape One and watch it again; then reread Chapter One.

## Chapter One Review Questions

1. What does the term “modular design” mean?
2. If a client wants the maximum number of lines on his or her system, the maximum number of lines is \_\_\_\_\_ and the maximum number of stations is \_\_\_\_\_
3. If a client wants the maximum number of stations on his or her system, the maximum number of lines is \_\_\_\_\_ and the maximum number of stations is \_\_\_\_\_
4. The number of lines and stations on a DXP is dependent upon what?
5. The DXP main cabinet holds a maximum of 20 boards; True or False?
6. The DXP can use any modem that supports the correct baud rates; True or False?
7. How long will a DXP battery backup provide operation to the DXP in the event of a power failure?
8. Is the interface board ever mandatory? If so, when? If not, why not?
9. What is the maximum number of Interface boards that you can install in a system?

10. The interface board for the main cabinet is interchangeable with the expansion cabinet interface board; True or False?
11. What are the three uses for the six-pin jack on the Services board?
12. What does it mean if the light on the Services board goes off?
13. How many serial data ports are there on the CPU board?
14. Which of the following is not housed on the CPU board:
  - Primary processing and control circuits
  - Master Timing
  - Interface connector for system memory
  - Primary system memory
  - Conferencing circuitry
  - System calendar and clock.
15. Where does the software card mount in the DXP?
16. What is the difference between the standard RAM and the expanded RAM?
17. What are the three types of station board?
18. If a station board's LED is steady-off with a five-second blink rate, the board has a microprocessor problem; true or false?

19. Station boards have a \_\_\_\_\_ cable for connection to the station wiring.
  
20. What are the four types of line boards that the DXP supports?
  - 2 1. Each DXP line board provides \_\_\_\_\_ surge protection.
  
22. Where is the connection for a power fail telephone located?
  
23. DID lines are outgoing only; true or false?
  
24. The T1 board provides support for E & M Tie lines and ground start lines; true or false?
  
25. You can install two Auxiliary boards in the DXP, and you can install them in any universal slot; true or false?
  
26. What purpose does the **DTMF** tone card serve?
  
27. Each communications card provides \_\_\_\_\_?
  
28. You only need a sync. card if you are using \_\_\_\_\_?



29. The expansion cabinet needs its own power supply; true or false?

30. The expansion cabinet holds a maximum of \_\_\_\_\_ boards (excluding the interface 2 board)?

3 1. In Part One of the DXP video series, what is the narrator's name?

**2*****Planning An Installation***

---

<b>Chapter Two: Planning An Installation .....</b>	<b>2-1</b>
2.1 Introducing Chapter Two .....	2-1
2.2 Ordering The Right Equipment .....	2-2
2.3 Evaluating The Installation Site .....	2-3
2.4 Planning The Dedicated Equipment Room .....	2-3
2.5 Using The Right Tools .....	2-4
2.6 Preparing An MDF Diagram .....	2-5
2.7 Checking The Hardware .....	2-6
2.8 Testing The Stations .....	2-8
2.9 Concluding Chapter Two .....	2-8
Chapter Two Review Questions .....	2-9

# 2

## *Planning An Installation*

---

### *2.1 Introducing Chapter Two*

One of your primary responsibilities as the DXP installer is to determine the type and quantity of equipment needed for each installation site. Remember that the needs and specifications of each installation site will be different based on the number of lines, stations and peripheral equipment that fits that customer's business. When you begin a new installation, ask yourself some of the following questions:

- What are the client's present and future telecommunications needs? Are you replacing an existing business telephone system, or is this a completely new installation?
- What are the problems the client is experiencing with his or her old telephone system? Why is a DXP the right telephone system?
- How many lines and stations are you going to use? Remember to leave plenty of room for future expansion.
- Will you use ground start, loop start, T1, or DID lines?
- Will you have digital, analog, or IST stations?
- What peripheral equipment will you use: paging device, music source, or battery backup, for example.

You'll have to answer all of these questions well in advance of actually ordering any of the equipment for you installation. Keep in mind that your customers aren't going to know whether they need DID or ground start lines, for example, so you will have to make those decisions based on your understanding of the client's needs.

## 2.2 Ordering The Right Equipment

In determining what equipment to order, keep the client's long-range plans in mind. Make sure that you can add lines or stations when the time comes to do so.

Remember that the two auxiliary/universal slots are the only slots that accommodate Auxiliary boards. If you install a line or station board in these slots, there will be no room for Auxiliary boards when the client needs them. If at all possible, reserve at least one of the auxiliary/universal slots for an Auxiliary board, and put the station and line boards in the universal and line slots respectively.

For assistance in choosing the right boards, consult Comdial publication GCA40-070 "Configuration and Planning." Also see the DXP Software Request Form. Both of these publications are in the DXP System Manual. You can find the product codes for DXP parts on the last page of GCA40-112 "DXP General Description."

You may also want to purchase another Comdial videotape series entitled "*How to Sell Business Telephone Systems (V-1 OC)*," which provides not only marketing and programming tips but also gives practical examples of the types of questions to ask a client.

## **Evaluating The Installation Site**

### **2.3**

An important part of your pre-installation work is to map-out the geography of the site. If you can, get up-to-date blueprints of the building. If blueprints are unavailable, draw up your own rough floor plans and cross sections of the building.

Make sure that at a minimum you have all of the following information:

- The location of the equipment room.
- The anticipated location of all of the various telephones.
- The current location of the cable runs for pre-existing CO lines and phone sets.

## **Planning The Dedicated Equipment Room**

### **2.4**

Comdial recommends that you use a dedicated equipment room for the DXP installation. If you do have other equipment in the room, make sure you check for radio frequency interference. If you aren't going to use an equipment room, make sure to install the DXP in a low-traffic area where the equipment and wiring won't be bumped or knocked loose.

Keep in mind that the distance between the main cabinet and the Telco/PBX must be 25 feet or less (Comdial recommends a nominal distance of 7 feet).

You must also install the equipment in an area whose temperature stays between 32 and 122 degrees fahrenheit with less than 90 percent non-condensing humidity.

An important element to the equipment room is the AC power; hopefully, your equipment room has accessible outlets, if not, make sure to have a professional electrician install one. The DXP requires a dedicated 117V AC 15 AMP circuit for installation. We need to make sure that the outlet is within four feet of where we mount the DXP so that the power cord reaches.

*(For more on this, read GCA40-112, DXP General Description)*

## 2.5 Using The Right Tools

Before you begin your system layout, you need to make sure that you have all the right tools for a proper installation. Most of you have installed telephone systems before, so none of this information is new to you. In truth, you'll probably have a standard list much longer than the one we provide. Use these items as an essentials list, a bare minimum of what you should have to install a system. You'll need the following:

- fasteners, either wood screws or toggle bolts, to attach the common equipment to the backboard,
- a screwdriver to match the wood screws,
- an electric drill,
- punch-down tool for fastening wires to a type-66 block,
- crimping tool for 623-type modular plugs,
- 3-prong AC circuit tester,
- # 10 or 12 gauge insulated, solid-copper wire for grounding the system,
- all associated surge protection-AC, line, and serial,
- a connectorized female 25-pair cable (at least ten feet long) for each station and line board (note that loop-start line boards use modular jacks for line connections)

This list is a minimum of what you'll need. Your own experience will guide you in selecting what is necessary.

## 2.6 Preparing An MDF Diagram

Begin the layout plan by determining where each piece of equipment will mount on the Main Distribution Frame (MDF). Standard 3/4-inch plywood usually works well as the main distribution frame. Using an MDF helps us in several ways: it provides stability for the system—many office walls are drywall, and the MDF helps ensure that your moorings won't slip or shift in the drywall; the MDF also isolates the system from the wall, keeping condensation off the equipment; lastly, the MDF makes moving the equipment relatively pain-free.

In planning the layout of the MDF, you should diagram all of your various cable runs in detail and consider where you should position the following devices:

- the main cabinet
- the expansion cabinet,
- the surge protector(s),
- the ground cables,
- station blocks,
- line blocks,
- the music source,
- a paging amplifier,
- a modem,
- the battery backup
- an OPX-X,
- a VMI-X,
- an ATI-D-1 PT,
- and finally, the cabling and wiring requirements.

Even if you are not installing these devices, allocate space for them on the MDF because they may be installed later.

As far as the location of the DXP on the board, you will want to put it in the left-hand corner since all of the wiring comes out on the right side of the cabinet. If you are going to mount the battery backup on the left, be sure to leave adequate room. Whether you are using an expansion cabinet or not, you should leave enough room on the MDF for both cabinets. The expansion cabinet always mounts above the main cabinet. The cabinets have to be no more than two inches apart to allow the cables from the interface boards to connect.

Make sure all of your cable runs are as short as possible. When you wire your stations, remember that the length from the DXP to the stations depends upon the type of station and the gauge of wire (see section 1.8 in this manual for more information). You also want to keep the wires as far away from fluorescent lighting as possible. If you do have to cross these lights, run the wires perpendicular to the lights in order to keep interference negligible.

For more on DXP specifications, see GCA40-112, "DXP General Description."

## 2.7 Checking The Hardware

It's a good idea to check all of your hardware thoroughly before you get to your installation site. Unpack all of the equipment and make sure that there has been no damage during shipping; then test each piece individually to make sure it operates correctly. Use the following list as a general guideline for pre-installation testing.

- Check the power supply voltages of both the main cabinet and expansion cabinet's power supply. Refer to IMI66-085 for the correct power supply voltages.
  
- Once you know that the power supply voltages are correct, slide the power supply into its location and plug it in. You can now begin installing and testing your boards. All of the boards are shipped in static-safe bags. Make sure you are in a static-safe area and wearing a static-discharge wrist strap before you handle any of the boards or cards.
  
- Visually inspect each board when you take it out of the box to make sure there are no visible defects and to make sure you have the correct board.
  
  
- Begin testing with the CPU and Services board (the RAM and software cards must be installed). When testing the CPU board, make sure that DIP switch 8 is in the "on" position. With both boards inserted and seated properly, turn on the power supply and watch the LED on each board: Remember that many of the boards have a different LED flash rate to indicate proper operation.

Read Section One of this manual for LED light indications. It's a good idea to test all of the boards in the actual slots where they will be installed, if for no other reason than to make sure you have planned the configuration accurately. By testing all of the boards, you also make sure that each of the DXP's slots is fully functional.



- If you do have a board malfunction, turn the power back off and re-seat the board; if you didn't insert the mounting screws, do so. Power the system back up and check the boards again. If you still have a malfunction, try inserting a different CPU or services board; if the other board works, you know there is a problem with your original board. Should you experience any of these malfunctions, contact your Comdial technical-services representative for more troubleshooting tips and technical support.
  
- Always remember to turn the power off before you insert the next board to prevent damaging the boards. Some of the boards, the station and line boards specifically, have pre-power jacks that allow you to work with the power on. Other boards, like the AUX. board, require that you have the power off before doing any work. It's a good idea to turn the power off just in case.

## **2.8** **Testing The** **Stations**

With your station boards installed, do a quick check on the digital stations themselves. Plug each station into a station port and then use a digital armiger (you can purchase these from any supply house). Plug the armiger into the board and test each port on the board with a telephone that you know is operable. Then unpack each of the telephones and test them on one of the station ports. Testing the boards one-by-one this way not only guarantees that all of our equipment works as it should, but it also makes it immediately obvious which board is the problem should a malfunction arise. Plus, you'll know all of this information well in advance of your installation date.

## **2.9** **Concluding** **Chapter Two**

This section of the training series has given you a foundation for planning and evaluating your installation site. If you are unsure about any of this information, rewind tape two, Planning an Installation, and reread this section of the manual.

## Chapter Two Review Questions

1. In evaluating the DXP installation site, what are three things that you should always consider before you begin a new installation?
2. In planning for an installation, you must also consider peripherals such as (name four).
3. In considering what components you need to order for the system:  
The number of telephones will determine how many \_\_\_\_\_  
The type of telephones will determine whether you use \_\_\_\_\_  
\_\_\_\_\_, or \_\_\_\_\_ boards.  
The number of lines will determine how many \_\_\_\_\_  
The total number and type of boards will determine whether you will need \_\_\_\_\_.
4. When you are installing the boards, always place the first two station boards in the auxiliary/universal slots to allow for future expansion, true or false?
5. What is the required temperature range of a dedicated equipment room?
6. The DXP requires a \_\_\_\_\_ circuit for installation.
7. You need to make sure that the DXP is within 25 feet of the outlet; true or false?
8. Name five tools that Comdial recommends you to have for an installation.

9. MDF stands for \_\_\_\_\_
  
10. Give three reasons for putting your equipment on an MDF?
  
11. The cabinet should be located to the right of the AC power source to minimize the cabling distances; true or false?
  
12. Before you connect the power for testing, you should always perform a \_\_\_\_\_?
  
13. What should you do if you have a board malfunction during your testing?
  
14. What are the first two boards that you should install when testing your system?
  
15. You should use a \_\_\_\_\_ to check your digital stations.
  
16. In the second video of the DXP training series, the narrator and installer are putting a DXP in what type of business? What is the business's name?
  
17. Video Two introduces an installer and programmer; what is his name?

# 3

## *Installing The DXP*

---

<b>Chapter Three: Installing The DXP .....</b>	<b>3-1</b>
3.1 Introducing Chapter Three .....	3-1
3.2 Mounting The Main Cabinet .....	3-2
3.3 Mounting The Expansion Cabinet .....	3-3
3.4 Grounding The System.. .....	3-3
3.5 Installing The Power Supply .....	3-4
Expansion Cabinet Power Supply.. .....	3-5
3.6 Connecting A Battery Backup .....	3-6
3.7 Installing The Boards .....	3-7
Board locations .....	3-7
Using The Pre-power jack.....	3-7
Services Board .....	3-8
CPU Board.. .....	3-8
Interface Boards .....	3-8
Station Boards.. .....	3-8
Line Boards .....	3-9
Auxiliary Board.. .....	3-9
Conference Board .....	3-9
3.8 Connecting The Lines.. .....	3-10
Surge Protection .....	3-10

3.9	Connecting The Stations .....	3-11
	Station Wiring .....	3-1 1
3.10	Testing The Stations .....	3-12
3.11	Connecting An External Paging Device .....	3-13
3.12	Connecting A Modem .....	3-14
3.13	Connecting A Music Source .....	3-15
3.14	Installing The Ring Generator .....	3-15
3.15	Connecting The PC Attendant .....	3-16
	P C Attendant Wire Rotation .....	3-1 6
	P C Attendant line Connection.. .....	3-1 6
3.16	Connecting A Printer .....	3-17
3.17	Concluding Chapter Three .....	3-18
	Chapter Three Review Questions .....	3-19

# 3

## *Installing The DXP*

---

### **3.1** *Introducing Chapter Three*

Installing a DXP is relatively quick and easy because by the time you begin the installation you will have already done much of the preliminary work. When you get to your installation site, you will have gone through many of the most crucial steps:

- selected the correct hardware,
- chose the telephones and lines,
- configured the equipment room,
- and positioned the equipment on the MDF.

When you have completed this preliminary work and checked all of the hardware to make sure that it operated properly, you are ready to install the system. When you have finished with this section of the training, you should be acquainted with all of the following:

- hardware installation, including the cabinets, boards, modem, and ring generator,
- DXP power requirements,
- station installation,
- line and station wiring,
- and finally, the peripheral equipment, including the paging amplifier, external music source, SMDA printer, and PC Attendant.

## 3.2 Mounting The Main Cabinet

Comdial recommends that you mount both cabinets on a main-distribution frame (3/4-inch plywood works well). Before you begin mounting the equipment, decide upon the overall layout and draw outlines of each piece of equipment on the backboard.

When you secure the backboard to the wall, make sure the screws go through the studs in the wall and not just through the sheet rock or wall covering. A fully-loaded DXP can weigh from 80 to 100 pounds, so the stability of the mounting is crucial. Mounting the backboard to the wall studs provides all the stability the DXP needs.

Remember to mount the cabinet on the left side of the MDF; all of the wiring connections are on the right side of the main cabinet, so putting the cabinet on the left keeps the wiring as short as possible.

- The DXP main cabinet has six screw-mount openings. These mounting holes are approximately 24.5 inches apart.
- Insert the top two mounting screws into the backboard and tighten them within approximately 1/4-inch of the mounting surface. You may have to drill these holes ahead of time, depending upon your mounting surface.
- Hang the cabinet on the top screws, sliding it down until it hangs securely.
- Then, insert and tighten the remaining four screws through the mounting tabs located on the lower edge of the cabinet.
- Finally, tighten all six screws until they are flush with the DXP. The screws for the DXP itself only need to go through the backboard to ensure stability.
- If you are going to mount an expansion cabinet, remove the access plates from the top of the main cabinet; this is where you will run the connecting cables between the two cabinets.



### **3.3** **Mounting The Expansion Cabinet**

The installation of the expansion cabinet is basically identical to that of the main cabinet. The mounting screws for the expansion cabinet are 18 <sup>5</sup>/<sub>16</sub> inches apart. You must always install the expansion cabinet above the main cabinet-no exceptions. Remember that you need to keep the two cabinets within two inches of one another to connect the cable for the two interface boards. Once you have secured both cabinets to the MDF, you need to ground them to an earth-ground (see section **3.4, Grounding The System**).

### **3.4** **Grounding The System**

The DXP system has internal secondary surge protection on all line ports, and in order for this protection to be effective, you must connect the cabinets to a reliable earth ground such as a metal cold water pipe or a building frame ground. The ground stud is located on the side of the main cabinet. You can use # 10, or #12 gauge solid copper wire for grounding.

Run the ground wire from the expansion cabinet down to the main cabinet and finally to the earth ground. Ideally, the grounding wire should be shorter than 20 feet. Grounding the system provides secondary line surge protection, and AC surge protection; it also serves as the ground for ground start, DID, and E and M tie lines. (For information on primary surge protection devices, see Section 3.8, **Installing The Lines**).

## 3.5 Installing The Power Supply

The power supply for the DXP's main cabinet (DXPSM) and expansion cabinet (DXPSX) are shipped separately and require some installation. During your initial preparation, you made sure that the DXP cabinet would be mounted no further than four feet away from a dedicated 117V AC 15 AMP circuit, with a third-wire ground on a standard electrical outlet. To avoid power fluctuations caused by other electrical appliances, it's best not to install anything but the DXP system on the outlet. Always use an AC surge protector to protect the DXP from fluctuations in the AC power. Since the AC power cord is only four feet long, make sure to mount the surge protector on the left side of the main cabinet.

Also, to avoid an accidental power loss, make sure the outlet doesn't have a switch to turn off power. After you have chosen your dedicated outlet, always do a voltage check on the outlet before you plug in the system. To check the voltage using an AC Volt meter, first check the voltage between the neutral and the "hot" side of the outlet; the reading should be between 90 and 129 VAC. If the voltage range is beyond this specification, contact a qualified electrician immediately.

- The power supply slides into the slot on the left side of the cabinet; it has two openings which slide over the two metal posts on the front of the DXP cabinet.
- Attach the two hex-nuts through the slots on the front of the power supply and into the DXP cabinet.
- Install the remaining screw in the back of the power supply and into the cabinet. Route the power cord through the slot on the side of the cabinet. (for more information on the main cabinet power supply, see IMI66-085.)
- Remember to connect the power to a surge protector and not directly to an outlet.

## Expansion Cabinet Power Supply

The installation of the expansion cabinet power supply is virtually identical to that of the main cabinet power supply. One critical difference between the two, however, is that there is an AC and DC connection from the expansion cabinet's power supply to the main cabinet's power supply (for more information on the expansion cabinet power supply, see **IMI66-086**). Both the power cord and the DC connection from the expansion cabinet run through the access hole on the bottom of the expansion cabinet and through the hole on the top on the main cabinet. The AC cord then plugs into the three-pronged outlet on the front of the main power supply; the DC power cable connects to the S-pin male connectors on the main and expansion cabinet's power supplies.

You should have checked both of your power supply voltages earlier, so now power-down and continue with your installation (see **IMI66-085** for information on testing the power supplies).

## 3.6 Connecting A Battery Backup

The DXP works with the Comdial BBLDX. Should the AC power fail, this main battery backup provides a minimum of one hour of system operation on a 70% loaded system. To guarantee an hour with an expansion cabinet, you need two battery backups. Comdial has created a formula whereby you can determine the battery backup time for your system based on your number of lines and stations (see IMI89-074). You can install an additional battery backup, or another manufacturer's battery backup unit, if you determine that one UPS won't provide the backup time needed.

Note that a battery backup may take up to 12 hours to recharge after it has been completely discharged. You may also need to wait 12 hours after your initial installation before you have full battery backup capabilities.

- Remove the lid from the empty metal enclosure and save the retaining hardware; you should mount the battery backup on the left or below the main cabinet. Also leave room below the battery backup to add another assembly in the future.
- Once you have attached the assembly to the wall, slide the batteries into their cabinet. You have to wire the five batteries together in series with the supplied cable.
- Now plug in the power cord. Always be sure that the AC power cord is connected to the electrical outlet and the power switch is in the "on" position before you connect the external battery backup to the main cabinet. Having the power connected ensures that the internal protection circuitry is operating to prevent damage that could result from improper connection.
- Check the output voltage of the power supply before you connect the batteries to the DXP power supply. The output voltage should be between 34.3 and 34.6 volts; if it's any higher, the batteries could overcharge and be damaged. The measured voltage should be between 27 and 35 volts (see IMI89-074 for voltage test).
- Disconnect the power cable from the battery backup and power-down before you move on with the installation. If you leave the battery backup connected, you will be drawing power from the battery during the rest of your installation.

### 3.7 Installing The Boards

As part of your pre-installation work, you will have made sure that all of your boards were fully functional. So you can now go ahead and start installing them.

When you work with any of the boards, always wear a static discharge wrist strap and work in a static-safe work area. Do not remove the board from its static-protected bag until you are in a static-safe area (for information on electro-static discharge, see IMI01-005, Handling of Electrostatically Sensitive Components). When installing any board into the DXP, push only on the tabs on the outer edges of the board.

## Board Locations

Labels appear under each slot on the front edge of the cabinets, indicating which board should go in the slot, and the boards are mechanically keyed to fit only in the correct slots.

When inserting circuit boards, orient them so that they line up with the top and bottom guides on the card cage. Keep in mind that the boards fit snugly into the slots. Slide the boards into the card cage until the connector on the back edge of the board properly mates with the connector on the backplane.

If you suddenly encounter resistance while inserting a board into the card cage, do not try to force the board into place.

Keep in mind that Universal/Auxiliary 1 and Universal/Auxiliary 2 are the only two slots in the entire system, including the expansion cabinet, that hold an auxiliary board.

## Using The Pre-power jack

The services, CPU, and auxiliary boards all have to be installed with the power off; line and station boards have pre-power jacks that allow you to install them while the system still has power. The pre-power jack is typically for when you are adding board into an existing system and you don't want to disturb the customer's service. If you're installing a new system, there's no need to keep the power on.

If you ever insert a station, line, or interface board while the DXP system is on, make sure to prepower the board first to prevent a power surge to the board or to the system. You must prepower the system before the board makes contact with the backplane.

- Use the standard telephone handset coil cord supplied with the main cabinet and connect one end of the cord to the prepower jack on the main cabinet's power supply unit and the other end to the prepower jack on the board. Simply making the connection prepowers the board. The LED on the board will flash to indicate that the board has been pre-powered.

## Services Board

The second slot in the main cabinet is reserved for the services board. You must have the power off to install the services board.

## CPU Board

Remember that the CPU board consists of the RAM and Software cards. Use the supplied # 4 machine screws to connect the RAM card to the CPU board. The RAM card is connected to the CPU board by using the supplied screws and washers. A 64-pin DIN connector connects the CPU board to the RAM card.

The Software card is connected to the RAM card with the supplied lockwashers and machine screws. Signals pass between the RAM card and the Software card through a 64-pin, dual, in-line connector.

Once you have attached the RAM and Software cards to the CPU board, insert the entire assembly into the correct slot in the card cage. Make sure DIP switch 8 is in the "on" position. Then power up the system and check the status light on the CPU board. If it lights without flashing, power off and move on.

## Interface Boards

The first slot in the cabinet, moving from left to right, is for the Interface 1 board (DXINM). The interface 1 board buffers the signals sent from the main cabinet to the expansion cabinet. The expansion cabinet interface board (DXINX) mounts in the first slot in the expansion cabinet. The slot for the interface 1 board is smaller than any of the other card-cage slots. The interface board is the only half-sized board that inserts directly into the backplane. The interface boards are connected with a 64-pin ribbon cable.

## Station Boards

You can install a station board in any universal slot in either cabinet. The DXP automatically numbers stations according to the station board location; the number designations move from left to right, and from the main cabinet to the expansion cabinet.

Each station board uses either one or two 25-pair amphenol connectors to go from the station board to the station punch-down block. Each station board has a pre-power jack that allows a technician to service the board while the system still has AC power on. (for more information on the Station boards, see IMI66-085.)

## Line Boards

You can install a line board in any universal slot or in the four dedicated line slots; note that Unlike the station board designations, the line slots are numbered from right to left. Each line board also has a pre-power jack that allows a technician to service the board while the system still has AC power on. The connection of the line board depends upon the type of line board (for information on the wiring of line boards, see IMI66-085).

## Auxiliary Board

You can install two auxiliary boards in the DXP, but you can *only* install them in the two Universal / Auxiliary slots of the main cabinet. The option cards include the **DTMF** Tone card, DXOPT-TON, the communications card, DXOPT-COM, and the T1 sync. card, DXOPT-SYN. You can only install the DXOPT-COM card on the lower two slots of the auxiliary board. These cards mount onto the auxiliary board, much like the RAM and software cards mount onto the CPU board.

## Conference Board

You can install a conference board (DXCNF) in any universal or universal / auxiliary slot, and you can install multiple conference boards. The conference board also has a pre-power jack that allows a technician to service the board while the system still has AC power on (for more information on the Conference board, see IMI66-085).

## 3.8 Connecting The Lines

When you do any work with telephone lines, always adhere to the following safety guidelines:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in a wet location unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.

The telephone company's "demarcation block," commonly referred to as the **RJ21X**, is usually a 66-type connector block or a series of individual 4-position modular jacks. You must place your own specialized 66-block next to the demarcation block and connect them with # 24 gauge wire. Before you run line cables to the cabinet, use a telephone test-set to check each CO line for a dial tone.

Always take thorough notes about line locations and types; you will need all of this information later when you connect your peripheral equipment and program your lines and line groups. Good records are essential too if we need to come back later and make line changes or move lines.

### Surge Protection

The telephone company usually offers a basic protection against the possibility of transient voltage spikes traveling through the lines, but that protection usually only guards the CO circuits and not the DXP. In order to fully protect your lines, install and properly ground primary surge protection on all lines. Comdial recommends that you use gas-discharge tubes, but any similar line-protection device will suffice. Once all of the lines are connected from the demarcation blocks to the 66 blocks, it's a good idea to mount another series of 66-blocks; these blocks will connect directly to the **DXP's** multipurpose line boards. Having the connections to the DXP and to the demarcation blocks separated by another 66-block allows you to move the lines easily without having to alter the wiring scheme from the CO or to the DXP.

**IMI66-085** provides a diagram illustrating the line connections; it shows the connections in relation to the 25-pair **amphenol** connector. When you are wiring your lines, keep in mind that ground start lines are polarity sensitive.



### 3.9 Connecting The Stations

Station connections, like line connections, are typically through 66M-xx connector blocks. The station boards, like many of the line boards, are also connected through 25-pair male amphenol connectors. While the station boards have protection against shorts, it's better to punch down the wiring with the power off.

Both IST devices and digital stations are two-wire connections, but you should skip space on the IST block to avoid crosstalk. With digital signals, crosstalk isn't a problem. The polarity on the wires isn't important for either the digital or IST stations.

If your station cables must cross over fluorescent lights, the cables should cross the lights at a 90-degree angle to diminish the effect of the magnetic field that builds up around the lights. You should also make sure that the wires are elevated at least two feet above the light. If the telephone wire runs near a light that is fluttering, you may encounter some interference, so make sure any such light is replaced before you continue.

## Station Wiring

Use the same approach to station connections as you did with your lines; connect each station board to a 66-block, again using both sides of the block. Then cross connect that 66-block to another 66-block that will be connected to the house wiring. This dual connection makes moving any of your stations much easier since you don't have to change any of the wiring to the station boards or to the house wiring. If you are running any station wire outside the building, be sure to provide extra surge protection on the station cables.

The maximum total distance allowed from the common equipment to the stations is 1500 feet for multiline telephones, using # 24 gauge twisted pair cable, and 3000 feet for industry standard telephones using # 24 gauge, twisted pair cable (see section 1.8 of this manual for more cabling information). If you have any spare conductors on the cables between the 66-blocks and the station jacks, it is a good practice to connect them to earth ground to help prevent them from inducing radio frequency and / or AC interference into the system.

### 3.10 Testing The Stations

Power up the DXP and take a voltage measurement across each signal pair on the type-66 station block. The appropriate voltage measurements are also shown on charts in IMI66-085.

To test the stations, plug in the digital station and check to see that the LCD appears (if applicable). Once the LCD comes up, perform a station self-test:

- unplug the telephone,
- press and hold the 1 key as you plug the telephone back in (mute key on analog, such as ExecuTech, telephones).
- If all of the LEDs light in sequence and the telephone rings, the station is working.
- Finally, seize an intercom line and make a call. Complete the call to make sure that you have two-way communication.

Make sure that any Scout 900MX digital wireless telephones are all fully charged before you place them in service. Also check your industry-standard telephones. Plug the station in, and make sure that you hear a dialtone. Make sure that the IST stations ring when called, to ensure that the ring generator is working properly.

### **3.11 Connecting An External Paging Device**

You can connect a paging device either to the paging port on the Services board or to a line port. The line port can be used to couple a station's voice path to an external paging device. Any station with the line appearance can use the PA system by selecting the line; IST stations can use the amplifier by dialing a line-group access code. When the paging device is connected to a line port, users can speak through or dial DTMF tones or pulses to the external device through the PA device, depending upon the type of paging device.

Connect the voice pair (tip and ring) leads of the line dedicated as an auxiliary port to the audio input of an external paging amplifier. You will have to program the line as an auxiliary line in programming.

Make sure to consult the installation manual of the paging device for any requirements or specifications beyond those of the DXP.

## 3.12 Connecting A Modem

The DXP has its own proprietary modem, product number DXMDM, so installation is simple. You can use a non-proprietary modem, but using the modem designed for the DXP is a good idea. The modem installs next to the power supply in the main cabinet. All that's involved in the hardware connection is attaching the mounting screw to the card cage. The top jack on the modem is for the line cord, and the bottom jack is for the serial data connection. You can connect the modem to any available serial data port on DXP. The power cord from the modem attaches to the **precharge** port on the power supply. We'll set the Dip switch 7 to the ON position because the modem depends upon the DXP for its power and configuration, and with switch 7 on, the system automatically sends the initialization string to the modem in case of a power failure or system reboot.

### **3.13**

## **Connecting A Music Source**

You can connect a maximum of two customer-supplied music sources to the DXP to provide background music and music on hold. The music sources connect to the jack on the services board. The input impedance of the music interface is approximately 500 ohms. You can create a special announcement on hold for outside callers. Remember that it's illegal to use a radio station as your music-on-hold.

### **3.14**

## **Installing The Ring Generator**

The ring generator (DXRNG) provides ringing voltage and message waiting voltage to the industry standard devices. Remember that you need a ring generator in each cabinet that has an IST board. The ring generator mounts directly above the power supply in either cabinet, and it plugs into the backplane. You must have a ring generator in each cabinet that you use industry standard telephone boards.

## 3.15 Connecting The PC Attendant

The PC Attendant requires two loop-start line ports, one serial data port, and one logical station port. Connect the two line ports for audio connection to the DXP, one for transmit and one for receive, and the serial data port for the data communication. You don't need to wire the station port, but we do have to assign it to the PC Attendant in programming. Having a station port assigned provides a logical port to use for programming station features on the PC Attendant.

We'll start with the serial connection from the serial data port on the DXP to a standard 6-conductor modular jack. When connecting the serial data port, keep in mind that you must have an odd number of wire rotations to ensure that the roll-over in a standard line cord remains intact.

### PC Attendant Wire Rotation

Connect the data port on the DXP to a 6-conductor modular jack using a standard 6-conductor line cord; Comdial recommends 3-pair, twisted, shielded, 24-gauge wire from this modular jack to the PC Attendant's location. The wires are color coded, and at the DXP end you should keep the colors consistent, wiring red to red, green to green, and so on. At the PC Attendant location, install another 6-conductor modular jack. Bring the wires from the first modular jack and connect them to the modular jack at the PC Attendant location, but rotate the color coded connections: red to green, green to red, and so on. Now connect the 9-pin connector supplied with the PC Attendant to this modular jack with a 6-conductor line cord and your connection is complete. Because you have rolled our house wiring, the transmit data now connects with your receive data. Keep in mind that the connection between the PC Attendant and the DXP must be 500 feet or less.

### PC Attendant Line Connection

The PC Attendant line connection is just like any other line connection. For the PC Attendant you need to use Loop-start lines. You also need to make sure that the lines are paired; 1 and 2, or 3 and 4, for example. With all of your wiring done, check the PC Attendant to see if you have communication.

The DXP's battery backup does not provide backup power to any of the peripheral equipment, like the PC Attendant, so you might want to purchase a secondary uninterruptible power supply, which would also provide AC surge protection. Should there be a power-outage, the PC Attendant will still be able to process all of the calls for the facility.

### 3.16 *Connecting A Printer*

You can connect a serial-data printer for SMDA records. You can connect the printer to any serial data port on the DXP, but serial data port two is defaulted for a printer. If your printer is not near the DXP, you must put one modular jack on the wall next to the DXP and another next to the printer. Wire these two together with 24-gauge, shielded wire, making sure to rotate the wires. The printer only requires the transmit data and signal ground wires. The handshaking connection usually isn't necessary unless you are running at more than 2400 baud. Check your printer manual for printer baud rate information. You'll have to provide your own 25-pin connector for the printer.

**3.17**  
***Concluding***  
***Chapter Three***

That concludes the installation section of the training. Before you move on to programming chapter, complete the questions on installation. If you are unsure about any of the installation procedures, review part three of the training series, Installing the DXP, and re-read this chapter. When you've finished, you'll be ready to move on to Chapter Four, ***Programming the System.***



## Chapter Three Review Questions

1. A fully loaded DXP can weigh as much as \_\_\_\_\_.
2. The DXP main cabinet has \_\_\_\_\_ screw-mount openings, which are approximately \_\_\_\_\_ inches apart.
3. How much space can you leave between the expansion cabinet and the main cabinet? Why?
4. You can install the expansion cabinet above or to the left of the main cabinet; true or false?
5. The grounding wire should be \_\_\_\_\_ wire with a maximum length of less than \_\_\_\_\_.
6. The power supply requires a dedicated \_\_\_\_\_?
7. You don't need to use an AC surge protector unless you have an expansion cabinet; true or false?
8. You only need to check the voltage on the main cabinet power supply unit, true or false?
9. How is the expansion cabinet power supply different from that of the main cabinet?
10. Always mount the optional battery pack above the expansion cabinet, true or false?

11. What is the correct output voltage of the DXP power supply?
  
12. The BBLDX provides up to 12 hours of battery backup; true or false?
  
13. Describe two measures you can take to prevent electrostatic discharge damage to the boards.
  
14. The boards should be inserted with the power on, true or false?
  
15. What prevents you from inserting a board in the wrong slot?
  
16. What two things must you attach to the CPU board before you install it?
  
17. The station ports and line ports are both numbered the same way from left to right on the designation strip of the card cage; true or false?
  
18. The interface boards are connected with\_\_\_\_\_?
  
19. If you ever have to insert a station or line board when the system is under power, you must \_\_\_\_\_
  
20. List two of the four Comdial safety guidelines for working with telephone lines.

21. To prevent damage from transient-voltage spikes on line jumper cables, you should install \_\_\_\_\_
  
22. When installing lines, it's important to remember that ground start lines are \_\_\_\_\_
  
23. Station connections are through \_\_\_\_\_
  
24. The polarity of digital station connections is essential; true or false?
  
25. At the station block, you should tie unused station pairs to ground, true or false?
  
26. You can install an external paging device on either the Services or CPU board; true or false?
  
27. Which serial data port must you use to connect the modem?
  
28. Setting DIP switch 7 on the modem to "on" accomplishes what?
  
29. The input impedance of the music interface is approximately \_\_\_\_\_.
  
30. You only need one ring generator, no matter how many IST stations you have; true or false?

- 3 1. Having a station port for the PC Attendant does what?
  
32. Explain what it means to “roll” the house wiring for the PC Attendant.
  
33. The maximum distance between the DXP cabinet and the PC Attendant   is  .
  
34. Which serial data port is defaulted for an SMDA/SMDR printer?
  
35. In the DXP video series, does the installation use the Scout 900MX digital wireless telephones?
  
36. How many men are shown installing the DXP in the video?
  
37. Why did the installation site in the video use an external paging device?



# ***Programming The DXP***

---

<b>Chapter Four: Programming The DXP</b> .....	* ..... 4-1
4.1 Introducing Programming .....	4-1
4.2 Using Other publications .....	4-2
4.3 Two ways to Program .....	4-3
4.4 Connecting Data Devices .....	4-4
4.5 Using A Modem .....	4-5
4.6 Using The DXP Menus .....	4-6
4.7 Accessing the Main Menu .....	4-7
4.8 Understanding The Main Menu .....	4-8
Chapter Four Review Questions .....	4-9

# 4

## Programming The DXP

### 4.1 Introducing Programming

The DXP comes from the factory already programmed with certain features. However, you will frequently have to alter or add on to these “default” settings to maximize the DXP’s capabilities (see section 5.2, *Master Clearing The System*, and section 5.3, *Setting The System Defaults*, for more information.) As the DXP installer and programmer, you will be responsible for knowing all of the system’s features and capabilities (for more information on the system features, see GCA40–112, *DXP General Description*).

This chapter discusses the basics of DXP programming, including the data device connections and on-screen programming options. Use IMI66–111, the DXP programming manual, as a reference as you continue through this correspondence manual.



**A to Z KELLATRONICS, INC.**

**tel: 800.766.3425**

**fax: 800.720.1172**

**818.773.8888**

**818.773.8899**

**www.kellatronics.com**

**info@kellatronics.com**

## 4.2 *Using Other publications*

Two Comdial publications can help you with DXP programming:

*"Programming Records For The DXP Digital Communications System,"* IMI66-088, is shipped with each DXP. This document closely follows the sequence and layout of the DXP's programming menus. Prior to programming, go through this document with the client, explaining the DXP's various features, and record programming selections in the spaces provided.

*"Video Display Terminal Programming Instructions,"* DXP Digital Communications System," IMI66-087, is made available to authorized DXP installers. This document allows you to avoid going through the entire programming sequence from start to finish when you want to modify certain features after initial programming. Using this document, you can go directly to the feature you want to program. The document includes a handy cross-reference chart that lists DXP features alphabetically. Each entry includes a brief feature description and the keyboard commands needed to program the feature.

*NOTE: Be sure to carefully read each section of your correspondence manual for references to other relevant Comdial publications.*

### 4.3 **Two ways to Program**

There are two distinctly different ways in which you can program the DXP: directly through the DXP or through the database program PCMMI.

The most common form of DXP programming is to directly connect a PC, video display terminal (VDT), or dumb terminal to one of the serial ports on the CPU board. Then, using PROCOMM Plus for Windows™, or some other communications software, you can change the default database in the DXP. With this direct connection, any changes that you make in the DXP are immediately altered in the database. You cannot save your programming choices to disk if you are using a VDT or dumb terminal.

The second way to program the DXP is through the database creation program called PCMMI (Personal Computer Man Machine Interface), which allows you to make DXP database changes without being connected to the DXP. When you have created the database, however, you must then upload that information into the DXP through a serial port using your communication software. PCMMI allows you the flexibility to work with the database without having the DXP hardware in front of you.

While you cannot use a telephone set to fully program the DXP, you can use a telephone to do some basic programming such as setting the system clock and system speed dials (for more information see GCA40-113).

For more information about VDT and PC programming and related software, consult *IMI66-087 Video Display Terminal Programming Instructions, DXP Digital Communications System*.



## 4.4 Connecting Data Devices

The DXP has two serial data ports on its CPU board that accommodate data devices such as VDTs, PCs, printers and modems. You can also add serial data ports with the communications card (DXPCOM).

If the cable from the data device you want to use is not already equipped with an RS232-type jack, refer to the data device manufacturer's manual. Also see, IMI66-085, for the proper wiring connections. When connecting a data device, be sure to consider the following information:

- The DXP and the data device each have a transmit data lead, a receive data lead and a signal ground. For a VDT, connect the DXP's receive data lead to the VDT's transmit data lead and connect the DXP's transmit data lead to the VDT's receive data lead and connect the DXP's signal ground or SG lead to the device's SG lead.
- If "handshaking" is necessary between the DXP and the data device, connect the DXP CTS (clear to send) lead to the appropriate lead of the data device. For more information about these connections, consult IMI 66-085.
- Data devices connected to the DXP should be configured to operate compatibly with the DXP's default setting of eight-bit data with one stop bit and no parity at a baud rate of 9600 baud, for port one. Port two defaults to seven-bit data, two stop bit, no parity and 300 baud.

Remember that the maximum distance between the DXP cabinet and the data device should not exceed 500 feet unless short-haul modems are used.

## 4.5 Using A Modem

To program the DXP remotely through a VDT or PC, you must use a pair of data modems. These modems can be any commercially available, Hayes-compatible modems with auto-answer capability.

You should verify that the modems have auto-answer capability before purchasing them. If the modems do not have auto-answer capability, someone at the site must manually activate the on-site modem.

When you install a modem, always consult the modem manufacturer's manual and check the configuration of the signal leads. If the modem's cable is not equipped with an RS232 jack compatible with the DXP's serial data ports, you might have to rewire the cable with the proper connector.

To connect the modem to the DXP, run the modem's cable between the modem's data jack and one of the DXP serial port; then connect the modem to the outside telephone network in one of two ways:

- Reserve a line exclusively for remote programming by punching down the appropriate leads on the type-66 line block and running a line cable directly to the network jack on the modem.
- Install a line switch for the modem between the type-66 line block and the common equipment; the line will be available for system users unless the switch is thrown, at which time the remote programmer will have exclusive use of the line. Keep in mind that using this method requires someone at the installation to turn the switch before remote programming can begin.

To begin remote programming after you have installed the modems, establish the data link between the modems by dialing the appropriate phone number. Then program the DXP exactly as if your VDT or PC were connected directly to the system.

## 4.6 Using The DXP Menus

The DXP is a menu-driven system, and many of the features are located in sub-menus. Each menu may contain several sub-menus, and it will take you some time to become familiar enough with the DXP that you know where all of the features are located (see **GCA40-112, DXP General Description**, for a full description of the DXP features).

- To maneuver through the DXP menus, enter the number that corresponds with that feature.
- Since several of the sub-menus have multiple pages, you may often have to use the “CTRL-N” to move to the next page and “CTRL-P” to move to the previous page. Also, some menus give you questions as options; these questions are usually self-explanatory and the commands are easy to understand.
- To return to the previous menu, select the item on the menu that allows you to do this or press ESCAPE. To return to the main menu, press CTRL-T.
- You must separate successive entries for a single item with a space or a comma. However, entries should never end in a comma. You can enter many entries by specifying a range; for example, entering 101- 1.50 includes all entries between 101 and 150.

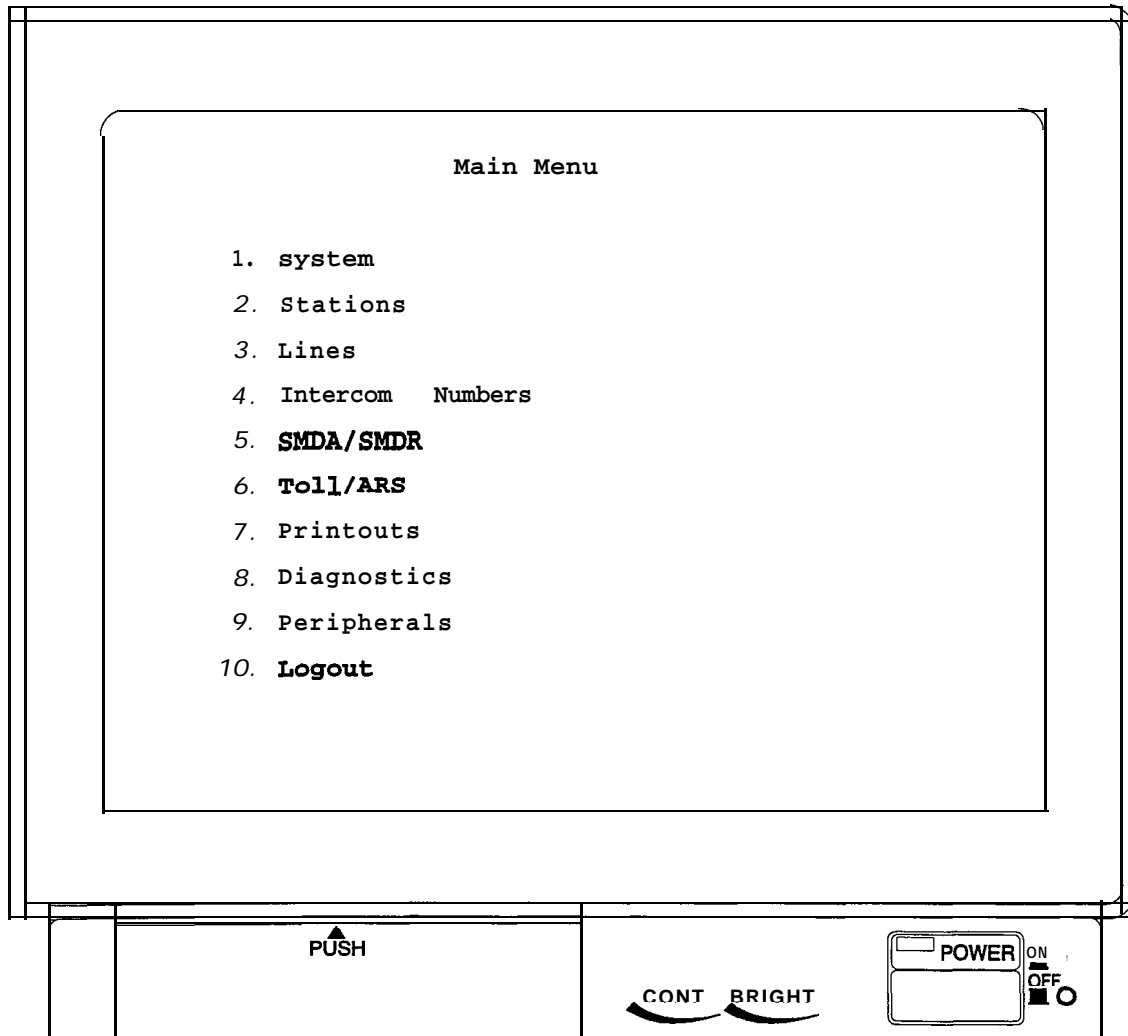
While you may not know exactly where in programming a feature is located, you can probably find the feature simply by looking at the DXP main menu. The DXP programming is divided into several broad classifications; these main menu classifications allow you to do all of your associated programming together **-system, station, and line, for example**.

Since the system operates on a 10-minute time-out cycle, you must enter a selection or response within this time. If you don't enter a response within 10 minutes, the programming sequence is aborted and the message "Logout Programming" appears on the screen. This automatic log-off function acts as a safeguard to prevent tampering by unauthorized persons.

## 4.7 Accessing the Main Menu

The first menu that appears on the screen when programming the DXP with a VDT or PC is called the “main menu.” To access the main menu:

- Power up the DXP and the VDT or PC.
- Press ENTER to bring up the banner display.
- Type in the programmer’s password code, I \*746\*, and press ENTER. The main menu appears with the following items (the password isn’t required in PCMMI programming).



## 4.8 Understanding The Main Menu

The items on the main menu correspond to the major categories of the DXP's database. The first three items on the main menu represent the following:

- **System**, involves features that affect the operation of every telephone in the system. Some examples of features in this category are system timing features like Unanswered Call Ring Back, Recall/Flash, and Pause Time. System programming is examined in detail in Chapter Five.
- **Stations**, involves features programmed for individual telephones. These include button assignments and ringing assignments as well as features like Do Not Disturb, Call Forwarding and Personalized Ringing. Station programming is examined in greater detail in Chapter Six.
- **Line**, involves features associated with the line ports that connect the system to the lines from the outside world. This category includes features such as Automatic Line Selection, Line Grouping, and Line Restrictions. Line programming is examined in detail in Chapter Seven.

In addition to these three main categories, the rest of the DXP programming is divided into several other broad classifications, which are as follows:

- Intercom Numbers.
- SMDA/SMDR.
- Toll Restriction/Automatic Route Selection.
- Printouts.
- Diagnostics.
- Peripherals
- **Logout**, allows you to escape from the DXP's database, and it terminates the programming sequence. If you choose this option, you will drop out of the programming mode, and the message "Logout Programming" will appear on the screen. Note that any changes you have made in the PCMMI will be lost unless you save them.

## Chapter Four Review Questions

1. What two Comdial documents can assist you when you are doing your DXP programming?
2. How does programming the DXP directly from a VDT or PC differ from programming through the PCMMI?
3. You can program the DXP entirely with a telephone, as long as it is an LCD speakerphone; true or false?
4. The DXP supports a maximum of two serial data ports; true or false?
5. List the default values of the two serial data ports on the CPU.
6. The maximum distance between any data device and the DXP is \_\_\_\_\_, unless you use \_\_\_\_\_.
7. Describe the two fundamental ways to connect a modem.
8. What do the following keyboard functions do when programming a DXP: CTRL-N, CTRL-P, CTRL-T?
9. The DXP is on ten-minute time out cycle; what does that mean?
10. What are the first three options on the DXP main menu?



# System Programming

---

<b>Chapter Five: System Programming</b> .....	<b>5-1</b>
5.1 Introducing System Programming .....	5-1
5.2 Master Clearing The System .....	5-2
5.3 Setting The System Defaults .....	5-4
System Default.. .....	5-4
Class Of Service Default .....	5-4
Station Default .....	5-4
Button Map Default .....	5-5
Line Default .....	5-5
Tables Default .....	5-5
DID Translation Table Default .....	5-5
Clear System Status Log.. .....	5-5
Onboard Software Upgrade .....	5-6
5.4 Terminal Setup .....	5-7
5.5 LCD Messages .....	5-8
5.6 Save/Restore Database .....	5-10
5.7 Serial Ports.....	5-12
Auxiliary Serial Data Ports .....	5-13
Modem Setup .....	5-14
5.8 SOHVA Table Programming .....	5-15
SOHVA Groups .....	5-15
5.9 Speed Dial Programming .....	5-17
System Speed Dial Groups .....	5-17
System Speed Dial .....	5-17
Speed Dial Sets .....	5-17

5.10	Time and Date (System Clock) .....	5-19
5.11	System Timing .....	5-20
	Call Park Recall .....	5-20
	Page Recall .....	5-20
	Camp-On Tone .....	5-21
	DTMF Extended Dialing (Tone Length) .....	5-21
	Hold Recall .....	5-21
	Attendant Hold Recall .....	5-21
	Paging Access .....	5-21
	Pause Time .....	5-22
	Recall/Flash .....	5-22
	Station Transfer Recall .....	5-22
	Periodic Tone Time .....	5-22
	Maximum Call Duration Time .....	5-22
	Internal Interdigit Dialing .....	5-23
	Maximum Line-To-Line Connect Duration .....	5-23
	Camp-On/Automatic Call Back Ring .....	5-24
	Out Dial Delay Time .....	5-24
	Authorization Code Time-out .....	5-24
	IST Ring Time-out .....	5-24
	IST DTMF Receiver Time-out .....	5-24
	IST Flash Time .....	5-25
	Voice Mail DTMF Tone .....	5-25
	Pulse Dial Interdigit Time .....	5-25
	Pulse Dial Make/Pulse Dial Break (Pulse Dial Ratio) .....	5-25
5.12	System Parameters .....	5-26
	Synchronized Ringing .....	5-26
	Automatic Attendant Immediate Transfer .....	5-26
	Automatic Route Selection ( <i>ARS Enable</i> ) .....	5-27
	Automatic Route Selection Dial Tone .....	5-27
	Toll ARS Dialing Pause .....	5-27
	System Status Reporting .....	5-27
	T1 Status Reporting .....	5-27
	Major Alarm Alerting .....	5-28
	Central Message Desk .....	5-28
	IST Ringing Per Phase .....	5-28
	IST Ringing Patterns ( <i>Ring Mode</i> ) .....	5-28
	IST Ring Frequency .....	5-28



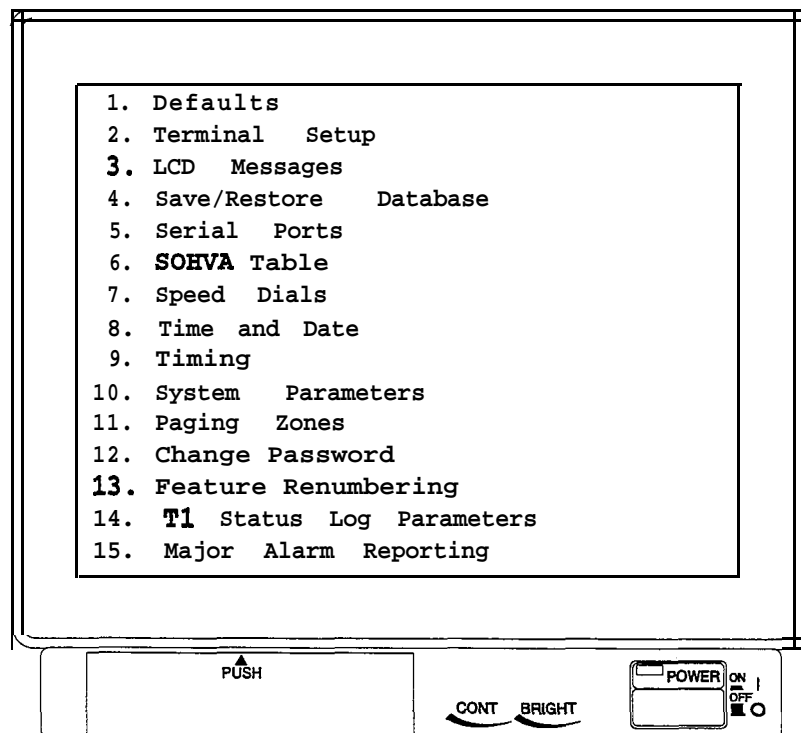
Operator Station .....	5-29
Line Disconnect Automatic Camp-On.. .....	5-30
Automatic Station Relocation .....	5-30
Default Relocation Response .....	5-31
Ring Back Tone .....	5-31
Day 1, Day 2, and Night Ringing Begin and End Times.. .....	5-31
5.13 Paging Zones .....	5-32
Zone Programming (Zone Names, Transmit Stations, Receive Stations) .....	5-32
Relays External Paging Equipment Control .....	5-33
Relays Line Answer From Any Station .....	5-33
Common Audible Ringer .....	5-33
5.14 Change Password.....	5-34
Installer and Administrator Password .....	5-34
System Manager Password .....	5-35
Attendant Password.....	5-35
5.15 Feature Renumbering .....	5-36
5.16 Programming The T 1 Parameters .....	5-38
5.17 Major Alarm Reporting .....	5-38
Chapter Five Review Questions .....	5-39

# 5

## System Programming

### 5.1 Introducing System Programming

System programming involves features that affect the operation of every telephone in the system. Chapter Five focuses on all of the features that are currently part of system programming. While you are reading through this correspondence manual, use **IMO1 11, Programming The DXP**, as a reference. The screen shown below details the features that are part of system programming.



The DXP Main Menu

## 5.2 Master Clearing The System

The first item on the system menu is defaults; the defaults menu lets you return any of the DXP settings to their original factory-set parameters. The following section details the master clearing of the entire system, while section 5.3 covers the rest of the defaults menu.

The master clear feature is an on-line procedure that returns the entire system to the default operating parameters, clears **all** stored speed dial numbers, and clears any other custom programming as well. Master clear is not part of the off-line PCMMI programming procedure. The system takes 15 to 20 seconds to exercise a master clear command depending upon the system size.

You can take one of three different master clear options.

*NOTE: None of these master clear modes changes the serial port settings. Only performing a software upgrade changes the serial ports to the default settings.*

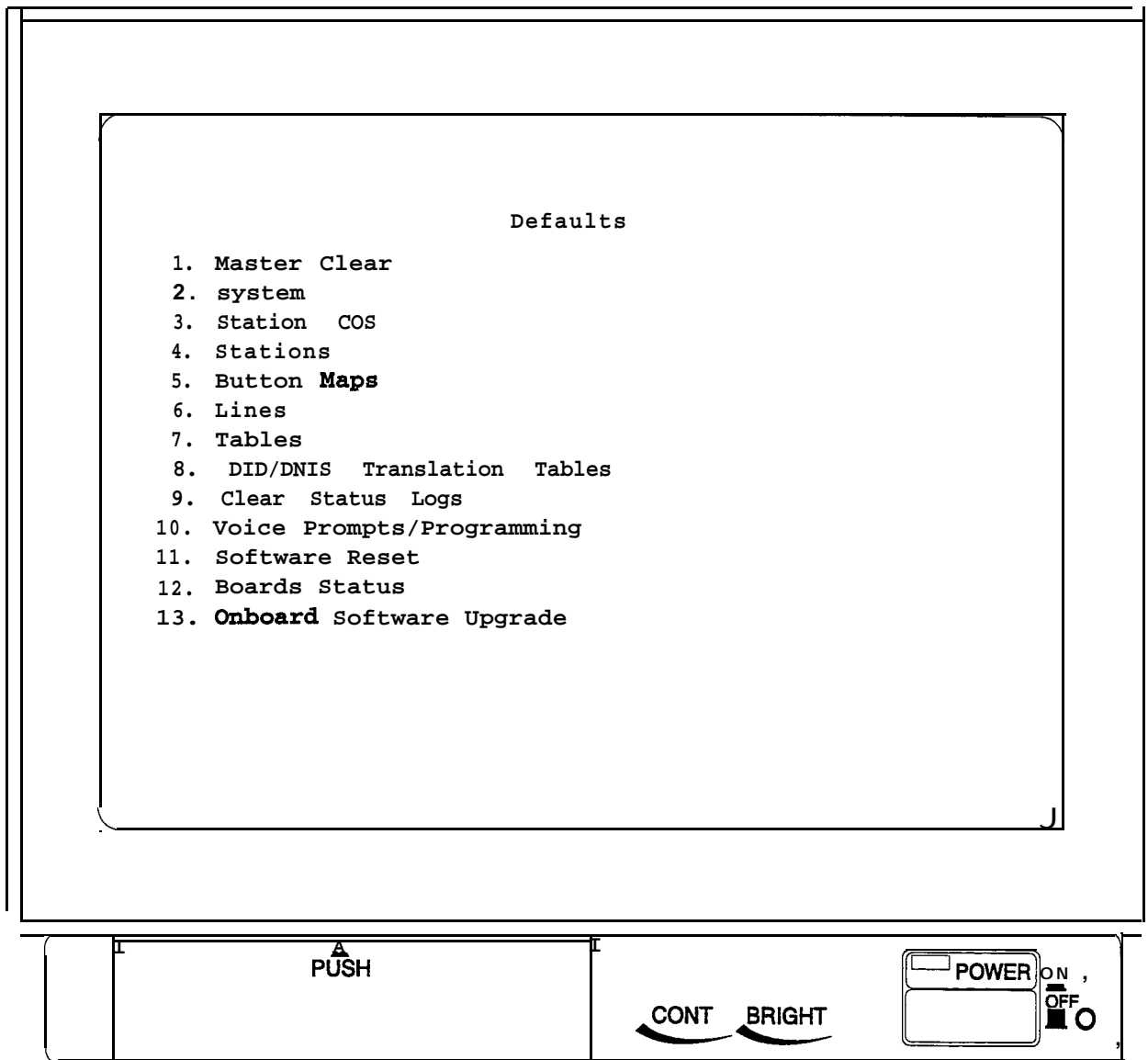
**With master clear mode 1 option,** the system assumes a set of parameters that reflect a key system arrangement. This configuration means that multiline telephones, except stations 101 and 102, receive direct line appearances in their button maps but have no group intercoms assigned to their hunt lists. Stations 101 and 102 have four group intercom numbers assigned to their hunt lists and are button mapped accordingly.

**With master clear mode 2 option,** the system assumes a set of parameters that reflect a hybrid, or PBX-like, system arrangement, which means that multiline telephones have no direct line appearances in their button maps; however, they do have two unique group intercoms assigned to their button maps and to their hunt lists.

**With master clear mode 3 option,** the system assumes a set of parameters that does not map any station buttons, assigns no group intercom access or personal intercom numbers to the stations, and disables both zone and all-call paging features.

### **CAUTION**

*You can only exercise the master clear when you enter the programming session with the installer password; however, in a defaulted system, the administrator password is the same as the installer password, giving master clear privileges to the administrator as well. For information on changing the password, see section 5.1.5.*



**The Defaults Menu**

## 5.3 Setting The System Defaults

Apart from master clearing the entire system, you can also return certain categories of programming back to their original settings. The following list details the default setting options.

### System Default

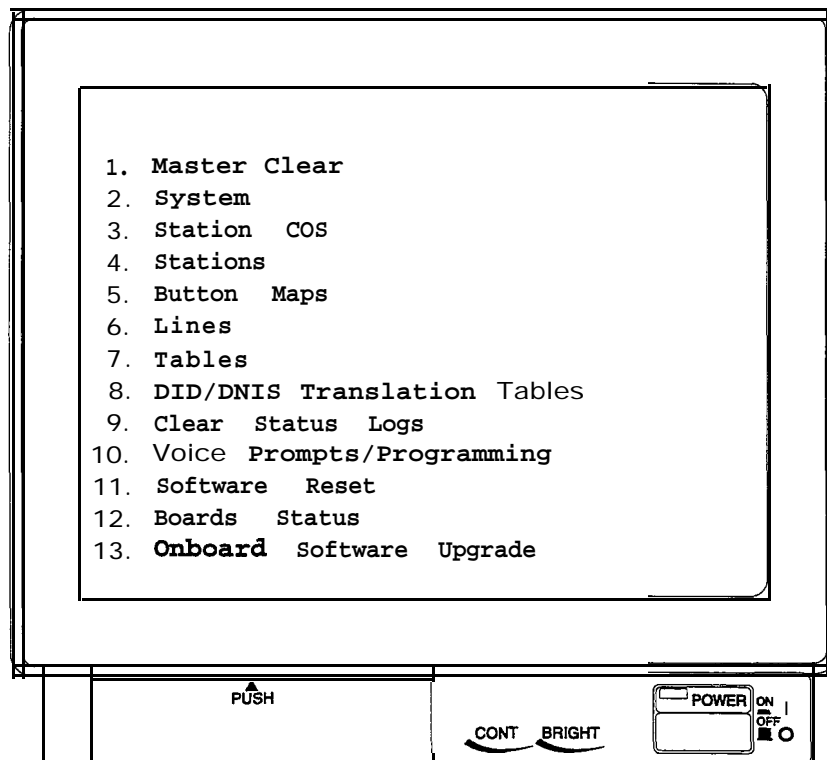
The system default sets the system configuration features to the default operating parameters. When the system default is performed, certain programmed data, such as custom LCD messages and system speed dial numbers, are lost.

### Class Of Service Default

There are 32 station class of service (COS) feature sets or groups of features. Each set can have differently configured features. This default programming returns one or all station COS sets to the default configured parameters.

### Station Default

Each station can have individually configured operating features. The station default sets the configuration of these features to the default parameters.



*The Defaults Menu*

## Button Map Default

Every programmable button at each telephone connected to the system provides line selection, direct station selection, or other functions. Programming action for a particular station assigns a function to each button. You can create unique button function assignments, known as button mapping, at each station. This default erases all unique button function assignments. Personal speed dial numbers and autodial numbers are cleared with the button map default action.

## Line Default

Each line can have individually configured operating conditions. The line default sets these conditions to the default parameters.

## Tables Default

Various system-wide operating features depend upon tables of information to control their parameters. These tables are programmable to let the features match a broad range of site requirements. This table default procedure resets the following programmable tables to the default conditions: SOHVA tables, toll restriction tables, ARS route tables, modify digits tables, and account code verify tables.

### **CAUTION**

*Remember, the system erases all programmed entries when you take this defaulting action.*

## DID Translation Table Default

If you have programmed translation tables for DID use (see sections 8.22 and 8.23), you can clear them with this procedure.

## Clear System Status Log

If you have enabled system status reporting (see section 5.12) at a station, you can turn off its status light by using this procedure. Use the system printout information in section 13 to view the status report before turning off the light at the status reporting station.

## Onboard Software Upgrade

This feature will save a database internally within the memory- of the DXP and restore that database after you have turned the DXP off and upgraded the operating system software. Saving the database in this manner eliminates the need for a personal computer with an XMODEM communications program to transfer the database. You must have the expanded RAM, DXRAM-EXP68K, in order to use the **onboard** software upgrade.

The saved and reloaded database includes all of the following data:

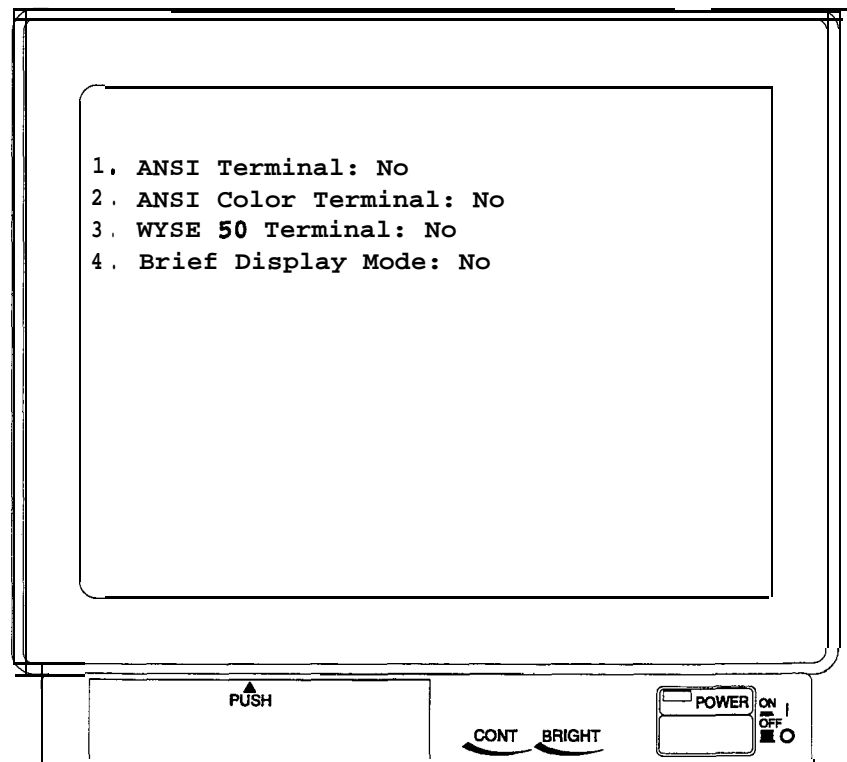
- system information,
- station parameters,
- line parameters,
- toll restriction and automatic route selection parameters,
- and system speed dial numbers.

The **onboard** software upgrade does not include the **SMDA/SMDR** records. If you need these **SMDA/SMDR** records, you must make a printout of them before you can perform the database storage because this save/restore feature overwrites the current stored records and they will be lost (see section 10 for **SMDA/SMDR** information).

## 5.4 Terminal Setup

You must match the system to the type of VDT that you use to program it.

- If your terminal is ANSI, select item one, ANSI Terminal, and press ENTER. Then press the space bar to choose the “yes” option.
- If your terminal is ANSI color, select “yes” for item two, ANSI Color Terminal.
- If your terminal is a WYSE terminal, select “yes” for item three, WYSE 50 Terminal.
- If you are using a teleprinter such as a TI silent 700, select “yes” for item four, Brief Display Mode.



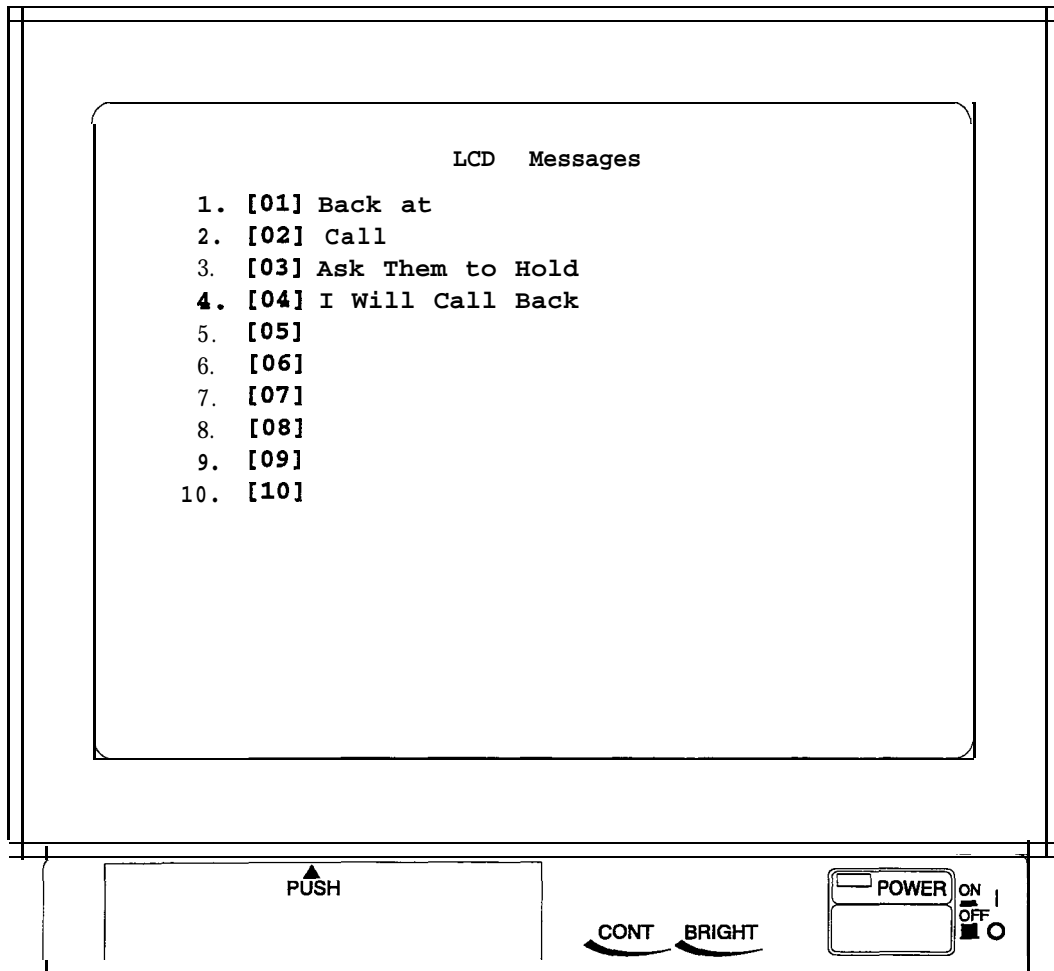
*The Terminal Setup Menu*



## 5.5 LCD Messages

LCD Messaging allows station users to set a message at their stations that displays on calling LCD speakerphones; this is a convenient way for DXP users to communicate their current location or expected time of return, for example. The DXP can store up to 30 different L-CD messages, and each message can have a maximum of 16 characters. Either the installer or the system attendant can program the LCD messages. The DXP defaults with five LCD messages already programmed (see the menu screen below).

Once you have created all of the desired LCD messages, you will have to assign each station with the appropriate message (see section 6.16 for more information).



*The LCD Messaging Menu*

## 5.6 *Save/Restore Database*

This feature saves a database externally from the DXP to a file in DOS; Restore allows you to transfer a database DOS file into a DXP or into a PCMMI program. Also, you can use this feature anytime to back up the stored programming as a security measure. Employ a personal computer with an XMODEM communications program to store the database on a magnetic diskette and reload it from the diskette after software upgrades.

*NOTE: The amount of PC RAM required to operate PCMMI depends upon the version of PCMMI that you are running. You may have to alter your **Config.sys** and **Autoexec.bat** file in order to free up enough conventional RAM for PCMMI.*

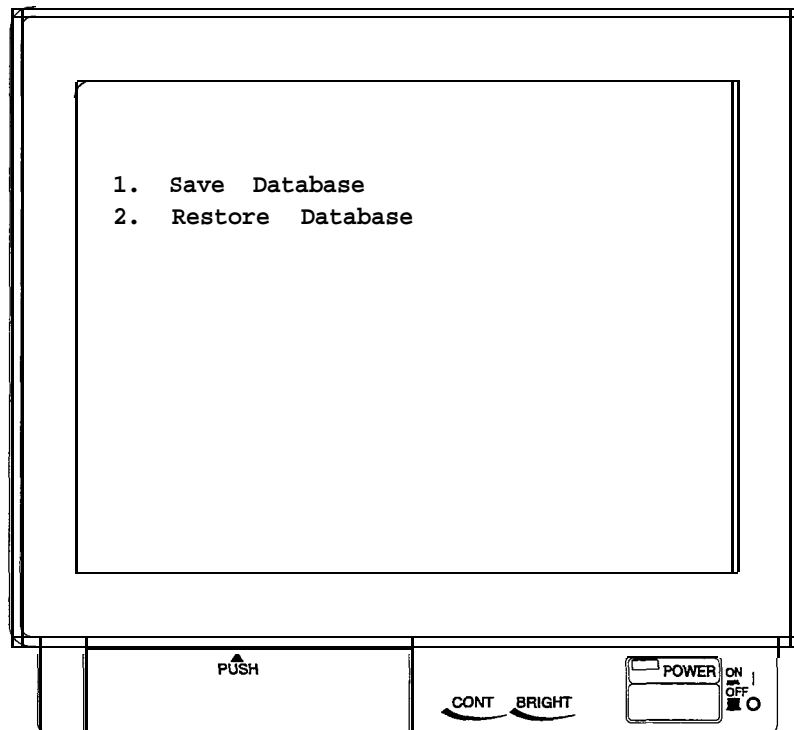
The saved and reloaded database includes the following data:

- system information,
- station parameters,
- line parameters,
- toll restriction and automatic route selection parameters,
- and system speed dial numbers

The saved and reloaded database *does not* include the SMDA/SMDR records. If you need these SMDA/SMDR records, you must make a printout of them before you perform the database storage because this save/restore feature does not record the stored records, and they will be lost.

During programming, the system stores feature data at several places in its database. To ensure that a database save procedure includes all of a feature's stored data, the system saves the entire database whenever you perform the save/restore database programming procedure.

*NOTE: The system will take an additional two to three minutes to power up **after** it receives AC power because of the time required for the database restore processing. Also note that in PCMMI programming, this selection allows you to save a copy of the database to a DOS file. You should save frequently when you are working on a program, since loss **of** power or exiting the PCMMI program deletes any changes showing on the screen.*



**The Save/Restore Database Menu**

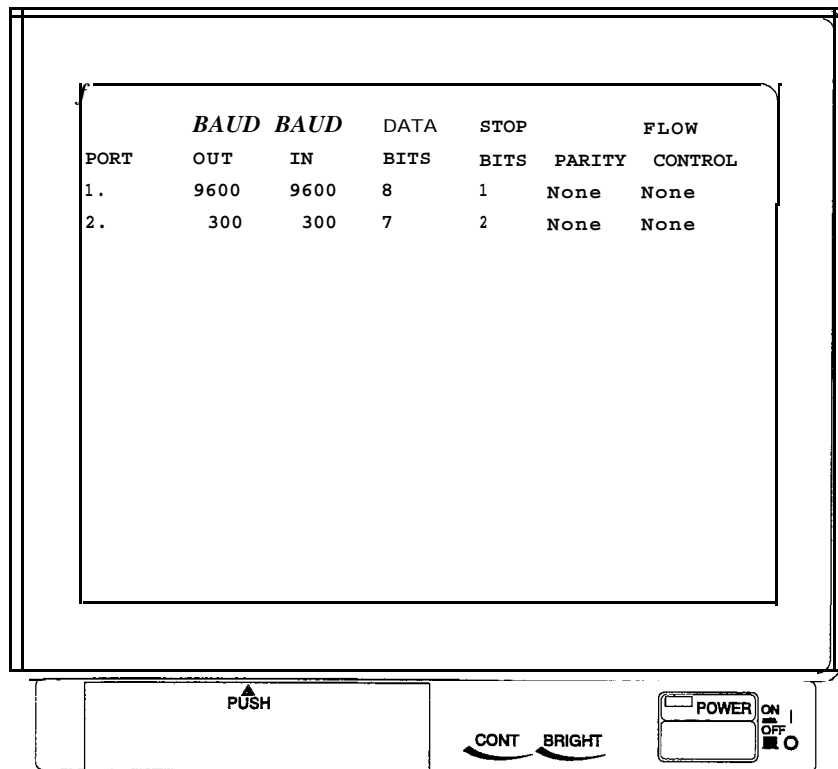
## 5.7 Serial Ports

The DXP provides two main serial data ports on the CPU board and four auxiliary serial ports on each DXOPT-COM communications card. The DXOPT-COM cards are installed onto the DXAUX auxiliary circuit board. Since a DXAUX board accepts two DXOPT-COM cards and the system accepts two DXAUX boards, the DXP can provide a maximum of 16 auxiliary serial data ports.

Every serial data port provides an RS232 interface that you can use for such things as VDT, modem, and data printer connection (for modem information, see the paragraph entitled “*Modem Setup*” within this section). The system recognizes the serial data ports by unique number identifiers (see the paragraph on auxiliary data ports on the following page).

On the serial data ports menu you set the data communications parameters of the serial data ports. The serial data parameters that you set using this procedure remain in effect until you reprogram them. The settings will not change even if you perform a master clear of the system (unless you use the switched master clear method detailed in Section 5.2; With that procedure, the system also defaults its serial data ports).

*NOTE: The main serial data ports are high-speed data ports that are programmable to 9600 baud.*

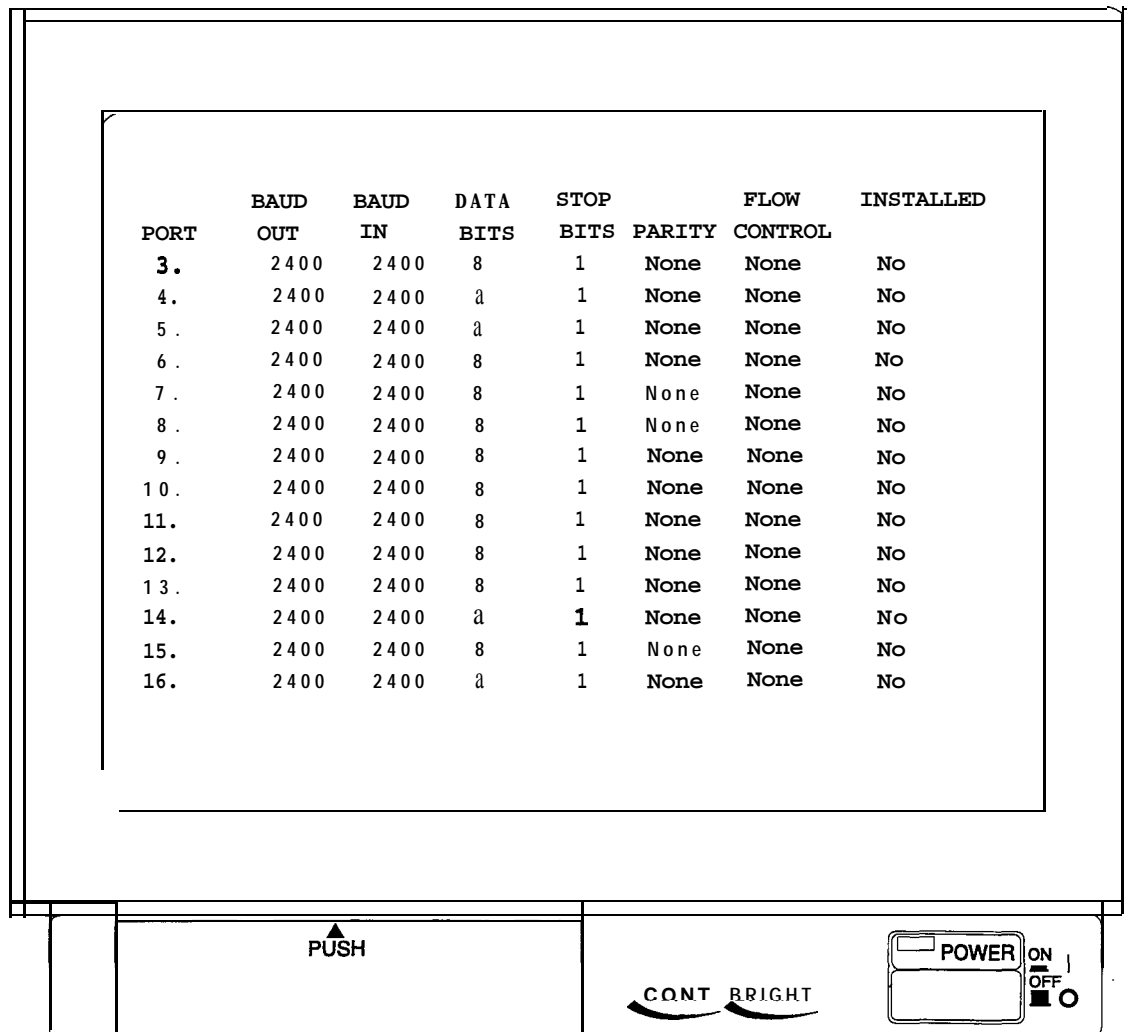


### The Main Serial Ports Menu

### Auxiliary Serial Data Ports

The main serial data ports are 1 and 2, and the serial data ports on the first DXAUX board are 3-6 (upper slot) and 7-10 (lower slot). The serial data ports on the second DXAUX board are 11-14 (upper slot) and 15-18 (lower slot). The port numbering of the auxiliary serial data ports is fixed. Notice on the screen below that the baud rates for the auxiliary data ports are defaulted to 2400; however, you can program them to 9600 baud. Also, there is an additional column telling you whether the DXOPT-COM card is installed.

*NOTE: The auxiliary board can support one device for 9600 baud transmit and receive at any given time. If you program multiple serial ports for any rate above 1200 baud and more than one of those ports is active in the same direction at the same time, the effective throughput may be less than the set value.*



The Auxiliary Serial Ports Menu

## Modem Setup

The system supports the operation of the DXMDM serial data.mo.dem. The DXMDM is a general-purpose, Hayes\*-compatible, 300, 1200, and 2400 automatic baud detect, serial data modem that receives its operating power and configuration programming from the DXP system. After you install and connect the DXMDM, you must program the modem port number into the system memory. Since the serial data port default for both the modem and the SMDR serial data printer is main port 2, it is a good practice to choose a different modem port if the site employs both devices.

Regardless of which port you choose for modem connection, the system arranges for that port to automatically match the baud rate and serial data parameters of the modem.

*\* Hayes is a registered trademark of Hayes Microcomputer Products.*

## 5.8 SOHVA Tab/e Programming

### SOHVA Groups

Subdued Off-Hook Voice Announce (SOHVA) allows a telephone user to break in on any call that is in progress on another extension without his or her voice being heard by the outside party. SOHVA calling groups control the pattern in which station ports receive and/or originate SOHVA calls to one another. You must first form the SOHVA groups and then assign the groups to individual stations. (See section 7.17 for information on assigning various SOHVA groups to individual stations.)

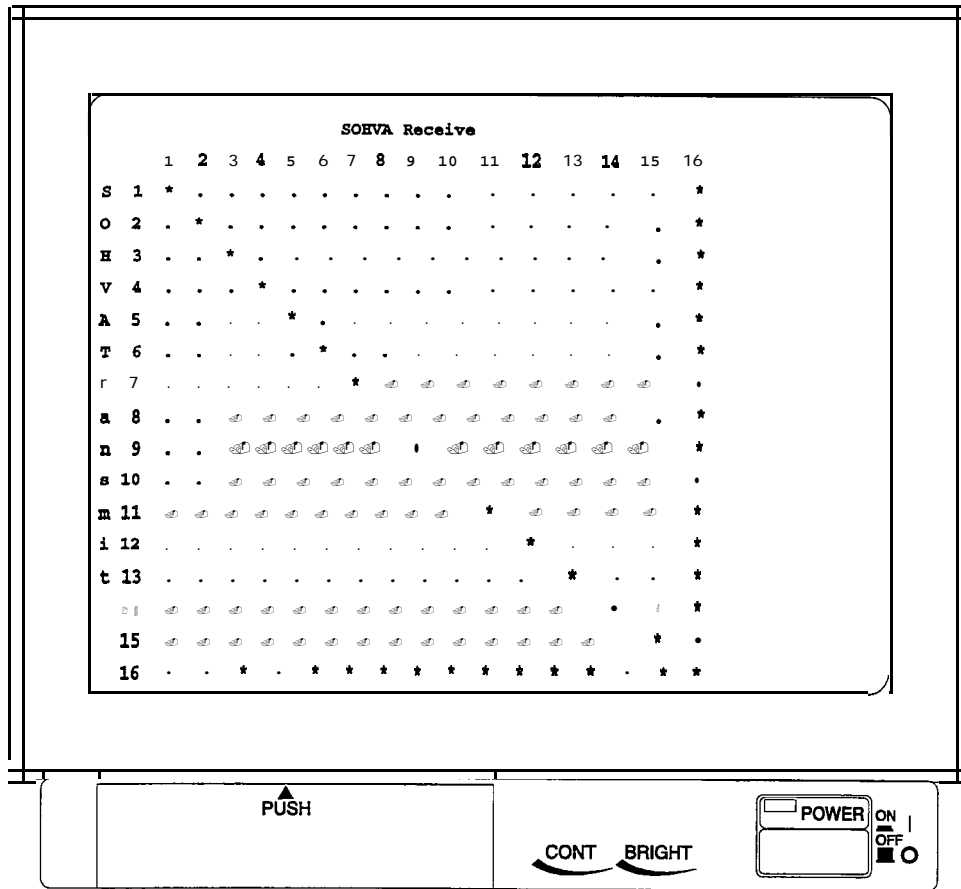
You can organize individual stations into as many as 16 different SOHVA groups.

When a station is assigned to a SOHVA group, it can transmit and receive SOHVA messages to and from other telephones in that group. Also, you can give or deny each SOHVA group the ability to transmit or receive SOHVA messages from other SOHVA groups.

Make sure you keep track of the SOHVA groups you program and their various capabilities; use the chart provided in **IMI66-088**, Programming Records for the DXP Digital Communications System; this publication lists the DXP's SOHVA group default settings.

At default, group 16 has the ability to send and receive SOHVAs to any group; all other groups have the ability to send and receive SOHVAs within their group and to group 16 only.





The SOHVA Table Menu

## 5.9 Speed Dial Programming

The system provides 500 system speed dial numbers (200 speed dials on DXP rev. 4 and earlier), which are outside telephone numbers that any DXP user can access by pressing a three-digit dialing code.

### System Speed Dial Groups

The system divides 500 system speed dial numbers into 50 groups with 10 numbers available in each group. Each screen represents a speed dial group. Assign none, one, or a range of groups (n-nn) to each station class of service (see section 6.26 for more information).

### System Speed Dial

Use this programming feature to provide a list of 500 speed dial numbers to all stations in the system. Under the preselect column, choose the prime line/last line used or designate the line or line group that the system will automatically select for speed dialing. If you choose a line or line group, you must enter that number under the line or line group number column. Store up to 32 digits including 1-9, \*, #, Hookflash signaling "f," and pauses "p."

Also refer to section 6.26 for more speed dial information.

Beginning with software release 8.B, you can choose the intercom to be automatically selected for speed dialing. This enhancement allows you to store intercom selections along with feature codes as speed dial numbers.

### Speed Dial Sets


A speed dial set is a group of 10 speed dial locations. The system allocates three speed dial sets to each telephone as a default, but you can allocate up to 10 sets to a telephone if you wish. When a DSS/BLF console is operated as a companion to a telephone, you can allocate speed dial sets at the companion telephone that the system will then share with the console. The system reserves one speed dial set for the telephone's dial pad buttons 0-9 (see section 7.5 for information on setting speed dial sets on individual stations).

SPEED DIAL	PRE-SELECT	LINE / LINE GRP	NUMBER
1. <b>100</b>	PRIME/LAST	1	
2. 101	PRIME/LAST	1	
3. 102	<b>PRIME/LAST</b>	1	
4. 103	PRIME/LAST	1	
5. 104	PRIME/LAST	1	
6. 105	PRIME/LAST	1	
7. 106	PRIME/LAST	1	
8. 107	PRIME/LAST	1	
9. 108	PRIME/LAST	1	
10. 109	PRIME/LAST	1	

▲  
PUSH

CONT BRIGHT

POWER ON | OFF



### The System Speed Dial Menu

## **5.10 Time and Date (System Clock)**

The system clock provides time and date information for display on LCD speakerphones and for SMDR/SMDA timing and reporting. The clock also tells the system when to shift between day and night mode. You must set the correct time and date to allow the system to operate properly. You can use either 12- or 24-hour format for the time. Enter the date in order of month, day, and year.

**NOTE: If you are running PCMMI, this feature reads the PC clock only.**

## 5.1 1 System Timing

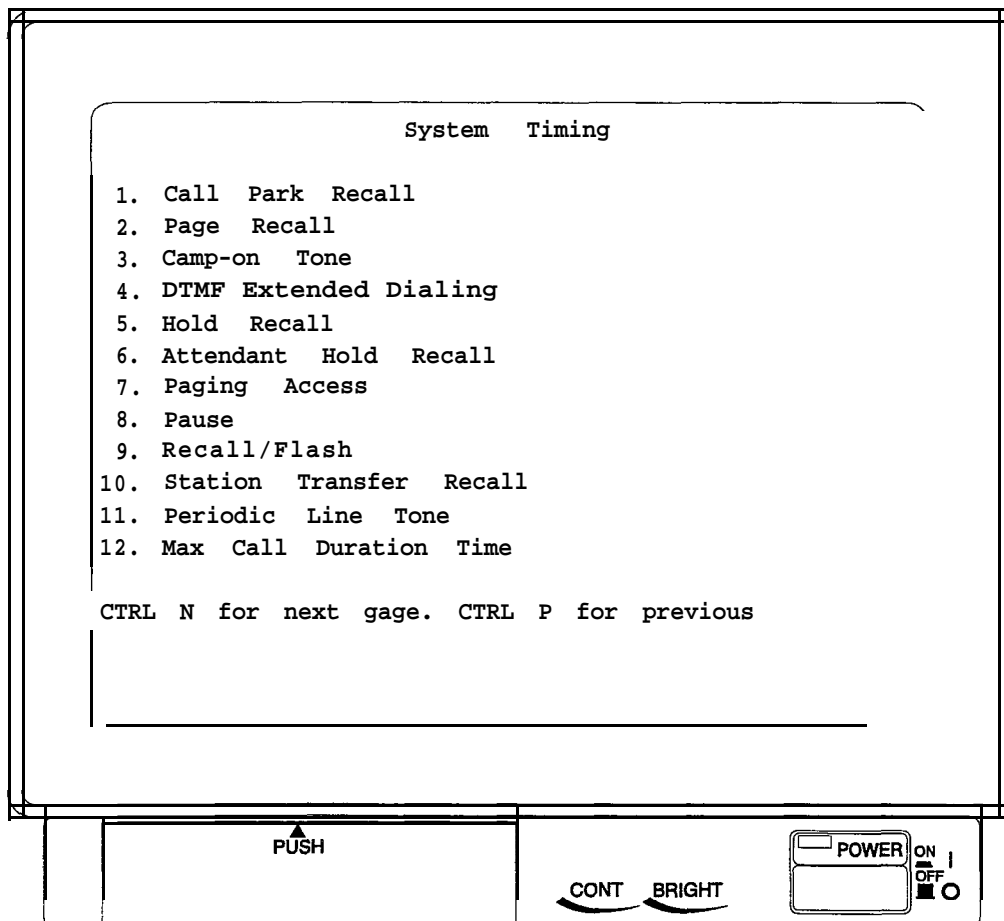
The system timing menu allows you to change various system-wide timing features. Refer to IMI66-088, *Programming Records for the DXP Digital Communications System*, for a records chart listing all of the timing options.

### Call Park Recall

Parking a call means placing it on a system-wide hold status where any DXP user who dials the appropriate access code can pick up the call. A call that is left in a park orbit longer than the length of time that you program with this feature will automatically return to a hold recall condition at the parking station.

### Page Recall

Page recall works with the Tracker paging system. The page recall feature sets the amount of time before a call placed in a track orbit recalls the station that placed the call in the orbit.



*The System Timing Menu*

## Camp-On Tone

A DXP user can camp onto a telephone when he or she calls a station and gets a busy or ring-no-answer (internal calls only). If the calling station camps-on, the busy station receives a brief camp-on tone, letting him or her know that a call is waiting. When the called station becomes available, the calling station rings, and when he or she lifts the handset, the system places the call to the camped-on station. Use this procedure to set the duration of the camp-on tone that the system sends to the busy station (also see the timing parameter in this section for Camp-On/Automatic Call Back Ring).

## DTMF Extended Dialing (Tone Length) (Applies to analog telephones)

Use this programming feature to set the length of the **DTMF** tones. The system generates **DTMF** tones of extended length when users take their telephones off-hook and then wait until after the system sounds the *extended dialing* tone burst. Also, if analog telephone users take their telephones off-hook and then wait to begin manually dialing until after the system sounds *the extended dialing* tone burst, the system will extend the length of the manually dialed **DTMF** tones. Another way to engage extended tones is to place the line on hold momentarily and immediately retrieve the line. After setting this extended **DTMF** tone length, you must enable the feature's use at each station where it is needed (see section 7.32).

## Hold Recall

After a call has been on hold at a station for a programmed length of time, it recalls to the station that placed it on hold. Use this procedure to set the length of the recall time for a held call.

## Attendant Hold Recall

After a call has been on hold at an attendant station for a programmed length of time it recalls to the attendant station. Use this procedure to set the length of the recall time for a held call at an attendant station.

## Paging Access

If you have enabled paging transmit capability at a station, it has access to external paging equipment. With this procedure, you can set the maximum length of time that the station can stay connected to the equipment.

### **Pause Time**

During speed dialing, it is sometimes necessary to have the system delay the sending of digits to give host system switching equipment time to prepare to receive them. A pause, stored in the speed dial number, provides this delay. This programming procedure determines the duration of the pause. The person who stores the speed dial number must press the telephone's HOLD button at the point in the number digit sequence where he or she needs the pause (for example, 9—pause—18049782200).

### **Recall/Flash**

A station can generate either a line disconnect signal (recall) or a host system feature access signal (flash) when its user presses the telephone's TAP button. Use this procedure to arrange for either the recall or the flash signal.

### **Station Transfer Recall**

After a transferred call has been waiting at a station for a programmed length of time it recalls to the station that transferred it. Use this procedure to set the recall time for a transferred call.

### **Periodic Tone Time**

You can set the system to send periodic warning tones that remind users to keep conversations short on certain outside lines (see section 6.32 to enable this feature). The periodic tone time sets the intervals at which you wish the periodic warning tones to occur,

### **Maximum Call Duration Time**

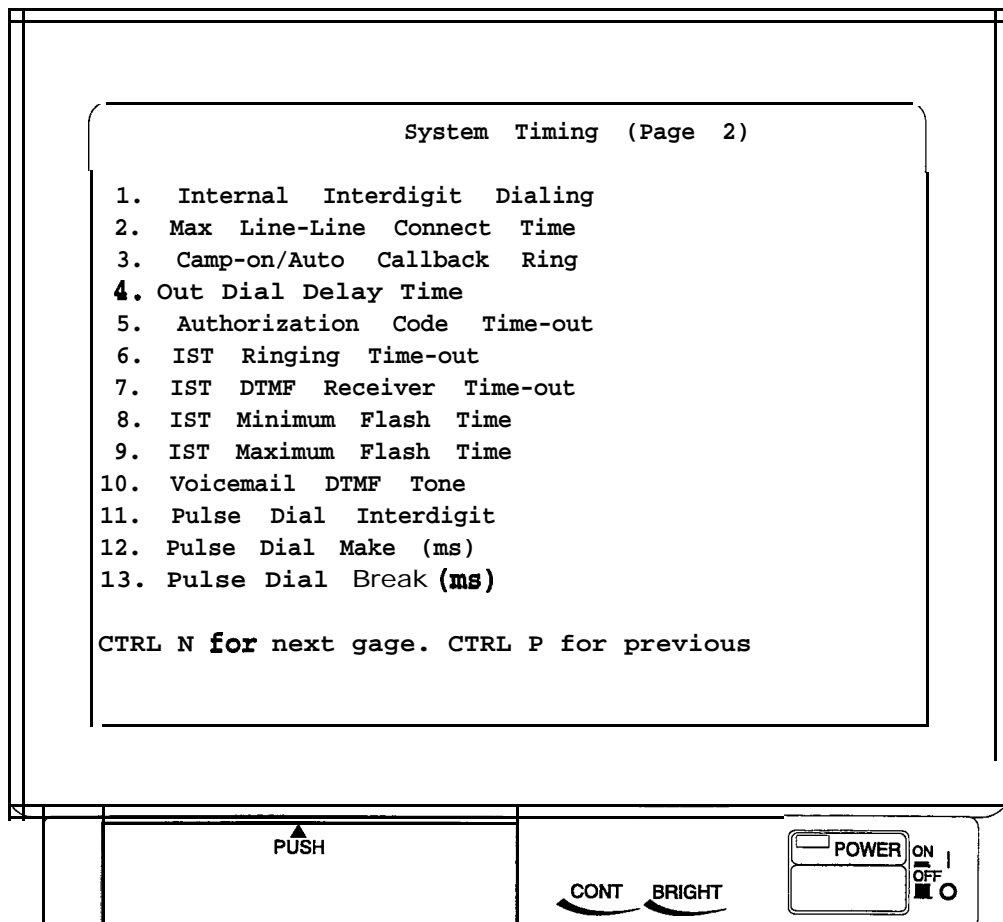
The system provides a maximum call duration feature that automatically cuts off calls on certain lines after a preprogrammed time (see section 6.33). After you enable the maximum call duration feature, use this procedure to set the cut off time.

## Internal Interdigit Dialing

A timer starts running with the dialing of each digit during intercom number dialing. It also starts running whenever the user accesses the intercom number path and does not dial any digits. When the timer “times out,” the system returns the station to an idle state. Use this procedure to set the intercom dialing time-out period for the entire system.

## Maximum Line-To-Line Connect Duration

After you have given a station the ability to set up an unsupervised conference between two lines (see section 6.36), you should use this procedure to set the maximum amount of time that an unsupervised conference can continue. When the time out occurs, the system recalls the station from where the user enabled the unsupervised conference.



*The System Timing Menu-Page Two*



### **Camp-On/Automatic Call Back Ring**

After you enable a call waiting tone (see section 6.9), use this procedure to set the duration of the camp-on/automatic ringback ring that the system sounds when it returns a camp-on call to the original station.

### **Out Dial Delay Time**

The system will wait for a programmed length of time before sending automatically dialed numbers over an outside line. This delay gives the host system time to return dial tone before the system begins dialing the number. Different host systems require different periods of time between when a line is picked up and when dial tone is returned. Use this procedure to match this system to your host system.

### **Authorization Code Time-out**

After you have enabled the authorization code feature (see section 10.2), you must set the authorization code time-out. Once a user uses the authorization code to access his or her telephone features, those features remain in effect until any idle time at the telephone exceeds the authorization code time-out period; use this feature to program that time-out period.

### **IST Ring Time-out**

Use this procedure to set the number of times that the system sends a ring signal to an industry-standard telephone on a system-wide basis. Although the ringing stops at the industry-standard telephone when the time-out occurs, the system continues to present the call at the telephone for answering until the caller abandons it.

### **IST DTMF Receiver Time-out**

You can program the amount of time that the system waits to receive a DTMF tone from an industry-standard telephone, after the user has lifted the telephone's handset and before he or she has pressed a dial pad digit. The system disconnects the telephone after this time-out occurs. If this disconnection occurs, the user must hang up the handset and lift it again to re-establish the dial tone.

### IST Flash Time

You can program the timed length of the signal that results when a user of an industry-standard telephone presses and releases the telephone hookswitch (or presses the **TAP** button if available on his or her telephone). Often, a signal with a short time length (typically 500-750 ms) serves to alert the system to receive a feature code (flash); while a signal with a long time length (typically 1 S-2.0 sec) serves to disconnect the line and re-establish dial tone (recall). The value that you set with this procedure is the maximum value for recognizing a flash from an industry-standard telephone. Beginning with software release **6.A**, you can also set the minimum value for recognizing a flash from an industry-standard telephone.

### Voice Mail DTMF Tone

The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports; it defaults the length to 80 msec, but you can program other lengths as needed.

Refer to Section *15* for other voice mail programming requirements.

### Pulse Dial Interdigit Time

You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The DXP defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments. Refer to *Section 8.10* to enable pulse dialing.

### Pulse Dial Make/Pulse Dial Break (Pulse *Dial Ratio*)

Use this procedure to set the make/break ratio for rotary dial signaling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signaling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec. Refer to *Section 8.10* to enable pulse dialing.

## 5.12 System Parameters

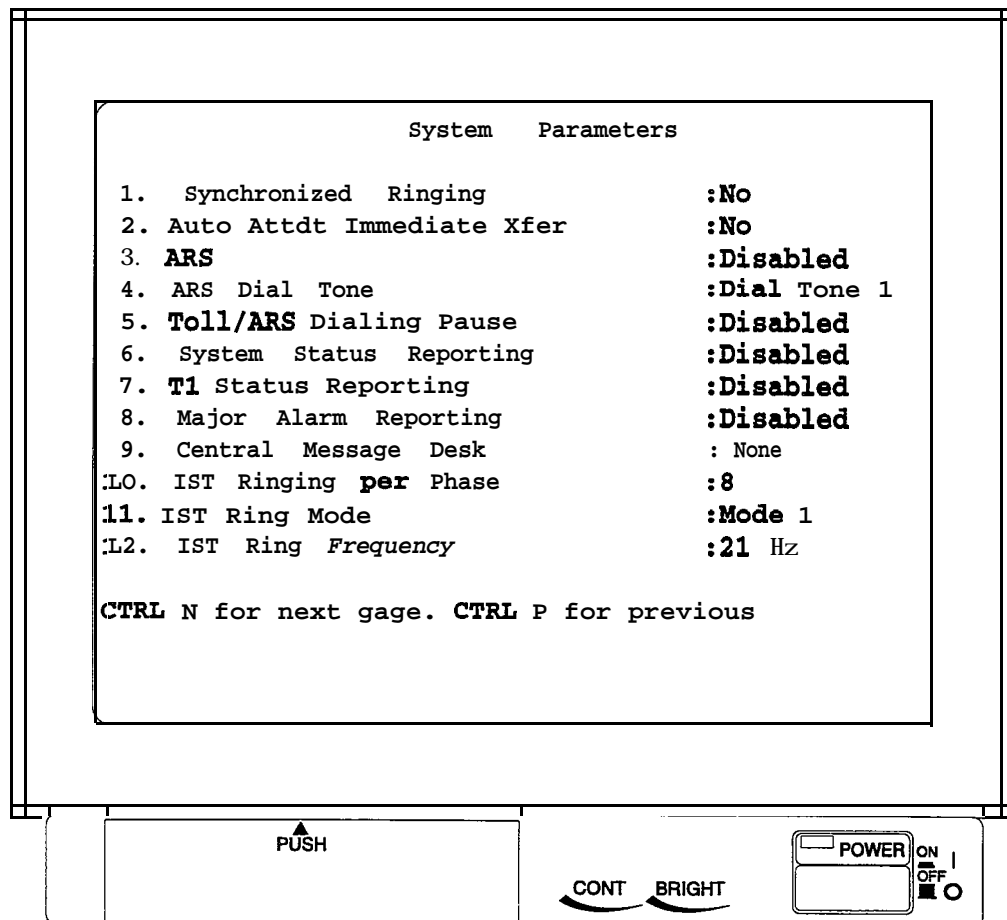
The items listed under the system parameters menu set the majority of the operating limits for the entire system.

### Synchronized Ringing

The system can provide an audible distinction between internal and external call ringing when needed by following the cadence of the input signal. Set the feature to yes to enable this distinction. This feature does not apply to direct inward dial lines and E&M lines.

### Automatic Attendant Immediate Transfer

You should choose the automatic attendant immediate transfer mode for voice mail transfers. This feature allows the system to transfer a call as soon as it answers. However, if you turn on the voice mail screen and confirm options (see the voice mail programming manual for details), do not turn on this immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system.



*The System Parameters Menu*

### Automatic Route Selection (*ARS Enable*)

Automatic route selection (ARS) permits the system to select the least-costly line group that is available to a station to route its outgoing call. The system modifies the dialed number, if needed, to match the selected line group. You can enable or disable automatic route selection on a system-wide basis. A defaulted system has ARS disabled. Refer to *Section 12* for other ARS programming details.

### Automatic Route Selection Dial Tone

You can select one of three ARS dial tones that users hear whenever they enter the ARS access code.

- Dial Tone 1 - steady intercom dial tone (dual tones of 480 Hz + 620 Hz),
- Dial Tone 2 - same as dial tone 1 only preceded by three short tones (200 ms on, 200 ms off)
- Dial Tone 3 - steady simulated central office ring back tone (dual tones of 440 Hz + 480 Hz).

### Toll ARS Dialing Pause

You can enter a pause at the end of a toll restricted number to indicate that dialing is complete. For ARS purposes, the pause lets the system distinguish between similar numbers. This feature merely enables the dialing pause; you still must enter the pauses where necessary in each toll restricted number (for more information on ARS, see section 12).

### System Status Reporting

If you enable status reporting, the system will notify certain designated stations when system status conditions occur. The system notifies these stations by turning on their status light. Refer to section 7.37 procedure to map a status light at a telephone.

### T1 Status Reporting

If you enable T1 status reporting, the system will notify certain designated stations when T1 status conditions occur. The system notifies these stations by turning on their status light. Refer to section 7.37 procedure to map a status light at a telephone.

## Major Alarm Alerting

Major alarm rings occur whenever a number of faults exceed a programmed threshold. Starting with software release 7.A, you can use a telephone station to clear a major alarm ring by pressing the INTERCOM button and then dialing a feature code (default code is #09). However, the telephone station must have a class of service (COS) assigned to it that has this feature enabled.

## Central Message Desk

Use this procedure to designate one station as the central message desk: to take messages for other system stations, control the message waiting light at those stations, and deliver messages to their users upon request.

*NOTE: Do not assign this feature to voice mail station ports since it activates only one port and inhibits all other station ports from having message wait originate capability.*

## IST Ringing Per Phase

You can connect two industry-standard telephones per IST station port; however, those ports will share the same assigned intercom number. When you install one telephone per port, you must set the IST ringing per phase feature to 16. When you place two telephones at any IST station port, you must change the IST ringing per phase feature to 8. A setting of 16 allows up to 48 industry-standard telephones per cabinet (main cabinet and expansion cabinet) to ring simultaneously. A setting of 8 reduces this simultaneous ringing total to 24 telephones per cabinet. This programming selection is on a system-wide basis.

## IST Ringing Patterns (Ring Mode)

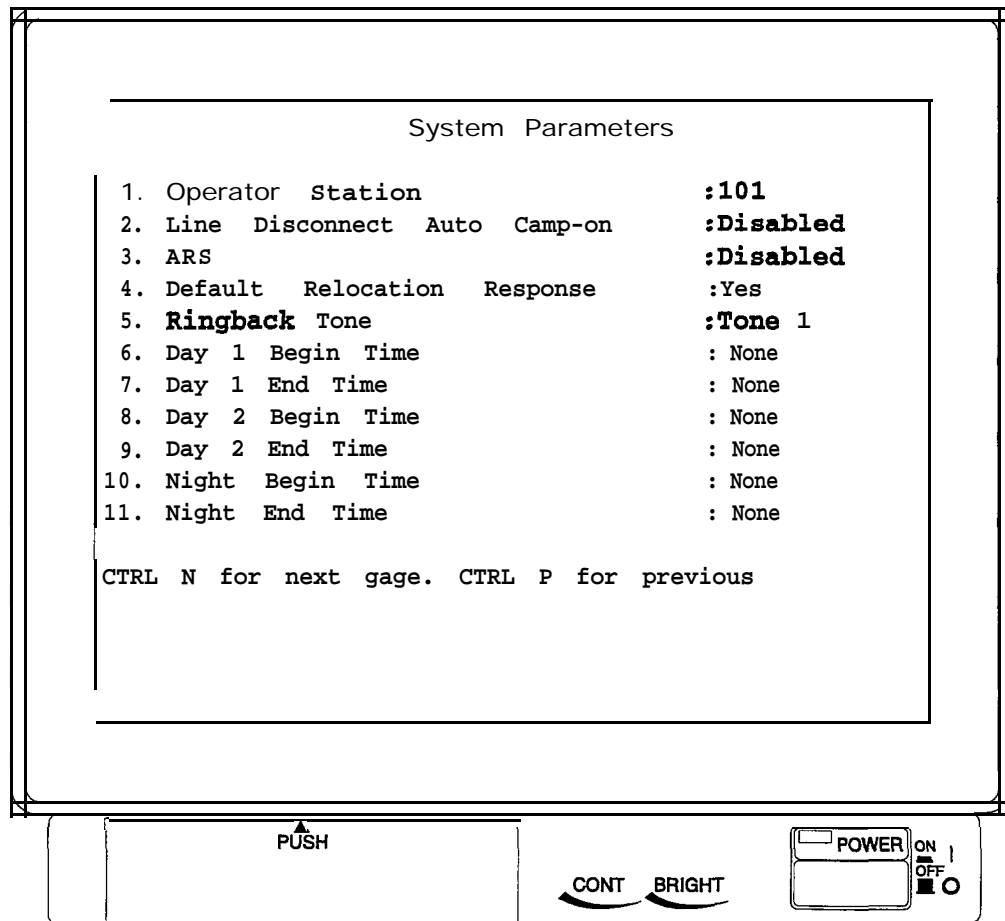
You can program the ringing pattern for either IST ring mode-1 or IST ring mode-2. Mode-1 causes a two-second ring phase while mode-2 causes a shorter one second ring phase. For this feature to function properly, ensure that the DXIST (industry-standard telephone interface board) contains firmware revision 2C or higher

## IST Ring Frequency

The system will allow you to set a ring frequency of 25 Hz for international applications or set a ring frequency of 21 Hz for domestic applications. Choose a setting that matches the ring frequency of the installed ring generator.

### Operator Station

You can designate the station that you want to ring when system users dial the operator. Usually this station is an attendant position station; however, the operator station can be any station in the system.



**The System Parameters Menu-Page Two**

### Line Disconnect Automatic Camp-On

If a user at a current station selects a line that a previous station has released from busy but the system has not yet returned to idle, the system arranges for the current station to camp-on to the line before the system makes the line idle. After the system makes the line idle, it immediately connects the camped-on station to the line. With this feature disabled, a station cannot select a line until after the system has returned the line to idle. Refer to **Section 8.12** to set the time that the system waits before it makes a line idle after a station releases it from busy.

### Automatic Station Relocation

The system will automatically recognize a particular station should someone relocate it to a different station port. After being installed at a new port location, a relocated station will provide the same class of service parameters and station features that it provided at its original port location. Also, the relocated station will respond to the same personal intercom number that it responded to at its original port location. A relocated station prompts the user to take action to either accept its original programming or accept the programming at the new port.

## Default Relocation Response

When someone relocates a digital telephone from one station port to another port, the relocated telephone prompts the user to take action to determine the station parameters. The user can either accept the parameters from the station's original port or accept those from the new port. He or she has 10 seconds to make the choice. If the user takes no action, the station assumes the parameters determined by this programming procedure. If you set the programming choice to YES, the station assumes the parameters from the original station port. If you set the programming choice to NO, the station assumes the parameters from the new port.

## Ring Back Tone

By default, when callers call an intercom party, they receive an intercom ring back tone to tell them that the called intercom station is ringing. Also, when callers call over the CO line, callers receive a CO-style ring back tone to tell them that the distant CO telephone is ringing. Some system users find intercom ring back tone confusing. If you encounter this situation with your users, you can take this programming action to assign CO-style ring back tone to intercom calls.

## Day 1, Day 2, and Night Ringing Begin and End Times

You can divide the DXP programming into three different time frames: day 1, day 2, and night. You are only changing the ringing assignments of the selected stations with this feature (see section 7.14 for information on assigning stations with ringing patterns). These ringing assignments are helpful for sending calls to an auxiliary attendant during lunch hour or for automatically setting the system into night mode after hours. With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods. This feature does not affect toll restriction assignments. Also refer to Section 7.14 for related flexible ringing assignment programming.



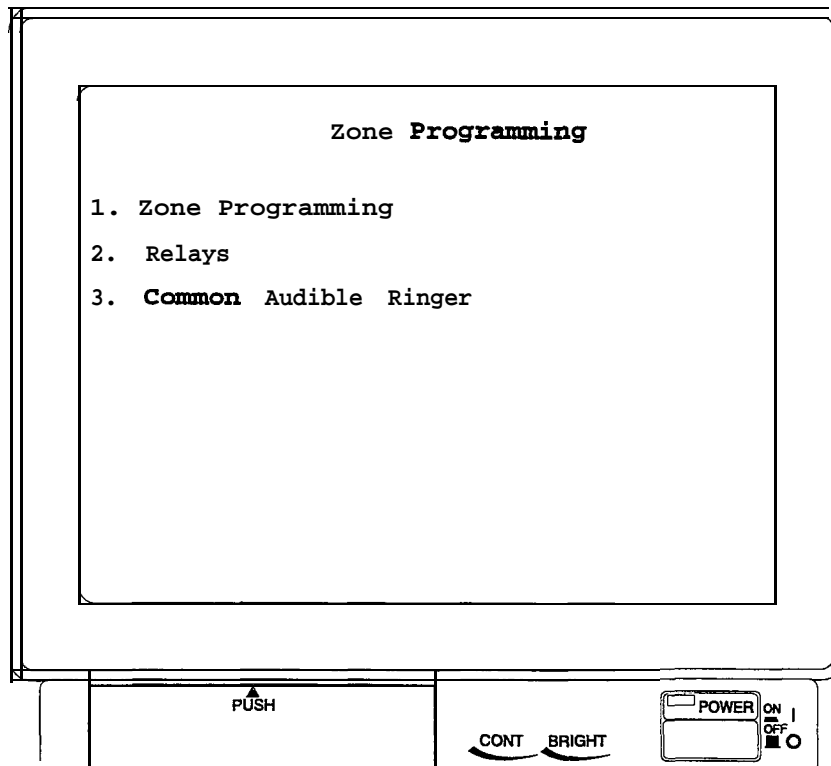
## 5.13 Paging Zones

### Zone Programming (Zone Names, Transmit Stations, Receive Stations)

Use this programming procedure to arrange stations to transmit and receive voice announcements, to and from a particular group of stations or to all stations in the system. Also use this procedure to assign names to paging zones when a site requires named zones.

The zone programming menu lists sub-menu options for all of the following:

- giving the zone a name,
- specifying the extensions that can transmit paging messages to the telephones assigned to the zone,
- specifying the telephones that will receive paging messages as members of the zone,
- designating a relay from one to four that will serve as the interface for the zone,
- and designating a station port for connection of an external paging device.



**The Zone Programming Menu**

## Relays External Paging Equipment Control

The relays serve two different purposes: you can use them to control an external paging amplifier, or you can use them to track the ringing signal on any or all line ports. If you connect customer-supplied external paging equipment to the system's external paging port and that equipment requires external control, use this programming procedure to assign a relay to control the paging equipment. Relays one and two are associated with jack number three on the CPU board, while relays three and four are associated with jack number four on the CPU board. The relays menu lists the following items:

- direct ring,
- delayed ring,
- number one day mode,
- number two day mode,
- and the night mode of ringing for the various lines.

## Relays Line Answer From Any Station

Assign one or more of the four relays located on the central processor board to track the ring signal of any or all line ports. You can arrange for a relay to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes. Typically, installers wire these relays to control loud bells or other external ringers. Users, upon hearing the external ringers, can dial feature codes to answer the call that is ringing on the associated lines.

## Common Audible Ringer

If you connect a customer-supplied external paging equipment to the system's external paging port, use this programming procedure to arrange for that equipment to sound the ring signal of any or all lines. You can arrange for it to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes. Upon hearing the ringing over the external paging equipment, the user can dial feature codes to answer the call that is ringing on the associated lines. Refer to Section 7.14 to assign lines to the ringing modes.

*NOTE: You can assign the same ringing pattern to an unused and unconnected relay that you assign to the external paging equipment. If you do this, station users can dial the call pick up codes associated with the assigned relays to answer the calls that sound over the external paging equipment.*

## 5.14 Change Password

You can use this programming procedure to change the VDT program entry password for both the installer and the *administrator* and change the main programming station entry code for the *system manager* and the *attendant*.

### Installer and Administrator Password

The default sequence for both the *installer* and the *administrator* VDT password entries is: I \*746\*.

You can change part or all of either or both of these passwords to a customized sequence of up to 15 digits and/or letters. You can enter both upper and lower case letters if you desire but do keep in mind that the programmer must enter the password later just as you program it here with the letters properly placed in either upper or lower case.

## System Manager Password

The default system manager station entry code is as follows: INTERCOM button, \* # 746 \*. You can change the default password portion of this station entry code (the 6 portion) to a custom value of up to 15 digits. Thus, a new station entry could be as follows: INTERCOM button, \* #74 nnnnnnnnnnnnnnnnnnn \*.

You can also change the feature code portion of the system manager station entry (the \*#74 sequence). You can change the feature code from \*#74 to a custom code of up to four digits (no letters allowed). Thus, a new *system manager* entry could be as follows: INTERCOM button, nnnn 6 \*. Further, if you couple the allowed password change with the allowed feature code change, a system manager station programming entry code could be as follows: INTERCOM button, nnnnnnnnnnnnnnnnnnn \* (for information on changing this feature code, see section 5.15, Feature Renumbering).

## Attendant Password

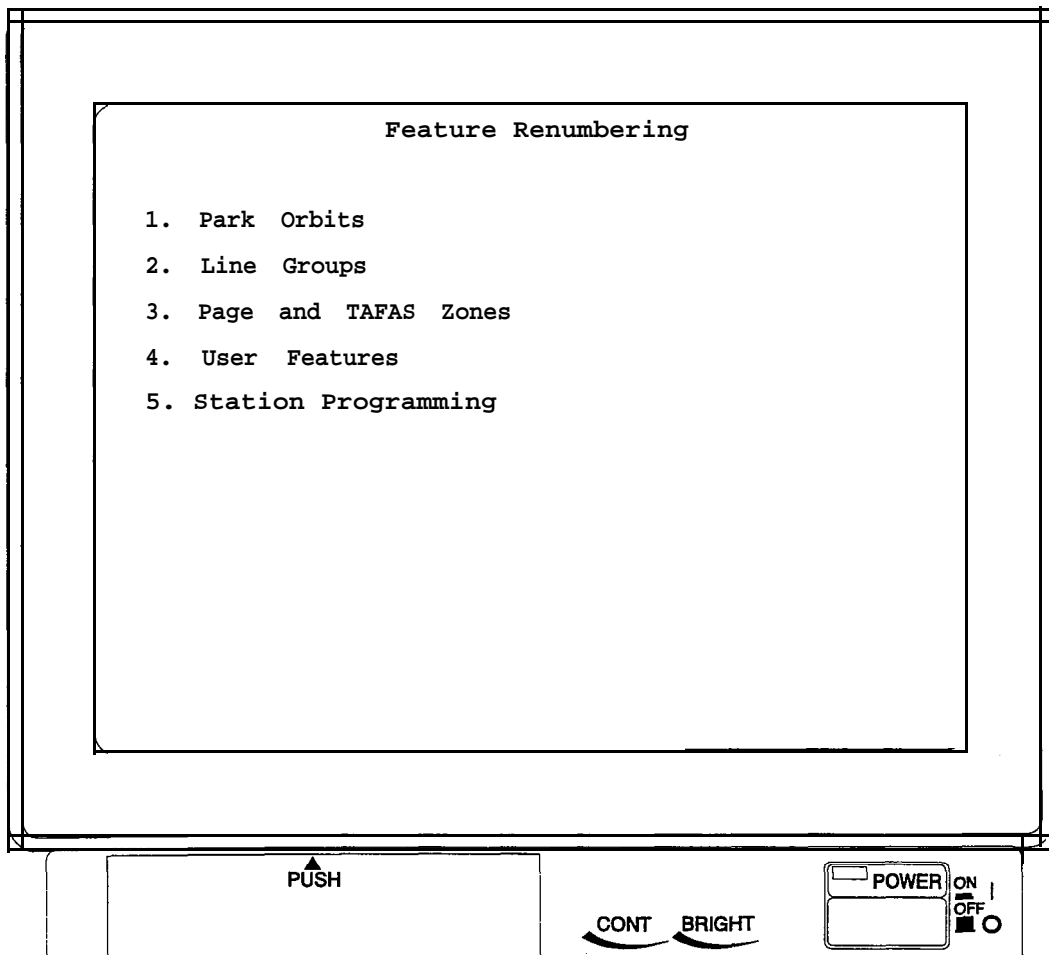
The default attendant station entry code is as follows: INTERCOM button, \* #0 \*. The feature code part of this entry is the \*#0 sequence. You can change the feature code from the \*#0 code to a custom code of up to four digits (no letters allowed). Thus, a new attendant entry could be as follows: INTERCOM button, nnnn \* (for information on changing this feature code, see section 5.15, Changing The Feature Codes).

*NOTE: The new feature code must not **conflict** with existing dialing codes. Either choose a different feature code or use the programming procedure titled Feature Renumbering to renumber any dialing codes that conflict.*

## 5.15 Feature Renumbering

Dialing codes for user features are flexible so that you can renumber them. You may have to renumber a feature if site requirements dictate that personal or group intercom numbers fall within a certain block or sequence. Since new number assignments cannot conflict with existing numbers, the system provides a block of unassigned numbers that you can use for renumber assignment. At default, the system assigns blocks of numbers in the following ranges:

- 101-292 = personal intercom,
- 3101-3292, 4101-4292, 5000-5023 = group intercom,
- 5024-5999 = unassigned,
- 600-899, \*, # = feature codes
- 9 = line group 1



*The Feature Renumbering Menu*

*NOTE: The number block of 5024-5999 is unassigned at default.  
Use it for code renumbering.*

**CAUTION**

*If a number conflict exists, the system will prompt you to remove the conflict. Before responding to this prompt with a y (yes), be sure that doing so will not disturb other programmed features that depend upon the removed extension number. Before entering a new number, make sure you delete the original conflict.*

## 5.16 Programming The T1 Parameters

When the system is using the T1 option, you can program status and alarm alerting parameters. Also, you can program the DXP loss insertion that affects audio levels in the individual T1 channels. The specific programming instructions for the T1 parameters are shown in the following list:

- enable T1 status reporting and major alarm alerting,
- program status log parameters,
- program major alarm alerting parameters,
- assign system status button to station,  
print and clear the status log,
- program DXP loss insertion.

## 5.17 Major Alarm Reporting

You can program the system to activate an external, customer-supplied audible or visual alarm to alert the attendant of an alarm condition. The external alarm connects to one of the relay jacks (J3 or J4) on the front of the DXCPU board. Make sure the alarming device complies with system voltage and power requirements. You determine when a major alarm alerting condition should occur by programming threshold values and corresponding time periods for each type of alarm caused by a transmission error. Whenever the threshold value is reached within the programmed time period, the selected relay on the DXCPU board is activated by the board's circuits, which in turn, activate the external alarm. The system attendant can turn the **alarm** off from any specified station by dialing a feature code.

## Chapter Five Review Questions

1. What is the first item on the system programming menu and what is its function?
2. How many master clear modes does the DXP have?
3. Master Clear option two clears all of the serial port settings; true or false?
4. Using the station class of service defaults menu will automatically reset *all* of the station classes of service to their defaulted settings; true or false?
5. How would you clear the speed dial and autodial numbers from a station?
6. Using the **onboard** software upgrade feature saves all of the DXP database except.\_\_\_\_\_
7. The DXP can store up to different LCD messages,
8. What does it mean to restore the DXP database?
9. You cannot perform on on-board software upgrade unless you have the expanded **RAM** card; true or false?
10. You can install a maximum of \_\_\_\_\_ auxiliary boards, which provide the possibility of a maximum of \_\_\_\_\_ serial data ports.
11. You can set the serial data ports to a maximum of 2400 baud; true or false?



12. At the default setting, all stations have the ability to SOHVA all other stations; true or false?
  
13. How many system speed dials does the DXP provide?
  
14. What purpose does the DXP system clock serve?
  
15. You cannot program the length of the DXP camp-on tone; true or false?
  
16. List three of the DXP timing features and explain what they do.
  
17. Define system status reporting.
  
18. The DXP allows you to set either an IST ring frequency of \_\_\_\_\_ for domestic dialing or \_\_\_\_\_ for international applications.
  
19. A setting of 16 on the IST ring-per-phase menu allows up to \_\_\_\_\_ industry standard telephones to ring simultaneously.
  
20. If you relocate a station to another port, the system automatically gives that station the programming features from the new port; true or false?
  
21. Relays one and two are associated with jack number \_\_\_\_\_ on the CPU board.
  
22. The installer password and the administrator password are defaulted to be the same; true or false.

23. You can renumber the DXP feature codes; true or false.

24. Major alarm reporting is a T1 feature only; true or false?

# 6

## Station COS Programming

<b>Chapter Six: Station COS Programming . . . . *</b>	<b>6-1</b>
6.1 Introducing Station COS Programming .....	6-1
6.2 Account Codes .....	6-2
6.3 Automatic Hold .....	6-2
Automatic Hold On Intercom Number .....	6-2
Automatic Hold On Lines .....	6-2
6.4 Background Music .....	6-3
6.5 Call Cost Display ( <i>Display Of Calls</i> ) .....	6-3
6.6 Call Forward .....	6-4
Call Forward Of All, Personal, Busy, or Ring-No Answer (RNA) Calls.. .....	6-4
Call Forward RNA, Ring (On) Busy .....	6-4
Call Forward, Default Forward Type (For Busy Or Ring-No Answer Calls) .....	6-5
Recall Call Forward .....	6-5
6.7 Call Park .....	6-6
Call Park Access .....	6-6
Call Park Recall .....	6-6
6.8 Call Pick-Up .....	6-6
Call Pick-Up, Enable .....	6-6
Call Pick-Up Group .....	6-6
6.9 Call Waiting (Tone) .....	6-7
6.10 Camp-On Programming .....	6-8
Camp-On Originate, Camp-On Receive .....	6-8

6.11	Do Not Disturb Programming .....	6-9
	Do Not Disturb Inhibit.. .....	6-9
	Do Not Disturb Override.. .....	6-9
6.12	Exclusive Hold .....	6-9
6.13	Executive Override Programming .....	6-9
	Executive Override (Enable or Disable) .....	6-9
	Executive Override Block.....	6-9
6.14	Idle Line Programming.....	6-10
	Idle Line Preference .....	6-10
	Idle Line Priority.. .....	6-10
6.15	IST Distinctive Ringing.....	6-10
6.16	LCD Messaging .....	6-10
6.17	Meet Me Answer Page .....	6-11
6.18	Message Deposit ( <b>Response Messaging</b> ).....	6-11
6.19	Message Wait Originate (Message Waiting).....	6-11
6.20	Music Or Tone On Hold .....	6-12
6.21	Paging Receive .....	6-12
6.22	Paging Transmit.....	6-13
6.23	Ringling Preference (Ringling Line Preference) .....	6-13
6.24	Day Route Access/Night Route Access .....	6-14
6.25	Day Restriction Level/Night Restriction Level .....	6-15
6.26	System Speed Dial Groups .....	6-16
6.27	Directed Station Hold .....	6-16
6.28	Remote Station Disable .....	6-16
6.29	Station Monitoring .....	6-17
6.30	Line Answer .....	6-18
6.31	Line Originate .....	6-18
6.32	Periodic Line Tone .....	6-19
	Periodic Line Tone Time .....	6-19
6.33	Maximum Call Duration.....	6-19
	Maximum Call Duration Time.....	6-19
6.34	Line Group Access .....	6-19
6.35	Line Group Queue .....	6-20

6.36	Line-To-Line Transfer ( <i>Unsupervised Conference</i> ). .....	6-20
	Line-To-Line Connect Duration .....	6-20
6.37	Voice Announce Block.....	6-20
6.38	Internal IST Flash .....	6-21
6.39	Forced Account Codes .....	6-22
6.40	Allow Busy Display ( <i>Display Of Busy Status</i> ). .....	6-22
6.41	Clear Major Alarm Ring .....	6-22
6.42	Handset Volume On Impact Telephones.. .....	6-23
6.43	Restrict ARS Hookflash .....	6-23
6.44	Quick Transfer .....	6-24
6.45	Enhanced LCD Display .....	6-24
	Chapter Six Review Questions .....	6-25

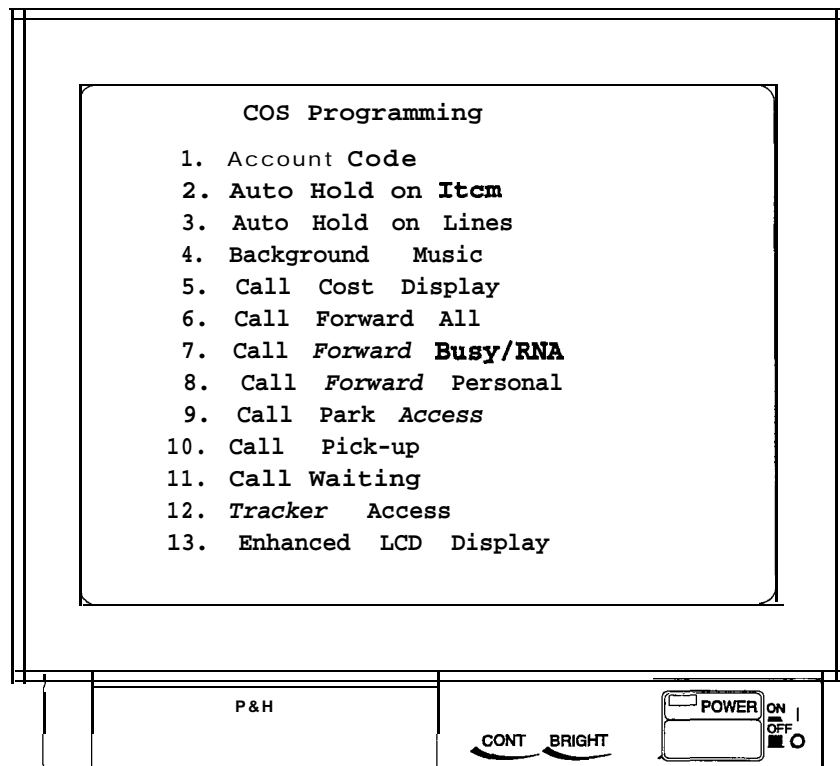
# 6

## Station COS Programming

### 6.1 Introducing Station COS Programming

Station class of service programming allows you to assign blocks of features to groups of stations. By enabling or disabling certain features, you can create a “class of service” that can be assigned to any number of stations. You can program up to 32 classes of service; class of service one defaults with the PC Attendant in mind, while class of service 32 defaults with settings for an average station. All of the other classes of service are defaulted to zero or the lowest possible values for all features.

I



*The COS Menu-screen one*

## 6.2 *Account Codes*

After you have enabled the account code feature for the system, have set its parameters, and have programmed its list of account codes into the system (Section 10.2), use this procedure to turn the feature on for a station class of service and make it either forced or optional.. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls. See *Section 10.3* for an exception to forced account code entry.

## 6.3 *Automatic Hold*

### **Automatic Hold On Intercom Number**

The system automatically places a current inside call on hold when a station user presses an intercom button or line button other than the one for the active call.

### **Automatic Hold On Lines**

The system automatically places a current outside call on hold when a station user presses another line or intercom button.

## **6.4 Background Music**

Music or other supplied audio information is available at a station through the telephone speaker and is turned on or off by the station user when he or she dials the appropriate codes. Use this procedure to assign background music to stations.

The music or information source is external to the common equipment and is customer supplied. The system will accept two music sources, and you can use one source for this feature and the other source for the music on hold feature (Section 8.5).

## **6.5 Call Cost Display (Display Of Calls)**

If you have arranged for the system to employ call costing (Section 12.5), you can use this procedure to arrange for an LCD speakerphone to display the cost of a call made from that station.



## 6.6 Call Forward

### Call Forward Of All, Personal, Busy, or Ring-No Answer (RNA) Calls

Use this procedure to give stations the ability to forward the calls that they receive at their stations to another station for answering. This feature allows these users to forward either all of the calls that their stations receive or just the calls they receive on their prime line and personal intercom number. Further, it can limit them to forwarding only the calls that their stations receive while it is busy or unattended (ring no-answer calls). If you choose this last option, you will have to arrange the call forwarding default scheme at individual stations using the procedure detailed below, **Call Forward RNA, Ring (On) Busy (Enhanced Call Forwarding)**.

#### Call Forward RNA, Ring (On) Busy (Enhanced *Call Forwarding*)

At default, the system immediately forwards calls that reach a busy station. You can take this programming action to allow calls to a busy station to ring in a subdued manner before they forward if the user chooses them to do so. This subdued ringing of calls to a busy station requires an idle intercom number at the busy station. Plus, if you have assigned group intercoms to the station, you must program them into a hunt list, procedure, to ensure that this call forward feature will function properly.

### **Call Forward, Default Forward Type (For Busy Or Ring-No Answer Calls)**

Use this procedure to arrange the call forward default scheme for individual stations. With this feature, the system will automatically forward ringing calls to another station after a preset number of rings. Since this is an automatic forwarding of the calls, the station users do not have to take any action; however, any user-enabled call forwarding overrides this automatic call forwarding.

This procedure determines answers for the following questions: can busy/RNA call forwarding take place at a station, to what intercom number will calls be forwarded to, and what type of calls will the system forward.

You must also program the number of rings that occur before this automatic call forwarding can take place (Section 7.14).

### **Recall Call Forward**

When you enable this feature, any held, parked, and transferred calls that recall to a station while it is busy on another call follow the call forwarding path set up for that station.

## **6.7** **Call Park**

### **Call Park Access**

Access to call park enables the station user to place as many as nine calls in park zones, or orbits, where they are retrievable by all system users. Assigning a call park button on the telephone provides visual LED to indicate in-use status; it also provides one-button access.

### **Call Park Recall**

A call that is left in a park orbit longer than the length of time that you program with this feature will automatically return to a hold recall condition at the parking station.

## **6.8** **Call Pick-Up**

### **Call Pick-Up, Enable**

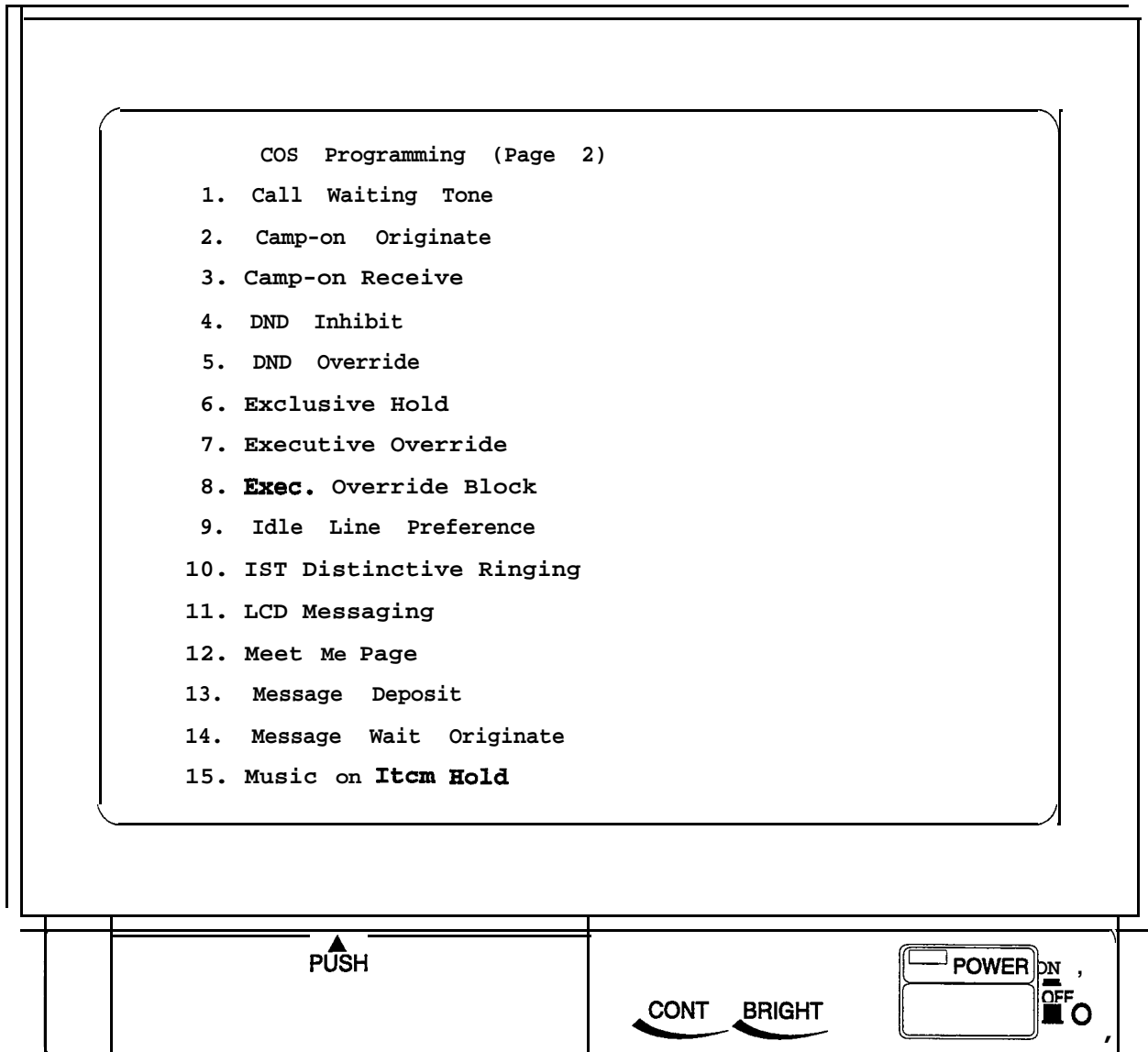
A station user can dial a code plus an intercom number of a ringing or on-hold station and answer the call from his or her station. Remember, you must also assign this class of service to the station that you wish to have this feature.

### **Call Pick-Up Group**

Use this procedure to place a number of stations in a call pick-up group so that one station can answer a call ringing at any other station in the group.

## 6.9 Call Waiting (Tone)

Use this procedure to provide a station with the ability to send a tone signal to a busy called station. Also, refer to *Section 5.11* to enable basic camp-on ability at a station.



**The COS Menu-screen two**

## 6.10 Camp-On Programming

### Camp-On Originate, Camp-On Receive (*Camp-On/Call Back*)

If a busy tone or a ring no-answer is encountered when one station calls another, the calling station user can initiate a camp-on to the busy station and wait for it to become idle or initiate an automatic callback when the called station becomes available. Use this procedure to enable this feature for a class of service of stations. Also, use the section 5.11 procedure to enable a call waiting tone and to set the duration of the camp-on/automatic callback ring and the duration of a camp-on tone that the system sends to a busy station.

## **6.11** **Do Not Disturb** **Programming**

### **Do Not Disturb Inhibit**

This feature prevents a station from entering the do-not-disturb mode of operation.

### **Do Not Disturb Override**

This feature allows a station to override a do-not-disturb condition at another station. If the station does not have interactive buttons, you must program a DND override button. When a user presses the DND override button, he or she signals the DND station; when the call is complete, the station in DND must reactive the do-not-disturb condition on his or her telephone.

## **6.12** / **Exclusive Hold**

When you enable this feature, it prevents a telephone user at one station from picking up a call that someone placed on hold at another station.

## **6.13** **Executive** **Override** **Programming**

### **Executive Override (Enable or *Disable*)**

You can program a class of stations so its users have the ability to override a busy or a do not disturb condition at other stations; this feature creates a three-way conference.

### **Executive Override Block**

Use this procedure to arrange a station class of service that blocks executive overrides. This feature must be enabled for DND override to function properly.

## **6.14** **Idle Line** **Programming**

### **Idle Line Preference**

When you enable this feature, a station automatically connects to an idle line when the user lifts the telephone's handset.

### **Idle Line Priority**

If you give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this programming action to set the priority in which the system chooses the idle lines for use. You can place up to eight lines in this priority list.

## **6.15** **IST Distinctive** **Ringling**

An industry-standard telephone can sound one ring cadence for intercom calls and a different ring cadence for outside calls or it can sound the same ring cadence for both types of calls. You must select one of these ringing styles on a station class of service basis. All industry-standard telephones with the same class of service have the same ringing style.

## **6.16** **LCD Messaging**

This procedure allows station users to set a message at their stations that will be displayed on calling LCD speakerphones. You can use the second part of this procedure to program the actual LCD messages. Alternately, The attendant can program the LCD messages using procedures found in the attendant guide.

**6.17.**  
**Meet Me Answer  
Page**

When you enable this feature at a station, its user can dial a code in response to an all-call or zone page and meet the pager in a private conversation.

**6.18**  
**Message Deposit  
(Response  
Messaging)**

This procedure allows station users to call an LCD speakerphone and arrange for a message to be left on its display. The message is for the called party to read if she or he is unable to answer the caller. Refer to section 5.5 for details about programming the LCD messages that can be deposited. Also, you can use the procedure assign a Response Message button to the telephone; however, users can do this for themselves if they need the button (see section 7.37 for more information).

**6.19**  
**Message Wait  
Originate  
(Message  
Waiting)**

When you enable this feature, a station user can dial a feature code to control the message waiting light at another station.



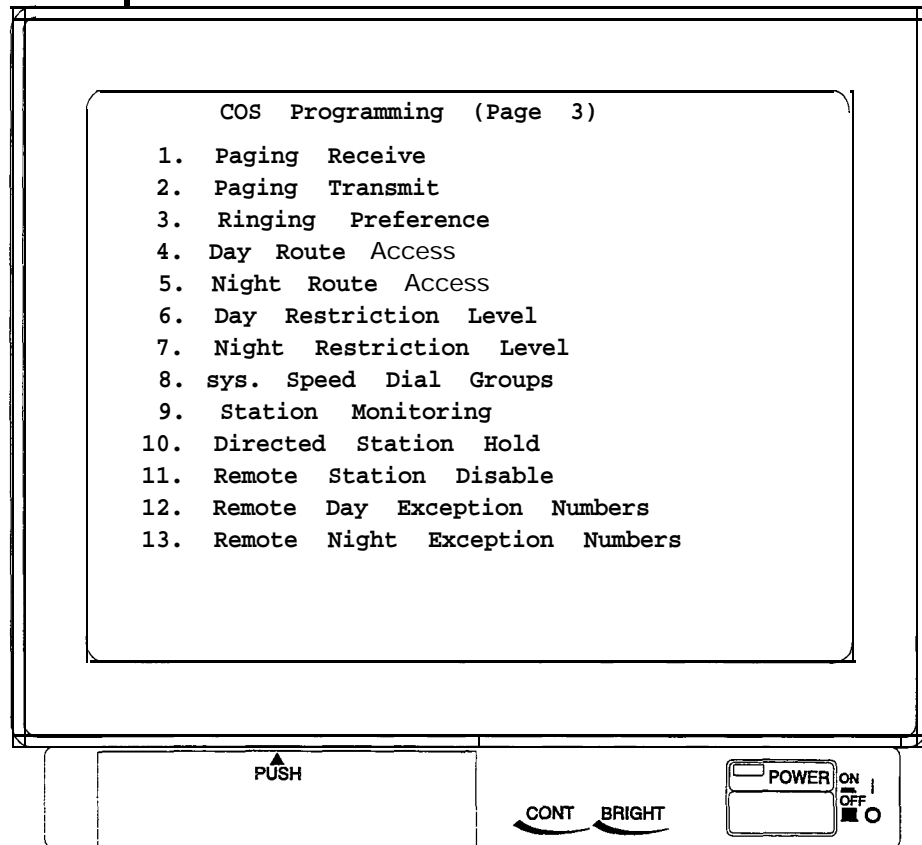
## 6.26 Music Or Tone On Hold

With this feature enabled, the system supplies music, tone bursts or other audio information to callers while they are on hold. The music or information source is external to the common equipment and is customer supplied. Since the system accepts two music sources, you can use one source for music-on-hold and the other source for the background music feature discussed in section 6.4.

When the system supplies tone bursts to callers while they are on hold, it sounds two .1 second long tone bursts separated by a 0.1 second interval of silence. It repeats this tone burst sequence every 5 seconds.

## 6.21 Paging Receive

Use this procedure to give stations the ability to receive voice announcements with the station handset and monitor speaker. For other paging requirements, refer to *Section 6. II.*



**The COS Menu-screen three**

**6.22**  
**Paging Transmit**

Use this procedure to give stations the ability to transmit voice announcements to one or all other station handsets and monitor speakers.

**6.23**  
**Ringling Preference**  
**(Ringling Line Preference)**

When you enable this feature, a station can automatically connect to a ringling line when a user takes his or her telephone off-hook. Refer to section 7.14 for other ringling considerations. This feature also enables the orange LED available on certain telephone models, which helps to distinguish which line is ringling.

## **6.24**

### **Day Route Access/Night Route Access**

You must use section 12.4 to build and assign automatic route selection (ARS) route tables before the system can perform ARS on a dialed number. Each of the six routes of a route table require a route access level of 1 to 4. ARS uses this route access level to **determine** if the dialing station has access to dial out on the route; it does this by comparing a station's route access level to the required dial out access level. If the station route access level is greater than or equal to the route access level that you assign to the route, the system allows the station to access the route. Otherwise, the system will not accept the dialed number and sounds an error at the station's speaker or handset. The route access level allows some stations to gain access to the more costly routes in a route table while denying those routes to others. Just as you program each route from least to most costly, you must also arrange the station's route access level to increase from a low level to a high level; this is necessary because once the system denies access because of the access level, it will not try another route. You should program the system so that the more costly the route is, the higher the access level needed.

## **6.25**

### **Day Restriction Level/Night Restriction Level**

Use restriction level programming (section 11.4) to create as many as eight different toll calling categories, which allow or deny certain numbers, such as toll calls, to various station users.

You can assign one of eight different restriction (1-8) levels or assign an “allow all” level or a “deny all” level. Level 8 is the least restrictive from a station viewpoint but the most restrictive from a restriction table viewpoint. (For example, a station with a restriction of 8 is only restricted from dialing “deny all” numbers and it can dial numbers with restriction levels of 1-8. A station with a restriction level of 1-7 cannot dial a number with a toll restriction table entry of 8.) The “allow all” entry ensures that the system applies no dialing restriction to a number (example: 911). The “deny all” ensures that station user can never a number (example: 1-900).

## **6.26** *System Speed Dial Groups*

The system provides 500 system speed dial numbers (200 speed dial number in DXP rev. 4 and earlier). These numbers are divided into 50 groups with 10 numbers available in each group. Assign none, one, or a range of groups (n -nn) to each station class of service. Refer to section 5.9 for additional speed dial considerations.

## **6.27** *Directed Station Hold*

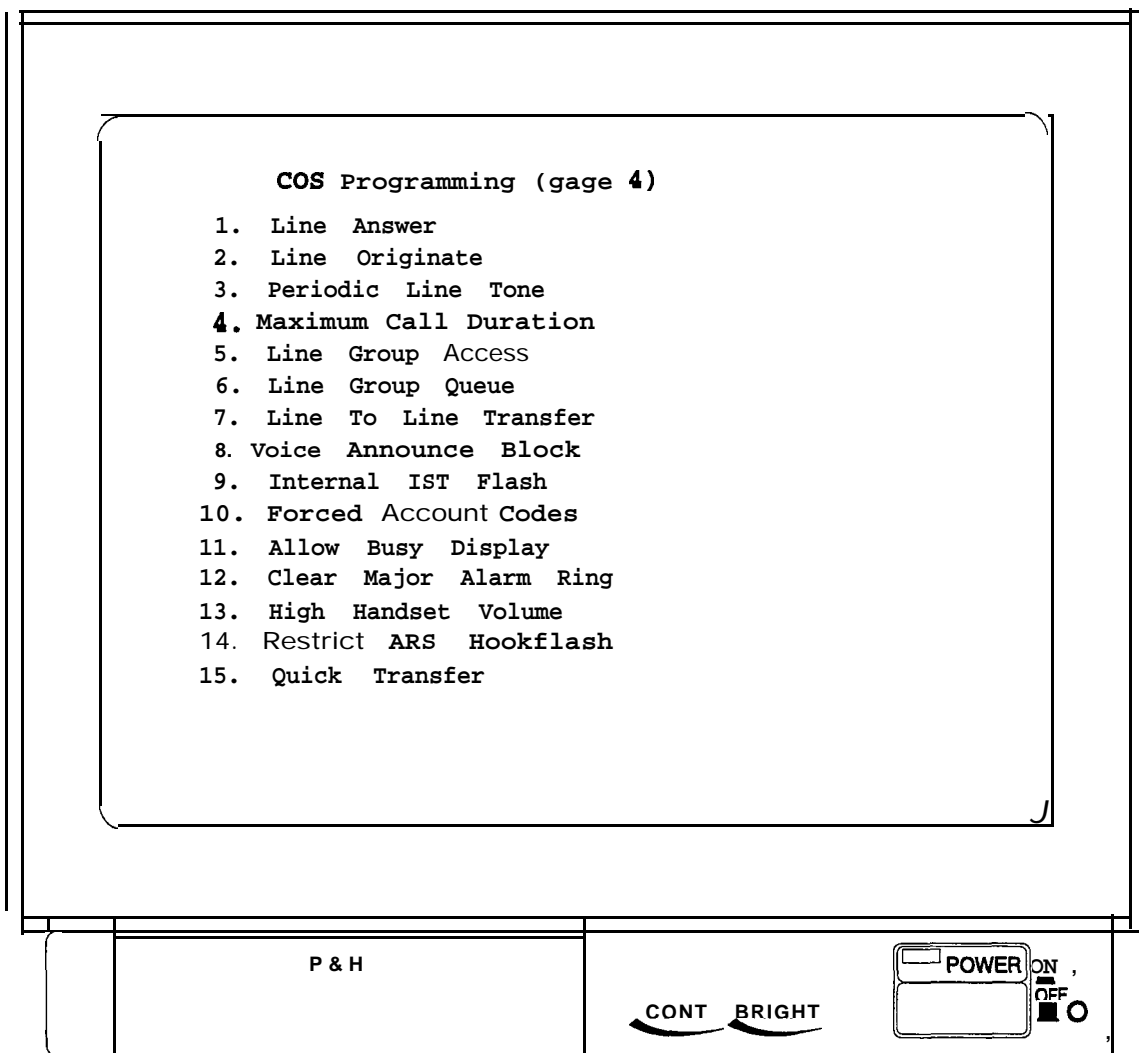
This feature, when enabled, allows station users to pick up the last call a user placed on hold at another station. This feature does not allow users to pick up exclusive hold calls or calls that are in the process of being transferred. Also, the feature does not allow users to send a directed call hold to a station where its user is scanning the currently held calls. In addition, this feature allows users to place a call on hold at another station and have this call appear to be the one that has been on hold there for the longest time. Features such as hold recall apply to the station that sent the directed call hold and not to the station that received the directed call hold.

## **6.28** *Remote Station Disable*

With software release 6.A, this feature, when enabled, allows users at stations to dial a code and remotely disable or enable another station. Normally, you should give this capability to the system attendant, but you can assign it to any class of service that is appropriate.

## 6.29 Station Monitoring

When you enable this feature, the busy lamp field (BLF) light of an associated direct-station-select select (DSS) button provides a visual indication of idle, busy, and ringing status of the station it represents. A station user can press this DSS button to make a one-button pick-up of a ringing station. When you disable this feature, the BLF shows only idle and busy conditions of the DSS station.



*The COS Menu-screen four*

**6.30**  
**Line Answer**

This feature provides station access to a line for call answering purposes. You must turn on both line originate and line answer for a line to be fully usable.

**6.31**  
**Line Originate**

This feature provides station access to a line for call originating purposes for an entire class of service of stations. You must turn on both line originate and line answer for a line to be fully usable.

### **6.32** **Periodic Line Tone**

This feature provides periodic warning tones to station users while they are busy on certain lines. The warning tone consists of one 500 ms burst, a 100 ms off period, and one 100 ms burst. The tone reminds the users to keep their conversations short on these lines. You can enable this feature for a class of service of telephones and then specify the particular lines that you deem applicable. Further, you can select how often the tone sounds. Also refer to Section 6.33 for a related feature.

#### **Periodic Line Tone Time**

After you enable the periodic warning tones that remind users to keep conversations short on certain outside lines, use this procedure to set how often that you wish the periodic warning tones to occur.

### **6.33** **Maximum Call Duration**

This feature automatically cuts off calls on certain lines after a preprogrammed time. The system will not cut off calls made to an emergency number (Section 10.4). The system sounds a warning tone at the busy station 10 seconds before it disconnects the call. The warning tone consists of one 800 ms burst followed by eight 100 ms bursts. Also refer to section 6.32 for a related feature.

#### **Maximum Call Duration Time**

After you enable the maximum call duration feature, use this procedure to set the cut off time.

### **6.34** **Line Group Access**

Use this procedure to give a station access to line groups. Refer to section 8.20 for other line group considerations.



**6.35**  
**Line Group**  
**Queue**

Use this procedure to give a station the ability to queue for an idle line in a line group. Refer to section 8.20 for other line group considerations.

**6.36**  
**Line-To-Line**  
**Transfer**  
**(Unsupervised**  
**Conference)**

This programming feature gives a station the ability to set up an unsupervised conference between two lines.

**Line-To-Line Connect Duration**

After you have given a station the ability to set up an unsupervised conference between two lines, use this procedure to set the maximum amount of time that an unsupervised conference can continue. When the time out occurs, the system recalls the station from where the user enabled the unsupervised conference.

**6.37**  
**Voice Announce**  
**Block**

When you enable this programming feature, a station has the ability to block voice-announced internal signaling when its user dials the proper code.

## 6.38 Internal /ST Flash

If industry-standard telephone users access an outside line using the line group feature and then quickly press and release (flash) the telephone's hookswitch, the IST will react in one of two different ways depending upon how you program this feature.

With the internal IST flash feature disabled, IST users can flash the hookswitch while on an outside line and generate a hookflash signal on the outside line; however, they cannot flash the hookswitch to obtain intercom dial tone. (The section 5.11 procedure sets the hookflash signal time. This signal time determines whether the IST hookflash signal is long enough to recall the outside line dial tone or short enough to access the outside line host system features. Refer to the CO specifications for actual timing requirements.)

**With the internal IST flash feature enabled,** IST users can flash the hookswitch while on an outside line and obtain intercom dial tone; however, if they need to generate a hookflash signal on the outside line, they must flash for intercom and then dial \*08.

Dialing \*08 over the intercom, generates an outside line hookflash signal and returns the telephone to the outside line.

### 6.39 **Forced Account Codes**

After you have enabled the account code feature for the system, have set its parameters, and have programmed its list of account codes into the system, turn the feature on for a station class of service and make it either forced or optional. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls. See section 10.2 for other account code programming considerations and section 10.3 for an exception to forced account code entry.

*NOTE: Changing the account code length will default the **entire** table.*

### 6.40 **Allow Busy Display (Display Of Busy Status)**

When you activate this feature, users calling a busy station from an LCD speakerphone can read the busy status of the called station on the telephone's display. (for example, **Busy with line 2**).

With the feature inactive, the display shows busy but does not reveal the busy status.

### 6.41 **Clear Major Alarm Ring**

This feature allows users to clear the major alarm ring condition from a telephone station. To make this feature available to users, you must first program a class of service as described below and then assign that class of service to the user's telephone station.

## **6.42** **Handset Volume** **On Impact** **Telephones**

You can program the handset volume feature on *Impact* telephones to offer the station user more choices in selecting the handset volume level locally from his or her telephone. Normally, users have up to 8 volume levels that they can select. However, when you program the high level, the user's handset volume choices increase to 13.

## **6.43** **Restrict ARS** **Hookflash**

This feature enhances ARS response to hookflash action on an outside line when that action is followed by dialed digits. With the feature enabled, the system delays response to a hookswitch flash until after the ARS feature verifies that all subsequent dialed digits are valid. With the feature disabled, the system sends the hookflash over the line without waiting for the ARS feature to verify the validity of subsequent dialed digits. This station class of service feature is applicable only when the ARS feature is active.

## **6.44** **Quick Transfer**

The quick transfer feature allows users to perform an automatic screened or unscreened transfer of an incoming line call without pressing their telephone's TRANS/CNF button. The transfer occurs automatically as soon as the user who answers the call dials the intercom number or access code for the transfer location. The system begins the call transfer process as soon as the user dials a digit on his or her dial pad, and it affects the transfer as soon as the user hangs up or presses his or her telephone's RELEASE button. When this feature is active, it greatly reduces the keystrokes that users must take to transfer calls over a tie line.

## **6.45** **Enhanced LCD Display**

In systems operating with software releases prior to 8.B, when users receive intercom calls, their LCD-equipped telephone displays the name of the calling station or its personal intercom number if it does not have an assigned name.

With software release 8.B, you can take programming action that enhances the display of an LCD-equipped telephone so that it shows both the name of the calling station and its personal intercom number.

## Chapter Six Review Questions

1. The DXP provides 42 classes of service; true or false?
2. At default, all of the classes of service have the same settings; true or false?
3. Define the difference between account codes and forced account codes.
4. The DXP accepts a maximum of \_\_\_\_\_ external music sources.
5. You can program the DXP to forward all calls or j u s t calls.
6. What function does a call pick-up group serve?
7. No matter what type of telephone you are using, you must program a DND override button for that station to have the DND override feature; true or false?
8. Define Idle line preference.
9. The ring cadence for DXP intercom calls and external calls is the same; true or false?
10. If you have not installed a background music source, the DXP can play \_\_\_\_\_ to callers waiting on hold.
11. Which class of service feature gives stations the ability to transmit voice announcement to one or all other stations.

12. You can program up to nine routes per automatic route selection table; true or false?
  
13. Including the “deny-all” and “allow-all” levels, there are a total of \_\_\_\_\_ toll restriction levels.
  
14. It’s a good idea to give every station the “remote station disable” feature; true or false?
  
15. You must turn on line originate and \_\_\_\_\_ for a line to be fully usable.
  
16. The periodic line tone and the maximum call duration tone are identical: true or false?
  
17. It is not possible for IST station users to generate an external hookflash through the DXP; true or false?
  
18. You can program the handset volume levels on \_\_\_\_\_ telephones.
  
19. Define Quick transfer.
  
20. Enhance LCD only works on DXP software \_\_\_\_\_ and later.

# 7

## Station Programming

---

<b>Chapter Seven: Station Programming</b> .....	<b>7-1</b>
7.1 Introducing Station Programming .....	7-1
7.2 Personal Intercom Number .....	7-2
7.3 Station Name .....	7-2
7.4 Class Of Service .....	7-2
7.5 Speed Dial Sets .....	7-3
7.6 Idle Line Priority .....	7-3
7.7 Intercom Hunt List .....	7-3
7.8 Group Intercom Access .....	7-4
7.9 Prime Line Programming .....	7-4
Prime Line Type .....	1-4
Prime Line .....	7-4
Prime Line Group .....	7-4
Prime Intercom Number .....	7-4
7.10 Tone Or Voice Signaling (Tone First) .....	7-5
7.11 Call Announce Beeps (Call Announce Tone Bursts) .....	7-5
7.12 Default Forward Type .....	7-6
Intercom Number Forwarded to .....	7-6
Forward Type .....	7-6
7.13 Forward RNA Ring Busy (Enhanced Call Forwarding) .....	7-7



1.14	Flexible Ringing Assignments .....	7-7
	Direct Ringing.. .....	7-7
	Delayed Ringing .....	7-7
	Day 1 Ring .....	7-8
	Day 2 Ring .....	7-8
	Day 1, Day 2, And Night Ringing Begin And End Times.. .....	7-8
	Night Ring ( <b>Night Transfer • Of Ringing</b> ) .....	7-8
	Caller ID Ring No-Answer (RNA) .....	7-8
	Ring-no-answer Rings .....	7-9
7.15	Personalized Ringing Tone.. .....	7-9
7.16	LCD Contrast.....	7-9
7.17	Service Observing .....	7-10
7.18	Day Exception Number/Night Exception Number .....	7-11
7.19	SOHVA Beeps (SOHVA Tone Bursts)SOHVA Groups .....	7-11
7.20	Busy On SOHVA .....	7-11
7.21	Pick-Up Groups .....	7-11
7.22	Through Dialing (Thru-Dialing). .....	7-12
7.23	Single Line Proprietary Telephone TAP Button .....	7-12
7.24	Ringling On Busy (Enhanced Subdued Ringing).....	7-12
7.25	Allow Ringer Off (Ringer Volume Off) .....	7-13
7.26	Station Disable .....	7-14
7.27	DSS/BLF Consoles Installed.. .....	7-14
7.28	Programming Port (Database Programming Station). .....	7-15
7.29	Automatic Voice Mail Transfer On Busy .....	7-15
7.30	Headset .....	7-15
7.31	Attendant Position (Alternate, Overflow) .....	7-16
7.32	Extended DTMF Dialing .....	7-16
7.33	Interactive Button Support (Softkeys Setup).....	7-17
7.34	IST Hold Confirmation.....	7-18
7.35	Transfer Ring Cadence .....	7-18
7.36	Ring Back On Busy.. .....	7-19
7.37	Button Mapping By Station.....	7-20
7.38	Telephone Types (Phone Types) .....	7-21

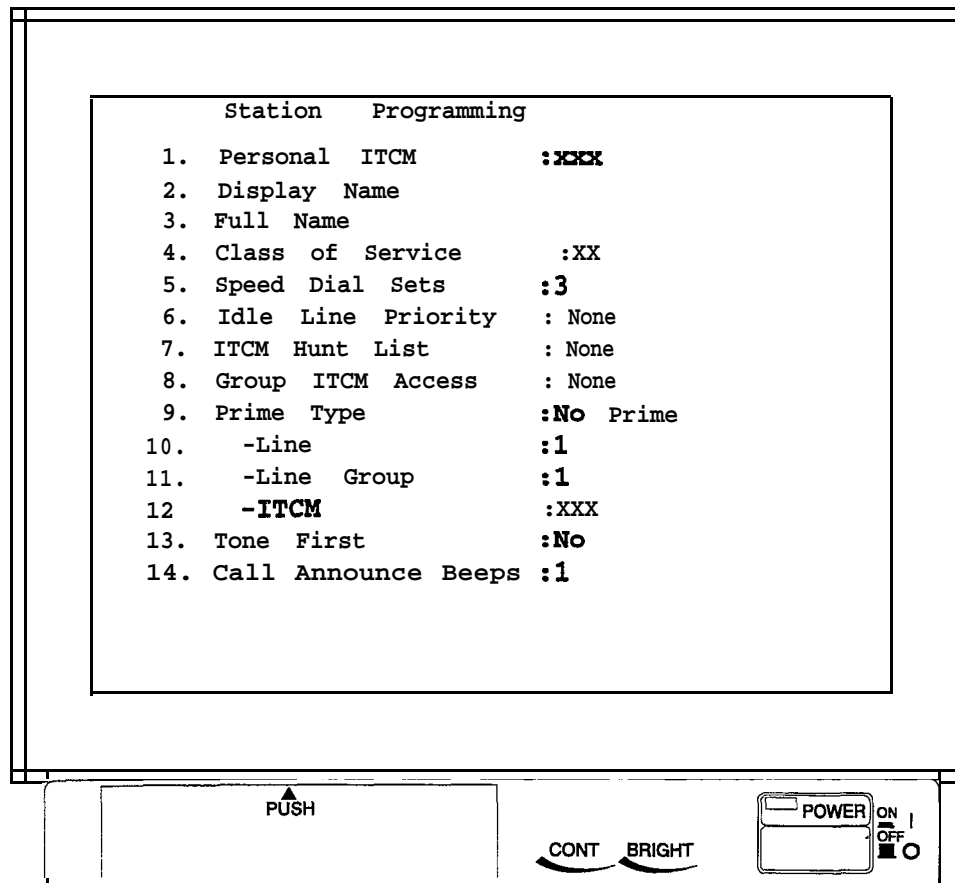
7.39 Copy Model Programming .....	7-22
Block Programming, Class of Service .....	7-22
Block Programming, Station Features .....	7-22
Block Programming, Button Mapping .....	7-22
Chapter Seven Review Questions .....	7-23

# 7

## Station Programming

### 7.1 Introducing Station Programming

Station programming allows you to customize each telephone station to fit the needs of its user. Unlike class of service programming, where you set features for a group of stations, with station programming, you can set the features for a single station.



The Station Menu-screen one

## 7.2 Personal Intercom Number

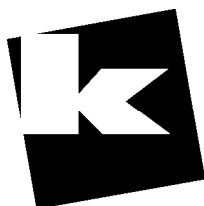
Use this programming procedure to change the station's personal intercom number. Also refer to section 9.1.

## 7.3 Station Name

You can assign a display name and a full name to a station. A display name is composed of a maximum of seven characters and shows in the display of an LCD speakerphone as an identification aid. A full name is composed of a maximum of 20 characters and shows in some voice mail and open architecture interface applications. You can compose a valid name from any alpha-numeric character; however, the first character of a display name must be an alphabetic character (no numbers). You can also add station names by following the procedure described in section 9.1.

## 7.4 Class Of Service

You can assign a group of preprogrammed class of service station features to a station. The system makes up to 32 different classes of service available, and you can program the feature values differently in each one (see section six for class of service programming information).



**A to Z KELLATRONICS, INC.**

**tel: 800.766.3425**

**fax: 800.720.1172**

**818.773.8888**

**818.773.8899**

**www.kellatronics.com**

**info@kellatronics.com**

## **7.5** **Speed Dial Sets**

A speed dial set is a group of 10 speed dial locations. The system allocates three speed dial sets to each telephone as a default but you can allocate up to 10 sets to a telephone if you wish. When a DSS/BLF console is operated as a companion to a telephone, you can allocate speed dial sets at the companion telephone that the system will then share with the console. The system reserves one speed dial set for the telephone's dial pad buttons 0-9. For other speed dial considerations, see sections 5.9 and 6.26.

## **7.6** **Idle Line Priority**

If you give a station the ability to automatically connect to an idle assigned line when the user takes the handset off-hook, take this programming action to set the priority in which the system chooses the idle lines for use (see section 6.14 for more information). You can place up to eight lines in this priority list.

## **7.7** **Intercom Hunt List**

Place personal intercom and group intercom numbers in a list with this programming procedure. Calls to a busy personal intercom number will search the list for an idle number at which to ring. Up to eight intercom numbers are allowed in a hunt list. These can be all group intercom numbers or one personal intercom number and seven group intercom numbers. See section 9 for other intercom number considerations.

## 7.8 Group Intercom Access

Use this procedure to add group intercom numbers to stations for their use. Also refer to section 7.37 to map buttons for group intercom number selection. See section 9 for other intercom number considerations.

## 7.9 Prime Line Programming

### Prime Line Type

When you enable this feature, the station automatically selects a line, line group, or intercom number for use when the station user takes the station off hook.

### Prime Line

Use this procedure to give the station prime line. With prime line, the station automatically selects the line when the station is off hook.

### Prime Line Group

Use this procedure to give the station prime line group. With prime line group, the station automatically selects the line group when the station is off hook.

### Prime Intercom Number

Use this procedure to give the station prime intercom number. With prime intercom, the station automatically selects the appropriate intercom path when the station is off hook.

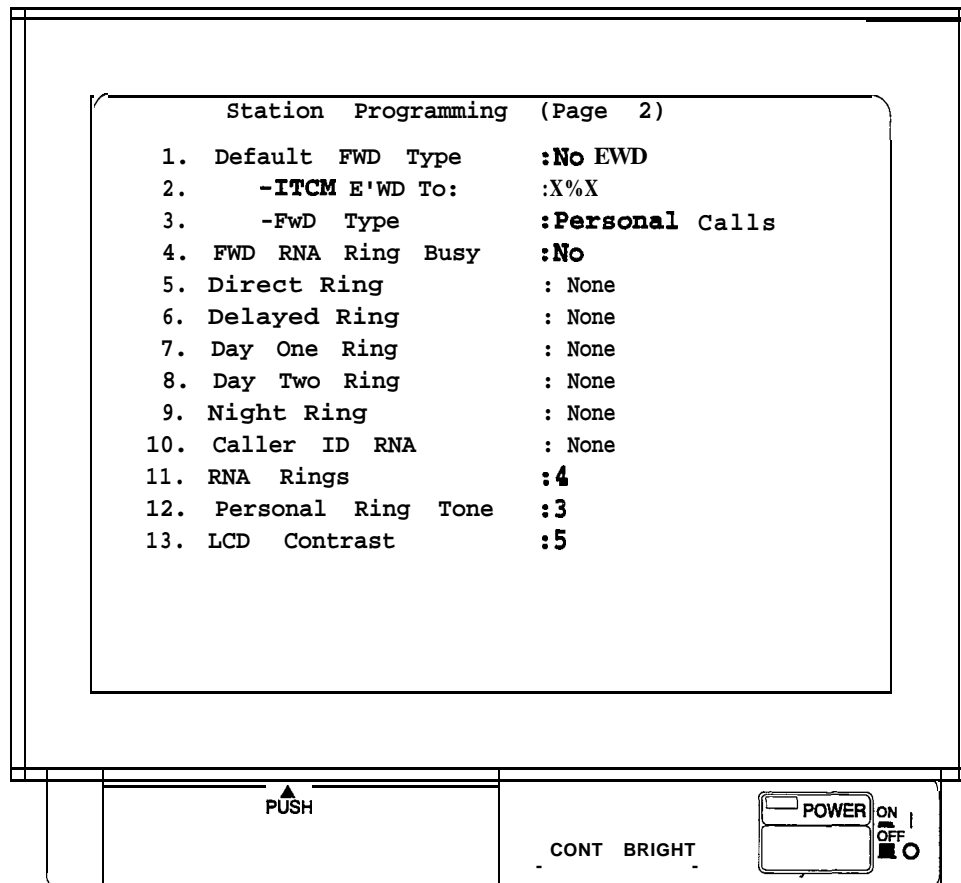
***NOTE:** You can create an intercom hot line telephone by assigning one telephone's personal intercom number as the prime intercom of another telephone. When the user takes this programmed telephone off hook, it automatically calls the other telephone.*

## 7.10 Tone Or Voice Signaling (Tone First)

Intercom calls are either tone or voice signaled as a first choice with the other mode available as a second choice. Use this procedure to select the first choice in intercom signaling on a per station basis.

## 7.11 Call Announce Beeps (Call Announce Tone Bursts)

You can set the number of call announce tone bursts from one to five, and you can do this for each station in the system.



The Station Menu-screen two

## **7.12** **Default Forward** **Type**

Use this procedure to arrange the call forward default scheme for individual stations. With this feature, the system will automatically forward ringing calls to another station after a preset number of rings. Since this is an automatic forwarding of the calls, the station users do not have to take any action; however, any user-enabled call forwarding that they take at their stations will override this automatic call forwarding. This procedure determines whether or not intercom busy/RNA call forwarding can take place at a station. You must also program the number of rings that must occur before this automatic call forwarding can take place (section 7.14). For additional call forwarding considerations, see section 6.6.

### **Intercom Number Forwarded To**

Use this procedure to assign the intercom number of a station to receive another station's forwarded calls.

### **Forward Type (For Busy Or Ring - No Answer Calls)**

Use this procedure to arrange what type of calls will forward from the station. You must also program the number of rings that must occur before this automatic call forwarding can take place (section 7.14).



### **7.13 Forward RNA Ring Busy (Enhanced Call Forwarding)**

The call forward feature allows a station user to choose to receive several rings for RNA calls before the system forwards them. At default, the system immediately forwards calls that reach a busy station. You can take this programming action to allow calls to a busy station to ring in a subdued manner before they forward if the user chooses them to do so. This subdued ringing of calls to a busy station requires an idle intercom number at the busy station. Plus, if you have assigned group intercoms to the station, you must program them into a hunt list to ensure that this call forward feature will function properly (see section 6.6 for other call forwarding considerations).

### **7.14 Flexible Ringing Assignments**

Program ringing assignments on a per station/per line/per intercom number basis. Ringing can be immediate, delayed, or special purpose. Use the procedures in this section to customize the ringing features for the system. If needed, use section 5.13 procedure to arrange for a relay to track the ringing of the direct, delayed, day 1, day 2, or night ringing modes (use Section 5.12 to program these ringing modes). Plus, if your installer connects customer-supplied external paging equipment to the system's external paging port, use the Section 5.13 procedure to arrange for that equipment to sound the ring signal of any or all lines.

#### **Direct Ringing**

Use this procedure to choose the line ports that you want to ring at a station as soon as a call appears. Direct ringing sounds during the day 1 and day 2 time periods but does not ring during the night ringing mode or during the manual night transfer (of ringing) operation.

#### **Delayed Ringing**

Use this procedure to choose the line ports that you want to ring at a station after waiting a short time period from when a call appears. Delayed ringing sounds during day 1, day 2 time periods, during the night ringing mode, and during the manual night transfer (of ringing) operation.

### Day 1 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 1 ringing mode time period. Refer to the paragraph below titled, **Day 1, Day 2, and Night Ringing Begin and End Times**, to set the beginning and ending times of this ringing.

### Day 2 Ring

Use this procedure to choose the line ports that you want to ring at stations during the day 2 ringing mode time period. Refer to the paragraph below titled, **Day 1, Day 2, and Night Ringing Begin and End Times**, to set the beginning and ending times of this ringing.

### Day 1, Day 2, And Night Ringing Begin And End Times

With this programming procedure, set the begin and end times of the day 1, day 2, and night ringing time periods.

### Night Ring (*Night Transfer - Of Ringing*)

Choose the line ports that you want to direct or delay ring during the night ringing mode of operation. The ringing arrangement that you configure here is the arrangement that is active both during the automatic night ringing time period and whenever the attendant manually activates the night transfer (of ringing) operation. Do note that the attendant commanded night ringing period supersedes the automatic night ringing period. Refer to the above paragraph titled, **Day 1, Day 2, and Night Ringing Begin and End Times**, to set the time for the automatic night ringing period.

### Caller ID Ring No-Answer (RNA)

This feature offers telephone users the ability to review calls that ring at their stations while they are away. The system stores caller ID RNA records and allows users to review them and use one-button dialing to return those calls. The feature also denotes the identification of the last station that reviewed the records, helping prevent multiple call backs to the same number. After users review the caller ID RNA records, the system deletes the records from their telephones but retains them in the SMDA storage so that they can be accessed later. For complete caller ID programming, refer to section 15.2.

## Ring No-Answer Rings

This procedure sets the amount of rings that sound at one station port before the call rolls over to ring at another station port. Any system feature that requires a ring no-answer value (for example, call forwarding) uses the setting that you program here.

The system defaults the ring no-answer value at regular station ports to four rings, and it defaults ports programmed to function as voice mail ports to three rings; this insures that, at default, the voice mail equipment will have sufficient time to answer a call before it rolls over to the next port.

### **7.15** **Personalized** **Ringling Tone**

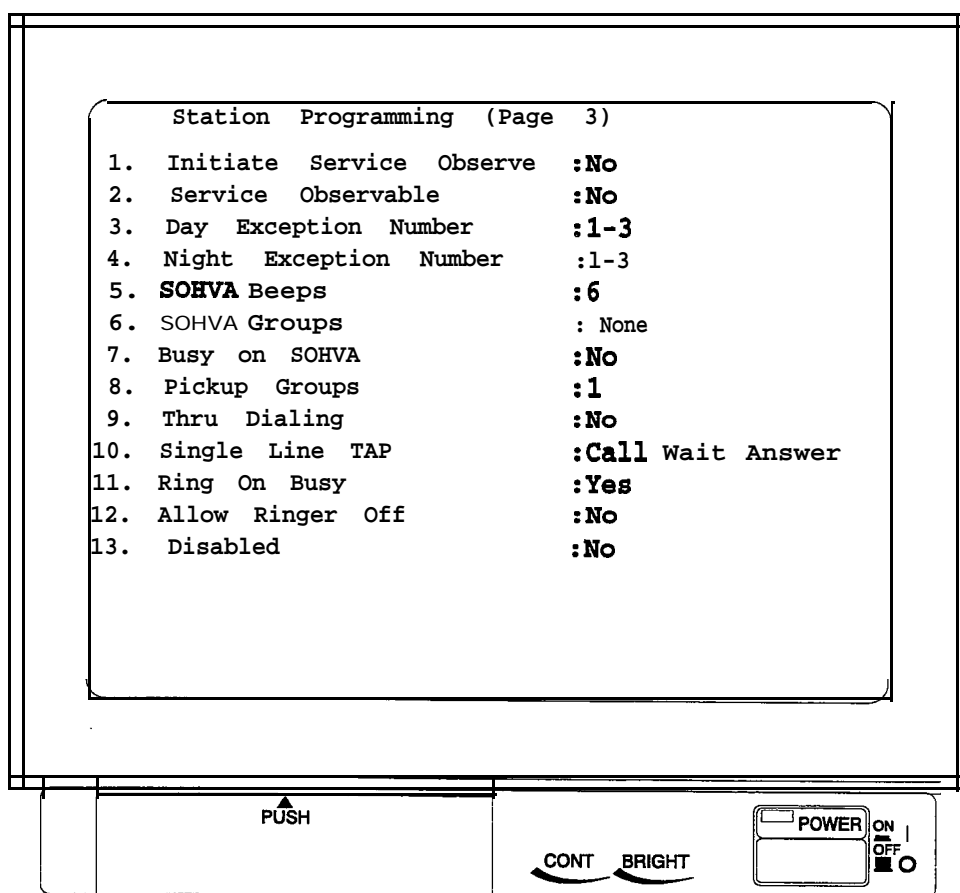
Program a station to ring in one of several distinctive tones for proprietary digital telephones and in one of four distinctive tones for analog telephones. While industry-standard telephones do not provide personalized ringing, you can set distinctive ringing for them using the section 6.15 procedure. The user can also change the ringing tone at his or her telephone (see the appropriate system user's guide).

### **7.16** **LCD Contrast**

Adjust the intensity of the display on digital LCD speakerphones with this procedure. The user can also change the display contrast at his or her telephone using instructions provided in the system user's guide.

## 7.17 Service Observing

This feature allows a station to enter an in-progress call in an unannounced, muted mode to monitor the conversation. Use this procedure to give a station service observe capability and to make other stations available for service observing.



*The Station Menu-screen three*

## **7.18 Day Exception Number/Night Exception Number**

Exception numbers allow stations to dial numbers that they are not normally allowed to dial by their automatic route selection/toll restriction levels. If the toll restriction table exception number matches one of the exception numbers that you assign to the station using the following procedure, the station is allowed to dial the number. The exception number values that you can assign are 1 through 32 and NONE. You can assign 32 exception numbers to each station. You also must assign one exception number to each toll restriction table line entry (Section 11.5). The system checks for a match between one of the numbers assigned here and a number on the toll restriction table; if there is a match, the call is allowed.

## **7.19 SOHVA Beeps (SOHVA Tone Bursts)SOHVA Groups**

You can choose the number of tone bursts that each telephone user hears preceding a SOHVA message. You can program the tones from one to six,

SOHVA calling groups control the pattern in which station ports receive and/or originate SOHVA calls to one another. You must first form the SOHVA groups (Section 5.8) and then assign the groups to individual stations with the following procedure.

## **7.20 Busy On SOHVA**

At default, the system returns a ring back tone to users who make SOHVA calls to busy stations; however, this procedure allows you to arrange for telephone users to receive a busy signal instead of the ring back tone. This feature lets non-LCD telephone users know that a called station is busy.

## **7.21 Pick-Up Groups**

Use this procedure to place a number of stations in a call pick-up group so that one station can answer a call ringing at any other station in the group.

## **7.22 Through Dialing (Thru-Dialing)**

This procedure allows DTMF tones generated by an external device connected to the system to pass through the system and out to any line connection.

## **7.23 Single Line Proprietary Telephone TAP Button**

Use this procedure to set the function of the TAP button on single line proprietary telephones.

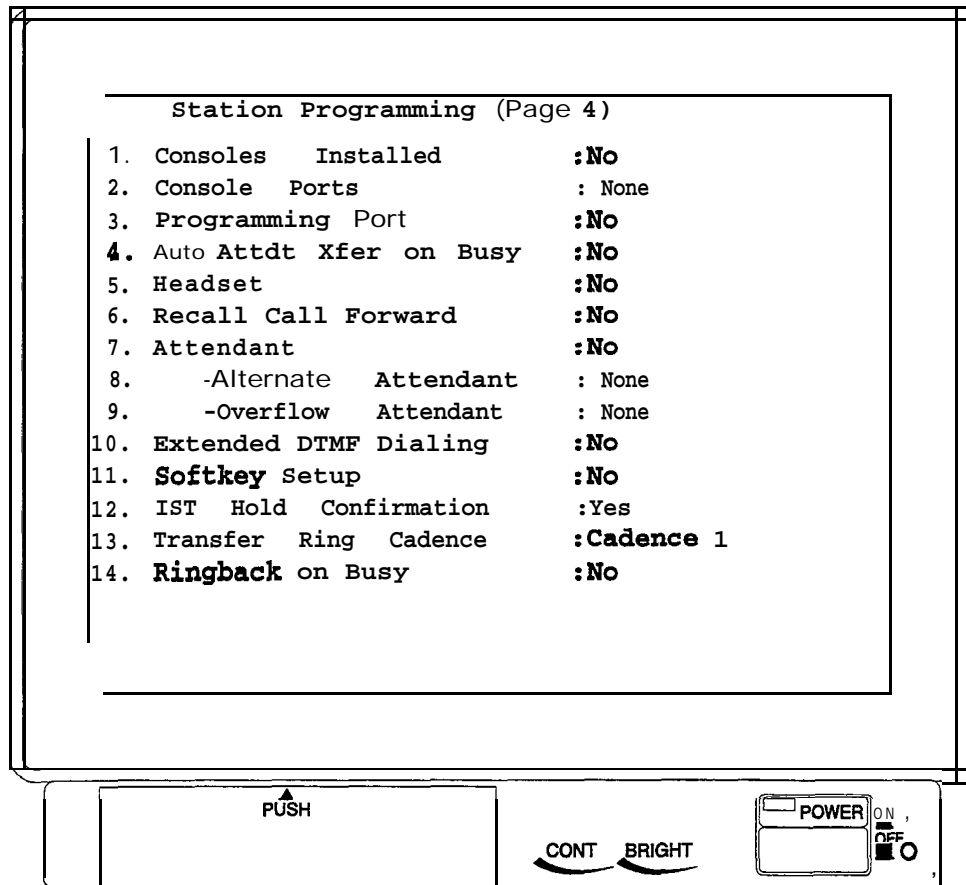
## **7.24 Ringing On Busy (Enhanced Subdued Ringing)**

When a telephone is busy on a call and another call comes to that telephone, the system subdues the ringing of the second call to a lower volume but allows the call to continue to ring at this subdued volume until the caller abandons it. The system shortens the ringing of another call to model 8024S, 8124S, 8012S, and 8112S speakerphones that are busy in the speakerphone mode to one quick tone burst; however, if these telephones are busy in an off-hook manner (non-speakerphone mode), the system still subdues the ringing of the second call to a lower volume and allows the call to continue to ring at this subdued volume until the caller abandons the call.

If a user does not wish to hear subdued ringing while he or she is busy on a call (even the one quick tone burst on those particular models that provide it) you can take this programming action to eliminate all ringing by a second call.

**7.25**  
**Allow Ringer Off**  
**(Ringer Volume**  
**Off)**

On some proprietary telephones, the user selects the ringer volume level by pressing a rocker-type volume control repeatedly to select one of four different volume levels. The lowest volume setting is essentially an off condition as the telephone sounds only one low-volume ring burst when a call rings the station. Sometimes users would rather not receive even one ring burst. For these cases, program the system so that it completely silences the ringer at a telephone when its user selects the lowest volume setting.



*The Station Menu-screen four*

## **7.26 Station Disable**

Disable a station port with this feature. Refer to Section 7.38 for the procedure for marking the station port as undefined after you disable the port. Use the Section 6.28 procedure to give a station the capability to disable other stations.

## **7.27 DSS/BLF Consoles Installed**

Use this procedure to assign DSS/BLF consoles to a station and to identify the ports that the consoles occupy.

*NOTE: Before you can assign a console and name the console port with this programming step, you must use the section 7.38 programming procedure to identify the type of console and the station port to which it is assigned.*



## **7.28 Programming Port (Database Programming Station)**

This procedure assigns limited database programming ability to a station.

*NOTE: You must ensure that there is an LCD speakerphone connected to the station port that you choose with this feature.*

## **7.29 Automatic Voice Mail Transfer On Busy**

You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system will ring a busy telephone when the voice mail system is attempting to transfer a call to it, giving the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signaled by the presence of a new call, and the voice mail system will automatically route the call to the busy telephone's voice mail box. For complete voice mail programming, see Section 15.6.

## **7.30 Headset**

This procedure enables the use of a headset at a telephone.

### **7.31 Attendant Position (Alternate, Overflow)**

The attendant position station provides incoming call direction, and it controls system-wide operating features. Additionally, the attendant position is responsible for certain programming features. The system defaults two stations as attendant positions (101 and 102) but it does not limit the number of attendant positions that it can support. Also refer to section 5.12.

### **7.32 Extended DTMF Dialing**

You can enable the extended DTMF length dialing feature on a per-station basis with this programming procedure. The system generates DTMF tones of extended length when users take their telephones off-hook and then wait until after the system sounds the extended dialing tone burst before they engage automatic dialing. This feature also allows an analog station to generate extended DTMF tones when its user manually dials numbers at the telephone's dial pad after hearing an extended dialing tone burst. Since digital telephones generate a DTMF tone for as long as the user presses the dial pad button during manual dialing, this feature is only applicable on automatically dialed numbers at digital telephones.

### **7.33 Interactive Button Support (Softkeys Setup)**

The system provides support for interactive buttons on LCD speakerphones with product codes of 7010S and 7016S (all revisions), and 7700S (revision H and earlier). The three interactive buttons and the associated expanded displays provide quick, easy access to system features and straight-forward button programming without the need for dialing codes. At default, the interactive button support is disabled; therefore, you must take programming action to enable it. When you enable them, the system overrides any previous mapped function at the buttons with this new assignment. If, after you have enabled the support, you take new action to button map any of the interactive buttons to another assignment, the new assignment will take effect at that button. In addition, the system will clear the remaining two buttons and disable the interactive button support. If you replace any of these LCD speakerphones with a non-display telephone, the system recognizes it as such and does not assign interactive buttons to it. Since the system allows you to enable interactive buttons with station programming action, it does not provide a means for assigning interactive buttons with the button mapping procedure. After you have enabled the interactive buttons, you can look at the button assignments with the button mapping procedure, and note that the system identifies them as **SOFT1**, **SOFT2**, and **SOFT3**.

### **7.34 IST Hold Confirmation**

Industry-standard telephones sound a special hold confirmation tone when their users place calls on hold. Prior to this software release, these telephones returned to intercom dial tone when their users placed calls on hold. The system defaults with the special confirmation tone enabled; however, you can disable the feature if you wish. The confirmation tone is three 80 ms. on -80 ms. off tone bursts repeated at 800 ms. intervals.

### **7.35 Transfer Ring Cadence**

A telephone user can select the ringing cadence that announces a transferred line call. They have two choices: Ring cadence one provides a 2 sec. on-4 sec. off tone. Ring cadence two provides a 0.5 sec.- 5.5 sec. off tone. Ring cadence one is available to telephone users as a default and they can select the other one as they need it. Use this procedure to select the default cadence for each system station.

### 7.36 *Ring Back On Busy*

In systems operating with software releases prior to 8.B, when someone calls another telephone and the calling party is busy on an outside line, the caller hears a ring back tone-not a busy tone. When the caller is using a non-display telephone he or she has no means of knowing the busy status of the called party. (Remember, LCD speakerphones display called party status- for details on this feature, see section 6.40, *Allow Busy Display*.)

With software release 8.B, you can take programming action that allows callers to hear a busy tone instead of a ring back tone when they call a party who is busy on an outside line.

## **7.37 Button Mapping By Station**

The system assigns certain functions to each of the station buttons as a default condition. Reassign the button functions with this programming feature. You can assign functions at a first level or at a second level at each button. Assign functions at the first level that require status light feedback because the system does not provide status light feedback to buttons at the second level (press CONTROL N to display the second level).

You can also use this procedure to map the buttons on a DSS/BLF console (press CONTROL N to display the console buttons) but first you must use the Section 7.27, *DSS/BLF Consoles Installed*, procedure to assign the console to the station and name the console port.

## 7.38 Telephone Types (Phone Types)

This programming feature allows you to identify the particular type of system telephone equipment that you or your installer will connect to each station port.

You can also mark the station port equipment as undefined so that the system will not test the port for a specific type of equipment and will not include the port in any menu presentations. Also refer to Section 7.26, *Station Disable*, for the procedure for disabling a station port.

*NOTE: Depending upon which equipment you choose, the system will present **different** sub-menus that allow you to further define the equipment as to the quantity of lines it can serve, whether it is a speakerphone, whether it is a **DSS/BLF** console, and other defining characteristics. Follow the sub-menu prompts and press ENTER after you have typed each selection.*

## **7.39**

### **Copy Model Programming**

#### **Block Programming, Class-Of-Service**

Program some or all class-of-service categories to match the . programming of a model class-of-service category.

#### **Block Programming, Station Features**

Program some or all stations to have the same features as a model station. The system does not copy the following features from the model station:

- station name,
- intercom numbers,
- personal speed dial numbers,
- DSS/BLF console installed,
- console port,
- alternate attendant,
- overflow attendant,
- interactive button support
- ITCM Hunt list.

#### **Block Programming, Button Mapping**

Program some or all stations to have the same button features as a model station.



## Chapter Seven Review Questions

1. The DXP defaults all of the personal intercom numbers, and you cannot change those numbers; true or false?
2. You can program a station name with a maximum of \_\_\_\_\_ characters (full station name), but only \_\_\_\_\_ of those characters show up on an LCD speakerphone (display name).
3. You can program up to \_\_\_\_\_ personal intercoms in an intercom hunt list; you can also program \_\_\_\_\_ group intercoms in the hunt list.
4. All of the intercoms in a hunt list must be group intercoms; true or false?
5. You cannot program a speed dial on a station's dial pad numbers; true or false?
6. Explain the difference between prime line, prime line group, and prime intercom.
7. At default, the DXP automatically forwards calls that reach a busy extension; true or false?
8. Why does the DXP default voice mail ports with a different ring-no-answer number of rings?
9. Define the service observe feature.

10. What do call pickup groups do?
  
  
  
  
  
  
  
  
  
  
11. If you have set a toll restriction on a certain area code, there is no way for any station to dial a number in that area code; true or false?
  
  
  
  
  
  
  
  
  
  
12. As long as there is an LCD speakerphone on a port, you can program that port with limited database programming capabilities; true or false?
  
  
  
  
  
  
  
  
  
  
13. You cannot button map or reprogram the interactive buttons on any of the Impact telephones (models 7010S, 7016S, and 7700S); true or false?
  
  
  
  
  
  
  
  
  
  
14. Define button mapping.
  
  
  
  
  
  
  
  
  
  
15. Once you have programmed a class of service you can copy all of the features into another class of service using what feature?



# Line Programming

---

## Chapter Eight: Programming The Lines ..... 8-1

8.1	Introducing Line Programming .....	8-1
8.2	Line Name .....	8-2
8.3	Line Type.. .....	8-2
	Ground Start Lines.. .....	8-2
	Loop Start Lines .....	8-2
	E&M Tie Lines .....	8-3
	DID Lines.. .....	8-3
	Auxiliary Port.....	8-3
	E&M DNIS Lines .....	8-3
8.4	Line Disable.. .....	8-4
8.5	Music Or Tone On Hold .....	8-4
8.6	Automatic Privacy (Privacy <b>Release</b> ) .....	8-5
8.7	SMDR.. .....	8-5
8.8	Cost Incoming .....	8-5
8.9	Pad Level-Transmit, Receive.. .....	8-6
8.10	Dialing Mode .....	8-7
	Pulse Dial Ratio .....	8-7
	Pulse Dial Interdigit Time.. .....	8-7
8.11	Abandon Hold Release .....	8-8
8.12	Positive Disconnect Time.. .....	8-8
8.13	Toll Groups.. .....	8-9
8.14	DTMF Level .....	8-9

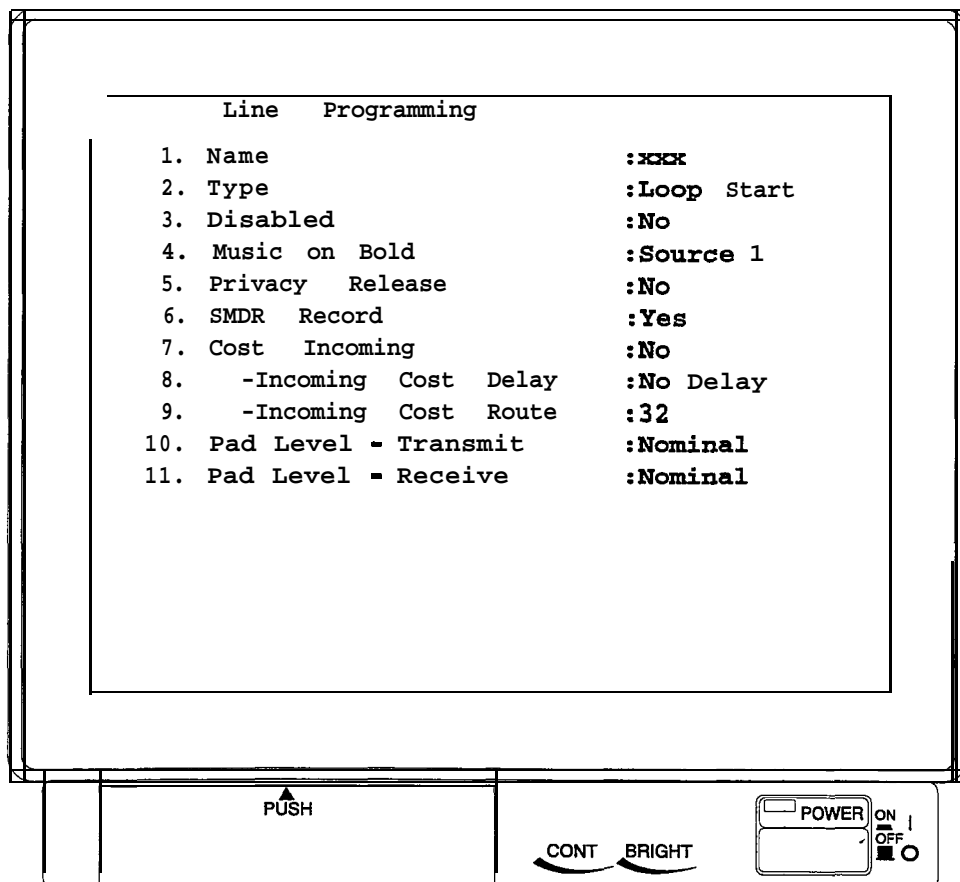
8.15	Busy Lead Detection .....	8-10
8.16	Disconnect Supervision .....	8-10
8.17	Caller ID Active .....	8-10
8.18	Voice Mail ID.. .....	8-11
8.19	DISA and DISA Voice Options .....	8-1 1
8.20	Line Group Progrannning .....	8-12
8.21	Copy Model Line .....	8-12
8.22	Direct Inward Dialing (DID) Support .....	8-13
8.23	DID Options .....	8-14
	DID/DNIS Block Name .....	8-14
	DID Control Signaling .....	8-14
	Expected C O Digits .....	8-15
	Dialing Mode .....	8-15
	ANI Delivery.. .....	8-15
	DISA Voice Options .....	8-15
	DID Alternate Routing .....	8-16
8.24	DID/DNIS Translation Tables .....	8-17
8.25	Direct Inward System Access (DISA) .....	8-18
	DISA Specific Programming .....	8-18
8.26	Enabling Or Disabling DISA Lines .....	8-19
	Programming DISA Authorization Codes .....	8-19
	Remote COS Programming .....	8-19
	Chapter Eight Review Questions .....	8-20

# 8

## Line Programming

### 8.1 Introducing Line Programming

The DXP is capable of using several types of lines, and each line type offers different programming options. Line programming allows you to set the parameters for each line.



The Line Menu---screen one

## 8.2 Line Name

You can assign a name to a line. A name shows in the display of an LCD speakerphone as an identification aid. A valid name is composed of any seven alpha-numeric characters, but the first character must be an alphabetic character.

## 8.3 Line Type

Condition the line port as to the type of line or function that the port serves.

### Ground Start Lines

With ground-start lines, the DXP momentarily grounds the ring lead, signally the CO to establish a communications link. When the CO detects this ground, it momentarily grounds the TIP lead. The DXP responds by removing its ground connection and bridging itself across the tip and ring leads. The CO then removes its ground connection and returns **dialtone** to the DXP. Ground start lines help in preventing call-collision and are useful in high-traffic applications.

### Loop Start Lines

With loop start lines, the DXP bridges a resistance across the tip and ring leads, signaling the CO to establish a communications link for an outgoing call. The CO detects the resulting current flow and supplies dial tone to the DXP. The CO signals an incoming call to the DXP by placing an alternating voltage (ring signal) on the tip lead. The DXP then generates ringing to the DXP station being called. When a station answers the ringing, the circuit is completed as it was for outgoing calls. Loop start lines cannot provide any sure means of determining when a distant party hangs up his or her telephone. For a system that experiences moderate incoming and outgoing call volume and does not cost calls, loop start lines provide an economical choice for connecting the DXP to the central office (CO) equipment.

### **E&M Tie Lines**

Ports three and four on each multipurpose board are the only ports that support E and M tie lines. Tie lines are special circuits that allow the DXP to communicate with remotely located equipment such as the following: another DXP, a PBX, or other common carrier (OCC), for long distance calls.

### **DID Lines**

The DID board lets stations have their own telephone number without having a separate line dedicated to that station. The central office sends digits to the DXP, which interprets the digits and routes the call to the appropriate station. For example, you can have fifty stations and only ten DID lines, and each station can still have its own published telephone number. However, only ten of the stations can be on calls at one time. DID lines are incoming only, so if you need outward dialing, you'll need more than just DID lines.

### **Auxiliary Port**

If you name a line port as an auxiliary port, you condition the line port to interface with external paging equipment instead of a telephone line.

### **E&M DNIS Lines**

Dialed Number Identification Service (DNIS) is a T1 service feature for E&M lines. Long distance carriers offer DNIS as a feature to dial 800 and dial 900 lines. DNIS identifies the numbers that callers dial to reach an internal telephone system. Businesses served by a dial 800 or dial 900 service allow calls to ring on any available line within an assigned block of lines and then have their internal telephone system process the DNIS information to route the calls to their proper destinations.

## **8.4** **Line Disable**

Take a line port out of service because of defect or other reason using this programming choice.

## **8.5** **Music Or Tone On Hold**

With this feature enabled, the system will supply music, tone bursts or other audio information to callers while they are on hold. The music or information source is external to the common equipment and is customer supplied. The system will accept two music sources. You can use one source for this feature and the other source for the background music feature discussed in *Section 7.1.3*. When the system supplies tone bursts to callers while they are on hold, it sounds two .1 second-long tone bursts separated by a .1 second interval of silence; it repeats this tone burst sequence every 5 seconds.



## **8.6** **Automatic** **Privacy (Privacy** **Release)**

Assign privacy release to a line so that a user can press the privacy button on his or her telephone and change a private line into a non-private one as needed. When a line is private, a station user has exclusive use of it during a call. Also refer to section 7.37, *Button, Mapping*, to map a privacy button on the user's telephone.

## **8.7** **SMDR**

When you enable this feature, the system stores SMDR information for the specified line. Refer to section 10 for other SMDA/SMDR programming considerations.

## **8.8** **Cost Incoming**

If you have arranged for the system to cost calls, you can arrange for it to also cost incoming calls on a per-line basis. You can arrange for the costing to begin as soon as the call arrives in the system, to begin after the user answers the call, or to begin after a programmed delay. Plus, you can pick the call-rate table that you want the system to use when it costs the call. Refer to section 12 for other automatic route selection programming considerations.

## **8.9 Pad Level-Transmit, Receive**

This feature enhances the DXPT1 digital carrier transmission option, the pad level programming feature adjusts voice levels for both the transmit and receive circuits in the individual channels. The choices include: Gain 2, Gain 1, Nominal, Loss 1, Loss 2, Loss 3, Loss 4, and Loss 5. These settings provide an approximate +6 to -15 dB range of choices. Starting at the Nominal setting, each gain level represents an approximate 3 dB amplification of the signal level from the previous setting, and each loss level represents an approximate 3 dB attenuation of the signal level from the previous setting. Because digital transmission does not lose volume level as readily as analog transmission does, it is likely that the receive level may be noticeably higher when using the T1 option. Therefore, you may need to select a low setting such as Loss 2 for the voice level receive parameter when programming this feature for T1 lines that are being used exclusively for voice transmission. Further, if you choose a setting to increase the receive gain, you should carefully examine speakerphone operation. It is possible to select a receive gain that will, under certain conditions, interfere with proper speakerphone operation.

## 8.10 Dialing Mode

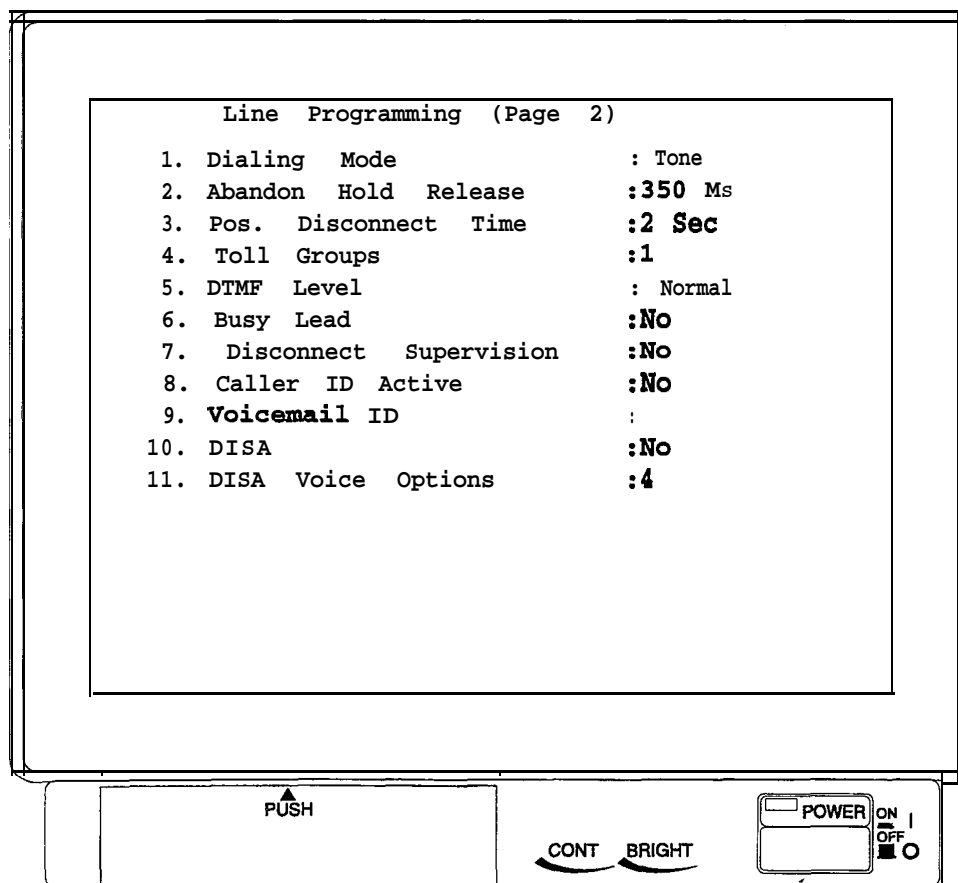
Program the line port to match either a DTMF tone or a rotary (pulse) dialing line as supplied by the central office (CO).

### Pulse Dial Make/Pulse Dial Break (Pulse Dial Ratio)

Use this procedure to set the make/break ratio for rotary dial signaling to match rotary dial line requirements. You can set the line make/break ratio for rotary dial (pulse dial) signaling in a more flexible manner to match many different rotary dial line requirements. You can set the make time and the break time independently in one msec. increments to any time from one to 99 msec.

### Pulse Dial Interdigit Time

You can set the interdigit time between dial pulses when the system pulse-dials a number over a line. The DXP defaults this time to 200 msec. and provides a range of timing values between 100 msec. and one sec. that you can set in 100 msec. increments.



*The Station Menu-screen two*

**8.11**  
**Abandon Hold**  
**Release**

When a distant party abandons a hold condition and his or her station disconnects from the line, the central office sends a forward disconnect signal to the system. This signal is either 50 or 350 msec. long. Use this procedure to program the line port to match the central office signal length.

**8.12**  
**Positive**  
**Disconnect Time**

When a station drops a line after its user has finished using it, the system waits a programmable length of time before it allows another station to access that line. This time delay helps prevent such conditions as call-collision. The system holds the line status light on during the time out period.

### **8.13** **Toll Groups**

You must identify the individual lines that you do not want users to access when they dial toll-restricted numbers. Do this by first assigning the lines to toll groups and then assigning those toll groups to the restricted number. There are 32 toll groups available for line assignment. Assign one, several, or all lines to any desired toll group or combination of toll groups as needed. See section 11 for complete toll restriction programming details.

### **8.14** **DTMF Level**

Adjust the audio level of the DTMF signals to a low (-5 db), medium (0 db), or high (+3 db) setting. Certain sites may require a higher db level to overcome line conditions that could interfere with reliable dialing such as a long loop distance to the central office.

### **8.15 Busy Lead Detection**

When you enable this feature, the system can detect an off-hook condition in a telephony device such as a modem, FAX machine, industry-standard telephone, or similar device that an installer has connected to a line ahead of the system. When the system detects the off-hook condition, it makes a busy indication appear at system stations that have this line appearance.

**NOTE: Busy Lead Detection only works on line two of each line board.**

### **8.16 Disconnect Supervision**

When you enable this feature, the system detects a break in loop current anytime one occurs during an outside call. You must set this feature to yes for DISA lines

### **8.17 Caller ID Active**

When caller identification (ID) information is available from the central office, take this programming action to match the line port to the feature. You must also assign the caller ID lines to the stations and assign special-purpose station buttons to control the feature. Refer to section 15.2 for complete caller ID programming details.

## **8.18** **Voice Mail ID**

You can assign an identification number to each line so that the voicemail system can provide customized call handling on a per-line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the DXP routes a call that is ringing at a particular line to the voice mail system, it routes it with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes. This allows the DXP lines to be answered in a customized manner by the voice mail system's automatic attendant. Refer to Section 15.6 for complete voice mail programming details.

## **8.19** **DISA and DISA** **Voice Options**

These features enable or disable DISA capability on each line. Use the DISA Voice options 1 through 4 to select digital voice announce (DVA) messages (see sections 8.25 and 8.26 for complete DISA and DVA information). You must set Disconnect Supervision to yes for DISA lines.

**8.20**  
**Line Group**  
**Programming**

Use this procedure to group similar type line ports together for dial-up access. There are a maximum of 16 different line groups available. During operation, the system searches for an idle line in the line group in the same order that you program them using this procedure.-

**8.21**  
**Copy Model Line**

Program some or all line ports to have the same programming as a model line port. Note that the line name does not copy. Make sure to use the most typical line as your model.



## **8.22**

### **Direct Inward Dialing (DID) support**

The DID line board (DXPCO-DD4 and DD8) allows incoming CO calls to reach internal DXP intercom extensions by direct dialing. No attendant assistance is necessary. Since DID lines are incoming only, their direct appearance is limited to attendant stations where status indication may be useful. DID operation requires a group of published directory numbers (400 maximum) provided by the telephone company central office (CO). These directory numbers are incoming only and the DXP translates them to the appropriate personal or group intercom number for ringing. The lines will accept outgoing DTMF digits during a call to support personal identification number dialing and similar uses.

The DXP handles DID calls in the same manner that it handles regular intercom calls and will forward them via a hunt list or a call forwarding scheme. An unanswered DID call will either continue to ring or route to a programmed ring no-answer (RNA) destination. If neither forwarding nor RNA is available, the system provides no routing.

The system returns a ringback signal to DID callers when a called station is in the do not disturb (DND) mode. The system returns an off-hook indication to the CO when a DID line is disabled. The DXP synchronized ringing feature does not have any affect on DID calls, and the Caller ID feature is not available.

## 8.23 DID Options

### DID/DNIS Block Name

Choose a 7-character name to associate with each DID/DNIS block.

### DID Control Signaling

Decide upon which address supervision signaling protocol that you will use. This decision will depend upon the type of supervision that is compatible with the CO requirements.

**Immediate Start:** Use this protocol for rotary (pulse dial) lines. With this protocol, the CO will not expect address supervision signaling and may begin pulsing the dialing digits as soon as 65 msec. after it connects to the line.

**Wink Start:** With this protocol, the CO will expect address supervision signaling. After the CO connects to the line, the DXP will reverse the polarity of the line for a period of 200 msec when it is ready to receive digits (that is, the DTMF receiver is available for tone dial lines). This “wink” signal indicates to the CO that the DXP is ready to receive incoming digits. After the wink occurs and the line polarity returns to normal, the CO will begin sending the dialing digits. If the CO does not see the wink within 4 to 8 seconds (heavy traffic timings), it may route the call to network reorder or retry the call on another line. Typically, a CO will try to dial two times. A second failure will result in network reorder. Wink start protocol is the best choice for its combination of integrity checks and retrial capabilities.

**Delay Start:** With this protocol, the CO will expect address supervision signaling. Approximately 100 msec. after the CO connects to the line, the DXP will reverse the polarity of the line for a period of at least 140 msec. It will hold this reversal until it is ready to receive incoming digits. At that time, it will return the polarity to normal. After the line polarity returns to normal, the CO will begin sending the dialing digits. If the CO does not see the line polarity return to normal within 4 to 8 seconds, it will route the call to network reorder. There is no requirement for the CO to retry failures on lines with delay dial signaling.

## Expected CO Digits

Obtain a block of numbers for use from the CO. The DXP supports a maximum of 400 numbers (for example, 555-1000 through 555-1 399). You can have a maximum of four DID blocks with each DID block using its own name, signaling protocol, digit addressing method and number of digits needed to avoid numbering conflicts. As a default, the system assigns all DID lines to block one. A DID block represents a group of lines that the system will use to receive calls for one or more CO directory number blocks.

*NOTE: You will derive maximum user convenience if you choose the CO block to match the intercom numbers that you have assigned to the DXP system. (For example, if your intercom numbers are 1000 - 1399, they would match the sample CO block.)*

Determine the quantity of unique digits in the string that you expect to receive from the CO. The number of digits expected should be large enough to avoid numbering conflicts within a DID block and provide future growth. In the case of the CO block mentioned above, the quantity of unique digits is three to cover 1000 through 1399. If the CO block was 555-1 100 through 555-1 192, the string quantity would be two to cover 00 through 192.

## Dialing Mode

Based upon the system's expected incoming call volume and recommendations and requirements of the CO, determine whether the CO will send address digits by DTMF tones or by loop pulse (rotary) dialing. (Always choose DTMF tones if possible.)

## ANI Delivery

Enable or disable the DXP to process ANI information that is delivered by the long distance common carrier as a T1 feature on dial 800 and dial 900 lines. Refer to Section 8.7.4 for details about the ANI feature.

## DISA Voice Options

Use the DISA Voice Options 1 through 4 to select digital voice announce (DVA) message levels. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA-configured DID line is covered by DVA. Refer to Section 16 for complete DVA programming details.

### **DID Alternate Routing**

Use this procedure to select an attendant station to serve as an alternate routing station. The system will route DID calls to this station if it cannot find the digits it receives from the CO in the translation table. The system will ring this station with a distinctive ring tone or pattern that you program. If you do not select an attendant station with this procedure, the system routes the call to the dial 0 station. If the dial 0 station is not available, the system returns a reorder tone to the caller.

## 8.24 DID/DNIS Translation Tables

When you initialize a translation table, you must first enter the string of CO digits that you obtain from the telephone company. Then you must enter the intercom number that you want to match with the first CO digit sequence in the string. With this feature, the system automatically matches the remainder of the CO digit string to consecutive intercom numbers beginning with the one that you entered. You can edit the translation table by selecting the item number for each entry and making the changes that you deem necessary. The translation table includes the following listed items:

**CO Digit String:** This is the actual string of digits expected from the CO. Within a table, each CO digit sequence in the string must be unique. While each CO digit sequence must have an assigned extension number, you can assign the same extension number to several CO digit sequences if you wish.

**Name:** As an option, you can enter a seven character name for each CO digit sequence in the string. If you assign a name, the system will use it for LCD display during signaling.

**Day Number:** This personal or group intercom number is the one that the system will ring when a **DID/DNIS** call arrives through the matching CO digit sequence during normal or daytime operations. **DID/DNIS will not** support Delay Ring, Day 1 ring, or Day 2 ring modes.

**Night Number:** As an option, you can assign a personal or group intercom number that the system can ring when a **DID/DNIS** call arrives through the matching CO digit sequence during night transfer (of ringing) operations.

**Ring Code:** As an option you can choose one of eight distinctive ringing codes for each CO digit sequence in the string. Remember, the proprietary analog telephones provide only four distinctive ring possibilities.

## 8.25 Direct Inward System Access (DISA)

Through the DISA programming routines, you can configure a system to allow outside callers to call directly into the system. DISA callers can dial authorization codes that allow them to use the system's features that are normally available only to inside callers.

*NOTE: It is possible to use the automatic route selection (ARS) feature (section 12) along with the DISA **feature to route DISA calls that pass through the system**. If you enable this application, you may need to add pauses in the ARS modify digits table to account for the time delay the system experiences in obtaining the CO dial tone. The amount **of** time delay varies **for** each installation; therefore, you **must** test your installation to determine the time required to obtain a CO dial tone when using the DISA feature. You can then adjust the system timing pause time or add multiple pauses to **offset** this delay.*

### DISA Specific Programming

The purpose of the DISA specific programming is to perform the following tasks:

- Enable extensions where **day/night** DISA calls will be routed when call-routing is necessary,
- Enable proprietary **voice mail** to receive DISA calls and route the calls to a dedicated mailbox that holds the appropriate intercept greetings,
- Select access **lockout time** (the amount of time that the line remains locked-out from use after invalid conditions occur—such as, when a caller repeatedly dials an invalid authorization code),
- Select the timeout period for DISA extensions that ring without answer (**RNA**),
- Select the **maximum timeout period** for the reminder tone that sounds during an in-process call when the DISA caller is using an outside line and the system has no disconnect supervision. This tone sounds at set intervals to remind the caller that he or she must dial a code (any single digit) or be disconnected within 10 seconds,
- Select the option to either route a DISA call or drop it after caller dials an invalid authorization code

## 8.26 Enabling Or Disabling DISA Lines

Use the following programming instructions to enable or disable DISA capability on lines 1 through 128. Also, use the DISA Voice Options 1 through 4 to select digital voice announce (@VA) messages. For example, selecting DISA voice option 2 will cause welcome greeting 2, day main menu 2, night main menu 2, recall no answer 2, and recall busy 2 prompts to play whenever a DISA line is covered by DVA. Refer to section 15.4 for complete DVA programming details.

### Programming DISA Authorization Codes

DISA callers with assigned authorization codes have access to advanced system features. Authorization codes are associated with either personal or group intercom numbers; therefore, when a DISA caller enters his or her authorization code, the code alerts the system as to what features to make available to the caller. Once callers access features with authorization codes, the access remains in effect until any idle time exceeds the authorization code time-out period. Use this programming procedure to assign or modify authorization codes and to tie the authorization codes to accompanying intercom numbers. See the following paragraph, **Remote COS Programming**, for information on assigning a station class of service to the intercom numbers.

### Remote COS Programming

DISA callers that have assigned authorization codes have access to advanced system features. The features that they have access to are controlled by the station class of service that you assign with this programming procedure. The intercom number that is associated with this remote COS assignment is the same intercom number that is associated with the caller's DISA authorization code that you set using the **Programming DISA Authorization Codes** procedure described in the previous paragraph.

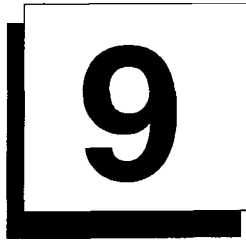
## Chapter Eight Review Questions

1. You can name a line with up to 20 alpha numeric characters; true or false?
2. Ground start lines are beneficial for what reason?
3. Ports three and four of any multipurpose line board can be used for E & M tie lines; true or false?
4. DID lines are outgoing only; true or false?
5. Once you program a line as private, the user cannot take the line out of privacy mode; true or false?
6. The abandon hold release time is either \_\_\_\_\_ or \_\_\_\_\_ msec.
7. There are a total of \_\_\_\_\_ toll groups available for line assignment.
8. There are a maximum of \_\_\_\_\_ line groups available on the DXP.
9. The DID provides three types of control signaling: wink start, delay start, and \_\_\_\_\_.



10. DID/DNIS will not support Delay Ring, Day 1 ring, or Day 2 ring; true or false?

11. DISA allows outside callers to call directly into the DXP; true or false?



# *Intercom Numbers*

---

<b>Chapter Nine: Intercom Numbers.....</b>	<b>9-1</b>
9.1 Introducing Intercom Programming .....	9-1
9.2 Modifying Intercom Numbers .....	9-2
9.3 Adding Intercom Numbers .....	9-3
9.4 Removing Intercom Numbers .....	9-3
9.5 Renumbering Intercom Numbers .....	9-4
Chapter Nine Review Questions .....	9-5

# 9

## Intercom Numbers

### 9.1 Introducing Intercom Programming

The system provides a maximum of 600 intercom slots with 192 slots set up as personal intercom numbers and up to 408 group intercom numbers. Group intercom numbers are four digits and begin with number 3 101. At default, the blocks of intercom numbers are assigned as follows:

101-292 = personal intercom numbers

3101-3292, 4101-4292, 5000-5023 = group intercom numbers

5024-5999 = unassigned-used for renumbering purposes

600-899 = feature codes

Remember, the system numbers the station ports and defaults the personal intercom numbers beginning with the station board located in the left-most slot nearest the central processor unit (CPU) circuit board (station port 1 is personal intercom number 101, for example). If a station slot is unavailable (the system includes an auxiliary board for instance), that block of personal intercom numbers is also unavailable for use until you use the procedure in section 9.5 to re-number the unavailable intercom numbers. For example, if the slot that provides station ports 1-8 (intercom 101-1 16) is occupied by a DXAUX board and you wish to retain that intercom block, you can arrange station ports 17-192 to begin at intercom 101.



**A to Z KELLATRONICS, INC.**

**tel: 800.766.3425**

**fax: 800.720.1172**

**818.773.8888**

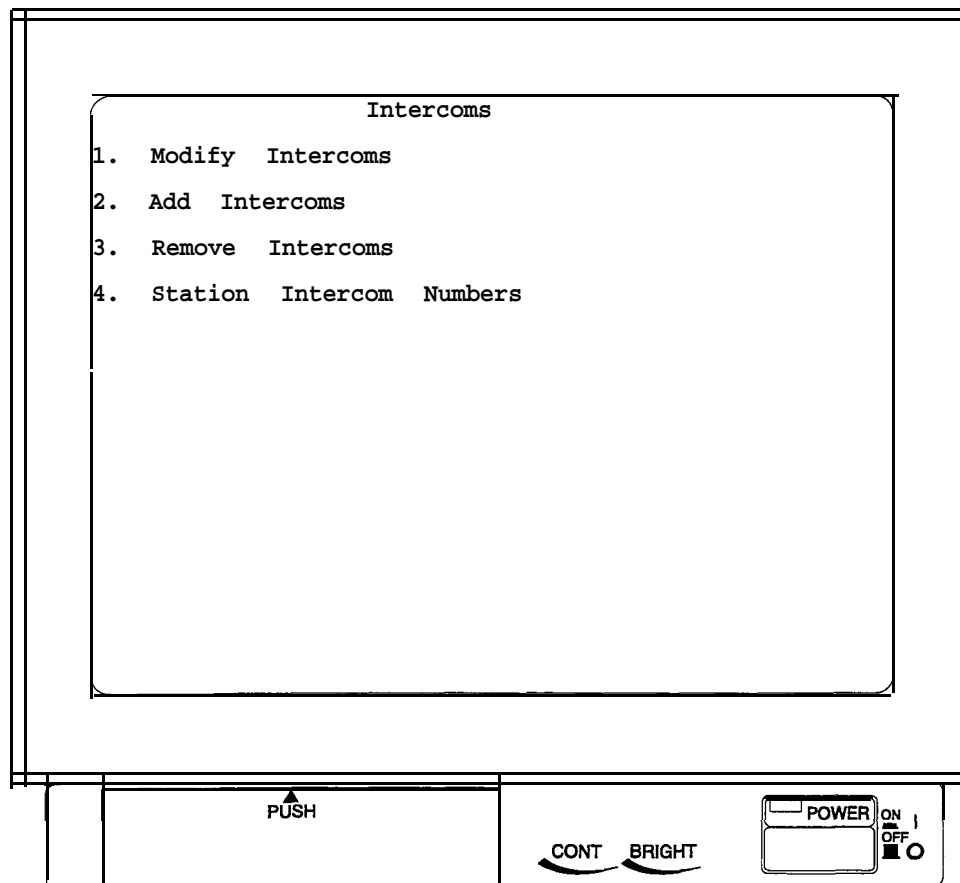
**818.773.8899**

**www.kellatronics.com**

**info@kellatronics.com**

## 9.2 Modifying Intercom Numbers

Use this programming procedure to modify intercom numbers and station names. A display name is composed of a maximum of seven characters and shows in the display of an LCD speakerphone as an identification aid. A full name is composed of a maximum of 20 characters and shows in some voice mail and open architecture interface applications. You can compose a valid name from any alpha-numeric character; however, the first character of a display name must be an alphabetic character. Refer to section 7.3 for the creating station names procedure.



The Intercom Menu-screen one

## 9.3 Adding Intercom Numbers

Use the procedure to add intercom numbers or to add group intercom numbers to stations for their use. Also refer to Section 7.37 to map buttons for group intercom number selection.

*NOTE: Use the Intercom Hunt List feature to place personal intercom and group intercom numbers in a list. Calls to a busy hunt list number will search the list for an idle number at which to ring. You can enter up to eight intercom numbers in a hunt list; these can be all group intercom numbers or one personal intercom number and seven group intercom numbers. Do not place the same group intercom number in more than one hunt list.*

## 9.4 Removing Intercom Numbers

Use this procedure to remove intercom numbers. If you remove or renumber an intercom number, be sure that you do not use the old intercom number in button mapping, hunt lists, call forwarding and similar applications.

**9.5**  
**Renumbering**  
**In tercom**  
**Numbers**

Use this procedure to renumber one intercom number or a block of intercom numbers. If you renumber an intercom number, be sure that you do not use the old intercom number in button mapping, hunt lists, call forwarding and similar applications.

## Chapter Nine Review Questions

1. At default, intercom number 5000 is designated for what purpose? ▪
2. The system defaults the station ports and personal intercom numbers beginning with the right-most station board; true or false?
3. Group intercom numbers are always digits long.
4. The first character of a station display name must be a \_\_\_\_\_.
5. You must remove intercom numbers one at a time; true or false?

# 10

## SMDA/SMDR

---

<b>Chapter Ten: SMDA/SMDR .....</b>	<b>10-1</b>
10.1 Introducing SMDA/SMDR Programming .....	10-1
10.2 SMDA/SMDR Parameters .....	10-2
Dial Time Limit .....	10-2
Answer Time Limit.....	10-2
SMDR Print Parameter .....	10-2
SMDR Record Format .....	10-2
Account Code (System Parameters).....	10-3
Account Code Display And Account Code Display Time .....	10-3
Account Code Length .....	10-3
SMDA Attendant Delete .....	10-4
SMDA/SMDR Printer Port .....	10-4
Report Option.....	10-4
SMDR Record.....	10-4
10.3 Automatic Reports (SMDA) .....	10-5
Add, Remove, Display Account Codes.....	10-6
Account Code (For Class Of Service).....	10-6
10.4 Emergency Numbers .....	10-7
10.5 Authorization Code .....	10-7
Chapter Ten Review Questions .....	10-8



# 10

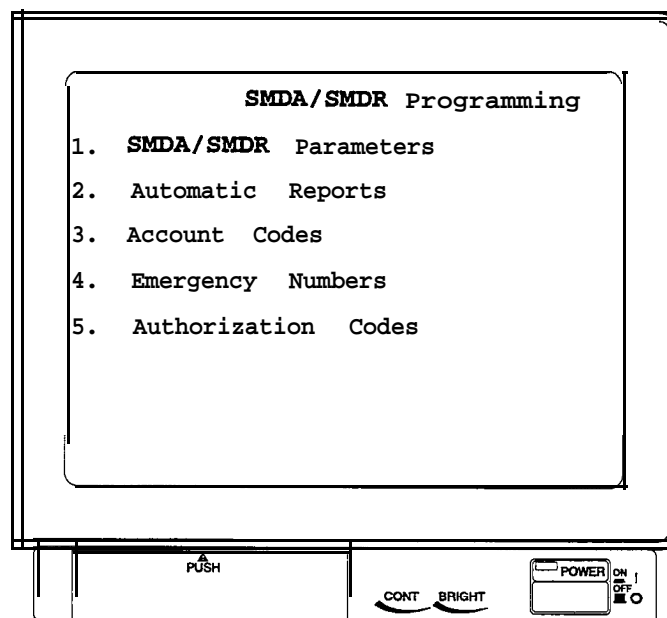
## SMDA/SMDR

### 10.1 Introducing SMDA/SMDR Programming

The system automatically provides an SMDA report whenever the costed-call storage reaches 95 percent of capacity. The programmer can arrange the system to print the reports automatically at a specific time. The attendant can view the number of free records or delete all stored records. Deleting all stored records ensures that the system is storing only the latest SMDA reports and provides a known starting point for record storage.

There are four different Station Message Detail Accounting reports.

- Detailed report sorted by stations
- Detailed report sorted by account codes
- Line summary report
- A general output of all records



The SMDA/SMDR Menu

## 10.2 SMDNSMDR Parameters

### Dial Time Limit

The system does not cost dialing time when it records the time-of a call for costing purposes. You can program the amount of time that the system waits before costing a call. Refer to section 12.5 for related call costing information.

### Answer Time Limit

Program the amount of time that the system waits before beginning to cost a call. This time allows for a call to ring and be answered before being costed. Refer to section 12.5 for related call costing information.

### SMDR Print Parameter

When you turn on the SMDR with this programming action, the system provides continuous printout of system-wide station call activity as it is collected. You can arrange for the printout to include the cost of each reported call or to report the calls without the costing information. Refer to section 12.5 for related call costing information.

### SMDR Record Format

Choose either a station message detail report (SMDR) format or a station message detailed accounting (SMDA) format for the report.

The system presents each record in an 80-column format and ends it with a carriage return/line feed.

## Account Code (System Parameters)

Account codes are used to identify calls by category, so that the system can record costing by that category. You can arrange the system to force the user to enter an account code and have the system verify it before it allows the user to make a call. Turn on the account code feature for the entire system using this procedure. Also, enable or disable system verification of the entered code. If you enable verification, the system compares the account code entered by a station user with the programmed account code entries that you have assigned. If the system does not find a match and you have enabled the forced account code feature through station class of service, the system prevents any further dialing until the user enters a matching account code. If you have not enabled verification, the system does not check the entered account code for a match. See section 10.3 for further account code programming details.

### Account Code Display And Account Code Display Time

As a feature to LCD speakerphone users, a message appears in the telephone's display to prompt the user to enter an account code during incoming and outgoing calls. If the system does not require such a prompt (for example, because the account code feature is disabled), turn off the prompting message display with this programming operation. If the system does require the prompting display and you enable it using this procedure, also set the length of time that the prompt shows on the user's display. See section 10.3 for further account code programming details.

*NOTE: When the account code display is on, the user must enter an account code within the display time when he or she is making an outgoing call; otherwise, the system will drop the line.*

### Account Code Length

An account code can be a minimum of three digits or a maximum of 16 digits. Use this procedure to set the number of account code digits. See section 10.3 for further account code programming details.

*NOTE: If you change the account code length, you will delete all currently programmed account codes.*

### **SMDA Attendant Delete**

Use this programming feature to provide the system attendant with the ability to delete SMDA records from the system memory.

### **SMDA/SMDR Printer Port**

Use this programming feature to determine the serial data port through which the system will route its generated SMDA/SMDR.

### **Report Option**

You can arrange for the SMDR/SMDA parameters to convey either the cost of calls that the stations make or the amount of time that lines have been on hold at the stations.

### **SMDR Record**

When you enable this feature, the system stores SMDR records for the specified line (see section 8.7, **SMDR Record for Lines**, for more information).

## 10.3 Automatic Reports (SMDA)

Program the system to automatically provide call cost reports for printing.

- Choose the day and time that the printout is desired.
- Choose the type and detail of each report.
- Dictate whether the call records are to be erased from the system memory after they are printed.

The SMDA feature allows the system to store various call records and generate reports of these records for printout. These reports include either station, line, account codes, or all of the above. When the system generates a station report, it will generate a separate report for any and all stations that have had outside call activity.

- The station report shows all calls that the station user has made and received along with totals and averages. Line reports show the totals for each active line in the system.
- The line report shows the number of calls, total minutes busy, number of incomplete calls, and cost for each line. The line report also summarizes line group activity as well.
- The account code report provides the same information as the station report except the records are based upon each account code.
- The all record report sends all stored SMDA records to the serial data port. This report is not in groups as is the station, line or account code reports but rather is in a chronological order.

You can view the number of free records or you can delete all stored SMDA records to insure that only the latest SMDA reports are being stored or to provide a known starting port for record storage.

*NOTE: If your programming terminal shares the same port as your data printer and you command it delete all records, the system will not take this action until you log out **of** the VDT programming mode.*

In addition to this manual report command, you can also request the system to generate reports automatically on a timed basis. You or the system user can employ the system manager and attendant programming procedure to request reports at a programming station. Finally, the system will automatically generate an automatic report when its memory nears its saturation point (95 percent full).

*NOTE: If you select the delete records option and your VDT is installed in the printer port, the system will not delete the **SMDA** records until you log out **from** the programming mode.*

### **Add, Remove, Display Account Codes**

Use this procedure to assign up to 1000 account codes (each up to 16 digits in length-see *Section 10.3.3*). Alternately, use this procedure to remove previously assigned account codes from the system. Add or remove one account code at a time or an entire block of account codes all at once. To assign numbers that user's can dial without entering an account code, refer to section 10.4.

### **Account Code (For Class Of Service)**

After you have enabled the account code feature for the system, set its parameters, and programmed its list of account codes into the system, turn the feature on for a station class of service and make it either forced or optional. If you make it a forced account code, the user must enter an account code before the system will let him or her dial the number for an outgoing call. Also, on incoming calls a user must enter an account code before the system will allow him or her to make any future outgoing calls (see section 6.2, *Account Codes*, for more information).

## 10.4 Emergency Numbers

When the system requires an account code, a telephone user must enter it before the system allows him or her to dial a number; however, the system does not require an account code prior to allowing a telephone user to dial a designated emergency number. Use this procedure to list the designated emergency numbers. The system accepts a total of 16 numbers. Each number can be up to 16 digits long.

## 10.5 Authorization Code

Authorization codes provide system users the mobility to use their class of service (COS) features, prime line assignments, and exception numbers on any telephone in the system. One popular term for such a feature is *walking class of service*. Don't confuse authorization codes with account codes. Authorization codes are associated with personal intercom numbers as are COS, prime markings, and exception numbers. Therefore, when a user enters his or her authorization code at any system telephone, the code alerts the system as to what features to make available to the user. The user can employ the telephone for anything allowed by his or her personal intercom number; however, he or she cannot disturb the last number redial stored there by the normal user. Once a user accesses his or her telephone features, they remain in effect until any idle time at the telephone exceeds the authorization code time-out period (see section 5.12, *System Timing Features*, for more information).

As an additional feature, when a telephone is mapped with a lock button, a user can press it and then dial an authorization code. This action denies access to that telephone by other users. Use the procedure given here to program and assign authorization codes. Use Chapter Six, *Station COS Programming*, to match the COS to the personal intercom number and use the section 7.37, *Button Mapping*, to assign the lock button to a telephone.

*NOTE: You can include a two second pause as part of the authorization code by typing a p at the point in the code where you wish a pause to occur. If you include a pause, a user must wait two seconds at the proper point when he or she dials the authorization code because the pause is now part of the code.*

## Chapter Ten Review Questions

1. The DXP automatically provides an SMDA report whenever the costed-call storage reaches\_\_\_\_\_percent?
2. You can set the DXP to report SMDA information sorted in four different ways:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. The DXP always includes the dialing time in costing a call; true or false?
4. Account codes can only be used on outgoing calls; true or false?
5. An account code can be a maximum of\_\_\_\_\_digits.
6. Changing the account code length automatically deletes all current account codes; true or false?
7. The DXP stores the SMDA “All Record” reports in what format?
8. You can manually force the DXP to print the SMDA/SMDR records; true or false?



9. You can program a maximum of \_\_\_\_\_ account codes in the DXP.
  
10. If you have programmed forced account codes for each station, those station users must dial the account code for any outgoing calls; true or false?
  
11. A user can enter his or her authorization code at a telephone and override that station's authorization code and features; true or false?

# 11

## *Toll Restriction*

---

<b>Chapter Eleven: Toll Restriction .....</b>	<b>11-1</b>
11.1 Introducing Toll Restriction .....	11-1
11.2 Restriction Levels .....	11-2
11.3 Toll Groups .....	11-3
11.4 Restricted Numbers .....	11-3
11.5 Exception Numbers .....	11-4
Chapter Eleven Review Questions .....	11-5

# 11

## Toll Restriction

---

### 11.1 Introducing Toll Restriction

The toll restriction/automatic route selection option is located on the main menu as “Toll / ARS.” And while the two features are grouped together in programming, this correspondence manual separates them for added explanation. Chapter Twelve covers the automatic route selection feature.

With the toll restriction feature, the system allows or denies outgoing line calls to selected users over selected lines. As a user dials a number from a station that has toll restriction assigned, the toll restriction feature first makes a comparison between the dialed number and the telephone number entries on the toll restriction table. It compares the dialed number up to the last digit in the entry. At that point it considers it a match and applies the other restriction tests whether the station user keeps dialing or not.

The dialing option table provides for not only toll restriction but also automatic route selection and call costing features (see chapter chapter thirteen for more information on call-costing). Toll restriction meets different dialing needs by allowing users to dial certain numbers (in-state toll calls, for example) yet restricting them from dialing numbers other numbers (1-900 numbers for example). A defaulted system allows station users to dial any number they choose to dial. When programming the various aspects of toll restriction, use the planning sheets provided in IMI66- 110, **Programming Records For The DXP Digital Communications System**.

## 11.2 Restriction Levels

The restriction table sets up the test structure to determine whether a particular station can or cannot make a call. The restriction table allows a maximum of 400 entries; broken down into 10 entries on a page. You assign each entry a value from 1 to 8, or with “allow all” or “deny all.” The “allow all” entry ensures that the system applies no dialing restriction to a number (example: 911). The “deny all” ensures that a station user can never dial a number (example: 1-900).

In station Class of Service programming, you assign each class of service with a value of 1 through 8 as well. These numbers make up the fundamental test for the toll restriction system. If a station’s class of service toll restriction level is higher than or equal to the level assigned to the telephone number on the toll restriction menu, then the station can place the call. Likewise, if the station’s level is lower than that of the number, the call is denied. The higher the number in class of service, the more dialing patterns the system will allow.

### ***11.3 Toll Groups***

You must assign to toll groups the individual lines that are to have toll restriction levels. First assign the lines to toll groups and then assign those toll groups to the restricted number. There are 32 toll groups available for line assignment. Assign one, several, or all lines to any desired toll group or combination of toll groups as needed.

### ***11.4 Restricted Numbers***

Program restricted numbers as entries in the toll restriction table. The system will accept up to 400 entries. Each restricted number can be up to 16 digits long and can be comprised of the digits 0-9 plus the “match any” digit (@) if needed.

If you program the system to include the automatic route selection (ARS) feature, always fill out the restricted numbers with the @ digit (see Chapter Twelve for ARS information).

## 11.5 Exception Numbers

Exception numbers allow stations to dial numbers that are not normally allowed by their restriction levels. When a user dials a number at his or her station, the toll restriction feature compares it to the toll restriction numbers, the toll groups, the restriction level, and to the exception number. If the system makes a match, the station is not allowed to dial the number. However, if the exception number of the toll restriction table line entry matches one of the exception numbers assigned to the station, the station is allowed to dial the number. The exception number values that you can assign are 1-32 and NONE. You can assign 32 exception numbers to each station. You can assign one exception number to each toll restriction table line entry. The feature provides you with separate line entries expressly for the purpose of specifying special dialing exceptions.

## Chapter Eleven Review Questions

1. At default, the DXP has 1-900 numbers as denied to all stations; true or false?
2. The toll restriction table allows a maximum of \_\_\_\_\_ entries.
3. In \_\_\_\_\_ programming, you assign each station a value of \_\_\_\_\_ that the DXP uses to match against the level of the restricted number to determine whether the call is allowed or not.
4. If a station's restriction level is higher than that assigned to the dialed number, the call is not allowed; true or false?
5. Toll restricted numbers can be \_\_\_\_\_ digits long.
6. Define exception numbers.
7. You can assign up to \_\_\_\_\_ exception numbers.

# 12

## ***Automatic Route Selection***

---

<b>Chapter Twelve: Automatic Route Selection . . . . . *</b>	<b>12-1</b>
12.1 Introducing Automatic Route Selection .....	12-1
12.2 ARS Enable .....	12-2
12.3 Line Groups for ARS .....	12-2
12.4 Route Tables (ARS) .....	12-3
Route Table Warning Tone.. .....	12-4
Routes .....	12-4
Route Access Level.. .....	12-5
Modify Digit Table .....	12-5
12.5 Costing Information (ARS) .....	12-6
Call Cost Display (Display Of Costed Calls).....	12-6
Cost Incoming.. .....	12-6
12.6 Automatic Route Selection for Speed Dial Numbers.. .....	12-7
Chapter Twelve Review Questions .....	12-8



# 12

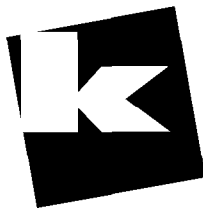
## Automatic Route Selection

### 12.1 Introducing Automatic Route Selection

Automatic Route Selection (ARS) allows the system to automatically route a call over the least-costly line group available to that station. The system automatically modifies the dialed number, if needed, to match the selected line group. Additionally, ARS provides the costing information for the dialed call that is reported by the station message detail accounting feature. ARS makes routing decisions (which lines to route a call over, if and how to modify a number, and costing information) based entirely upon the programming of the system.

*NOTE: When the ARS feature is active, the user selects ARS by dialing 9. Because direct line selection by the user bypasses the ARS route selection feature, the programmer normally does not give stations direct line appearance when ARS is part of the system operation.*

The ARS feature can operate with the toll restriction feature or independently from it; however, both features use the same entry table for programming. The programmer enables or disables automatic route selection on a system-wide basis. A defaulted system has ARS disabled.



**AtoZ KELLATRONICS, INC.**

**tel: 800.766.3425**

**fax: 800.720.1172**

**818.773.8888**

**818.773.8899**

**www.kellatronics.com**

**info@kellatronics.com**

## 12.2 ARS Enable

You can enable or disable automatic route selection on a system-wide basis. A defaulted system has ARS disabled.

## 12.3 Line Groups for ARS

Before automatic route selection can operate, you must group similar lines together into line groups. The system can have a total of 16 line groups with unlimited lines in each group.

Be sure that you program similar line types together into the same line groups to take advantage of the efficiency and cost savings associated with automatic route selection. Some examples of lines that have similar characteristics and should be grouped together into line groups are as listed below:

- outgoing WATS lines to a particular area,
- FX lines to a frequently called area,
- similar AT&T long distance lines,
- similar MCI lines,

A line group can consist of only one line, (for example, if only one FX line exists) to allow the ARS feature to route calls over that group (FX line) for any calls to the FX line area.

**NOTE:** To prevent system users from accessing *non-ARS* line groups, use section 5.15, *Feature Renumbering*, to clear the dialing codes for all non-ARS line groups.

## 12.4 Route Tables (ARS)

The ARS feature interacts with the toll restriction feature. You must enter a number into the toll restriction table and assign a route table (1-32) to that number before the system can perform ARS. The system will route only those numbers that you have assigned a route number and entered on the toll restriction table. The route table entry specifies the following parameters:

- over what line group the call will route,
- I -whether the station is permitted to make a call on that group,
- whether the dialed numbers must be modified to match that line group.

If a dialed number is not matched by an entry in the toll restriction table, it is routed by route table 32-the default route table. The system defaults table 32 to use line group 16 and it defaults line group 16 to use all lines. You must either remove all invalid lines from line group 16 or make table 32 inactive if you do not need default routing.

The entered numbers can be some of the same numbers that you enter as toll restriction numbers or additional numbers. You can enter a maximum of 400 toll restriction and/or ARS numbers. Each entered number can be up to 16 digits long and can be comprised of digits 0-9 plus the “match any” digit (@) if needed.

*NOTE: When the system accepts a number entry into the toll restriction table, it re-orders all of the table entries. The system places a 0 after all other digits in the entries. Also, it places a number with a leading 1 ahead of the same number without a leading 1.*

## Route Table Warning Tone

You can arrange for the system to sound a warning tone in the user's handset or station speaker if ARS routes a call on any route other than the least expensive. This tone indicates that the system has chosen a more expensive line group. If a station user hears this tone, he or she should hang up and try again later.

## Routes

There are a total of 32 route tables that you can program for the system. Each route table can contain up to 6 routes. Each of these routes conveys the data listed as follows:

- the line group to route the call over,
- the access level of the route,
- the modify digit table,
- all costing information.

Program the six routes from the least costly routing method to the most costly routing method. The costliness of the route is determined by the line group over which the call is routed. ARS will always try to select route 1 first, and then routes 2 through 6, when routing a call. If a station, through its class of service assignment, does not have a route access level high enough to allow it access the route selected by ARS, dialing is denied; similarly, if a caller does not have access to the first route level, the call will never try the other routes. If the route access level is high enough, ARS will route the call based on the routing information. If the system cannot route the call over the line group that ARS first selects, ARS will try the next route of the route table. Once again the route access level is tested. This process is repeated, up to a maximum of 6 times. If the station has access to at least the first route, but is unable to dial out (because all lines are busy), it will receive a busy tone in the handset or speaker. The station can then camp-on the route so it will ring when a line in the route table becomes available.

## Route Access Level

Each of the six routes of a route table require a route access level of 1 to 4. ARS uses this route access level to determine if the dialing station has access to dial out on the route. Each station, through its class of service, is also assigned a route access level of 1 to 4. Before the system accepts a dialed number, ARS compares the route access level entries. If the station route access level is greater than or equal to the route access level assigned to the route, the station is allowed to access the route. Otherwise, the system will not accept the dialed number, and sounds an error at the station's speaker or handset. The route access level allows some stations to gain access to the more costly routes in a route table while denying it to others. Just as you program each route from least to most costly, you must also arrange the route access level to increase from a low level to a high level. This is necessary because once the system denies dialing because of the level, it will not try another route. Program the DXP so that the more costly the route is, the higher the access level needed to access it.

## Modify Digit Table

Each of the six routes in each route table has a modify digit table. This modify digit table details any modifications that the system needs to do to the user-dialed number. This need for modification is determined by the type of lines that you include in the line group for the route.

If a line group requires that the dialed number be in a specific format, you must set up an appropriate modify digit table. You must program the index number of this table into the specifications of the route that the line group is found. The sole purpose of the index number and the corresponding table are to modify the number dialed by the station user.

There are 16 modify digit tables in the system. Each modify digit table contains the following information:

- numerical sequence of the digits to be added (valid digits are 0-9 and the pause *p*, digit) in a digit string that can be up to 20 digits long,
- number of digits to be deleted from the dialed number (this value can be from 0 to 10).

*NOTE: When ARS modifies the dialed number, it first deletes from the beginning of the number and then adds to the beginning of the number.*

## **12.5 Costing Information (ARS)**

Each route in every route table contains costing information. The costing information includes a surcharge, a first tier cost-per-minute, a second tier cost-per-minute, and the amount of time to cost the call at first tier cost before switching to the second tier cost. The surcharge is a dollars and cents value that the system adds to the total cost of a call. You can program both tier costs in one-cent increments in the range of \$0.0 through \$99.99 per minute.

Even if the system does not route a call through ARS (for example, when a station user direct selects a line), the system will still access the costing information to cost the call.

The system reports call costs as part of the SMDA report.

### **Call Cost Display (Display Of Costed Calls)**

If you have arranged for the system to employ call costing, you can use this procedure to arrange for an LCD speakerphone to display the cost of a call made from that station.

### **Cost Incoming**

If you have arranged for the system to cost calls, you can arrange for it to also cost incoming calls on a per line basis. You can arrange for the costing to begin as soon as the call arrives in the system, to begin after the user answers the call, or to begin after a programmed delay. You also can pick the call-rate table that you want the system to use when it costs the call.

## **12.6 Automatic Route Selection for Speed Dial Numbers**

You can arrange for the system to process the system speed dial, and any personal speed dial numbers, that you program for the users, through the automatic route selection (ARS) feature. If the users program their own personal speed dial numbers and you have enabled ARS processing of calls, they must prefix their personal speed dial numbers with the ARS preselect code.

If you are using DISA with ARS, the programmer must determine the pause time for when a user is calling out on a DISA line and attempting to dial out via ARS. Once you determine the pauses, you need to insert them in a modify digit table.

## Chapter Twelve Review Questions

1. You cannot use call costing with ARS; true or false?
2. The ARS feature uses a different entry table from the toll restriction feature; true or false?
3. At default, the DXP has ARS enabled; true or false?
4. Direct line selection bypasses ARS; true or false?
5. The route table specifies the following three parameters:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. What is the “match any digit” symbol used by the DXP?
7. You can program a maximum of \_\_\_\_\_ routes on each route table.
8. A pause is an example of a modified digit from the modify digit table; true or false?



9. The DXP can cost both incoming and outgoing calls; true or false?

10. You cannot use speed dials with ARS; true or false?

# 13

## *System Printouts*

---

<b>Chapter Thirteen: System Printouts .....</b>	<b>13-1</b>
13.1 Introducing System Printouts .....	13-1
13.2 Identifying System Printouts .....	13-2
Chapter Thirteen Review Questions .....	13-3

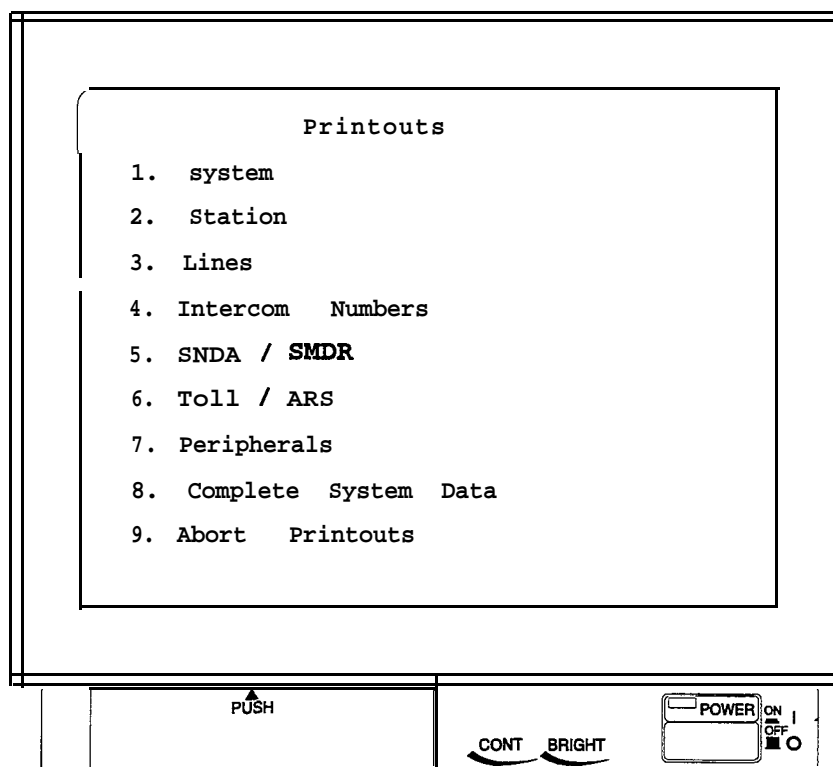
# 13

## System Printouts

### 13.1 Introducing System Printouts

The system makes a wide variety of printout records available. Use this programming procedure to choose the user's desired printout types and to direct the printouts to either the SMDA/SMDR data printer or the VDT screen.

*NOTE: Press CONTROL C to stop a printout to the VDT screen when necessary. This action will not stop printout to a data printer.*



*The Printouts Menu*

## **13.2**

### **Identifying System Printouts**

You can choose to printout information in any of the following categories:

1. System
2. Station
3. Lines
4. Intercom Numbers
5. SMDA / SMDR
6. Toll / ARS
7. Peripherals
8. Complete System Data
9. Abort Printouts

## **Chapter Thirteen Review Questions**

1. You can send SMDA/SMDR reports to one of two devices, what are they?  
▪
2. Chapter\_\_\_\_\_provides further SMDA/SMDR information.
3. Pressing CTRL C stops a data printout to the printer; true or false?

**14*****Diagnostics***

---

<b>Chapter Fourteen: Diagnostics .....</b>	<b>14-1</b>
14.1 Introducing Diagnostics.. .....	14-1
14.2 Initialize Diagnostic Data .....	14-2
14.3 ROM Checksum Verification .....	14-2
14.4 Scratch RAM Test .....	14-2
14.5 Non Volatile RAM test .....	14-2
14.6 Time Switch Memory Test .....	14-3
14.7 Main CPU DTMF Receiver Test.....	14-3
14.8 AUX Board DTMF Receiver Test .....	14-3
14.9 Speaker Coefficients .....	14-4
14.10 CPU Board and DIP Switches .....	14-4
Chapter Fourteen Review Questions .....	14-5

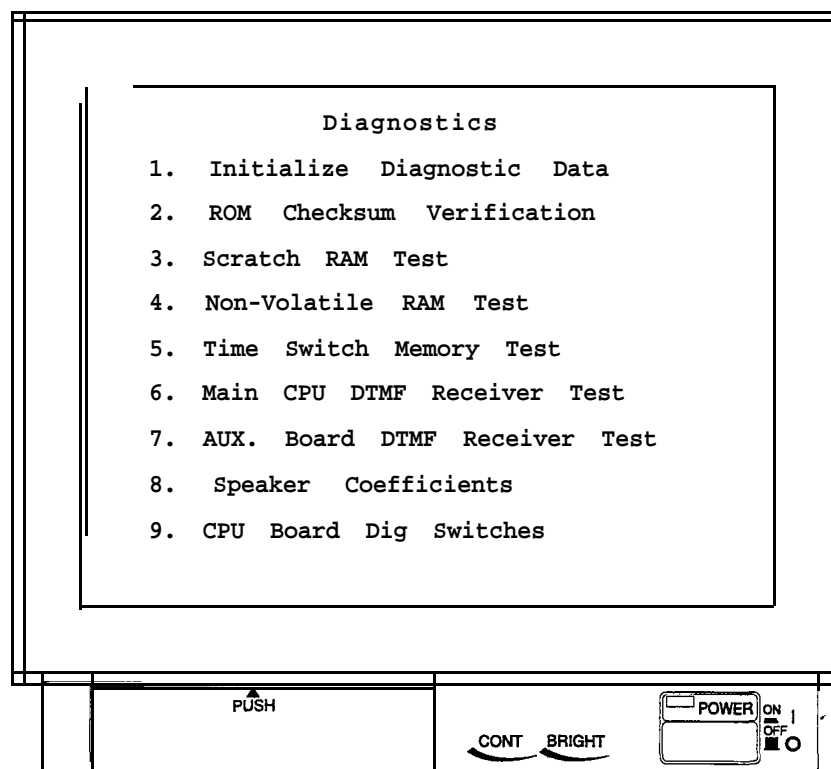
# 14

## Diagnostics

### 14.1 Introducing Diagnostics

The DXP provides you with the option of doing several different types of diagnostic checks on the system. This chapter details the types of diagnostics and their functions.

*NOTE: You should perform all diagnostic tests on an idle system and under the direction of a Comdial technician. A busy system could produce invalid test results. Because there **are** numerous items that could contribute to a failure of any of these tests, Comdial assistance is required in interpreting the results **of** the diagnostic tests.*



*The Diagnostics Menu*

## **14.2** **Initialize** **Diagnostic Data**

This option clears all previous diagnostic test results from memory.

## **14.3** **ROM Checksum** **Verification**

The ROM checksum test calculates and displays a checksum to test the integrity of the system software EPROMs.

## **14.4** **Scratch RAM** **Test**

This test checks the integrity of the scratch RAM area by writing and reading words in memory. The test works by writing a known pattern, "55AA" into memory and then reading the area of memory back. The system then writes and reads a second known pattern, "AA55." This algorithm checks every byte in the the scratch RAM area. If an error occurs, the system displays a message stating that the test failed. Scratch RAM is considered the working area of memory for the DXP's microprocessor. This area of memory is "volatile," which means that any data in this area is lost when the system loses power.

## **14.5** **Non Volatile** **RAM test**

This test checks the integrity of the NOV-RAM area of memory. The NOV-RAM area of memory is write protected and backed up by super capacitors on the DXP's RAM memory board. The programmed database and SMDRs are stored in this area of memory. This test uses the same write/read algorithm as the scratch RAM employs.

|



**14.6**  
**Time Switch**  
**Memory Test**

This test checks all 256 timeslots with a write/read algorithm pattern similar to that of the **scratch/NOV-RAM** test. All voice and tones into and out of the DXP pass through the timeswitch.

**14.7**  
**Main CPU DTMF**  
**Receiver Test**

This diagnostic test checks the two main DTMF receivers on the CPU board for functionality. It performs its check by connecting DTMF tones 0-9, \*, and # through the timeswitch and confirming that the correct tone was recognized by the receiver. If an error occurs, the system displays a message stating which receiver failed.

**14.8**  
**AUX Board**  
**DTMF Receiver**  
**Test**

This diagnostic test checks all of the DTMF receivers on the installed auxiliary boards. The same functional DTMF tone check is performed as for the two main DTMF receivers. If an error occurs, the system displays a message stating which DTMF receiver on which DTMF tone card and which AUX board has failed.

## 14.9 Speaker Coefficients

Certain models of Comdial digital telephones have performance characteristics that can be modified by using this section of diagnostics. Do not attempt to modify any of the values found in this section unless you have been directed to do so by a Comdial technician; doing so could severely impact the performance of the associated telephone. Once modified, these values remain in the telephone's permanent memory and are not affected by a DXP master clear.

## 14.10 CPU Board and DIP Switches

This section displays the current settings of the eight DIP switches on the DXP CPU board. This screen updates simultaneously as the switches are changed. This diagnostic is useful for determining the status of the switches from a remote location.

The current switches used are as follows:

- Switch 1—Fixes serial port baud rates to known values
- Switch 4—Initializes DXP Modem—sets auto answer, for example. Switch should always be on to ensure that the DXP will re-initialize the modem after a loss of power or reset.

	Baud In	Baud Out	Data Bits	Stop Bits	Parity	Flow Ctrl.
Port 1	9600	9600	8	1	None	None
Port 2	300	300	7	2	None	None

- Switch 8—Used for DXP software upgrades. Automatically performs a master clear when a different revision of software is detected upon power up. If the software is changed to a different revision and this switch is not “on,” the system won't run.

## Chapter Fourteen Review Questions

1. You should never perform a diagnostic test on an idle system; true or false?
2. To test the working area of the DXP's memory, you should perform a \_\_\_\_\_ diagnostic test.
3. What test ensures that the DXP recognizes DTMF tones that do not pass through an aux. board?
4. You will frequently change the speakerphone coefficients of a station and should do so at a regular interval; true or false?
5. Master clearing the system eliminates any speakerphone coefficients changes; true or false?
6. DIP switch seven on the CPU board performs what function?
7. What are the default values of port two on the CPU board?
8. If you upgrade the system software and DIP switch 9 on the CPU board is not "on," the system won't work; true or false?

# 15

## Peripherals

---

<b>Chapter Fifteen: Peripherals .....</b>	<b>15-1</b>
15.1 Introducing the DXP Peripheral Equipment .....	15-1
15.2 Caller ID Programming .....	15-2
Deleting Viewed RNA Record (for Caller ID) .....	15-2
Setting Absorb Ring Time (for Caller ID) .....	15-2
Arranging Local Call Table (for Caller ID) .....	15-3
Making Caller ID Active .....	15-3
Setting Caller ID Baud Rate .....	15-3
Arranging Caller ID Ring No-Answer (RNA).....	15-3
15.3 Tracker Paging System Programming .....	15-4
Programming Tracker Paging System Options.....	15-4
Making Tracker Paging System Assignments .....	15-5
COS Programming For Tracker Access .....	15-5
15.4 Digital Voice Announce Programming .....	15-6
Understanding The Line/Voice Option	
/DVA Relationships .....	15-7
Defining DVA Messages .....	15-7
Programming Intercoms For DVA Messages .....	15-10
Obtaining DVA Status Reports .....	15-10
Recording The DVA Messages .....	15-11
Editing The DVA Messages .....	15-11

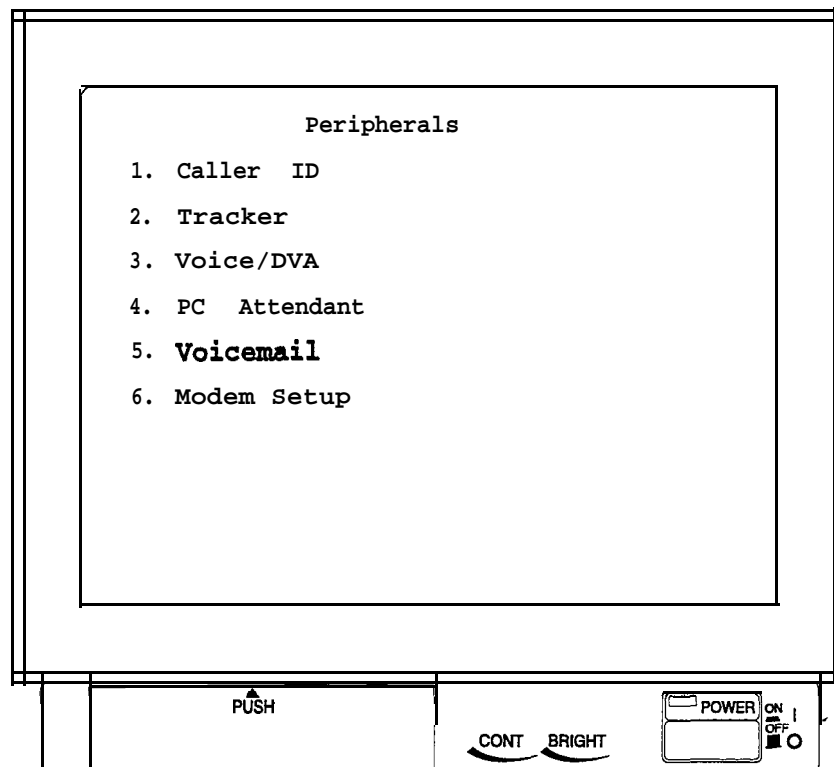
15.5 PC Attendant Position Programming .....	15-12
Enabling The PC Attendant Position .....	15-12
Programming A Hunt List For PC Attendant Use .....	15-12
Assigning Lines For PC Attendant Use .....	15-13
Assigning The PC Attendant Position Text Messaging Buttons .....	15-13
Mapping PC Attendant Position Function Keys .....	15-13
15.6 Voice Mail Programming .....	15-14
Arranging Station Ports For Voice Mail Use.....	15-14
Assigning Intercom Numbers To Voice Mail Connections .....	15-14
Arranging Voice Mail Call Transfer Parameters— Automatic Attendant Transfer On Busy .....	15-15
Immediate Transfer .....	15-15
Assigning Transfer-To-Voice Mail Button .....	15-15
Arranging Voice Mail Ringing Options .....	15-16
Assigning Voice Mail Identification (ID) Number.....	15-16
Enabling Extended DTMF Tones For Voice Mail Use.....	15-16
Setting The Voice Mail Integration Digits .....	15-17
15.7 Modem Setup.....	15-19
Chapter Fifteen Review Questions.. .....	15-20

# 15

## Peripheral Equipment

### 15.1 Introducing the DXP Peripheral Equipment

The DXP offers the capability to use several types of optional equipment known as peripherals. Use this chapter as an overview for all of the peripheral devices. Note that each of these devices is covered in detail and each section may discuss features that previously were mentioned in earlier chapters (unlike the station programming chapter, for example, which simply follows the station menu on the PCMMI).



*The Peripherals Menu*

## 15.2 Caller ID Programming

The DXP caller ID feature supports an externally connected, customer-supplied caller ID device (product code CID08). This hardware device supports eight caller ID conditioned lines, and you can serial connect up to eight devices to give the DXP the ability to support a maximum of 64 caller ID conditioned lines. The caller ID unit interfaces with the DXP through any main or auxiliary serial data port (section 5.7). Any proprietary LCD speakerphone can receive and display caller ID information (keep in mind that analog telephones only provide one line of caller ID information-typically the phone number. The display conveys all available caller ID information from the time the call rings at the station, through all line transitions, until the line disconnects. The system stores caller ID information in its SMDA storage and makes it available in the SMDA printout.

In programming for caller ID support, you must match the data baud rate with that of the CID08, you must enable the caller ID lines, and you must assign them to ring on the telephones. You can set the caller ID options and enter the local area codes and local exchange codes that you want the system to skip when it automatically dials a return call. You can also assign caller ID ring no-answer (RNA) capability to the telephones that are on caller ID lines. Users of these telephones have the ability to review this caller ID RNA information and return the call. They can also note if anyone else has already viewed a record, thus preventing redundant returns. The caller ID information does transfer from station to station; for example, if voice mail transfers a call to extension 101, that extension receives the caller ID information.

### Deleting Viewed RNA Record (for Caller ID) (Peripherals Menu)

When the system makes caller ID RNA information available to a group of stations, any station user in the group can review the information by pressing the telephone's CID button. The system then removes the record from that telephone but continues to flash the CID button status light for other stations in the group. If you enable this feature, the system will remove the caller ID record from all telephones if any user in the group views a record.

### Setting Absorb Ring Time (for Caller ID) (Peripherals Menu)

Use this procedure to specify the amount of time the system waits while it generates caller ID information before it generates system ringing.

### Arranging Local Call Table (for Caller ID) (Peripherals Menu)

When telephone users review caller ID RNA calls, they press their SAVE button to return the call, and the system automatically dials the number. If the area code or office code part of the stored number matches the entries that you program with this procedure, the system will skip that part of the number as it dials.

### Making Caller ID Active (Line Menu, 8.17)

When caller identification (ID) information is available from the central office, take this programming action to match the line port to the feature. You must also assign the caller ID lines to the stations and assign special-purpose station buttons to control the feature.

### Setting Caller ID Baud Rate (System Menu, 5.7)

You must program the parameters of the main or auxiliary serial data port where the installer has connected the CID08 device. The serial data port parameters must match the data parameters of the CID08 device. Usually, these parameters are as follows: 9600 baud, eight data bits, no parity bit, and one stop bit.

### Arranging Caller ID Ring No-Answer (RNA) (Station Menu, 7.14)

This feature offers telephone users the ability to review calls that ring at their stations while they are away. The system stores caller ID RNA records and allows users to review them and use one-button dialing to return those calls that need returning. The feature also conveys the identification of the last station that reviewed the records, thus helping prevent multiple call backs to the same number. After users review the caller ID RNA records, the system deletes the records from their telephones yet retains them in the SMDA storage so that they can be accessed later.



**AtoZ KELLATRONICS, INC.**

tel: 800.766.3425

fax: 800.720.1172

818.773.8888

818.773.8899

[www.kellatronics.com](http://www.kellatronics.com)

[info@kellatronics.com](mailto:info@kellatronics.com)



## 15.3 Tracker Paging System Programming

The Tracker Paging System is a paging device that interfaces a DXP system with Tracker pagers (personal pager devices). When the Tracker Paging System is installed, you must use the following programming routines to establish proper communications between the system and individual Tracker pager users.

### Programming Tracker Paging System Options

Tracker Paging System options consist of selecting the serial port that you will use for connecting the base station, enabling or disabling Tracker Paging System operation, and selecting PC Attendant 1 through 4.

*NOTE: After you have enabled the Tracker paging system and saved your programming selections, the DXP system connects with the Tracker base station and displays the following message:*

**Initializing TRACKER unit, please wait. . .**

*If the Tracker base station is correctly installed and operational, the DXP system then displays the following message:*

**Installation complete, TRACKER is on line**

*If, however, the Tracker base station is not installed or fails to connect, the DXP system displays the following message:*

**Installation error, verify programming or installation**

## Making Tracker Paging System Assignments

As part of the Tracker programming, you have to assign individual Tracker Pagers to a station extension number, select the pager types, and assign a block of pagers to a Tracker Paging System base station. You can also use this programming method for making minor modifications after the system has been installed and programmed.

*NOTE: Tracker pager designations are as follows:*

*P1 000 (numeric display only)*

*P2000 (1 -line alphanumeric display)*

*P3000 (2-line alphanumeric display)*

*P4000 (4-line alphanumeric display)*

## COS Programming For Tracker Access

Assign tracker access to a particular station intercom or group of intercoms using the following class of service (COS) programming. (The default is yes for COS1 and COS32.)

*NOTE: To activate this feature, you must assign the COS type that you programmed to the desired intercom(s). See Chapter Seven, "Station Programming. "*

## 15.4 Digital Voice Announce Programming

The digital voice announce device (DVA) is an optional line-powered unit that connects to a digital station port and plays pre-recorded voice prompts and dialing instructions to incoming callers on the direct inward system access (DISA) lines.

Currently, DISA is the only DXP feature to take advantage of the DVA's voice prompting capability; therefore, for the DVA to function, you must have DISA lines assigned and programmed. The maximum number of DVA units you can install is limited only by the number of DXP station ports (192). Once you connect the DVA to a digital station port, the DVA identifies itself to the DXP, so you do not have any phone-type programming to do. You don't have to program the system to send DTMF or ringing signals to activate the DVA, because DISA programming determines the DVA's actions. When you use a DVA in conjunction with DISA, the DXP automatically answers the DISA lines and guides the callers with DVA-originated voice prompts.

A DVA accepts and stores up to four recorded messages, with a total maximum recorded time for all messages of two minutes.


Each message type has a two-digit system index number (for example: 10 = Welcome Greeting 1, 11 = Welcome Greeting 2, and so forth). You use this index number to identify the messages when you record them. Many of the messages have a single-digit group option number appended to their names (for example: Welcome Greeting 1, Day Main Menu 1, and so forth). You use this message group number to place messages for a particular category of caller together (all group 1 messages for sales calls, all group 2 messages for service calls, and so forth). You assign a message group to a DISA line based on the line's DISA voice option. Group 1 messages correspond with DISA voice option 1, and so on. You assign a voice option, and thus a message group, to a DISA line using programming procedures given in section 8.19, DISA and DISA voice options.

## Understanding The Line/Voice Option/DVA Relationships

Take as an example a company with several departments; the company reserves all group-1 messages for the sales department and reserves all group-2 messages for the customer service department. The company attendant records the group 1 and 2 message to have meaning for the sales and customer service departments. The system programmer assigns DISA lines 1, 2, and 3 to the sales department and DISA line 4, 5, and 6 to the customer service department. He or she also programs DISA line 1-3 to have voice option 1 and DISA line 4-6 to have voice option 2. This organization allows callers to DISA line 1-3 to receive and respond to messages associated with the sales department and callers to DISA line 4-6 to receive and respond to messages associated with the customer service department.

## Defining DVA Messages

The available DVA messages include the following categories

DVA Index Number	Message Type	Message Definition
10-13	Welcome Greetings 1-4	Messages that identify company or department to caller.
14-17	Day Main Menus 1-4	System plays these messages during normal business hours.
18-21	Night Main Menus 1-4	System plays these these messages during close of business hours.
22-25	Recall No Answer 1-4	System plays these messages when the called station does not answer.
26-29	Recall Busy 1-4	System plays these messages when called station does not answer.
	Please Hold	System plays this message callers when they page their called party.

31	Password Prompt	This message prompts callers to enter password for access to advanced DISA features
32	Account Code	System plays this message to callers who request line groups on systems that require forced account code entry
33	Dial Feature	This message plays after the caller enters password for advanced DISA features
<b>34-37</b>	Day Routing 1-4	If system can not provide DISA callers with the requested service, it plays this message.
<b>38-41</b>	Night Routing 1-4	^
42	Reminder Prompt	DISA Callers who are allowed to access advance system features receive this message if they are making a line to line connection through the DXP. The message periodically prompts them to dial a code to continue the connection.

43	Digit Collection	<p>This message prompts callers to dial a code before the system routes their call. When used with telephony services, this dialed code causes a screen showing caller's identification and data to appear on computer at called station's location. System plays the message requesting the dialed entry after a welcome message and before a day menu message. Digit collection message plays first if there is no welcome message and plays after the default routing extension if there is no day menu message. The caller dialed digits also show on the called station's display</p>
----	------------------	--

## Programming Intercoms For DVA Messages

For each message type, you can assign up to ten intercom numbers and assign a single-access digit to each of these intercom numbers. You can assign feature codes as well as intercom numbers. For example, if you have installed the Tracker Paging System option, you can program the Tracker Pager access code (\*8) to an appropriate message and assign a single-digit dialing code to the access code, allowing DISA callers to track their called party by dialing the appropriate single digit when prompted by voice message. The caller then enters his or her call-back number and the # symbol to complete the page.

## Obtaining DVA Status Reports

Use this programming procedure to obtain DVA status information (voice digit translation, voice allocation by DVA, voice allocation by message, and voice resource analysis).

*NOTE: **If** you select the voice resource analysis you get a list **of** all message types. You may need this information to complete the intercom programming **for** DVA (see previous paragraph, Programming Intercoms For DVA Messages).*

## Recording The DVA Messages

You or the system attendant must record the messages that the DVA plays to the callers. Record messages in one of two ways: either by delivering them from the telephone handset at the attendant station or by playing the contents of a professionally-supplied tape recording into the DVA memory. Each DVA stores up to four unique messages. The total message storage time is two minutes and you can divide this time as necessary among the four messages or use the entire two minutes for one message if needed. Because of the time constraints, it is a good practice to script your messages ahead of time so that you can read them aloud in a clear and concise manner as you store them in the DVA memory.

### **CAUTION**

*It is important to keep in mind that the system shares the messages among all installed DVAs. You do not control which DVA stores which message. For example, if you make eight different recordings with two DVAs, the system distributes the messages in both units. If someone later removes one unit from service, the only messages that will play are those stored in the remaining DVA. To Determine which DVA stores which message, see the section on obtaining DVA status reports.*

## Editing The DVA Messages

After DVA messages exist, you can play them, copy them, and delete them as necessary.

*NOTE: If your installer has connected more than two DVAs to the system, the system automatically selects the DVA that will receive the copied message. Likewise, the system automatically selects the DVA that it uses for playing back the message to a caller. Additional DVAs become a shared resource for the system's memory and are not dedicated to particular lines.*



## 15.5 PC Attendant Position Programming

The computerized attendant operating position consists of the following:

- a DOS-based personal computer,
- a proprietary interface circuit board (factory-installed in the computer expansion slot),
- a customized keyboard,
- a program diskette,
- and all necessary cables for connecting the equipment to the system.

The system will accept four PC attendant positions. Each PC attendant position replaces one telephone from the system because a telephone cannot be connected to the same station location that the programmer assigns to the Total Control PC attendant position.

### Enabling The PC Attendant Position

Each PC attendant position requires a station port (though you do not need station board installed for that port), two line ports, a serial data port, and a dedicated line group for operation. You must identify these items for each PC attendant position.

*NOTE: The lines that you assign here are exclusively for PC attendant position use and cannot be used for out-going call operations. Do not assign them for any other system use.*

### Programming A Hunt List For PC Attendant Use

Assign eight intercom numbers to an intercom hunt list for the PC attendant position's use. The assigned numbers must include the personal intercom number of the PC attendant position (the number for the station location that the PC attendant position occupies) and seven group intercom numbers that are set aside for its exclusive use (group intercom numbers range from 3 101–3292, 4110–4292, 5000-5023) . When you assign group intercom numbers to the hunt list, the system automatically adds them to the group intercom access list for the PC attendant position.

*NOTE: You can't assign the same group intercom to more than one station's intercom hunt list. Also, reserve these group intercom numbers for exclusive use by the PC attendant position. Do not assign them to any other station.*

## Assigning Lines For PC Attendant Use

Choose several lines that the PC attendant position can use for call origination; assign them to line group 16; assign line group 16 to a particular class of service, and assign that particular class of service to the PC attendant position. The line key on the keyboard is fixed to select line group 16. You must assign lines to line group 16 before the attendant can select a line for use.

## Assigning The PC Attendant Position Text Messaging Buttons

Use this programming procedure to assign special text messaging functions to system telephone buttons. User's can press these buttons to access the text messaging feature provided by the PC attendant position. Program the telephone to provide the following button functions:

**Text Message** button for the user to press to step forward through the fields of a message that show in the telephone's display window,

**Print button** for the user to press to send the displayed message to an attendant selected data printer for hard-copy printout,

**Next** button for the user to press to sequence through a group of stored messages,

**Previous** button for the user to press to back-up through the fields of a message that he or she has already read,

**Delete** button for the user to press to erase a message after he or she has read it or sent it to the data printer,

**Quit** button for the user to press to end a text messaging session.

## Mapping PC Attendant Position Function Keys

The DXP adds programmable function keys to the PC Attendant Position. The programmable features are in addition to the fixed features currently provided by function keys F1 through F12. You can assign a different feature to each function key from the list of functions shown in section 7.37.

## 15.6 Voice Mail Programming

After connecting a voice mail system to the DXP system (see IMI89-080, Installation Instructions For Installing Voice Mail Equipment On The DXP Digital Communications System for voice mail installation information), program the DXP to operate properly with the voice mail system.

### Arranging Station Ports For Voice Mail Use

After you have connected voice mail ports to the system station ports through the appropriate interface devices (for example, the VMI-X interface device used with analog station ports, the ATI-D-1PT interface device used with the digital station ports, or the DXIST station board used with industry-standard telephone ports), you must identify the station ports where these devices are connected.

### Assigning Intercom Numbers To Voice Mail Connections

You must identify the station intercom number of each voice mail connection and link these numbers together to form a circular hunt group for call-handling purposes. For example, assign intercom numbers 121, 122,123, and 124 to voice mail ports 1, 2, 3, and 4 then link 121 to 122,122 to 123, 123 to 124, and 124 to 121.

*Programming Hint: To make the LCD readouts at the system telephones more descriptive during call transfers, use section 7.3, Station Names, to assign a descriptive name to the personal intercom numbers. If you do assign intercom names, be sure to name each voice mail port differently. For instance, you can name them VMI, VM2, VM3, and VM4; however, do not name each port VM without personalizing it further with a unique suffix (such as 1, 2, 3, 4 or A, B, C, D for example).*

### Arranging Voice Mail Call Transfer Parameters— Automatic Attendant Transfer On Busy (Station Menu, 7.29)

You can enable automatic attendant transfer on busy for individual station ports if you wish. With this feature enabled, the system rings a busy telephone when the voice mail system is attempting to transfer a call to it, which gives the user the option of leaving his or her present call and taking the new one. With the feature disabled, the busy telephone is not signaled by the presence of a new call, and voice mail automatically routes the call to the busy telephone's voice mailbox.

### Immediate Transfer (System Menu, 5.12)

You should choose the automatic attendant immediate transfer mode for voice mail transfers; it allows the system to transfer a call as soon as it answers. However, if you turn on the voice mail screen and confirm options (see the voice mail programming manual for details), do not turn on the DXP immediate transfer mode. Immediate transfer is a system-wide parameter and affects all telephones in the system.

### Assigning Transfer-To-Voice Mail Button (Station Menu, 7.37)

A system user can use a pre-programmed button to transfer an incoming call directly to a voice mail box so the caller can leave a message. You must use the button mapping programming procedure to assign this Transfer-To-Voice Mail button at a system telephone.

*NOTE: Type **XVM** plus a two-digit code (0-32) that equals one **of** the voice mail ports. Usually, you will enter the code **for the first** voice mail port and let the extension number linking (that you have previously arranged) decide which voice mail port actually handles the call. However if you have arranged voice mail ports into groups **for** department answering, enter the voice mail port code **for** the group that also includes the telephone that you are button mapping.*

### **Arranging Voice Mail Ringing Options (Station Menu, 7.14)**

The DXP system automatically enables ringing line preference at the voice mail station ports. With this feature enabled, the voice mail system's automatic attendant will answer calls. You can use direct, delayed, or night ringing features to determine how quickly or when voice mail answers the calls. With direct ringing, calls ring at the voice mail port immediately. With delayed ringing, the calls direct ring at a telephone before they delay ring the voice mail and the automated attendant answers them.

### **Assigning Voice Mail Identification (ID) Number (Line Menu, 8.18)**

You can assign an identification number to each DXP line so that the voice mail system can provide customized call handling on a per line basis. Use voice mail system programming to match this ID number to a particular personal directory or transaction box within the voice mail system. When the DXP routes a call that is ringing at a particular line to the voice mail system, it routes the call with the ID number. The voice mail system then sends the call to the box that corresponds to the line's ID number. You can use voice mail system programming to construct customized answering prompts for the individual boxes, which allows the voice mail system to answer DXP lines with IDs in a customized manner.

### **Enabling Extended DTMF Tones For Voice Mail Use (System Menu, 5.11)**

The system provides a means by which you can set the length of the DTMF tones that it generates when a user dials a number from his or her telephone. Since the voice mail system may require a different DTMF tone length than that which you have provided for the telephones, the system provides a means for you to set a separate DTMF tone length for voice mail station ports. The DXP defaults the length to 80 msec, but you can program other lengths as needed.

## Setting The Voice Mail Integration Digits

You can choose the DTMF digits that the DXP sends to a voice mail system. A voice mail system uses these DTMF digits to determine system and station status so that it can properly process a call. You must be versed in your voice mail's requirements before you can assign DTMF integration digits in the DXP. The system defaults the voice mail parameters to match the Comdial voice mail system. Certain applications in countries with dialing plans different than the United States may require different integration digits. The default digits are shown in the following list and discussed below:

Follow Extension ID = 2                      Intercom/Answer Confirmation = 1  
Busy = 2    Do Not Disturb = 3  
Incoming Intercom Answer = 9      Disconnect = A

**Follow Extension ID** – When the voice mail system receives a forwarded call from a ring no-answer (RNA) or busy station, the DXP sends to the voice mail system the extension number of the forwarded call followed by this DTMF digit (n). The DXP sends this digit within 500 ms. of the time the voice mail system answers the call. For example, if extension 101 is forwarded to voice mail, and voice mail answers a forward RNA or busy forwarded call, the DXP sends 101n to the voice mail system within 500 ms of the answer time.

**Intercom/Answer Confirmation** – The DXP sends this DTMF digit to the voice mail system to confirm that an intercom path (without dial tone) is available for the voice mail system's call transfer or dialing use. The DXP sends this digit within 500 ms of the time it detects the voice mail system's off-hook or hookflash condition. The DXP also immediately sends this digit to the voice mail system when a station answers a voice mail transferred call. This action can alert the voice mail system to disconnect and leave the parties connected.

**Busy** – If the voice mail system transfers a call to a station that is busy on a call, the DXP sends this DTMF digit to the voice system. When the voice mail system receives this digit, it can abandon the transfer, reconnect to the call, and offer the caller whatever options the the voice mail system has available in its programming. If the DXP's auto-attendant-transfer-on-busy feature is active, the DXP will not send the DTMF digit to the voice mail system, therefore allowing the system to transfer a second call to the station.

**DND** – If the voice mail system transfers a call to a station that is in the do not disturb (DND) mode, the DXP sends this DTMF digit to the voice system. Receiving this digit allows the voice mail system to distinguish between a busy and a DND condition and offer the caller the appropriate choices.

**Incoming Intercom Answer**– The DXP sends this DTMF digit to the voice mail system when a station user makes an intercom call to the voice mail system. This action allows the voice mail system to distinguish between internal and external calls and offer the caller appropriate prompts and dialing options.

**Disconnect** – When an outside line or intercom party hangs up, the DXP sends this DTMF digit to the voice mail system to command an immediate disconnect. For outside calls, the central office (CO) must provide disconnect supervision to the DXP, and you must program the DXP line for abandon hold release and disconnect supervision (see section 8.11, *Abandon Hold Release*, for details). At default, the DXP sends the DTMF tone for the *A* character as the disconnect digit. Since a caller cannot dial an *A* from a telephone. This feature eliminates callers from causing an accidental disconnect by dialing this digit on their telephone's dial pad.

## **15.7** **Modem Setup**

The system supports the operation of the DXMDM serial data modem. The DXMDM is a general-purpose, Hayes\*-compatible, 300, 1200, and 2400 automatic baud detect, serial data modem that receives its operating power and configuration programming from the DXP system. After you install and connect the DXMDM, you must program the modem port number into the system memory. Since the serial data port default for both the modem and the SMDR serial data printer is main port 2, it is a good practice to choose a different modem port if the site employs both devices.

Regardless of which port you choose for modem connection, the system arranges for that port to automatically match the baud rate and serial data parameters of the modem.

\* Hayes is a registered trademark of Hayes Microcomputer Products.



## Chapter Fifteen Review Questions

1. Analog telephones only provide one line of caller ID information; true or false?
2. Does caller ID information transfer from station to station?
3. Caller ID baud rate is usually 1200 baud; true or false?
4. List the four Tracker pager designations.
5. The maximum number of DVA units is 16; true or false?
6. For the DVA to function, you must have \_\_\_\_\_ lines assigned and programmed.
7. The total DVA message storage time is four minutes; true or false?
8. If you are using multiple DVAs, you cannot program which DVA contains which message; true or false?
9. The system accepts up to \_\_\_\_\_ PC Attendant positions.

10. The PC Attendant requires two line ports for operation; these line ports can still be used, however, for outgoing and incoming calls; true or false?
  
11. You must use a DXIST for digital station ports to use voice mail; true or false?
  
12. What purpose does immediate transfer serve when being used with voice mail?
  
13. The DXP defaults with integration digits to match Comdial voice mail: you cannot change these values; true or false?
  
14. The DXP modem, DXMDM, has a maximum of 9600 baud; true or false?

**16****Review Answers**

---

**Chapter One:  
Review Answers**

1. The term modular design means that the system's electronic components are housed in a series of self-contained printed wire boards that can be arranged quickly and easily into a variety of configurations.
2. 120, 16
3. 32, 192
4. The number and type of line and station boards that you install.
5. False (it holds a maximum of 12 boards)
6. True. There is a DXP proprietary modem, but any Hayes compatible modem will work.
7. The exact amount of time depends upon the line and station configuration, but a standard is one hour without an expansion cabinet.
8. Yes. If you are using an expansion cabinet you will need the two interface boards connecting the main cabinet and the expansion cabinet.
9. You will only ever need two interface boards-one in each cabinet.
10. False; the boards are not interchangeable.
11. Input for music on hold  
Input for background music  
Output for external pager.
12. System malfunction.
13. The CPU board has four 6-pin modular jacks that provide the interface for two serial data devices and four relay contacts.

14. Master timing
15. Onto the RAM card; the software card is part of the CPU assembly.
16. The main difference is that the standard RAM card provides approximately 200 SMDRs; the expanded RAM provides 12,200 and allows for onboard software upgrade.
17. Digital  
Analog  
Industry Standard.
18. False; steady on and steady off indicate a malfunction.
19. 25-pair amphenol connector.
20. Loop start  
Multipurpose  
T1  
DID.
21. Secondary.
22. Each line board has a power-fail relay.
23. False. DID stands for Direct Inward Dialing, so DID lines are incoming only.
24. True.
25. False. The DXP supports up to two auxiliary boards, and they must be installed in either of the universal/auxiliary slots in the main cabinet.
26. The DTMF tone card expands the DXP's industry standard dialing by providing additional IST dialing paths.
27. Four additional serial data ports to the DXP.
28. A T1 board.
29. True.
30. The expansion cabinet holds eight additional boards (seven if you exclude the interface 2 board)
31. Karren Warner.

## Chapter Two: Review Answers

1. As a minimum, think about the clients present and future needs, the number and type of lines and stations you will need now, and how much room have you left for future expansion.
2. Paging device, music source, battery backup, voice mail.
3. Station boards  
Analog, Digital, or Industry Standard  
Line boards  
An Expansion cabinet
4. False. Try to reserve these for auxiliary boards.
5. 32-122 degrees fahrenheit with less than 90 percent non-condensing humidity.
6. Dedicated 117V AC 15 Amp
7. False. The DXP needs to be within 7 feet of an outlet, 25 feet from the telco's punch-down blocks.
8. Fasteners  
Screwdriver  
Drill  
Punch-down tool  
3-prong circuit tester
9. Main Distribution Frame
10. stability  
mobility  
keeping condensation off of equipment.
11. True.
12. Voltage check.
13. Turn the power off and re-seat the board; if you didn't install the mounting screws, do so.
14. CPU and Services.
15. Digital Armiger.
16. Femwick Country Club is a golf course.
17. Dave Huxley.

## Chapter Three: Review Answers

1. 50- 100 pounds.
2. Six,  
24.5
3. Keep the distance to a maximum of two inches to connect the two interface boards; this ensures that you won't exceed the ribbon cable length.
4. False. The expansion cabinet always goes on top of the main cabinet.
5. # 10 or # 12 gauge wire  
20 feet
6. 117V AC 15 AMP circuit.
7. False. You should always use a surge protector.
8. False. Check the output voltage of both power supplies.
9. It has a DC input and no pre-power on battery backup.
10. False. Mount below or to the left of the main cabinet.
11. 34.3 and 34.6 volts
12. False. The battery backup provides approximately 1 -hour of backup time.
13. Work in a static safe area and wear a static discharge wrist strap.
14. False. While line and station boards do have pre-power jacks, you should install the boards with the power off unless otherwise necessary.
15. The card cage is mechanically keyed to prevent you from inserting the wrong board.
16. RAM card  
Software card.
17. False. Line ports are numbered from right to left.
18. 64-pin ribbon cable.
19. Use the pre-power jack. You can leave the power on for the line and station boards.
20. Never install lines during lightning storm.  
Never touch uninsulated telephone wires or terminal unless the line has been disconnected at the network interface.
21. Primary surge protection. Comdial recommends that you use gas discharge tubes.

22. Polarity sensitive.
23. 66M-xx connector blocks.
24. False.
25. True. Grounding these pairs helps cut down on RF interference.
26. False. You can install a paging device on Services board or on a line port.
27. You can connect the modem to any serial data port.
28. With DIP switch 7 “on,” the system automatically sends the initialization string to the modem in case of a power fail.
29. 500 Ohms.
30. False. You need one ring generator in each cabinet where you have installed IST stations.
31. The station port simply provides a logical port for the PC Attendant during DXP programming.
32. Rolling the wiring means that the transmit data wire connects with the receive data wire (and visa-versa) between the two modular jacks.
33. 500 feet.
34. Serial data port two is defaulted for the SMDA/SMDR.
35. Yes.
36. One technician (not including the male narrator).
37. To send pages to people on the golf course.

## Chapter Four: Review Answers

1. IMI66-088, DXP Programming Records  
IMI66-087, VDT Programming Manual
2. With PCMMI, you don't have to be directly connected to the DXP to change the database.
3. False. You can do some DXP programming through a telephone but not all of it.
4. False. The DXOPT COM card provides four additional serial data ports (you can have a total of 16 serial data ports on the DXP).
5. Port One: 9600, 8, 1, No Parity  
Port Two: 300, 7, 2, No Parity
6. 500 ft  
short-haul modem
7. Dedicate a line for the modem or install a line switch for the modem.
8. CTRL-N takes you to the next page, CTRL-P takes you to the previous page, CTRL-T returns you to the main menu.
9. If you have not performed any programming within the time-out period the system automatically logs out of the programming menu, and you must re-enter the password.
10. System  
Stations  
Line



## Chapter Five: Review Answers

1. The defaults menu lets you return certain elements of DXP programming to their factory settings.
2. Three.
3. False. None of the master clear settings clear the serial ports.
4. False. You can default each COS individually.
5. Button map default.
6. SMDA/SMDR records.
7. 30.
8. Restoring the database means that you are transferring the database from a DOS file into a DXP.
9. True. You must have the expanded RAM card installed to ensure proper save or restore operation.
10. 2  
16
11. False. The serial data ports accept up to 9600 baud.
12. False. At default, each station can SOHVA within its own group. Only group 16 can SOHVA all stations.
13. 500 (200 prior to Rev. 5)
14. System clock works for SMDA/SMDR records, day night timing, and LCD speakerphone display.
15. False.
16. Section 5.11 defines all of the DXP timing features.
17. With system status reporting enabled, the DXP notifies certain designated stations of system status conditions.
18. 21Hz  
25Hz
19. 48.
20. This feature depends upon how you have programmed default relocation response. If you set the programming choice to "yes," the station assumes the parameters from the original station port; "no," and the station assumes the parameters of the new port.

- 21. Three.
- 22. True.
- 23. True.
- 24. False.

## Chapter Six: Review Answers

1. False. The DXP has 32 classes of service.
2. False. COS 1 and COS 32 are defaulted differently from the other classes of service.
3. A station user must dial a forced account code for a call to go through; non-forced account codes are not mandatory.
4. Two.
5. Personal intercom and prime line.
6. Gives stations in a group the ability to pickup calls ringing at other stations in that group.
7. False. LCD speakerphones that have interactive buttons already have the DND override button.
8. Idle line preference means that a station automatically connects to an idle line when the user lifts the handset.
9. False. The ring cadence is different for intercom and outside-line calls.
10. Tone bursts.
11. Paging Transmit.
12. False. You can program six routes per ARS table.
13. 10: restriction levels 1-8, and deny all and allow all.
14. False. It's probably not a good idea to let anyone but the attendant have this feature.
15. Line Answer.
16. False. Periodic line tone is merely a reminder of call time; on the contrary, once a station reaches the maximum call duration time, the call is disconnected.
17. False. IST users can, if programmed, send an internal or external hookflash.
18. Impact.
19. Quick transfer allows users to perform an automatic screened or unscreened transfer without pressing their station's TRNS/CNF button.
20. 8b.

## Chapter Seven: Review Answers

1. False. Personal intercom numbers are programmable.
2. 20, 7.
3. Eight.
4. False. You can include one personal intercom in a hunt list.
5. False.
6. Prime line: station automatically selects the line when the station is off-hook,  
Prime intercom: station automatically selects the intercom when the station is off-hook,  
Prime line group: station automatically selects the line group when the station is off-hook.
7. False.
8. To ensure that at default, the voice mail equipment will have sufficient time to answer a call before it rolls over to the next port.
9. Service observe allows a station to enter an in-progress call in an unannounced, muted mode to monitor the conversation.
10. Call pickup groups stations to pickup an call at any other station in their group.
11. False. Exception numbers are special numbers that would normally be disallowed.
12. True.
13. False. These buttons are programmable.
14. Button mapping allows you to determine the function of the buttons on a station.
15. Copy Model Programming.

## **Chapter Eight: Review Answers**

1. False. Line names can be no longer than seven characters.
2. Ground start lines help in preventing call collision.
3. True.
4. False. DID stands for Direct Inward Dialing.
5. False. You can also program a privacy release button that releases the line from privacy mode.
6. 500r 350
7. 32
8. 16.
9. Immediate Start.
10. True.
11. True. DISA stands for Direct Inward System Access.

## **Chapter Nine: Review Answers**

1. Defaulted as a group intercom.
2. False. Intercom numbers are defaulted from left to right.
3. Four.
4. Alphabetic character.
5. False. Like many DXP features, removing intercoms can be done in a block fashion.

## **Chapter Ten: Review Answers**

1. 95 percent.
2. Stations  
Account Codes  
Lines  
All records
3. False. However, you must program the dialing time limit (section 10.2)
4. False. Account codes can be used for incoming or outgoing calls.
5. 16.
6. True.
7. Chronological order.
8. True.
9. 1000.
10. True.
11. True.

## Chapter Eleven: Review Answers

1. False.
2. 400 entries, broken down to 10 entries per page.
3. Station Class of Service  
1 through 8
4. False. The station's number must be higher than or equal to the toll restriction number.
5. 16.
6. Exception numbers are numbers that would normally be disallowed by your toll-restriction programming. For example, if you program 1-804 as deny all, you can still program 1-804-978-2000 as an exception to that general rule.
7. You can assign up to 32 exception numbers to each station.



## *Chapter Twelve: Review Answers*

1. False. Call costing is in intricate part of ARS.
2. False. ARS is part of the Toll restriction table.
3. False.
4. True.
5. Line group that call routes over  
Whether the station is permitted to call on that group  
Whether dialed numbers must be modified to match the line group.
6. The @ is the match any digit.
7. 6.
8. True.
9. True.
10. False. You can use speed dials with ARS (section 12.6, Automatic Route Selection for Speed Dial Numbers)

**Chapter Thirteen:  
Review Answers**

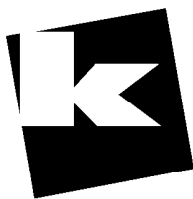
1. An SMDA/SMDR printer or VDT screen.
2. Ten.
3. False. It will stop a printout to a VDT screen, not a printer.

**Chapter  
Fourteen:  
Review Answers**

1. False. The system should always be idle before you do any diagnostic test.
2. Scratch RAM test.
3. Main CPU DTMF Receiver test.
4. False. You should not perform this diagnostic check unless directed to do so by a Comdial technician.
5. False. These values remain in the station's permanent memory and are not affected by a master clear.
6. DIP switch seven initializes the DXP Modem.
7. 300 baud, 7 data bits, 2 stop bits, no parity
8. False. DIP Switch 8 is used for software upgrades.

## Chapter Fifteen: Review Answers

1. True.
2. Yes. Caller ID information will transfer.
3. False. Caller ID baud rate is usually 9600 baud.
4. P1000 (numeric display)  
P2000 (1 line alphanumeric display)  
P3000 (2 line alphanumeric display)  
P4000 (4 line alphanumeric display)
5. False. You can have a maximum of 192 DVAs on the DXP.
6. DISA.
7. False. The DVA storage time is two minutes per DVA.
8. True. The DVAs randomly split up the messages.
9. 4.
10. False. These lines are exclusively for the PC Attendant and cannot be used for incoming or outgoing calls.
11. False. DXIST is for industry standard telephones.
12. It allows the system to transfer a call to voice mail as soon as it answers,
13. False. You can program the integration digits to match another voice mail system.
14. False. 2400 is the maximum baud rate for the DXMDM proprietary modem.



**A to Z KELLATRONICS, INC.**

**tel: 800.766.3425** **fax: 800.720.1172**

**818.773.8888** **318.773.8899**

**www.kellatronics.com** **info@kellatronics.com**



# Index

## A

Section	Page Number
Abandon Hold Release .....	.8-8
Absorb Ring Time (for Caller ID) .....	15-2
Accessing the Main Menu .....	.4-7
Account Code (For Class Of Service) .....	10-6
Account Code (System Parameters) .....	. 0-3
Account Code Display And	
Account Code Display Time.. .....	10-3
Account Code Length .....	10-3
Account Codes, Add Remove .....	10-6
Account Codes .....	6-2
Account Codes .....	.6-22
Add, Remove, Display Account Codes .....	.10-6
Adding Intercom Numbers .....	9-3
Administrator Password .....	.5-34
Alarm Reporting .....	5-38
Allow Busy Display (Display Of Busy Status) ...	6-22
Allow Ringer Off (Ringer Volume Off) .....	7-13
Alternate Routing, DID .....	.8- 16
Analog Station Board.. .....	1-9
ANI Delivery.. .....	.8-15
Answer Time Limit, SMDA/SMDR .....	10-2
Arranging Local Call Table (for Caller ID) .....	.15-3
Arranging Station Ports For Voice Mail Use ...	15-14
ARS Enable.. .....	.12-2
ARS Hookflash, hookflash .....	6-23
Assigning Lines For PC Attendant Use .....	15- 13
Assigning Transfer-To-Voice Mail Button .....	15-15
Attendant Hold Recall.. .....	5-21
Attendant Position (Alternate, Overflow).....	.7-16
Authorization Code Time-out.. .....	5-24
Authorization Code.....	10-7
Automatic Attendant Immediate Transfer.. .....	.5-26
Automatic Attendant Transfer On Busy .....	15-15
Automatic Hold .....	.6-2
Automatic Hold On Intercom Number.. .....	.6-2

Automatic Hold On Lines.. .....	6-2
Automatic Privacy (Privacy Release) .....	8-5
Automatic Route Selection (ARS Enable) .....	5-27
Automatic Route Selection Dial Tone.. .....	5-27
Automatic Route Selection	
for Speed Dial Numbers .....	12-7
Automatic Route Selection .....	12-1
Automatic Station Relocation .....	5-30
Automatic Voice Mail Transfer On Busy.. .....	7- 15
AUX Board DTMF Receiver Test.. .....	14-3
Auxiliary Board and Add-On Cards .....	1-14
Auxiliary Board, Installing .....	3-9
Auxiliary Board.. .....	3-9
Auxiliary Port.. .....	8-3
Auxiliary Serial Data Ports .....	5- 13

## B

Background Music .....	6-3
Battery Backup, Connecting .....	3-6
Block Programming, Button Mapping.....	.7-22
Block Programming, Class of Service.....	.7-22
Block Programming, Station Features .....	.7-22
Board locations .....	3-7
Busy Lead Detection .....	8-10
Busy On SOHVA .....	7-1 1
Button Map Default.. .....	5-5
Button Mapping By Station .....	7-20
Button Mapping, Button Mapping .....	7-22

## C

Call Announce Beeps (Call Announce	
Tone Bursts) .....	7-5
Call Cost Display (Display Of Calls).....	6-3
Call Cost Display (Display Of Costed Calls) .....	12-6
Call Duration Time.. .....	6- 19
Call Duration .....	6-19

Call Forward .....	6-4
Call Forward Of All, Personal, Busy, or Ring-No Answer (RNA) Calls.. .....	6-4
Call Forward RNA, Ring (On) Busy .....	6-4
Call Forward, Default Forward Type (For Busy Or Ring-No Answer).. .....	6-4
Call Park Access.. .....	6-6
Call Park Recall.. .....	5-20
Call Park Recall.. .....	6-6
Call Park .....	6-6
Call Pick-Up Group .....	6-6
Call Pick-Up, Enable.. .....	6-6
Call Pick-Up .....	6-6
Call Waiting (Tone).. .....	6-7
Caller ID Active .....	15-3
Caller ID Active .....	8-10
Caller ID Programming.. .....	15-2
Caller ID Ring No-Answer (RNA) .....	15-3
Caller ID Ring No-Answer (RNA) .....	7-8
Camp-On Originate, Camp-On Receive .....	6-8
Camp-On Programming .....	6-8
Camp-On Tone.. .....	5-21
Camp-On/Automatic Call Back Ring .....	5-24
Central Message Desk.. .....	5-28
Change Password .....	5-34
Chapter Two Review Questions.. .....	2-9
Checking The Hardware.. .....	2-6
Class Of Service .....	7-2
Class Of Service Default .....	5-4
Clear Major Alarm Ring .....	6-22
Clear System Status Log .....	5-6
Clock, System .....	5-19
Common Audible Ringer.. .....	5-33
Communications Card.. .....	1-15
Concluding Chapter One.. .....	1-17
Concluding Chapter Two .....	2-8
Conference Board, Installing .....	3-9
Conference Board.. .....	1-16
Conference Board.. .....	3-9
Connecting A Battery Backup .....	3-6
Connecting A Modem.. .....	3-14
Connecting A Music Source .....	3-15
Connecting A Printer.. .....	3-17
Connecting An External Paging Device .....	3-13
Connecting Data Devices .....	4-4
Connecting The Lines .....	3-10
Connecting The PC Attendant .....	3-16
Connecting The Stations .....	3-11
Copy Model Line .....	8-12
Copy Model Programming.. .....	7-22
COS Programming For Tracker Access.. .....	15-5
Cost Incoming .....	8-5
Cost Incoming .....	12-6
CPU Assembly .....	1-7
CPU Board and DIP Switches.. .....	14-4
CPU Board .....	3-8

**D**

Data Devices, Connecting .....	4-4
Database Programming Station .....	7-15
Database, Save / Restore .....	5-10
Day 1 Ring .....	7-8
Day 1, Day 2, and Night Ringing Begin and End Times .....	5-3 1
Day 1, Day 2, And Night Ringing Begin And End Times .....	7-8
Day 2 Ring .....	7-8
Day Exception Number/Night Exception Number .....	7-1 1
Day Restriction Level /Night Restriction Level .....	6-15
Day Route Access/Night Route Access .....	6-14
Default Forward Type .....	7-6
Default Relocation Response .....	5-3 1
Defaults, System .....	5-4
Defining DVA Messages .....	15-7
Delayed Ringing .....	7-7
Deleting Viewed RNA Record (for Caller ID) .....	15-2
Diagnostic Data .....	14-2
Diagnostics .....	14-1
Dialing Mode.. .....	8-15
Dialing Mode.. .....	8-7
DID Alternate Routing .....	8-16
DID board .....	1-13
DID Control Signaling .....	8-14
DID Lines .....	8-3
DID Options .....	8-14
DID Translation Table Default.. .....	5-5
DID/DNIS Block Name .....	8-14
DID/DNIS Translation Tables.. .....	8-17
Digital Station Board.. .....	1-9
Digital Voice Announce Programming.. .....	15-6
Direct Inward Dialing (DID) Support .....	8-13
Direct Inward System Access @ISA). .....	8-18
Direct Ringing .....	7-7
Directed Station Hold .....	6-16
DISA and DISA Voice Options .....	8-1 1
DISA Lines, Enabling or Disabling .....	8-19
DISA Specific Programming .....	8-18
DISA Voice Options .....	8-15
Disable, Station .....	7-14
Disabling DISA Lines .....	8-19
Disconnect Supervision .....	8-10
Disconnect Time, Positive .....	8-8
Do Not Disturb Inhibit.. .....	6-9
Do Not Disturb Override.. .....	6-9
Do Not Disturb Programming .....	6-9
DSS/BLF Consoles Installed .....	7-14
DTMF Dialing, Extended I.. .....	7- 16
DTMF Extended Dialing (Tone Length) .....	5-21
DTMF Level .....	8-9

DTMF Tone Card .....	1-14
DVA Messages .....	15-7
DVA Messages, Editing .....	15-11
DVA Messages .....	15-11
DVA Status Reports .....	15-10
DXP Hardware .....	1-3
DXP Main Cabinet .....	1-4
DXP Peripheral Equipment .....	15-1

## E

E&M DNIS Lines .....	8-3
E&M Tie Lines .....	8-3
Editing The DVA Messages .....	15-11
Enabling Extended DTMF Tones For Voice Mail Use .....	15-16
Enabling Or Disabling DISA Lines .....	8-19
Enabling The PC Attendant Position .....	15-12
Enhanced LCD Display .....	6-24
Equipment Room .....	2-3
Evaluating The Installation Site .....	2-3
Exception Numbers .....	11-4
Exclusive Hold .....	6-9
Executive Override (Enable or Disable) .....	6-9
Executive Override Block .....	6-9
Executive Override <b>Programming</b> .....	6-9
Expansion Cabinet .....	3-3
Expansion Cabinet Power Supply .....	3-5
Expected CO Digits .....	8-15
Extended DTMF Dialing .....	7-16
Extended DTMF Tones For Voice Mail Use .....	15-16
External Paging Device .....	3-13

## F

Feature Renumbering .....	5-36
Flash, IST .....	6-21
Flexible Ringing Assignments .....	7-7
Forced Account Codes .....	6-22
Forward RNA Ring Busy (Enhanced Call Forwarding) .....	7-7
Forward Type, Default .....	7-6
Forward Type .....	7-6

## G

Ground Start Lines .....	8-2
Group Intercom Access .....	7-4
Groups, Toll .....	11-3
Groups, Toll .....	8-9

## H

Handset Volume On Impact Telephones .....	6-23
Hardware, Checking The .....	2-6
Headset .....	7-15
Hold On Intercom Number .....	6-2
Hold On Lines .....	6-2
Hold Recall, Attendant .....	5-2 1
Hold Recall .....	5-2 1
Hold Release .....	8-8
Hold, Directed Station .....	6-16
Hold, Music on .....	6-12
Hold, Music on .....	8-4
Hunt List For PC Attendant Use .....	15-12
Hunt List, Intercom .....	7-3

## I

Identifying System Printouts .....	13-2
Identifying The Mandatory DXP Boards .....	1-6
Identifying The Station Boards .....	1-9
Idle Line Preference .....	6-10
Idle Line Priority .....	6-10
Idle Line Priority .....	7-3
Idle Line Programming .....	6-10
Immediate Transfer, Voice Mail .....	15-15
Industry Standard Telephone Board .....	1-10
Initialize Diagnostic Data .....	14-2
Installer and Administrator Password .....	5-34
Installing The Boards .....	3-7
Installing The Power Supply .....	3-4
Installing The Ring Generator .....	3-15
Interactive Button Support (Softkeys Setup) .....	7-17
Intercom Access, Group .....	7-4
Intercom Hunt List .....	7-3
Intercom Number Forwarded to .....	7-6
Intercom Number, Personal .....	7-2
Intercom Number, Prime .....	7-4
Intercom Numbers, Removing and Adding .....	9-3
Intercom Numbers To Voice Mail Connections .....	15-14
Intercom Programming .....	9-1
Interface Boards, Installing .....	1-6
Interface Boards .....	1-6
Interface Boards .....	3-8
Internal Interdigit Dialing .....	5-23
Internal IST Flash .....	6-21
Introducing Automatic Route Selection .....	12-1
Introducing Chapter Three .....	3-1
Introducing Chapter Two .....	2-1
Introducing Diagnostics .....	14-1
Introducing Intercom Programming .....	9-1
Introducing Line Programming .....	8-1
Introducing Programming .....	4-1
Introducing SMDA/SMDR Programming .....	10-1

Introducing Station COS Programming..... 6-1  
 Introducing Station Programming..... 7-1  
 Introducing System Printouts..... 13-1  
 Introducing System Programming ..... 5-1  
 Introducing The DXP Hardware ..... 1-3  
 Introducing the DXP Peripheral Equipment.....15- 1  
 Introducing Toll Restriction .....11-1  
 IST Distinctive Ringing .....6-10  
 IST DTMF Receiver Time-out ..... 5-24  
 IST Flash Time.. ..... 5-25  
 IST Flash ..... 6-2 1  
 IST Hold Confirmation ..... 7-18  
 IST Ring Frequency ..... 5-28  
 IST Ring Time-out ..... 5-24  
 IST Ringing Patterns (Ring Mode) ..... 5-28  
 IST Ringing Per Phase ..... 5-28

## L

LCD Contrast ..... 7-9  
 LCD Display.. ..... 6-24  
 LCD Messages ..... 5-8  
 LCD Messaging.. ..... 6-10  
 Line Boards, Installing ..... 3-9  
 Line Boards ..... 1-1 1  
 Line Default.. ..... 5-5  
 Line Disable ..... 8-4  
 Line Disconnect Automatic Camp-On ..... 5-30  
 Line Group Access ..... 6-19  
 Line Group Programming ..... 8-12  
 Line Group Queue ..... 6-2 0  
 Line Groups for ARS ..... 12-2  
 Line Name ..... 8-2  
 Line Originate ..... 6-18  
 Line Tone Time ..... 6-19  
 Line Type.. ..... 8-2  
 Line-To-Line Connect Duration ..... 6-20  
 Line-To-Line Transfer  
 (Unsupervised Conference)..... 6-20  
 Lines For PC Attendant, Assigning ..... 15-13  
 Lines, DID ..... 8-3  
 Lines, E and M Tie ..... 8-2  
 Lines, Ground Start ..... 8-2  
 Lines, Loop Start ..... 8-2  
 Local Call Table (for Caller ID)..... 15-3  
 Loop start line board..... 1-12  
 Loop Start Lines ..... 8-2

## M

Main Cabinet, Mounting The ..... 3-2  
 Main Cabinet ..... 3-2  
 Main CPU DTMF Receiver Test ..... 14-3  
 Main Menu, Accessing The ..... 4-7  
 Main Menu, Understanding The ..... 4-8

Major Alarm Alerting..... 5-28  
 Major Alarm Reporting ..... 5-38  
 Major Alarm Ring, Clearing ..... 6-22  
 Making Caller ID Active..... 15-3  
 Making Tracker Paging System Assignments , 15-5  
 Mandatory DXP Boards ..... 1-6  
 Mapping PC Attendant Position  
 Function Keys ..... 15-1 3  
 Maximum Call Duration Time.. ..... 5-22  
 Maximum Call Duration Time ..... 6-19  
 Maximum Call Duration.. ..... 6-19  
 Maximum Line-To-Line Connect Duration .... 5-23  
 MDF Diagram..... 2-5  
 Meet Me Answer Page ..... 6-11  
 Menus, Using The ..... 4-6  
 Message Deposit (Response Messaging) ..... 6-11  
 Message Wait Originate (Message Waiting) .... 6-11  
 Messages, DVA ..... 15-11  
 Messages, LCD ..... 5-8  
 Messaging, LCD ..... 6-10  
 Modem Setup.. ..... 15-19  
 Modem Setup.. ..... 5-14  
 Modem, connecting A ..... 3-14  
 Modem, Using A ..... 4-5  
 Modify Digit Table.. ..... 12-5  
 Modifying Intercom Numbers..... 9-2  
 Monitoring, Station ..... 6-17  
 Mounting The Expansion Cabinet ..... 3-3  
 Mounting The Main Cabinet ..... 3-2  
 Multipurpose line board ..... 1-12  
 Music Or Tone On Hold ..... 8-4  
 Music Or Tone On Hold ..... 6-12  
 Music Source, connecting A ..... 3-15  
 Music, Background ..... 6-3

## N

Name, Line ..... 8-2  
 Name, Station ..... 7-2  
 Night Ring (Night Transfer • Of Ringing) ..... 7-8  
 Non Volatile R A M test.. ..... 14-2

## O

Onboard Software Upgrade.. ..... 5-6  
 Operator Station.. ..... 5-29  
 Ordering The Right Equipment..... 2-2  
 Out Dial Delay Time ..... 5-24  
 Overflow, Alternate ..... 7-16



**P**

Pad Level-Transmit, Receive .....	8-6
Page Recall .....	5-20
Paging Access .....	5-21
Paging Device .....	3-13
Paging Device, Connecting A .....	3-13
Paging Equipment Control, Relays .....	5-33
Paging Receive .....	6-12
Paging Transmit .....	6-13
Paging Zones .....	5-32
Password, Changing .....	5-34
Pause Time .....	5-22
PC Attendant line Connection .....	3-16
PC Attendant Position Programming.. .....	15-12
PC Attendant Position Text Messaging Buttons	15-13
PC Attendant Position, Enabling .....	15-12
PC Attendant Wire Rotation .....	3-16
PC Attendant, Connecting .....	3-16
Periodic Line Tone Time .....	6-19
Periodic Line Tone.. .....	6-19
Periodic Tone Time.. .....	5-22
Personal Intercom Number .....	7-2
Personalized Ringing Tone .....	7-9
Pick-Up Groups .....	7-11
Planning A n Installation .....	2-1
Planning The Dedicated Equipment Room.. .....	2-3
Positive Disconnect Time .....	8-8
Power Supply, Expansion Cabinet .....	3-5
Power Supply, Installing .....	3-4
Power Supply .....	3-4
Pre-power jack, Using .....	3-7
Pre-power jack .....	3-7
Preparing An MDF Diagram .....	2-5
Prime Intercom Number .....	7-4
Prime Line .....	7-4
Prime Line Group.. .....	7-4
Prime Line Programming .....	7-4
Prime Line Type.. .....	7-4
Print Parameter.....	10-2
Printer Port, SMDA/SMDR .....	10-4
Printer, connecting A .....	3-17
Privacy Release .....	8-5
Programming A Hunt List For PC Attendant Use .....	15-12
Programming DISA Authorization Codes .....	8-19
Programming Intercoms For DVA Messages .....	15-10
Programming Port (Database Programming Station) .....	7-15
Programming The T1 Parameters .....	5-38
Programming Tracker Paging System Options .....	15-4
Programming, Copy Model .....	7-22
Programming, Introducing .....	4-1
Publications, Using Other .....	4-2
Pulse Dial Interdigit Time .....	5-25

Pulse Dial Interdigit Time .....	8-7
Pulse Dial Make/Pulse .....	
Dial Break (Pulse Dial Ratio) .....	5-25
Pulse Dial Ratio .....	8-7

**Q**

Queue, Line Group .....	6-20
Quick Transfer .....	6-24

**R**

R A M Card.. .....	1-8
R A M Test.. .....	14-2
Recall Call Forward .....	6-5
Recall/Flash .....	5-22
Record Format , SMDR .....	10-2
Recording The DVA Messages.. .....	15-11
Relays External Paging Equipment Control .....	5-33
Relays Line Answer From Any Station.. .....	5-33
Relocation Response .....	5-31
Remote COS Programming .....	8-19
Remote Station Disable.. .....	6-16
Removing Intercom Numbers .....	9-3
Report Option.. .....	10-4
Restrict ARS Hookflash .....	6-23
Restricted Numbers.. .....	11-3
Restriction Levels.. .....	11-2
Right Equipment .....	2-2
Right Tools .....	2-4
Ring Back On Busy.....	7-19
Ring Back Tone.. .....	5-31
Ring Generator, Installing The .....	3-15
Ring-no-answer Rings.. .....	7-9
Ringing Assignments .....	7-7
Ringing On Busy (Enhanced Subdued Ringing).. .....	7-12
Ringing Options, Voice Mail .....	15-16
Ringing Preference (Ringing Line Preference) ...	6-13
Ringing Tone, Personalized .....	7-9
Ringing, IST .....	6-10
RNA Record, Deleting (for Caller ID) .....	15-2
ROM Checksum Verification .....	14-2
Route Access Level .....	12-5
Route Table Warning Tone.....	12-4
Route Tables (ARS) .....	12-3
Routes .....	12-4

## S

Save/Restore Database .....	5-10
Scratch RAM Test .....	14-2
Serial Ports .....	5-12
Service Observing .....	7-10
Services Board .....	1-7
Services Board .....	3-8
Setting Absorb Ring Time (for Caller ID) .....	15-2
Setting Caller ID Baud Rate .....	15-3
Setting The System Defaults .....	5-4
Single Line Proprietary Telephone	
TAP Button .....	7-12
SMDA Attendant Delete .....	10-4
SMDA/SMDR Parameters .....	10-2
SMDA/SMDR Printer Port .....	10-4
SMDR Print Parameter .....	10-2
SMDR Record Format .....	10-2
SMDR Record .....	10-4
SMDR .....	8-5
Software Upgrade .....	5-6
SOHVA Beeps (SOHVA Tone Bursts)	
SOHVA Groups .....	7-11
SOHVA Groups .....	5-15
SOHVA Table Programming .....	5-15
SOHVA, Busy on .....	7-11
Speaker Coefficients .....	14-4
Speed Dial Groups .....	5-17
Speed Dial Programming .....	5-17
Speed Dial Sets .....	5-17
Speed Dial Sets .....	7-3
Station Boards .....	1-9
Station Boards .....	3-8
Station Default .....	5-4
Station Disable .....	7-14
Station Disable .....	6-16
Station Monitoring .....	6-17
Station Name .....	7-2
Station Ports For Voice Mail Use .....	15-14
Station Relocation .....	5-30
Station Transfer Recall .....	5-22
Station Wiring .....	3-11
Stations, Connecting The .....	3-11
Surge Protection .....	3-10
Synchronization Card .....	1-15
Synchronized Ringing .....	5-26
System Default .....	5-4
System Manager Password .....	5-35
System Parameters .....	5-26
System Printouts .....	13-1
System Programming, Introducing .....	5-1
System Speed Dial Groups .....	5-17
System Speed Dial Groups .....	6-16
System Speed Dial .....	5-17
System Status Log, Clearing .....	5-6

System Status Reporting .....	5-27
System Timing .....	5-20

## T

T1 Parameters, programming .....	5-38
T1 Status Reporting .....	5-27
Tables Default .....	5-5
TAP Button, SLPS .....	7-12
Telephone Types (Phone Types) .....	7-21
Terminal Setup .....	5-7
Testing The Stations .....	2-8
Testing The Stations .....	3-12
The DXP's modular design .....	1-3
Through Dialing (Thru-Dialing) .....	7-12
TI board .....	1-13
Time and Date (System Clock) .....	5-19
Time Switch Memory Test .....	14-3
Timing, System .....	5-20
Toll ARS Dialing Pause .....	5-27
Toll Groups .....	11-3
Toll Groups .....	8-9
Toll Restriction .....	11-1
Tone Or Voice Signaling (Tone First) .....	7-5
Tracker Paging System Assignments .....	15-5
Tracker Paging System Options .....	15-4
Tracker Paging System Programming .....	15-4
Transfer Ring Cadence .....	7-18
Transfer, Automatic Attendant .....	5-26
Transfer, Line-to-Line .....	6-20
Transfer, Quick .....	6-24
Transfer-To-Voice Mail Button .....	15-15
Translation Tables, DID/DNIS .....	8-17
Transmit, Receive .....	8-6

## U

Understanding The Main Menu .....	4-8
Unsupervised Conference .....	6-20
Using A Modem .....	4-5
Using Other publications .....	4-2
Using The Auxiliary Board	
and Add-On Cards .....	1-14
Using The Conference Board .....	1-16
Using The DXP Menus .....	4-6
Using The Pre-power jack .....	3-7
Using The Right Tools .....	2-4

**V**

Voice Announce Block ..... 6-20  
Voice Mail DTMF Tone..... 5-25  
Voice Mail ID ..... 8-11  
Voice Mail Identification (ID) Number..... 15-16  
Voice Mail Integration Digits ..... 15-17  
Voice Mail Programming ..... 15-14  
Voice Mail Ringing Options ..... 15-16  
Voice Mail Transfer On Busy.. ..... 7-15  
Volume Off, Allow Ringer Off ..... 7-13  
Volume On Impact Telephones ..... 6-23

**W**

Warning Tone, ARS Route Table .....124  
Wiring The Stations .....140

**Z**

Zone Programming, .....532