



EC500 Extension to Cellular
Release 2
Installation and Administration Guide

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- System administration documents
- Security documents
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- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

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- A busy tone is received
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EMC Directive 89/336/EEC
Low-Voltage Directive 73/23/EEC

Acknowledgment

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Contents

Copyright and Legal Notices

About This Document

- Purpose xi
 - Intended Audiences xi
 - Reason for Reissue xi
 - How to Use This Document xi
 - Conventions Used xii
 - Symbolic Conventions xii
 - Typographic Conventions xii
 - Related Documentation/Training xii
-

Chapter 1: Overview of EC500 Extension to Cellular

- Introduction 1-1
 - Customer Configurations 1-1
 - Platforms 1-2
 - Hardware 1-2
 - System Administration Terminal 1-2
- Feature Description 1-2
 - Enabling and Disabling EC500 1-3
 - Call Waiting, Call Identification, and Voice Mail 1-3
- Feature Implementation 1-4
- Capacity Limitations 1-6
- Security Considerations 1-8
- Feature Operation 1-8
 - Enabling/Disabling EC500 1-8
 - Receiving Calls 1-9
- Feature Interactions 1-10
 - Cellular Service Provider Voice Mail 1-10
 - Feature Access Codes 1-10
 - Message Waiting Indication 1-10
 - “Notify Me” under Unified Messenger® for MS Exchange® 1-11

Contents

Chapter 2: Installation and Planning

- Installation 2-1
 - Configuration/Environment Requirements 2-1
 - Installation of Loop-Back ISDN-PRI DS1 Packs 2-2
 - Amphenol Connectors 2-2
 - D8W Connectors 2-2
 - Installation of IP Loop-Back Cards 2-3
 - Setting Customer Options 2-3
- Administration Planning 2-5
 - Planning Requirements 2-5
 - Dial Plan for XMOBILE Stations 2-5
 - Security Codes 2-6
 - Enabling and Disabling 2-6

Chapter 3: Administration

- Introduction 3-1
- Setting the Customer Options for EC500 3-2
- X-Mobility Outbound and Inbound Trunk Administration 3-3
 - ISDN-PRI Trunk Administration 3-3
 - Outbound ISDN-PRI Trunk Administration 3-4
 - Inbound ISDN-PRI Trunk Administration 3-10
 - H.323 IP Trunk Administration 3-17
 - Outbound H.323 Trunk Administration 3-20
 - Inbound H.323 Trunk Administration 3-24
- Creating a Change Feature Access Code for Station Security Codes 3-29
- XMOBILE Station Administration 3-30
- Sending 10-digit Caller Identification for Locally Originated Calls 3-34
- Setting Up the Avaya EC500 Access Number 3-35
- Setting Up Avaya EC500 Enable/Disable Feature Access Codes 3-36
- Voice Mail Administration 3-37
 - Using Corporate Voice Mail to Receive Messages 3-37
 - Preventing Messages from Automatically Going to Cellular Voice Mail 3-38
 - “Notify Me” under Unified Messenger® for MS Exchange® 3-38

Contents

Chapter 4: Installation and Administration Test

- Introduction 4-1
- Test Procedures 4-1

Chapter 5: Maintenance

- Introduction 5-1
- XMOBILE Station Maintenance (Busy Out and Release) 5-1
- Command Descriptions 5-2
- Display Errors/Alarms 5-3
- System Restarts 5-3

Chapter 6: Troubleshooting

- Introduction 6-1
- Error Conditions 6-1
 - Users Cannot Receive EC500 Calls on Their Cell Phones 6-1
- Terminal Error Codes 6-6

Appendix A: Avaya EC500 - Other Configurations

- Enabling/Disabling Individual EC500 Bridged Extensions A-6

Appendix B: R1 and R2 Interoperability

Glossary

Contents

Index

About This Document

Purpose

This guide describes the installation, administration, maintenance, and troubleshooting tasks necessary to install and set up Release 2 of Avaya EC500 Extension to Cellular (EC500).

Intended Audiences

Audiences for this guide include System Administrators, Software Specialists, and Avaya technical personnel.

Reason for Reissue

This guide has been reissued to provide information for Release 2 of the EC500 solution of the Avaya Communications Server.

How to Use This Document

The document is organized as follows:

Chapter 1, Overview of EC500 - Provides an overview of features, capacity considerations, hardware/software requirements and security.

Chapter 2, Installation and Planning - Provides information on installation of ISDN and IP loop back trunks needed for EC500, as well as planning tasks to be performed before EC500 XMOBILE station extensions are administered.

Chapter 3, Administration - Provides detailed instructions on administering loop back trunks and XMOBILE stations for EC500 implementation.

Chapter 4, Installation and Administration Test - Provides basic test procedures for the EC500 installation.

Chapter 5, Maintenance - Provides details on the busy out and release capabilities for XMOBILE stations.

Chapter 6, Troubleshooting - Provides errors conditions, causes, and resolutions that may occur with EC500 operation.


Appendix A, Avaya EC500 - Other Configurations - Provides details on EC500 Stand-Alone and Multiple Bridge Mode configurations.

Appendix B, R1 and R2 Interoperability - Provides an overview of Release 1 and Release 2 and their compatibility.

Conventions Used

This guide uses the following textual, symbolic, and typographic conventions to help you interpret information.

Symbolic Conventions

 **NOTE:** This symbol precedes additional information about a topic. This information is not required to run your system.

Typographic Conventions

This guide uses the following typographic conventions:

command	Words printed in this type are commands that you enter into your system.
device	Words printed in this type indicate parameters associated with a command for which you must substitute the appropriate value. For example, when entering the mount command, device must be replaced with the name of the drive that contains the installation disk.
File, OK	Words in bold refer to items on menus and screens that you select to perform a task.
<i>italics</i>	Italic type indicates a document that contains additional information about a topic.
Enter	Words in bold represent a single key that should be pressed. These include Ctrl , Enter , Esc , Insert , and Delete .

Related Documentation/Training

Related documentation:

Avaya EC500 Extension to Cellular Release 2 User Guide, Issue 1, July 2001
(210-100-700)

Avaya EC500 Extension to Cellular Installation/Administration Guide, Issue 1,
February 8, 2001(210-100-500)

Unified Messenger® Telephone User Interface Online Guide, accessed via
<http://support.avaya.com>

*DEFINITY® Enterprise Communications Server Release 9 Administration for
Network Connectivity Guide* (555-233-504)

DEFINITY Documentation Release 9 or greater, provided with the DEFINITY
product

Online documentation for EC500 and Unified Messenger is provided at the
following URLs:

<http://support.avaya.com>

<http://support.avaya.com/wireless>

http://associate2.avaya.com/sales_market/wireless/EC500page.htm

Chapter 1: Overview of EC500 Extension to Cellular

1

Introduction

EC500 offers your users the freedom to work anywhere, anytime, using any type of cellular or wireless phone. With EC500, calls to an office number are extended to a cell phone, allowing users to receive work-related calls wherever they are and whenever they need to. The cell phone user receives the same features and capabilities for incoming calls as a Caller ID enabled analog telephone connected directly to the Avaya Communications Server (G3V9.5+). EC500 provides this capability regardless of the cell phone's Cellular Service Provider or the cellular standard in use.

This guide describes the high-level functions of EC500, hardware and software requirements for implementation, and the installation, administration, and maintenance tasks necessary to set up and maintain Release 2 of EC500 Extension to Cellular.

Customer Configurations

EC500 provides the ability to operate a cell phone as a standard, Caller ID enabled telephone connected directly to the Avaya Communications Server. The most commonly implemented configuration is Dual Bridge Mode. This configuration provides two call appearances to bridge a cell phone with Call Waiting to an office number. A variation on this implementation would be to bridge only one call appearance on the cell phone to the office number.

In cases where a user does not require a physical office number, the cell phone can be bridged to an Administration Without Hardware (AWOH) extension on the Avaya Communications Server. This configuration gives the user an enterprise presence for incoming business calls via the cell phone.

This guide focuses on the Dual Bridge Mode. Other customer configurations - Multiple Bridge Mode, Single Bridge Mode, and Standalone Mode are discussed in Appendix A.

Platforms

Release 2 of EC500 is available in Avaya Communications Server switch software release 9.5 running on all Avaya Communication Server platforms, such as DEFINITY, ProLogix, BCS, GuestWorks®, DEFINITY One™, and ECLIPS. Any capacity differences are due to differences in the numbers of stations, trunks, and circuit packs supported on the different Avaya Communications Server platforms.

Hardware

For proper operation of EC500, cell phones must be digital and not analog phones.

EC500 calls are possible over any kind of ISDN trunk including PRI trunks, H.323 IP trunks, and ATM-CES (ISDN) emulation. To implement EC500 using ISDN-PRI trunks, a pair of UDS1 (TN464F/GP or TN2464GB) cards is required. The UDS1 cards must be physically configured for 32 channels (via a dipswitch). The trunks must be cabled in a loop back arrangement (transmit leads connected to receive leads). These trunks are dedicated to EC500 and cannot be used for any other purpose.

It is recommended that EC500 be implemented using H.323 IP trunks only if H.323 IP trunks or end points are already being used on the Avaya Communications server. The IP boards (TN2302AP and TN799B) used for loop back trunking can be part of a pool of IP boards used for other purposes. Setup of the loop back arrangements for the IP boards is accomplished through settings in the System Administration Terminal (see [Chapter 3: Administration](#)).

System Administration Terminal

The screens in this guide may not match the version that exists on the system administration terminal for your Avaya Communications Server. However, all fields described here as essential for EC500 setup and administration can be found on all versions of the terminals, regardless of any variation in field layouts. In the screens shown here, the essential fields are indicated in bold-face underlined type.

Feature Description

EC500 allows a cell phone in an external network to be treated as if it were an extension on the Avaya Communications Server. This is accomplished by administering the cell phone as an XMOBILE bridge of the office number.

The bridged extension is used only to route calls **to** a remote phone. When using your cell phone to place a call, there is no interaction with EC500, even when EC500 is enabled. Your cell phone performs exactly as it did prior to enabling it for EC500.

Enabling and Disabling EC500

The extensions for the cell phone can be disabled and enabled by the user at any time from any telephone with Touch Tone® capability. Security codes are set up for this feature to protect the phone from unwanted tampering.

The EC500 enabling/disabling feature can be invoked at:

- The office number associated with the cell phone.
- Any other station on the switch.
- Any phone (cell phone or otherwise) in the external network, through the trunk interface to the switch via an EC500 Access Number (Telecommuting Access Number on the System Administration Terminal).

Call Waiting, Call Identification, and Voice Mail

EC500 allows use of standard cellular features such as incoming call waiting and caller identification.

- If the cell phone (and network) supports calling number identification, the Avaya Communications Server delivers the calling number to it. For internally originated calls, the calling number may be presented in either the national numbering plan format (i.e. 10 digits) or as a less than 10 digit extension, depending upon how it is administered. Some cellular phone networks only pass calling number information in the national format while others are more flexible.
- If the cell phone (and network) supports call waiting, EC500 can be administered to deliver a second call to the cell phone while it is busy on another call. The cell phone features (i.e. swapping calls, conferencing the calls) may then be used to answer the second call and manipulate the two calls at the cell phone.

Since the cell phone is treated as local extension on the Avaya Communications Server, it can be completely integrated with the Corporate voice mail system while retaining its own Cellular Service Provider voice mail. The office number retains the primary extension on the Avaya Communications Server. Calls to the office number simultaneously ring the office number and the cell phone. If neither answer then standard coverage arrangements take effect. As needed, EC500 can be disabled when not in use in order to ensure the use of the Corporate voice mail.

The System Administrator can control in-service and out-of-service status of the bridged extensions through a busy out and release maintenance capability added in Release 2 of EC500.

Feature Implementation

EC500 builds on an Avaya Communications Server feature called X-Mobility that allows extensions to be remoted over an ISDN trunk. Unlike traditional off-premise extensions, the stations are not tied to fixed channels on the T1/E1 interface. Instead, channels are allocated dynamically with each new call, allowing significantly more efficient usage of the T1/E1 interfaces via traffic engineering. In most respects, these stations, administered with a station type of XMOBILE, behave like regular analog (POTS) telephones. In particular, they can be bridged to office numbers.

Routing for the EC500 extensions takes the following path:

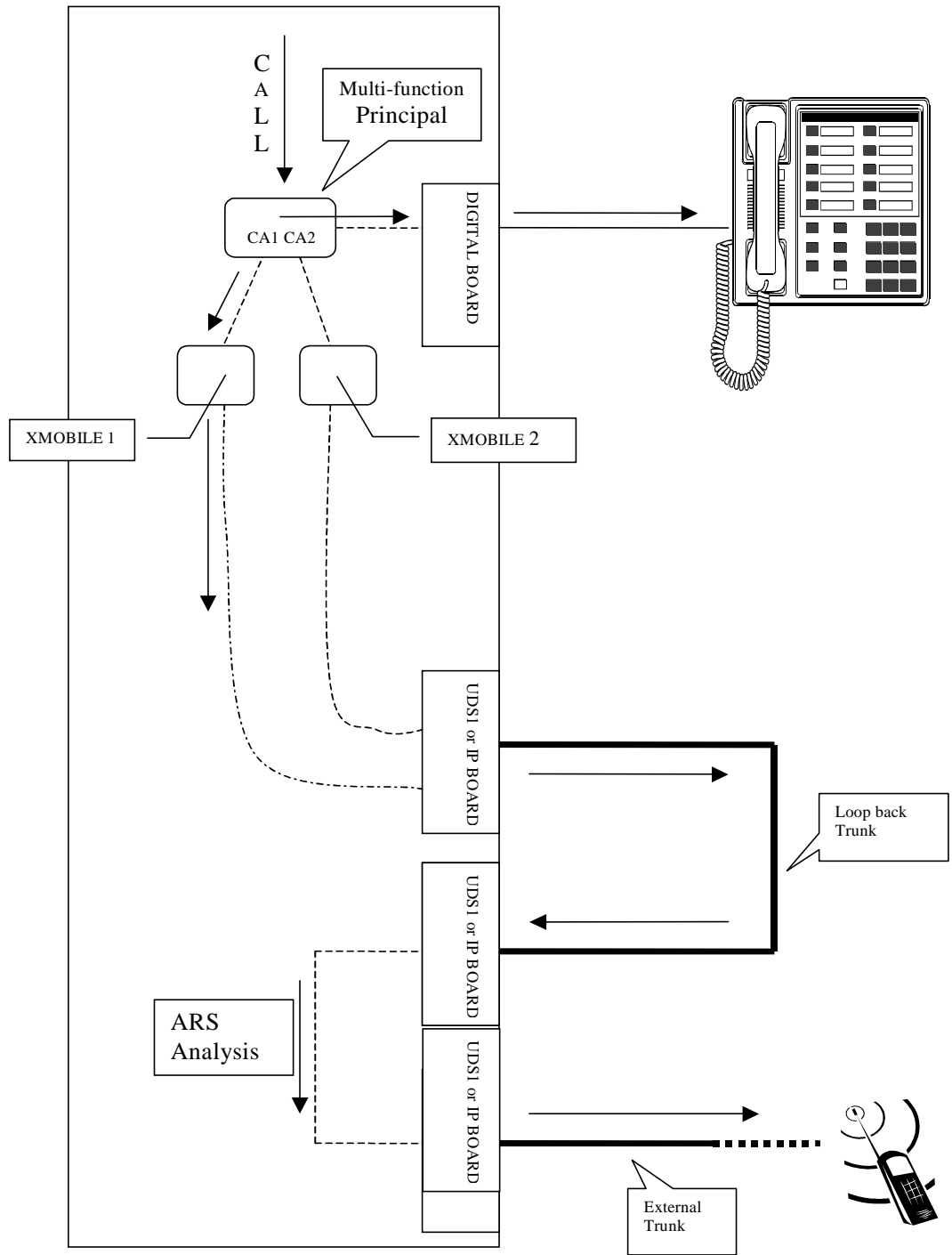
1. An XMOBILE type of station has no fixed port assignment. Instead, it is associated with an ISDN-PRI (or H.323 IP) trunk group. Any time someone calls an XMOBILE station either directly or because he calls the principal office number that the XMOBILE station is bridged to, a call goes out over an associated ISDN (or H.323 IP) trunk. In Release 2, the Avaya Communications Server maps the XMOBILE extension to the user's cell phone number so that the call goes out to the cell phone.
2. The outbound call must be brought back into the Avaya Communications Server in order to send it out to the external network. To do this using ISDN-PRI trunk groups, two DS1 boards are cabled back-to-back to loop the call back into the Avaya Communications Server. It is not possible to loop back on a single DS1. To do this using H.323 IP trunks, IP boards handle the loop back arrangement. The loop back trunks connect only to the Avaya Communications Server and are dedicated to EC500 traffic.
3. The incoming looped back call is processed with ARS Analysis and the call is finally routed out of the Avaya Communications Server to the cell phone through another DS1 board. This board is part of the existing set of customer DS1 boards used for external ISDN trunk traffic.

IP boards (TN2302AP and TN799B) are to be used to satisfy the loop back arrangement for H.323 IP trunks. In a switch that already uses H.323 IP trunks there are a number of advantages in using H.323 IP trunks for the EC500 loop back.

1. A single IP board can handle 64 calls.
2. The loop back connection can be done internally within a single board (32 calls in and 32 calls out).
3. The IP boards used for loop back trunking may be part of a pool of IP boards used for other purposes.

Figure 1-1, on the following page, illustrates EC500 call routing.

Figure 1-1. EC500 Loopback over DS1 Boards



Capacity Limitations

In Release 2 of EC500, the maximum number of XMOBILE stations that can be administered on a switch is based on the station maximum on the switch. The number of cell phones in EC500 is limited to 30% of the station maximum, assuming Dual Bridge Mode, and depending upon the user configuration of your implementation. Maximum cell phones are 8300 for G3R, 800 for SI, and 300 for all other configurations. In addition, there is a practical limit based upon the number of trunks available to service XMOBILE calls.

Traffic engineering is needed to ensure that there are enough trunks available to handle the traffic sent to the cell phones. This applies to both external trunks and the special loop back trunks.

Use the following table as a guide for engineering the number of DS1 board pairs needed for loop back trunks. The cells in the table show the number of users supported by a pair of DS1 boards.

Table 1-1. Traffic Engineering PRI Loop Back Trunks

Time spent on cellular calls----->	3 min/busy hour	5 min/busy hour	10 min/busy hour	20 min/busy hour
Answer at cell phone				
10% of time	2000	1500	923	521
20% of time	1385	947	529	281
30% of time	1059	692	371	192
40% of time	857	545	285	146
50% of time	720	450	232	118
60% of time	621	383	195	99
70% of time	545	333	169	85
80% of time	486	295	148	74
90% of time	439	264	132	66
100% of time	400	240	120	60

Note the following when using this table:

- 30 trunks (1 DS1 Board's worth) can support 20 Erlangs of traffic with a blocking factor of 1 in 100.
- All of the above calculations were produced by dividing 20 by the fraction of time that a cell phone is on a call in a busy hour.
- Calls that are not answered at a cell phone tie up a trunk for 20 seconds in these calculations.
- Two phone calls may be present at a cell phone simultaneously (via call waiting). For performing traffic calculations, the time spent on both calls is added together to determine the total time spent on cell phone calls.
- The external traffic created by EC500 must be added to other outbound ISDN traffic to compute the total number of external ISDN trunks required. Since this traffic varies widely from customer to customer, no table is provided for external trunk calculations.

Table 1-1 also can be used as a guide for engineering the use of H.323 IP trunks, with the following considerations:

- The numbers shown apply to one IP board used in a loop back configuration.
- These numbers actually understate the capacity slightly since the H.323 IP trunk can loop 32 calls per board and the table reflects a limit of 30.

Security Considerations

The EC500 feature does not degrade security on the Avaya Communications Server. There is no capability for the malicious user to change the destination (cell phone number) that XMOBILE calls are sent to.

EC500 makes use of station security codes to ensure that the user has control over who is enabling and disabling his extensions.

In addition, the XMOBILE station busy out and release capability allows an Administrator to temporarily take extensions offline as necessary due to lost or stolen cell phones. For a more permanent solution, remove the mapping and bridging administration associated with the XMOBILE station.

While using an EC500 cell phone on a business call the user may hear a beep tone indicating someone has picked up the office number and is listening in on the call. Avaya provides that beep tone for security purposes. If a user suspects unauthorized use of the office number or an enabled EC500 cell phone, the call should be ended immediately and the user's Station Security Code(s) should be changed immediately. See [Chapter 5: Maintenance](#), and [Chapter 6: Troubleshooting](#), for more information on handling this situation

If additional security is required, administer one of Avaya's exclusion features.

Feature Operation

When EC500 is administered, the cell phone is initially in a disabled state. Users need to enable their cell phones before they can begin to use the EC500 solution.

Enabling/Disabling EC500

Enabling and disabling EC500 is accomplished using EC500 Enable and Disable Feature Access Codes. These need to be set through the System Administration Terminal and then communicated to the users. See [Chapter 3: Administration](#) for procedures to set up these Feature Access Codes). Using these codes, the user can disable or enable all XMOBILE stations associated with his or her office number.

EC500 Enable and Disable Feature Access Codes are used in the following way:

- A user wishes to enable or disable all EC500 XMOBILE stations **using his or her office number**. The user enters the following in sequence:
 1. The EC500 Enable Feature Access Code or Disable Feature Access Code.
 2. # to bypass entering the office number.
 3. The office number Station Security Code.

4. A final #.

The user receives either a confirmation or an intercept tone depending upon the success or failure of the procedure.

- A user wishes to enable or disable all EC500 XMOBILE stations **using an internal extension that is not his or her office number**. The user enters the following in sequence:

1. The EC500 Enable Feature Access Code or Disable Feature Access Code.
2. The extension number of his or her office number followed by #.
3. The office number Station Security Code.
4. A final #.

The user receives either a confirmation or an intercept tone depending upon the success or failure of the procedure.

- A user wishes to enable or disable all EC500 XMOBILE stations **from any phone in the external network**. Whether it's the user's cell phone or another phone does not make a difference in this procedure. The user enters the following in sequence:

1. The Avaya EC500 Access Number (Telecommuting Access Number). The user should receive a dial tone.
2. The EC500 Enable Feature Access Code or Disable Feature Access Code.
3. The extension number of his or her office number followed by #.
4. The office number Station Security Code.
5. A final #.

The user receives either a confirmation or an intercept tone depending upon the success or failure of the procedure.

These procedures enable or disable all EC500 XMOBILE stations at the same time. If you want your users to have the ability to individually enable and disable each bridged extension, see [Appendix A: Avaya EC500 - Other Configurations](#).

Receiving Calls

EC500 is a solution for delivering office calls to a cell phone and not for originating calls from the cell phone through the Avaya Communications Server.

With EC500, when a call is made to an office number with a mapped XMOBILE bridge, the call is extended out of the Avaya Communications Server to alert a cell phone. If the Avaya Communications Server is administered to send calling number information, then it is presented to the cell phone. When the cell phone answers the call, the Avaya Communications Server treats it like a local answer of a physically connected station, and the following is true:

- Status station of the XMOBILE station shows it off-hook. It shows both the port used on the outbound loop back trunk group and the other connected port.
- Any office number busy indicators tracking the XMOBILE station light up to show that it is busy.
- Any other station linked to the call as part of a bridge or temporary bridge is able to bridge on to that call.

Feature Interactions

Generally, an XMOBILE station may be administered (and used) like an analog station. The following are exceptions:

Cellular Service Provider Voice Mail

While XMOBILE stations may have standard Avaya Communications Server voice mail coverage (i.e. AUDIX®), cell phones usually have voice mail coverage from the Service Provider. Although there is no way to indicate a preference for use of a specific system, there is a way to coordinate the two systems.

It is generally possible to set up the number of don't answer rings so that one or the other always answer first. However, there are coverage options in both the Avaya Communications Server (busy, active, send-all-calls) and the network (cell phone unavailable, network congested) that causes a call to immediately go to the respective voice mail. Users should realize that an unanswered call might result in a voice mail message in either mailbox.

Distinctive Alerting

Cell phones do not receive distinct rings for different types of calls.

Feature Access Codes

The cell phone can activate Avaya Communications Server features accessible via the Avaya EC500 Access Number (Avaya Communications Server Telecommuting Access number).

Message Waiting Indication

The cell phones cannot receive any form of message waiting indication directly from the Avaya Communications Server.

“Notify Me” under Unified Messenger® for MS Exchange®

If the user has access to the “Notify Me” feature of Unified Messenger for Microsoft Exchange (Version 4.0 or later), he or she is notified of messages in the Corporate voice mailbox via your cell phone’s display. For more information on using this feature see “Setting Notify Me” in the *Unified Messenger Telephone User Interface Online Guide*, accessed via:

<http://support.avaya.com>

 **NOTE:**

The user’s cell phone must support text messaging to use this feature.

Chapter 2: Installation and Planning

2

Installation

This section describes installation and settings that must be in place before you can administer the EC500 bridges.

Configuration/Environment Requirements

Software and Platforms

Release 2 of EC500 is available in Avaya Communications Server switch software release 9.5 running on all Avaya Communication Server models, such as DEFINITY, ProLogix, BCS, GuestWorks, DEFINITY One, and ECLIPS. Any capacity differences are due to differences in the numbers of stations, trunks, and circuit packs supported on the different Avaya Communications Server platforms.

Hardware

For proper operation of EC500, cell phones must be digital and not analog phones.

EC500 calls are possible over any kind of ISDN trunk including PRI trunks, H.323 IP trunks, and ATM-CES (ISDN) emulation. To implement EC500 using ISDN-PRI trunks, a pair of UDS1 (TN464F/GP or TN2464GB) cards is required. The UDS1 cards must be physically configured for 32 channels (via a dipswitch). The trunks must be cabled in a loop back arrangement (transmit leads connected to receive leads). These trunks are dedicated to EC500 and cannot be used for any other purpose. Instructions for setting up the loop back cables are provided in the next section.

It is recommended that EC500 be implemented using H.323 IP trunks only if H.323 IP trunks or end points are already being used on the Avaya Communications server. The IP boards (TN2302AP and TN799B) used for loop back trunking can be part of a pool of IP boards used for other purposes. Setup of the loop back arrangements for the IP boards is accomplished through settings in the System Administration Terminal (see [Chapter 3: Administration](#)).

Installation of Loop-Back ISDN-PRI DS1 Packs

The following describes the process for installing the basic requirement for EC500 - two UDS1 cards cabled for loop back connectivity. For evaluating how many pairs of these cards you need, see the section [Capacity Limitations](#) in Chapter 1.

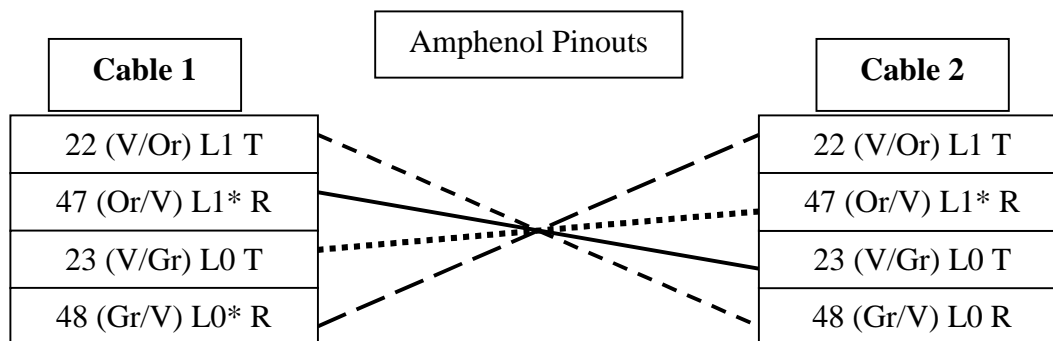
There are two types of connectors that can be used, Amphenol and D8W.

Amphenol Connectors

If you are using Amphenol use the following procedure:

1. Physically configure two UDS1 cards for 32 channels (via a dip switch), and then cable them in a loop back arrangement (transmit leads connected to receive leads via cross connect).
2. Route each of the DS1s to the wall field via standard Amphenol cables (PEC 63190).
3. At the wall field, cross connect the 22nd pair (V/Or-Or/V) of Cable 1 to the 23rd pair (V/Gr-Gr/V) of Cable 2.
4. Cross connect the 23rd (V/Gr-Gr/V) pair of Cable 1 to the 22nd pair (V/Or-Or/V) of Cable 2.

Figure 2-1. EC500 Cross Connect Cable (Amphenol)



NOTE:

If a loop back cable needs to be made, use standard Amphenol 25 pair male connectors with a cable length of approximately 6 feet and make the connections as the drawing indicates.

D8W Connectors

If you are using D8W connector, you need the following hardware:

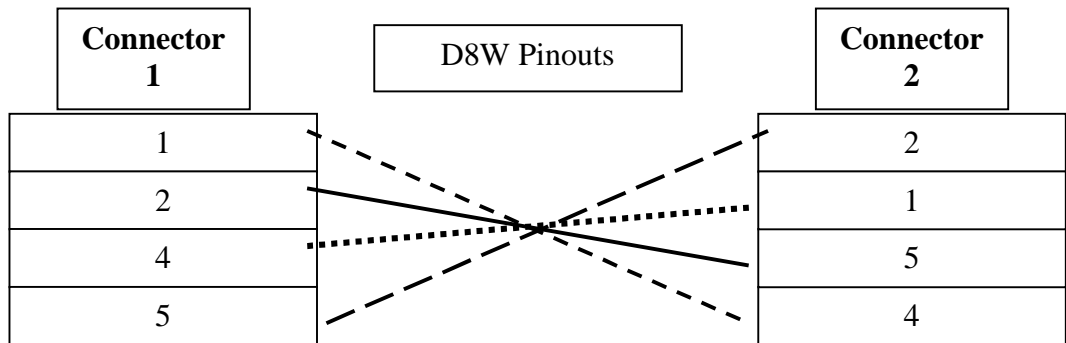
- D8W cable with RJ45 connectors.
- RJ-45 connector.

- two 356A 50 pin to RJ-45 (8 connection) adapters.

For setting up the loop back trunks using D8W connector, use the following procedure:

1. Reconnect the wires with a new connector such that the wires are in the following positions:
 - Wire 1 becomes Wire 4.
 - Wire 4 becomes Wire 1.
 - Wire 2 becomes Wire 5.
 - Wire 5 becomes Wire 2.
 - Wires 3, 6, 7, 8 can be connected at the same position since they are not used.
2. Connect the cable in slot 8 of both adapters.
3. Connect the 356A adapters to the back of the switch to the connectors corresponding to the DS1 boards.

Figure 2-2. EC500 Cross Connect Cable (D8W)



Installation of IP Loop Back Cards

Setup of the loop back arrangements for the IP boards is accomplished through settings in the System Administration Terminal (see Chapter 3, "Administration"). You will need the slot numbers for the cards for these administration tasks.

To evaluate how many H.323 IP trunks you need to handle EC500, see the section [Capacity Limitations](#) in Chapter 1.

Setting Customer Options

Avaya technical support must enter certain settings in the System-Parameters Customer-Options screen on the System Administration Terminal before you can administer EC500.

The fields and their settings are:

G3 Version - must be set to V9 or greater.

Maximum XMOBILE Stations - must be set to the number of XMOBILE stations that are to be used for EC500. This number must be greater than zero. It is usually two times the number of users.

Maximum Administered IP Trunks - must be set to accommodate the number of IP loopback trunks.

Enhanced EC500 - must be set to **y**. **G3 Version** and **Maximum XMOBILE Stations** - must be set as shown above before **Enhanced EC500** can be set to **y**.

ARS - must be set to **y**.

Extended Cvg/Fwd Admin - must be set to **y** (for access to the Telecommuting Access Number screen where you set the EC500 Access Code).

ISDN-PRI - must be set to **y**.

H.323 Trunks - must be set to **y** if you intend to use H.323 IP trunks. This field should already be set if you have H.323 IP trunks installed.

Administration Planning

In a typical EC500 configuration, the XMOBILE station, which is mapped to the cell phone, is bridged to the principal published number, which is usually a user's office number. In order to support call waiting on the cell phone, two XMOBILE stations which are mapped to the same cell phone are bridged to the two call appearances of the office number. For example, XMOBILE Station One bridged to call appearance One of the office number and XMOBILE Station Two bridged to call appearance two of the office number.

EC500 gives users control over whether to receive EC500 calls on their cell phone. In Release 2, users have the ability to enable and disable all bridged extensions with one phone call. As in Release 1, they still have the ability to disable one extension at a time if desired.

Planning Requirements

EC500 users expect to receive the following information from the Administrator:

- The Station Security Code associated with the office number.
- The Change Station Security Code Feature Access Code.
- EC500 Enable/Disable Feature Access Codes (EC500 Activation/Deactivation on the System Administration Terminal).
- The Avaya EC500 Access Number (Telecommuting Access Number on the System Administration Terminal).

In support of these requirements specify the following:

- A Dial Plan for XMOBILE extensions.
- An extension number for the Avaya EC500 Access Number.
- EC500 Activation/Deactivation codes to enable/disable EC500.
- A Feature Access Code for changing the Station Security Code.

Dial Plan for XMOBILE Stations

Have a specific scheme for assigning XMOBILE stations. It makes it much easier to manage administration and user support with an organized, consistent numbering plan. There are different ways to organize a Dial Plan:

- Special first digits for XMOBILE extensions (Example 1).
- Correlation between XMOBILE extensions and office number (Example 2).
- Correlation between XMOBILE extensions and cell phone numbers (Example 3).

The following examples show possible ways to organize the Dial Plan.

Example 1:

office number **1234**
cell phone 777-555-8765
XMOBILE 1 **2234**
XMOBILE 2 **3234**

Example 2:

office number **1234**
cell phone 777-555-8765
XMOBILE 1 **1235**
XMOBILE 2 **1236**

Example 3:

office number 1234
cell phone 777-555-8765
XMOBILE 1 **2765**
XMOBILE 2 **3765**

Security Codes

Select an Avaya EC500 Access Number which is accessible externally as well as internally. This is set on the System Administration Terminal by setting the Telecommuting Access Number. See [Chapter 3: Administration](#).

Select Station Security Codes for the principal phone and its associated XMOBILE extensions.

Also, select a Station Security Code Change Feature Access Code (FAC). When an XMOBILE station is added, it needs to be given a default security code. Users should ultimately set their own office number Security Code using the Station Security Code Change Feature Access Code.

Enabling and Disabling Feature Access Codes

Select the EC500 Feature Access Codes for Enabling and Disabling. These are set in the Change Feature Access Codes screen in the System Administration Terminal.

Introduction

This chapter provides instructions for setting up and administering:

- The EC500 loop back trunks - ISDN-PRI and IP(H.323).
- A Change Station Security Code Feature Access Number for the user to change the office number Station Security Code.
- The XMOBILE stations that are used to bridge the cell phone to the office number line.
- The EC500 Access Number for external access to Feature Access Codes features.
- The EC500 Enable/Disable Feature Access Codes.
- Voice Mail coordination between the office and the cell phones.

Most of the EC500 administration tasks are accomplished through the Avaya Communications Server System Administration Terminal. The Terminal screens in this guide are meant to be examples and may not match exactly with the version that exists on the system administration terminal for your Avaya Communications Server switch. However, all fields described here as essential for EC500 set up and administration can be found on all versions of the terminals, regardless of the variations in field layouts. In the screens shown here, the essential fields are indicated in bold-face underlined type.

Setting the Customer Options for EC500

Avaya technical support ("init" login) must enter certain settings in the System-Parameters Customer-Options screen on the System Administration Terminal before you can administer the EC500 extensions.

The fields and their settings are:

G3 Version - must be set to V9 or greater.

Maximum XMOBILE Stations - must be set to the number of XMOBILE stations that are to be used for EC500. This number must be greater than zero. It is usually two times the number of users.

Maximum Administered IP Trunks - must be set to accommodate the number of IP loopback trunks.

Enhanced EC500 - must be set to **y**. **G3 Version** and **Maximum XMOBILE Stations** must be set as shown above before **Enhanced EC500** can be set to **y**.

ARS - must be set to **y**.

Extended Cvg/Fwd Admin - must be set to **y** (for access to the Telecommuting Access Number screen where you set the Avaya EC500 Access Code).

ISDN-PRI - must be set to **y**.

H.323 Trunks - must be set to **y** if you intend to use H.323 IP trunks. This field should already be set if you have H.323 IP trunks installed.

X-Mobility Outbound and Inbound Trunk Administration

An EC500 call actually consists of two distinct calls within the Avaya Communications Server. The first call leg terminates on a station which may be a standard office number with an XMOBILE extension bridged to it. This XMOBILE extension is mapped to the cell phone number. (See [Appendix A: Avaya EC500 - Other Configurations](#) for information on customer configurations other than Dual Bridge mode — two bridged extensions to a cell phone).

The second call leg is routed over a pair of trunk groups that are administered for EC500 calls. These trunks are connected in a loop back arrangement. Calls are routed out of the Avaya Communications Server via the trunk group which is identified on the XMOBILE station screen as the **Mobility Trunk Group**. As a result of the loop back arrangement, the call is routed back into the Avaya Communications Server via the other trunk in the loop back arrangement. The calls routed back into the Avaya Communications Server are then rerouted via ARS Analysis to the cell phone.

You can administer either ISDN trunks or H.323 IP trunks for EC500, depending upon your particular installation and design. It is recommended that EC500 be implemented using H.323 IP trunks only if H.323 IP trunks or end points are already being used on the Avaya Communications server. The IP boards (CLAN and MEDPRO) used for loop back trunking can be part of a pool of IP boards used for other purposes. Set up of the loop back arrangements for the IP boards is accomplished through settings in the System Administration Terminal.

This section describes the process of setting up these trunks, using settings on the System Administration Terminal for your switch. See the next section, [XMOBILE Station Administration](#), for information on setting up the XMOBILE station extensions and bridging them to the office number.

⇒ NOTE:

In the screens shown here, the essential fields are indicated in bold-face underlined type.

ISDN-PRI Trunk Administration

The ISDN-PRI trunk interfaces use ISDN signaling and support 30 voice channels apiece. Large installations may require multiple interfaces per trunk group.

OUTBOUND ISDN-PRI Trunk Administration

In our example, we administer the outbound trunk group of the two loop back trunk groups. For this example the circuit pack number 1b15 is used.

The dip switch on the DS1 circuit pack must be set for 32 channels.

At the System Administration terminal:

1. Type **add ds1 b15** and press **Enter**.

The DS1 screen appears.

Figure 3-1. DS1 Circuit Pack Screen

```

add ds1 b15                                     Page 1 of 1
DS1 CIRCUIT PACK

Location: 01B15                                Name: EC500 (OUT)
Bit Rate: 2.048                               Line Coding: hdb3

Signaling Mode: isdn-pri
Connect: pbx                                   Interface: network
CentreVu Long Timers? n                       Country Protocol: etsi
Interworking Message: PROGRESS                Protocol Version: a
Interface Companding: alaw                     CRC? y
Idle Code: 11111111                           DCP/Analog Bearer Capability: 3.1kHz

Slip Detection? n                             Near-end CSU Type: other

```

2. Enter the values shown above in the fields **Name**, **Bit Rate**, **Line Coding**, **Signaling Mode**, **Connect**, **Interface**, **Country Protocol**, **Interface Companding**, and **CRC**.

⇒ NOTE:

Name is a suggested value. It can be anything you choose to name the circuit pack.

3. Press **Enter** or **Submit**, depending on your terminal.
4. Type **add trunk-group 15** and press **Enter**.

The Trunk Group screen appears.

Figure 3-2. Trunk Group Screen

```

add trunk-group 15                                     Page 1 of 10
                                     TRUNK GROUP

Group Number: 15                                     Group Type: isdn                                     CDR Reports: y
Group Name: EC500 (OUT)                               COR: 1                                     TN: 1                                     TAC: 115
Direction: outgoing                                   Outgoing Display? n
Dial Access? y                                         Busy Threshold: 99
Queue Length: 0
Service Type: tie                                     TestCall ITC: rest
Far End Test Line No:

TestCall BCC: 4
TRUNK PARAMETERS
  Codeset to Send Display: 0                               Codeset to Send National IEs: 6
  Max Message Size to Send: 260                           Charge Advice: none
  Supplementary Service Protocol: a                   Digit Handling (in/out): enbloc/enbloc

Trunk Hunt: cyclical
Digital Loss Group: 13

Bit Rate: 1200                                           Synchronization: async   Duplex: full
Disconnect Supervision - Out? y
Answer Supervision Timeout: 0
    
```

5. Enter the values shown above in the fields **Group Type**, **Group Name**, **COR**, **TAC**, **Direction**, **Dial Access**, **Service Type**, **Supplementary Service Protocol**, **Digit Handling**, **Trunk Hunt**, and **Disconnect Supervision**.

⇒ NOTE:

Group Name is a suggested value. It can be anything you choose to name the group.

The field **COR** (Class of Restrictions) defines restrictions and privileges associated with the trunk group. This setting should allow for making outgoing calls.

The value shown for **TAC** is an example only. Enter this with a value that is in accordance with your Dial Plan.

6. Press the **Next Page** button.

The Trunk Group page 2 of 10 screen appears -- the Trunk Features screen.

Figure 3-3. Trunk Features Screen

```
add trunk-group 15                                     Page 2 of 10
TRUNK FEATURES
  ACA Assignment? n          Measured: none      Wideband Support? n
                             Internal Alert? n          Maintenance Tests? y
                             Data Restriction? n          NCA-TSC Trunk Member:
                             Send Name: n                Send Calling Number: y
  Used for DCS? n
  Suppress # Outpulsing? n  Numbering Format: public
  Outgoing Channel ID Encoding: preferred  UUI IE Treatment: service-provider
                             Replace Restricted Numbers? n
                             Replace Unavailable Numbers? n
                             Send Connected Number: n
  Send UCID? n
  Send Codeset 6/7 LAI IE? y          Dsl Echo Cancellation? n
                                     US NI Delayed Calling Name Update? n
                                     Network (Japan) Needs Connect Before Disconnect? n
```

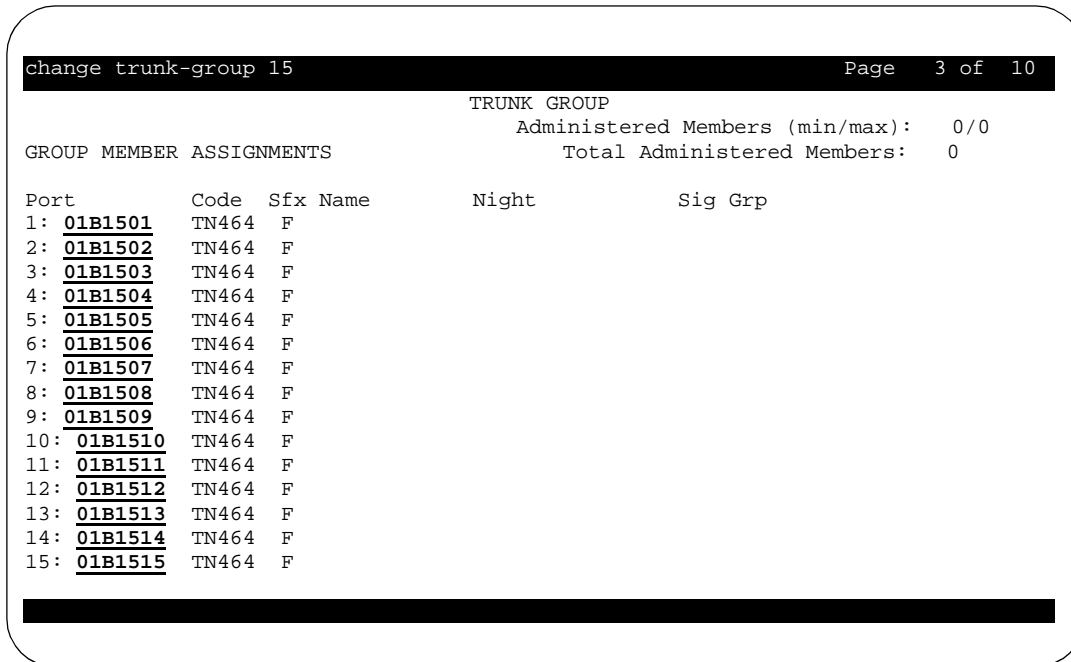
7. Enter the values shown above in the fields **Send Calling Number**, **Numbering Format**, and **Outgoing Channel ID Encoding**.
8. Press **Enter** or **Submit**, depending on your terminal.
9. Type **add signaling-group 15** and press **Enter**.
The Signaling Group screen appears.

Figure 3-4. Signaling Group Screen

```
add signaling-group 15                               Page 1 of 5
                                     SIGNALING GROUP
Group Number: 15
Associated Signaling? y                      Max number of NCA TSC: 0
Primary D-Channel: 01B1516                   Max number of CA TSC: 0
Trunk Group for Channel Selection:              Trunk Group for NCA TSC:
Supplementary Service Protocol: a           X-Mobility/Wireless Type: NONE
```

10. Enter the values shown above in the fields **Associated Signaling**, **Primary D-Channel**, and **Supplementary Service Protocol**.
11. Press **Enter** or **Submit**, depending on your terminal.
12. Type **change trunk-group 15** and press **Enter**.
13. Press **Next Page** twice to advance to the Trunk Group Member Assignment screen.

Figure 3-5. Trunk Group Member Assignment Screen (page 3 of 10)



14. Enter the port information as shown above and press **Next Page**.

The next page of the Trunk Group Member Assignments screen appears. Port 16 is not entered on this screen as it's reserved for D-Channel signaling.

Figure 3-6. Trunk Group Member Assignments Screen-cont. (page 4 of 10)

```
change trunk-group 15                                     Page 4 of 10
TRUNK GROUP
Administered Members (min/max): 0/0
GROUP MEMBER ASSIGNMENTS                               Total Administered Members: 0

Port      Code Sfx Name      Night      Sig Grp
16: 01B1517 TN464 F
17: 01B1518 TN464 F
18: 01B1519 TN464 F
19: 01B1520 TN464 F
20: 01B1521 TN464 F
21: 01B1522 TN464 F
22: 01B1523 TN464 F
23: 01B1524 TN464 F
24: 01B1525 TN464 F
25: 01B1526 TN464 F
26: 01B1527 TN464 F
27: 01B1528 TN464 F
28: 01B1529 TN464 F
29: 01B1530 TN464 F
30: 01B1531 TN464 F
```

15. Enter the port information as shown above and press **Enter** or **Submit**, depending on your terminal.

INBOUND ISDN-PRI Trunk Administration

In our example, we administer the inbound trunk group of the two loop back trunk groups. For this example the circuit pack number 1b13 is used.

The dip switch on the DS1 circuit pack must be set for 32 channels.

At the System Administration terminal:

1. Type **add ds1 b13** and press **Enter**.

The DS1 screen appears.

Figure 3-7. DS1 Circuit Pack Screen

```

add ds1 b13                                     Page 1 of 1
DS1 CIRCUIT PACK

Location: 01B13                                Name: EC500 (IN)
Bit Rate: 2.048                               Line Coding: hdb3

Signaling Mode: isdn-pri
Connect: pbx                                   Interface: user
CentreVu Long Timers? n                       Country Protocol: etsi
Interworking Message: PROGRESS                Protocol Version: a
Interface Companding: alaw                     CRC? y
Idle Code: 11111111                            DCP/Analog Bearer Capability: 3.1kHz

Slip Detection? n                             Near-end CSU Type: other

```

2. Enter the values shown above in the fields **Name**, **Bit Rate**, **Line Coding**, **Signaling Mode**, **Connect**, **Interface**, **Country Protocol**, **Interface Companding**, and **CRC**.



NOTE:

Name is a suggested value. It can be anything you choose to name the circuit pack.

3. Press **Enter** or **Submit**, depending on your terminal.
4. Type **add trunk-group 13** and press **Enter**.

The Trunk Group screen appears.

Figure 3-8. Trunk Group Screen

```

add trunk-group 13                                     Page 1 of 10
                                     TRUNK GROUP
Group Number: 13                                     Group Type: isdn           CDR Reports: y
  Group Name: EC500 (IN)                   COR: 1                 TN: 1           TAC: 113
  Direction: incoming                   Outgoing Display? n
  Dial Access? n                               Busy Threshold: 99       Night Service:
Service Type: tie                               Auth Code? n           TestCall ITC: rest
                                     Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
  Codeset to Send Display: 0                   Codeset to Send National IEs: 6
  Max Message Size to Send: 260               Charge Advice: none
  Supplementary Service Protocol: a         Digit Handling (in/out): enbloc/enbloc
                                     Trunk Hunt: cyclical           QSIG Value-Added? n
                                     Digital Loss Group: 13
Calling Number - Delete:      Insert:           Numbering Format: nat1-pub
  Bit Rate: 1200              Synchronization: async   Duplex: full
Disconnect Supervision - In? y
Answer Supervision Timeout: 0

```

5. Enter the values shown above in the fields **Group Type**, **Group Name**, **COR**, **Direction**, **TAC**, **Service Type**, **Supplementary Service Protocol**, **Digit Handling**, **Trunk Hunt**, **Numbering Format**, and **Disconnect Supervision**.

⇒ NOTE:

Group Name is a suggested value. It can be anything you choose to name the group.

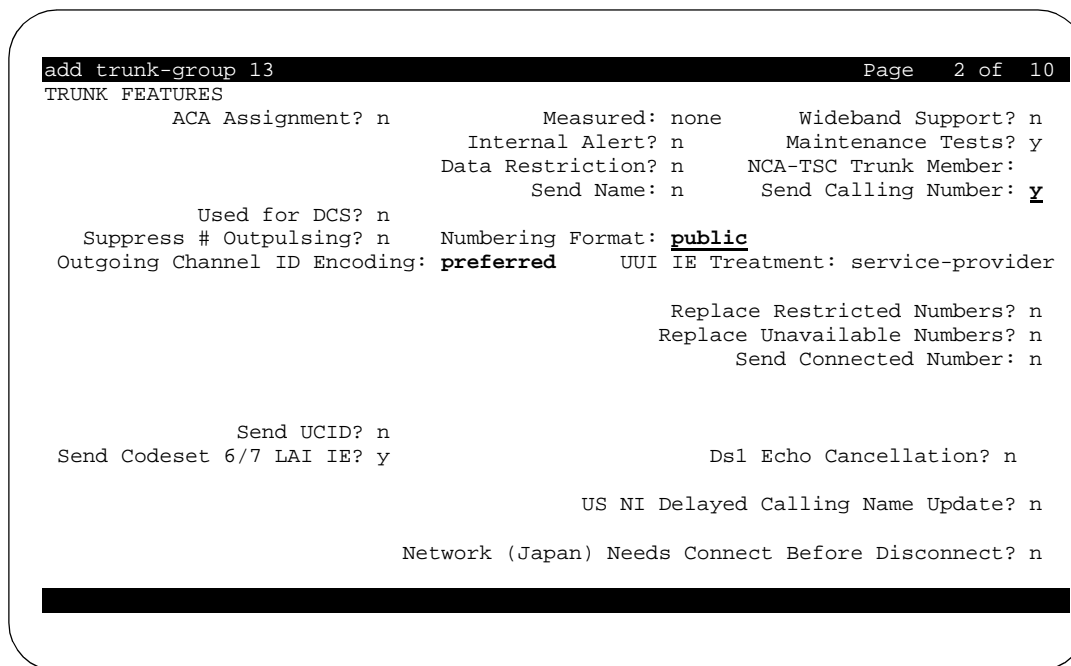
The field **COR** (Class of Restrictions) defines restrictions and privileges associated with the trunk group. This setting should allow for making outgoing calls.

The value shown for **TAC** is an example only. Enter this with a value that is in accordance with your Dial Plan.

6. Press **Next Page**.

The next page of the Trunk Group screen appears - the Trunk Features screen.

Figure 3-9. Trunk Features Screen



7. Enter the values shown above in the fields **Send Calling Number**, **Numbering Format**, and **Outgoing Channel ID Encoding**.

8. Press **Next Page**.

The next page of the Trunk Group screen appears - the Incoming Call Handling Treatment screen.

Figure 3-10. Incoming Call Handling Treatment Screen (Trunk Group 3 of 10)

```
add trunk-group 13                                     Page 3 of 10
INCOMING CALL HANDLING TREATMENT
Service/      Called   Called   Del   Insert   Per Call   Night
Feature       Len     Number
tie                               9
CPN/BN       Serv
```

9. Enter the following fields with the appropriate values:
 - **Service/Feature** - must be **tie**
 - **Called Len** - left blank. This allows for any call length to be routed through ARS trunk routing tables.
 - **Insert** - enter the ARS Feature Access Code that invokes the ARS routing tables for external trunks in your Dial Plan. ARS Analysis must be administered to correctly process the cell phone numbers.
10. Press **Enter** or **Submit**, depending on your terminal.
11. Type **add signaling-group 13** and press **Enter**.
The Signaling Group screen appears.

Figure 3-11. Signaling Group Screen

```
add signaling-group 13                                     Page 1 of 5
Group Number: 13
Associated Signaling? y                                Max number of NCA TSC: 0
Primary D-Channel: 01B1316                             Max number of CA TSC: 0
Trunk Group for Channel Selection:                       Trunk Group for NCA TSC:
Supplementary Service Protocol: a                     X-Mobility/Wireless Type: NONE
```

12. Enter the values shown above in the fields **Associated Signaling**, **Primary D-Channel**, **Supplementary Service Protocol**, and **X-Mobility / Wireless Type**.
13. Press **Enter** or **Submit**, depending on your terminal.
14. Type `change trunk-group 13` and press **Enter**.
15. Press **Next Page** to advance to the Trunk Group Member Assignments screen.

Figure 3-12. Trunk Group Member Assignments Screen (page 4 of 10)

```
change trunk-group 13                                     Page 4 of 10
TRUNK GROUP
Administered Members (min/max): 0/0
Total Administered Members: 0
GROUP MEMBER ASSIGNMENTS
Port      Code Sfx Name      Night      Sig Grp
1: 01B1301 TN464 F
2: 01B1302 TN464 F
3: 01B1303 TN464 F
4: 01B1304 TN464 F
5: 01B1305 TN464 F
6: 01B1306 TN464 F
7: 01B1307 TN464 F
8: 01B1308 TN464 F
9: 01B1309 TN464 F
10: 01B1310 TN464 F
11: 01B1311 TN464 F
12: 01B1312 TN464 F
13: 01B1313 TN464 F
14: 01B1314 TN464 F
15: 01B1315 TN464 F
```

16. Enter the port information as shown above and press **Next Page**.

The next page of the Trunk Group Member Assignments screen appears. Port 16 is not entered on this screen as it's reserved for D-Channel signaling.

Figure 3-13. Trunk Group Member Assignments Screen-cont. (5 of 10)

```
change trunk-group 13                                     Page 5 of 10
TRUNK GROUP
Administered Members (min/max): 0/0
GROUP MEMBER ASSIGNMENTS                               Total Administered Members: 0

Port      Code Sfx Name      Night      Sig Grp
16: 01B1317 TN464 F
17: 01B1318 TN464 F
18: 01B1319 TN464 F
19: 01B1320 TN464 F
20: 01B1321 TN464 F
21: 01B1322 TN464 F
22: 01B1323 TN464 F
23: 01B1324 TN464 F
24: 01B1325 TN464 F
25: 01B1326 TN464 F
26: 01B1327 TN464 F
27: 01B1328 TN464 F
28: 01B1329 TN464 F
29: 01B1330 TN464 F
30: 01B1331 TN464 F
```

17. Enter the port information as shown above and press **Enter** or **Submit**, depending on your terminal.

H.323 IP Trunk Administration

EC500 loop back trunks may also be set up using IP boards (TN2302AP and TN799B). In a switch that already uses H.323 IP there are a number of advantages in using H.323 IP trunks for the loop back.

1. A single IP board can handle 64 calls.
2. The loop back connection can be done internally within a single board (32 calls in and 32 calls out).
3. The IP boards used for loop back trunking may be part of a pool of IP boards used for other purposes.

See [Capacity Limitations](#) in Chapter 1 for information on estimating trunk XMOBILE Station number and usage.

You should already have Node Names, IP Interfaces, and Data Modules set up in your IP system. The following screen examples illustrate the settings for these screens. You can use existing hardware for EC500, or add hardware, depending upon your capacity utilization.

Figure 3-14. IP Node Names Screen

```

display node-names ip
                                     IP NODE NAMES

      Name                IP Address
default                 0 .0 .0 .0
mm1_CLAN                135.17 .111.59
mm1_MEDPRO             135.17 .111.64
mm2_CLAN                135.17 .111.71
mm2_MEDPRO             135.17 .111.72
mm3_CLAN                135.17 .111.61
mm3_Loopback           135.17 .111.61
mm3_MEDPRO             135.17 .111.66

```

You must create an entry on the IP Node Names screen that has the same IP address as the CLAN card used for the loop back trunks. In this example the entry is called **mm3_Loopback** and it has the same IP address as **mm3_CLAN**.



NOTE:

It is recommended that EC500 be implemented using H.323 IP trunks only if H.323 IP trunks or endpoints are already being used on the Avaya Communications server.

Figure 3-15. IP Interfaces Screen

```
display ip-interfaces Page 1 of 6
IP INTERFACES
Enable
Eth Pt Type Slot Code Sfx Node Name Subnet Mask Gateway Address Net Rgn
Y C-LAN 01C15 TN799 B mm3 CLAN 255.255.255.0 135.17 .111.61 1
Y MEDPRO 01C16 TN2302 mm3 MEDPRO 255.255.255.0 135.17 .111.61 1
n
n
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n
n
n
n
n
n
n
n
n
n
n
n
n
n
n
n
n
```

Figure 3-16. Data Module Screen

```
display data-module 40015
DATA MODULE
Data Extension: 40015 Name: CLAN C15
Type: ethernet
Port: 01C1517
Link: 15

Network uses 1's for Broadcast Addresses? Y
```


For information about and fields related to H.323 IP trunk administration, see Chapter 3, "IP Solutions," in the *DEFINITY Enterprise Communications Server Release 9 Administration for Network Connectivity Guide* (555-233-504).

OUTBOUND H.323 IP Trunk Administration

In our example, we administer the outbound trunk group of the two loop back trunk groups on the System Administration Terminal. For this example the number 25 is used for the outgoing trunk group, signaling group and port (5000+25). It is useful to coordinate these numbers for maintenance and tracking purposes.

1. Type **add trunk-group 25** and press **Enter**.

The Trunk Group screen appears.

Figure 3-17. Trunk Group Screen

```

add trunk-group 25                                     Page 1 of 9
                                     TRUNK GROUP
Group Number: 25                                     Group Type: isdn           CDR Reports: y
  Group Name: IP loopback (OUT)                   COR: 1                 TN: 1           TAC: 125
  Direction: outgoing                               Outgoing Display? n       Carrier Medium: IP
  Dial Access? y                                     Busy Threshold: 99
  Queue Length: 0
  Service Type: tie                                   TestCall ITC: rest
                                     Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
  Codeset to Send Display: 6           Codeset to Send National IEs: 6
  Max Message Size to Send: 260       Charge Advice: none
  Supplementary Service Protocol: a    Digit Handling (in/out): enbloc/enbloc
                                     Trunk Hunt: cyclical           QSIG Value-Added? n
                                     Digital Loss Group: 13
                                     Bit Rate: 1200           Synchronization: async   Duplex: full
  Disconnect Supervision -             Out? y
  Answer Supervision Timeout: 0

```

2. Enter the values shown above in the fields **Group Type**, **Group Name**, **COR**, **TAC**, **Direction**, **Carrier Medium**, **Dial Access**, **Service Type**, **Digit Handling**, **Trunk Hunt**, and **Disconnect Supervision**.

⇒ NOTE:

Group Name is a suggested value. It can be anything you choose to name the group.

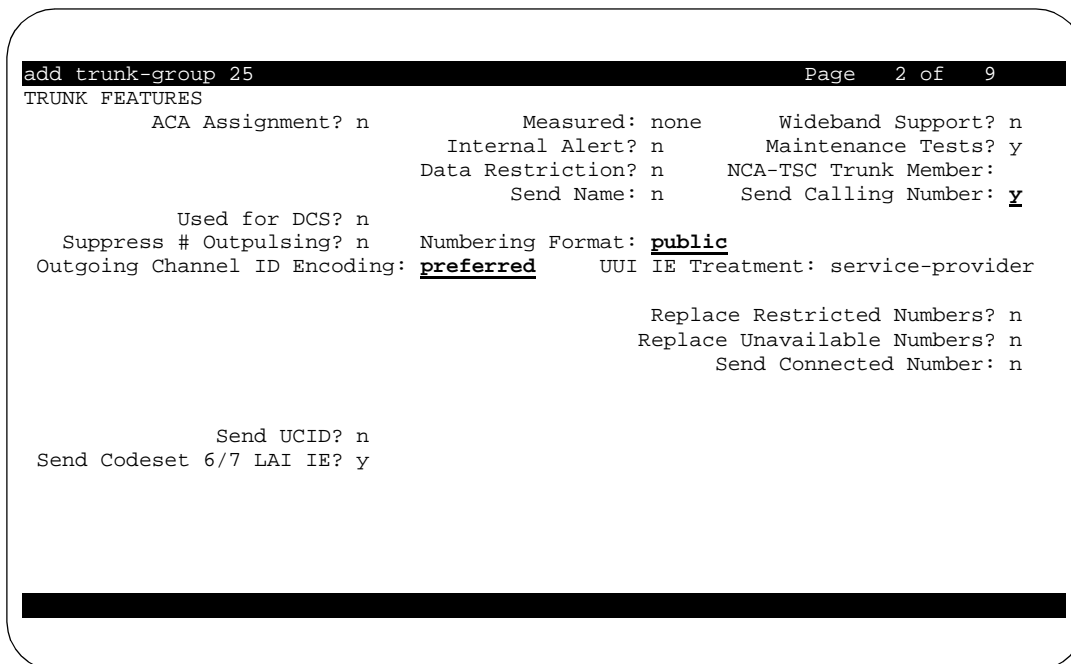
The field **COR** (Class of Restrictions) defines restrictions and privileges associated with the trunk group. This setting should allow for making outgoing calls.

The value shown for **TAC** is an example only. Enter this with a value that is in accordance with your Dial Plan.

3. Press the **Next Page** button.

The Trunk Features screen appears.

Figure 3-18. Trunk Features Screen



4. Enter the values shown above in the fields **Send Calling Number**, **Numbering Format**, and **Outgoing Channel ID Encoding**.

5. Press **Enter** or **Submit**, depending on your terminal.

6. Type **add signaling-group 25** and press **Enter**.

The Signaling Group screen appears.

Figure 3-19. Signaling Group Screen

```

add signaling-group 25                                     Page 1 of 5
                SIGNALING GROUP

Group Number: 25          Group Type: h.323
Remote Office? n          Max number of NCA TSC: 0
                          Max number of CA TSC: 0
                          Trunk Group for NCA TSC:

Trunk Group for Channel Selection: 25
Supplementary Service Protocol: a          Network Call Transfer? n

Near-end Node Name: mm3 CLAN          Far-end Node Name: mm3 Loopback
Near-end Listen Port: 5025          Far-end Listen Port: 5035
Far-end Network Region: 1
LRQ Required? n          Calls Share IP Signaling Connection? y
RRQ Required? n          Bypass If IP Threshold Exceeded? n
                          Direct IP-IP Audio Connections? y
                          IP Audio Hairpinning? y
                          Internetworking Message: PROgress

```

7. Type **h.323** in the **Group Type** field, as shown above. When you tab out of the field, the screen automatically refreshes with fields appropriate for H.323 IP set up.
8. Using the example shown above, enter values for the fields **Trunk Group for Channel Selection**, **Near-end Node Name**, **Far-end Node Name**, **Near-end Listen Port**, **Far-end Listen Port**, **Far-end Network Region**, **Calls Share IP Signaling Connection**, **Direct IP-IP Audio Connections**, and **IP Audio Hairpinning**.

⇒ NOTE:

The value for **Trunk Group for Channel Selection** is the number for the Trunk Group that you just administered.

The Trunk Group associated with this Signaling Group must have the **Carrier Medium** field (Figure 3-17, Trunk Group screen page 1), set to **IP** in order for the Signaling Group to be set to H.323 IP here.

The Far-end Node Name field and the Near-end Node Name field **cannot** contain the same node name. However, the Far-end Node Name field **must** contain the node name entry with the same IP address as the Near-end Node Name. See [Figure 3-14](#).

Port numbers must be equal to or greater than 5000. The Near-end and Far-end Listen Ports have been assigned numbers in this example that match the outgoing and incoming trunk group and signaling group numbers. This assists with tracking and maintenance tasks.

9. Press **Enter** or **Submit**, depending on your terminal.
10. Type `change trunk-group 25` and press **Enter**.
11. Press **Next Page** to advance to the Trunk Group Member Assignments screen.

Figure 3-20. Trunk Group Screen (page 3 of 10)

```
change trunk-group 25                                     Page 3 of 9
                                                         TRUNK GROUP
                                                         Administered Members (min/max): 1/4
GROUP MEMBER ASSIGNMENTS                               Total Administered Members: 4
Port      Code Sfx Name                                Sig Grp
1: IP
2: IP
3: IP
4: IP
5: IP
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:
```

12. Type **IP** in the `Port` field for as many channels (Group Members) as you are utilizing.
13. When all channels are entered, press **Enter** or **Submit**, depending on your terminal.
The next time you display this screen, system-assigned port numbers appear.
14. Press **Next Page** as needed to enter more ports.
15. Press **Enter** or **Submit**, depending on your terminal.

INBOUND H.323 IP Trunk Administration

In our example, we administer the inbound trunk group of the two loop back trunk groups on the System Administration Terminal. For this example the number 35 is used for the outgoing trunk group, signaling group and port (5000+35). It is useful to coordinate these numbers for maintenance and tracking purposes.

1. Type add **trunk-group 35** and press **Enter**.

The Trunk Group screen appears.

Figure 3-21. Trunk Group Screen

```

add trunk-group 35                                     Page 1 of 10
                                     TRUNK GROUP
Group Number: 35                                     Group Type: isdn                               CDR Reports: y
Group Name: IP loopback (IN)                       COR: 1                                           TN: 1         TAC: 135
Direction: incoming                               Outgoing Display? n                             Carrier Medium: IP
Dial Access? y                                     Busy Threshold: 99                               Night Service:
Service Type: tie                                   Auth Code? n                                     TestCall ITC: rest
Far End Test Line No:
TestCall BCC: 4
TRUNK PARAMETERS
Codeset to Send Display: 6                         Codeset to Send National IEs: 6
Max Message Size to Send: 260                     Charge Advice: none
Supplementary Service Protocol: a                 Digit Handling (in/out): enbloc/enbloc
Trunk Hunt: cyclical                               QSIG Value-Added? n
Digital Loss Group: 13
Calling Number - Delete:                          Insert:                                           Numbering Format: nat1-pub
Bit Rate: 1200                                    Synchronization: async                          Duplex: full
Disconnect Supervision - In? y
Answer Supervision Timeout: 0

```

2. Enter the values shown above in the fields **Group Type**, **Group Name**, **COR**, **TAC**, **Direction**, **Carrier Medium**, **Service Type**, **Digit Handling**, **Trunk Hunt**, **Numbering Format**, and **Disconnect Supervision**.

⇒ NOTE:

Group Name is a suggested value. It can be anything you choose to name the group.

The field **COR** (Class of Restrictions) defines restrictions and privileges associated with the trunk group. This setting should allow for making outgoing calls.

The value shown for **TAC** is an example only. Enter this with a value that is in accordance with your Dial Plan.

3. Press **Next Page**.

The Trunk Features screen appears.

Figure 3-22. Trunk Features Screen

```
add trunk-group 35                                     Page 2 of 10
TRUNK FEATURES
  ACA Assignment? n                               Measured: none       Wideband Support? n
                                           Internal Alert? n     Maintenance Tests? y
                                           Data Restriction? n   NCA-TSC Trunk Member:
                                           Send Name: n         Send Calling Number: y
  Used for DCS? n
  Suppress # Outpulsing? n                       Numbering Format: public
  Outgoing Channel ID Encoding: preferred       UUI IE Treatment: service-provider
                                           Replace Restricted Numbers? n
                                           Replace Unavailable Numbers? n
                                           Send Connected Number: n
  Send UCID? n
  Send Codeset 6/7 LAI IE? y
                                           Network (Japan) Needs Connect Before Disconnect? n
```

4. Enter the values shown above in the fields **Send Calling Number**, **Numbering Format**, and **Outgoing Channel ID Encoding**.
5. Press **Enter** or **Submit**, depending on your terminal.
6. Type **add signaling-group 35** and press **Enter**.

The Signaling Group screen appears.

Figure 3-23. Signaling Group Screen

```

add signaling-group 35                               Page 1 of 5
                SIGNALING GROUP

Group Number: 35          Group Type: h.323
Remote Office? n          Max number of NCA TSC: 0
                          Max number of CA TSC: 0
                          Trunk Group for NCA TSC:

Trunk Group for Channel Selection: 35
Supplementary Service Protocol: a          Network Call Transfer? n

Near-end Node Name: mm3_CLAN          Far-end Node Name: mm3_Loopback
Near-end Listen Port: 5035          Far-end Listen Port: 5025
Far-end Network Region: 1
LRQ Required? n          Calls Share IP Signaling Connection? Y
RRQ Required? N          Bypass If IP Threshold Exceeded? n
                          Direct IP-IP Audio Connections? Y
                          IP Audio Hairpinning? Y
                          Internetworking Message: PROGRESS

```

7. Type **h.323** in the **Group Type** field, as shown above. When you tab out of the field, the screen automatically refreshes with fields appropriate for H.323 IP set up.
8. Using the example shown above, enter values for the fields **Trunk Group for Channel Selection**, **Near-end Node Name**, **Far-end Node Name**, **Near-end Listen Port**, **Far-end Listen Port**, **Far-end Network Region**, **Calls Share IP Signaling Connection**, **Direct IP-IP Audio Connections**, and **IP Audio Hairpinning**.

⇒ NOTE:

The value for **Trunk Group for Channel Selection** is the number for the Trunk Group that you just administered.

The Trunk Group associated with this Signaling Group must have the **Carrier Medium** field (Figure 3-21, Trunk Group screen - page 1) set to **IP** in order for the Signaling Group to be set to H.323 IP here.

The Far-end Node Name field and the Near-end Node Name field **cannot** contain the same node name. However, the Far-end Node Name field **must** contain the node name entry with the same IP address as the Near-end Node Name. See [Figure 3-14](#).

Port numbers must be equal to or greater than 5000. The Near-end and Far-end Listen Ports have been assigned numbers in this example that match the outgoing and incoming trunk group and signaling group numbers. This assists with tracking and maintenance tasks.

9. Press **Enter** or **Submit**, depending on your terminal.
10. Type `change trunk-group 35` and press **Enter**.
11. Press **Next Page** to advanced to the Incoming Call Handling Treatment screen.

Figure 3-24. Incoming Call Handling Treatment Screen

change trunk-group 35					Page 3 of 10	
INCOMING CALL HANDLING TREATMENT						
Service/ Feature	Called Len	Called Number	Del	Insert	Per Call CPN/BN	Night Serv
<u>tie</u>				<u>9</u>		

12. Enter the following fields with the appropriate values
 - **Service/Feature** - must be **tie**.
 - **Called Len** - left blank. This allows for any call length to be routed through ARS trunk routing tables.
 - **Insert** - enter the ARS Feature Access Code that invokes the ARS routing tables for external trunks in your Dial Plan. ARS Analysis must be administered to correctly process the cell phone numbers.
13. Press **Enter**.
14. Press **Next Page** until the Trunk Group screen for Group Member Assignments appears.

Figure 3-25. Trunk Group Screen for Group Member Assignments

```
change trunk-group 35                                     Page 4 of 10
TRUNK GROUP
Administered Members (min/max): 1/4
GROUP MEMBER ASSIGNMENTS                               Total Administered Members: 4

  Port   Code Sfx Name      Night      Sig Grp
1: IP
2: IP
3: IP
4: IP
5: IP
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:
```

15. Type **IP** in the **Port** field for as many channels (Group Members) are you are utilizing. See [Capacity Limitations](#) in Chapter 1 for information on assessing the number of channels you need for EC500 setup.
16. Press **Next Page** as needed to enter more ports.
17. When all channels are entered, press **Enter** or **Submit**.

The next time you display this screen, system-assigned port numbers appear.

Creating a Change Feature Access Code for Station Security Codes (SSC)

When users are enabling and disabling EC500, they need to know the Station Security Code associated with their office number. You must be sure to administer these Station Security Codes for the principal EC500 office numbers.

Release 2 provides the capability for users to enable or disable all bridged extensions at once, using the Security Code for their principal phone (an office number or an AWOH extension set up on the Avaya Communications Server).

Station Security Codes provide security to station users by preventing other users from accessing functions associated with the user's station. Each station user can change his or her own SSC if the user knows the station's current settings. You must create a system-wide SSC change Feature Access Code (FAC) that users can invoke to change their SSC. You must also administer and provide their individual SSCs to users. A user cannot change a blank SSC.

To create a system-wide SSC change Feature Access Code (FAC) at the System Administration Terminal:

1. Type **change feature-access-codes** and press **Enter**.
The Feature Access Code screen appears.
2. Press **Next Page**.
The Feature Access Code screen page 2 appears.
3. Type a code valid for your Dial Plan (i.e. #5) in the **Station Security Code Change Access Code** field. This sets the access codes for this feature.
4. Press **Enter** or **Submit**, depending on your terminal.
The Command prompt appears.
5. Type **change system-parameters security** and press **Enter**.
The Security-Related System Parameters screen appears.
6. Press **Next Page** to advance to page 2 of the Security-Related System Parameters screen.
7. Type a number in the **Minimum Station Security Code Length** field that is based on your Dial Plan and press **Enter**. This determines the minimum required length of the Station Security Code. Longer codes are more secure.

XMOBILE Station Administration

The cell phone number is mapped to an XMOBILE station type on the Avaya Communications Server. If the cell phone supports call waiting, then two XMOBILE extensions are administered on the Avaya Communications Server for the cell phone. Each extension is bridged to a call appearance of a multi-function station. The station may be a standard office number (presumably the primary extension of the cell phone user) or may be an AWOH (Administration Without Hardware) dummy station to provide a single Avaya Communications Server extension for the cell phone.

Note that when EC500 is administered, the initial state of the cell phone is disabled. The user must enable EC500 in order to receive calls from the Avaya Communications Server.

In our example we administer two cellular mapped XMOBILE stations as bridges of a standard Avaya Communications Server office number to a cell phone. The office number is extension 1234 and the two bridged XMOBILE stations mapped to the cell phone are 1034 and 1134.

To administer the first XMOBILE station:

1. Type **add station 1034** and press **Enter**.

The Station screen appears.

Figure 3-26. Station Screen

```

add station 1034                                     Page 1 of 3
                                     STATION
Extension: 1034                                     Lock Messages? n          BCC: 0
Type: XMOBILE                                     Security Code: 1234567   TN: 1
Name: John's cell 1                               Coverage Path 1:          COR: 1
                                               Coverage Path 2:          COS: 1
                                               Hunt-to Station:

STATION OPTIONS
Mobility Trunk Group: 15                               Message Lamp Ext: 1034
Display Module? n                                       Message Waiting Type: NONE

CELL PHONE NUMBER MAPPING
Dial Prefix: 1
Cell Phone Number: 7325551212
Mapping Mode: termination

```

2. Enter the following fields with the appropriate values:

- **Type** - XMOBILE
- **Security Code** - up to 7 digits
- **Name** - this is a suggested value. Enter a value that will indicate that the station is for a particular person's cell phone, and for a specific call appearance.
- **Mobility Trunk Group** - enter the ISDN or H.323 IP **outbound** trunk group used for EC500.
- **Display Module** - n.
- **Message Waiting Type** - none.
- **Dial Prefix** - any number that might be required besides the cell phone number itself. For example, 1 for U.S. domestic long distance, or 011 for international cell phone numbers.

 **NOTE:**

After you have established a Dial Prefix for a particular Cell Phone Number you can change it at a later date for one XMOBILE station and the system will automatically change it for all the other XMOBILE stations that have the same Dial Prefix/Cell Phone Number pair.

- **Cell Phone Number** - phone number (external to Avaya Communications Server) assigned by the cellular Service Provider for the cell phone. For international calls, country codes must be included.

It is recommended that you enter a Dial Prefix full 10-digit Cell Phone Number regardless of whether the cell phone is local or not. Note that your ARS Analysis has to be administered to handle this.

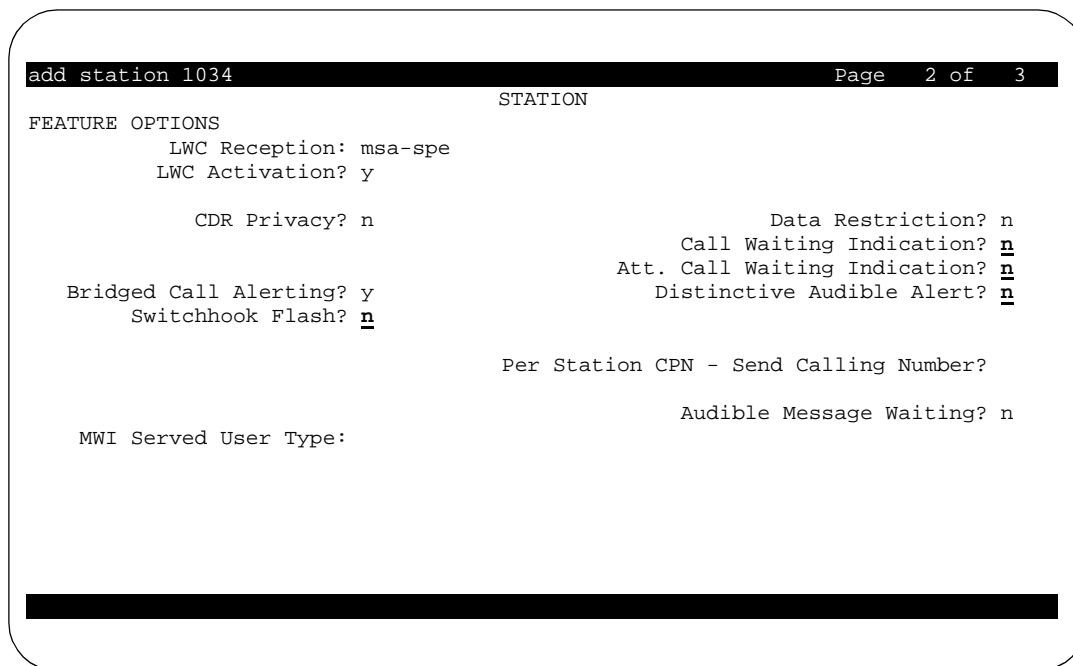
- The **Mapping Mode** field appears only on Avaya internal screens ("init" and "inads" logins) and can only be used by internal Avaya technical personnel. Once the Dial Prefix and Cell Phone Number fields have been entered and submitted the value in the hidden **Mapping Mode** field internally defaults to **termination**.

If you are logged in as "init" or "inads" you must enter **termination** in this field.

3. Press **Next Page**.

The next page of the Station screen appears.

Figure 3-27. Station Screen (2 of 3)



4. Set the following fields to **n**: **Switchhook Flash**, **Call Waiting Indication**, **Att. Call Waiting Indication**, and **Distinctive Audible Alert**.
5. Press the **Next Page** button.

The next page of the Station screen appears - page 3 of 3.

Figure 3-28. Station Screen (3 of 3)

```
add station 1034 Page 3 of 3
STATION

ABBREVIATED DIALING
List1:____ List2:____ List3:

HOT LINE DESTINATION
Abbreviated Dialing List Number (From above 1, 2 or 3):
Dial Code:

Line Appearance: brdg-appr Btn:1 Ext:1234
```

6. On this screen you bridge the XMOBILE station extension to the office number or AWOH line. Enter the fields **Line Appearance**, **Btn**, and **Ext**. with the appropriate information. The **Ext**. field should be the extension of the office number or AWOH line administered for the user.
7. Press **Enter** or **Submit**, depending on your terminal.

To administer a second EC500 Extension for the cellular user to take advantage of the call waiting feature:

1. Type `add station 1134` and press **Enter**.
The Station screen appears.
2. Enter all fields as shown for the first station you administered, **with the following exceptions**:
 - The **Name** field in the Station screen, page 1, should reflect that this second station is for call appearance 2.
 - The **Btn:** field in the Station screen, page 3 should be set to 2 for the second line appearance of the office number. ***This is very important.***

Sending 10-digit Caller Identification for Locally Originated Calls

Most cell phones require a 10-digit number as the calling number. The Avaya Communications Server must be administered to provide this for locally-originated calls. To administer this on the System Administration Terminal for stations associated with either ISDN or H.323 IP trunks:

1. Type change `isdn public-unknown-numbering` and press **Enter**.

The ISDN Numbering - Public/Unknown Format screen appears.

Figure 3-29. ISDN Numbering - Public/Unknown Format Screen

Ext Len	Ext Code	Trk Grp(s)	CPN Prefix	Total CPN Len	Ext Len	Ext Code	Trk Grp(s)	CPN Prefix	Total CPN Len
<u>4</u>	<u>1</u>		<u>732817</u>	<u>10</u>					

2. Create an entry (as above) to add a prefix to extensions to create a 10-digit calling number.
 - **Ext Code** - the starting digit(s) of the extension.
 - **Trk Grp(s)** - leaving this blank means that it applies to all trunks in the system.
3. Press **Enter** or **Submit**, depending on your terminal.

Setting Up the Avaya EC500 Access Number

EC500 uses the Avaya Communications Server Telecommuting Access Number for users to enable or disable EC500, or change their office number's Station Security Code.

⇒ NOTE:

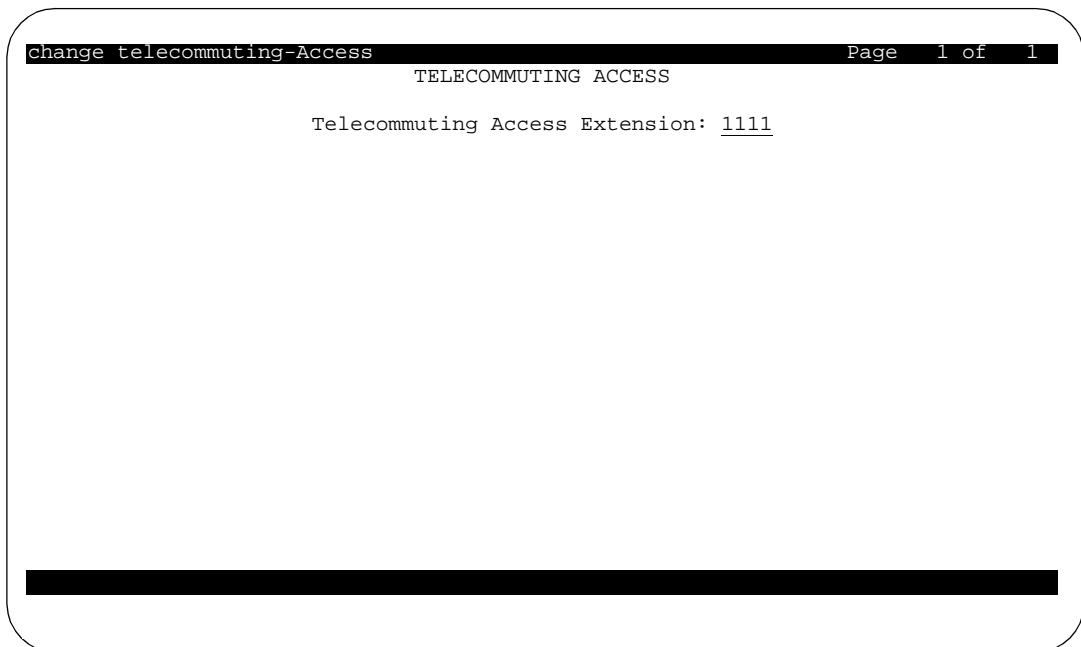
Skip this procedure if a Telecommuting Access Number already exists on your system.

To configure the Avaya Communications Server for EC500 access:

1. Type **change telecommuting-access** and press **Enter**.

The Telecommuting Access screen appears.

Figure 3-30. Telecommuting Access Screen



2. In the **Telecommuting Access Number** field, type an extension in accordance with the Dial Plan; for example, **1111**. This is the Avaya EC500 Access Number you provide for users to enable or disable EC500, or to change their Station Security Code. The Telecommuting Access Number must be a direct inward dialing (DID) or a central office (CO) trunk destination for off-premises features to work.
3. Press **Enter** or **Submit**, depending on your terminal.

Setting Up the Avaya EC500

Enable/Disable Feature Access Codes

To administer the EC500 Feature Access Codes (EC500 Activation and Deactivation) for enabling or disabling:

1. Type **change feature-access-codes** and press **Enter**.
The Feature Access Code screen appears.
2. Press **Next Page** to advance to page 2.

Figure 3-31. Feature Access Screen

```

change feature-access-codes                               Page 2 of 5
                FEATURE ACCESS CODE (FAC)

Emergency Access to Attendant Code: *11
  Enhanced EC500 Activation: *81           Deactivation: #81
Extended Call Fwd Activate Busy D/A: *23   All: *24   Deactivation: #23
Extended Group Call Pickup Access Code:
  Facility Test Calls Access Code:
    Flash Access Code: *88
  Group Control Restrict Activation: *15     Deactivation: #15
    Hunt Group Busy Activation: *81         Deactivation: #81
    ISDN Access Code:
  Last Number Dialed Access Code: *54
  Leave Word Calling Message Retrieval Lock: *45
  Leave Word Calling Message Retrieval Unlock: #45
  Leave Word Calling Send A Message: *60
  Leave Word Calling Cancel A Message: #60
  Malicious Call Trace Activation:           Deactivation:
PASTE (Display PBX data on Phone) Access Code:
Personal Station Access (PSA) Associate Code:       Dissociate Code:
  Per Call CPN Blocking Code Access Code:
  Per Call CPN Unblocking Code Access Code:
  Print Messages Access Code: *65

```

3. Set an access code in accordance with your Dial Plan for the following fields.
 - Enhanced EC500 Activation - ***81** in this example
 - Enhanced EC500 Deactivation - **#81** in this example
4. Press **Enter** or **Submit**, depending on your terminal.

Voice Mail Administration

Unanswered office number calls are usually routed to a user's Corporate voice mail after a pre-determined number of rings, but many Cellular Service Providers also offer voice messaging. As an Administrator, you may be called upon to troubleshoot individual situations to help the user understand the options and the potential conflicts resulting from a voice mail preference.

The key action you can take to assist the user is to coordinate a default to a specific voice mail system by setting the number of rings on the office number before the Corporate voice mail answers so that the preferred system picks up unanswered calls before the other system. This section provides procedures for you to use when working with the users.

It is important to note that there are coverage options in both the Avaya Communications Server (busy, active, send-all-calls) and the network (cell phone unavailable, network congested) that can cause a call to immediately go to the respective voice mail. Users should recognize that despite efforts to allow their preferred voice messaging system to pick up calls before the other system does, an unanswered call could sometimes result in a message in *either* system's voice mailbox.

Using Corporate Voice Mail to Receive Messages

To receive voice messages through the Corporate voice messaging system, the Cellular Service Provider's voice mail feature must be set to ring longer than the Corporate voice messaging system does. For example, if the Corporate voice messaging system automatically picks up an unanswered call on the third ring, the user should set the cell phone's voice mail system to pick up unanswered calls on the fourth or fifth ring. This ensures that the Corporate voice messaging system will pick up all unanswered calls before the Cellular voice mail system does.

If the user cannot set the number of rings on the cell phone by themselves, he or she should contact the Cellular Service Provider for assistance. The user should request at least one more ring than his or her office number to ensure that the Corporate voice messaging system picks up messages.

⇒ NOTE:

If the user is using the cell phone exclusively for business purposes, he or she can request that Cellular voice mail be turned off (disabled) by the Service Provider.

If you wish to change the number of rings on the office number as part of the solution, type **change coverage path n** on the System Administration Terminal and modify the values in the **Number of Rings** field.

Preventing Messages from Automatically Going to Cellular Voice Mail

Most Cellular Service Providers route calls automatically to their own voice mail systems when a cell phone is turned off or in an out of coverage area.

To prevent work-related calls from being automatically routed to the users' Cellular voice mail system, tell them that they must **disable EC500 before shutting down their cell phone**. Incoming calls to their office number will then be routed to the Corporate voice messaging system, while personal calls will continue to be picked up by their Cellular voice mail system.

“Notify Me” under Unified Messenger® for MS Exchange®

If users have access to the “Notify Me” feature of Unified Messenger for Microsoft Exchange (Version 4.0 or later), they are notified of messages in their Corporate voice mailbox via their cell phone's display. For more information on using this feature see “Setting Notify Me” in the *Unified Messenger Telephone User Interface Online Guide*, accessed via:

<http://support.avaya.com>

 **NOTE:**

The cell phone must support text messaging to use this feature.

Chapter 4: Installation and Administration Test

4

Introduction

Once EC500 has been administered, use the installation test procedures in this chapter to ensure that the EC500 solution performs as expected. The EC500 installation test and customer acceptance procedures follow the same guidelines used for testing a new station added to the switch. However, a review of the basic test procedures is provided in this chapter.

Test Procedures

When performing these tests, it may be necessary to place several calls to the cell phone.

1. Using a Touch Tone telephone, dial the number of the user's main extension - to ensure simultaneous ringing of the user's office number and cell phone.
2. Once the cell phone begins to ring, check the following:
 - Check the cell phone's display panel to ensure 10 digit ANI is passed.
 - Do not answer the call and verify that the call covers to the user's primary voice mail account (usually the Corporate office voice mail box). If the call doesn't cover properly, the Avaya installation team, or technician, needs to review the coverage path number of rings and setup for corporate voice mail coverage. It also may be necessary to experiment with the number of rings set at the Cellular Service Provider and in the office number coverage path to get the desired voice mail coverage. See [Voice Mail Administration](#), in Chapter 3.
3. To test whether the cell phone's second call appearance is in service, follow these steps:
 - Using a Touch Tone telephone, dial the user's main extension.

- Begin your "test" conversation by answering the call ringing on the cell phone.
- With the test conversation in place and active, place another call to the user's main extension. The call should ring at the second call appearance on the main extension, as well as at the cell phone. Also, the cell phone's display screen should show the second incoming call. Using the Service Provider's call waiting feature, answer the second call.

If any of the test procedures fail, depending on the problem encountered, the installation team needs to double check that all administration entries were input correctly. If they are administered correctly, [Chapter 6: Troubleshooting](#), for further problem resolution procedures.

Introduction

EC500 Release 2 introduces busy out and release maintenance capabilities for XMOBILE stations. Regardless of the in-use state of an XMOBILE station, maintenance commands to busy out and release the XMOBILE stations can be issued by authorized System Administrators on the Avaya Communications Server System Administration Terminal. This chapter describes these maintenance commands.

EC500 does not require any changes to trunk maintenance. When XMOBILE stations are active on a call no maintenance testing is performed, although a hardware connection exists along the ISDN-PRI or H.323 IP port and the trunk media to the cell phone system.

XMOBILE Station Maintenance (Busy Out and Release)

The following are the principal uses of the busy out and release maintenance commands:

1. If an EC500 XMOBILE station hangs in an error state that cannot be cleared by ending the call with the 'end call' button on the handset, the System Administrator must issue the **busyout station <XMOBILE extension>** command followed by the **release station <XMOBILE extension>** command.

This resets and clears all associated switch resources and drops the connection between the switch and the handset.

2. The System Technician/Administrator is able to release any previously busied out XMOBILE station using the **release station <XMOBILE extension>**. The service state of the XMOBILE station is then restored to In-Service.

3. If a mapped cell phone becomes lost or stolen, the System Administrator can issue the `busyout station <XMOBILE extension>` to all associated XMOBILE extensions to prevent unauthorized access to the Avaya Communications Server. This is a temporary solution since translation reload results in clearing the busied out service state and makes the cell phone available. In addition, the System Administrator should disable EC500 for the station. See [Chapter 6: Troubleshooting](#) for further information.

The XMOBILE station busy out command on the System Administration Terminal is available to System Technicians and Administrators. When successfully issued, the following conditions exist for the busied out XMOBILE station:

- No new calls (incoming or outgoing) are delivered to the cell phone via the switch. It does not affect the operation of the cell phone with regard to incoming calls from its Service Provider.
- All existing connections that exist over the links associated with the business connection are torn down and the connected parties dropped from their call.
- The service state is set to Out-Of-Service on the status station form.

Busied out XMOBILE service states are not retained across planned SPE interchanges on G3R only.

Busied out XMOBILE service states are not retained after severe system restarts (levels 3, 4, and 5).

The EC500 state is not impacted by the busy out and release commands. If enabled or disabled, it stays in that state regardless of the busy out state.

Command Descriptions

`busyout station <XMOBILE station extension>`

The busyout maintenance command puts the XMOBILE station into an “out-of-service” state and clears all switch resources used by the XMOBILE station, making the mapped cell phone unavailable to receive incoming calls from the Avaya Communications Server.

When the service state of an XMOBILE station changes from In-Service to Out-of-Service, error type 18 is logged in the error log against the XMOBILE station and a warning alarm is raised and logged in the alarm log. Once busied out, all subsequent requests to busy out the XMOBILE station are aborted.

`release station <XMOBILE extension>`

The release maintenance command puts the XMOBILE station into an “in-service” state, making it available for incoming calls. The warning alarm for the previously busied out station is cleared.

When the service state of an XMOBILE station changes from Out-of-Service to In-Service, error type 18 is removed from the error log and the warning alarm is removed from the alarm log. Once released, all subsequent requests to release the XMOBILE station are aborted. The mapped cell phone is now available to receive incoming EC500 calls.

Display Errors/Alarms

LED's are not used to indicate the service state of XMOBILE stations because no circuit pack is associated with an XMOBILE station. No visual change is observed on the mapped cell phone when the XMOBILE station for that set is busied out.

The **display errors** and **display alarms** maintenance commands on the System Administration Terminal show the errors and alarms logged against busied out XMOBILE stations.

System Restarts

The current service state for an XMOBILE station is preserved for system restarts at levels 1 and 2.

XMOBILE station service states are not saved for system restart levels 3, 4, and 5 and the service state for all administered XMOBILE stations is reset to the In-Service state after the switch is successfully rebooted following the restarts.

Status Station Command

```
status station <XMOBILE extension>
```

The **status station** maintenance command is used to view the service state of the XMOBILE station.

The EC500 state is shown on the status station **<XMOBILE extension>** screen for Dual and Multiple Bridge EC500 XMOBILE stations.

- When EC500 is disabled, two asterisks (“**”) are displayed in the **CF Destination Ext:** field.
- When EC500 is enabled, the “**” are removed and the **CF Destination Ext:** field does not show any entries.
- When a new EC500 XMOBILE station is added, the station comes up in the disabled state. However, in this case, the status station command will not show any “**”s in the **CF Destination Ext:** field

Chapter 6: Troubleshooting

6

Introduction

This chapter describes problems that may occur during operation of the EC500 solution and possible ways of resolving these problems.

Error Conditions

Most problems reported by users of EC500 are likely not to be problems with EC500 itself. In most cases, they are caused by user confusion due to unexpected interaction between the Cellular Service Provider and EC500 features.

Below is a recommended troubleshooting procedure to follow when users cannot receive EC500 calls on their cell phones. In addition, Table 6-1 identifies other possible problems that might be encountered during operation of EC500. See [Chapter 4: Installation and Administration Test](#), for test procedures to verify the connection to the cell phone.

Users Cannot Receive EC500 Calls on Their Cell Phones

If an EC500 user is not able to receive EC500 calls on the cell phone, follow these procedures in the suggested order to isolate and fix the problem. After each step, you may want to verify that the problem has been fixed by making an EC500 call to the mapped cell phone.

1. Verify that you can call the cell phone from the switch. This also verifies that the user's service contract with the Cellular Service Provider (CSP) is active, and that the user gets good coverage in that area.

Check this by making a direct call to the cell phone's published number. When making this test call, wait until the call rings the cell phone (which verifies that there is coverage), or until the call goes to the CSP's voice mail (which verifies that the service is provided but there may not be good coverage).

2. Use the **status station** command for the principal number that the XMOBILE is bridged to and verify that SAC or Call Forwarding has not been activated on the principal extension.
3. Use the **status station <XMOBILE extension>** command to check the following:
 - The service state is "in service/idle." If not, use the **release <XMOBILE extension>** command to put it back in the active state.
 - The EC500 state is enabled, by verifying that the **CF Destination Ext:** field is blank. If EC500 is disabled, you will see the designated CF destination or, if the XMOBILE extension is bridged, two asterisks (**) in this field. (An exception is a newly disabled state, without the asterisks appearing on the Status Station screen.) If EC500 is disabled, ask the user to enable EC500 for the principal office number.
4. On the XMOBILE Station screen verify that the entries in the **Mobility Trunk Group**, **Dial Prefix**, and **Cell Phone Number** fields are correct as specified in [Chapter 3: Administration](#).
5. Enter the **status trunk <trunk group number>** command for both the inbound and outbound trunks in the loop back arrangement and verify that the trunk ports are in service, and that there are enough ports for the projected EC500 traffic needs; that is, not all ports are in an active state.

If all (or most) ports are active you may need to administer more trunk ports.

If the trunk ports are in an out-of-service state:

- Verify that the trunk administration is correct, as specified in [Chapter 3: Administration](#).
- Check the yellow LED on the circuit packs used in the loop back arrangement.
 - If the yellow LED is ON but the trunk is down, do a **test board long clear <ppcss>** for both the trunks in the loop back arrangement. If this does not fix the problem, continue with the procedures in the next step, Perform Hardware Checks.
 - If the yellow LED is OFF, continue with the procedures in the next step, Perform hardware Checks.
- Perform hardware checks:
 - If using DS1 loop back:
 - If amphenol connector is being used:
 - Verify that the loop back cable is properly cross-connected as specified in [Chapter 2: Installation and Planning](#).

- If the connection is correct, the problem could be a bad cable. Replace the cable.
- If a D8W connector is being used:
 - Verify that it is connected to Slot 8 of the Type 356A connector.
 - If the above check is OK, the cause of the problem could be a bad cable. Replace the cable.
 - The cause of the problem could also be that the 356A connector is bad. Replace the connector.

If using H.323 IP trunks for the loop back arrangement:

- Verify that the administration is as specified in Chapter 3: Administration.
 - Busy out and release the two signalling groups associated with EC500 loopback.
 - See maintenance documentation that can be obtained from the web site:
http://prodpubs.avaya.com/final/definity/r9.5/233758_3.pdf
6. Check the **COR** of the inbound trunk in the loop back arrangement and verify that the trunk does not have calling restrictions, that it is not outward restricted, and that its Facility Restriction Level (FRL) is sufficient to access an external ISDN trunk facility. If any such problems are found, administer the right **COR** for that trunk.
 7. Check the ARS Analysis table and make sure that there is an entry to route the cell phone number over an ISDN trunk on the switch.

If the problem cannot be corrected by following the above procedure, or those listed in the chart below, escalate the issue to an Avaya technician. In addition to the checks listed above, verify with the technician that the EC500 XMOBILE station is not restricted from receiving incoming calls.

Figure 6-1. Error Conditions in the Operation of EC500

Situation	Possible Cause(s)	Suggested Action or Resolution
Users cannot receive EC500 calls on their cell phones.	See the procedure at the beginning of this chapter, <u>Users Cannot Receive EC500 Calls on Their Cell Phones</u> for detailed information on possible sources of the problem.	See the procedure at the beginning of this chapter, <u>Users Cannot Receive EC500 Calls on Their Cell Phones</u> for detailed instructions on troubleshooting this problem.
The user reports that all calls go directly to the cellular voice mail, but the cell phone is on and working fine.	Both XMOBILE extensions may be bridged to the same line appearance on the principal phone.	Make sure that both XMOBILE extensions are not bridged to the same line appearance on the principal phone.
The user reports that voice mail messages are not going to the mailbox of choice.	Incoming calls to an office number are usually routed to the resident AUDIX voice mail after a pre-determined number of rings. For cell phone calls, the same functionality exists from the Service Provider. At this time there is no way to coordinate the two different voice mail systems using EC500.	It is possible to set up the number of rings before coverage answers so that one or the other voice mail systems always answers first. Users may need to contact their Cellular Service Provider to change the number of rings at their cell phone. However, there are coverage options in both the Avaya Communications Server (busy, active, send-all-calls) and the network (cell phone unavailable, network congested) that cause a call to immediately go to the respective voice mail. Users should realize that an unanswered call could result in a voice mail message in either mailbox.

Situation	Possible Cause(s)	Suggested Action or Resolution
<p>The user reports that he or she is missing calls at the office number because the cell phone voice mail is picking up the call instead.</p>	<p>The user has turned off the cell phone or the phone is in an out of coverage area. When this is the case, Service Providers usually have the calls routed to voice mail automatically. There is no way to control this with EC500.</p>	<p>It is recommended that EC500 be disabled prior to leaving a coverage area or turning off the cell phone. This allows the user to pick up the call on the office number or let the Corporate voice mail answer the calls.</p>
	<p>Both XMOBILEs are bridged to the same line appearance on the principal phone.</p>	<p>Check that the first XMOBILE is bridged to the first line appearance and the second XMOBILE is bridged to the second line appearance.</p>
<p>The user reports that the cell phone is not receiving caller identification numbers for calls from the Avaya Communications Server, while the office number that the cell phone is bridged to does.</p>	<p>The Avaya Communications Server has not been administered properly for sending 10-digit caller identification numbers. Most Service Providers require a 10-digit number.</p>	<p>1) Recheck the outbound trunk screen to make sure send calling is set to yes. 2) Recheck the inbound trunk screen and make sure the numbering format field on the inbound loop back trunk is set to nat1-pub.</p>
	<p>External trunks serving the cell phone are using a non-ISDN trunk.</p>	<p>Change the routing administration to route over an ISDN trunk.</p>
	<p>There is an incorrect entry on the ISDN public-unknown numbering screen.</p>	<p>Verify that the entries on the ISDN public-unknown numbering screen are correct.</p>

Situation	Possible Cause(s)	Suggested Action or Resolution
The user reports that the cell phone is receiving a switch default caller identification number for calls from the Avaya Communications Server.	The ISDN Service Provider (SP) is replacing the caller identification with a fixed Caller ID.	Escalate the issue to your Telecom Manager who may contact your ISDN SP to request that this be fixed or find an alternate ISDN SP that allows the caller identification to pass.
	The switch is blocking the outgoing caller identification and is passing a default Caller ID.	Change your switch administration to allow caller identification to go outside the switch.
The user hears a beep while on a call originating from the Avaya Communications Server, but is not able to use the call waiting feature on the cell phone to switch to the other call.	Most likely the user is hearing the tone provided by the Avaya Communications Server when call waiting is enabled at the switch.	You have two possibilities: 1) communicate to the user that when a call waiting indication is heard, but the user can't switch the call, he or she needs to hang up on the first call in order to receive the call, OR 2) disable call waiting at the switch level and the regular call waiting capability provided by the Cellular Service Provider then handles the call waiting feature.

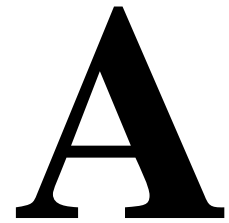
Terminal Error Codes

When the service state of an XMOBILE station changes from In-Service to Out-of-Service, error type 18 is logged in the error log against the XMOBILE station and a warning alarm is raised and logged in the alarm log.

When the service state of an XMOBILE station changes from Out-of-Service to In-Service, error type 18 is removed from the error log and the warning alarm is removed from the alarm log.

See [Chapter 5: Maintenance](#) for more information on busy out and release maintenance commands.

Appendix A: Avaya EC500 - Other Configurations



EC500 provides the ability to operate a cellular or other remote phone as a standard, Caller ID enabled telephone connected directly to the Avaya Communications Server. Dual Bridge Mode, which provides two call appearances to map a cell phone with Call Waiting as part of its cellular service contract to an office number, is the most commonly implemented mode. Single Bridge Mode is a variation on this implementation. In this configuration only one call appearance on the cell phone is bridged to the office number.

Other possible customer configurations are:

Multiple Bridge Mode - Some users may want to bridge their home or other office number, as well as their cell phone, to their principal office number. This might require three or more extensions on the Avaya Communications Server.

Dual Bridge (using AWOH) - For users who do not require a physical on-site office number, the cell phone can be bridged to an Administration Without Hardware (AWOH) extension. In this way the user still has an enterprise presence for incoming business calls via the cell phone.

Standalone Mode - This configuration provides a single phone to be used as a member of a hunt group or coverage group, or possibly an Automatic Call Distribution (ACD) system. For call waiting, administer a second standalone XMOBILE station which is mapped to the same cell phone. Set the station hunting field to the extension of the first XMOBILE station. Note that the two XMOBILE stations must be enabled and disabled independently.

In general the installation, administration, and maintenance of these modes are identical to what is described in this guide for the Dual Bridge Mode because the loop trunk administration and XMOBILE station administration use the same procedures.

The following are considerations for these different configurations.

For **Multiple Bridge Mode** the user may want to enable and disable each XMOBILE station extension individually. If so, the user needs to be told the extension number and Station Security Code of each XMOBILE station.

For Standalone mode:

- A local user wishing to call the XMOBILE station may activate automatic callback towards it. When the cell phone ends its call, the automatic callback feature works normally. (It calls the local user and then the cell phone).
- If the standalone cellular is part of an ACD split or skill, system measurements show that the call has been answered.
- Although XMOBILE stations may be administered in ACD splits and skills, there is no way to invoke ACD Feature Access Codes from the cell phone. Therefore, the XMOBILE station must be logged in via another means such as:
 - Administration of an office number as a bridge of the XMOBILE.
 - A computer telephone interface.
 - Auto available splits.
- Use of auto available splits is an option. Note that service observing is not possible on the cell phone.
- Although an XMOBILE station can be administered for call waiting (independent of the Cellular Service Provider's call waiting capability), use of this is not recommended because of its limitations and potential for confusion to the user. For Avaya Communications Server-based call waiting there is no way to retrieve the waiting call other than ending the current one.

Enabling/Disabling Individual EC500 Bridged Extensions

Enabling and disabling EC500 is accomplished using EC500 Enable and Disable Feature Access Codes. These and Station Security Codes need to be set through the System Administration Terminal and then communicated to the users. See [Chapter 3: Administration](#) for procedures to set up these Codes).

Using these codes, the typical EC500 user (Dual Bridge Mode) can disable or enable all XMOBILE stations associated with his or her office number at the same time. However, for other configurations, as described in this appendix, users may wish to enable and disable each EC500 extension individually. Note that the initial state of an EC500 administered extension is always disabled.

The typical user will disable and enable all cell phone mapped XMOBILE Stations at once using his or her office number and the Station Security Code associated with that office number. *In order to enable and disable **individual extensions** the user needs to have the extension number and Station Security Code for **each** cell phone mapped XMOBILE Station.*

Individual extensions can be enabled and disabled in the following ways:

- A user wishes to enable or disable the cell phone mapped XMOBILE station at **an internal extension**. The user enters the following in sequence:
 1. The EC500 Enable Feature Access Code or Disable Feature Access Code.
 2. The extension number of the cell phone mapped XMOBILE Station, followed by #.
 3. The Station Security Code assigned to the mapped XMOBILE Station.
 4. A final #.

The user receives either a confirmation or an intercept tone depending upon the success or failure of the procedure.

- A user wishes to enable or disable cell phone mapped XMOBILE stations **from any phone in the external network**. Whether it's the user's cell phone or another phone does not make a difference in this procedure. The user enters the following in sequence:
 1. The Avaya EC500 Access Number (Telecommuting Access Number). The user should receive a dial tone.
 2. The EC500 Enable Feature Access Code or Disable Feature Access Code.
 3. The extension number of the cell phone mapped XMOBILE Station, followed by #.
 4. The Station Security Code assigned to the mapped XMOBILE Station.
 5. A final #.

The user receives either a confirmation or an intercept tone depending upon the success or failure of the procedure.

These procedures must be repeated for each cell phone mapped XMOBILE Station that the user wishes to enable or disable.

Appendix B: R1 and R2 Interoperability

B

Release 2 EC500 can be administered and operated concurrently with Release 1. You can continue to support users with Release 1 as you add users with Release 2, or you may choose to upgrade all users to Release 2.

New features in Release 2 are:

- Increased capacity for EC500 users.
- Busy out and release maintenance features for XMOBILE stations.
- Access codes to simplify enabling and disabling EC500.
- H.323 IP Trunking.

The most significant new feature to the user is the new enabling/disabling functionality which allows the user to enable or disable all bridged extensions with one phone call. Using this primary method of enabling/disabling avoids the need for the user to remember multiple extension numbers and for the user to make an individual call to enable/disable each extension. Users still retain the ability to enable/disable extensions individually, as long as you communicate the XMOBILE station extension number assigned to each bridged extension as well as the office number Station Security Code to them.

To enable EC500 R1 functionality, the following must be set on the System-Parameters Customer-Options screen via the System Administration Terminal:

1. The G3 version must be set to V9.
2. The customer option **Maximum XMOBILE Stations** must be greater than zero.
3. The **Extended Cvg/Fwd Admin** field must be set to **y**.

To enable the additional EC500 R2 functionality, the preceding must be set, as well as the following:

1. The **Enhanced EC500** customer option must be set to **y**.
2. If you are using H.323 IP trunks for EC500, **h. 323 trunks** must be set to **y**.

For information on installation and administration of Release 1 of EC500, see *Avaya EC500 Extension to Cellular Installation/Administration Guide*, Issue 1, February 8, 2001.

Glossary

A

Administration Without Hardware (AWOH)

A station that is administered with out a dedicated, physical set.

ATM-CES

Asynchronous Transfer Mode - Circuit Emulation Service. This is a trunk capability that supports the equivalent of 8 ISDN interfaces over a single facility. Each interface may have as many as 30 channels.

Automatic Route Selection (ARS)

A table-based routing feature used to select a trunk for public network routing.

Avaya Communications Server

Avaya Communications Server includes the DEFINITY® ECS and the IP600 Communication Server.

Avaya EC500 Access Number

The Telecommuting Access Number. The number used to dial into the Avaya Communications Server to allow enabling/disabling EC500 and changing the Station Security Code.

Avaya EC500 Call

Call to an extension on the Avaya Communications server (either the principal extension in a bridging scenario, or the XMOBILE station that maps to a cell phone in a standalone scenario) that results in alerting the associated cell phone.

Avaya EC500 Extension to Cellular

The feature that allows integration of cell phones under the control of a public cell phone Service Provider with the Avaya Communications Server.

Avaya EC500 Extension

The extension number of the XMOBILE on the Avaya Communications Server that maps each line appearance of the office number to the cell phone.

B

Basic Rate Interface (BRI)

A digital message-based protocol intended primarily for the control of advanced telephone sets although it is also used in some countries for trunking.

C

Class of Restrictions (COR)

A group of attributes that affect the calling capabilities of stations and trunks.

Corporate Voice Mail

The voice mail system provided by the user's Telecom Department. Typically this will be AUDIX. There is no current way to coordinate this voice mail with the Service Provider's voice mail.

D

DEFINITY

An Avaya, Inc. telephone system -- referred to as a "switch."

Dial Prefix

Any number that might be required for dialing besides the cell phone number itself. For example, 01 for U.S. domestic long distance, or 011 for international cell phone numbers.

Direct Inward Calling (DID)

A feature whereby extensions are associated with numbers in the national numbering plan so that they may be directly dialed from outside of the Avaya ECS.

Disable

Deactivate EC500 using the EC500 Disable Feature Access Code.

E

ECLIPS

Enterprise Class IP Solutions that includes the IP600 Communication Server.

Enable

Activate EC500 using the EC500 Enable Feature Access Code.

EC500

See Avaya EC500 Extension to Cellular.

F

Feature Access Code (FAC)

A pre-administered dial sequence that performs a feature operation.

I

In-Service

A station has been administered and is in normal operation mode.

Internet Protocol (IP)

A suite of information exchanged message sets widely used for data transmission and increasingly used for transmission of voice.

ISDN Trunk

This is a trunk (group) that uses a form of message-based signaling (Q.931) over a dedicated control channel. There are different types of ISDN trunks that are distinguished by the type of carrier medium used: PRI/BRI, IP, or ATM-CES.

M

Mobility Trunk Group

A field on the XMOBILE station form containing the group number of the outbound loop back trunk group associated with the XMOBILE stations. All active calls at the XMOBILE station use members of this trunk group.

O

Out-of-Service

The station is out of service due to a busy out action issued by a system technician/system administrator. No calls can be placed or received while in this state.

P

PHS (Personal Handy-phone Service)

This is a widely used standard for mobile telephony in Japan used in public and business offers. It is supported as an X-Mobility special application on the Avaya ECS.

PRI (Primary Rate Interface)

A digital message-based protocol intended primarily for the control of advanced digital trunks although it is also used for end points requiring high bandwidth.

Principal Extension

In a bridging arrangement, the station whose extension is primary and identifies the entire bridge.

S

Service Provider

A company that supplies cell phone service to a particular area. EC500 is Service Provider independent.

Station Security Code

The security code assigned to each station for enabling and disabling EC500. The System Administrator supplies this number.

T

Telecommuting Access Number

The Avaya EC500 Access Number. The number used to dial into the Avaya Communications Server to allow enabling/disabling EC500 and changing the Station Security Code.

Text Messaging

A facility provided in many cell phones which allows the user to receive short text messages on the display of the phone. The receipt of the message is often accompanied by an audible alert and the user can then display, delete, or save the message. This facility is sometimes referred to as Short Message Services (SMS).

U

Unified Messenger[®] for MS Exchange[®]

A software application that consolidates voice, email and fax messages into one mailbox. When combined with EC500, provides a text message via the cell (or other remote) phone's display screen to notify users of messages in their Corporate voice messaging system. Applies only to EC500 users with Unified Messenger's "Notify Me" feature installed on their office phone system.

User

Any person who uses a cell or other remote phone as an EC500 bridge to the Avaya Communications Server.

X

X-Mobility

An Avaya Communications Server feature that supports an off-premise extension via an ISDN trunk connection. This feature is built upon the Administration Without Hardware (AWOH) feature. The station type administered is XMOBILE, also called the XMOBILE station.

Index

Numerics

356A adapters 2-3

A

ACD split and skill 6

Administration

 Outbound ISDN-PRI trunk administration 3-4
administration 337

 H.323 IP trunks 3-17

 Inbound ISDN-PRI trunks 3-10

 Outbound H.323 IP trunks 3-20

 testing 4-1

 voicemail 3-37

 XMOBILE Stations 3-30, 3-33

Administration planning 2-5

administration tasks 3-1

Administration Without Hardware 1-1, GL-1, 5

alarms 5-3

amphenol connectors 2-2

ARS 2-4, GL-1

ARS Analysis 3-3, 6-3

auto available splits A-2

automatic call back A-1

automatic callback A-2

Avaya Communications Server GL-1

Avaya EC500 Access Number 2-5, 3-35

Avaya EC500 Enable/Disable Feature Access
Codes 3-36

AWOH GL-1, A-1

B

busy out 5-1

busy out station command 5-1

C

Call Identification 1-3

Call Waiting 1-3

call waiting A-1

Caller ID 1-3, 3-34

capacity limitations 1-6

cell phone

 initial state 3-30

Cell Phone Number 3-31

Cellular Service Provider 1-1

Change Feature Access Code, Station Security
Code 3-29

Change Station Security Code Feature Access
Code 2-5

CLAN 3-3

command

 display alarms 5-3

 display errors 5-3

 status station 5-3

coverage group A-1

D

D8W connector 2-2

Dial Plan 2-5

Dial Prefix 3-31

display alarms 5-3

display alarms command 5-3

display errors 5-3

display errors command 5-3

DS1 boards 1-4

Dual Bridge Mode 1-1

E

EC500 Activation/Deactivation 2-5

EC500 Enable/Disable Feature Access Codes 2-5,
3-36

Enable/Disable Feature Access Codes 3-36

Enabling and Disabling EC500 1-3, 1-8, A-1
enabling and disabling individual extensions A-1
Enhanced EC500 2-4
error conditions 6-1
Extended Cvg/Fwd Admin 2-4

F

Feature Access Codes 3-36
Feature Description 1-2
Feature Implementation 1-4
Feature Interactions 1-10

- Cellular Service Provider 1-10
- Distinctive Alerting 1-10
- Feature Access Codes 1-10
- Message Waiting Indication 1-11
- Unified Messenger 1-11

G

G3 Version 2-4

H

H.323 IP Trunk Administration 3-17

- Inbound 3-24
- Outbound 3-20

H.323 Trunks 1-2, 1-4, 2-4, 3-3, 3-17
hardware checks 6-2
hardware requirements 1-2, 2-1
hunt group A-1

I

Inbound H.323 IP Trunk Administration 3-24
Inbound ISDN-PRI Trunk Administration 3-10
"init" login 3-2
installation 2-1

- H.323 IP Trunks 2-2

IP loop back cards 2-3
ISDN-PRI DS1 Packs 2-2
ISDN-PRI trunks 2-2
loop back trunks 2-2
setting customer options 2-3
testing 4-1

installation test 4-1
interoperability B-1
IP boards 1-6
ISDN trunks 3-3
ISDN-PRI 2-4
ISDN-PRI Trunk Administration 3-3

- Inbound 3-10
- Outbound 3-4

ISDN-PRI trunks 1-2, 1-4

L

loop back trunks 1-4

M

maintenance 5-1

- busy out 5-1
- release 5-1

Mapping Mode 3-31
Maximum Administered IP Trunks field 2-4
Maximum XMOBILE Stations 2-4
MEDPRO 3-3
Mobility Trunk Group field 3-3
Multiple Bridge Mode A-1

O

Outbound H.323 IP Trunk Administration 3-20
Outbound ISDN-PRI Trunk Administration 3-4

P

planning 2-5
 Avaya EC500 Access Number 2-5
 Change Station Security Code Feature Access Code 2-5
 Dial Plan 2-5
 EC500 Enable/Disable Feature Access Codes 2-5
 Enabling and Disabling Feature Access Codes 2-6
 requirements 2-5
 Station Security Code 2-5
 Telecommuting Access Number 2-5
platforms 2-1
platforms supported 1-2

R

release 5-1
Release 1 and Release 2 interoperability B-1
release station command 5-1
RJ45 connectors 2-2
routing for EC500 1-4
rrors 5-3

S

security 1-8, 3-29
Security Codes 2-6
 Avaya EC500 Access Number 2-6
 Station Security Codes
 Security Codes
 Station Security Code Change Feature Access Code 2-6
Standalone Mode A-1
Station Security Code 2-5, 3-29
Station Security Code Change Feature Access Code 3-29

status station command 5-3, 6-2
System-Parameters Customer-Options screen 3-2

T

Telecommuting Access Number 2-5, 335
test procedures 4-1
TN2303AP 1-6
TN799B 1-6
traffic engineering 1-6, 1-7
troubleshooting 6-1

U

UDS1 card 1-2
usage
 trunk 1-6
 XMOBILE stations 1-6

V

voice mail 1-3
 cellular service provider 1-10
voicemail 3-37

X

XMOBILE Station 3-3
XMOBILE station 5-3
XMOBILE Station Administration 3-30, 3-33
XMOBILE Stations
 busy out 5-1
 Dial Plan 2-5
 enabling/disabling individual extensions A-2
 maintenance 5-1
 release 5-1
X-Mobility 1-4
X-Mobility Outbound and Inbound Trunk Administration 3-3

