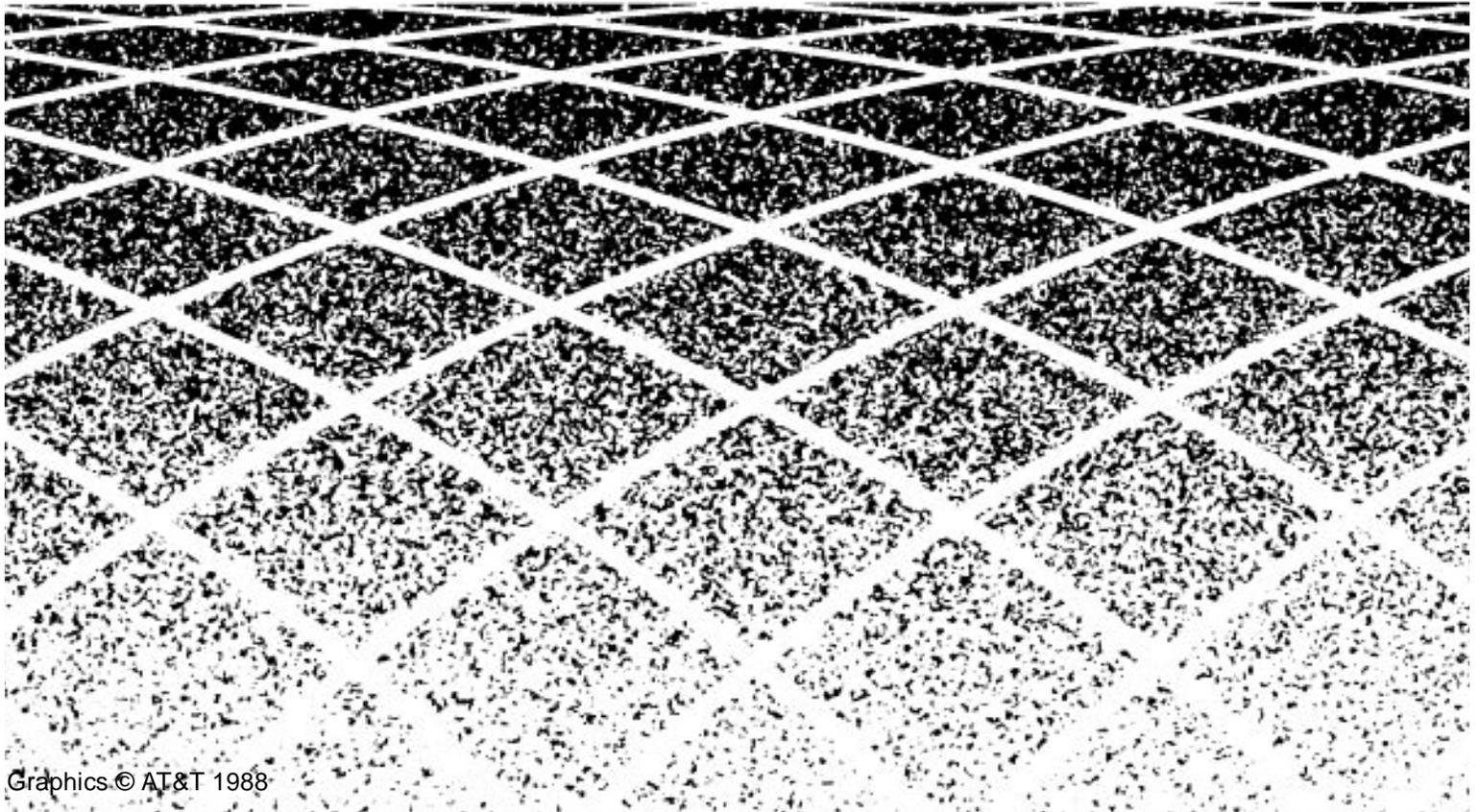




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DEFINITY Enterprise Communications Server Release 5 Overview



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About This Book

What is the Purpose of This Book?

This book provides general information about the components and capabilities of the DEFINITY[®] Enterprise Communications Server (referred to as DEFINITY ECS or the system). It also discusses practical and creative applications for the DEFINITY ECS platform.

Who Should Read This Book?

This book is written for those who are considering the purchase of a DEFINITY ECS system and for Lucent Technologies representatives and distributors who need high-level information about the system and how it can be used.

What Is In This Book?

This book discusses all DEFINITY capabilities available world-wide. It defines common, practical solutions and suggests unusual, creative ones.



NOTE:

Some products are unavailable in some countries. Please check with your local distributor for further information about which features and Solutions are available to you.

This overview of DEFINITY ECS is composed of the following chapters:

- *Chapter 1, "Introduction"*— outlines basic advantages, capabilities, hardware and software components and system configurations.

- *Chapter 2, "Industry Applications"*— discusses how DEFINITY ECS meets the communications requirements of several example industries.
- *Chapter 3, "Call Center Solutions"* — discusses features that help you set up and manage an efficient call center.
- *Chapter 4, "Computer-Telephone Integration Solutions"* — discusses features that merge computer and telephone functions.
- *Chapter 5, "Mobility Solutions"* — discusses products and features that allow you to keep in touch with colleagues and clients while moving about freely inside and outside the workplace.
- *Chapter 6, "Telecommuting Solutions"* — discusses features and products that allow you and your associates to work effectively off-site.
- *Chapter 7, "Data Management Solutions"* — discusses features that help you manage telecommunications information.
- *Chapter 8, "Desktop Solutions"* — discusses features that are available at your desktop computer or telephone.
- *Chapter 9, "Multimedia Solutions"* — discusses features that allow you to send and receive synchronized voice and image information.
- *Chapter 10, "Networking Solutions"* — discusses features that help you network your equipment and Solutions.
- *Chapter 11, "Service Upgrade Solutions"* — discusses the advantages inherent in the process of upgrading telephone service using DEFINITY ECS.
- *Chapter 12, "System Management Solutions"* — discusses the many ways in which you can manage the DEFINITY ECS and related systems.
- *Chapter 13, "Voice Processing Solutions"* — discusses DEFINITY ECS features that help you handle incoming and outgoing calls efficiently.
- *Appendix A, "Features"* — summarizes the features discussed in this book.
- *Appendix B, "System Capacity Limits"* — contains a table that lists the capacity of each feature.
- *Appendix C, "References"* — lists and describes additional DEFINITY ECS documents.

A glossary, list of abbreviations, and an index are also provided at the back of the book.

How Should I Use This Book?

You will probably want to read or skim the *Overview* chapter first to get a basic understanding of the DEFINITY system. The *Industry Applications* chapter is probably a good place to go next, because it discusses in general terms specific applications that may help you apply DEFINITY ECS creatively. It probably does

not describe your industry or situation exactly, but scanning several of the examples should help you generate ideas about similar solutions you might apply.

The more in-depth discussions of general applications in Chapters 3 through 12 will probably be of most benefit to you after you have been through the industry examples (Chapter 2). Read chapters 3 through 12 selectively, focusing on the solutions that suit your circumstances.

The back matter is composed of reference materials.

Company and Product Names

Lucent Technologies, Inc. is a new corporation composed of what were formerly the communications systems and technology units of AT&T. Thus, some products and services are attributed to AT&T and others are attributed to Lucent. The AT&T name and logo will continue to be replaced by the Lucent name and logo as the distinctions in products and purposes become clear. Thank you for your patience during the transition.

Additionally, DEFINITY Enterprise Communications Server (ECS) is a new name for what was formerly known as DEFINITY Generic 3 (G3). The new name more accurately reflects the expanded capabilities of the product as a distributed communications server. DEFINITY ECS Release 5, which will be generally available September 30, 1996, is the next major DEFINITY system release after DEFINITY Generic 3 Version 4.

Conventions Used in This Book

The following conventions are used in this book:

- The word “*system*” is a general term for the DEFINITY Enterprise Communications Server.
- The information in this book refers to DEFINITY ECS Release 5 unless otherwise specified.

Trademarks and Service Marks

The following are trademarks or registered trademarks of AT&T:

- AUDIX[®]
- Call Accounting System for Windows[®]
- CALLMASTER[®]
- CallVisor[™]
- CenterVu[™]

- Concorde 4500™
- CONVERSANT®
- DATAPHONE®
- DEFINITY®
- DIMENSION®
- FreeWorks™
- INTUITY™
- MEGACOM®
- MERLIN®
- MULTIQUEST®
- OneVision™
- Quorum™
- TELESEER®
- VOICE POWER®
- UNIX®
- Venue 2000™

The following are trademarks or registered trademarks of other companies:

- INFORMIX® (registered trademark of Informix Software, Inc.)
- MS-DOS® (registered trademark of the Microsoft Corporation)
- MicroSoft® (registered trademark of Microsoft Corporation)
- Windows™ (trademark of the Microsoft Corporation)
- Solaris™ (trademark of Sun Microsystems, Inc.)

Other References

Please see Appendix C for a detailed list of DEFINITY ECS documentation.

How Can I Order Other Books?

To obtain DEFINITY Communications System documentation, contact:

General Business Communications System Publications Fulfillment Center
PO Box 4100
Crawfordsville, Indiana 47933-3126
U. S. A.

+1-317-361-5353
+1-317-364-5355 Fax
(Central Standard Time Zone)

If you are in North America:
1-800-457-1235
1-800-457-1764 Fax

How Can I Make Comments About This book?

AT&T welcomes your feedback. Please fill out the reader comment card at the front of this manual and return it. Your comments are of great value and help improve our documentation.

If the reader comment card is missing, fax your comments to 303-538-1741, and mention this document's name and number, *DEFINITY Enterprise Communication Server Overview Release 5*, 555-230-024, Issue 2.

DEFINITY Enterprise Communications Server (ECS) organizes and routes voice, data, image and video transmissions (Figure 1-1). To streamline the handling of different types of data, the transmitted information is digitized (distilled into representative sequences). The system can also receive and transmit analog (undigitized) information, which is digitized internally by the system.

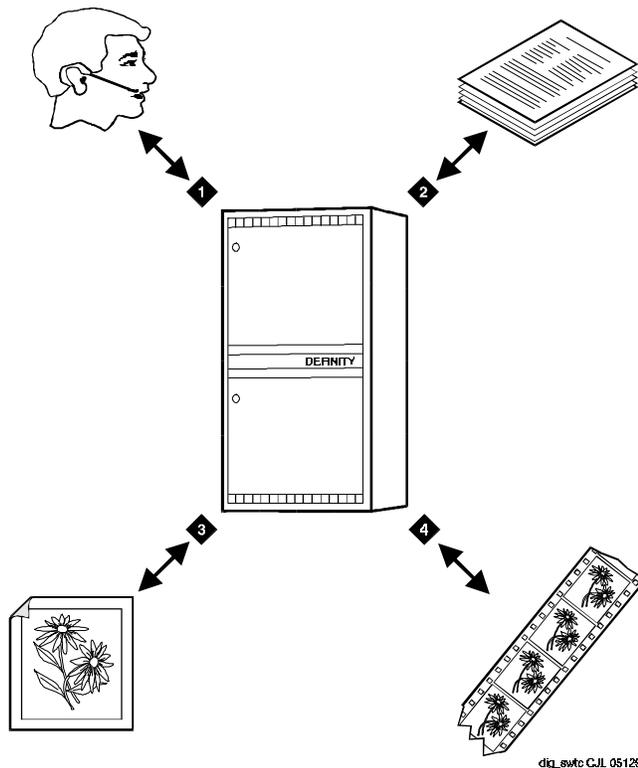
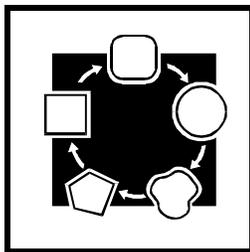


Figure 1-1. DEFINITY Enterprise Communications Server

DEFINITY ECS Advantages

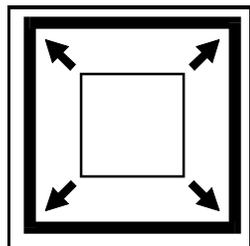
The DEFINITY DEFINITY ECS is the first truly global multimedia platform. It handles multimedia traffic as efficiently as any system available, while its state-of-the-art design further enhances AT&T and Lucent Technologies' reputation for world-class reliability. The system not only accommodates but also integrates most related equipment throughout the world. Its modular design anticipates growth and change. All this translates to an exciting array of practical and creative applications for your business.

Adaptable



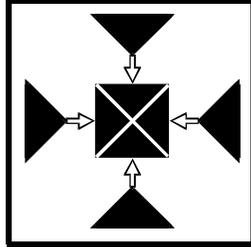
DEFINITY ECS's open architecture and modular design make it compatible with a wide variety of hardware and software—both Lucent tools and tools from other vendors. These may include personal and shared computers, terminals, computer networks, telephones, fax machines, and multimedia equipment. Multilingual options are available for messaging, call-related displays, and many related applications. The system was designed to accommodate existing and anticipated global communications standards and protocols. It is adaptable to varying standards world-wide, providing efficient service even when connected to conventional networks.

Expandable



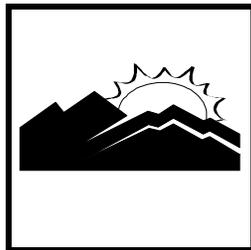
Modular port circuits, carriers (circuit shelves), and cabinets can be added to accommodate growth. Each DEFINITY ECS can also be networked to additional systems (DEFINITY ECS or other types) to service many simultaneous voice, data, image and video transmissions. These networks can be either centralized or geographically widespread. Regardless of configuration, the system is always expandable, always for moderate incremental cost. DEFINITY ECS makes available a seamless array of options designed to anticipate growth and change in your business.

Integrating



Sometimes the most important function of the DEFINITY ECS is its control and coordination of all your desktop tools and shared resources. It not only communicates with most networks and equipment throughout the world, but unifies them by translating protocols and standards as necessary. The system is designed to accommodate multimedia and network integration tools. It also offers many features that integrate computer and telephone. DEFINITY ECS's integrating capabilities and its association with many leading-edge tools make it a good investment for future growth. These attributes also enhance the value of your related investments.

Reliable/Recoverable



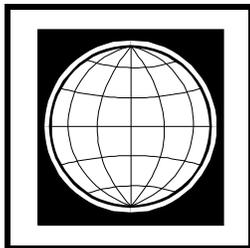
DEFINITY ECS is inherently reliable by design. That reliability can be enhanced by redundant configurations (see "Configuring for Reliability/Recoverability" in this chapter). Every essential component in the system is designed to be duplicated. For these reasons, adjacent systems (network, power supply, etc.) are far more likely than the DEFINITY ECS itself to fail. If something connected to the system should fail, the DEFINITY ECS keeps working until those systems are restored. If the disturbance is great enough that the DEFINITY ECS is also disabled, the system's modular design provides you many options for getting your communications back into service quickly.

State of the Art



DEFINITY ECS is the first telecommunications system to manage bandwidth precisely, which allows it to handle high bandwidth multimedia information while still conserving resources. It is also the first telecommunications system to use RISC (reduced instruction set computer) processors. The system is designed to accommodate anticipated innovations such as ATM (Asynchronous Transfer Mode).

DEFINITY ECS: A Global Multimedia Platform



DEFINITY ECS has been installed in more than 90 countries. It is the first truly global multimedia platform:

- It is compatible with a wide variety of tools, from group video systems to desktop network management applications and much more.
- It accommodates existing and emerging world-wide standards and protocols.
- Using bandwidth-on-demand, it provides the most efficient multimedia transmissions available.
- It offers multilingual options for many applications.
- It is designed to accommodate new innovations as they emerge.
- It is inherently reliable and provides many options for recovering quickly if disabled.
- It expands easily to accommodate your future needs.

World-class call features and multi-language displays and voice prompts speed your communications with customers and associates around the globe. Messaging services enhance communication and productivity within your organization and enable business transactions across multiple time zones. You can even have calls received after business hours relayed to an office still open for business in another part of the world. This saves the cost of round-the-clock staff and keeps your customers in touch with your best agents.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

International Capabilities

DEFINITY ECS provides features that allow for differences in telecommunication standards around the world, allowing you to use the same communications system at your various locations in other countries. If you are reading this book, it is likely that the system has been type approved in your country. Check with your local distributor for more information.

For more detailed information on the system's robust international capabilities, see the *DEFINITY ECS Release 5 System Description and Specifications*, 555-230-210 and *AT&T Network and Data Connectivity*, 555-025-201.

Hardware

Though the primary components are the same, your DEFINITY ECS can vary widely in size and appearance, depending on your capacity requirements. It may be as small as a single wall-mounted cabinet, or it may be as large as several tall cabinets linked together in the same room or even hundreds of kilometers apart. Regardless of configuration, however, the system's footprint is relatively small.

DEFINITY ECS's main hardware components are the Processor Port Network, the Expansion Port Network, and the optional Center Stage Switch.

Processor Port Network

The Processor Port Network is the central processing unit that supervises system operation. Every DEFINITY ECS has one Processor Port Network; it is often the only component in small systems.

Within the Processor Port Network is the Switch Processing Element, which is the command center for the system. The DEFINITY ECS switch processing element has a proven capacity of 130,000 to 250,000 calls per hour, depending on the size of the system. The performance you realize will depend on the call processing, administrative, and maintenance activities in which your system is engaged.

Expansion Port Network

Expansion Port Networks are used when the Processor Port Network grows past its physical port capacity or must serve geographically dispersed offices. They provide additional ports as needed. A system can have up to 43 Expansion Port Networks.

Center Stage Switch

The Center Stage Switch is a connection hub that provides port network communication. It is an essential component of a DEFINITY ECS configuration if the system is composed of more than three port networks. Often it is incorporated in smaller configurations to allow for growth. The Center Stage Switch consists of from one to three switch nodes. Switch nodes are composed of one or two switch node carriers, depending on whether the system is being duplicated for enhanced reliability. Each carrier can reside in the Processor Port Network cabinet or an Expansion Port Network cabinet. One switch node can accommodate up to 15 Expansion Port Networks.

Carriers and Cabinets

Carriers are enclosed shelves composed of vertical slots that hold circuit packs. Circuit packs make up the logic, memory, and switching circuitry for the system. Port circuit packs connect to telephones, computers, and communications lines. The carriers are designed to accept any type of port circuit pack in each circuit pack position.

Each cabinet contains at least one carrier. The circuit packs fit into connectors attached to the rear of the slots. Every connector is connected to signal buses and power supplies in the cabinet. The cabinets also house equipment that supplies power backup, ringing signal voltage, and mass storage for software translations.

There are three types of cabinets:

- Compact single-carrier cabinet. This cabinet, which can be mounted on a wall, houses small system configurations for small organizations. It contains one Processor Port Network and does not connect to any Expansion Port Networks.
- Single-carrier cabinet. These cabinets are modular and can be stacked up to four high. They are often used by small businesses that are growing or expect to grow.
- Multicarrier cabinet. A tall cabinet that contains up to five carriers. Multicarrier cabinets are used by large organizations that require larger configurations.

Compact Single-Carrier Cabinets

Figure 1-2 shows a compact single-carrier cabinet.

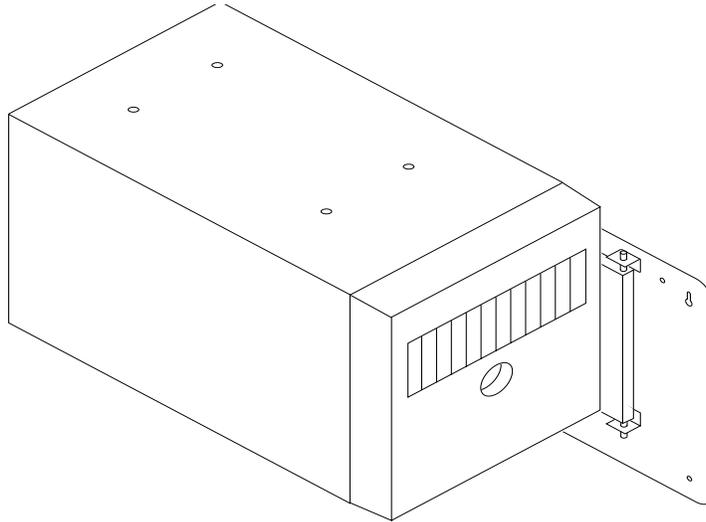


Figure 1-2. Compact Single-Carrier Cabinet

The compact single carrier cabinet has the following characteristics:

- It provides DEFINITY features and applications in a small package.
- It is the only cabinet required for small organizations.
- It can be mounted on a wall.
- It contains both dedicated and universal port slots: three dedicated control circuit packs and ten port slots.

The compact cabinet is designed to stand alone, so it is not used for high reliability configurations (See “Configuring for Reliability/Recoverability” in this chapter). It does not support Integrated Services Digital Network (ISDN) BRI, adjunct switch applications interface (ASAI), or Expansion Port Networks.

Single-Carrier Cabinets

Figure 1-3 shows a typical single-carrier cabinet.

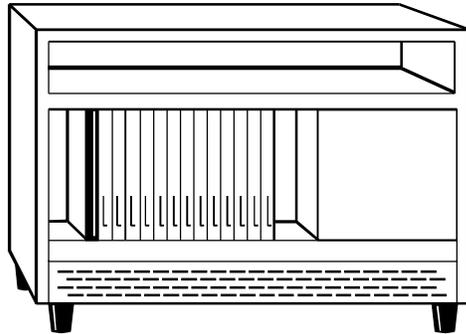


Figure 1-3. Typical Single-Carrier Cabinet

A maximum of four single-carrier cabinets can be stacked on top of each other to form a single Processor Port Network or Expansion Port Network. There are four types of single-carrier cabinets:

- Control cabinet (located in the Processor Port Network only), which contains ports, a control complex (for call processing), and an optional interface to a duplicated control cabinet.
- Duplicated control cabinet (optional and located only in the Processor Port Network), which contains a duplicated control complex, ports, and an interface to an expansion control cabinet.
- Expansion control cabinet (optional and located only in an Expansion Port Network), which contains ports, a tone-clock, an interface to a Processor Port Network cabinet, and a maintenance interface.
- Port cabinet (located in the Processor Port Network and in Expansion Port Networks), which contains ports and an interface to an expansion control cabinet.

Figure 1-4 shows a typical cabinet stack.

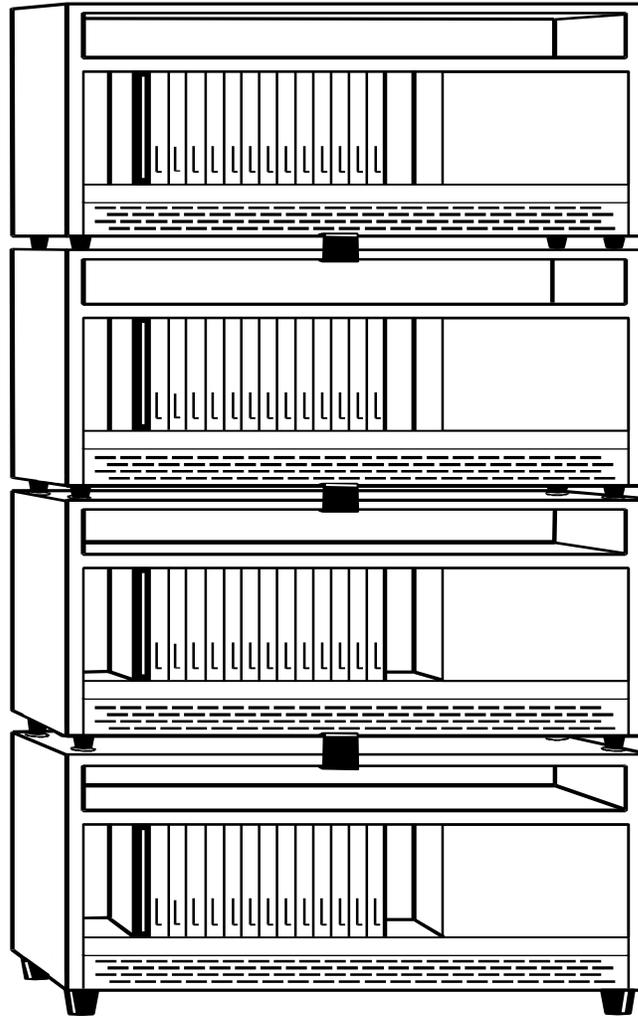


Figure 1-4. Typical Cabinet Stack (Four Cabinets Maximum)

Multicarrier Cabinets

Figure 1-5 shows a typical multi-carrier cabinet.

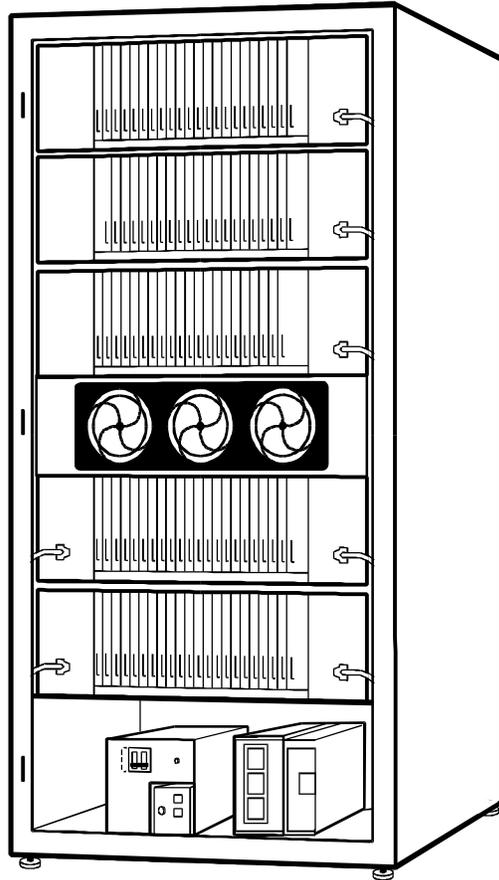


Figure 1-5. Typical Multi-Carrier Cabinet

There are three types of multicarrier cabinets:

- The Processor Port Network cabinet, which contains:
 - The processor that performs call processing
 - Ports
 - An interface to an Expansion Port Network cabinet (optional)
 - A Center Stage Switch (optional)

- The Expansion Port Network cabinet, which contains:
 - Additional ports
 - Interfaces to the Processor Port Network cabinet and other Expansion Port Network cabinets
 - Maintenance interface
 - Components of a Center Stage Switch (optional)
- The auxiliary cabinet, which contains equipment used for optional system-related hardware

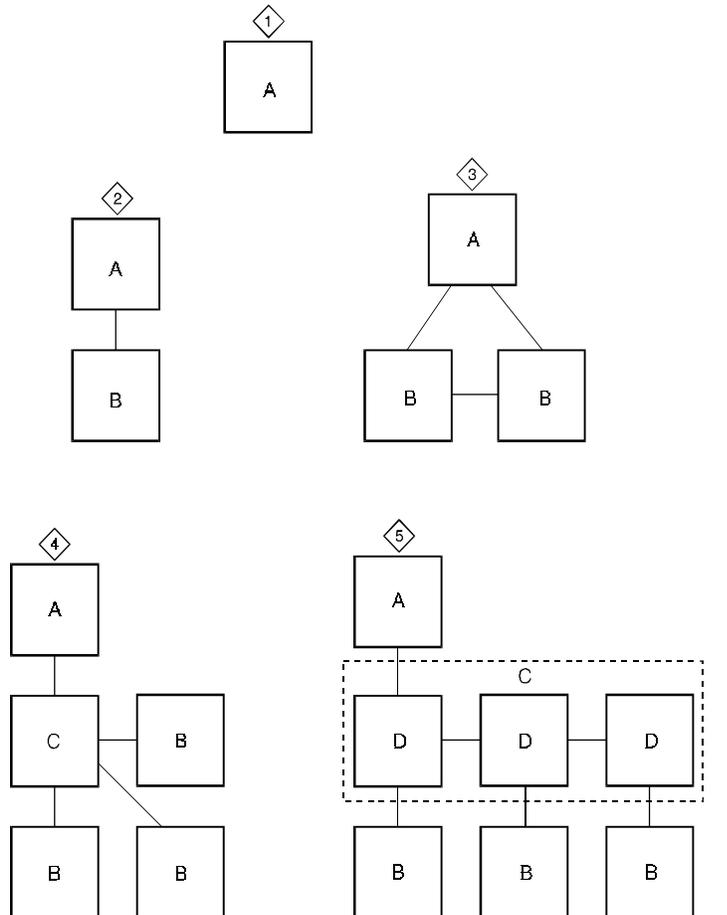
Control, duplicated control, expansion control, port, and switch node carriers can be installed in multicarrier Processor Port Network and Expansion Port Network cabinets. (See the descriptions of these carriers in the previous section “Single-Carrier Cabinets”.)

For more detailed hardware information, see the *DEFINITY ECS Release 5 System Description and Specifications*, 555-230-210.

Standard Configurations

The DEFINITY ECS hardware can be configured in a variety of ways, depending on the number of endpoints the switch serves and the number of circuit packs required to connect the endpoints.

Figure 1-6 shows the five main system configurations.



- | | |
|--|---------------------------|
| 1) Basic System | A) Processor Port Network |
| 2) Directly Connected System | B) Expansion Port Network |
| 3) Directly Connected System with Two EPNs | C) Center Stage Switch |
| 4) CSS-Connected System with up to 15 EPNs | D) Switch Node |
| 5) CSS-Connected System with up to 43 EPNs | |

Figure 1-6. Standard Configurations

The main configurations are:

1. Basic system consisting of a Processor Port Network (PPN) only.
2. Directly-connected system consisting of two Port Networks (PNs): one PPN and one Expansion Port Network (EPN) connected directly together.
3. Directly-connected system consisting of three PNs (one PPN and two EPNs) connected directly together.
4. Center Stage Switch-connected system consisting of up to 15 EPNs interconnected by one Switch Node (SN) to the PPN.
5. Center Stage Switch-connected system consisting of up to 21 EPNs interconnected by two SNs to the PPN, and up to 43 EPNs interconnected by three SNs to the PPN.

Direct-Connect Configurations

Direct-connect configurations have these distinguishing characteristics:

- Every port network is connected to every other port network via an expansion interface circuit pack and a fiber optic cable.
- Each fiber is connected to a fiber transceiver that can transmit great distances.

In large systems, a port network can be hundreds of kilometers away from the central site. These remote port networks are connected to the other port networks via a Digital Signal Level 1 (DS1) or E1 link attached to a converter board, which in turn is connected to the expansion interface. The converter board converts the fiber optic signals between DS1 protocol and the internal expansion interface protocol so the signal can travel over dedicated public or private lines.

Center Stage Switch Configurations

Center Stage configurations have these distinguishing characteristics:

- An expansion interface in every port network is connected to a switch node interface in the Center Stage Switch.
- Remote Expansion Port Networks require E1/DS1 Converter pairs at the remote end and switch node E1/DS1 Converter pairs at the switch node. In the pairs, the E1/DS1 Converter board converts the fiber optic signals between E1/DS1 protocol and the internal expansion interface protocol so the signal can travel over dedicated public or private lines.
- Switch node interfaces and fiber optic cables are also required for communication between switch node carriers. The number of switch node interfaces required depends on the call traffic between port networks whose switch node interfaces reside in different carriers.

Reliability and Recoverability

The system is designed to recover from a power outage or other failure instantly, regardless of the source of the failure. Each port network includes a set of segmented, parallel buses. If one of the paired segments fails, the other bus segment continues to handle communications. You can always further enhance the system's reliability by duplicating critical components such as processors or fiber-optic links between port networks.

In systems with duplicated control carriers, the entire processor complex is duplicated in the processor cabinet. Should the active elements fail, the standby elements are instantly activated and assume system control. All in-process calls and system activities are maintained. New user service is restored in about 10 seconds; application links recover within two seconds.

In addition, all system I/O links also stay operational. These links include support for the Call Management System, the CallVisor Adjunct/Switch Applications Interface, a Distributed Communications System, and the INTUITY AUDIX Voice Messaging System. Redundancy is built into the packet bus, and higher packet bus reliability can optionally be achieved by adding a maintenance/test circuit pack to each port network.

Memory shadowing, a unique DEFINITY ECS capability, is a function where the memory in the standby processor is continuously updated to reflect the memory in the active processor. This permits the system to change from one processor to another without any noticeable interruptions in service. Memory shadowing is not only important for maintaining basic intercom, incoming, and outgoing calls, but also for complex calling processes such as queuing and call vectoring operations.

Much of DEFINITY ECS's reliability and recoverability is attributable to the switch architecture and the power of the system software. The distributed processor architecture provides subsystem processors on each circuit pack, for example. A standard maintenance routine is conducted automatically by the system, as are periodic backups of translations. All of this inherent reliability/recoverability can be further enhanced by redundancy in system configuration.

Configuring for Reliability/Recoverability

DEFINITY ECS can be configured to meet the disaster recovery needs of any business. For example:

- Calls can be routed through an alternate DEFINITY ECS if one site is destroyed or disabled by natural or man-made disaster.
- Multimedia (voice, video, data) connections to the network can all be made redundant, in case of network failures. The system can be routed through multiple public exchanges to protect against network failures (a cable or fiber being cut, for example).

- DEFINITY's universal hardware and flexible software allow systems to be reconfigured quickly in emergency situations. Port networks can be added and network routing can be changed in a matter of minutes.

Based on the needs of your organization, three redundancy configurations are available:

- Standard Reliability
- High Reliability
- Critical Reliability

Standard Reliability

The built-in duplication of many of its parts makes the system inherently reliable. In addition to the dual bus, the system includes:

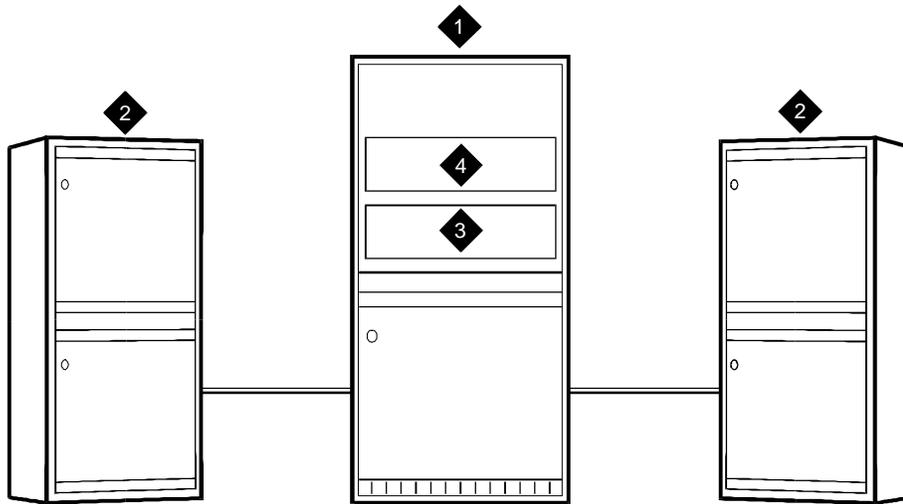
- One control carrier
- One tone-clock circuit pack per port network
- Port networks interconnected by single fiber cables

High Reliability

High reliability systems include the following:

- Two control carriers (located in the Processor Port Network cabinet), which contain duplicate processor and tone-clock circuit packs (one is active and the other is in standby)
- One tone-clock circuit pack per Expansion Port Network
- Duplicate connections between the Center Stage Switch and the Processor Port Network
- Expansion port networks connected by single fiber cables
- Duplicate switch node clock circuit packs (one is active and the other is in standby) in each switch node carrier

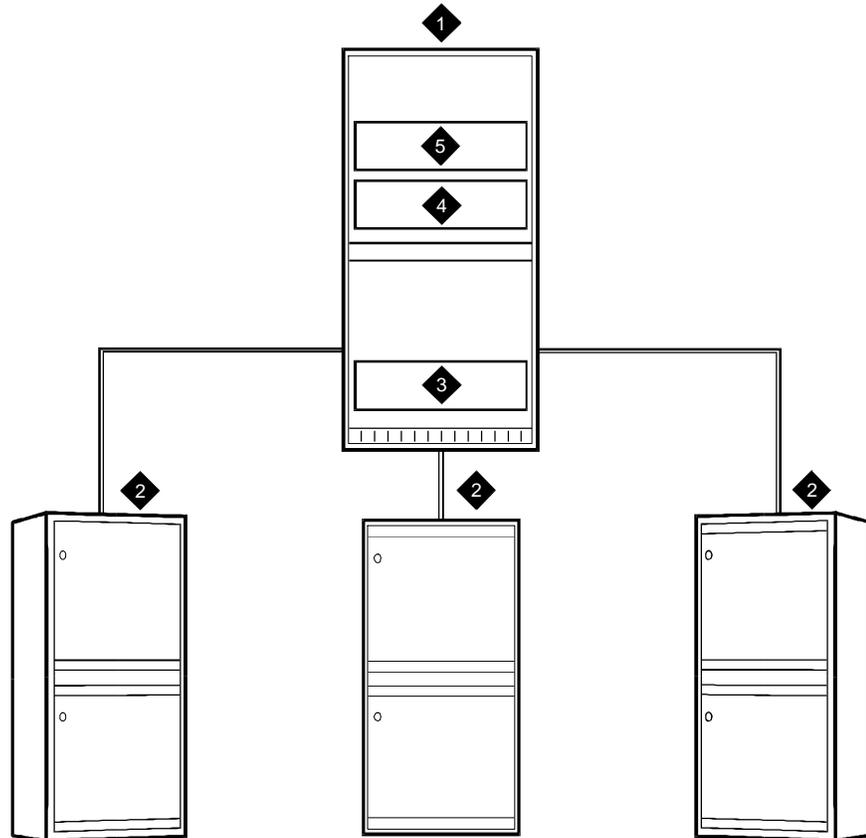
Figure 1-7 shows a high reliability, directly connected system.



- | | |
|---------------------------|------------------------------|
| 1) Processor Port Network | 3) Control Carrier |
| 2) Expansion Port Network | 4) Duplicate Control Carrier |

Figure 1-7. High Reliability, Directly Connected DEFINITY ECS

Figure 1-8 shows a high reliability center stage system, where the Center Stage Switch is connected to both the active and standby control carrier.



- 1) Processor Port Network
- 2) Expansion Port Network
- 3) Center Stage Switch
- 4) Control Carrier
- 5) Duplicate Control Carrier

Figure 1-8. High Reliability Center Stage DEFINITY ECS

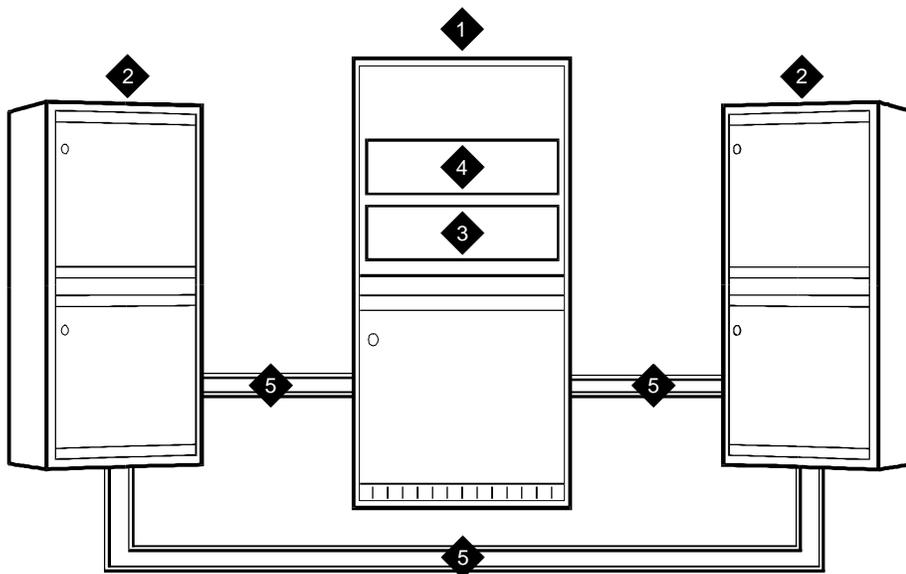
Critical Reliability

Critical reliability systems are fully operational over 99 percent of the time, on average. No other switch vendor offers this level of system redundancy.

A critical reliability DEFINITY ECS includes:

- Two control carriers
- Two tone-clock circuit packs in each port network
- Two connections between port networks or between Expansion Port Networks and the Center Stage Switch
- Two switch node carriers in center-stage systems

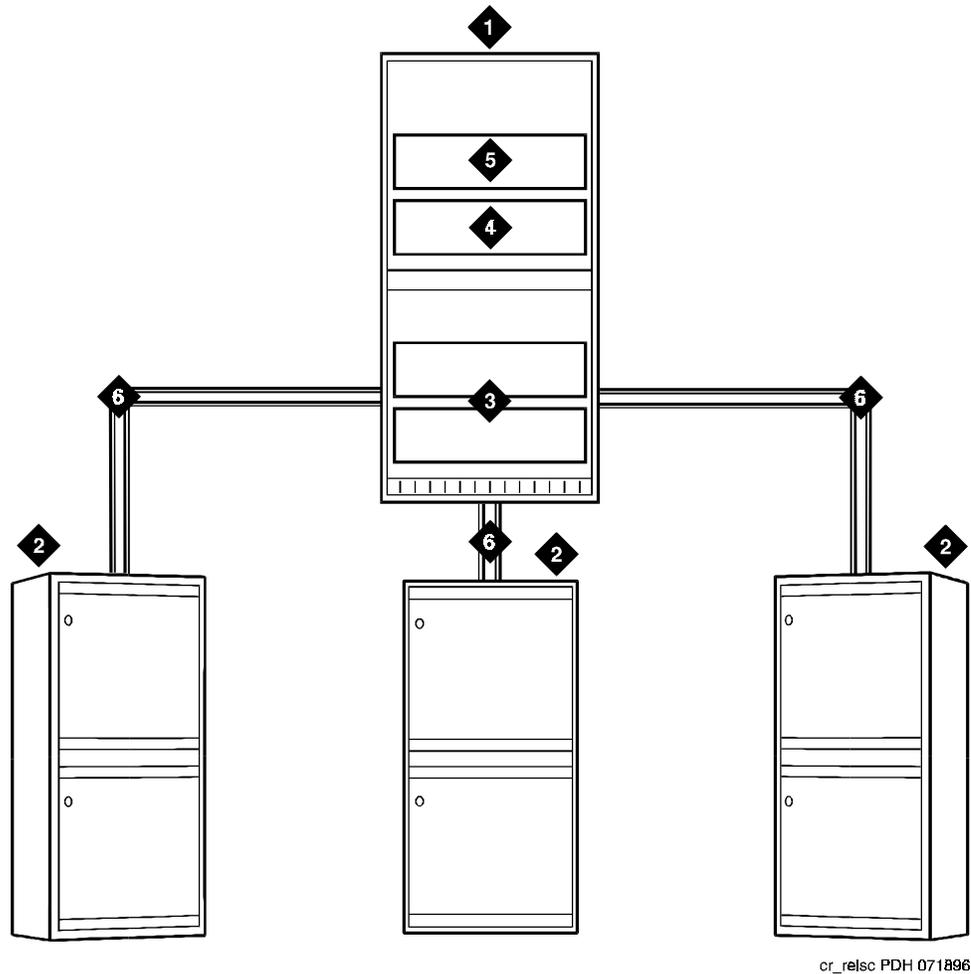
Figure 1-9 shows two control carriers and duplicate fiber-optic cables that connect each port network in a critically reliable, directly-connected system.



- | | |
|---------------------------|------------------------------|
| 1) Processor Port Network | 3) Control Carrier |
| 2) Expansion Port Network | 4) Duplicate Control Carrier |
| | 5) Fiber Optic Cables |

Figure 1-9. Critical Reliability, Directly Connected System

Figure 1-10 shows two control carriers and two Center Stage Switches in a critical reliability, Center Stage duplex system. As shown in Figure 1-10, a fiber-optic cable connects each port network to the Center Stage Switch, and another fiber-optic cable connects each Center Stage Switch to the duplicate Center Stage Switch.



- | | |
|------------------------------|------------------------------|
| 1) Processor Port Network | 4) Control Carrier |
| 2) Expansion Port Network | 5) Duplicate Control Carrier |
| 3) Center Stage Switches (2) | 6) Fiber Optic Cable |

Figure 1-10. Critical Reliability Center Stage ECS System

Connections to ECS

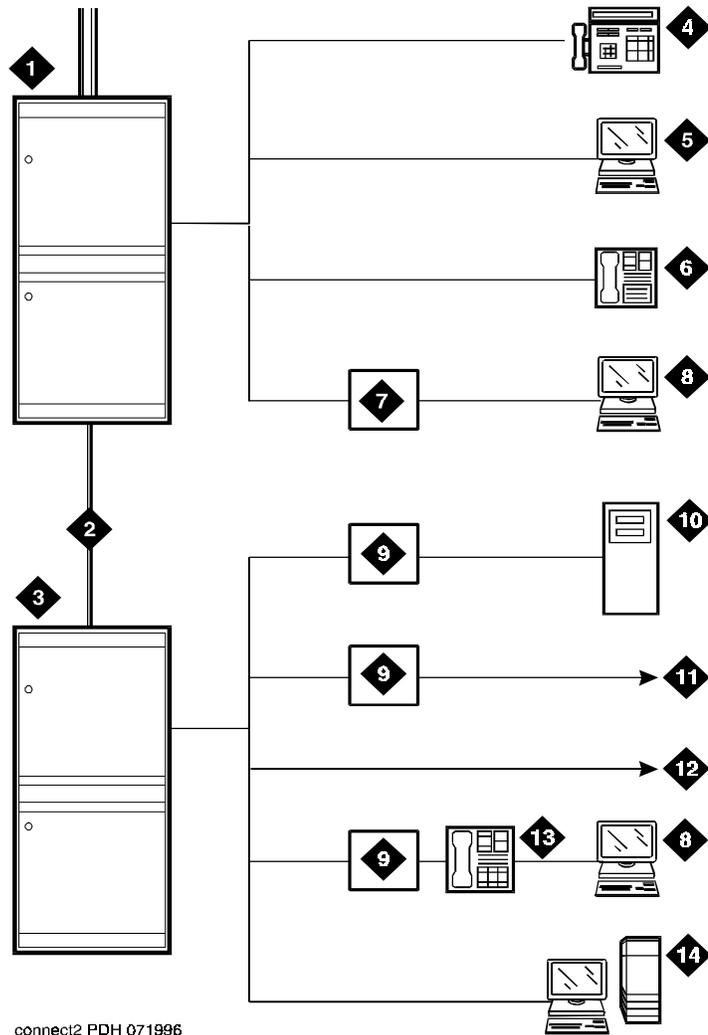
DEFINITY ECS can be connected to communications paths that transmit voice and data signals between the system and a Central Office and/or other systems. The system can also be connected to public and private networks. The system can also be connected to:

- Data Communications Equipment, such as a data module, which translates transmitted data to a form compatible with the communications channel.
- Data Terminal Equipment, such as a workstation, which generates or receives data.
- Other peripherals for administering and maintaining the system and auxiliary equipment for features such as Loudspeaker Paging and Music-On-Hold.

Figure 1-11 shows a typical system with a Processor Port Network and an Expansion Port Network.

 **NOTE:**

Actual equipment may appear different than the equipment shown.



connect2 PDH 071996

- | | |
|----------------------------|---|
| 1) Processor Port Network | 8) Data Terminal |
| 2) Fiber Optic Cable | 9) Data Module |
| 3) Expansion Port Network | 10) Voice Messaging System |
| 4) Attendant Console | 11) Outside Private Line |
| 5) Administration Terminal | 12) Outside Lines |
| 6) Business Telephone | 13) Multi-Appearance Business Telephone |
| 7) Asynchronous Data Unit | 14) Host Computer |

Figure 1-11. Typical DEFINITY ECS Connections

Adjunct Connections

In addition to station connections, DEFINITY ECS includes many connections for adjunct (subordinate, related) equipment. The system provides an advanced X.25 (called BX.25) dedicated link adjunct interface, which can support a variety of adjuncts, including:

- INTUITY AUDIX Voice Processing System
- DEFINITY AUDIX Voice Processing System (internal)
- Call Management System

The BX.25 interface is also used between DEFINITY ECS systems for Distributed Communications Service.

DEFINITY ECS provides Electronic Industries Association (EIA) RS-232 ports for management terminal connections to the active processor and, in the case of duplication, for management terminal connections to the standby processor. In addition, a tip/ring connector with a built-in modem is provided for remote administration.

The Expansion Port Network maintenance circuit pack has a single EIA RS-232 port for connecting a management terminal. Data between the processor complex and the Expansion Port Network maintenance circuit-pack port is multiplexed onto the fiber optic link connecting the Expansion Port Network to the Processor Port Network. The terminal on the Expansion Port Network maintenance circuit pack has the full capabilities of any other management terminal, but operates at a lower speed.

Other RS-232 ports connect to the following typical adjuncts:

- Property Management System
- Call Detail Recording Units
- G3 Management Applications
- Call Detail Recording printer
- Basic Call Management System terminals
- System printer

DEFINITY ECS supports CallVisor Adjunct/Switch Applications Interface messages over ISDN-BRI lines. CallVisor Adjunct/Switch Applications Interface allows adjunct computers access to DEFINITY ECS features and information for computer/telephone integration applications. CallVisor Adjunct/Switch Applications Interface and DEFINITY ECS support the following typical adjuncts and applications:

- Inbound Call Management
- DEC Computer Integrated Telephony programming library
- Computer telephony integration

DEFINITY ECS uses an analog line circuit to support voice adjunct and interface functions such as:

- Loudspeaker paging
- Music-on-hold
- Queue status indications
- Recorded announcement
- External alarm inputs

DEFINITY ECS supports an auxiliary trunk interface that connects to equipment supporting features such as:

- Recorded announcement
- Music-on-hold
- Loudspeaker paging

DEFINITY ECS supports typical network interfaces such as:

- Electronic Tandem Network
- Distributed Communications System — over either X.25 links or ISDN temporary signaling connections
- ISDN-PRI

Telephone Connections

All signals between analog telephones and the DEFINITY ECS are in analog form over a pair of wires. Digital DCP telephones using the Digital Communications Protocol employ digital transmission for integrated voice and data signals and control signals. Transmission is over a connection consisting of one or two pairs of wires. Each connection supports one signaling channel and two information (voice and data) channels.

The 8400 digital telephones automatically detect whether they are plugged into a two-wire or four-wire digital line circuit pack. The 9400 digital telephones provide inexpensive support for two-wire installations.

Like the digital DCP telephones, ISDN telephones transmit voice, data, and control signals digitally. With the ISDN telephones, the transmission employs the world-wide standard BRI protocol between the DEFINITY ECS and the telephone.

Network Connections

AT&T is the first telecommunications vendor to provide compatibility with the Q-SIG global networking protocol. This means you can connect the DEFINITY ECS with other switches throughout the world. AT&T developed Q-SIG Global Networking to comply with the Q-SIG standards developed by the European

Computer Manufacturer's Association and the International Standardization Organization. It supports the ISDN-PRI connection from switch to switch as long as both systems support the same protocol options.

AT&T supports both E1 and DS1 lines. As industry standards around the world, E1 and DS1 provide the latest alternative to analog trunking. T1/E1 access and conversion allows simultaneous connection to both T1 (1.544 Mbps) and E1 (2.048 Mbps).

DEFINITY ECS's support of ISDN-PRI, ISDN-BRI, and available public network services means that you can achieve full end-to-end ISDN connectivity and take advantage of ISDN services and features. The system provides complete ISDN support in one system for small systems with 20 telephones up to large systems with 25,000 telephones.

DEFINITY ECS also supports connection to an Electronic Tandem Network. Different Electronic Tandem Network locations are connected via analog or digital tie trunks. For example, a DS1 or E1 interface can act as a high-speed digital backbone for voice and data communications between Electronic Tandem Network locations.

For Distributed Communications System (DCS) network connections, tie trunks interconnect the switches that serve the DCS complex. The tie-trunk network may be configured as a tandem tie-trunk network, a main/satellite/tributary network, or an Electronic Tandem Network. The links connecting a Distributed Communication System may also be provided across a Software Defined Network. To support DCS customers who also have ISDN-Primary Rate Interface, DEFINITY ECS can transport DCS messages over ISDN-Primary Rate Interface D channels. As a result, you are no longer limited to private-line connections between your various locations. You can also use public network services.

DEFINITY ECS's support of wideband signaling allows the system to handle applications with transmission rates greater than 64 kbps in a single call. This includes videoconferencing, Local Area Network bridging, and other wideband applications. The system switches wideband data at $N \times DS0$ data rates — a standard for international networking.

For more information, see Chapter 10, "Networking Solutions".

Remote Service

DEFINITY ECS's remote-service capabilities allow greater flexibility in configuring your system. Although the system has high capacity and supports up to 25,000 lines, you may need to serve some users who are far from the main system. To satisfy these needs, you can use remote Expansion Port Networks using fiber-optic links. For locations further apart, you can connect a port network remotely over one to four DS1 or E1 lines using a converter.

The number of DS1 or E1 lines required to support the remote port network depends on the requirements of the remote port network. For example, with four DS1/E1 lines, a maximum of 94 simultaneous voice and/or data connections can be made between the remote port network and the DEFINITY ECS. Two channels are reserved for signaling between the remote port network and the system.

Power

DEFINITY ECS can be powered with either 120/208/240V AC (50/60Hz) or 48V DC power. When commercial AC power is not available, the system will operate off DC power supplied by battery reserve.

During a power outage, individual cabinets will continue to function for up to 15 seconds; the control carrier will function for up to 10 minutes without power, depending on configuration. Optionally, an uninterruptible power supply can protect a DEFINITY ECS system from under or over-voltage conditions, line frequency fluctuations, and power blackout of short duration. A battery backup system can be used to provide power for up to 8 hours, depending on the type and quantity of circuit packs and amount of traffic during the holdover period.

Software

All DEFINITY ECS systems throughout the world use the same basic software. To provide this commonality while still accommodating wide variations in configurations and options, the system dynamically allocates internal memory storage. Memory is sized when the system is initialized, selecting the proper software parameters based on the hardware configuration.

Optional Software

In addition to the basic software, various optional packages can enhance the capabilities of the system. The basic software is a prerequisite for all the optional packages, which are listed below.

Networking Software

Networking software provides enhanced routing capabilities for calls processed through the system. These routing capabilities provide for transmission of calls and auxiliary call information through the system or over public or private networks. Descriptions of specific networking packages are given below.

Automatic Route Selection (ARS) Software. Provides access to public and private communications networks. Provides for long-distance calls to be routed over the best available and/or most economical routes. Provides outgoing access to local Central Office, Foreign Exchange, Wide Area Telecommunications Service, and other long distance carriers. Provides transparent access to

any Interexchange Carrier. Provides partitioning of Automatic Route Selection routing patterns.

Centralized Attendant Service (CAS) Software. Provides Centralized Attendant Service, a feature permitting multi-location DEFINITY ECS customers served by separate switching vehicles to concentrate attendant positions at a single main system location.

An attendant queue collects calls from all locations (main and branch). Each branch location can have its own listed directory number and is able to switch all of its incoming calls to the centralized attendant positions over release link trunks. An incoming listed directory number call from a branch will be received at the main system via a release link trunk. It is then extended back to the requested extension at the branch system over the same release link trunk.

When connection is made at the branch extension, the local system extension will be switched directly to the trunk receiving the Listed Directory Number call. The release link trunk to the main system will then be dropped, allowing the release link trunk to be used for another call.

Prerequisite: Release link tie trunks (analog or digital).

Distributed Communications System (DCS) Software. Provides Distributed Communications System compatibility with transparent operation of many features across DEFINITY systems. Includes four- and five-digit uniform dialing (Uniform Dial Plan functionality) and one to four digit steering.

Private Network Access (PNA) Software. Provides Automatic Alternate Routing, seven-digit uniform dialing, subnetwork trunking, and Private Network Access. This software must be used when DEFINITY ECS is part of an Electronic Tandem Network.

Primary Rate Interface (PRI) Software. Provides an internationally-accepted, standard interface for end-to-end digital connectivity. Used with a T1/E1 interface and supports 23 (T1) or 30 (E1) 64 kbps voice or data "B-Channels" and one 64 kbps signaling "D Channel" for total bandwidth of 1.544 MB (T1) or 2.048 MB (E1).

Prerequisite: Automatic Route Selection and/or Private Network Access software.

Uniform Dial Plan Software. Provides four- or five-digit Uniform Dial Plan and one to four digit steering. Should not be ordered with Distributed Communications System software.

Wideband Software. Allows you to aggregate Digital Signal Level-0 channels up to the capacity of the span. Use this feature for video or high speed data through the system. The wideband feature supports H0, H11, and H12 standards, where applicable, as well as customer defined data rates.

Prerequisites: Primary Rate Interface software and Automatic Route Selection and/or Private Network Access software.

Call Center Software

The CenterVu™ Call Management System software provides for the administration and management of agent and network resources to most efficiently route incoming calls, personalize customer service, and make the most of your computing environment. See Chapter 3, "Call Center Solutions" for more information.

Four Call Center packages are available:

- Basic Call Center
- Call Center Plus
- Call Center Deluxe
- Call Center Elite

For more information about DEFINITY Call Center features, see Chapter 3, "Call Center Solutions".

Adjunct Switch Applications Interface (ASAI) Software

Provides an open architecture that enables the DEFINITY ECS to share information with a variety of computing platforms and Computer-Telephone Integration software. Applications include automatic screen displays of customer information, coordinated voice/data transfer, and outbound calling.

Miscellaneous Software

Software packages that do not fall into any of the preceding categories are listed below.

Audible Message Waiting Software

Optional software for audibly notifying users that they have messages waiting (often used in place of a message-waiting lamp).

Answer Detection Software

Provides more accurate call detail records where tone detection is possible and Network Answer Supervision is not received. Primarily a hotel/motel application.

Authorization Code Software

Permits the customer to selectively specify levels of calling privileges which override in-place restrictions. In addition to line access, authorization codes are used for unique identification for billing and security purposes. From 4- to 7-digit authorization codes are supported.

Enhanced Abbreviated Dialing Software

Provides the capability to store and retrieve up to 10,000 entries to simplify or eliminate manual dialing. Users may automatically dial a pre-stored number by dialing an abbreviated code or, for a multi-function telephone user, by depressing an assigned button. The stored entries automatically dialed by the Enhanced Abbreviated dialing features are organized into number lists. There are three types of number lists: personal, group, and enhanced.

Forced Entry of Account Codes Software

Software that forces users to enter account codes. By requiring account codes to be dialed on specific outgoing calls, this feature software provides an easy method of allocating the costs of specific calls to the correct project, department, etc. Call information is recorded by the Call Detail Recording feature for this purpose. Account code length can be up to 15 digits.

Hotel/Motel Software Enhancement

Most hotel/motel features are provided with the basic software. This additional package enables you to administer the language for the wakeup call and provides you with enhanced room status information.

Look-Ahead Interflow Software

A load-balancing enhancement that analyzes demand and directs each call to the call center best able to handle it. This capability is provided via the use of a private or public network Integrated Services Digital Network-Primary Rate Interface connection with the receiving system to reject or accept the call.

Prerequisites: Call Vectoring, Primary Rate Interface, and Private Network Access software.

Tenant Partitioning Software

Software that allows you to partition the DEFINITY ECS and lease the system's services and features to tenants. This provides the robust features of a large system to your small business tenants and provides you with a new revenue source.

Multiple Music on Hold

Used with Tenant Partitioning software, this software allows tenants to choose their own music for callers on hold and also allows them to create custom messages.

Multiple Audio/Music Sources

Software that allows you to create flexible menus of delay announcements. Up to 256 messages or music selections of varying lengths can be played based on the nature of the call, the length of the wait, or service objective.

The following application discussions explain how the DEFINITY ECS meets communications challenges in various industries. Though the specific requirements of the industries vary throughout the world, the general information presented here should be useful for generating ideas. Even if none of the applications precisely match your situation, the examples may suggest creative solutions you can apply to suit your needs.

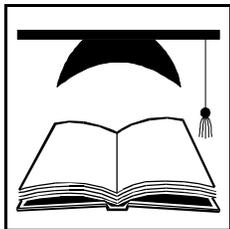
As technological and organizational change continues to accelerate worldwide, even the distinctions between industries are losing significance. In the financial services industry, for example, banks, brokerage houses and insurance companies now offer many of the same services. In this chapter, industries are presented in the broadest terms, with little regard for overlap. For example, the insurance industry can be considered under both the healthcare and financial services headings.

In most cases it is difficult to consider the switch without also considering its array of options. Many of the solutions discussed in this chapter are enabled by optional hardware and software. The DEFINITY ECS is the essential integrating platform that coordinates and enhances these specialized tools. Even if your intention is to purchase a basic system, it is important to gain some understanding of the many options the system provides so you can eventually capitalize on those advantages.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Higher Education



University and college administrators continually seek to:

- Ensure reliable telephone service
- Organize course offerings and events
- Coordinate information and services
- Communicate easily with the outside world
- Teach many students for low cost
- Plan for expansion and innovation

Ensure Reliable Telephone Service

Each DEFINITY ECS can service up to 25,000 telephones, and the systems can be networked together to accommodate many more. The size and efficiency of the switch allows universities to generate revenue from student phone service, which offsets the cost of other services.

The reliability of the switch is without equal. The system's automatic backup features, maintenance tests, and line monitoring functions work proactively to protect your investment. These and related features identify potential difficulties well before the system's operations might be compromised, further enhancing the high reliability inherent in the DEFINITY ECS architecture.

Organize Course Offerings and Events

Registering students for classes usually requires setting up a special area, hiring extra staff, and having students wait in line. This is inconvenient, expensive, and time-consuming.

INTUITY CONVERSANT allows students to register by telephone. Here's one way you might set it up:

1. Each student dials the CONVERSANT number, then enters a student number and a unique security code.
2. The system locks out students who are not eligible to register.
3. The student enters the numbers of classes to be added or dropped.
4. While the student is entering the numbers, the system:
 - Recites the student's selections back to the student for verification.
 - Determines the availability of the requested courses and whether the student is eligible for them.
 - Rejects the classes that are not available to the student and asks the student to specify alternative courses.

- Calls and leaves a message for the appropriate teacher when a course nears its enrollment limit.
 - Connects with the school's billing system to total fees or allow the student to pay with a credit card.
5. When the student is finished registering, the system faxes a copy of the course schedule.

Coordinate Information and Services

Many universities have enormous campuses or are composed of a network of scattered colleges and offices. Efficient connections among the many elements are essential to the integrity of the institution. A variety of DEFINITY ECS options can help coordinate information and services from many locations:

- Wireless and cordless telephones allow librarians, technicians and clerks to easily search for things while talking to the person requesting the search.
- Voice messaging systems can be digitally networked using existing voice and data networks. This allows satellite campuses or offices to access common directories and handle messages as if they were all on the same campus.
- INTUITY Message Manager keeps a record of all voice, data, or fax messages by category and sorts the information.
- A video kiosk set up in a central location gives students easy access to services that are located far away.
- Video conferencing equipment allows teachers and managers to easily participate in policy-making meetings, regardless of location.
- The security of all campuses can be coordinated and enhanced in the following ways:
 - The DEFINITY Call Center efficiently routes emergency calls to security staff.
 - DEFINITY PassageWay logs incoming calls and pinpoints the location of the telephone making the call, using DEFINITY's name/number display capability.
 - Call Management Software logs the speed of the response so that response times can be measured and improved.

Communicate Easily with the Outside World

Most schools receive a huge number of incoming calls. The number of calls also fluctuates a great deal — going up just prior to the start of a semester, for example. Often the callers are unsure which department or individual they need to talk

to. The switch must therefore be flexible enough to handle fluctuating call volume while satisfy each caller's particular needs. Here's how DEFINITY ECS's Call Center tools meet these needs:

- Automatic Call Distribution routes incoming calls to a group of operators who use equipment that allows them to handle multiple calls. As additional calls come in, they are placed in queue. When the queue gets too long, the overflow calls are automatically routed to standby operators during periods of high call volume. Display telephones alert the standby operators that they are handling overflow calls.
- The Expected Wait Time feature provides a reliable estimate of the time a caller will wait in queue before being connected to an agent. Based on that time, different choices are presented to the caller, such as remaining in queue, leaving a message for a later callback, or transferring to automated services (on INTUITY Conversant Applications). Callers are more comfortable waiting in queue when they know how long the wait will be and can choose alternate options.
- Call Management Software keeps statistics on number of abandoned calls, average length of call, average wait time, etc. so you can manage staff and track productivity.
- Expert Agent Selection and Call Prompting allow callers to identify special needs (such as language) and preferences and routes those calls to the appropriate operators.

The Internet also provides an important link to the outside world. Lucent's network access products — Acculink Access Controller and Acculink Bandwidth Controller — provide high-speed access while still managing resources efficiently. This can obviate the need for additional lines and equipment.

Teach Many Students for Low Cost

Educators now have many options for making the most of their resources while providing a top quality education for many students. DEFINITY ECS provides efficient, integrated access to both the school and to world-wide resources:

- DEFINITY ECS's "Distance Learning" video tools overcome barriers of time and distance by allowing students to work together and access classroom information regardless of location.
- Acculink access to the Internet (see "Communicate Easily with the Outside World") can put information at the fingertips of many students without wasting network resources.
- Speakerphones or more sophisticated interactive video tools allow distant experts to share knowledge with students in the classroom.

- Desktop Conferencing Systems enable students to see and speak with one another and also collaborate on documents. They can create and jointly edit documents that may reside on only one computer in one location. The students can work together as if they were all seated at the same table.
- TransTalk telephones help teachers and students solve software problems while talking with technical experts.
- DEFINITY ECS incorporates many efficiencies while providing this access because it manages bandwidth accurately. It can cost-effectively integrate voice, video and data calls over a single network access facility to a school's public or private network.
 - It gives users switched access to a host computer over wideband (T1/E1) communication lines. Since the switch precisely allocates resources as needed, this speeds transmissions while allowing the system to handle more calls.
 - It allocates bandwidth for data calls when permanent data circuits are busy.
- The MultiPoint Control Unit can seamlessly integrate with a DEFINITY network to coordinate video (voice and data) conference calls from 2-24 locations.

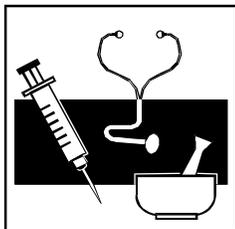
These tools allow schools to form partnerships with each other world-wide, enhancing the overall quality of education they offer while spawning new revenue-generating opportunities.

Plan for Expansion and Innovation

Schools must be at the forefront of communications innovation, so it's important to use a platform that can accommodate rapidly evolving requirements. DEFINITY ECS is:

- Designed to be easily enlarged or networked together to accommodate virtually any size requirement.
- Capable of switching multimedia (synchronized audio and video) today.
- Unmatched in its ability to switch voice, video and data traffic.
- Compatible with many different products from many different vendors so that it fully integrates all of your tools and options.
- Designed to accommodate existing and emerging standards and protocols.

Healthcare



The healthcare industry may include providers, insurance companies, employers, patients, researchers, pharmaceutical companies, and the government.

Healthcare administrators worldwide seek to:

- Maximize resources to reduce or contain costs
- Improve response in a busy urban environment
- Maximize productivity and efficiency of high-salaried professionals
- Provide highly efficient service, without losing the human touch
- Promote wellness and satisfaction with easy access to information within the community
- Improve accessibility to specialized medical care
- Maintain skills and collaborative relationships regardless of location

Maximize Resources to Reduce Costs

For individual healthcare providers, cost containment and reduction is the key to survival and growth. The rules of healthcare payment are changing, and providers must keep the costs of care down without sacrificing quality.

Beyond providing quality care — always an overriding concern — healthcare's primary goal is to maximize resources through efficient operation. Savings can be realized in reexamining everything from staff size and operations to the number and type of rooms provided.

DEFINITY ECS can provide a variety of options to fully use available resources. It can turn the telecommunications investment into a seamless network for managing and monitoring heavy call volumes and messaging, with the following results:

- Communicating between locations is easier
- System administration is centralized
- Information can be obtained by all locations from a single source

INTUITY CONVERSANT Interactive Voice Response System can help provide the following benefits:

- Contain costs with better room utilization

Efficient room management is very important in the healthcare environment. Shorter stays make it challenging to keep rooms ready for reassignment. With INTUITY CONVERSANT, when a patient is discharged,

the escort enters a short code on the telephone. This indicates to the housekeeping staff that the patient has left, and the room is ready to prepare for the next patient. When the housekeeping staff has cleaned the room, they enter a code to alert admissions that the room can immediately be reassigned.

- Link to food and drug services

When patients are discharged, the patient's meals are cancelled, thus saving wasted food that otherwise may have been delivered. The pharmacy is similarly notified so drugs are not delivered needlessly.

- 24-hour access to business office

CONVERSANT's automated attendants can provide 24-hour access to the business office so patients and others can request account balances, copies of bills, etc.

- Pre-admission over the telephone

Quick access to an automated attendant can speed the hospital checking-in process.

Improve Response in a Busy Urban Environment

Mid-sized hospitals deal with a high percentage of emergencies, both in the hospital and in the outside community. Hospitals can improve their patient services and emergency response by:

- Mobilizing staff during disasters or emergencies outside the hospital
- Improving response to emergencies inside the hospital
- Improving emergency room response for the many critical cases arriving by ambulance

DEFINITY ECS products can provide the following services to hospitals:

- The INTUITY CONVERSANT Voice Information System provides emergency outcalling. The system calls a predefined emergency response staff. Upon receiving the call or page, the staff members can call into a voice mailbox to receive specific instructions for the emergency situation.
- PagePac systems provide an effective way to broadcast emergency situations throughout an entire department or facility. Visual paging ensures that the hearing-impaired are also notified of emergencies.
- TransTalk mobile telephones help nurses stay in touch with doctors and technical experts while carrying out their duties.

DEFINITY ECS helps hospitals improve emergency services without adding staff.

Maximize Productivity and Efficiency

Many healthcare facilities participate in an integrated health network consisting of numerous hospitals, clinics, doctors, offices, laboratories, and other medical facilities. Although they are often autonomously managed, these multiple sites have to function as a single organization to keep costs down and enable the facilities to be financially successful.

Staff of integrated health networks includes administrators, nurses, technicians, physicians, and support personnel. Many members of the staff are active multiple shifts, and are seldom confined to an office.

Healthcare facilities need to be able to:

- Manage multiple sites as if they were one
- Maintain close communication links between widely-operated facilities, and include related organizations such as suppliers and clinics
- Reduce unnecessary overhead paging
- Improve response to emergencies
- Provide an efficient way to communicate non-emergency information to busy mobile staff

DEFINITY ECS products can help healthcare facilities maintain productivity and efficiency with the following products and features:

- Standardized DEFINITY ECS systems, networked for feature transparency with four-digit dialing between locations, can ensure that staff wastes no time adapting to the communications system as they go from location to location.
- Voice Messaging systems, networked together, can reduce personal paging and eliminate telephone tag when staff must continuously leave messages and wait for returned calls.
- DEFINITY call center packages can support the facility's busiest offices, such as: business office, hotline groups, clinics, and admissions offices.
- AT&T Call Accounting System for Windows® allows healthcare facilities to chargeback telephone equipment and usage to doctors, clinics, and offices.
- PagePac systems provide an effective way to communicate with nurses, doctors and others who must be mobile. Visual paging ensures that the hearing-impaired are also contacted.
- AT&T DEFINITY Systems Management package enables healthcare facilities to collect DEFINITY directory information to be used by various departments for a system directory.

- Outside labs, pharmacies, physicians' practices, vendors, and other organizations who frequently deal with the healthcare facility can obtain guest mailboxes on the voice messaging system. The healthcare institutions can thus avoid toll charges that should be paid by others.

By using AT&T products, healthcare facilities can reap the following benefits:

- Improved communication between staff members in different locations
- Simplified administration of dispersed systems
- Better response to true emergencies
- Improved staff efficiency and satisfaction

Provide Highly Efficient Phone Service

Many healthcare facilities encounter problems responding to the large number of incoming calls to their busiest offices. Callers are frequently put on hold for long periods of time before representatives are available to help them.

Healthcare facilities need to:

- Eliminate the frustration experienced by callers and the negative image they receive of the facility
- Improve the quality of service, without increasing the costs to do so
- Optimize staffing by using the staff for what they were trained

DEFINITY ECS products can provide the following capabilities to the healthcare industry:

- Critical reliability system configurations, which ensure that the system is fully operational more than 99 percent of the time.
- The INTUITY CONVERSANT System gives callers access to basic information 24 hours a day, seven days a week.

For example, callers can find out the balance owed or get a copy of their bill — without speaking to an agent.

- DEFINITY Communications System with call center provides Expert Agent Selection (EAS) with Call Prompting, which enables calls to be routed appropriately.

Medicare claims, for example, can be routed to the assigned agent based on caller input. Agents are happier because they are spending more time helping callers in their areas of expertise.

Call Vectoring in conjunction with INTUITY CONVERSANT enables callers to check their account information with the hospital's mainframe system while waiting to speak to an agent. If they still need to speak to a

representative, they do not lose their place in line. Callers can also be given the anticipated wait time before reaching an agent, and be offered the option of leaving a message for a later callback.

- PassageWay™ products allow a caller's record to appear on the agent's screen as the call rings on the phone, based on caller input or Calling Line (or number) Identification. This eliminates the need for the agent to ask identifying questions and locate the records more easily. It also improves service by enabling the agent to greet the caller by name and begin to address the issues more quickly.

The business office can also make payment inquiries to the insurance carrier or patient during idle periods via a worklist that is downloaded from the hospital database and designed for preview dialing. This allows the agent to quickly review the insurance record and initiate the call from their computer with a mouse click.

- AT&T DEFINITY CenterVu Call Management System (CMS) allows the business office supervisor to assign the appropriate number of representatives and analyze call volume to identify opportunities for improvement. The CMS can also be used by the supervisor to determine if representatives are responding in a timely way to callers.

By using AT&T products, healthcare facilities can provide more efficient phone service and in return, reap the following benefits:

- Faster response to callers
- Accurate staffing
- More personal service
- Higher productivity
- Improved image of the healthcare facility

Promote Wellness and Satisfaction with Easy Access to Information within the Community

Healthcare facilities gauge the satisfaction level of their services from patients and community as a measure of their success. Facilities need to provide the best "first impression" of the hospital. In most cases, it's in the best interest of the healthcare provider and insurer to promote wellness in order to keep hospitalization costs down.

Healthcare facilities need to:

- Provide easy access to wellness information
- Educate the public about preventative measures
- Encourage the public to take control of their health issues in a timely manner
- Provide referrals for healthcare professionals and specialists

DEFINITY ECS offers an easy way to help the healthcare industry:

- INTUITY CONVERSANT enables a health information hotline, which is an audio library of health tips and procedures. This allows patients to help themselves. It can separate calls into groups of those who need care immediately, those who need to be scheduled with a physician, and those who simply need basic information, such as the remedy for a bee sting.
- DEFINITY AUDIX allows callers to leave non-emergency questions or messages for later callbacks, so that callers can get personal attention.
- INTUITY CONVERSANT allows healthcare facilities to provide physician referrals, schedule appointments on the spot, or to provide basic health information via voice or fax.

AT&T products help healthcare facilities to provide first-rate personal care in a cost-efficient manner.

Improve Accessibility to Specialists

Medical professionals often need to contact specialists in a particular field, but are restricted because of time, distance, and expense. They provide better medical care by:

- Consulting with experts, sometimes during surgery
- Overcoming boundaries of distance — by consulting with any physician, no matter where they are located

AT&T provides healthcare with the ability to send video from a remote site to specialists, without waiting for postal delays. Group Video and Desktop Conferencing systems provide the following benefits:

- Extend expertise
- Improve patient care
- Foster collaboration
- Teach new skills
- Save travel time and expense

Using a video camera, physicians can transmit high-quality images during surgery over a phone line to colleagues at advanced medical centers while the operation is still underway. The professionals can exchange images and confer over the same phone line. The process is as easy to orchestrate as a regular phone call.

Physicians can also use the video systems regularly for rapid exchange of images between research teams and colleagues. Patients in rural areas can be screened, and video can be examined across a long distance, all during the time of an office visit at the remote setting.

Desktop conferencing systems can be used in patients' homes by home health nurses to confer with physicians about patient conditions. This enables more patients to be cared for outside the hospital, and reduces the need for the very ill to travel to the hospital or physician's office.

Maintain Skills and Collaborative Relationships Regardless of Location

In the Healthcare industry, there is an urgent need for multiple sites to operate as one and for medical professionals to collaborate remotely, so they can provide top quality health care to patients in rural areas. Doctors and nurses must also stay abreast of technological innovations in the field and continue their educations.

DEFINITY ECS can play a critical role in connecting remote and sparsely populated communities with the advanced centers in healthcare. This technology enables the same level of sophistication in the rural settings as that available in the urban medical centers by:

- Improving communications
- Improving staff satisfaction
- Increasing personnel skills
- Providing improved patient care
- Reducing time and expense of travel

The AT&T desktop conferencing System can help with:

- Continuing medical education.

Doctors can learn at their desktops, without having to pay for expensive travel bills and time away from their office and home.

Medical students can be educated at remote sites. Distance learning can help medical students assigned to rural clinics learn from doctors in hub hospitals and medical centers.

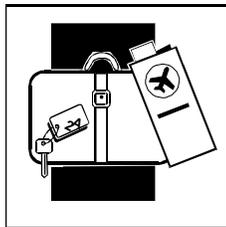
- Virtual consultation.

Patients can talk to physicians, and primary care providers can talk to specialists using Group Video or Desktop Conferencing Systems. Instead of bringing patients in outlying areas to the hub hospital, doctors can conduct virtual meetings with the ability to share charts and images from electrocardiograms, magnetic resonance imaging, cardiotomography scans, bone density scans, and other visual diagnostic tools by using the document camera or other medical peripherals. (Note: this should be used for consultation only; it should not be considered diagnostic by itself.)

- Remote consultations by non-physician medical staff, which are often difficult to arrange in rural areas.

Nutritionists, for example, are particularly scarce in remote settings. A nutritionist can use video to communicate with a patient in a distant facility, showing food models of healthy portions and being face-to-face with the patient for better understanding.

Hospitality



The hospitality industry is composed primarily of hotels, motels, and restaurants.

Hospitality facilities worldwide seek to:

- Control costs
- Improve operating efficiency
- Enhance guest services

Control Costs

Hospitality providers must contain costs in order to maintain a profit and stay competitive in the industry.

Two ways to help control costs are as follows:

- Separate long-distance calling privileges
Hotel and motel guests frequently place long-distance phone calls from their rooms, while providers disallow staff members from accessing long-distance phone service.
- Charge guests more accurately for terminated calls
Hospitality providers need the ability to detect short duration calls (that is, calls that terminate before the specified answer detection time-out), enabling hotels to more accurately charge guests for these calls.

DEFINITY products can provide the following capabilities to the hospitality industry to help control costs:

- World Class Routing features, which allows hotels to separate long-distance calling privileges for guests and administrative staff.
- An Answer Detection feature that enhances the DEFINITY system's ability to detect short duration calls.

Improve Operating Efficiency

Hospitality service facilities continuously deal with fluctuating economies, and must maintain maximum efficiency to ensure smooth operations and productive employees.

Two ways hotels can improve operating efficiency are as follows:

- Simplify guest billing for phone expenses
Hotels and motels need simplified guest billing, along with the ability to generate guest phone records
- Powerful voice-messaging service

Guests and administrative staff need to be able to leave voicemail for other guests and staff members. Guests can have callers leave messages for them privately, without having to involve the front desk.

DEFINITY products can provide the following capabilities to the hospitality industry to maintain maximum operating efficiency:

- Call Detail Recording feature work in combination with system adjuncts to generate guest records and call costs records.
- Intuity and DEFINITY AUDIX allow guests and the administrative staff to create, store, send, and receive spoken messages electronically. Spoken prompts guide the user through each step of the procedure. These messaging services are available in a variety of languages.

Enhance Guest Services

Hospitality providers must constantly find ways to enhance guest services. Staff must work hard to make its guests feel comfortable, and to maintain and uphold a reputation for outstanding service. Today's harried consumers want to get top-quality service for their hard-earned income.

Hotels can enhance guest services as follows:

- Review guest requests for services
Hotels and motels need a way to review guest requests and ensure that guest's needs and requests are met in an efficient manner by the staff.
- Connect to internal computer systems
Staff can provide better customer service by linking the telephone system to the hotel's internal computer system for registration information and voice messaging features.
- Provide phones with modem hookups and conference call capabilities.

DEFINITY products can provide the following capabilities to the hospitality industry to enhance guest services:

- Guest activity reports containing information on items such as requests for wakeup calls and delivery of these calls can be printed in hard-copy form or can be viewed at the Administration terminal. These reports help the administrative staff to ensure that guest requests for services are not overlooked, and that guests get prompt and efficient service from the staff.
- DEFINITY and INTUITY AUDIX™ allows guests and the administrative staff to create, store, send, and receive spoken messages electronically. Spoken prompts guide the user through each step of the procedure. These messaging services are available in a variety of languages.
- Having Group Video systems on hand allows guests to conduct planned or even impromptu video conferences.

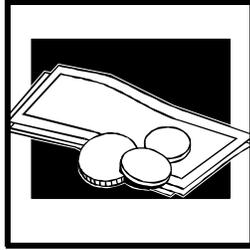
- A PassageWay solution at the front desk can allow a hotel concierge to put guest information on screen instantly when the guest or an outside caller calls.

Specialized DEFINITY ECS Solutions

DEFINITY ECS can also provide the following features for hospitality services:

- Automatic Wakeup
- Do Not Disturb
- Emergency Access to the Attendant
- Mixed Numbering
- Names Registration
- Property Management System (PMS) Interface
- Maid Status
- Guest messaging

Financial Services



The financial services industry may include banking institutions, credit unions, insurance companies, mutual funds companies, and brokerage firms. These types of businesses are nearly indistinguishable from one another in some areas. Deregulation, technological advances and strong competition induce each to offer a broad range of financial services. Many of these services are automated in order to improve customer service and make the most of available resources.

Financial service providers worldwide seek to:

- Control costs
- Automate routine transactions
- Network regional and global offices
- Upgrade customer service

Control Costs

Cost savings are inherent in many DEFINITY solutions. Using an automated attendant in place of an employee to answer routine calls reduces payroll expenses, for example, and using the switch to share account information between widely separated offices eliminates the need for redundant software. Beyond the day-to-day savings that automation and networking provide, however, DEFINITY ECS includes some capabilities that directly affect your operating costs.

Tenant Partitioning

Often you can recover the initial and ongoing costs of the switch itself by investing in a DEFINITY ECS configuration that can handle both your own needs and the needs of the tenants in your building. The system allows you to assign partitions within the system, giving each tenant the privacy and security of an individual switch. In this way small tenants can take advantage of the advanced features of a large system that they would not normally be able to afford. Extra space in your building is more easily let, and you have a continuing source of revenue. As your business grows, you can replace tenants with employees on the switch and in the building.

Automated Administration

The G3 Management Applications (G3-MA) are a set of powerful administration programs that run on a personal computer. They allow you to combine and automate many tasks while administering an almost unlimited number of switches and related systems. You can use G3-MA from a central location to make whole-

sale changes quickly, even setting up all of the switch administration before a switch is operational, for example. G3-MA greatly reduces the cost of maintaining all of your telecommunications equipment by allowing you to share data between systems and store switch settings on the personal computer. You can further save by reducing technical staff and training expenses, as the system is relatively easy to learn and use.

Automate Routine Transactions

In many countries, as much as a quarter of all bank transactions are conducted by telephone. For related businesses such as brokerage houses, the percentage can be much higher. Typically, at least half of these calls are from callers requesting routine information. The Intuity CONVERSANT System allows you to set up an automated attendant that screens calls for your busy customer service representatives. For example, the attendant may handle incoming calls by offering the following options to the caller:

- For business hours, press 1.
- For interest rates, press 2.
- To receive a loan application, press 3.
- To speak to a customer service representative, press 0.
- Or simply enter the extension of the person you are trying to reach.

For the calls channeled to your customer service representatives, DEFINITY ECS's Automatic Call Distribution holds overflow calls in queue for the next available representative. It generates reports that identify peak calling periods, how much time representatives are spending on calls, and which lines are being used. This allows you to maintain high quality customer service while adjusting the size and working hours of your staff.

A real advantage of the Intuity CONVERSANT system is that it allows your customers to bank 24 hours a day. With additional CONVERSANT software, your customers can:

- Inquire about their accounts and get balances
- Transfer funds from one account or investment to another
- Identify checks that have cleared or transactions that have been made
- Stop a transaction or payment on a check
- Pay fees or bills

Network Regional and Global Offices

If your company has offices scattered throughout different regions or countries, it's probably important to you that your procedures are the same everywhere. Your customers probably expect consistent service wherever they go and how-

ever they choose to interact with your firm. Networking the offices together is an obvious solution, because it also allows the offices to share information. To accommodate this, your switch must be flexible enough to accommodate a variety of requirements and equipment.

Q-SIG Global Networking

AT&T is the first switch manufacturer to offer Q-SIG — a global standard for vendor-independent networking. Q-SIG has been adopted by the International Standardization Organization, ensuring its acceptance worldwide. AT&T's Q-SIG Global Networking allows you to network different types of systems throughout the world. If, for example, you have acquired an office in another country that uses a non-AT&T switch, AT&T's Q-SIG Global Networking allows you to incorporate that switch into a DEFINITY ECS network. The systems can work seamlessly together, through shared features, flexible numbering plans and simplified network operations and management.

Call Center

Once your offices are networked together, you can set up a call center hub at one office so that your incoming calls are handled consistently and efficiently. Here's how you might set up your call center:

1. DEFINITY ECS's Automatic Call Distribution routes the calls to your hub office.
2. The switch identifies the country from where the call originated.
3. In the caller's native language (English, Parisian French, German, or Castilian Spanish — other languages available soon), a CONVERSANT system asks the caller for his or her account number and type of transaction desired.
4. The call is routed to an agent who speaks the caller's language.
5. The CallVisor ASAI provides the agent with the caller's account information on the agent's console screen.

If the customer requires special attention, the Expert Agent Selection feature sends the caller to the appropriate agent. For example, a customer from France seeking information on investment opportunities is routed to a French-speaking financial planner.

There are a few ways to accommodate those who are calling from rotary telephones. The simplest way is to send the caller to an agent for personal attention if the caller does not enter information immediately after being prompted by the automated attendant. If this solution is impractical, you can distribute inexpensive touch-tone devices to your rotary-phone customers. If those customers speak UK English, Parisian French, German, or Castilian Spanish, you can even use CONVERSANT's Automatic Speech Recognition, prompting the callers to choose various options. (This will soon be available for other languages. Check with your local distributor.)

Group Video Systems

A final aspect of standardizing your customer service is training. Some banks have set up Group Video Systems at their branches and a MultiPoint Control Unit at the home office. This allows full-motion, real-time interactive video calls among them. All the branches in the network can watch and participate in training sessions.

The MultiPoint Control Unit works in several modes:

- Voice Activated Switching — All locations see the person speaking and the person speaking sees the person who spoke before.
- Presentation — All locations see the presenter, and when questions are asked, all hear the questions but continue to see the presenter.
- Broadcast Autoscan — All locations see the presenter, and the presenter can scan locations at intervals.

Improve Customer Service

Improved customer service is inherent in many DEFINITY ECS solutions. Using an Intuity CONVERSANT system to answer and screen calls reduces the time customers wait in a calling queue, for example, and using video systems for training ensures uniform, quality service. Beyond these indirect improvements, however, the system includes some capabilities that directly upgrade your customer service.

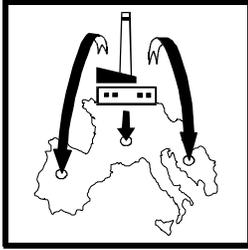
AT&T's call center technology allows you to set measurable customer service goals. You can monitor calls to help ensure that abandoned calls are eliminated or reduced. The Average Rolling Speed of Answer feature ensures that customer calls are handled promptly. The reports generated by the CenterVu Call Management System can help you evaluate agent's productivity. Using these reports, you can also plan staffing levels to meet demand as needed. CenterVu Report Designer allows you to create customized graphic reports for the specific needs of your call center.

AT&T's CenterVu Supervisor allows managers to generate reports by exporting data to common spreadsheet programs. You can even leave this application running in the background on your computer, and it will alert you when crucial thresholds have been exceeded.

Here are some additional ways DEFINITY ECS can help you serve your customers:

- Intuity CONVERSANT brokerage applications allow your brokerage customers who use car telephones to access account information by speaking rather than pressing keys.
- Expected Wait Time tells callers how long they can expect to wait in queue, and offers transactions options according to how long they will be waiting.
- The system can also be set up to provide callers with investment and loan information related to their portfolios while they are waiting in queue.
- DEFINITY ECS's open architecture allows you to easily change and modify features to meet the changing needs of your customers. For example, setting up a telemarketing center often requires making only minor modifications to your DEFINITY ECS call center.
- Some global organizations have calls received after business hours relayed to an office still open for business in another part of the world. This saves the cost of round-the-clock staff and keeps your customers in touch with your best agents.

Wholesale Distribution



The wholesale distribution industry includes both merchants and agents. Merchants buy and sell merchandise, while agents limit themselves to presenting the merchandise and negotiating its sale. Some wholesale distribution companies serve both functions, depending on the circumstances. Most wholesale distribution companies are relatively small, and face increasing competition from larger firms and even from manufacturers themselves. Therefore, most wholesalers cannot easily raise the prices of their products. Continued success requires that they reduce costs and offer more services to both suppliers and customers.

Wholesale Distributors worldwide seek to:

- Provide convenient access to product information
- Automate or streamline ordering procedures
- Provide retailer feedback to suppliers
- Automate routine tasks
- Network regional and global offices
- Upgrade customer service

Provide Convenient Access to Product Information

Intuity AUDIX allows retailers to get product information at the touch of a button. For example, when a clothing retailer calls the wholesaler's product information number, AUDIX presents the caller with the following options:

- For information about women's clothing, press 1.
- For information about men's clothing, press 2.
- For information about children's and young adult's clothing, press 3.
- For information about shoes, press 4.
- To speak to a representative, press 5.
- Or simply enter the extension number of the person you are trying to reach.

The retailer has the option of listening to the product information or having it faxed automatically. You can also have AUDIX call customer service representatives to notify them when they receive voice messages from special customers.

Automate or Streamline Ordering Procedures

Many of the DEFINITY Call Center features that we have described for other industries apply equally to wholesale distribution. Just as in other applications, for example, the switch can route calls based on the time of day or the number of calls in queue. This allows you to have calls received after business hours transferred to an office that's still open. You can also have calls transferred that have been waiting in queue too long.

The Expected Wait Time feature provides a reliable estimate of the time a caller will wait in queue before being connected to an agent. Based on that time, different choices are presented to the caller, such as remaining in queue, leaving a message for a later callback, or transferring to automated services (on INTUITY Conversant Applications). Callers are more comfortable waiting in queue when they know how long the wait will be and can choose alternate options.

The DEFINITY ECS offers a wide range of Call Center features which allow customers to order via fax, via automated voice messaging, or via expedited personal service with minimal waiting in queue.

Provide Retailer Feedback to Suppliers

Any of DEFINITY ECS's voice messaging products allow you to set up a voice mailbox for receiving comments from retailers. You can handle the information more elegantly by setting up an interactive survey using the CONVERSANT Voice Information system. For example, those calling a retailer's feedback hotline might be presented with the following options:

- To comment on an order, press 1.
- To comment on a product, press 2.

After making one of these selections, the caller is given additional options, such as:

- Was your order delivered when promised?
- Was your order complete?
- Was your order undamaged?

The system can be set up to tabulate the data and generate reports, which could be invaluable to suppliers. You can set up similar surveys to provide a variety of market information for suppliers — giving them information about the effectiveness of an advertising campaign, for example.

DEFINITY Call Center applications are designed to efficiently connect each caller with the representative best suited to serve that caller. The DEFINITY ECS begins the process by capturing information about the caller even before the call is routed. That information is integrated with existing databases (see Chapter 4, “Computer-Telephone Integration Solutions”) and the combined data is used to match caller to agent. Additional DEFINITY features politely keep callers waiting in queue (a holding place for incoming calls) informed about how long it will probably take to process the call. Detailed call statistics are constantly available to agents and supervisors.

Calls coming into your DEFINITY ECS call center are queued up and routed based on information that the system continually acquires. Each of your customers can be presented with a variety of options for leaving a voice message, leaving a fax, or monitoring the status of his or her call. Using CONVERSANT voice response software, the system can even respond appropriately to spoken information.

This section describes the DEFINITY ECS call-center capabilities:

- *Automatic Call Distribution*, which manages call traffic and work flow.
- *Call Vectoring*, which allows managers to create controlled routing scenarios that give each caller the best possible service at the least cost.
- *Look-Ahead Interflow*, which balances incoming call loads between two or more DEFINITY ECS systems.
- *Call Prompting*, which allows you to handle incoming calls based on digits entered by the calling party.
- *Expert Agent Selection*, which matches the needs of your callers to the skills of your call center agents, ensuring the best possible service to the caller.

- *Voice Response Integration*, which combines and integrates the capabilities of your DEFINITY call center system with those of your CONVERSANT Voice Information System.
- *CallVisor ASAI*, which delivers call information to a host computer application which routes calls and supplies information to agents.
- *CenterVu Call Management System*, which provides reporting and management information about your call center.
- *CenterVu Supervisor*, which provides a Microsoft® Windows™-based graphic interface for your CenterVu Call Management System.
- *Basic Call Management System*, which provides call management reporting for smaller call center operations.

DEFINITY ECS provides an applications platform that consists of several elements. When these elements are integrated to meet your business requirements, you will have the advanced call distribution and management capabilities that will deliver the performance and growth necessary for your business success.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Automatic Call Distribution (ACD)

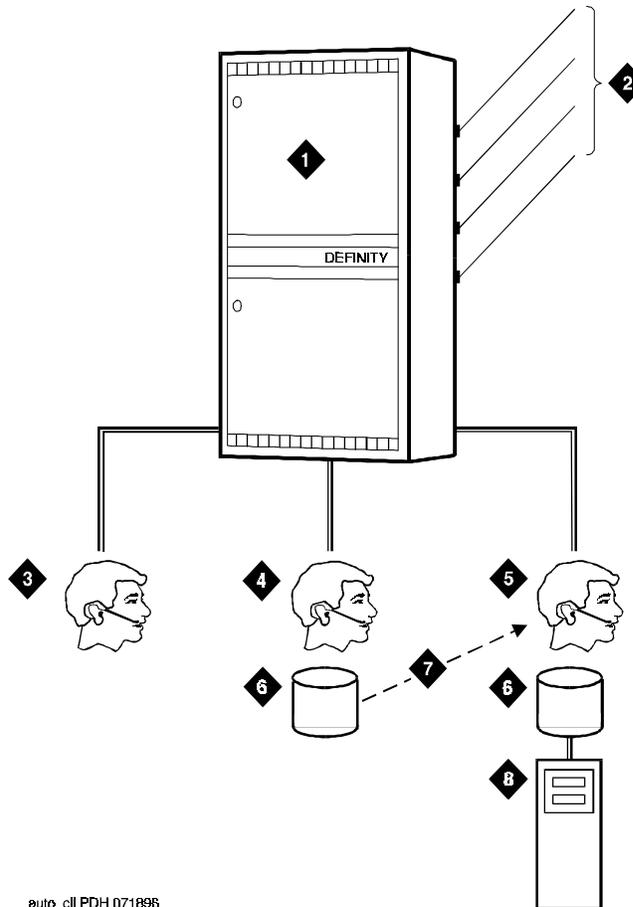
If your company has departments (such as sales, billing, or customer service) that handle large volumes of incoming calls, you can benefit by using DEFINITY ECS's powerful ACD capabilities. ACD is the basic building block for call center applications.

ACD offers you a method for distributing incoming calls efficiently and equitably among available agents. With ACD, incoming calls can be directed to the first idle (Direct Department Calling) or most idle agent within a group of agents. With most idle agent distribution, an incoming call is routed to the agent who has been available for the longest time, resulting in balanced workloads for agents.

Agents in an ACD environment are assigned to a hunt group, a group of agents handling the same types of calls. DEFINITY ECS supports up to 600 different hunt groups. Each hunt group has associated trunks, stations, recordings, and queues. You can assign many ACD features on a per-hunt group basis to meet the different needs of diverse agent groups. You can link a telephone number to an ACD hunt group by associating a published number (often an 800 number) with the hunt group extension number of the hunt group.

Each DEFINITY ECS can support and measure up to 5,200 agents. The total number your system can support will depend on the system configuration, the number of hunt groups to which agents are assigned, and the version of CenterVu Call Management System you use.

In the Figure 3-1 example of a travel agency, Hunt Group A receives calls only when agents are available since it has no queue. Calls to Hunt Group B can be queued while agents are unavailable, and redirected to Hunt Group C if not answered within an administrable time. Calls to Hunt Group C are redirected to voice mail if not answered within an administrable time.



auto_cll PDH 071896

- | | | | |
|---|--------------------------|---|------------------------------|
| 1 | DEFINITY ECS | 5 | Group C: General Information |
| 2 | Incoming Lines | 6 | Queues |
| 3 | Group A: Business Travel | 7 | Call Coverage to Group C |
| 4 | Group B: Personal Travel | 8 | Voice Mail |

Figure 3-1. A Basic Example of Automatic Call Distribution

DEFINITY ECS places all Automatic Call Distribution calls into a queue. Each call stays in the queue until an agent becomes available, until an optional timed inter-

val expires, or until the caller hangs up. If the call has not been answered after an administrable period of time, an announcement can be played for queued callers. The call can then be connected to music to let the caller know that the call has not been dropped, it can be sent to a coverage path, or it can be connected to another announcement.

You can set a maximum queue length in a group to anywhere from 0 to 999 calls, and you can establish a queue warning level. If the preset maximum queue length is reached, additional incoming calls are redirected to a call-coverage path (if administered), ensuring that calls are routed to an extension that will answer the call or are given a busy signal. A priority-queuing feature allows you to designate which calls should receive priority; these calls override the standard first-in-first-out queuing pattern.

Two features provide for redirection of ACD hunt group calls:

- Intraflow allows an ACD call to be redirected from one hunt group to another through coverage paths that are assigned to determine call redirection criteria.
- Interflow allows new calls in a hunt group's queue to overflow and be sent to another ACD hunt group on another system using the Call Forwarding All Calls feature. Interflow can be useful during the evening, during peak operation times, or at other times when agents are unavailable.

ACD agents can use any DEFINITY ECS telephone. The CallMaster digital telephone, described in Chapter 8, "Desktop Solutions", is particularly recommended to meet the needs of ACD agents. A number of special ACD agent features can be assigned to agents' telephones to enable them to perform their jobs effectively. In addition, special features are available to assist supervisors in observing and monitoring the performance of agents.

Additional features give your company even more options when using ACD:

- Stroke Counts provide ACD agents with the ability to record up to nine definable events on a per-call basis by pressing a button when CenterVu Call Management System is active. A tenth event records audio difficulty. Forced Entry of Stroke Counts can be administered for every call answered in the Manual-In mode.
- Call Work Codes allow ACD agents to enter up to 16 digits while on an ACD call (or in After Call Work mode) to record the occurrence of definable events (such as account codes, social security numbers, or phone numbers). CenterVu Call Management System is required to record Call Work Code information. Forced Entry of Call Work Codes can be administered for every call answered in the Manual-In mode.
- Queue-Status uses button lamps and telephone displays to indicate call status for calls waiting in an ACD queue on telephones with a digital display. It can also display how long the oldest call has been waiting.

- Dialed-Number Identification Service allows agents to identify (via display telephones) the purpose of each incoming call and greet the caller appropriately.
- Automatic Available hunt group allows CONVERSANT Voice Information System or other “nonhuman” agent positions to be automatically staffed and made available.
- Each agent can be logged into as many as four hunt groups at a time.
- Malicious Call Trace allows you to designate stations that can trace emergency or threatening calls. When an agent receives a malicious call, the agent presses the Malicious Call Trace button. The system gathers trace information and connects a voice recorder to the call. All equipment used to complete the call is held up (the call cannot be disconnected) until the feature is deactivated.
- Redirection on No Answer allows an unanswered, ringing call to be redirected to an ACD queue or to a Vector Directory Number (see below) after an administered interval. The agent position will also be taken out of service.
- VuStats provides agents and supervisors with call management information on their telephone displays. This customized information can include how many calls an agent has taken and how many agents are on break, for example.

Call Vectoring

Call Vectoring is a versatile method of routing incoming calls that can be combined with Automatic Call Distribution for maximum benefit and call center efficiency. A call vector is a series of call-processing steps (such as providing ringing tones, busy tones, music, announcements, and queuing the call to an Automatic Call Distribution hunt group) that define how calls are handled and routed. The steps, called vector commands, determine the type of processing that specific calls will receive.

Vector commands may direct calls to on-premises or off-premises destinations, to any skill or hunt group, or to a specific call treatment such as an announcement, forced disconnect, forced busy, or music.

With combinations of different vector commands, incoming callers can be treated differently depending on the time or day of the call, the expected wait time, the importance of the call, or other criteria. DEFINITY ECS can route incoming callers to up to 512 different vectors. Each vector can have up to 32 commands. DEFINITY ECS also allows vectors to be linked via the “Go to Vector” command.

Vector Directory Numbers and Vectors

Calls access DEFINITY ECS vectors using vector directory numbers (Vector Directory Numbers). A Vector Directory Number is a “soft” extension number that is not assigned to a physical equipment location. A Vector Directory Number has several properties that are administered by the system manager and that include the extension number, Vector Directory Number name, class of restriction, display override, and the vector number associated with the Vector Directory Number.

Access to a Vector Directory Number may occur in many ways. Since a Vector Directory Number is an extension, it can be accessed in almost any way that an extension can be accessed.

Each Vector Directory Number maps to one vector. However, several Vector Directory Numbers may map to the same vector.

When answering a call, the answering agent will see the information (such as the name) associated with the Vector Directory Number on their display and can respond to the call with knowledge of the dialed number. This operation provides Dialed-Number Identification Service, allowing the agent to identify the purpose of the incoming call.

Applications

There are many different applications for Call Vectoring. However, Call Vectoring is used primarily to handle the call activity of Automatic Call Distribution hunt groups. Call Vectoring can also manage a queue by keeping calls queued in up to three hunt groups (with four different priority levels) while also providing a series of other processing options. Other common applications include:

Special Treatment for Selected Callers

For example, calls from preferred credit card customers may receive priority treatment, but they do not have to be handled by a separate hunt group. Agents in the same hunt group can handle both preferred customers and all other customers. Calls to different Vector Directory Numbers (and vectors) can queue to different priority levels, with preferred customers having top priority. This means that when all agents are busy in this hunt group, calls from preferred customers would go to the top of the queue ahead of other callers already in the queue.

Night Treatment

During non-business hours, the call vector could route calls to a specified destination such as an announcement and then disconnect the call. During business hours, the vector could queue calls to hunt groups for connections with agents. All of this can be accomplished automatically without any intervention by the hunt group supervisor.

Off-loading of Periodic Excess Calls

A vector can check conditions in the targeted hunt group, such as the number of calls already in queue. If the number is above a certain threshold, the vector bypasses that hunt group and routes the call to another hunt group or the vector can return a busy signal. However, if the number is below the threshold, the vector queues the call to that hunt group.

Information Announcements for the Calling Party

The human intervention needed to distribute common messages can be minimized with information announcements. People with a common interest can be instructed to call a specific number (a Vector Directory Number) that connects to a specific announcement vector, which routes callers to a voice messaging system or to an integrated announcement circuit pack in the system.

Look-Ahead Interflow

Look-Ahead Interflow allows two DEFINITY systems equipped with Automatic Call Distribution, Call Vectoring, and interconnected Integrated Services Digital Network-Primary Rate Interface (ISDN-PRI) lines to exchange information on the D-channel. In this way the systems can predetermine whether the receiving system can handle a call diverted from the sending system. This feature allows your company to ensure serving your customers incoming calls within specified service levels, even when one of your call centers is experiencing increased call requests. For example, you could direct calls to your call center in London if your call center in Paris is experiencing heavy call requests or cannot satisfy incoming calls for some reason.

Look-Ahead Interflow enhances Call Vectoring interflow by ensuring that calls do not interflow to a backup system that cannot satisfy expected service levels.

A Look-Ahead Interflow call is attempted when a route to number command successfully accesses an ISDN-PRI trunk group. A vector on the receiving system then either accepts or denies the Look-Ahead Interflow call attempt based on some condition, usually an Expected Wait Time threshold. The sending system does not relinquish control of the call until it is accepted by the receiving system. Until the call is accepted, the caller continues to hear any audio (such as ring-back or music) applied by the sending system, and the call remains in any sending system queues. If the call is accepted, the call is removed from any queues at the sending system, and control of the call is passed to the receiving system.

If the call is denied, vector processing simply continues at the sending system. Audible feedback and the call's position in any queues at the sending system remain unaltered so the caller is unaware that a Look-Ahead Interflow call attempt has been made. The call vector may then apply alternate treatment, which may include placing another Look-Ahead Interflow call to an alternate backup system.

Look-Ahead Interflow is available on private network ISDN-PRI or Software Defined Network connections.

Call Prompting

Call Prompting, an integrated subset of Call Vectoring, may be used in various applications to enhance call handling based on information collected from the calling party. Call Prompting uses Call Vector commands to route calls based on the information collected. It allows you to solicit and provide information to incoming callers who are in queue without causing them to lose their place in queue. Four applications are described below.

- Automated attendant — Allows the calling party to enter the number of any extension on the system. The call is then routed to the extension. This allows you to reduce cost by reducing the need for live attendants.
- DIVA (data in/voice answer) — Allows the calling party to hear selected announcements based on the digits that he or she enters. This may be used for applications such as an audio bulletin board.
- Data collection — Allows the calling party to enter data that can then be used by a host computer application to assist in call handling. For example, this data may be the calling party's account number, which could be used to support an inquiry/response application.
- Call center messaging — Gives the calling party the option of leaving a message or waiting in queue for an agent. This may be used for an on-line order entry system or to further automate an incoming-call center operation.

Expert Agent Selection

Expert Agent Selection provides a method for your call center managers to match the needs of your callers to the skills/talents of your agents, ensuring the best possible service to the caller. Expert Agent Selection allows certain skill types to be assigned to a call type or Vector Directory Number. Routing incoming calls through a Vector Directory Number then allows the system administrator to direct calls to agents who have the particular agent skills required to fulfill the caller's needs successfully.

Caller needs can be identified by several methods. For example, information may be passed from the network in Dialed-Number Identification Service digits or Integrated System Digital Network messages, by call prompting digits or digits entered at a Voice Response Unit, or by using CallVisor Adjunct Switch Applications Interface to access a host database. Expert Agent Selection then uses each of the following capabilities to fulfill the caller's needs.

Call Distribution Based on Skill

Calls that require certain agent skills (such as “speaks Spanish” or “knowledgeable about Product X”) can be matched to an agent who matches the required skill. You can assign one of up to 600 skill numbers to each need or group of needs. The skills are administered and associated for each of the following:

- Vector Directory Numbers
- Agent Login IDs
- Callers

You can assign agents up to four skills or sets of skills. Examples of agents’ skills are: speaks Spanish, knows about Product X, can handle complaint calls, or has access to a particular database. Each of the agent’s skills are rated on a scale of 1-16. The ACD software distributes any call waiting for one of the agent’s Level 1 skills when the agent becomes available. If no calls are waiting for a Level 1 skill, the queued calls for Level 2 skills are distributed to the agent, and so on. Optionally, agents can take the highest priority, oldest call in queue, ignoring the skill levels.

Up to three different skills can be administered to a Vector Directory Number in a prioritized manner. The first or primary skill administered to a Vector Directory Number would be the skill that is required or desired to service a call to that Vector Directory Number. The second and third skills are optionally administered to a Vector Directory Number and represent other skills that are allowed to handle calls to that Vector Directory Number.

Logical Agent

Logical Agent associates an agent’s login ID with a particular telephone only when that agent is logged into a particular terminal.

The DEFINITY ECS treats agent login IDs as extension numbers. It identifies agents based on their individual login IDs. Thus, each agent is no longer associated with a particular telephone. Agents can use any console and multiple agents can use the same console on different shifts.

Agents use a single set of agent work mode buttons for all their skills. Work mode buttons no longer have particular hunt groups (or skills) assigned to them. Any telephone with work mode buttons can be used by any agent.

In addition to skills, the following capabilities are associated with agents’ login IDs.

- *Calls* — calls to the agent login ID reach the agent independent of the telephone the agent is using.
- *Name* — calls to or from the agent display the name associated with the agent login ID and not the name associated with the telephone.

- *Coverage* — when the agent is logged out, busy or does not answer, calls to the login ID go to the coverage path associated with the agent and not to the coverage path associated with the telephone.
- *Restrictions* — calls to the login ID or from the agent use the restrictions associated with the agent and not the telephone.

Each console is fully functional even when an agent is not logged in. The restrictions, coverage, and name revert to the telephone administration when the agent logs out.

Direct Agent Calling

Direct Agent Calling allows calls to be placed or transferred to an agent and have the call treated as an ACD call. Direct Agent calls can be originated by stations or trunks (with the proper Class of Restriction). If the originator or receiver does not have the proper Class of Restriction, the call is treated as a normal non-ACD (personal) call.

Reason Codes

Reason Codes allow agents to specify the reason for going to Auxiliary Work mode or logging out. Codes can be assigned to any reason: taking a break, meeting, training, lunch, or handling mail, for example.

Voice Response Integration

Voice Response Integration combines call vectoring capabilities with the capabilities of voice response units, particularly the CONVERSANT Voice Information System. Voice Response Integration can do the following things:

- Execute a CONVERSANT script while retaining control of the call in DEFINITY vector processing
- Execute a CONVERSANT script while the call remains in the hunt group queue and retains its position in the queue
- Pool CONVERSANT ports for multiple application
- Use CONVERSANT as a flexible external announcement device
- Pass data between DEFINITY and CONVERSANT
- Tandem Voice Response Unit data through DEFINITY to an Adjunct Switch Applications Interface host

These capabilities are provided by the converse command, which is an enhancement to basic call vectoring. The integration of Voice Response Units with vector processing provides the following advantages:

- Access to local and host databases

- Validation of caller information
- Text to speech capabilities
- Speech recognition
- Increased recorded announcement capacity
- Audiotext applications
- Interactive Voice Response applications
- Transaction processing applications

One of the advantages of Voice Response Integration is that it allows your callers to make more productive use of queuing time. For example, while a call is waiting in queue, the caller can listen to product information by completing an interactive voice response transaction. In some cases, it may even be possible to resolve the customer's questions while the call is in queue. This can help reduce the workload of agents during peak intervals.

If your caller was previously queued to an ACD hunt group, position in queue will be maintained during the execution of a CONVERSANT script. If an agent on the DEFINITY system becomes available to service the call, the line to the CONVERSANT Voice Information System is immediately dropped, and the calling party is connected to the available agent.

CallVisor Adjunct Switch Application Interface

CallVisor Adjunct Switch Application Interface (ASAI) enhances ACD by providing improved call automation. This improves agent efficiency and tracking. Data-screen delivery can be automated. The system provides an interface between the DEFINITY ECS and host computer applications. This two-way link lets the host system determine who should get incoming calls and control the routing of calls.

Home Agent/DEFINITY Extender

Two products, Home Agent and DEFINITY Extender, allow your agents to work from home. With DEFINITY Extender, agents can use display consoles from home and work exactly as they would in an office. Home Agent offers a similar solution that enhances the capabilities of analog telephones. See Chapter 6, "Telecommuting Solutions" for more information.

CenterVu Call Management System

The CenterVu Call Management System is a software product that collects call traffic data, formats management reports, and provides an administration interface for Automatic Call Distribution on your DEFINITY ECS. It helps you manage the people, traffic load, and equipment in an ACD environment by answering such questions as:

- How many calls are we handling?
- How many callers abandon their calls before talking with an agent?
- Are all agents handling a fair share of the calling load?
- Are our lines busy often enough to warrant adding additional ones?
- How has traffic changed in a given ACD hunt group over the past year?

The CenterVu Call Management System operates on a Sun Sparcserver 5 or 20 computer in conjunction with DEFINITY ECS. The DEFINITY ECS processor sends information relating to trunk calls, station calls, calls routed by call vectoring, queued calls, agent actions, etc. to the CenterVu Call Management System while call center activities are in progress. You can then generate real-time and historical reports.

Real-time reports are displayed on the screen and dynamically show the status of agents, agent groups, ACD queues, one group's performance compared to that of another group, one agent's performance compared to that of another agent, abandoned calls versus answered calls, etc.

The real-time information display can be updated every 3 to 30 seconds depending on the processor and environment being used. The system allows you to have multiple windows open and functioning simultaneously on a single terminal. Each window can be resized and repositioned on the screen. You can also scroll through the information in the window.

Historical reports summarize call data into intervals (15, 30, or 60 minutes), and by daily, weekly, or monthly totals. Historical data can be kept on-line at all times to satisfy a variety of management information needs. The historical reports help you know when to reorganize your ACD agent group structure, change staffing levels, reprogram your incoming call vectors, reallocate your incoming trunks, and redistribute your call-traffic loads. They can be scheduled to print automatically at intervals.

You can select how much and how long summary data is stored. Weekly and monthly summary data can be stored for up to ten years.

You can customize your reports using the standard reports as a starting point. For example, you can overwrite the headings in copies of standard reports. You can also create your own calculations. This flexibility enables you to report on aspects of the ACD activity unique to your organization.

In addition to standard reports, the CenterVu Call Management System has a comprehensive, optional forecasting system that can help you predict the number of ACD agents you will need at some future date. You can use archived CenterVu Call Management System data, add variable data, change and remove forecasting data, and capture data from a particular period in order to forecast staffing requirements.

CenterVu Supervisor

CenterVu Supervisor is a MicroSoft Windows-based graphic interface for the CenterVu Call Management System described above. Besides the convenience of managing calls from a personal computer, the primary advantages of CenterVu Supervisor are:

- Enhanced Reporting — The application provides many new ways to view data:
 - Pie and bar charts
 - Integrated reports that combine real-time data with historical data
 - Threshold limits on real-time reports
- Customized Reports — The Report Designer feature allows you to easily create your own reports.
- Graphical Interface — The familiar windows-type interface allows users to learn the application more quickly.
- Data Export — The application allows you to easily export data into other Windows applications.

The CenterVu Call Management System is a prerequisite for the CenterVu Supervisor software.

Basic Call Management System

The Basic Call Management System, an integrated, internal capability, is a cost-effective solution for small start-up call centers, for existing companies with minimum system-measuring/reporting requirements or as a back-up to the CenterVu Call Management System. The Basic Call Management System helps you fine tune your call-center operation by providing reports with the data necessary to measure your call center agents' performances.

This feature offers call management control and reporting at a low cost for call-centers of up to 2000 agents. The Basic Call Management System is ideal for companies who need call management features but do not require the same capacities available with the larger CenterVu Call Management System, which requires an adjunct processor.

The Basic Call Management System collects and processes DEFINITY ECS's ACD call data (up to seven days) within the system; an adjunct processor is not required to produce call management reports.

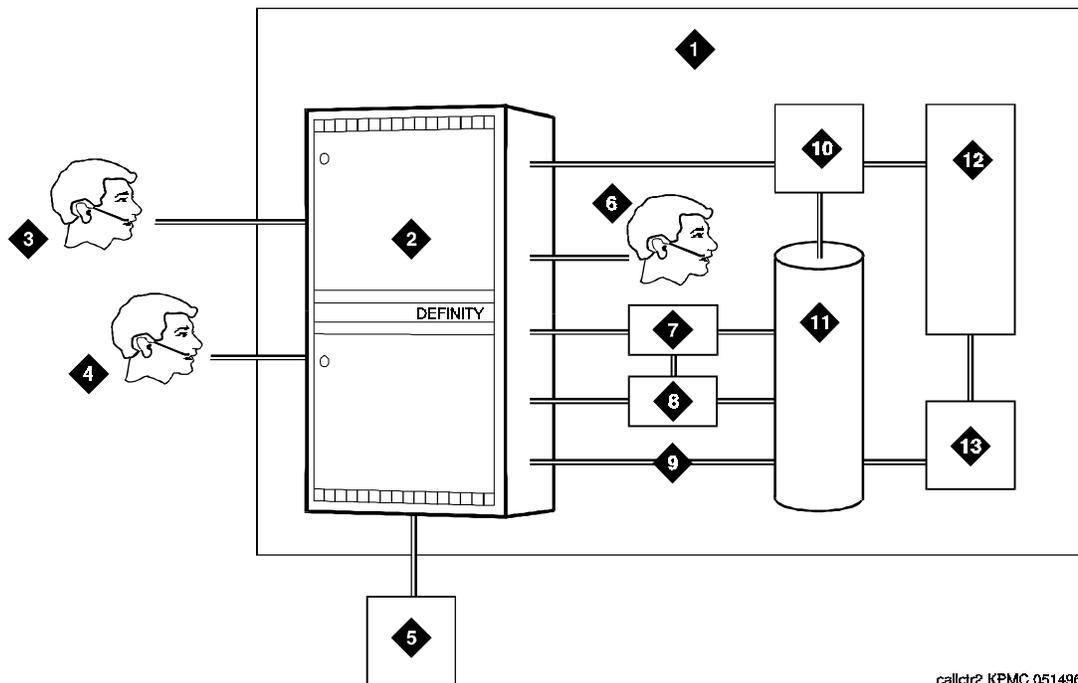
The Basic Call Management System provides various measurements for monitoring the operations of an ACD application. Basic Call Management System software organizes ACD calls and call-center measurements into functionally different reports that supply information useful for managing ACD facilities and personnel. The reports can be displayed on the system administration terminal in real time, printed immediately, or scheduled for printing at a later time via the Report Scheduler feature.

The following are the types of reports that can be generated:

- Real-time reports
 - Agent Status
 - System Status
 - Vector Directory Number Status
- Historical reports
 - Agent
 - Agent Summary
 - Split
 - Split Summary
 - Trunk Group
 - Vector Directory Number report

Call Center Summary

Figure 3-2 summarizes how you might set up a DEFINITY Call Center.



callctr2 KPMC 051496

- | | | | |
|---|---|----|---|
| 1 | Your Office Building | 8 | CentreVu Supervisor |
| 2 | DEFINITY ECS | 9 | CallVisor Adjunct Switch Applications Interface |
| 3 | Remote Agents Using DEFINITY Extender | 10 | INTUITY Conversant Voice Response System |
| 4 | Remote Agents Using Home Agent | 11 | Local Area Network |
| 5 | Remote Call Center Using Look Ahead Interflow | 12 | Host Computer |
| 6 | Local Agents Organized By Skill | 13 | Computer-Telephone Interface Server |
| 7 | CentreVu Call Management System | | |

Figure 3-2. A DEFINITY Call Center

Table 3-1 summarizes the four Call Center packages available with the DEFINITY ECS. These packages are available for all versions of the system. Specific configurations depend on the number of agents in the call center.

Table 3-1. Call Center Packages Available in the DEFINITY ECS

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Automatic Call Distribution	X	X	X	X
Redirect On No Answer	X	X	X	X
Auto Available Split	X	X	X	X
Service Observing Basic	X	X	X	X
Service Observing Remote	X	X	X	X
MIA Across Skills/Splits and ACW Treatment Options	X	X	X	X
ACW in MIA List	X	X	X	X
Multiple Call Handling On Request	X	X	X	X
VuStats	X	X	X	X
Service Level	X	X	X	X
Login IDs	X	X	X	X
VuStats Enhancements	X	X	X	X
Move Agent/Change Skills While Staffed	X	X	X	X
Forced Multiple Call Handling	X	X	X	X
Multiple Announcement Boards	X	X	X	X
Basic Call Management System		X	X	X
Service Level		X	X	X
Login IDs		X	X	X
Timed After Call Work/Agent Pause Between Calls		X	X	X
Call Vectoring			X	X

Continued on next page

**Table 3-1. Call Center Packages Available in the DEFINITY ECS —
Continued**

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Call Prompting			X	X
Administrable Inter-digit Timeout			X	X
Caller Information Forwarding ¹			X	X
Service Observe on Vector Directory Number			X	X
Vector Directory Number of Origin Announcement			X	X
Vector Directory Number Real Time Report			X	X
Call Work Codes			X	X
Redirect On No Answer To Vector Directory Number			X	X
Vector Initiated Service Observing			X	X
Enhanced Vector Administration			X	X
Route To With/Without Coverage			X	X
Vectoring Enhancements			X	X
Wildcard Matching			X	X
Multiple Audio/Music Sources			X	X
Vectoring Advanced Routing			X	X
ASA Routing			X	X
EWT Routing			X	X
VDN Calls Routing			X	X
Vectoring ANI/II Digits Routing			X	X
Expert Agent Selection				X
Increased Skills Capacities				X

Continued on next page

**Table 3-1. Call Center Packages Available in the DEFINITY ECS —
Continued**

Feature	Call Center Basic	Call Center Plus	Call Center Deluxe	Call Center Elite
Add/Remove Skills by Feature Access Code				X
Service Observing on Logical Agent				X
MWL for Logical Agent Coverage				X
Inspect Button Shows Station Name				X
Reason Codes				X

1. Caller Information Forwarding is only available in the United States.

Computer-Telephone Integration is a fundamental component of efficient call center operations. Consequently, Chapter 4, "Computer-Telephone Integration Solutions" includes additional call center information.

Computer-Telephone Integration Solutions

4

Telecommunications and information systems are the fundamental building blocks of most businesses. Whether a sale is being made, a question being answered, or an order being placed, the telephone is the primary communications medium. And the information to make the sale, answer the question, or fulfill the order is stored in the computer.

If these two building blocks are closely integrated, your business will realize benefits that will redefine your standards for success and customer satisfaction. DEFINITY ECS integrates data processing, data communications, and voice communications.

The following products work with DEFINITY ECS to unite your computer and telephone in powerful ways:

- DEFINITY PC Console
- Callvisor Adjunct Switch Application Interface
- CallVisor computer-telephone integration products
- CallVisor Enhanced Services
- Several applications and products that make use of the CallVisor products
- PassageWay

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

DEFINITY PC Console

Lucent Technologies DEFINITY PC Console allows your call attendants to handle incoming calls efficiently by personal computer. Using the familiar Microsoft Windows graphical interface, the attendants can easily keep track of how long callers have been on hold and who they are waiting for. Attendants can monitor up to six calls at once. They need not fumble with pen and paper when handling calls, as they can make notes on their computers about what each caller needs. All this contributes to make a favorable first impression with your customers. Having the call processing software on the same computer with spreadsheet, word processing, or other software allows the attendants to stay productive between calls.

Your company directory is displayed on screen with busy extensions shaded. A variety of search functions are available, so attendants can find names and extensions easily. On-line photo identification allows attendants to quickly identify employees. Calls are transferred with the press of a button. On-line help makes it easy for attendants to remind themselves how to use the system.

The PC Console is easily customized, so even if attendants from different shifts share the same computer, they can each preserve their preferences in the call processing environment. The system also accommodates any language that uses the Roman alphabet and ASCII 128 character set. If a Spanish-speaking attendant takes over for a French-speaking attendant, for example, a single press of a button converts all labels, error messages and on-line help to Spanish.

CallVisor Adjunct Switch Application Interface

The CallVisor Adjunct Switch Application Interface (ASAI), is an optional software package for the DEFINITY ECS, offers the productivity gains and customer service benefits of computer-telephone integration, including faster, more efficient call routing and handling. CallVisor ASAI establishes a built-in, two-way digital link for direct communication between your Switch and computing environment.

The CallVisor interface is based on International Telecommunications Union (ITU)-T standards for ISDN and on International Standards Organization (ISO) standards for data communications. This comprehensive and open applications-level interface provides access to and control of call-processing features via computer. DEFINITY ECS supports the interface on ISDN-BRI and TCP/IP connections as well.

AT&T developed CallVisor ASAI in cooperation with the 170-member ISDN/Digital Multiplexed Interface Users Group, an association of technology companies that promotes ISDN products and services. AT&T published the ASAI specifications in December 1989.

AT&T/Lucent Technologies has established development partnerships for ASAI with IBM, Hewlett-Packard, Dialogic, GIS, Tandem Computers, Stratus Computers, and Novell.

Lucent Technologies is offering ASAI to meet specific customer needs for integration applications. These applications include incoming and outgoing call management, customer service, and office automation. ASAI satisfies the following requirements for these applications:

- Simultaneous delivery of information about a customer to a call center agent's terminal with call delivery
- Set up, transfer, conference, and disconnect of calls controlled by a computer application rather than manually at a telephone
- Monitoring of calls arriving at particular extensions
- Routing of calls based on call information such as originating telephone number
- Controlling system features like "message-waiting lamp"
- Agent login and out-of-call center groups through computers

Capabilities

CallVisor Adjunct Switch Application Interface. Defines eight application service elements that incorporate 48 separate capabilities provided by the DEFINITY ECS system. The particular elements that are used in your application will depend on the computer-telephone integration product with which the system is communicating.

First Party Call Control. Used when the application is a communicating endpoint in the call to be monitored or controlled. For example, the application might involve a program on one PC making a call to a program on a second PC. An application using First Party Call Control capabilities is limited to monitoring and controlling only calls that are directed to it. The application can still take advantage of some of the more advanced features of ISDN, however, such as delivery of the calling-party number.

Third Party Call Control. Allows the computer application to control call functions for other endpoints on the system. For example, an application can specify two endpoints for a call and then request that the system establish a connection between those two endpoints. The application here is not a true endpoint in the call; it has merely used an ASAI message to request that the system make the call and notify it when the call has been made. Once established, the application can control the specific communication functions required by the call.

Notification Application Service Element. Allows an application to request delivery of information about events occurring in a system, such as alerting a station by an incoming call, or connecting or disconnecting from the call.

Routing. Lets the system request routing information for a call from an application on the computer. The application provides a route or destination for the call on or not on the system. For example, when a call arrives, the system can request a route for the call based on the calling-party or called-party number information it passes to the computer. The computer can then send back an extension to which the call can be routed.

Value Query. Requests information about the status or value of system objects or parameters. For example, an application can request the time of day, the status of call center agents and groups of agents, or information about the status of particular stations.

Set Value. Allows an application to change the status of system objects such as the message waiting indicator for a particular station.

Request Feature. Working with an application, can start and cancel Call Forwarding or Send All Calls, or log call center agents in and out and change their work modes.

Maintenance. Lets the system and computer send a message to show that the ASAI link is operating.

With CallVisor ASAI capabilities, an inbound call center application can perform a number of productive functions:

- Monitor calls and report on agent/split activity.
- Route calls based on Calling Line Identification and ACD activity such as the number of calls in queue and available agents.
- Prepare, deliver, and transfer the appropriate data screen to the agent along with the voice call; and copy the screen to the supervisor's terminal in response to an agent's request for help.
- Capture the telephone number of abandoned calls for later callback.
- Manage agent activity by automatically moving agents among splits based on calling volumes.

CallVisor ASAI also supports preview and predictive dialing in outbound call centers. Predictive Dialing ensures that call center agents only get answered calls. CallVisor ASAI uses DEFINITY hardware to obtain an analysis of call events such as whether a call has been answered or is busy.

CallVisor ASAI has a station-oriented mode of operation ideal for office automation applications. In this mode, the computer application acts as a surrogate end user, like a person with a telephone. The application can receive a call when it comes into a station, manipulate the call while it is at the station, and invoke station features like lighting the message waiting light, setting Send All Calls, or Call Forward.

These capabilities could be used, for example, to provide an integrated voice and electronic mail system for office personnel. With this system, office personnel can have a message waiting light turned on whenever an electronic mail message is received or get an electronic mail message when a voice mail message arrives. Another application is a "Follow-me" call forwarding application, in which calls are automatically forwarded to different locations based on a schedule entered by the user.

The CallVisor ASAI capabilities and features can be used to support a variety of applications in the call center environment — as well as office automation applications that include directory services, message desks, and phone management. CallVisor ASAI-based applications let DEFINITY ECS and your computers share and use information, complementing and enhancing the communications and data-processing capabilities these systems deliver. These capabilities can help you streamline operations, improve productivity, and improve customer satisfaction.

Architecture

ASAI integrates the DEFINITY ECS with main-frames, minicomputers, personal computers (PCs), and distributed computing environments (such as LANs and client-server environments) for call center and office automation applications. In an inbound call center, agents use a telephone and a computer connected to a computing environment. The computer uses information it receives over the ASAI link to display information about incoming calls on the agent's terminal.

In outbound call centers, the agents' equipment is similar, but the computing environment uses the ASAI link to make outbound calls. ASAI also shifts agents from inbound to outbound service and back. It can be used to provide screen-based dialing and other office automation applications.

An ISDN primary rate interface (PRI) link provides calling-party and called-party information to the various applications. This link is not required, but it lets applications use network information provided by ISDN to broaden its scope. Without a PRI link, automated voice response units can still gather information needed by prompting with DNIS.

Application Programming Interface

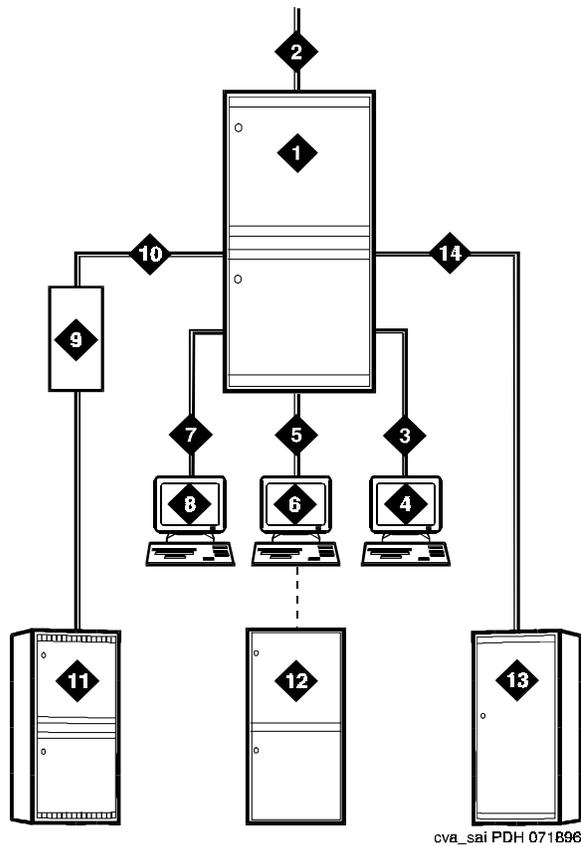
ASAI provides an applications programming interface, which can be used by vendors to develop computer-telephone integration applications. The applications programming interface supplies the syntax and operation of the function calls used to invoke ASAI capabilities. The interface can be used to communicate with vendor-specific application interfaces. For example, IBM has an application program interface known as CallPath' Services Architecture. Digital Equipment Corporation works with an application program DEFINITY ECS interface called Computer Integrated Telephony. Lucent Technologies CallVisor for UNIX can also be linked to ASAI.

CallVisor for UNIX

The Lucent Technologies CallVisor for UNIX provides an ASAI interface between a PC and your DEFINITY ECS. CallVisor for UNIX, also known as PC/ASAI is an excellent choice to bring the benefits of CTI to office automation applications in client-server computing environments.

CallVisor for UNIX uses the PC/ISDN Platform to provide connectivity to your DEFINITY ECS system. The software includes an application programming interface that allows you or vendors to develop applications that communicate and utilize the information provided by the ASAI link.

The Novell Telephony Service for Netware is an example of a product that brings you the benefits of linking your DEFINITY ECS with your computing environment. Telephony Service for Netware links Novell's Netware to your DEFINITY Generic system, providing access to common telephone features, such as autodialing, conference calling, and message management in combination with information stored in your client-server computing environment. The software also includes a Lucent PassageWay desktop application that gives you the ability to speed-dial calls and take notes that are associated with each call. Notes from previous conversations are available with each call.



- | | |
|---|---|
| 1) DEFINITY Generic 3 | 8) Personal Computer/ISDN Platforms |
| 2) Primary Rate Interface | 9) CallVisor ISDN Gateway |
| 3) CallVisor Adjunct Switch Applications Interface; Call monitor and control, Station monitor and control | 10) Calling number, Called number, Agent extension |
| 4) CallVisor for UNIX | 11) Inbound Call Management |
| 5) Adjunct Switch Applications Interface; Call events, Outbound call requests, Routing requests | 12) Voice Response Applications, Inbound Call Management |
| 6) Conversant Voice Information System | 13) Call Center, Office Automation |
| 7) Digital Communications Protocol/Basic Rate Interface | 14) Call monitor and control, Station monitor and control |

Figure 4-1. DEFINITY ECS and CallVisor Adjunct Switch Applications Interface

CallVisor ASAI Gateway

The CallVisor ASAI Gateway provides ASAI capabilities for the DEFINITY Generic 2 system. See your Lucent Technologies account team if you would like additional information on migrating your CallVisor ASAI Gateway to the DEFINITY ECS architecture.

CallVisor Services

With Lucent Technologies CallVisor Services Offerings, you can select the level of service that meets their specific business needs. For instance, you can choose only standard installation and maintenance of your DEFINITY CallVisor products.

You can increase the level of service to include complete management of the call-flow design and/or project management of the installation and servicing of the entire system, including other vendors' equipment. CallVisor Enhanced Services can provide you with the convenience and security of having a single point of contact for design, installation, and maintenance of your computer-telephone integration links.

CallVisor ASAI implementation services are available as follows:

- **Standard Installation** — This option offers the services of technicians to install and test all components of the computer-telephone integration.
- **Consultative Services** — With this option, consultants are available to assist you in the technical management and design of your computer-telephone integration application. The following services are included:
 - **Requirements Analysis** — includes surveying your current operating environment, proposed applications, and project goals and objectives with all parties involved in order to document the steps necessary to achieve success.
 - **Call Scenario Development** — provides a detailed description of the handling of each call that will be involved in your call center. The call scenarios developed then become part of the computing environment ASAI requirements.
 - **Call Center Consultation** — provides guidance in the design process for the Automatic Call Distribution portions of the project, including CMS report interpretation, split layout, and call handling in the ASAI environment.
 - **General Consulting** — provides technical support to your application developer.
 - **Functional Testing** — provides assistance in the design and execution of a test program to examine the deliverable components of your computer-telephone integration project.

- Acceptance Testing — provides assistance in the design and execution of a project acceptance test plan.
- Single Point of Contact — With this service option, Lucent Technologies manages the entire implementation of call center components from all vendors involved. Consultative services must be provided with this service.

CallVisor ASAI Maintenance Services

- Standard Maintenance Agreement — This contractual service offering is an extension of your warranty and includes call receipt, fault isolation, and trouble resolution for Lucent Technologies elements of the computer-telephone integration link.
- Single Point of Contact — This enhanced service provides you with management of all ongoing servicing for all Lucent Technologies equipment as well as other vendors' products in your CTI environment.

Other Vendor Products

AT&T/Lucent Technologies and a number of vendors have announced and jointly developed products and services that make use of CallVisor ASAI as solutions for your business needs. These efforts protect your business investment in existing Lucent and other vendor hardware and software while expanding your network capabilities to incorporate new technologies and to meet constantly changing business requirements. At the time of this book's printing, the following vendor implementations have been announced and are available.

Historically, IBM's CallPath/400 provided a direct link to the DEFINITY ECS system via CallVisor ASAI. CallPath/400 now requires Switch Server/2 for DEFINITY integration. CallPath Switch Server/2 was enhanced to support integration with CallPath CICS on Systems 370 and 390. DEFINITY/IBM Integrations are now based on the CallPath Server/2 PS/2 platform, and the CallPath Server/6000 platform. Either of these servers can support a variety of clients.

Lucent Technologies and Dialogic Corporation have integrated the DEFINITY CallVisor ASAI and Dialogic's CT-Connect product. Because Dialogic corporation was formed from a division of Digital Equipment Corporation, Dialogic's CT-Connect also supports Digital Equipment Corporation servers.

Stratus Computers Incorporated and Lucent Technologies have worked together to provide an interface between Stratus Adjunct Interface and Lucent's CallVisor ASAI. Stratus offers a hardware fault-tolerant system targeted for customers' critical on-line call center applications. The Stratus system is based on ASAI code that was licensed from Lucent Technologies. This facilitates keeping the Stratus product updated as new DEFINITY ASAI features are added.

Tandem Computers Incorporated and Lucent Technologies have announced development of an applications interface to link Tandem NonStop fault-tolerant computer systems and the DEFINITY ECS. This agreement lets both companies offer new applications and benefits resulting from an integrated interface from Lucent Technologies systems to Tandem computers. Tandem's Call Applications Manager lets users collect incoming-call information, such as a caller's phone and account numbers, from a database within seconds.

Hewlett-Packard has also announced a product for its Applied Computerized Telephone product line to connect HP 3000 and HP 9000 computers to DEFINITY ECS. The product supports Lucent Technologies Adjunct Switch Applications Interface in client/server implementations.

Global Information Services has implemented a computer telephone integration server for the microchannel midrange line of products. The GIS server 3000 is based on ASAI code licensed from Lucent Technologies to facilitate implementation of new features. GIS has partnered with several application vendors, and will support other systems beyond DEFINITY using a middleware-based link.

A Software Developer's Kit is available from Lucent Technologies that implements the ASAI interface for UNIX or Solaris® x86/Intel servers. The licensed software is bundled with an application package and re-sold to end users. This offering is primarily licensed to independent software vendors, value-added resellers, and systems integrators. Some technically advanced end users are also using the developer's kit.

Lucent Technologies will continue to develop partnering agreements with other vendors, continually enhancing your investment in Lucent Technologies technology. Contact your local Lucent Technologies representative to get the latest information on switch-to-host products that you can use to improve your bottom line.

PassageWay

Lucent Technologies PassageWay products bring the telephone and the personal computer together into an integrated voice and data workstation that can greatly enhance communications. With PassageWay, you can efficiently process calls while accessing powerful voice and data features. It also permits you to connect to a variety of host computers and other PCs through the networking strengths of DEFINITY Generic 3. PassageWay provides error-free data transfer between your personal computers and other shared resources. You can even create your own applications to take advantage of the PassageWay connection.

PassageWay Direct Connection

PassageWay Direct Connection links your company's desktop personal computers with an easy-to-use Microsoft Windows interface to give you greater business communications capabilities than either the telephone or the personal computer offer alone.

PassageWay Direct Connection provides valuable computer-telephone integration benefits, plus it is a platform bridge to a wealth of other computer-telephone integration applications. Open Application Programming Interface support and Windows Dynamic Data Exchange support allow independent software vendors or internal software developers to create new computer telephone integration applications or to enable existing applications to be interfaced to the telephone. These independent software vendor's products utilize the PassageWay platform to expand the power and flexibility of computer telephone integration at the desktop.

The PassageWay Direct Connection software applications are for the individual desktop personal computer. However, using the Application Programming Interface, Dynamic Data Exchange, or independent software vendor's products, PassageWay Direct Connection can be linked to the your Local Area Network.

PassageWay Direct Connection is well-suited for those users who are constantly conducting business using both the a Windows-based personal computer and an Lucent Technologies telephone and want to boost their efficiency.

Here is a list of the computer telephone integration software applications included with each PassageWay Direct Connection product:

- AT&T Call is a software card-file database that allows a customer's record to be previewed, the appropriate telephone number to be autodialed and notes to be taken quickly all with just a few mouse clicks.
- AT&T Buzz instantly retrieves and displays the AT&T Call record associated with an incoming call based on the Calling Party's Telephone Display Information (Automatic Number Identification, Call Prompting, Conversant). AT&T Buzz also allows users to answer incoming calls from their personal computer with only a single mouse click.
- Log Viewer automatically maintains a record of every call either made from AT&T Call or received from AT&T Buzz.

PassageWay Direct Connection supports those international companies who need A-law support and/or 8400 series telephones, which allow both two-wire and four-wire connections.

The following system requirements must be met for PassageWay Direct Connection to function properly:

- An IBM Compatible personal computer with:
 - 386 or higher microprocessor
 - Two megabytes of RAM (4MB recommended)
 - Two megabytes of hard disk space
 - 3.5" or 5/25" disk drive
 - An available serial port
 - Mouse or trackball
 - VGA (or higher resolution) monitor
- Microsoft Windows 3.1 or higher (in standard or enhanced mode) or Windows for Work Groups 3.11 or higher
- A DEFINITY ECS and one of the following telephones:
 - 7400 series telephone
 - CALLMASTER 4-wire Digital Communications Protocol telephone (with adjunct power)
 - 8400 series telephone
- Local adjunct power (or closet power) for the DEFINITY PassageWay Direct Connection device

PassageWay FastCall for Direct Connection

PassageWay Fast Calling Feature for Direct Connection is a Windows-based application which was developed by Aurora Systems for a variety of Lucent Technologies computer telephone integration platforms including PassageWay Direct Connection, PassageWay Telephony Services, and PC/Switch. The Fast Calling Feature delivers multiple computer telephone integration capabilities for Call Center and other computer users workers in your company. These capabilities include:

- Instant account information on screen (based on Calling/Called Party and/or Caller Input Identification)
- Coordinated Voice and Data Transfer
- Outbound Preview Dialling
- Inbound Call Handling Rules (user-defined call coverage)
- Personal computer-based telephony (activation of Conference, Transfer, Drop, and Hold from the personal computer)

The Fast Calling Feature resides between PassageWay and any Windows-based application on your Local Area Network, desktop personal computer, or mainframe. This approach allows existing applications to be simply and quickly

“telephony enabled” without the need for low-level software development. The Fast Calling Feature takes advantage of simple keyboard recorded scripts and macros.

The primary users of the Fast Calling Feature would be Call Center Agents or employees who use a personal computer in their work. If these users want to automate their existing Windows application to perform one of the five tasks listed above, Fast Calling can enable them to do just that.

PassageWay Telephony Services

PassageWay Telephony Services connects the DEFINITY ECS and Novell Networks. Developed in partnership with Novell, it allows you to integrate a variety of communications systems and software in one network. Its open architecture is based on the ECMA CSTA international standard. Besides standard Windows environments, PassageWay Telephony Services supports Windows NT, OS/2, Macintosh, and UnixWare operating systems on a Novell NetWare LAN. The Telephony Services Applications Programming Interface enables you to coordinate the applications on the network. The programming interface is supported by 30 telecommunications vendors.

The Bulk Administration feature allows you to use existing databases to provision the telephony server. You can also create filters for integrating the information the server requires, using a variety of software to manipulate the data. The LAN Traffic Measurements Utility provides tools for measuring LAN traffic versus telephony traffic.

The PassageWay Telephony Services installation programs and documentation are provided in U. S. English, French, German, Spanish, and Italian. See your local distributor for information on whether other languages are available.

Most businesses today struggle to improve customer service and increase profits while they control costs and staff size. That means employees have to be more productive, more responsive, and often more *mobile*. Wireless solutions allow you to control costs by reducing time and resources spent on paging employees, interrupting work to find a phone, rushing to answer calls, or being tethered to the desk waiting for an important call. Reliable wireless tools remove the fear of losing customers who couldn't wait to reach you directly.

Lucent Technologies is the top U. S. provider of wireless solutions for business. Lucent's FreeWorks™ Solutions offer a range of options from cordless telephones to integrated cellular business systems that greatly enhance the flexibility of wireless telephones.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Cordless Solution

Lucent's cordless telephones and speakerphones give you complete freedom to make and receive calls around your immediate work area. The Multi-line Digital Cordless Business Telephone features crystal clear voice quality, consistent privacy and secure operation. It also includes an intercom feature, conference and transfer capabilities, and programmable feature buttons.

Medium Range Mobility Solution

AT&T's TransTalk 9000 (Figure 5-1) is a multi-line, single zone solution that allows you to roam up to 700 feet (230 meters) from the base station. It effectively covers up to 500,000 square feet (150,000 square meters) in most business environments.

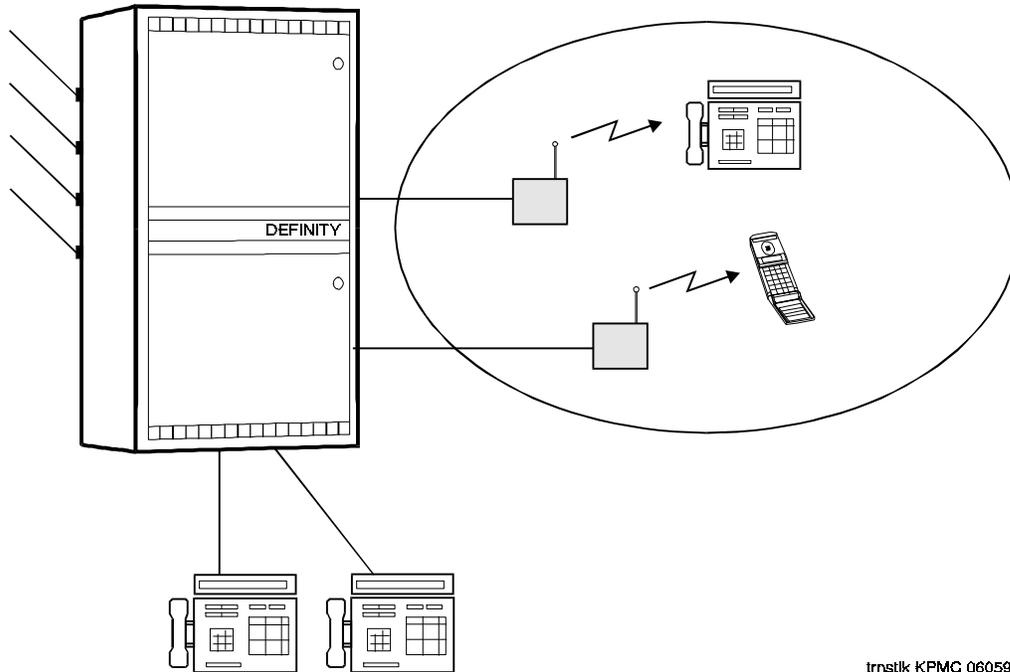


Figure 5-1. TransTalk 9000

TransTalk 9000 is available in two configurations:

- Complete System, consisting of a carrier that holds up to six radio modules, MDW 9000 wireless telephones, and corresponding charging cradles, radio modules, and holsters.
- Stand-alone, consisting of a single radio module, wireless telephone, charging cradle, and holster.

The wireless telephones have all the same features as the cordless business phone, plus these additional ones:

- Automatic registration
- Trouble lights
- Extended battery life
- Battery pack and optional battery backup

- Rapid battery charger (2 1/2 hours)
- Dynamic power adjustment
- Mute button
- Mobility range test capabilities

Long Range Mobility Solutions

Lucent Technologies offers two robust systems that will keep you in touch with customers, coworkers, and suppliers wherever you go in your office complex—desk-to-desk, office-to-office, or office-to-warehouse. In both systems, overlapping zones allow you to move about freely without changing phones (Figure 5-2). The phone connection is “handed off” from one transmitter to another as necessary .

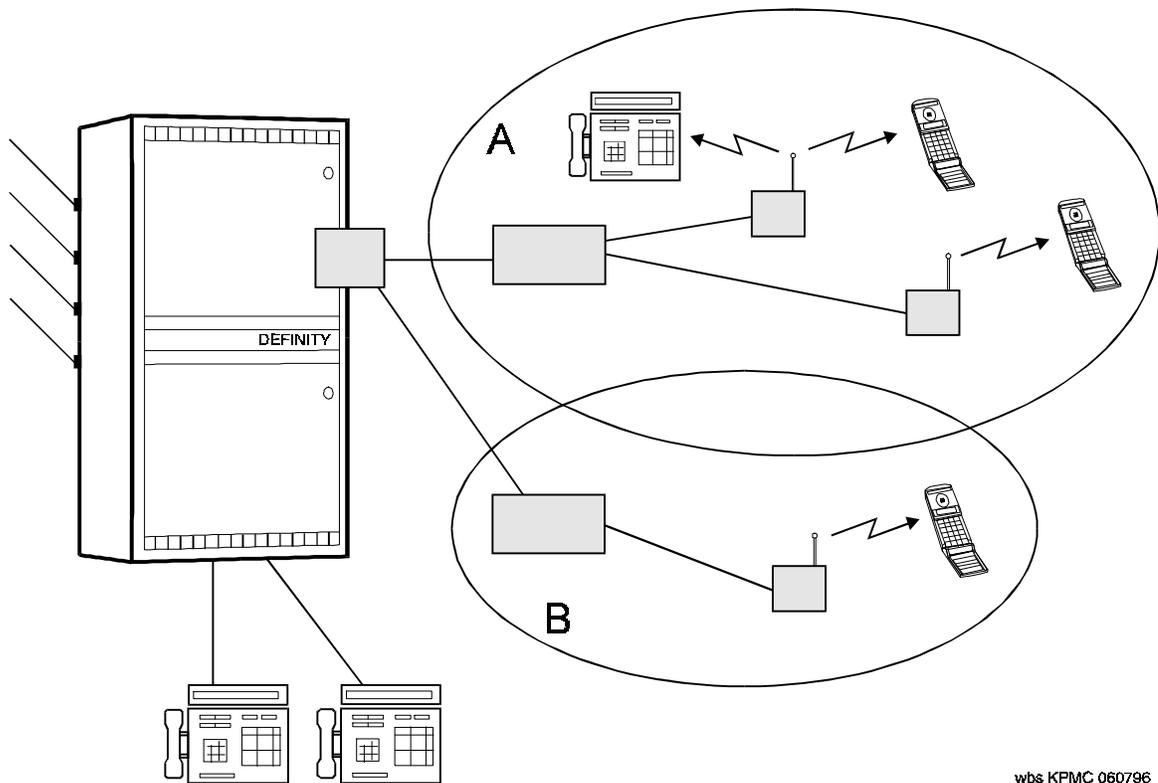


Figure 5-2. Long Range Mobility Solutions

The DEFINITY Wireless Business System and the Forum™ Personal Communications Manager are similar in many respects. The DEFINITY Wireless

Business System can be integrated with the DEFINITY ECS, and thus has some inherent efficiencies. The Forum uses an adjunct device but offers slightly higher capacities. It also uses an international industry standard that is more common in some parts of the world.

Both systems feature Lucent's Wireless System Engineering Expert Design System. This patented software, which is unique in the wireless industry, analyzes the building or campus space and determines how the wireless system should be configured. It precisely locates base stations within the structure or structures. The software effectively eliminates the most difficult aspect of wireless implementation and ensures maximum efficiency and lower life cycle costs.

DEFINITY Wireless Business System

The DEFINITY Wireless Business System relies on the DEFINITY ECS system to manage mobility. It uses Personal Wireless Telecommunications technology, which is a leading protocol in the United States. This standard, which has the primary advantage of permitting up to 12 simultaneous conversations per base station, defines the radio interface between the portable telephones and the base stations in the system.

The DEFINITY Wireless Business System is fully integrated with the DEFINITY ECS, and offers users full access to the DEFINITY ECS features. The system has the following maximum capacities:

- 260 wireless telephones
- 60 base stations
- 7,000 to 40,000 calls per busy hour (depending on DEFINITY ECS configuration)
- 3 million square foot (.9 million square meter) coverage area

Forum Personal Communications Manager

The Forum Personal Communications Manager uses a Forum switch, which can serve as an adjunct to DEFINITY ECS, to manage mobility. The system uses Cordless Telephone Generation 2 (CT2) technology, which is a global standard for wireless telephone service. This standard defines the radio interface between the Forum pocket telephones and the base stations in the system.

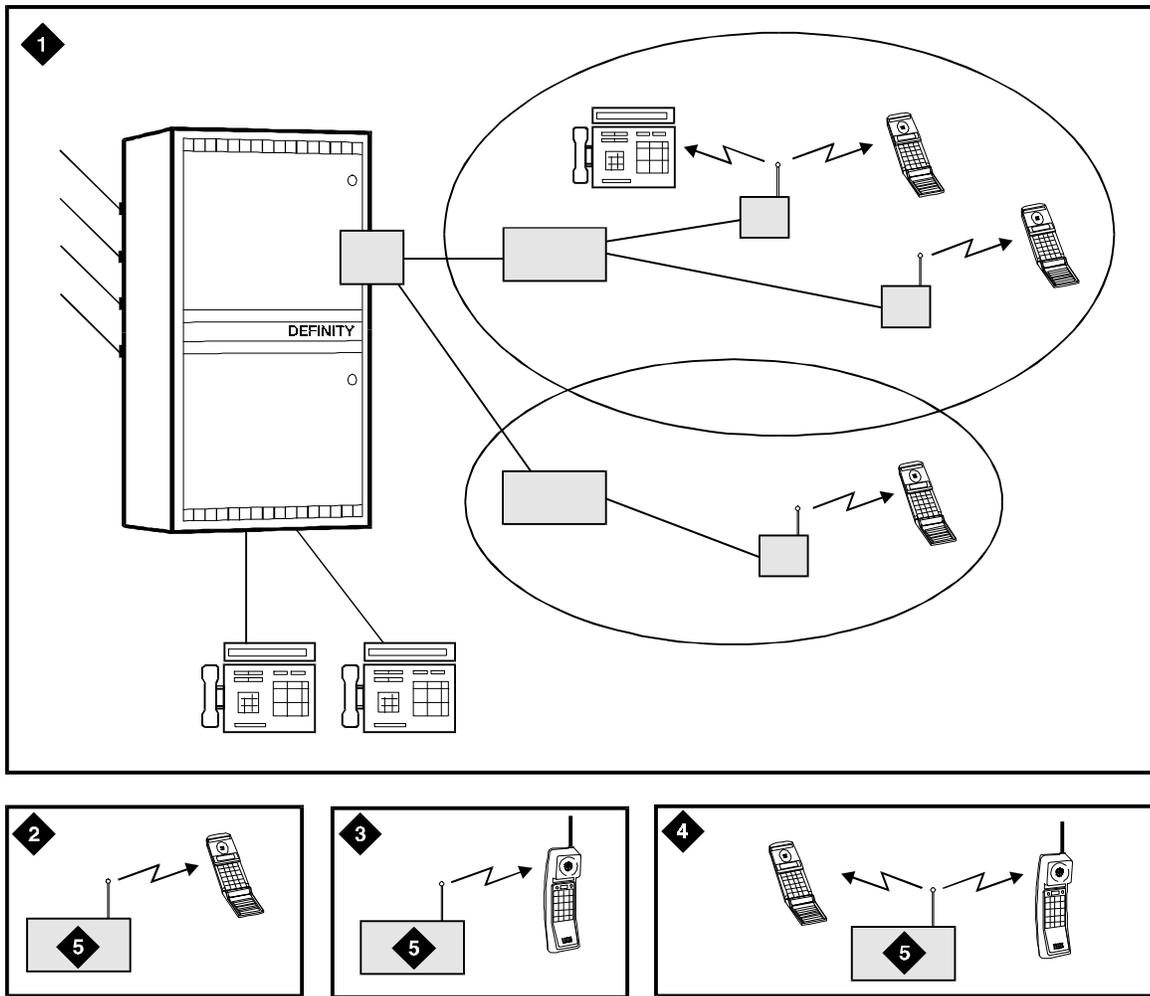
Forum's System Manager provides superior system administration capabilities. The Forum Personal Communications Manager can accommodate even the largest businesses. It has the following maximum capacities:

- 500 wireless telephones
- 126 base stations
- 6 PRI interfaces

- 1 Sun workstation
- 4 million square foot (1.2 million square meter) coverage area

Integrated Cellular Solution

The DEFINITY Cellular Business System allows you to walk or drive over a large area while still being integrated with your office environment, then move seamlessly into a standard cellular environment. It allows you to use the same full-featured cellular phone inside and outside your building. You can continue to place and receive calls, using your phone as a normal cellular phone after moving out of range of the system (Figure 5-3).



cellbs PDH 071896

- | | | | |
|---|-----------------|---|------------------|
| 1 | Office Building | 4 | Shopping Mall |
| 2 | Hotel Lobby | 5 | Cellular Network |
| 3 | Airport | | |

Figure 5-3. Cellular Business System

This integrated system also is supported by a version of AT&T's unique Wireless System Engineering Expert Design System. The design system automates system planning and configuration and ensures optimum performance.

The Cellular Business System supports up to 600 users. Local system coverage is up to 4 million square feet (1.2 million square meters).

Lucent Technologies research, supported by industry studies, shows that telecommuters are generally 15 to 30 percent more productive when they work at home. They convert travel time into productive work time, are less likely to be distracted by normal office routines, and frequently end up working longer hours with greater output. During severe weather, they can continue working when others cannot.

Special DEFINITY system modules are available for telecommuting. In addition, many standard DEFINITY ECS and voice messaging features work well for telecommuters.

DEFINITY Extender

DEFINITY Extender allows you to use a fully functional DCP telephone at a remote location. The telephone looks and performs exactly as if it were directly connected to your office DEFINITY ECS.

The system uses a module at the DEFINITY system and a module at the remote location to provide full service. The Extender works with the 8410D, the 8343, and the 603E DCP telephones. Since these DCP phones have displays, the system works well for call center agents working from home. A dial-in number and password makes the system reasonably secure from unauthorized use.

Lucent Technologies Telecommuter Module

Lucent Technologies's Telecommuter Module is a lower-end telecommuting solution that is ideal for telecommuters who are not necessarily call center agents. Incoming calls are redirected to the telecommuter's home number and redirected

back to call coverage (voice messaging or an attendant) if the telecommuter is busy or unavailable. The seamless connections give the caller the impression that the telecommuter is actually in the office.

The module makes the power of DEFINITY ECS available to telecommuters from any touch-tone phone. They can:

- Transfer a call
- Set up a conference call
- Use abbreviated dialing
- Place long-distance calls
- Receive, leave and retrieve voice messages

Telecommuters need not always be at a fixed location, as the target telephone number is easily changed. The modules can be reprogrammed to accommodate different users as well. The module can be set up in two modes:

- **Per Session Mode** (intensive calling requirements), in which a continuous link is maintained between the telecommuter's phone and the office DEFINITY ECS. It eliminates the need to log in and log out when making calls. The telecommuter's phone is continuously off-hook, and incoming calls indicated by a distinctive tone.
- **Per Call Mode** (moderate calling requirements), in which the employee must log in to make calls or use DEFINITY features. The module rings the telecommuter's phone when incoming calls arrive, using a distinctive tone. This allows the employee to distinguish between business and personal calls so he or she can answer appropriately.

Each module can be shared by as many as 25 users (though only one may be logged in at any one time). Several security features make it difficult for the system to be abused by hackers.

AUDIX Features for Telecommuting

The following DEFINITY (and Intuity) AUDIX features are useful for telecommuting:

- *Multiple Personal Greetings* allow subscribers to prepare a pool of up to nine personal greetings to save time and provide more personal customer service. Separate messages can indicate the subscriber is on the phone, away from the desk, on vacation, etc. Different messages also can apply to internal, external, or after-hours calls.
- *Outcalling* automatically dials a prearranged phone number or pager when messages are received in a user's mailbox. The system tells whoever answers that messages have been received.

-
- *Priority Outcalling* provides outcalling notification of priority messages only. This allows the telecommuter to be relatively undisturbed by notifications of messages that do not require immediate attention.
 - *Call Answering for Nonresident Subscribers* provides AUDIX System mailboxes for users who do not have an extension number on the DEFINITY system.

For example, when working at home, you set up Priority Outcalling so the system will call you when you have important messages. Then you activate a personal greeting that says something like, "Thanks for calling. I'm working away from the office today. I'll be checking voice mail periodically, so please leave a message. If your message is urgent, press 2 after recording it. This will give your message priority status. The system will notify me of your priority message almost immediately."

CONVERSANT Features for Telecommuting

The CONVERSANT Voice Information System also has built-in advantages for telecommuters. For example, it provides a fax mailbox for easy storage and access of faxes. It also allows salespeople to obtain information easily and enter orders from a remote location.

CONVERSANT also makes it easy for call center attendants to work at home using analog telephones. The HOME AGENT application assigns two analog ports on the DEFINITY system to each agent. The telecommuters appear to the system and to callers as on-site agents.

The agent working at home uses an analog feature telephone such as the AT&T 720. No display information can be provided to the agent, but the CONVERSANT system can speak to the agent during a call, supplying call processing status and other information. Log-ins and passwords help keep the system secure.

DEFINITY ECS is designed for fast, efficient, and reliable movement and management of data as well as voice information. All information transmitted through the system is carried in a digital format. Analog signals — both voice and data — are converted to digital form before being switched. Analog data compatible with data modules and fax machines can be transmitted through DEFINITY ECS at speeds up to 28.8 kbps. Digital data can be transmitted at speeds up to 64 kbps per channel.

Data Communications Capabilities

Whether your data environment is asynchronous, synchronous, or a combination of both, DEFINITY ECS's data-switching capabilities can greatly enhance your company's data communications. Using DEFINITY ECS to switch your company's data has many possible benefits:

- It can greatly reduce the number of terminals and amount of cabling required.
- It enables employees to gain needed access to host computers, applications, and databases.
- It provides connectivity between different data environments that your company may have — asynchronous, synchronous, and personal computer environments.
- The jacks, twisted-pair wiring, and optical fiber used by the premises distribution system contribute to easy installations and easy moves.
- Voice and data are integrated and transmitted over the same wires; employees can exchange data and discuss it over the phone at the same time.

- Your data communications system will benefit from many of DEFINITY ECS's capabilities. For example, voice features such as Abbreviated Dialing, Queuing, and Automatic Route Selection can also be applied to data communications. DEFINITY ECS's networking strengths can expand data connectivity to wider areas. And its system management capabilities can monitor and control your data communications.

DEFINITY ECS can be used in a variety of data applications. The ones listed below are just a few examples of the many ways in which you can use DEFINITY ECS to improve your data communications:

- Switched asynchronous host-computer access
- Switched synchronous host-computer access
- Off-site computer access via modem pooling
- Local area network bridging
- Information System Network access
- Personal computer networking
- Switched videoconferencing
- FAX networking

See your local distributor for information on how you can make DEFINITY ECS's data communications capabilities work for you.

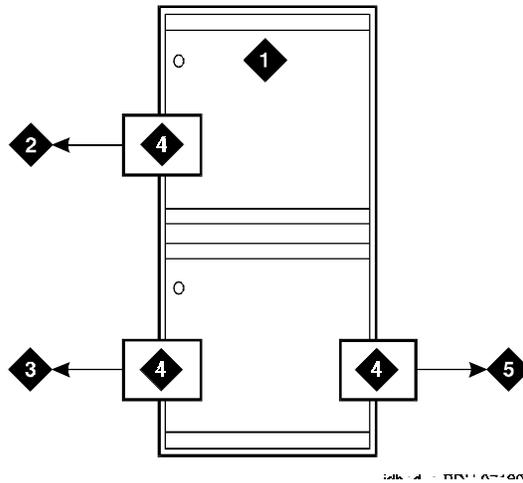
⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Data Management Features

DEFINITY ECS offers a number of data management features to help control your data environment and allow users quick and convenient access to data. Appendix B, "System Capacity Limits" contains a list of these data management features. The following list introduces just a few of these features:

- Wideband Switching (Figure 7-1) provides switching and networking capabilities to support end-to-end wideband connections between customer endpoints in either dedicated or switched networks connected to the DEFINITY ECS. Multiples of 64 kbps ($n \times 64$) are supported, providing compatibility with AT&T 384 kbps and 1.536 Mbps (H0 and H11) network services. The Digital Signal Level 1 board serves as both the line side and trunk side interface.



- | | |
|---|--|
| 1) DEFINITY ECS | 4) Digital Signal Level 1 |
| 2) ISDN-PRI to a Wideband Application | 5) ISDN-PRI to Switch or dedicated network |
| 3) Fractional T-1 to Wideband Application | |

Figure 7-1. DEFINITY ECS Wideband Switching Supports Your High-Speed Data Communications Requirements

- Administered Connections automatically establish an end-to-end connection between two data endpoints. An administered connection can be either permanent or scheduled. The feature supports Auto Restoration (preserving the active session) for connections routed over Software-Defined Data Network trunks and an administrable retry interval (from 1 to 60 minutes) to re-establish a connection. The resulting benefits are increased reliability of your data networks and improved disaster recovery.
- Alphanumeric Dialing enhances computer dialing by allowing a computer user to place a data call by entering an alphanumeric name, making dialing both convenient and user-friendly. When an alphanumeric name is entered from a user's terminal, the system converts the name to a sequence of digits by searching through an administered alphanumeric dialing table. The system then dials those digits just as if the user had entered the digits.

- Default Dialing enhances computer dialing by allowing a computer user to place a data call to a pre-administered destination by simply entering a carriage return at the "DIAL:" prompt. This gives computer users who dial a specific number the majority of the time a very simple method of dialing that number.
- Data Call Setup enables you to set up data calls (at any of the industry-standard rates) using a telephone or a computer keyboard.
- Data Hotline enables you to administer a data module so that when the module goes off-hook the data call is immediately placed to the preassigned number. This feature may also be used to restrict a data module to the assigned number only.
- Data Protection prevents disruption of data transmissions by DEFINITY ECS's other features or tones. Both the originating and terminating ends of the call are protected.
- Data Communications Access allows you to communicate with a computer via analog trunks.
- Host-Computer Access allows data endpoints with data modules to access a computer directly.
- Modem Pooling allows conversion resources to be grouped into pools and shared for access to analog facilities, eliminating the need for a dedicated modem at every terminal.

Digital Interfaces

Lucent Technologies DEFINITY ECS offers powerful digital interfaces for high-speed voice, data, and integrated voice/data transmission.

- AT&T's Digital Communications Protocol, a key part of DEFINITY's digital architecture, provides integrated voice and data communications between terminals and the system.
- AT&T's Digital Multiplexed Interface is a high-speed, economical interface for terminal-to-host, switch-to-host, and host-to-host communications.

DEFINITY ECS supports a wide variety of bit-oriented signalling formats on Digital Signal Level 1 (1.544-Mbps) facilities, compatible with local CO services, AT&T nodal network services (such as AT&T MEGACOM services), and services conforming to European Conference of Postal and Telecommunications standards in the international marketplace.

DEFINITY ECS implements both standard ISDN interfaces: ISDN Consultative Committee for International Telephone and Telegraph PRI and Basic Rate Interface. It is one of the first systems to make both ISDN interfaces available at all line sizes — small, medium, or large. With both interfaces, Lucent Technologies delivers the advantages of full end-to-end ISDN connectivity to every desktop.

Digital Communications Protocol

Digital Communications Protocol (DCP), a forerunner of ISDN-Basic Rate Interface, has been the architectural foundation for Lucent Technologies digital servers and switches. It provides advanced ISDN-like functions by integrating voice and high-speed data. DCP continues to serve as a key digital interface for DEFINITY ECS.

Like ISDN-Basic Rate Interface, DCP defines the communications interface between a terminal and the switch. It consists of two 64-kbps information (or bearer) channels and a separate 8-kbps channel for signalling and control information (or data channel). Out-of-band signalling via the data channel allows the information channels to be used for clear-channel transmission.

DCP's framing structure allows voice, data, and signalling information to be transmitted with low overhead and virtually free of errors. DCP transmits at a rate of 8,000 frames per second or 160 kbps. DCP allows data and digitized voice to be multiplexed on two twisted pairs, terminating in a standard telephone jack.

Digital Multiplexed Interface

DEFINITY ECS supports high-speed, efficient data communications through Lucent's Digital Multiplexed Interface. Digital Multiplexed Interface allows communications between a terminal and host computer, between a switch and host computer, and between two host computers.

Digital Multiplexed Interface is consistent with ISDN-PRI. 24 64-kbps channels (one of which is reserved for signalling information) transfer data between two endpoints through the DEFINITY ECS. The multiplexed channels can be sent over standard Digital Signal Level 1 facilities, allowing the host computer to be located remotely.

Digital Multiplexed Interface offers two major advantages. It delivers a standard, single-port interface for linking host computers internally and externally via T1 carrier. And, since it is compatible with ISDN standards and is licensed to numerous equipment manufacturers, it promotes multi-vendor connectivity.

DEFINITY ECS supports two versions of Digital Multiplexed Interface, each differing in the way information is carried over the 24th channel:

- Digital Multiplexed Interface-bit-oriented signalling carries framing and alarm data and signalling information for connections to host computers and other vendor equipment.
- Digital Multiplexed Interface message-oriented signalling, fully compatible with ISDN-PRI, uses the same message-oriented signalling format, Link Access Procedure on the D-channel, as ISDN-PRI for control and signalling. These signalling capabilities extend the advantages of Digital Multiplexed Interface-Message Oriented Signalling multiplexed communications to the public ISDN network.

Both Digital Multiplexed Interface-Bit Oriented Signalling and Digital Multiplexed Interface-Message Oriented Signalling use 23 information (bearer) channels and one signalling (data) channel multiplexed on a 1.544-Mbps Digital Signal Level 1 carrier link.

ISDN-PRI

ISDN-PRI delivers ISDN service to DEFINITY ECS for high-speed connectivity to the public switched telephone network and to other switches in a private or public network. It can also be used to connect to host computers that support the interface. PRI provides 24 64-kbps channels arranged in the North American ISDN standard of 23B plus D. That is, the 24 channels are divided into 23 bearer (B) channels at 64 kbps for information transmission and one signalling (D) channel at 64 kbps for control and signalling. Outside the United States, DEFINITY ECS also supports ISDN-PRI using the international E1 format, which provides 30B plus D.

DEFINITY ECS offers applications that use the ISDN-PRI. See Chapter 10, "Networking Solutions" for information on these applications.

World Class Core Basic Rate Interface (BRI)

World Class Core BRI provides an international BRI platform that offers multiple protocol options to meet specific country and application requirements. It provides access to Video Conferencing, Desktop Video Conferencing, Data Transmission, and other non-voice based applications that use BRI as a communication interface. Voice access is not supported though voice features are not blocked for World Class BRI terminals.

World class BRI devices must be administered as the new type "wcbri." You select a country protocol for each terminal that will use the feature. This selection determines both the code set modifications required to meet the national standards as well as the terminal initialization procedures if required.

World class BRI supports the following country protocols:

- Bellcore National ISDN-1 protocol in the United States (TR268)
- National protocols in Australia (AUSTEL TS013, Telecom Australia TPH 1962), Japan (NTT BRI) and Singapore (FETEX 150 TIF 218)
- ETSI NET 3 protocol (ETS 300 102) for use in most of Europe

World class BRI supports multipoint (up to two devices per port) only for the Bellcore National ISDN-1 Country Protocol option.

Data Modules

Data modules connect DEFINITY ECS with other communications equipment, changing protocol, connections, and timing as necessary.

DEFINITY ECS supports the following types of data module:

- High Speed Links
- Data stands
- Modular-processor data module
- 7000-series data modules
- Modular-trunk data module
- Asynchronous data unit
- Asynchronous data module (for ISDN-Basic Rate Interface telephones)
- Terminal adapters

All of these data modules support industry standards and include options for setting the operating profile to match that of the data equipment. The data modules that are currently available with DEFINITY ECS are described below.

High Speed Links

The DEFINITY High Speed Link, a DCP-based data module, lets you transmit data through your DEFINITY Communications System at faster speeds, allowing you to take advantage of emerging technologies such as videoconferencing and Local Area Network bridging.

More and more companies are realizing that technologies and applications, such as Local Area Network-to-Local Area Network communication, videoconferencing, file transfer, and Group 4 fax transmissions are necessary to compete effectively in a global market. The DEFINITY High Speed Link offers you a cost-effective way to manage these applications.

Used when integrated voice and data is not required, the High Speed Link has an internally timed V.35 interface for synchronous data transmissions at 56 kbps (half and full duplex) and 64 kbps (full duplex) in both switched and permanent connections.

It offers access to low-cost, dial-up communications and provides a link to high-speed network services such as the ACCUNET Switched Digital Services and Software Defined Data Network Services. When accessing these network services, the High Speed Link can communicate with applications terminating on either a digital service unit or another High Speed Link.

Its numerous testing features make system fault isolation easy. For example, the High Speed Link offers a variety of client-or network-initiated loop-back tests that increase reliability, such as the capability to isolate problems remotely.

There is an interface that can be configured as an RS-366 Automatic Calling Unit or an RS-232 asynchronous data interface that supports a limited AT command set for call control.

All options are software definable and stored in nonvolatile memory. The reset options feature makes it easy to load default options. Designed to be easily upgraded, the High Speed Link has a memory cartridge interface for firmer upgrades to support new features.

The unit is externally powered, and it can be rack mounted with up to eight units and located up to 5000 feet (1525 m) from the DEFINITY ECS.

7000-Series Data Modules

The 7000-series data modules are designed to give you simultaneous voice and data access in a single, low-cost data module. The single DCP connection means you will never miss a voice call when you are on a data call.

The 7400B Plus and 7400A dual-function data modules provide full-duplex, asynchronous connectivity for DCP applications. They emulate the industry-standard Hayes modems and work with host-connection software packages that use the Hayes command set. Priced competitively with Hayes-compatible modems (that operate at 1200-2400 bps), the modules give you a choice of transmission speeds ranging from 300 bps to 19.2 kbps.

The 7400B Plus provides integrated, simultaneous, voice/data communications over twisted pair wiring. It is easy to install and operate and plugs into any modular DCP telephone outlet. It features two ports: a modular DCP port for a digital telephone and an RS-232 port for a personal computer or terminal.

In desktop configuration, the 7400B Plus provides twisted-pair connectivity for personal computers and asynchronous computers at transmission speeds ranging from 300 bps to 19.2 kbps. It operates with all 7400-series digital telephones, including the CallMaster Voice Terminal. On the trunk side, the 7400B Plus can connect to asynchronous host computers at speeds as high as 19.2 kbps.

The 7400A simplifies modem-pooling connections. It offers an alternative to the modular trunk data module in environments where only asynchronous communications capabilities are required. When used with the 7400B Plus on the desktop, the 7400A in the modem pool can raise system speeds while supporting Hayes-compatible communications packages. The 7400A features simple connections: one for a DCP line to the DEFINITY ECS, another for an RS-232 connection to Hayes-compatible modems.

The 7500B data module gives you synchronous or asynchronous connectivity for ISDN-Basic Rate Interface applications such as video conferencing, FAX, and

personal computers at speeds up to 64 kbps. The 7500B features three connections: one to the Basic Rate Interface line to the DEFINITY ECS, one to a 7500-series telephone, and one (RS-232) to the computer. The module may be used stand-alone or in conjunction with a 7500 series telephone.

Asynchronous Data Unit

The asynchronous data unit offers an economic alternative to data modules for connecting Electronic Industries Association RS-232 data endpoints to the DEFINITY ECS. The Asynchronous Data Unit extends the 50-foot limitation of an RS-232 interface cable up to 40,000 feet (12,200 m), depending on the data speed and wire gauge of the distribution system. For example, a 19.2-kbps data rate can be supported to 2,000 feet (610 m). This allows RS-232 devices (such as terminals, host computers, multiplexers, printers, and personal computers) to be located great distances apart for private network applications. The Asynchronous Data Unit handles standard data rates from 300 bps to 19.2 kbps and non-standard asynchronous data rates below 1,800 bps. It provides asynchronous full-duplex operation.

The multiple asynchronous data unit is a circuit board that contains eight asynchronous data unit circuits housed in one unit. These are typically used in computer-room applications where several RS-232 connections are carried in a common cable from the host computer.

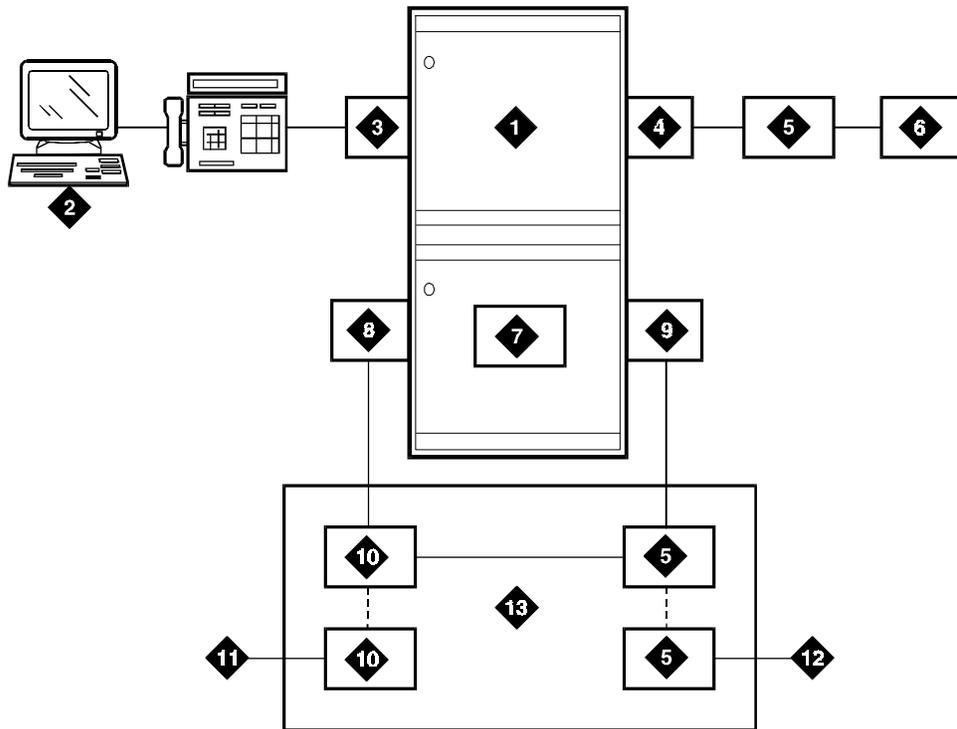
The Asynchronous Data Module is used in conjunction with the 7505, 7506, or 7507 ISDN-Basic Rate Interface telephone to support integrated voice and data. With the Asynchronous Data Module, computers or personal computers attached to the telephone can send and receive data through the DEFINITY ECS. The Asynchronous Data Module mounts in the base of a 7500-series ISDN-Basic Rate Interface telephone and provides asynchronous full-duplex operation at data rates up to 19.2 kbps.

Modems and Modem Pooling

Since DEFINITY ECS is a digital system and many public and private network facilities are analog, internal data communications often require modems to convert from digital signals to analog signals and vice versa. Data modules, as discussed earlier in this section, provide an interface between DEFINITY ECS and various Data Communications Equipment and Data Terminal Equipment. They handle conversion between DCP or Basic Rate Interface and the RS-232 signaling protocol used by most modems and computers. The combination of a modem and data modules is called a conversion resource.

The DEFINITY ECS Modem-Pooling feature eliminates the need for a dedicated modem at every terminal. It allows conversion resources to be grouped into pools and shared for access to analog facilities. Since the conversion resource is not permanently attached to the computer, the computer can access digital or analog facilities at will. DEFINITY ECS inserts the conversion resources when appropriate.

DEFINITY ECS modem pools are assigned into modem pool groups. A group can have up to 32 modems, called "members." DEFINITY ECS can have as many as 63 modem pool groups.



mod pool PDH 071896

- | | |
|--------------------------|-------------------------------------|
| 1) DEFINITY ECS | 7) Integrated Pooled Modem |
| 2) Asynchronous Terminal | 8) Data Line Port |
| 3) Digital Port | 9) Analog Port |
| 4) Analog Trunk | 10) 740A |
| 5) Modem | 11) Digital Communications Protocol |
| 6) Remote Application | 12) Analog |
| | 13) EIA Standard |

Figure 7-2. DEFINITY ECS Modem Pooling

The communications needs of the people in your company may vary widely. Some may need only basic telephone service. Others may need effective messaging services to save valuable time. Still others may require high speed data communications and access to a variety of host and personal computers.

DEFINITY ECS brings voice communications, data communications, visual communications, and messaging together on the desktop, and lets you customize types of service for various individuals.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Voice Features

With DEFINITY ECS, the employees in your company can easily place a simple telephone call while still having access to powerful features. These features range from the basics (such as Call Forwarding, Hold, Transfer, and Conference) to more sophisticated features intended for particular situations or users.

These features can be accessed in a variety of ways. For example, some can be accessed by pressing a fixed-feature button on the telephone. Many others can be accessed by dialing an access code or by pressing a programmed button on the telephone. Here are just a few examples of how particular voice features can help your employees to handle calls more efficiently.

Abbreviated Dialing

Allows you to dial frequently called or emergency numbers with just a few button presses instead of dialing the entire number one digit at a time. You can use Abbreviated Dialing to dial both internal and external numbers of up to 36 digits. Many telephones also allow you to program abbreviated dialing buttons so you can dial frequently dialed numbers with just one button press.

Conference

Allows you to set up a conference call with up to six people. Anyone in the world with access to a telephone can participate in your conference. The Conference button on your telephone allows you to set up the conference call without the aid of an attendant.

Integrated Announcements

DEFINITY G3 allows you to store recorded announcements (messages) internally within the switch. The announcements are digitized and stored in state-of-the-art electronic memory devices. DEFINITY's integrated announcements are:

- Easy to use. Announcements can be recorded and updated from any telephone. And all announcement configuration is performed from the G3 Management Terminal.
- Reliable. Even a power failure will not affect the integrity of your announcements. Because the announcements are stored digitally, voice quality does not degrade over time. There are no external boxes, messy cabling, or separate power supplies. And there are no tapes to jam or break.
- Flexible. Since the announcements are integrated within DEFINITY, the applications are almost endless. Announcements can be played to callers waiting for connection. They can be inserted into coverage paths to give out your hours of business. DEFINITY applications like vectoring were designed to take advantage of the power of integrated announcements.
- Ideal for a global market. Since you record your own announcements, any language can be provided -- even multiple languages on the same switch. For example, your hotel guests can receive wakeup greetings in their native language.
- Easily expandable. In larger DEFINITY configurations, if you need more announcement recording time, you can simply plug in another DEFINITY Announcement circuit pack.

Integrated Directory

Either through voice messaging or a display telephone, the system allows you to access the switch directory and retrieve an extension number. The directory contains an alphanumeric listing of all names and extension numbers connected to the system. The directory can be set up using several languages. (Contact your local distributor for a complete list of languages.)

Last Number Dialed

Allows you to redial your last call, whether it is an internal or an external call. You can press a single button to redial a number of up to 20 digits.

Leave Word Calling

Allows you to, with the touch of a button, leave a standard message ("Call me back," for example) for others on the same switch.

Call Coverage

The Call Coverage feature ensures that your calls are always answered and that callers rarely, if ever, receive a busy signal. Call Coverage is so flexible that external calls can be routed to one group of attendants and internal calls to an entirely different group.

In some respects, Call Coverage serves as a versatile secretary who screens your calls. It automatically redirects calls to other telephones and messaging services, allowing you to delegate or defer calls as needed.

You can redirect calls according to five status conditions: Active, Busy, Don't Answer, Cover All, and Send All Calls. If you are using one telephone line, the system considers you "active." If you are using all your available lines, the system considers you "busy." If the call goes unanswered, the status is "don't answer." Sometimes you might need to assign a secretary or other colleague to "cover all calls," or you may "send all calls" to a permanent voice messaging system or an assistant.

Call Coverage lets you redirect calls to suit any or all of these criteria. For each telephone, you can have up to four coverage paths. A path is a set of alternate extensions that a call can be sequentially transferred to. Each path can be composed of as many as three extensions, arranged in order of preference. A redirected call immediately goes to the first choice extension. If the first choice is not available, the system tries the second choice and then the third choice, if necessary.

Many people prefer to redirect all of their calls to the same answering points under all conditions, and need only one coverage path. If a secretary is available

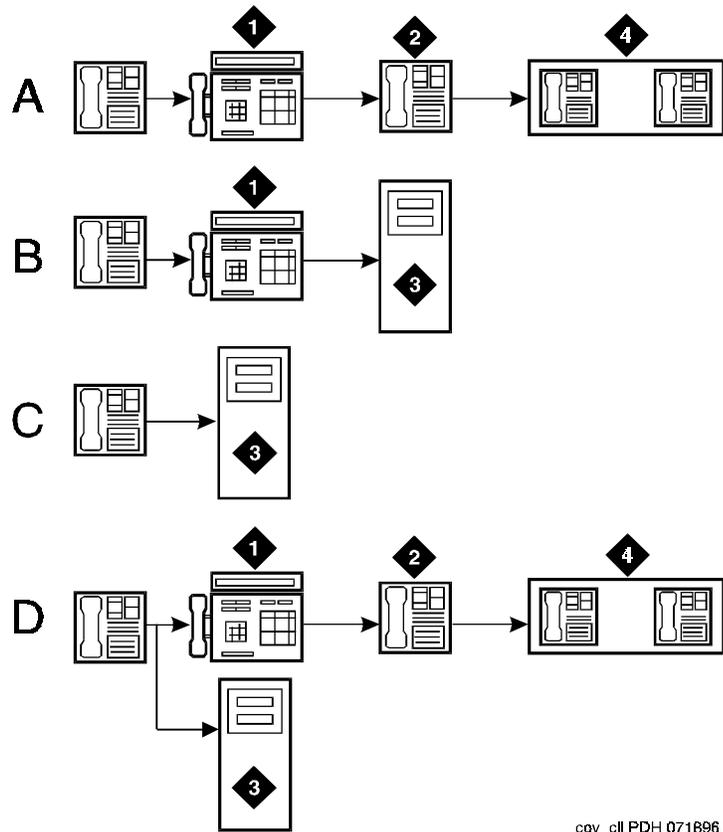
to cover all calls, even if you are available, the other criteria can be ignored. If you prefer to answer your own calls, however, you will probably require Busy, Don't Answer, and Send All Calls coverage. Send All Calls lets you redirect your calls by pressing a single button or dialing an access code.

Coverage Paths for a Manager

Figure 8-1 shows four coverage paths you might need as a manager. The example assumes you:

- Receive many external calls
- Share a secretary with two other managers
- Prefer to answer your own calls when available
- Travel frequently

External calls are important because they are usually from customers and require personal attention as they arrive. Internal calls are also important, but often need not be dealt with immediately by you or an assistant. In either case, Send All Calls is useful because it allows you to redirect all calls immediately when you are not available. This saves the caller the annoyance of waiting for several rings before being able to talk to someone or leave a message. The Call Coverage arrangement shown works well for many managers. Note that the same coverage path is used for all external calls because these calls need special attention even when you are unavailable.



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- A) External Calls: Active, Busy, Don't Answer 1) Secretary
- B) Internal Calls: Cover All 2) Clerk
- C) Internal Calls: Active, Busy, Don't Answer 3) AUDIX Voice Messaging
- D) Internal Calls: Send All Calls 4) Message Center Group

Figure 8-1. Typical G3 Call Coverage Options

Messaging Services

DEFINITY ECS offers a variety of integrated services that allow you to leave, send, and receive messages quickly accurately, and conveniently. Some of the available services include:

- INTUITY AUDIX Voice Information System
- DEFINITY AUDIX Voice Information System
- AUDIX Voice Power

These messaging services can be purchased with DEFINITY G3 and can be fully integrated with the G3 Leave Word Calling and Call Coverage features. A message-waiting lamp on your telephone lets you know when messages are waiting from any of the messaging services.

The AUDIX System and Call Coverage

Often an AUDIX system is set up as the last point on a call-coverage path, as in Figure 8-1 above. A secretary or colleague who answers a redirected call intended for you can also transfer the caller to your AUDIX mailbox. The caller may prefer to leave voice-mail for you if the message is personal, lengthy, or technical.

Many other options are available. For example, a caller can redirect a call from the AUDIX system to an attendant. Or the caller can transfer to another extension instead of leaving a message. You can even have the AUDIX automated attendant answer all calls to the company and send calls to various extensions. In this case, callers are instructed to enter keypad commands to direct the call.

Message-Retrieval Options

With the message-waiting lamp on their telephones, employees always know when they have messages. Messages can be retrieved in a variety of ways, such as:

- Display retrieval — Users having digital telephones with displays or a personal computer integrated with a telephone can display messages.
- *Speak-to-Me* — Using any touch-tone telephone, employees can dial *Speak-to-Me* and hear a synthesized voice read their messages over the phone.

These message-retrieval options can be assigned to users individually.

Telephones and Workstations

A wide variety of telephones are available with DEFINITY ECS, ranging from basic single-line telephones to sophisticated workstations that integrate voice data, image, and video communications. Your G3 configuration might incorporate a mixture of terminal types based on the various users' job functions. DEFINITY G3 telephones and workstations are easy to use and attractive while giving you the ability to tap into the power of the G3 system.

Telephones

DEFINITY ECS telephones fall into three basic families — analog, Digital Communications Protocol, and BRI. These terms describe how each type of telephone communicates with the DEFINITY ECS switch. These families of telephones are designed to accommodate the types of communications various users require. All telephones have touch-tone dialing and the message-waiting lamp for notification of messages.

Analog (Single-Line) Telephones

Single-line telephones are an economical choice for users who do not handle many calls and do not use modems and fax machines extensively.

All signals between analog telephones and the DEFINITY ECS switch are in analog form over a pair of wires. Only one incoming call can ring at a time, but the telephone can actually handle two calls — one active and one on hold. Depending on the particular telephone, you can alternate between two calls or set up a three-way conference using the switchhook or flash button. You can access DEFINITY ECS voice features by either entering access codes from your touch-tone keypad or pressing feature buttons. Several models of analog telephones are available.

DCP Telephones

Digital DCP telephones using the Digital Communications Protocol employ digital transmission for integrated voice and data signals and control signals. Transmission is over a connection consisting of one or two pairs of wires. Each connection supports one signalling channel and two information (voice and data) channels.

DCP telephones are used most effectively by those who have a high volume of calls, require access to multiple applications or databases, use switch features heavily, or require messaging services. These telephones can be used with personal computers to expand their capabilities.

These telephones provide the full range of DEFINITY ECS features on your desktop. In addition to multiline and multifunction capabilities, they provide access to integrated voice and data applications and messaging services. Some models include displays. DCP telephones can actually save you money by reducing the

number of lines, modems, and ports that would normally be needed for analog facilities.

ISDN BRI Telephones

Like the digital DCP telephones, ISDN telephones transmit voice, data, and control signals digitally. With the ISDN telephones, however, the transmission employs the world-wide standard BRI protocol between the switch and the telephone.

Also like the DCP telephones, these telephones can be used with personal computers to expand their digital capabilities. DEFINITY ECS's family of ISDN telephones includes several models that have unique features such as call logs and personal directories.

New Telephones for the Global Marketplace

With help from our many global customers, Lucent Technologies has developed new telephones, the 8400 series and the 9400 series, to meet the demand for two-wire telephones in the global marketplace.

8400 Series Telephones

The 8400 digital telephones are versatile two-wire/four-wire Digital Communications Protocol (DCP) telephones with new styling that offer new flexibility and cost savings. They automatically detect whether they are plugged into a two-wire or four-wire digital line circuit card. This is a significant benefit because it provides an easier transition to either a two-line or a four-line environment, therefore reducing wiring expenses and installation adjustments. It also allows you to save space inside the cabinet by using 16-port two-wire boards in place of 8-port four-wire boards.

In response to customers' requests, the handset has a larger mouthpiece, the telephone has raised buttons that provide improved tactile feel for easier use, and the finish is a scratch-resistant texture that preserves the telephone's appearance. Programmable speakers and microphones can be turned on or off by the system administrator.

There are four models of 8400 series telephones:

- 8403 — A three-line telephone without a display that can be wall mounted. This entry-level telephone is designed for users with basic call handling requirements. It is ideal for areas where there is minimum use, such as reception areas, copy rooms, file rooms, or warehouse locations. It has a built-in one-way (listen-only) speakerphone that facilitates off-hook dialing and listening to voice mail or broadcast messages. You can add a S201A speakerphone and use the inexpensive 8403 in a conference room.

- 8410B — A ten-line telephone without a display that can be wall mounted. This telephone is for employees with call coverage responsibilities who need multiple line appearances and extensive features. It has a built-in two-way speakerphone and programmable keys so you can access more switch features from the telephone.
- 8410D — A ten-line telephone with a two-line, 24-character display. This telephone has the same features as the 8410B and can also be wall mounted.
- 8434DX — A thirty-four-button set with a 2-line by 40-character display. This telephone is for the busy executive or executive assistant where extensive call handling and call coverage flexibility are vital. The 8434DX has a built-in two-way speakerphone and programmable keys. A 24-button expansion module can be added.

Here are the most important features of the 8400 telephones:

Administering Speakerphones. You can administer speakerphones either through the switch or through the telephone. The 8410B, 8410D, and 8434DX telephones can be administered as two-way speakerphones or one-way listen-only speakers, or you can disable the speakers. The 8403 can be administered as a one-way listen-only speaker or the speaker can be disabled.

Compatibility and Investment Protection. The 8400 series digital telephones are compatible with all two-wire DEFINITY G3 systems and future system releases, as well as with all earlier DEFINITY four-wire systems. The backward and forward compatibility of these telephones protects the investment you made in your existing wiring and your existing older version four-wire DEFINITY systems.

International Icons and Languages. International icons are used on the telephones, and buttons are available in several languages, as are the messages on display sets. You can also use a user-defined table to customize the translations. Additional international portability is provided with downloadable handset transmission parameters.

Doubled Capacity. When the 8400 series telephones are coupled with the new two-wire 16-port Digital Line Circuit Card, you benefit by having more capacity in each carrier. Therefore purchase of additional carriers or cabinets may not be necessary.

9400 Series Telephones

The 9400 digital telephones, also known as Europhones, provide inexpensive support for two-wire installations, while still providing a European design. Three models of the 9400 telephones are available in gray and cream white. The 9403, 9410B, 9410D, and 9434 telephones are similar in design and features to the 8400 series.

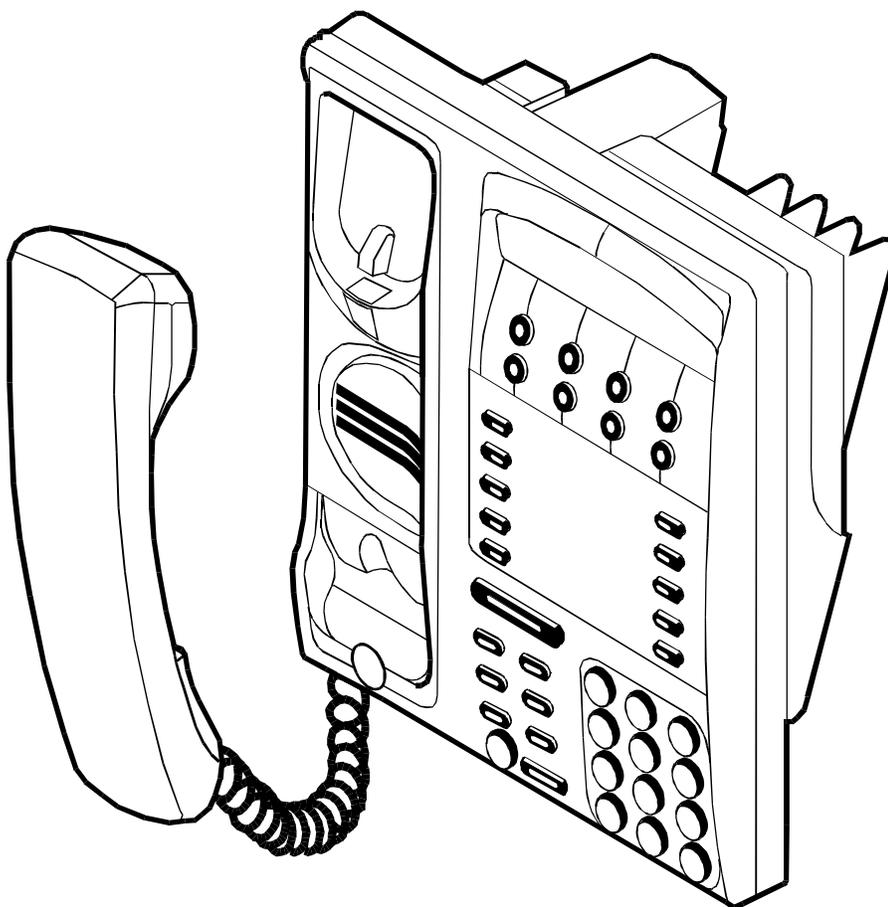


Figure 8-2. 9400 Series Telephone

Here are the most important features of the 9400 telephones:

International Language Support. The new 9400 digital telephones are available with labels and user's guides in several languages. Because the European requirements for the lettering on the keypad are not identical, Lucent Technologies has created an overlay that holds the necessary lettering for each country. Two overlays are available: one blank and one with letters, complying with CCITT standards.

Compatibility. Like the 8400 telephones, the 9400 telephones are compatible with all DEFINITY 2-wire installations. The connection is made via a two-wire, 16-port DCP interface card.

Solid Engineering. Compliance with the most rigid emission and electromagnetic requirements ensures the integrity of your installation.

Teleconferencing Products

How much of your business time do you spend in meetings — or traveling across the building, across town, or across hundreds of miles to get to a meeting? How often was time lost because vital information was left in someone's office? Meeting by phone or teleconferencing offers an attractive alternative. Meetings are suddenly more convenient, easier to schedule, and travel expenses are greatly reduced. The Lucent Technologies Quorum and Soundstation products provide you with all the benefits of voice conferencing.

Quorum A-28 Conference Bridge

The Quorum A-28 Conference Bridge is a microprocessor-controlled analog bridge. It allows you to activate a multipoint connection of switched and private-line circuits to create a single conversation. You can set up, monitor, and control your own teleconferences through your DEFINITY ECS.

You can set up and supervise the bridge connections through an attendant console. Participants can dial into a prearranged conference at a specified time. The calls are then connected automatically, or can be screened by the attendant before being added to the conference. The attendant can also monitor the transmission quality of any or all of the active conference links. Poor connections can be identified, isolated, and re-dialed without interrupting the rest of the conference.

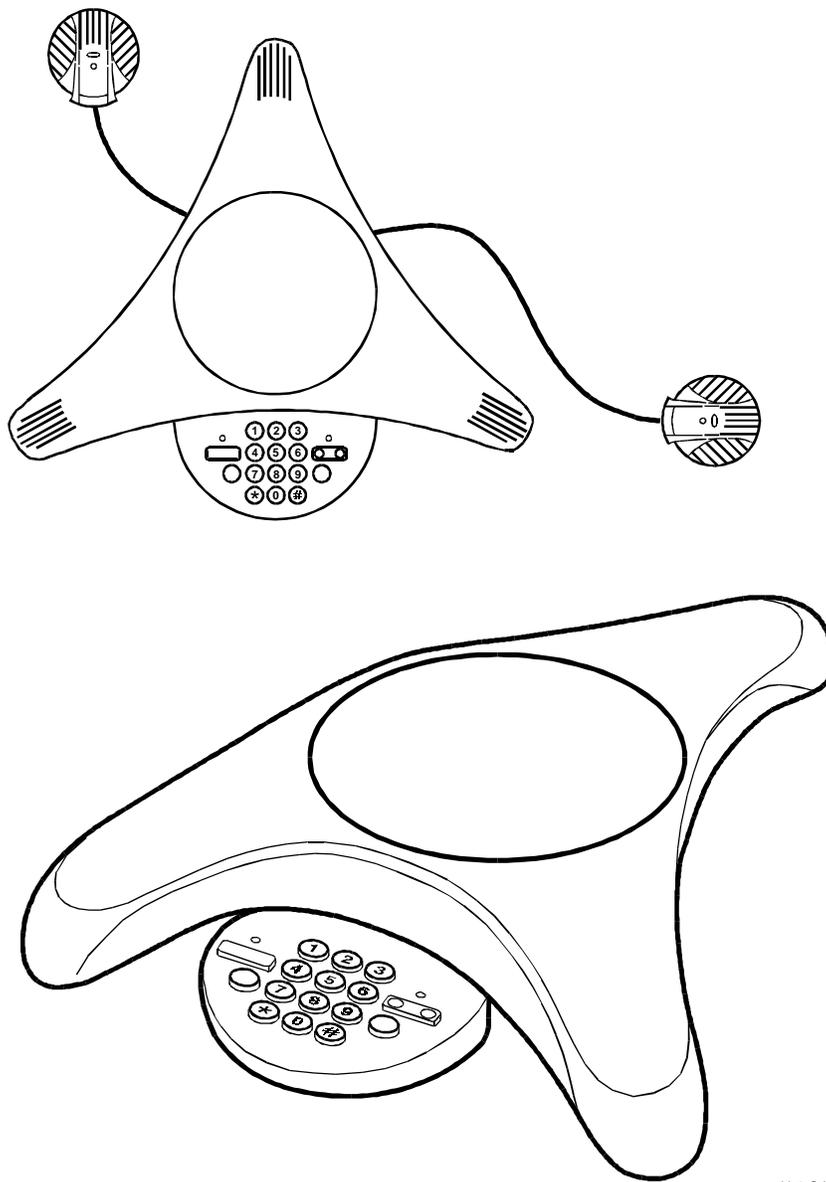
The bridge design ensures optimum sound clarity on the conference no matter how many participants are connected or where they are located. The bridge circuitry senses any differences in signal strength and electronically balances voice levels. It also filters any extraneous noises that could interfere with the conference.

The Quorum A-28 Conference Bridge allows you to connect up to 28 different people on a single conference call. Or you can set up multiple conferences — up to four conferences with seven participants each.

The bridge also provides a lecture mode that you can use for one-way broadcasts. Using the Mute feature, participants can be placed in a listen-only mode, allowing one speaker to address the rest of the conference.

SoundStation Audioconferencing Systems

Lucent Technologies's SoundStation and SoundStation EX Audioconferencing Systems enable a group of people in a conference room to share their conversation with others through a telephone connection. The Soundstation equipment permits natural conversation among many people — whether strong or soft, or from a standing or sitting position. Integrated components and a stylish tripod design make the console an attractive yet unobtrusive conference table centerpiece (Figure 8-3).



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Figure 8-3. Soundstation EX with External Microphones

The equipment's full-duplex technology allows conferees to speak at the same time, thus eliminating the tendency conventional speakerphones have of *clipping* — failing to transmit the beginning or ending sounds made in conversation. The SoundStation systems adapt automatically to changing room and telephone line conditions to permit natural, two-way conversations without distortion. This allows you to be heard without straining to hear what others are saying.

SoundStation

The SoundStation has three microphones and a digitally tuned speaker that provide 360-degree coverage, whether you use the system in an office or a conference room. It connects to an analog telephone line. The built-in keypad includes a mute button and a flash key. An additional port allows you to connect the speakerphone to a tape recorder.

The system is simple to install and use. You plug the phone line into a small wall module plugged into an outlet. A single cable from the wall module to the console reduces tabletop clutter. The console works like a normal telephone.

SoundStation EX

The SoundStation EX includes all the features and functions of the SoundStation. It accommodates larger conferences by including two palm-size external microphones that can be positioned up to six feet (1.8 m) on either side of the center console. An optional wireless microphone is available for stand-up presenters.

Your colleagues have asked to meet with you as soon as possible to discuss the latest project. The project team needs to discuss how to meet the timetable and satisfy your customer's expectations. The team also needs to view the prototype that the engineering department has just finished.

Standard business procedure would dictate that you jump on the next aeroplane — briefcase full of needed files and the prototype packed carefully for shipment. Hopefully, the prototype will arrive intact. And hopefully, the time away from the office won't set you too far back in your already hectic schedule.

But, now DEFINITY ECS provides an alternative to business as usual — revolutionary visual communication solutions. Through the use of Lucent Technologies's video products and services, you can meet with your colleagues — across the country or around the world — via visual communications. So, instead of heading to the airport, you take the prototype to the video conferencing room, feeling glad this face-to-face meeting doesn't involve luggage or jet-lag. And once your meeting is done, you're back at your office in a matter of minutes, ready to start implementing the decisions just made.

Besides the obvious advantage of reduced travel expenses, video conferencing allows you to make quicker decisions, provides ready access to essential information, allows you to consult with specialists on an as-needed basis, and ultimately allows you to bring products to market faster.

Visual communications provides other advantages for your normal day-to-day operations. Business meetings can benefit from the nuances a facial expression can convey sometimes more directly than the words being spoken. Employees can be trained on the latest products and procedures on a regular basis. You can meet with your suppliers without ever travelling to see the other.

This section will introduce you to the visual communication products that you can connect to your DEFINITY ECS to create a premier communications solution that satisfies all your needs — voice, data and video — just by dialing a telephone number. And for additional information on Lucent's visual solutions, contact your local distributor. If you are in North America, dial 1-800-VIDEOGO (prompt 3).

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Group Video System

Lucent's Group Video System turns a telephone call into a face-to-face meeting for conducting business with people across the country or around the world. Lucent's line of Group Video Systems, based on the PictureTel Group Video Line (System 1000, 4000, Venue 2000™ and Concorde 4500™), is designed to assure that your video conferences are the most effective possible.

A Group Video System can connect directly to your DEFINITY ECS system or to the network at speeds from 112 kbps up to 384 kbps. When connected to your DEFINITY ECS via either Data Communication Protocol ports or a DS1 interface, video calls are placed as easily as voice calls. And you can benefit by using your DEFINITY ECS's World Class Routing capabilities and the shared use of network facilities such as ACCUNET Switched Digital Services or Software Defined Digital Network.

Group Video Systems are totally self-contained and include a pan/tilt/zoom camera, a monitor, the control unit, communications equipment, and the equipment electronics. You can easily add peripheral equipment such as video cassette recorders to record the conference, document scanners to review hard-copy material with distant participants, and personal computers to supply spreadsheets or other computer-based conveniences.

You can equip any office or conference room with a Group Video System. Conferees can speak and act naturally without thinking about audio and video pickup. Advanced video-compression technology ensures excellent picture quality across a variety of available speeds (112 to 768 kbps). The system adapts automatically to room acoustics, and a unique, audio-compression algorithm yields distortion-free, full-duplex, interactive video without echo. A highly-sensitive microphone is built into the control unit, and if necessary, conferees can use up to four auxiliary desktop and/or lapel microphones.

You control the conference via a desktop keypad that easily turns the system on or off, dials the call, adjusts the audio volume, selects the video source, and positions the camera. The camera in most models has an auto-focus lens, plus zoom, pan, and tilt capabilities that let users move the camera to follow conferees as they move around the room. Optional capabilities include remote control of the far-end camera and camera presets that let conferees set up to eight camera

positions — four local and four remote — each accessible at the touch of a button.

An automatic feature of most Group Video System models is the use of a window (picture in a picture) for previewing, so you can see what your camera sees as well as what the far-end camera sees. The window also permits simultaneous viewing of far-end video and still-image graphics.

Group Video Systems are available in a variety of models that can accommodate an office, small meeting room, or even a spacious boardroom. All models have colour monitors, with dual monitors available on most for simultaneous viewing of video and high-resolution still images. The systems available are:

- The System 1000 — Quality, inexpensive group video products:
 - Model 30 — For small group or individual meetings.
 - Model 50 — For medium to large group meetings.
- The Venue 2000 — A relatively inexpensive system with an enhanced user interface.
- The System 4000EX — The industry's most popular high performance systems:
 - Model 200 — The office system: modular, portable, and well-suited for small offices and conference rooms.
 - Model 200 — The cart system: a larger, portable system on wheels.
- The Concorde 4500 — A highly advanced system offering superior transmission quality and unparalleled ease-of-use.

Telephone add-on is an option on all models. This enables you to add a voice conferee to the video conference. Other options include security codes, freeze-frame graphics, and video cassette recording.

The monitors can accommodate both the U.S. National Television System Committee standard and PAL, the European 625-line standard, providing global compatibility for your visual communication needs.

Desktop Conferencing Systems

Many meetings involve just two or three individuals who need to share information — whether it be text, data, graphics, or some other form of information. And with larger teams of people, these individuals may be separated in locations around the country or the world. They have the same need to meet strategic objectives, shorten project cycle time, and improve working relationships with project partners. These needs can also be satisfied through visual communications.

To satisfy these requirements, integrated telephone and PC visual communications systems are available. These desktop conferencing systems use ISDN-BRI or two switched 56-line network facilities.

Monitors and cameras create a unique desktop environment that provides you and your business with the following benefits:

- Software application screens and data can be called up, shared, changed, and annotated by video conferees while they hold a video conference.
- Geographically separated people are brought together along with the data and information they need to share at the desktop.
- Major obstacles to creative collaboration and situations that are information-intensive are overcome.
- Desktop workers can communicate with others who are using desktop conferencing or the Lucent Technologies Group Video System.
- Desktop workers can communicate with other systems supporting the ITU-T H.320 standard.
- Your DEFINITY ECS system is converted into a solution for all your communication requirements — voice, data, and video.

MultiPoint Control Unit

When connecting more than two video endpoints, you can use the MultiPoint Control Unit to set up and conduct multipoint video conferences. This is a stand-alone unit that provides easy-to-use multi-location video conferencing.

The MultiPoint Control Unit can operate behind any DEFINITY Communications System or can be directly connected to the network. The MultiPoint Control Unit can support from 4 to 64 ports in four-port increments. Those ports can then be used to connect multiple video endpoints, either Group Video System or Desktop Conferencing Systems, in a multipoint conference. Group Video System can be linked at speeds from 56 kbps to full T-1, while Desktop Conferencing Systems can be linked at speeds from 56 kbps to 384 kbps.

The MultiPoint Control Unit uses the ITU-T H.320 video conferencing standard to connect the video endpoints, assuring compatibility with other video endpoints that conform to the standard. In addition to compatibility, the H.320 standard ensures a common level of visual, graphics, and audio quality that will satisfy your visual communication requirements.

The MultiPoint Control Unit is built on the architecture of the DEFINITY Communications System. The MultiPoint Control Unit sits in its own carrier and takes up approximately the same space as a DEFINITY ECS single carrier cabinet. Designed for growth, the MultiPoint Control Unit's architecture allows you to add additional circuit packs and carriers as needed.

Arranging Conferences

With the MultiPoint Control Unit, multipoint video conferences are easy to setup, operate, and manage. You can use the reservation software provided with the MultiPoint Control Unit, available through the Management Terminal or through the optional Conference Reservation System.

You can assign a number to each conference participant and setup the MultiPoint Control Unit to link the video endpoints at the designated time. Calls can also be initiated through the Meet-Me function, allowing participants to dial into their call using a preassigned telephone number. The MultiPoint Control Unit can also be programmed to out-dial to the video endpoints at a designated time.

The MultiPoint Control Unit also supports dedicated multipoint conferencing. Your video conference users that require regular and frequent access to multipoint video conferences can be assured of system access as required.

DEFINITY ECS provides not only powerful voice and data capabilities, but connections to a variety of voice and data networks as well. AT&T/Lucent Technologies has long been a leader in networking. DEFINITY ECS continues to build on those established networking strengths to offer you network management features, network interfaces, a variety of private network configurations, and end-to-end ISDN capabilities. Lucent Technologies leadership in developing and supporting open international networking standards is also apparent in DEFINITY ECS's compatibility with the Q-SIG global standards.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

Q-SIG Global Networking

DEFINITY ECS was the first system world-wide to be compatible with the Q-SIG global networking protocol. This means you can connect the DEFINITY ECS with other switches throughout the world. AT&T/Lucent Technologies developed Q-SIG Global Networking to comply with the Q-SIG standards developed by the European Computer Manufacturer's Association and the International Standardization Organization. It supports the ISDN-Primary Rate Interface connection from switch to switch as long as both switches support the same protocol.

DEFINITY's initial release of Q-SIG Global Networking was a foundation for the European Computer Manufacturers' Association supplementary services. Q-SIG Global Networking has been continually refined with each DEFINITY release. It now provides the Name and Number Identification supplementary service and the Call Forwarding and Call Transfer features.

World Class Routing

DEFINITY ECS has been designed to be a world-class system that meets the needs of both domestic and global customers. One capability essential in meeting those needs is the ability to flexibly dial any location in the world, regardless of the dial plan used at that location. In recognition of this requirement, DEFINITY ECS has been designed with World Class Routing.

World Class Routing is a powerful enhancement to DEFINITY ECS's call-routing capabilities, linking several call-routing features to build a communications network capable of providing flexible call routing for any type of dialing plan while accommodating changes in both international and domestic dialing plans.

The following are key components of World Class Routing:

- Digit Conversion converts a dialed number for public network number to a private network number and vice versa. Dialed numbers matching entries in the digit conversion tables are treated and converted. Converted calls can be routed via the most optimum route, resulting in reduced network charges and appropriate use of the private network.
- Toll Analysis compares a dialed number to entries in the system's list. Based on the results, calls may be restricted from completion.
- Automatic Route Selection digit analysis compares a dialed public network number with entries in the system's tables, mapping the number to a selected public network routing pattern.
- Automatic Alternate Routing digit analysis compares a dialed private network number with entries in the system's tables, mapping the number to a selected private network routing pattern.

World Class Routing supports the Automatic Route Selection and Automatic Alternate Routing as separate features, but through generalized administration applicable to both features, provides both the same routing abilities. In addition, there are a number of capabilities that enhance the flexibility of routing in supporting your domestic and/or global calling requirements.

For example, 18-digit routing allows DEFINITY Generic 3 to determine call routing by analysing up to 18 digits with no restriction on the grouping or format of the digits, eliminating any assumptions about the use of a particular dialing plan.

International Direct Distance Dialed calls generally consist of an international access code, a country code, and a national number. Both codes may vary in length. DEFINITY Generic 3 support for International Direct Distance Dialed calls eliminates any restriction on the grouping and format of digits on Automatic Route Selection numbers. Call routing is determined by the digits and the length of the dialed number.

Multinational World Class Automatic Alternate Routing allows the Automatic Alternate Routing number (Electronic Tandem Network number) to be any number of digits in length.

Digit conversion can be used to reroute numbers, initially dialed to use Automatic Route Selection, to be converted to use Automatic Alternate Routing and vice versa. This utility can analyse a maximum of 18 digits. In this way, destinations in a customer's network can be called using the public network number. This feature can also be used to reroute certain Direct Distance Dialed destinations to specified alternate destinations (such as intercept, attendant, or another Direct Distance Dialed number).

Network Management Features

DEFINITY Generic 3 has a variety of features that enable you to manage your network resources effectively. Here are just a few examples of DEFINITY ECS features that can be used to manage your network — Time of Day Routing, Automatic Route Selection, Facility Restriction Level, Remote Network Access, Authorization Codes, and Automatic Alternate Routing.

Time of Day Routing

Time of Day Routing allows you to select the most economical routing of Automatic Route Selection and Automatic Alternate Routing calls based on the time of day and week a call is made.

With Time of Day Routing, your company can take advantage of lower calling rates during specific times. If your company has locations in different time zones, you can maximize the use of your public or private network facilities by utilizing those in the location that has the lowest calling rates at the particular time a call is made. You can also use this feature to change the routing patterns when an office is closed and to eliminate unauthorized calls. You can set up eight separate time of day charts to control routing at different times of the day.

Automatic Route Selection

Automatic Route Selection routes public network calls on the most desirable (usually the most economical) trunking facilities available on your DEFINITY Generic 3 when the call destinations are accessible through your public network.

DEFINITY ECS supports up to 640 routing patterns. Each routing pattern consists of up to 16 routing preferences (types of facilities) set up in the order you want them checked when a call is placed. Typically, the least expensive facility will be first on the list; the most expensive will be last.

If Generalized Route Selection is not being used when a call is made, the system selects a routing pattern based on the digits dialed. The routing preferences in

that pattern are checked in the order they were listed, and the first available facility is used to place the call. If not facility is available, the call can be queued until a facility becomes available.

Automatic Alternate Routing

Automatic Alternate Routing enables you to ensure that private network calls will be routed over the various trunking facilities available in your private network in the most effective manner possible. As with Automatic Route Selection, you set up various patterns for routing calls — in this case, with the private network. Depending on your DEFINITY ECS configuration, you can have up to 640 routing patterns. Each pattern includes a primary preference — the most preferred and direct route — and 15 alternate preferences. If the primary preference in a pattern is unavailable, the system searches the alternate preferences in the specified order until it finds one available.

Subnetwork Trunking

Subnetwork trunking is an Automatic Alternate Routing/Automatic Route Selection function that typically converts an on-network (private network) number to a public network number (based on patterns and preferences) for off-network routing. It can also convert a public network number to a private network number. Subnetwork trunking provides digit insertion, deletion, pauses, and/or wait for dial tone in digit outpulsing, as required, to permit calls to route to or through a remote switch, over tie trunks to a private network switch, or over central office trunks to the serving central office.

Generalized Route Selection

Generalized Route Selection gives you the capability to not only select the optimal call routing based on the dialed number, but also select the appropriate facility based on the type of call. Generalized Route Selection enhances Automatic Route Selection and Automatic Alternate Routing by incorporating additional parameters such as the type of call to be used in the decision of how a call is routed.

Different types of calls require the use of different types of facilities. For example, high-speed data calls must use digital facilities, whereas voice and voice-grade data calls can use either analog or digital facilities. DEFINITY ECS uses Generalized Route Selection to differentiate between these and other types of calls and route them on the appropriate trunks. Based on the call types and available trunk facilities, voice and data calls may be routed over different trunk types or integrated on the same trunk group. DEFINITY ECS also provides the capability to route calls based on the data format and the need for restricted or unrestricted facilities.

In order to select the appropriate trunking facility for a call, DEFINITY ECS must know the type of call being made. In order to do this, each originating facility

such as a telephone or data module has a bearer-capability class assigned. Some originating facilities, such as data modules, may have multiple bearer-capability classes. Each trunk group in the routing pattern is assigned a list of allowed bearer-capability classes. When a user makes a call, the system queries the originating facility for its bearer-capability class and then tries to route the call on a trunk group with a bearer-capability class that matches the bearer-capability class of the originating facility. If an exact match is not found, the system then tries to find a trunk group with a compatible bearer-capability class.

Since the system automatically chooses the right trunk based on the system administration, the DEFINITY Generic 3 system dial plan can be independent of the type of call being dialed. This makes life easier for your system users, who do not have to worry about dialing a different access number for different call types.

Facility Restriction Level

Facility Restriction Levels are used to limit user calling privileges for incoming and outgoing calls. The Facility Restriction Level determines if a call attempt is permitted and which routes can be used or denied in the routing process. Eight levels of Facility Restriction Levels can be assigned to telephones, computers, system management tools. DEFINITY ECS does not require the Facility Restriction Level to be in an ascending order when administered in the patterns or preferences through system management.

When a call is attempted, the system compares the Facility Restriction Level of the telephone with the Facility Restriction Level of the trunk routes available to complete the call. If the Facility Restriction Level of the telephone is equal to or higher than the Facility Restriction Level of trunks, the call is completed; if it is lower, the call is blocked on that preference and compared to the Facility Restriction Level of the next route available. If the call fails to match the Facility Restriction Level on the available preferences, the call may queue for the first available and compatible trunk group.

DEFINITY Generic 3 also provides a feature called Alternate Facility Restriction Levels that allows the attendant to temporarily change the Facility Restriction Levels on originating facilities to a different set of Facility Restriction Levels. It is used to grant users greater access to trunking facilities than is normally provided, such as when charges are lower during evening hours.

Bearer Capability Class

Bearer capability class uses information available in the switch to match the calling requirements of a specific call with the best available resources to support that call. Bearer capability applies to all calls and support facilities, but is of primary significance for data calls. Each call has a bearer requirement — that is, a set or range of requirements needed to support that call. For data calls, these requirements include data rate, synchronization, and channel type.

Remote Network Access

Designed to guard against unauthorized system access, Remote Network Access requires that a caller from outside the system dial either one of ten barrier codes or an authorization code to gain access to the network. Authorization codes and their corresponding network-access permissions are assigned to individual users.

When properly used, this feature enables you to control and administer system access security, while still providing your authorized users with the benefits of remote network access. The risks of unauthorized access can be minimized by combining the use of Remote Network Access with the following:

- An unpublished remote access number
- Deactivate unassigned barrier codes immediately
- Change barrier codes frequently
- Inform remote access users of their responsibility
- Monitor call detail reports for unauthorized or abnormal calling patterns

Authorization Codes

Authorization codes are used on particular calls to temporarily raise a telephone's Facility Restriction Level. This is useful for those who make calls from telephones other than their own or from outside the network. If a call you dial is blocked because the telephone's Facility Restriction Level is too low, you can enter your authorization code. If the Facility Restriction Level associated with the authorization code is equal to or higher than the Facility Restriction Level of the trunk facilities required to place the call, the call is then completed. Up to 90,000 different authorization codes will be in effect for your system at any one time. Using DEFINITY Generic 3's system management tools, you can assign authorization codes and change their associated Facility Restriction Level and network access permissions.

Network Interfaces and Equipment

DEFINITY Generic 3 supports a variety of interfaces to voice and data networks. Trunks supply links between DEFINITY ECS, the public network, and other switches. Digital Signal Level 1 interfaces offer high-speed digital connectivity between switches.

Trunk Group Circuits

Trunks provide the communications links between DEFINITY Generic 3 and other switches, including central office switches and other premises switches. Trunks that perform the same function are grouped together and administered as trunk groups. Trunks interface with DEFINITY Generic 3 via port circuit packs. DEFINITY ECS trunk group circuit types include the following:

Local Exchange Trunks

Local exchange trunks connect DEFINITY ECS to a central office. The following are some of the types available:

- Central office trunks, which connect DEFINITY ECS to the local central office for incoming and outgoing calls
- Foreign exchange trunks, which connect DEFINITY Generic 3 to a central office other than the local one
- Wide Area Telecommunications Service trunks, which allow you to place long-distance outgoing voice-grade calls to telephones in defined service areas, priced according to distance in the service area, length of the call, time of day, and the day of the week
- 800-service trunks, which let your business pay the charges for inbound long-distance calls so that callers can reach you toll-free
- Direct Inward Dialing trunks, which connect DEFINITY ECS to the local central office for incoming calls dialed directly to stations without attendant assistance
- Digital Service 1 trunks, which can be used to provide T1 or ISDN Primary Rate Interface service

Tie Trunks

Tie trunks carry communications between DEFINITY Generic 3 and other switches in a private network. Several types of trunks can be used, depending on the type of private network you establish.

Auxiliary Trunks

Auxiliary trunks connect devices in auxiliary cabinets with the switch. Some of the features that are supported with this type of trunk are recorded announcements, telephone dictation service, malicious call trace, and loudspeaker paging.

Miscellaneous Trunks

Miscellaneous trunks perform functions that do not fit neatly into any of those already described:

- Release-link trunks are used between switch locations to provide Centralized Attendant Service or Automatic Call Distribution group availability.
- Remote-access trunks provide off-premises users with access to DEFINITY Generic 3 features and networking.

Digital Interfaces

Lucent Technologies supports both E1 and Digital Signal Level 1 facilities. As industry standards around the world, E1 and Digital Signal Level 1 provide the latest alternative to analog trunking.

E1 Interface

DEFINITY Generic 3 also supports E1 connections. T1/E1 access and conversion allows simultaneous connection to both T1 (1.544 Mbps) and E1 (2.048 Mbps) facilities (using separate boards).

Digital Services 1 Interfaces

When planning your networking requirements, one of the options you should consider is multiplexing over Digital Services 1 (DS1) facilities. As the industry standard for interconnecting digital systems, DS1 is an economic alternative to analog trunking arrangements. Multiplexing up to 24 digitized voice/data communications paths onto a single T1 carrier or other high-speed digital facility (such as fibre or microwave) can reduce your network trunking and equipment costs.

Used to connect switches to the public network or to other switches in a private network, Digital Signal Level 1 also delivers high-speed, end-to-end digital connectivity. Voice and data calls are completed at transmission speeds of up to 64 kbps.

DEFINITY Generic 3 offers several options in supporting the Digital Signal Level 1 interface. The options include support for voice-grade Digital Signal Level 1, alternate voice/data, and Digital Multiplexed Interface. The voice-grade Digital Signal Level 1 interface is a T1 D4 channel-bank-compatible interface that does the following:

- Uses in-band bit-robbed signaling to provide 24 voice-grade-only tie trunks consisting of 56-kbps channels for voice and voice-grade data transmission
- Interconnects DEFINITY Generic 3 with other switches with an external D4 channel bank or with other switches (analog or digital) having the appropriate interfaces

- Interconnects DEFINITY Generic 3 with central offices such as Lucent Technologies's 4ESS switch (where services such as MEGACOM and Software Defined Network can be accessed) and 5ESS switches
- Interconnects DEFINITY Generic 3 with private networks by connection with DS1 facilities
- Can be used with the same Automatic Alternate Routing capabilities as normal analog E & M lead tie trunks

Configuring your DEFINITY Generic 3 with an alternate voice/data DS1 interface does the following:

- Uses out-of-band signaling in which signaling information is multiplexed onto one of the 64-kbps digital channels
- Permits end-to-end voice and digital data connections between DEFINITY Generic 3 switches
- Delivers 23 clear 64-kbps digital channels plus one signaling channel multiplexed onto a 1.544-Mbps Digital Signal Level 1 line with provisions for framing, maintenance, and signaling
- Delivers 8-kbps timing and slip information for synchronization subsystem
- Supports ground-start and loop-start switch-central office, foreign exchange, and Wide Area Telecommunications Service (inbound/outbound) trunks, as well as direct inward dial trunks, off-premise stations, and dedicated voice/data switch connections

DEFINITY Generic 3 DS1 interface capabilities include support for Digital Multiplexed Interface.

To achieve even greater benefits than those just listed, you can combine DEFINITY Generic 3 DS1 interfaces and ISDN-Primary Rate Interface to give you additional capabilities. ISDN-Primary Rate Interface is a DS1-compatible direct-connect access service that links the intelligence inherent in the network with the intelligence provided by your DEFINITY Generic 3.

For example, with ISDN-Primary Rate Interface, the Software Defined Data Network service may be accessed. Software Defined Data Network provides virtual private-line connectivity, via the switched network, for voice, data, and video applications. Software Defined Data Network services complement the Software Defined Network voice services.

DEFINITY ECS delivers Automatic Restoration capability with Software Defined Data Network, which restores disrupted connections between access endpoints (non-signaling trunk) and data endpoints (devices that connect the switch to computers and data communications equipment). This restoration is achieved within seconds of a service disruption so that critical data applications can remain operational.

Stratum 3 Clock

Many companies have solved their communications network needs by using high-speed digital facilities. However, many have found that standard synchronization timing systems are not accurate enough in these situations. Standard systems allow more slippage than is desirable for operations like high-speed bulk data transfer. The result is bit and frame losses which lead to lost data.

Stratum 3 clock is an optional external hardware adjunct for DEFINITY Generic 3 that is more accurate than standard systems. Stratum 3 clock has a maximum of 2.5 minutes of allowable error per year. The standard clock used in DEFINITY Generic 3 and many switch systems is a stratum 4E clock, which allows approximately 17 minutes of error per year.

ISDN

Lucent's DEFINITY Generic 3 provides complete ISDN support for small systems with 20 telephones up to large systems with 25,000 telephones. Demonstrating its role as a leader in making ISDN a universal reality, Lucent Technologies makes it possible for anyone connected to DEFINITY Generic 3 to benefit from ISDN capabilities and features.

ISDN eliminates the need for multiple, separate access arrangements for voice, data, facsimile, and video services and networks. Using the same pair of wires that now carry simple telephone calls, ISDN can deliver voice, data, and video services in digital format.

ISDN is a global access standard established by the Consultative Committee for International Telephone and Telegraph designed to help you move and manage information with unprecedented ease and productivity — anywhere in the world. ISDN uses a layered protocol that conforms to layers one, two, and three (physical, link, and network layers) of the seven-layer Open Systems Interconnect Reference Model of the International Standards Organization.

DEFINITY Generic 3 supports the two major interfaces specified in the ISDN standards — Primary Rate Interface and Basic Rate Interface.

- Primary Rate Interface is used for connecting premises equipment such as switches to the network, and acts as a powerful interface between intelligent equipment such as switches and computers.
- Basic Rate Interface is used for connecting telephones, computers, personal computers, and other desktop devices to higher-order equipment such as a switch.

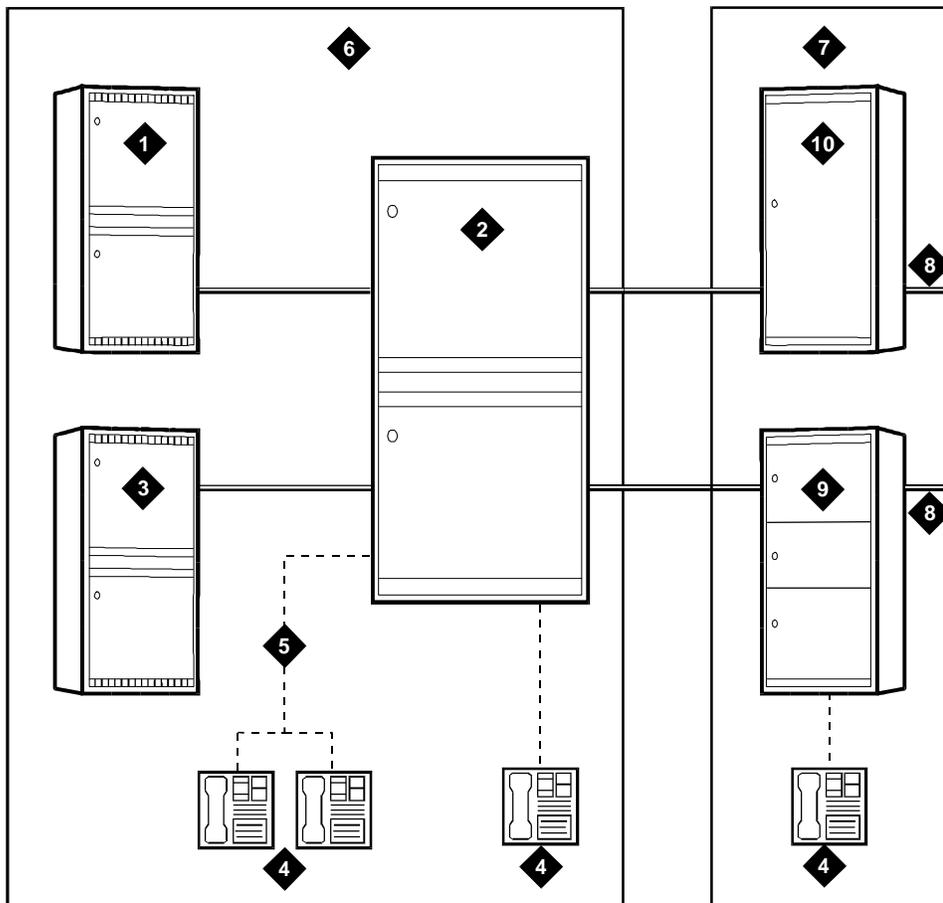
Both Primary Rate Interface and Basic Rate Interface are based on the same common building blocks — the use of a common interface to a transmission path that is divided into channels. Both Primary Rate Interface and Basic Rate Interface use two types of channels for communication:

- Bearer channels are the communications links in ISDN. They provide 64-kbps digital communications service for voice, data, video, and other information transmission.
- Delta channels, sometimes known as data channels, are the signaling links in ISDN. They carry call-control and call-related information, such as caller ID, between ISDN endpoints.

Primary Rate Interface, referred to as 23B + D or 30B + D on an E1 interface, uses 23 or 30 64-kbps B channels and one 64-kbps D channel. The 23 or 30 B channels can be used for 23 or 30 individual voice or data calls. Basic Rate Interface, referred to as 2B + D, uses two 64-kbps B channels and one 16-kbps D channel. The B channels give the user simultaneous voice and data transmission over the same connection. This channel architecture allows full and complete use of the 64-kbps B channels from endpoint to endpoint for information movement managed by signaling messages, called Q.931 messages, in the D channel.

To help your business achieve maximum benefits from ISDN and the public network, the following features reside within AT&T's ISDN service nodes.

- Call-by-Call Service Selection lets you reach multiple AT&T services via the same ISDN B channel. Therefore, a channel can be allocated among MEGACOM Wide Area Telecommunications Service, MEGACOM 800 Service, and other services on a dynamic basis, eliminating the need for dedicating each trunk or channel to a specific service.
- Automatic Number Identification, marketed as Information Forwarding-2 (INFO-2), is available on MEGACOM 800 Service. INFO-2 delivers the originating calling party's billing number to your DEFINITY Generic 3. In a call center environment, DEFINITY Generic 3 can pass this information on to a computer application via a computer-telephone integration interface to perform customer record lookups — thereby increasing agent productivity.
- Station Identification Number, similar to INFO-2, identifies the calling party number behind the switch. Station Identification delivers the originating caller's telephone number to the network where it is sent to the terminating location.



- | | |
|-----------------------------------|--------------------------------|
| 1) DEFINITY Generic 3 | 6) Private ISDN |
| 2) DEFINITY Generic 3 | 7) Public ISDN |
| 3) DEFINITY Generic 3 | 8) Public and Private Networks |
| 4) Basic Rate Interface Telephone | 9) Central Office Switch |
| 5) Passive Bus | 10) Tandem Switch |

Figure 10-1. DEFINITY Generic 3 and ISDN

- User-to-User Information sends user information from one endpoint to another using the D channel. Three forms are available: message associated data, sent within Q.931 call control messages during call establishment and call clearing; call-associated data, sent during call setup on a B channel; and noncall-associated data, sent with no related call-setup activity on the B channel. Applications for this feature include DCS, Look-Ahead Interflow, and display of calling party name and number.

DEFINITY Generic 3's support of ISDN-Primary Rate Interface, ISDN-Basic Rate Interface, and available public network services means that you can achieve full end-to-end ISDN connectivity and take advantage of ISDN services and features. For example, two switches connected by Primary Rate Interface can exchange calling party name and/or number information. The information is displayed on the called party's telephone. In addition, the called party's ID is also displayed at the calling party's telephone. This lets users identify the source of an incoming call before answering. Computer telephone integration interfaces can also use the information provided by the network to integrate your communications and data-processing systems.

DEFINITY Generic 3 also adds the following capabilities to the basic ISDN services, depending on local availability of support.

- ISDN flow control monitors message activity on the Primary Rate Interface D channel.
- Non-Facility-Associated Signaling allows a Primary Rate Interface D channel to supply signaling for B channels (voice and data) located on Primary Rate Interface interfaces other than the one where the D channel is found. As a result, one D channel can support call control and signaling for up to 20 Primary Rate Interfaces.
- D Channel backup, when administered, improves reliability in the event of a signaling link failure on a Non-Facility-Associated Signaling D channel group. A primary D channel provides signaling for the Non-Facility-Associated Signaling D channel group (two or more Primary Rate Interface facilities). A second D channel, located on a separate Primary Rate Interface facility of the same Non-Facility-Associated Signaling D Channel group, is designated as a backup. If the primary D channel fails, call-control signaling automatically transfers to the backup D channel.
- Temporary signaling connections are virtual packet-oriented D channel connections used to exchange user-to-user information on DCS over ISDN D channel and DCS AUDIX applications. Call-associated temporary signaling connections permit information exchanges that are associated with an existing B channel connection and noncall-associated temporary signaling connections allow this information exchange when no B channel connection exists. A user may request a call-associated temporary signaling connection either at call setup time or after the call has been setup. A call-associated temporary signaling connection is cleared when the associated B channel is cleared.

By combining AT&T's public network services and ISDN features with ECS's ISDN and system features, you can differentiate your business from your competitors', both in improved customer satisfaction and in greater operating efficiency. The result is improved profits and reduced costs. Here is a brief glance at a few of the possible ISDN applications:

- Combined incoming and outgoing call centers
- Dealer locator
- Sourcing
- Consumer-to business and business-to-business data retrieval
- Logging for callback
- Outgoing call management

Centralized Attendant Service

DEFINITY Generic 3 owners who have more than one switch location can benefit greatly by using the Centralized Attendant Service feature. Centralized Attendant Service reduces the number of required attendant, and, in most cases, all those attendants can be located at one of the switch locations, called "main." Switches at the other locations, called "branches," redirect their calls to the Centralized Attendant Service main. Thus, a company can have a centralized attendant group at the headquarters office and can handle calls from there for the branch offices.

All locations in a Centralized Attendant Service arrangement have a listed directory number. Calls to a branch listed directory number terminate at the main location, even if the branch location has an attendant. These listed directory number calls are routed to the centralized attendant group over trunk circuits called release-link trunks. These release link trunks are used only for centralized attendant calls and signaling.

After a call is processed by the centralized attendant, it is extended back to the branch location. The release link trunk is then dropped and made available for other calls to the centralized attendant.

If a DEFINITY ECS is a node within a Distributed Communication System and Centralized Attendant Service is provided, a centralized attendant can do the following:

- Control access to specific trunks at other nodes
- Directly access to specific trunks at another location

- Place test calls to telephones and trunk groups at other nodes
- Receive a visual warning that all trunks in a remote trunk group are busy or that the number of busy trunks in a remote group has reached a specified level

This feature ensures that all calls directed to an attendant at your company are handled efficiently.

Main/Satellite/Tributary

If you have modest network requirements, a main/satellite/tributary configuration is an attractive possibility for private networking. In this configuration, one DEFINITY Generic 3 location is the main, and remote switches are satellites or tributaries. Attendant positions and public network facilities are usually concentrated at the main.

All calls to or from a satellite pass through the switch at the main. The system appears to be a single switch with one listed directory number. A uniform dial plan provides a common four-digit or five-digit dial plan for a main/satellite configuration.

A tributary is similar to a satellite, but it has one or more attendant positions and its own listed directory number. Calls to its listed directory number go directly to the tributary.

The switches in a main/satellite/tributary network are connected by tie trunks. Trunks and switching facilities can be added as requirements grow.

An important DEFINITY Generic 3 networking feature is Main/Satellite Extended Trunk Access. Extended Trunk Access allows dialed digits that are undefined at a satellite or tributary switch to be routed over a trunk group to a main switch for interpretation. This means changes to the network numbering plan do not have to be propagated to all switches. Extended Trunk Access improves your control and reduces administration costs by making trunk networks considerably easier to maintain.

Electronic Tandem Network

If your company requires a medium to large network spanning a large geographic area, nationwide or even worldwide, Electronic Tandem Network is the answer. An Electronic Tandem Network is a wide-area private network that tandem calls through one or more switches to route the calls to their destinations.

An Electronic Tandem Network consists of tandem switches, inter-tandem tie trunks that interconnect them, access or bypass trunks from tandem switches to main switches, and the software and equipment to support call routing over the trunking facilities. Different Electronic Tandem Network locations are connected

via analog or digital tie trunks. For example, a DS1 interface can act as a high-speed (1.544 Mbps) digital backbone for voice and data communications between Electronic Tandem Network locations.

An Electronic Tandem Network can be configured hierarchically. An Electronic Tandem Network can connect individual switches; it can also connect other private networks (such as Main/Satellite/Tributary networks) together.

Within an Electronic Tandem Network, each location is identified by a unique private network location code, similar to the public network office codes that exist within an area code. When accessing the Electronic Tandem Network, a user simply dials the network office code plus the desired extension number, for a total of seven digits.

In an Electronic Tandem Network, DEFINITY Generic 3 provides a variety of features on a network-wide basis. Here are a few examples:

- **Uniform Dial Plan** — A unique four- or five-digit number assigned to each station on the network. Uniform numbering gives each station a unique number (location code plus extension) that can be used at any location in the Electronic Tandem Network to access that station. DEFINITY Generic 3 enhances the standard uniform dial plan with the unrestricted 5-digit uniform dial plan, which allows up to five digits to be parsed for call routing.
- **Extension Number Portability** — When employees move within the network, they can retain their extension numbers. The ability to keep extension numbers, and even Electronic Tandem Network and Direct Inward Dialed numbers, when moving to other locations within the company eliminates missed calls and saves valuable time.
- **Traveling Class Marks** — Traveling Class Marks are a mechanism for passing a caller's facility restriction level from one Extended Tandem Network switch to another. Traveling Class Marks allow privilege checking to be passed across switches through the Electronic Tandem Network.
- **Automatic Alternate Conditional Routing** — You can control the routing of particular calls using conditional routing. For example, you can limit the number of communications satellite hops (communications satellite links used as trunks) in any end-to-end private network routing pattern. Limiting the number of satellite hops may be desirable for controlling transmission quality or call delay in both voice and data calls.
- **Automatic Transmission Measurement System** — You can use this feature to perform routine and on-demand maintenance tests on facilities in the Electronic Tandem Network.
- **Enhanced Trunk Signaling and Error Recovery** — The reliability of Electronic Tandem Network calls is improved by allowing a trunk call to be retried on another circuit when signaling failures occur.

Distributed Communication System — Integrated SDN and Non-Integrated SDN

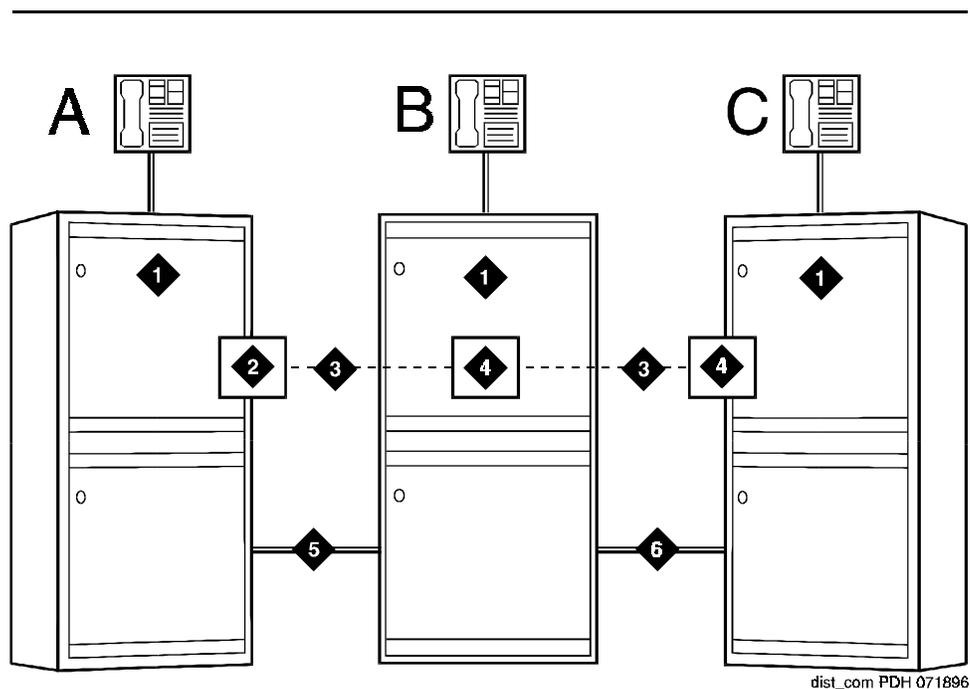
For a single-location or multi-location company that requires several systems, Distributed Communications System (DCS) may be the answer. DCS is a network arrangement of private switches, referred to as nodes. The maximum number of nodes that can be in a DCS varies from 20 to 63, depending on the particular configuration of switches. DCS nodes can be physically located in the same building, spread across a campus, or scattered across the country or around the world. Tie trunks interconnect the switches that serve the DCS complex. The tie-trunk network may be configured as a tandem tie-trunk network, a main/satellite/tributary network, or an Electronic Tandem Network. The links connecting a Distributed Communication System may also be provided across a Software Defined Network.

The functions and features of Distributed Communication System are made possible by the use of an advanced X.25 (BX.25) inter-processor data link connecting each switch, allowing call-processing to be passed from one switch to another. The data link supplies selected feature transparency and efficient utilization of facilities that can be shared.

Feature transparency means that features work the same from the user's perspective, whether the telephones involved are assigned to the same switch or different switches. Users in a DCS can dial each other with four or five digits as if they were all on the same switch.

Here are just a few examples of feature transparency in a Distributed Communication System:

- **Leave Word calling** — Allows you to touch a button on your voice-terminal and leave a standard “call me” message with your name and phone number. When your DEFINITY Generic 3 is linked with other switches in a DCS, you can call any employee in your company and press the Leave Word Calling button to automatically leave a message requesting a call back.
- **Calling-Party Name Display** — If your telephone is equipped with a digital display, information about the person calling you is displayed before you pick up the receiver. You can know who is calling if that person is in a nearby building or even across the country.
- **Centralized Messaging** — Messaging services for the entire Distributed Communication System network may be coordinated by one system, depending on volume and the version of the main and remote switches. This means that switches with smaller messaging requirements do not share a voice messaging system with another switch.



- | | |
|---------------------------------|--|
| 1) DEFINITY Generic 3: DCS node | 4) Packet Gateway |
| 2) Processor Interface | 5) Tie Trunk: Digital Signal Level 1 |
| 3) Data links (BX.25 protocol) | 6) Tie Trunk: ISDN-Primary Rate Interface switched network or private line |

Figure 10-2. DEFINITY Generic 3 as Part of a DCS

Distributed Communication System nodes are connected by tie trunks (using Digital Signal Level 1 and ISDN-Primary Rate Interface facilities, for example). In addition, a data link is provided between the various nodes (additional equipment such as a data module may be required), offering selected feature transparency across the network. With ISDN-Primary Rate Interface, the data link can be configured to use either a B-Channel or D-Channel. In Figure 10-2, Telephone A calls Telephone B and then sets up a conference with Telephone C; certain system features operate as if the telephones were all on the same switch.

Distributed Communications System and ISDN

To support DCS customers who also have ISDN-Primary Rate Interface, DEFINITY ECS can transport DCS messages over ISDN-Primary Rate Interface D channels. As a result, you are no longer limited to private-line connections between your various locations. You can also use public network services.

Software Defined Network supports all DCS features except the following:

- DCS attendant control of trunk group access
- DCS attendant direct trunk group selection
- DCS busy verification of terminals

All other capabilities and limitations associated with the DCS still apply. This allows your company to enhance network functions by adding the benefits of ISDN Q-SIG.

DEFINITY Generic 3 also supports interworking between the DCS signaling on the ISDN D channel and the DCS signaling on traditional signaling links. AUDIX systems network via DCS can also be supported over ISDN-Primary Rate Interface.

Wideband Signaling

DEFINITY ECS's support of wideband signaling allows the system to handle applications with transmission rates greater than 64 Kbps in a single call. This includes videoconferencing, Local Area Network bridging, and other wideband applications. The system switches wideband data at $N \times$ DS0 data rates — a standard for international networking.

Systems with only narrowband capabilities typically handle wideband transmissions by splitting the data stream into several calls. Advantages of wideband signaling support include:

- **Inexpensive transmission:** Wideband calls are often tarified differently. In the United States, wideband calls are about 30 percent less expensive than narrowband calls.
- **Simplified billing:** Because there is just one call, there is just one record, making billing and traffic measurements easy.
- **Reliability:** Because the data stream is not split, there are none of the synchronization problems or individual channel failures that can delay or disrupt narrowband switching of wideband data.
- **Faster call setup:** Placing a wideband call is faster than placing a narrowband call because ISDN is used and because there's only one call to place, as opposed to several.
- **Simplified administration:** Wideband signaling is administered on the DEFINITY ECS switch; handling wideband signaling on a narrowband switch typically requires additional equipment which must be administered separately.

All of DEFINITY ECS's networking features have been upgraded to handle wide-band signaling, notably:

- Access endpoints
- Administered connections
- Mixed mode signaling
- Call-by-call service
- Auto restoration
- World Class Routing
- ISDN

These upgrades further simplify the process of combining public and private networks and enhance the efficiency of combined networks.

Upgrading service typically presents a series of challenges. Will the new equipment be compatible with existing equipment and the local network? Must the service be interrupted? If so, for how long? Is it necessary to replace all related equipment? How much time must be budgeted for installation and retraining of administrators? How much space will the new system require? DEFINITY ECS actually expedites service upgrades because AT&T design engineers considered each aspect of the process:

- Connecting to the existing network
- Amortizing replacement costs
- Ensuring uninterrupted service during transition to a new system
- Storing new equipment
- Making optimum use of available lines
- Re-training administrators

Connecting to a Network

Upgrading telephone service in remote areas sometimes requires adapting equipment to work with unusual protocols. DEFINITY systems have been quickly modified to be compatible with networks in the remotest parts of the world.

AT&T is the first switch vendor to provide equipment designed to use the Q-SIG networking protocol. This protocol has been adopted by the International Standardization Organization as a global ISDN-based private networking standard. The DEFINITY ECS is thus not only adaptable to existing protocols, but readily communicates with new systems throughout the world.

Amortizing Replacement Costs

Sometimes your budget may not allow for wholesale replacement of all telecommunications equipment at once. The aggregate replacement cost of telephones, computers, and other desktop equipment can be high, even if the costs of the individual items are low. Ideally, this equipment can be replaced in stages, spreading the cost out over time. This requires, however, that the new switch be compatible with the old equipment.

DEFINITY ECS allows you to extend the life of your peripheral equipment indefinitely. It accommodates analog telephones, for example, and efficiently switches analog data. In addition, various financing options allow you to synchronize equipment payments with your cash flow cycles.

Ensuring Uninterrupted Service

An important consideration when upgrading service is, "How much time will our employees lose while the system is being connected?" In most cases, the interruption in service is minimal because the system is designed to be connected in parallel with the working switch. Even in a remote area where the equipment being replaced is very old, the switching can be transferred in a matter of hours.

Another consideration is, "How long will it take our people to adjust to the new system?" Again, this adjustment period is minimized by DEFINITY ECS's adaptability. Using the automatic route selection feature, the system can be configured to imitate the old switching system for the user's benefit. In a remote Russian town, for example, a nurse at the hospital still dials the same six-digit number she has always used to call home. What she does not know is that her home number is now actually an extension on the DEFINITY ECS. A hidden translation has allowed her to retain her home telephone number. DEFINITY ECS accommodates users in such a way that there is no difference in dialing an inside or outside call. Feature access codes can be assigned to mirror the old system as well.

Storing New Equipment

In one area, a steel plant's old communications system had occupied an entire floor of one building. A four-story building was planned for housing the new switch. The compact DEFINITY ECS required only one 4 X 8 meter room, which included plenty of room for expansion.

Making Optimum Use of Available Lines

Because many lines in some remote areas do not operate properly, sometimes as many as 40 percent more lines are used than are necessary for adequate service. Once a DEFINITY ECS is installed, the system generates detailed traffic

reports that document the relative reliability of the lines. This allows the staff to eliminate unreliable lines or petition for their repair, increasing overall system efficiency. The system's alarm reports even provide troubleshooting information for neighbouring switches in the public network.

Re-training Administrators

The reliability of the DEFINITY ECS system has allowed some organizations to profitably redeploy maintenance staff. Time-consuming daily maintenance is replaced by occasional attention to the system. The new G3-Management Applications software runs on a personal computer and saves administration time by automating repetitive tasks and consolidating related data. Recording moves and changes in all directories, for example, has never been easier. In some cases, the DEFINITY ECS is actually maintained remotely by AT&T personnel.

DEFINITY ECS is a digital communications system that can meet your most demanding voice and data requirements. But what about managing this powerful system? Managing a Switch system was once a formidable task, requiring specially trained administrators who could operate complex programming tools. But, as the capabilities of systems become more sophisticated, so too have the demands placed upon the tools that administer them.

Why? Because no matter how excellent a communications system is, you must be able to manage it effectively and easily for the system to really work for you. DEFINITY ECS gives you that capability by offering a variety of easy-to-use modular tools for managing your system. Whether your system is small or large, straightforward or sophisticated, or somewhere in-between, DEFINITY ECS has the tools to effectively and efficiently manage that system.

DEFINITY ECS's line of modular system management applications allows you to choose the tools best suited to your environment and requirements. This section takes a look at DEFINITY ECS's capabilities for system management.

DEFINITY ECS Management Terminal and Management Applications present two options for managing different systems based on size and requirements. DEFINITY Monitor I can be combined with either of these options to provide sophisticated tools for measuring and reporting your company's telecommunications traffic.

This section also briefly describes the main areas or functions of system management. Terminal and facility administration allows you to administer telephones, computers, facilities, and features throughout your system or network. Traffic allows you to measure, manage, and report on the voice and data communications traffic throughout your system or network. Maintenance allows you to view the health of your system and perform maintenance procedures on your own system, if you choose to do so.

This system management view of DEFINITY ECS gives you not only power and flexibility in a communications system but also the power and flexibility to manage that system.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

System Management Overview

DEFINITY ECS system management and maintenance architecture is based on the user-friendly architecture of the DEFINITY Generic 1. The architecture has been extended to provide additional benefits for customers at all line sizes.

In particular, DEFINITY ECS has the following capabilities:

Operation Support Systems Interface and System Access feature interface support

- Management Applications support
- Administration without hardware
- Performance measurements
- Switch-based reports
- Multiple concurrent administration/maintenance sessions
- Terminal translation initialization

System Access

System Access is the basis for transferring data and administrative commands back and forth between DEFINITY ECS and processor-based adjuncts. System Access provides external access to the system management, maintenance, and traffic data that is normally available only via the Management Terminal.

DEFINITY G3 System Access includes the end validation feature, which allows translations to be validated by the switch without actually committing a change to the switch. This allows the switch to check translations for errors without making a change in the switch data. End validation is useful for performing data validation on translations that will be downloaded to the switch, as well as for performing audits on translations stored in the adjunct. This capability makes it possible for adjuncts to validate translation data without maintaining a switch image database or a copy of the switch validation rules.

Concurrent User Sessions

In order to increase the efficiency of administration and maintenance functions, the DEFINITY ECS switch accommodates multiple concurrent administration and maintenance user sessions. Three or more devices (management terminals or operation support systems) can be connected to the switch to perform administration and/or maintenance tasks simultaneously. DEFINITY G3 supports eight concurrent administration and maintenance users — five can perform concurrent administration, and three can perform concurrent maintenance. The eight concurrent sessions can be in any combination of local and remote connections.

This feature increases the volume of administrative activity that can be performed in a given time period, allowing administrators to handle peak demand more effectively.

Options for System Management

DEFINITY ECS offers two main system management options. These options cover a wide range of requirements, allowing you to select the one that best meets your needs. Which choice you make depends partly on the size of your DEFINITY ECS system (number of lines and trunks, for example), the features it has, what requirements you have for managing it, and the number of systems that you would like to administer from one location. Then select either DEFINITY ECS Management Terminal or Management Applications to manage your system, with the possible addition of DEFINITY Monitor I and/or Trouble Tracker to provide additional capabilities.

These options have all been designed with similar user interfaces. Screen layouts and the use of commands and keys are very similar. This means that you can migrate from one option to another smoothly and with minimal training.

DEFINITY ECS Management Terminal

The Management Terminal is the integrated management tool built into every DEFINITY ECS. G3-Management Terminal is the best, built-in management product available in the marketplace.

G3-Management Terminal provides your system administrator with an intuitive interface. The interface provides forms-based selections, help keys, and a language-based interface (several languages are available).

The system administrator uses a G3-Management Terminal terminal to access the system to perform “task-oriented” administration and maintenance procedures. Several types of asynchronous terminals can be used as the G3-Management Terminal terminal. One such terminal is the Lucent 715 Multitasking Terminal.

Using the G3-Management Terminal terminal, the system manager can do all of the following:

- Manage system, voice-terminal, and data-terminal features on a day-to-day basis
- Perform system backups
- Monitor system performance
- Perform selected maintenance procedures
- Maintain system security

The Management Terminal is an excellent tool for administering your DEFINITY communications system.

DEFINITY G3 Management Applications

The G3 Management Applications, a personal computer-based tool, provides enhanced system management capabilities for DEFINITY ECS. The G3-Management Applications software runs on a selected list of certified Windows-based personal computers, including several laptop computers. See your Lucent Technologies account team for information on approved personal computers.

The G3-Management Applications software is composed of the G3-Management Applications “environment” that provides the tools and basic features of the G3-Management Applications and G3-Management Applications “applications” that run on top of the environment. The G3-Management Applications environment capabilities and applications include the following:

- Configuration Program displays information about the G3-Management Applications hardware and lets the user select colour-scheme and display options.
- Emulation is an enhanced terminal emulation with keyboard and mouse cursor control, colour screens, and extended help windows.
- Communication makes Electronic Industries Association RS-232 connection to the switch.
- Customer Release allows the G3-Management Applications to store information about each switch supported by the G3-Management Applications, including such information as switch release and version, switch name, and dial-up information.
- Data Management allows the system manager to:
 - Print custom-formatted reports of gathered switch data
 - Format G3-Management Applications data for export to other systems such as database management systems
 - Use as alternate way to access enhanced emulation for real-time communication with switch

- Retrieve switch data as needed and save in standard personal computer files for printing or exporting
- Enhanced Data Management allows the system manager to:
 - Make global changes rapidly to large amounts of switch translation data (such as changing set types, changing coverage path assignments, or changing class of service or class of restriction assignments) by creating a template for global changes
 - Provide transaction generation in order to pre-process switch-based commands on the personal computer, and later send them to the switch
- Bulk Administration is a set of administration capabilities that allow the system manager to administer many stations in bulk rather than on a station-by-station basis. It is primarily used during major moves or changes when the switch hardware is not yet available. Capabilities include:
 - Alias stations by mapping unsupported set types to supported set types
 - Create station models that contain feature information common to station user groups
 - Administer Basic Rate Interface sets in multipoint configuration
 - Create station detail records
 - Define hunt groups
 - Group and list provisioning
 - Generate (download) merged station and model data to the switch
 - Perform audits
- AUDIX Data Exchange allows you to transfer common data between a switch station form and an AUDIX subscriber form. This allows you to use your PC for both switch administration and AUDIX administration.

OneVision™ Network Management

Given its ability to switch and translate many types of information and protocols, DEFINITY G3 is the ideal platform for managing your voice, data, and video communications as one unit. The OneVision family of network management tools includes G3 Fault Management, which helps you manage related applications and equipment from one computer.

The Fault Management Application uses the industry standard Simple Network Management Protocol to deliver information to a network management computer. On the computer, the software presents a graphical representation of each G3 in the network. When an alarm occurs on any of the G3 systems, the icon representing the switch changes color, indicating the severity of the alarm. The system

then allows you to zoom in on the various switch components to target the trouble. It provides detailed information about the components during this troubleshooting process. You can query the system for detailed information at any time and request equipment inventories.

Perhaps most important, the enhanced cut-through feature provides access to the G3 integrated management utilities so you can manipulate the switch databases. Since the network management computer allows you to view both the switches and associated LANs from a single platform, it is possible to see what is happening simultaneously to both the voice and data networks. OneVision thus provides network perspective and switch management from one station.

Other Administration Tools

A variety of other Lucent Technologies tools are available for G3 administration.

DEFINITY Monitor I

DEFINITY Monitor I is a UNIX System V-based software application that enables you to monitor and store data on the use and performance of your DEFINITY ECS resources. For example, Monitor I allows you to record measurements of processors, network modules, trunks, attendants, Automatic Call Distribution operations, call coverage, and security.

Easy to use and maintain, Monitor I gives you a friendly interface to a standard set of reports to meet your needs. It allows you to generate customized traffic reports and provides formatted data for output to your host computer for graphic analysis or further customising.

With Monitor I, you can have the data and the tools that will allow you to identify and to implement needed adjustments to your DEFINITY G3 system. For example, you can identify the need to add or remove trunks in order to reach a desired grade of service or to meet service level objectives.

Lucent Technologies Trouble Tracker

Lucent Technologies Trouble Tracker is a Unified Network Management Architecture-compatible network management system that allows you to monitor the health of your switch network.

Trouble Tracker monitors alarms and trouble tickets to support a variety of Lucent Technologies and non-Lucent Technologies premises products. Trouble Tracker receives and logs alarms from a variety of different sources, creates and stores trouble tickets, forwards alarms to a variety of other locations, and provides management reports for planning and analysis.

System Management Capabilities

DEFINITY ECS system management capabilities are unparalleled in their ability to help you administer and manage your system, no matter what size it is or how sophisticated it may be. The following information describes just some of the many DEFINITY ECS capabilities.

Terminal Administration

DEFINITY ECS includes a number of features that ease, simplify, and accelerate the administration process.

Administration without Hardware

Administration without hardware gives you the ability to administer station forms without specifying a port location. Administered stations will not cause alarms or errors to be generated when the station is translated but not yet installed. These station types are referred to as “phantom” stations. Phantom extensions can be used for Automatic Call Distribution Dialed-Number Identification Service. This allows a phantom extension to be administered on the switch for each call type that needs to be identified to agents. The phantom Automatic Call Distribution extension either is “call forwarded” (via an attendant console) to an Automatic Call Distribution split or has its coverage path defined to include the Automatic Call Distribution split. The name field administered for the phantom extension will identify to the Automatic Call Distribution agent which service the caller is attempting to reach, allowing the agent to properly address the caller.

Administration Without Hardware also supports the ability to store station templates (models). These can later be used with the duplicate station command to implement many station forms of the same type in the switch.

Administration Without Hardware can be used to streamline system initializations, major additions, and rearrangement/changes by allowing telephone translations to be entered before the actual ports are assigned.

DEFINITY G3 Administration Without Hardware can be used on the following terminal types:

- Analog telephones
- Digital Communications Protocol telephones
- Hybrid telephones

Larger G3 configurations support additional terminal types to those listed above. These include:

- Attendant consoles
- Voice/computers (such as Digital Communications Protocol terminals with voice and data capabilities)

- Data modules
- ISDN Basic Rate Interface telephones and computers
- Analog queue warning ports
- Announcement circuit packs

Terminal Translation Initialization

DEFINITY G3 provides terminal translation initialization, a feature that works with Administration Without Hardware. Terminal translation initialization associates the terminal translation data with a specific port location through the entry of a special feature-access code, a terminal translation initialization security code, and an extension number from at a terminal that is connected to a wired, but untranslated jack.

Once a terminal is connected to an appropriate jack, the terminal user can dial the appropriate codes followed by a pre-translated extension number of an Administration Without Hardware terminal. The system will complete the administration of the terminal by associating the translation data with the port location and performing appropriate checks.

Terminal translation initialization reduces the labour associated with system initializations, major additions, rearrangement and changes, and building wiring. Translation data entry can be performed without knowledge of the physical layout of circuit packs. End-users can move their own station equipment if a building is wired to support it, reducing costs for station moves. Individual lines need only be wired to the correct type of port, rather than a specific port.

System administrators maintain control over the use of terminal translation initialization through security codes. By activating and deactivating security codes, administrators can control who uses terminal translation initialization — and when.

Scheduling

One of the capabilities that adds flexibility to G3's powerful administration tools is the ability to schedule non-interactive activities. Scheduling also allows you to schedule reports on a periodic basis.

The following information describes some of the DEFINITY ECS scheduling capabilities.

Functional Scheduling Enhancement

Functional scheduling allows you to specify the time a command will be executed or to specify that it should be executed on a periodic basis. Only commands that do not require user interaction after being entered on the command line (such as list, display, test) can be scheduled.

DEFINITY G3 also supports scheduling of “one shot” requests — commands that are executed only once and then removed from the scheduling queue automatically by the feature, such as save translation commands.

Functional scheduling enhances administration. For example, scheduling of save translations is particularly important when large numbers of translation changes are made during the day, ensuring that they will be saved to tape at the specified time. The “one shot” report is particularly useful for scheduling large print jobs at night that are normally run only once.

Other Management Features

Several other management features enhance your investment in G3.

Security Violation Notification

Security violation notification identifies potential hackers’ attempts to access the DEFINITY ECS. It notifies you when the number of invalid barrier-code attempts or invalid login attempts is greater than the administered threshold.

A monitor report displays the last 16 invalid barrier-code attempts and the last 16 invalid login attempts. This report is automatically updated every 30 seconds.

Host Interface

Host Interface, a G3-Management Applications capability, gives you direct access to data residing in the G3-Management Applications database. Using standard terminal emulation software with the XMODEM interface, you can retrieve DEFINITY ECS information to populate your own customer-developed databases.

System Reporting Capabilities

Ongoing management of your DEFINITY systems can be enhanced by data made available through reports. DEFINITY ECS gives you several options for obtaining reports on your system.

Switch-Based Reports

DEFINITY ECS has built-in capabilities for generating reports required for small, medium, and large systems. These reports are available without special hardware or software.

System Measurements reports supply information on the status of all communication facilities. These reports help determine the efficiency of resources, including but not limited to trunk groups, hunt groups, and the attendant group.

System Status reports supply information associated with the attendant group, major and minor alarms, and traffic measurements.

- The Recent Change History feature reports on the most recent administration and maintenance commands entered. DEFINITY ECS also supplies:
 - New site data on the station form. New fields include the set colour, building, floor, and headset. In addition, user-defined validation checks are provided for a subset of the site data items.
 - Scaling enhancements, as well as a ranging and filtering capability, for large switches. These allow your system administrator to restrict data reporting to only the desired amount of switch parameters.

DEFINITY G3r also includes the following reports:

- Class-of-Restriction report lists the extensions that have a particular Class of Restriction value or that fall within a range of Class of Restriction values.
- Class-of-Service report lists the extensions that have a particular Class of Service value or that fall within a range of Class of Service values.
- Site Data report lists, by extension, the site data associated with stations in the system. Ranging and filtering capabilities are provided for selected site fields.

Performance Measurements

A number of performance measurements are available on DEFINITY ECS. These measurements are available in the form of switch-based reports for local or remote access, and can be collected for subsequent analysis and reporting by adjuncts and operation support systems using the operation support system interface protocol. These reports include:

- Call Coverage reports display measurements of the distribution of traffic offered to call-coverage groups. Separate reports for all calls and external calls are supplied. Each report has sections that define group attributes, provide a summary of coverage-group call dispositions, and show the disposition of traffic at each coverage point. You can select which coverage groups are monitored via administration. The fields are as follows:
 - Group Attributes report the group number, number of principals, number and type of station (extension, Automatic Call Distribution) at each coverage point, and the number of ring cycles before the call is advanced to the next coverage point.
 - Summary reports the number of calls offered, advanced to coverage, answered, and abandoned before being answered for all calls offered to the group and for external calls offered to the group.

- Coverage Points differs based on whether “All Calls” or “External Calls” is selected. The “All Calls” report shows detail data for all calls to the group; the “External Calls” report shows detail data for only the external calls offered to the group. For each coverage point in the group, the number of calls offered, abandoned while at that coverage point, and overflowing to the next coverage point are listed.

These measurements can be used to engineer group sizes at coverage points and to detect station user abuse of the call-coverage feature.

- Processor Occupancy report provides summary information on how heavily the processor is loaded. It includes fields giving peg counts of the number of various call types and total calling rates for the measurement period. The data fields of this report are:
 - Processor occupancy for call processing (including the link subsystem) plus system management processes
 - Call processing (including the link subsystem), system management, and packet interface processor occupancy
 - Total calls, number of station-to-station calls, number of incoming trunk calls, number of outgoing trunk calls, and number of tandem calls

These measurements are listed for the last hour, today’s peak hour, and yesterday’s peak hour.

Large systems offer additional measurements that help configure the switch, determine the switch’s capacity for growth, and report unauthorized switch-access attempts. These measurements include:

- Traffic Summary report provides a performance summary of the switch with the following information:
 - Processor occupancy for call processing and system management
 - Attendant speed of service
 - Total switch-network blocking probability, as well as blocking probability of the highest port network and highest center-stage link
 - Total number of security violations as defined in the security violations report
 - A list of the trunk groups that experienced blocking higher than an administered design grade of service
 - Total trunks that are out of service
 - Total number of Call Detail Recording record buffer high-water-mark violations and buffer overflows

- Time stamps for when the following events last occurred:
 - Major alarm
 - The list of trunk groups to be studied with the detailed report were last changed
 - The list of coverage groups to be studied were last changed
 - The list of Automatic Alternate Routing/Automatic Route Selection routing patterns to be studied was last changed

These can be used to verify that your system and its users are not experiencing performance degradation due to overloaded switch resources.

- Attendant Position report lists the following:
 - Attendant usage
 - Number of calls answered
 - Total time the attendant was available to answer a new call
 - Average holding time on calls answered
- Security Violations report collects the following measurements:
 - System Management includes the number of successful and unsuccessful logins, the number of valid and invalid passwords, and the number of times a login name was valid but three successive invalid passwords were entered.
 - Call Processing lists the number of valid and invalid barrier codes entered, and the number of valid and invalid authorization codes entered for the total system, the stations on the system, all tie trunks, all remote access trunks, and the attendant consoles. In addition, the time and dial access code/extension from which the last ten violations occurred are recorded.
 - Maintenance Board lists the number of valid and invalid attempts to access the maintenance board.
- Tandem Traffic report provides information on facilities that serve tandem traffic.

The following measurements are useful in helping you evaluate the network engineering design for possible reconfiguration. They can help you decide how to reconfigure networks for lower-cost operation.

- Hunt Group Measurements lists various information including the number of calls that overflowed the group queue.
- Automatic Route Selection Pattern Measurements collects information on Automatic Route Selection patterns from when the report was administered into the measured pattern list until it is removed from the measured pattern list.

- Trunk Group Detailed Measurements reports on the traffic on a selected subset of trunk groups for a sequence of 24 measurement intervals whose length is customer-selectable between the options of 15 minutes, 30 minutes, and one hour. The report is divided into two sections:
 - Group Identification includes the trunk group number, size, type, direction, and size.
 - Measurements lists total usage, maintenance usage, total calls, incoming calls, tandem calls, group overflow, calls queued, queue overflow, percentage of all trunks busy, and percentage of outgoing blocking.

The following measurements and reports are needed for engineering and load balancing a large switch. These measurements include:

- Blockage Study report shows the blockages that occur for Time Division Multiplexing attempts and for Center Stage Switch connections for each port network and the blockages that occur between each pair of switch nodes.
- Port Network and Link Usage is used in balancing load between port networks and in engineering links (Expansion Port Network/Switch Node), especially remote Expansion Port Networks over Digital Signal Level 1 links. This report lists the measurements for all calls, intercom calls, incoming trunk calls, outgoing trunk calls, and tandem calls for each port network.

All of these measurements are accessible to an external host via the operation support system interface.

G3 Management Applications Reports and Data Acquisition Utilities

Through the G3-Management Applications, DEFINITY ECS supports reporting and data acquisition not available through the switch-based reports. This supports the consolidation and formatting functions that large organizations need. When excess data surpass a multiple-screen display capability, the ranging, sorting, and filtering capability provided by standard report-generation programs allows to restrict reports to only the desired data.

The data acquisition feature supports two capabilities:

- The ability to collect data from the switch via the operation support system interface
- The ability to use personal computer-based software, such as standard database programs or report-generation packages, to create custom reports from G3-Management Applications

For the G3-Management Applications reporting capability, data from selected switch-based reports is accessible on the G3-Management Applications in standard personal computer file format (such as ASCII G3-Management Applications). G3-Management Applications reporting allows you to do the following:

- Create files of switch data on the personal computer in a format compatible with available report-generation programs, such as dBASE III, Informix, and others
- Substitute the DEFINITY ECS-generated field headers with customer-defined headers
- Administer the file format, including which character to use as a field separator (space, comma, etc.) and which characters to use as a field value delimiter (quotes, no character, etc.)

Call Detail Recording

Also included in the timely and efficient management of your communications system is the management and control of call costs. Call Detail Recording allows you to monitor and analyse call patterns and usage in your system. DEFINITY ECS has enhanced the Call Detail Recording capabilities available to you.

Call Detail Recording Features

DEFINITY ECS enhances Call Detail Recording with the following new capabilities:

- Distinguish voice from data on trunk calls
- Determine if a data call used a conversion resource, such as a modem pool
- Choose whether to record the vector directory number in the "Dialled Number" field of the Call Detail Recording record, or record either the split or the agent extension in the same field
- Allow Call Detail Recording records to be generated for internal calls (calls to and from a set of extensions, including data endpoints) so administered (a maximum of 500 extensions in large configurations)
- With Call Privacy, allow up to seven digits of the dialled number to be blanked from the Call Detail Recording record

- Use a second Call Detail Recording port for sending Call Detail Recording data to a second source
- Provide Call Detail Recording call splitting, which allows incoming and outgoing calls to be split into separate call records in order to track calls that transferred to other internal parties

DEFINITY G3r adds the Variable Format Records feature, in addition to those also available on the other models. This feature provides a flexible means of incorporating new fields in the call detail record as new switch features and new Call Detail Recording devices become available. The variable format allows you to define a record in terms of its content (from a set of available data elements), the position of its fields, and the spacing between the fields. This method can be used to construct the 15-, 18-, and 24-word standard formats and custom formats.

If calls come in while the Call Detail Recording link is down and the buffer is filled to maximum, DEFINITY G3r gives you the following administrable call-record handling options:

- a. Block the calls with reorder
- b. Allow the calls to overwrite records
- c. Route the calls to an attendant with the option to proceed as a non-Call Detail Recording call

As you can see, DEFINITY ECS call-record handling capabilities are designed to be flexible, adapting to meet your present and future business needs.

Call Detail Recording Devices

The following output devices are supported by DEFINITY ECS:

- Local storage devices such as the Call Detail Recording Unit/S, and any customer-provided storage device with an RS-232C interface
- Processing devices — such as the Lucent Technologies Call Accounting System Plus, Cost Allocator, or host processors — that are supported over an RS-232C interface with XON/XOFF flow control
- Asynchronous ASCII printers with RS-232C interface

The enhanced variable format records feature capability in DEFINITY ECS supports any customer-defined data presentation, and therefore can support any devices over an RS-232C interface.

Call Accounting System Plus Version 3

Lucent Technologies's Call Accounting System Plus Version 3 is a comprehensive telecommunications cost-management system for your small to medium-sized business locations. Call Accounting System Plus Version 3 stores call records from the switch, assigns costs to the calls, and generates standard summary, detail, account code, selection, and preselected reports.

Call Accounting System Plus Version 3 collects information about telephone calls and computes the costs using actual telephone company rates. The system provides 11 major MTS metro rate tables. Call Accounting System Plus Version 3 can also provide customized site-specific rate tables to achieve a higher accuracy level on call-pricing, if your location has special local or long distance services.

Call Accounting System Plus Version 3 software, which runs on MS-DOS-based work group system computers, offers several new features:

- The ability to record and process Automatic Number Identification information
- Enhanced reporting
- Accommodates multiple private voice networks, non-traditional dialling patterns, and other call details that require additional call processing
- Streamlined system administration
- Comprehensive user assistance

Call Accounting System Plus Version 3 can be used to allocate costs, improve client invoicing, control system misuse, enhance employee management, and verify invoices.

Hacker Tracker

Lucent Technologies Hacker Tracker software automatically detects abnormal calling activities and provides real-time alarms and alerts the telecommunications staff.

Operating as an optional module that connects to Lucent Technologies Call Accounting System Plus Version 3, it uses information gathered by the call accounting system to continually monitor all incoming and outgoing telephone calls and alerts security or systems administrators when it detects calling activity that may signal toll fraud.

Call accounting systems typically track calls and generate reports so that companies can bill long distance service back to their internal organizations. Lucent Technologies Hacker Tracker uses that information to your company of unusual, potentially fraudulent calling patterns.

Administrators can define up to 10 different conditions that will trigger an alarm. For example, an administrator may instruct the system to track certain calling

patterns based on time of day or calls made to certain parts of the world. If the software detects a threshold violation, it automatically generates an alarm so the administrator can take immediate action to stop the fraud.

You can choose from a variety of alarm notifications. One option activates a computer's speaker and generates a "beeping" alarm tone when a security violation has occurred. Another can call someone at home by activating a digital pager.

Lucent Technologies Call Accounting System Plus Version 3 System, equipped with Hacker Tracker, connects to any Lucent system, including the System 75, System 85, and DEFINITY Communications Systems as well as the System 25 and MERLIN LEGEND Communications Systems. The system also connects to switches manufactured by Northern Telecom and Rolm.

Cost Allocator

Cost Allocator is Lucent Technologies response to the need for a high-powered, UNIX system-based, Switch call-accounting processing product. Targeted at the needs of the medium- to large-sized call-volume client, Cost Allocator receives, rates, and produces reports about incoming and outgoing call-detail records from multiple switches at multiple sites. Its capabilities complement the power, efficiencies, and value of the DEFINITY ECS.

Cost Allocator application software can process information from up to 255 sites. An optional built-in poller package allows Cost Allocator to collect information from up to 90 sites, polling 7 simultaneously. When polling volumes or needs for increased flexibility warrant, the software-based Call Detail Record Poller can be used in place of the basic poller option. Call Detail Recording Poller's expanded capacities allow collection from over 250 sites, with 28 polled simultaneously.

The system produces reports in a wide variety of standard formats, and custom reports are easily tailored to provide specialized information. Reports can be displayed on a terminal, sent to a printer, and/or saved on disk. Basic types of reports, available in detailed or summary levels, include the following:

- Organizational and Account Code reports list individual station-user or authorization-code costs.
- Analysis reports offer control over types of calls and call handling.
- Selection reports help investigate system misuse by isolating calls that match customer-defined criteria.

A Custom Report Writer option allows you to access the Cost Allocator database. Once it is accessed, you can define any type of report desired.

Call Detail Recording Unit/SE

The Call Detail Recording Unit/SE (Call Detail Recording Unit/SE) can be used when call detail record storage is more than 7,000 records.

The Call Detail Recording Unit/SE is a special-purpose processor containing a built-in modem and permanently installed Call Detail Recording Unit software. It is a local Call Detail Recording storage device that collects, optionally filters, and stores Call Detail Recordings from a variety of switches including the DEFINITY ECS.

Upon request from a Lucent Technologies polling system, the Call Detail Recording Unit/SE transmits all Call Detail Recordings received since the last poll. The same Call Detail Recordings can be retrieved by up to two polling systems. The polled Call Detail Recordings are then available for processing via Lucent's Cost Allocator Call Processing Accounting Management Solution.

Following are some of the Call Detail Recording Unit/SE highlights:

- Stores 77,000 Call Detail Recordings for a 24-word record
- Stores 127,000 Call Detail Recordings for an 18-word record
- Supports 15-, 18-, and 24-word Call Detail Recordings including ISDN
- Supports fixed and variable length Call Detail Recordings
- Supports record formats up to 132 ASCII characters plus end-of-record characters
- Collects up to 3,600 Call Detail Recordings per hour
- Can be remotely administered
- Provides 72 hours of Call Detail Recording retention via 9-volt battery backup
- Uses three filtering options on input from the switch to reduce the number of useless Call Detail Recordings
- Monitors/displays Call Detail Recordings as they are collected
- Offers automatic system initialization and power failure recovery
- Supports polling or remote maintenance via a built-in, 1200- or 2400-bps modem
- Uses a password for security protection for polling and administration
- Has alarm relay contacts for wiring to an alarm reporting device
- Performs on-line diagnostic tests (ROM, RAM, internal clock)
- Provides an on-line, real-time system status report

With less than 30 percent of person-to-person business calls reaching the intended party on the first attempt, day-to-day business can be frustrating. DEFINITY ECS integration with Lucent Technologies voice-messaging and voice-response products can help ensure that important calls are not lost.

For nearly a decade, AT&T/Lucent Technologies voice messaging and voice response systems have provided businesses with the voice processing tools to communicate more efficiently and make time spent on the job more productive. Whether companies have 10 employees or thousands, the dilemma of how to do more with less is driving them toward innovative voice processing solutions.

Within an organization, voice messaging, which is much more than just an answering machine, bypasses idle chatter to promote a communications mode that can be much more efficient than two-way calling. Lucent Technologies studies show that voice messages average 30 seconds whereas two-way calls run much longer and are devoted to business only 50 percent of the time.

The Lucent Technologies voice messaging solutions include:

- DEFINITY AUDIX
- INTUITY AUDIX
- CONVERSANT Voice Information System
- CONVERSANT Intro
- CONVERSANT Form Filler Plus

Integrating each of these products with your DEFINITY ECS measurably reduces overhead costs and improves efficiency — while ensuring that important calls aren't lost.

⇒ NOTE:

Some applications and products are unavailable in some countries. Please check with your local distributor for further information about which features and applications are available to you.

DEFINITY AUDIX Voice Messaging System

While many voice messaging systems require separate equipment and connections, the DEFINITY AUDIX System easily installs directly into your DEFINITY ECS cabinet to support advanced voice messaging capabilities without the need for an adjunct processor.

The DEFINITY AUDIX system gives small- to medium-sized businesses full voice messaging performance in a streamlined, cost-effective package. The result is high-performance voice messaging no matter what your business size.

Each DEFINITY AUDIX system supports up to 2000 mailboxes and stores either 6, 15, or 40 hours of recorded messages. It can be configured with two to eight ports (in two-port increments).

The system includes such features as multiple personal greetings, full-functioned automated attendants, outcalling for message notification, and multiple language support. The DEFINITY AUDIX System includes both analog and proprietary digital networking software, which allows it to exchange voice messages, subscriber profiles, and message status information with other voice messaging systems.

By embedding the voice messaging system within the DEFINITY ECS, the DEFINITY AUDIX system provides the following advantages:

- Because it is integrated within the switch, separate review and approval by government agencies for compliance with electrical requirements and other technical specifications often are not required.
- Connecting to the DEFINITY Communications System backplane provides direct access to switch interfaces such as time slots, signalling mechanisms, and power feeds.
- Bypassing analog ports and digital conversions provides a more efficient, higher quality call storage process.
- Using the same terminal with look-alike screens to administer both the switch and the DEFINITY AUDIX allows faster training and better performance.
- You can use DEFINITY ECS's maintenance strategy with DEFINITY AUDIX to allow remote maintenance by the same team that maintains the switch.

The entire system is contained on circuit cards, occupying five consecutive slots in a switch carrier. All the major components are economically mounted onto the multifunction board using the latest technology in large scale integration circuit chips and in surface mount fabrication. The components mounted on the board include the central processing unit, the small computer system interface unit that supports the tape drive and hard disk, the digital signal processor complexes that do speech processing, and the time slot interfaces for the switch.

In addition, an alarm board monitors the system power and environmental conditions, holds the disk drive, and includes a built-in modem for remote maintenance. The DEFINITY AUDIX System operates by emulating a switch digital port board.

Reliability and Security

In keeping with its commitment to assist clients in combating toll fraud, Lucent also designed the DEFINITY AUDIX System with security precautions against fraudulent access attempts. For example, the system only allows a transfer of calls to other voice mail subscribers. When a caller reaches the system and requests a transfer out, the system first checks the requested extension number against its subscriber database. If the extension number is not in the database, the transfer attempt is denied. Additionally, mailbox passwords can contain as many as 15 digits.

The alarm board on the DEFINITY AUDIX system has its own processor that allows maintenance and diagnostic access if the main processor fails. A liquid crystal display on the unit lets on-site technicians check system status. There also is a robust set of built-in diagnostics that technicians can access either on-site or remotely through a built-in modem. A special alarm-originating feature helps speed problem diagnosing and correction.

The system routinely performs self diagnostics. If it detects a problem, it automatically dials a Technical Service Center and produces a detailed alarm message with diagnostic specifics. The Technical Service Center staff responds quickly via the built-in modem to perform further diagnostics, isolate the problem, and take corrective action. As a back-up, the DEFINITY AUDIX system can send an alarm message to the switch.

Easy Installation and Expansion

The DEFINITY AUDIX System was designed for easy installation. There are no special power or cabling adjustments required. In fact, the system is as easy to install as a DEFINITY System circuit pack.

System expansion is simple. All the hardware required for the full 16 ports is included in the initial DEFINITY AUDIX system. If you decide to buy fewer than 16 ports initially, you can order additional ports at any time. Lucent Technologies can then activate those additional ports through a simple software change that

technicians download remotely. There is no need to modify the basic hardware, and the system still occupies only five slots.

Improved Clarity

A speech processing algorithm developed at Bell Laboratories encodes at 16 Kbps, giving the DEFINITY AUDIX system a major advantage over its competitors in that it can store many more messages in a smaller space.

The algorithm also improves the speech quality in system prompts, users' personalized greetings, and the voice messages themselves. Bell Laboratories listening studies show that the message playback clarity is unsurpassed in the voice messaging industry.

Enhanced speed-up/slow-down of message playback is now offered because of this new algorithm. DEFINITY AUDIX System users can play back messages twice as fast or at half speed with no distortion in pitch.

The Best Solution Worldwide

Lucent Technologies offers the DEFINITY AUDIX System in the same 91 countries as the DEFINITY System. Prompts are available in several languages. Lucent Technologies will continue to develop a wide variety of languages and bilingual capabilities.

The DEFINITY AUDIX System is the best voice messaging solution for international companies because it is integrated in the DEFINITY ECS. Because it does not constitute a separate piece of equipment, review and approval by government agencies are often not required.

Summary of DEFINITY AUDIX Features

DEFINITY AUDIX is a powerful voice mail system that enables you to create, store, send, and receive spoken messages electronically. Spoken prompts guide you as you enter simple one- or two-key commands at a touch-tone telephone. Subscribers can use the system 24 hours a day, sending and retrieving messages from any touch-tone telephone. And the AUDIX system helps to protect sensitive information by requiring users to enter a combination of subscriber login codes and passwords to access the system.

Whenever you call the DEFINITY AUDIX system, you interact with it by entering commands through your telephone's touch-tone keypad. You simply specify the desired activity, and follow the voice prompts for the desired task.

Special voice-processing features include Voice Mail, Call Answering, Outcalling, Multi-Level Automated Attendant, and Bulletin Board. The following is a summary of DEFINITY AUDIX capabilities:

- *Shared Extensions* provide personal mailboxes for persons sharing a phone.
- *Multiple Personal Greetings* allow subscribers to prepare a pool of up to nine personal greetings to save time and provide more personal customer service. Separate messages can indicate the subscriber is on the phone, away from the desk, on vacation, etc. Different messages also can apply to internal, external, or after-hours calls.
- *Priority Messaging* can place important messages ahead of others.
- *Outcalling*, which will automatically dial a prearranged phone number or pager when messages are received in a user's mailbox.
- *Priority Outcalling* provides outcalling notification of priority messages only.
- *Broadcasting*, which allows the same message to be sent to multiple recipients or to all users on the system.
- *System Broadcast* capabilities are available in two forms: Broadcast Voice Mail and Login Announcement.
- *AUDIX Directory*, which allows users to 'look-up' the extension number of any other user by simply entering their name on the telephone keypad.
- *Personal Directory* shortens the time required to locate correct names by accessing a user-customized list in the Names Directory.
- *Call Answering for Nonresident Subscribers* provides AUDIX System mailboxes for users who do not have an extension number on the Switch.
- *Full Mailbox Answer Mode* informs callers whenever messages cannot be left because there is no room in a subscriber's mailbox.
- *Name Record by Subscriber* lets users record their own names on the system.
- *Automatic Message Scan* can play all new messages in part or in their entirety without requiring the subscriber to press additional buttons — a feature particularly beneficial to users of car phones.
- *Sending Restrictions by Community* provides the capability to limit the communities of callers who can communicate via AUDIX Voice Messaging.
- *Group Lists*, allowing users to create mailing lists of up to 250 people to use for broadcasting messages.
- *Message Forwarding*, to let users forward messages they have received, with or without attached comments.
- *Name Addressing*, which allows users to enter the name of the caller if the extension number isn't known.

- *Private Messaging*, a special coding feature that prevents recipients from forwarding messages.
- *Leave Word Calling*, which allows users to simply press a button on their telephones in order to leave a standard *call me* message on any extension.
- *On-Line Help* provides users with instant access to voiced instructions at any point in the process.

Intuity AUDIX Voice Messaging System

The Intuity AUDIX system allows you to record, distribute, and receive messages in various mediums. The system runs on a MAP/5, MAP/40, or MAP/100 computer connected to the switch and allows the transfer of voice and fax communications to and from the switch via analog voice ports and data communications to and from the switch via a data link). The system can accommodate up to 64 voice ports and 1072 hours of stored messages.

The Intuity AUDIX system is similar to the DEFINITY AUDIX System, but offers the following additional features:

Fax Mail

Faxes are treated by the AUDIX system much as is voice mail. You can record a fax message in advance and send it to another subscriber with or without voice annotation. Like voice, the message is stored in the receiving subscriber's mailbox. The recipient can then print the fax at a special fax machine.

Intuity Message Manager

The Intuity Message Manager provides access to Intuity AUDIX voice processing features on a personal computer connected to a local area network (LAN). It also works with DEFINITY AUDIX. This feature requires three distinct components to operate:

- The *AUDIX server software* is purchasable with the Intuity AUDIX System as an Intuity Message Manager Right-to-Use. Also, this feature has Intuity AUDIX hardware requirements (see *Requirements*).
- The *Message Manager software* diskettes are separately purchasable and are installed either on each user's PC or on a LAN server.
- The *local area network* is wholly owned and maintained by the customer and must meet certain requirements for the Intuity Message Manager feature to work.

Message processing features available at a subscriber's PC with Intuity Message Manager include:

- Looking at up to sixteen message headers at a time and listening to messages in the order you choose. For subscribers who get many messages, this provides an easy way to view and prioritize the messages.
- Ability to send and receive fax-only or voice-fax messages, to view faxes on your PC, and optionally to print faxes.
- Recording, addressing, and scheduling messages.
- Replying to messages and forwarding messages.
- Annotating messages with a short subject line.
- Setting up AUDIX mailing lists on-line with easy text entry and editing. You can see the lists on-line and print lists on any local or network printer.
- Setting up personal greetings, multiple personal greetings, or multilingual greetings on-line makes it easier for you to manage and maintain your greetings, and annotating your greetings helps jog your memory.
- Browsing the subscriber directory.
- Administering Outcalling notification on-line with easy text entry and editing.
- Storing (archiving) voice messages on your PC for a permanent record of voice mail when needed.

Voice Messaging Systems and Call Coverage

The DEFINITY and Intuity AUDIX systems can be set up as the last points on a coverage path. Calls are then redirected to AUDIX if they are not answered by a previous station on the path. You can also assign the AUDIX system as the last point on one coverage path (such as a path for internal calls) and assign another messaging service as the last point on another coverage path.

In addition, a secretary or messaging agent who answers a call can transfer a caller to the AUDIX system "mailbox" of the original called party upon request. The caller may prefer to leave a voice mail message if the message is personal, lengthy, or highly technical.

Many other options are available for maximum flexibility. For example, a caller can choose to transfer from the system to an attendant or operator. Or the caller can transfer to another extension instead of leaving a message. Your company can choose to have an automated attendant answer calls to the company and direct calls to the right department quickly, so callers don't have to wait on hold. With automated attendant, callers can be instructed to enter keypad commands to direct the call to the appropriate point. This gives customers choice and control. It also allows you to make the most effective use of your personnel, while still providing your customers with the service they expect.

Intuity CONVERSANT System

The Intuity CONVERSANT Voice Information System is an interactive voice-response system that automates phone-call transactions from simple tasks like routing to the right department to complex tasks such as registering college students or providing bank balances. It communicates with customers in natural-sounding, digitally recorded speech. And it performs — 24 hours a day and without the services of an operator.

The system can handle single or multiple voice-response applications simultaneously, and can serve up to 48 callers at once. It can operate by itself to dispense information or collect data, or it can work with a host computer to access a large database such as bank account records. With its speech-recognition capability, even rotary telephone users can have access to sophisticated phone-based services. Advanced telephone features provide intelligent call-transfer capabilities and allow you to use the system in your existing telephone environment.

The system's speech-recognition feature offers speaker-independent recognition of strings of digits and a standard vocabulary consisting of the digits 0 through 9, "oh," "yes," and "no." With speaker-independent speech recognition, the system understands virtually any caller speaking American English. This differs from speaker-dependent recognition, which understands only one particular speaker.

INTUITY CONVERSANT Voice Information System also supports a text-to-speech option, a leading-edge technology developed by AT&T and Lucent Technologies. Text-to-speech uses computer-generated synthesized speech to help you automate applications that were previously impractical to implement with pre-recorded digitized speech. It is particularly useful for applications that require access to large-volume databases or for applications that access information that frequently changes. The feature has built-in intelligence that enables it to:

- Read abbreviations accurately. For example, "Dr." is spoken as "doctor" or "drive," depending on the context in which it occurs.
- Read numbers accurately. For example, the ZIP code, "11423," would be read, "One-one-four-two-three," and not as, "Eleven thousand four hundred twenty three."

You can also create new applications for the system by using the optional, easy-to-use CONVERSANT Script Builder, a menu-driven application development software package that gives you the tools to create a custom voice-response application.

INTUITY CONVERSANT Voice Information System is installed on the new 386-based hardware platform called the Multi-Application Platform/100, the first industry-standard, personal computer platform designed specifically for voice processing. It offers an innovative design, including a built-in uninterruptible power supply, a large universal-slot capacity, and components that are easily

accessible for servicing. This design provides support for many advanced features, such as speech recognition, text-to-speech, and ISDN capability.

Analog and digital network interfaces are available in 6-channel and 24-channel cards, respectively.

In addition, T1 capabilities offer connectivity to advanced network services providing cost efficiencies and access to newer 800 and 900 features. With these T1 services, call handling can be further automated by utilizing Dialed Number Identification Service and other types of network signalling.

INTUITY CONVERSANT Voice Information System interfaces to a variety of host systems, either asynchronously or synchronously. A CallVisor Adjunct Switch Applications Interface connection to DEFINITY ECS is available via a Basic Rate Interface card. This enables the switch and the Voice Information System to exchange data and control signals so the Voice Information System can assist in call handling. Also available are Ethernet Local Area Network interfaces using both twisted pair and coaxial cable.

INTUITY CONVERSANT Voice Information System is a wide-ranging, flexible product, ready to solve your needs for interactive voice-response services.

CONVERSANT Form Filler Plus

The versatile Form Filler Plus applications package for the CONVERSANT System lets you efficiently create a system that converts a caller's spoken responses to scripted prompts into usable data. Possible uses include orders placed verbally to an incoming call center, market survey responses, time and sales reports, and benefit claims.

The system records responses to as many as 10 prompts per call and delivers them on demand to a transcriber with a standardized, form-based screen for easy, error-free data entry. There's even room for remarks to supervisors and co-workers.

The prompts are easy to use. Initially, the caller is asked to select from a menu of products or services. Then the caller hears a series of voice prompts, such as "speak your name now" and "say the quantity you want now."

Safeguards are built in to ensure the caller is satisfied. After each prompt, the caller is given time to respond. If a mistake occurs, the system politely prompts you again. The caller also can listen to and rerecord the responses. At any time, the caller can reach a live attendant.

Individual prompts can be programmed to vary by time or day. In a service application, for example, callers in the morning can be prompted to select from rush or standard on-site help. In the late afternoon, the selection could be changed to night or next morning service. On weekends, there still could be another set of options. Call volume reports are readily available for any period.

The Form Filler Plus package comes with complete documentation, including a sample application used as a template for fast implementation via the easy-to-use Script Builder tool. Scripts can be revised on line; individual prompts can be changed without changing the entire transcription screen.

Features



This appendix provides an alphabetically arranged description of each feature of DEFINITY ECS. Not all features are available with each model and version of DEFINITY ECS. Please see the Appendix B, "System Capacity Limits" at the end of this book for feature availability information by model and version. In addition, not all system applications or adjunct applications may be available in your country. This book discusses all DEFINITY capabilities available internationally. Please check with your Lucent Technologies Account Team for further information and details about the specifics for your company and country.

Each feature is described briefly. Most DEFINITY features have many complex capabilities and options. The DEFINITY documentation set describes each feature in detail and provides complete implementation and administration information. Some features are systems of their own and have their own documentation, such as Call Detail Recording, AUDIX, and Call Management System. See your local distributor for more information on each of these DEFINITY features.

Features: A

The following section contains brief descriptions of features from *Abandoned Call Search* to *Automatic Wakeup*.

Abandoned Call Search

Identifies abandoned calls to the system when the outside central office does not notify the system quickly that calls have disconnected. Before an incoming Automatic Call Distribution split rings the hunt group member or agent, the system checks to make sure the calling party has not hung up the phone. If the calling party has hung up, the call does not ring the called party. Outside of the U.S., the

flash that is generated by this feature to check the call, may be responded to differently. This feature is suitable only for older central offices that do not provide timely answer supervision.

For global customers, Abandoned Call Search requires the use of a TN747B Central Office Trunk circuit pack. The same requirement is in effect if the serving central office is a Number One or Number Five Crossbar system. No additional software is required.

Abbreviated Dialing

Provides lists of stored phone numbers that can be used by telephone users and data terminal users. The user dials the list number and the one-, two-, or three-digit number associated with the phone number wanted. The number is then automatically dialed by the system. A frequently called number can be stored on an abbreviated dialing button and the user simply presses the button to make the call.

Additional TN748C tone detectors (up to five per system) may be required if the special "wait" character is used frequently. Other tone detector circuit packs may be more appropriate. Optional software is required for the Enhanced Abbreviated Dialing list.

Add or Remove Skills

Allows Automatic Call Distribution agents using Expert Agent Selection to add or remove skills. A skill is a talent or an ability of an agent that is identified within the system by a number. One place this can be used is in areas where callers speak different languages. If an agent speaks German, the agent is assigned a "German speaking" skill and an associated number. German speaking customers are prompted to dial that skill number and are automatically connected to the agent with that skill. This feature allows agents to add or remove a skill easily.

Expert Agent Skill software is required.

Administered Connections

Automatically establishes an end-to-end connection between two access or data endpoints. This feature provides the following enhanced capabilities: Support of both permanent and scheduled connections, Auto Restoration for connections routed over Software Defined Data Network trunks, an administrable retry interval for each administered connection, administrable alarm strategy per connection, establishment/retry/auto restoration order based on administered priority. Up to 128 administered connections can be established.

Hardware requirements vary depending on the type of Administered Connection desired. The following hardware may be required for Administered Connections:

- Access Endpoint Circuit Packs — TN767 Digital Services 1 Interface circuit pack (TN464B/C/D support A-law), TN760B Analog Tie Trunk (TN760D supports A-law).
- Data Endpoint Circuit Packs — TN726 Data Line or TN754 Digital Line (TN413, TN754B support A-law).
- Data Modules — 700A/700D Processor Data Module or Modular Processor Data Module, 700B/700C/700E Time Division Multiplexer or Modular Processor Data Module, 7400D series telephones with Digital Terminal Data Module, Personal Computer/PBX, 510D, 515 Business Communications Terminal.
- Trunk Circuit Packs — TN767 Digital Services 1 Interface circuit pack (TN464B/C/D support A-law), TN760 Analog Tie Trunk (TN760D supports A-law).
- TN758 Pooled Modem circuit pack.

No additional software is required.

Administrable Language Displays

Allows the messages that appear on telephone display units to be shown in the language spoken by the user. These messages are available in English (the default), French, Italian, or Spanish. In addition, messages can be administered on the system in a fifth language. The language for display messages is selected by each user. This feature is not available on 32-character displays. These displays default to English.

No additional software or hardware is required.

Administration Without Hardware

Allows the administration of a phone which is not physically present on the system at the time. This feature works the same as administration with hardware: when terminals are moved: user-activated features such as call forwarding and send all calls are preserved and functional. This greatly facilitates the speed of setting up and making changes to the telephones on the system.

No additional hardware or software is required.

Advice of Charge

Records the cost of an outgoing call in the call's Call Detail Record. The cost is expressed as either a charging or currency unit. The system administrator can use AOC information to account accurately for the cost of outgoing calls without

waiting for the next bill from the local telecommunications provider. This is especially important in countries where telephone bills are not itemized, but contain only the total number of units used.

Advice of Charge is the ISDN equivalent of Periodic Pulse Metering (PPM). It is only available for outgoing calls placed on an ISDN-PRI trunk. It is not available for incoming calls. Advice of Charge is available only in France, Germany, Australia, and countries with public networks running European Telecommunication Standards Institute (ETSI) compatible ISDN-PRI. It is not available in the United States

No additional hardware or software is required.

Agent Call Handling

Provides Automatic Call Distribution agents with the various capabilities required to answer and process Automatic Call Distribution calls. This feature allows agents to log in and log out easily, provides automatic and manual answering, allows agents to simultaneously work on multiple calls, handles four work modes, makes it easy for agents to get help from their supervisor, and provides several ways for agents to disconnect from a call.

No additional hardware is required, although CallMaster voice terminals are recommended for Automatic Call Distribution agents. Automatic Call Distribution software is required.

Alphanumeric Dialing

Allows data terminal users to make a call by entering a short alphanumeric name. The system then searches through an administered table and dials the longer phone number associated with that name in the table.

No additional hardware or software is required.

Alternate Facility Restriction Levels

Allows an authorized attendant on the system to quickly adjust facility restriction levels or authorization codes for lines or trunks. Each line or trunk is normally assigned a facility restriction level. With this feature alternate facility restriction levels are assigned also. At a certain time, the attendant can change to the alternates, this changing the access to lines and trunks. For example, a company might want use this feature to disable most long-distance calling at night so that unauthorized staff within the building at night cannot make long distance calls.

No additional hardware is required for this feature.

Answer Detection

Provides more accurate call detail records where tone detection is possible and Network Answer Supervision is not received. This feature does not accurately detect all types of tones, especially in countries whose tone schemes are not similar to the U.S.

Requires a TN744 Call Classifier circuit pack.

Attendant Auto-Manual Splitting

Allows the attendant to announce a call or talk privately with the called party without being heard by the other party on the call. This feature provides for splitting the calling party away so the attendant can confidentially determine if the called party wants to accept the call.

No additional hardware or software is required.

Attendant Call Waiting

Allows the attendant to let a single-line telephone user who is on the phone know that a call is waiting. The attendant is then free to answer other calls. The attendant hears a call waiting ringback tone and the busy telephone user hears a call waiting tone. This burst tone is heard only by the called telephone user.

No additional hardware or software is required.

Attendant Control of Trunk Group Access

Allows the attendant to control trunk groups and prevents telephone users from directly accessing a controlled trunk group. This allows the attendant to monitor the use of these trunk groups. By watching the lamps associated with the trunk groups, the attendant can determine if the number of busy trunks in a specific trunk group has reached a preset warning level and if all trunks in a specific trunk group are busy. The attendant can then handle other calls to these trunk groups accordingly.

No additional hardware or software is required.

Attendant Direct Extension Selection With Busy Lamp Field

Allows the attendant to keep track of extension status — whether the extension is idle or busy — and to place or extend calls to extension numbers without having to dial the extension number. The attendant can use this feature in two ways: using standard Direct Extension Selection access, or using enhanced Direct Extension Selection access. Without having to dial the extension number, the

attendant can place calls to 800 extensions using the basic selector console, and 2,000 extensions using the enhanced selector console; or up to 99899 extensions using the Group Select feature button.

Requires a selector console. No additional software is required.

Attendant Direct Trunk Group Selection

Allows the attendant direct access to an idle outgoing trunk by pressing the button assigned to the trunk group. This feature eliminates the need for the attendant to memorize, or look up, and dial the trunk access codes associated with frequently used trunk groups. Pressing a labelled button selects an idle trunk in the desired group.

No additional hardware or software is required.

Attendant Display

Shows call-related information that helps the attendant to operate the console. Also shows personal service and message information. Information is shown on the alphanumeric display on the attendant console. Attendants may select one of several available display message languages: English, French, Italian, or Spanish. In addition, your company may define one additional language for use by users and attendants on their display.

No additional hardware or software is required.

Attendant Intrusion (Call Offer)

Allows an attendant to enter an existing call to inform the person being called about a message or another call. Upon intrusion, tone may be applied if administered.

No special hardware is required for this feature in a stand-alone system.

Attendant Override of Diversion Features

Allows an attendant to bypass diversion features such as Send All Calls and Call Coverage by putting a call through to an extension even when these diversion features are on. This feature, together with Attendant Intrusion, can be used to get an emergency or urgent call through to a telephone user.

No special hardware requirements exist for this feature.

Attendant Priority Queue

Places incoming calls to the attendant in an orderly queue when these calls cannot go immediately to the attendant. This feature allows you to define twelve different categories of incoming attendant calls, including emergency calls which are given the highest priority.

There is no special hardware required for this feature.

Attendant Recall

Allows users to recall the attendant when they are on a two-party call or on an Attendant Conference call held on the console. Single-line users press the Recall button or flash the switchhook to recall the attendant. Multiappearance users press the Conference or Transfer button to recall the attendant and remain on the connection when either button is used.

No additional hardware or software is required.

Attendant Release Loop Operation

Allows the attendant to hold a call off the console if the call cannot immediately go through to the person being called. A timed reminder begins once the call is on hold. If the call is not answered within the allotted time, the call returns to the queue for the attendant. Timed reminders attempt to return the call to the attendant who previously handled it. Only when the original attendant is unavailable are calls returned to the queue.

No additional hardware or software is required.

Attendant Room Status

Allows an attendant to see whether a room is vacant or occupied and what the housekeeping status of each room is without having to use a property management system. This feature is available when you have Enhanced Hospitality enabled for your system. This feature combines capabilities of the Property Management System features Check-In/Check-Out and Housekeeping Status without requiring Property Management System.

You must have a Direct Extension Selector module to use this feature.

Attendant Serial Calling

Allows the attendant to transfer trunk calls that return to the same attendant after the called party hangs up. The returned call may then be transferred to another telephone within the system and this can continue to recur. This feature is particularly useful if trunks are scarce and Direct Inward Dialing services unavailable.

No special hardware is required for this feature.

Audible Message Waiting

Places a stutter at the beginning of the dial tone when a telephone user picks up the phone. This stutter dial tone indicates that the user has a message waiting. This feature is typically used with telephones that have no message waiting lights, but may not be available in countries that restrict the characteristics of dial tones provided to users.

No additional hardware or software is required.

Audio Information Exchange Interface

Provides an extensive message-handling system for recording and distributing spoken messages or voice mail. AUDIX prompts users to guide them through the process of creating, sending, retrieving, answering, saving, and forwarding spoken messages. AUDIX is available in versions that are either resident on the system (DEFINITY AUDIX) or in an external system. In addition, AUDIX systems can be networked through switches or other AUDIX machines. AUDIX Voice Power, AUDIX Voice Power Lodging, and AUDIX Voice Power Auto Attendant are examples of systems that can be networked through a switch using a data link. Prompt packages are available in a number of languages other than English and prompts can be further customized by your company.

For DEFINITY AUDIX, you must have five contiguous slots in the switch carrier. DEFINITY AUDIX supports up to eight ports. The data link for the external AUDIX (either the one-or two-cabinet configuration) varies depending on the type of switch.

For Distributed Communications System AUDIX, Distributed Communications System software is required.

Authorization Codes

Provides the ability to extend users' calling privileges and also provides security for users accessing the switch remotely. By dialing authorization codes, users can make calls that are otherwise not allowed from the phone they are using and can identify certain calls for cost-accounting purposes. For remote access users, authorization codes can be used to maintain security.

Auto Start and Don't Split

Auto Start allows the attendant to make a telephone call without pushing the start button first. If the attendant is on an active call and presses digits on the keypad, the system automatically splits the call and begins dialing the second call. The Don't Split feature deactivates the Auto Start feature and allows the sending of touch tones over the line for the purposes of such things as picking up messages.

Automatic Alternate Routing

Provides alternative routing choices for private on-network calls. With this feature the system automatically selects the preferred route (usually the least expensive) for private network calls. Automatic Alternate Routing also provides digit modification to allow on-network calls to route through the public network when an on-network route is not available. The private network that uses this feature is called an Extended Trunk Network.

Automatic Alternate Routing and Automatic Route Selection Partitioning

Provides for Automatic Alternate Routing and Automatic Route Selection to be partitioned among up to eight different groups of users within a single DEFINITY ECS switch. This feature allows different call routing for each group of users. One place where this feature is used is a hotel. A long distance call made by a hotel worker could be directly routed over a Direct Distance Dialing trunk. A long distance call made by a guest could be routed so that the charges for the call are billed back to the guest's hotel room.

Automatic Call Distribution

Provides automatic connection of incoming calls to specific hunt groups. Calls to a specific hunt group are automatically distributed among the agents assigned to that split. A hunt group can use two types of hunting to distribute calls. Direct hunting rings the first available extension number in the sequence of agents assigned to that hunt group and most idle agent hunting rings that available agent that has waited the longest period of time since completing a call. Automatic Call Distribution provides a wide range of call center capabilities.

Automatic Call Distribution — Auto-Available Split

Provides a way for members of an Automatic Call Distribution hunt group (Automatic Call Distribution group members who are usually found in call centers) to be always in AUTO-IN work mode. This feature is intended to be used for splits containing only nonhuman agents, such as recorders. This feature brings these nonhuman agents to an AUTO-IN work mode after the system is restarted.

Automatic Callback

Allows internal users who placed a call to a busy or unanswered internal telephone to be called back automatically when the called telephone becomes available. A busy voice terminal becomes available when the user hangs up after completing the current call. An unanswered voice terminal becomes available after it is used for another call and is then hung up. When a telephone becomes available, the system alerts the caller with a three-burst ring. The caller then lifts the handset and the ringing at the called telephone begins immediately.

Automatic Circuit Assurance

Assists an assigned user to identify possible trunk problems. The system maintains a record of the performance of individual trunks and automatically calls a designated user when a possible failure is detected. This feature provides better service through early detection of faulty trunks and consequently reduces out-of-service time.

Automatic Incoming Call Display

Displays the identity of an incoming caller when a user is already on a call. The displays are administrable and can be in English, French, Italian, or Spanish. Other languages may be available; see your local distributor.

Automatic Route Selection

Routes calls over the public network based on the preferred (normally the least expensive) route available at the time the call is placed. This feature provides a choice of a number of routes for any given public network call. A variety of numbers can be called using Automatic Route Selection. Long distance carrier code dialing is not required on routes selected by the system.

Automatic Transmission Measurement System

Provides for voice and data trunk facilities to be measured for satisfactory transmission performance. Acceptable performance, the scheduling of tests, and report contents are administrable.

Automatic Wakeup

Allows attendants, front desk users, and guests to request that a wakeup call be placed automatically to a certain extension number at a later time. When a wakeup call is placed and answered, the system can provide a recorded announcement (which can be a speech synthesis announcement), music, or simply silence. With the Integrated Announcement feature, multiple announcements enables international guests to use wakeup announcements in a variety of languages.

Features: B

The following section contains brief descriptions of features from *Basic Call Management System* to *Busy Verification of Terminals and Trunks*.

Basic Call Management System

Provides real-time and historical reports to assist you in managing individual agents, Automatic Call Distribution splits, and trunk groups. These reports are a subset of those available on the Call Management System adjunct. They can be accessed and displayed on the Management Terminal or printed on demand on the terminal's printer. In addition, the historical reports can be scheduled to print on the system printer.

Bridged Call Appearance — Multi-Appearance Voice Terminal

Allows calls to be handled from more than one telephone. A bridged call appearance is set up by administering a primary extension and the button number associated with it on a two-lamp button on another telephone. One way this feature is most often used is by secretaries or assistants who answer or handle calls to the primary extension (an executive, for example). When the primary extension receives a call, the bridged call appearance flashes or rings and the call can be handled as if the primary extension user was answering it.

Bridged Call Appearance — Single-Line Voice Terminal

Allows single-line telephones users to have a bridged appearance on a multi-appearance phone.

Busy Verification of Terminals and Trunks

Allows attendants and users of multi-appearance telephones to make test calls to trunks, telephones, and hunt groups to check the status of an apparently busy resource. With this feature, an attendant or multifunction telephone user can distinguish between a voice terminal that is truly busy and one that only appears busy because of some trouble condition. These users can also use the feature to quickly identify faulty trunks.

Features: C

The following section contains brief descriptions of features from *Call Coverage* to *Customer-Provided Equipment Alarm*.

Call Coverage

Provides for the automatic redirection of certain calls to a coverage path that might include such things as another telephone or group of telephones, AUDIX, hunt groups, or an attendant group. This feature is extremely versatile and permits suitable alternate answering arrangements for virtually every level of employee. A coverage path can include any of the following: a telephone, an attendant group, a uniform call distribution hunt group, a direct department calling hunt group, an automatic call distribution hunt group, AUDIX, or a coverage answer group (a group of up to eight voice terminals specifically established to answer redirected calls). All group members are rung simultaneously. Any group member can answer the call.

Call Detail Recording Account Code Dialing Forced Entry of Account Codes

Allows certain calls to be associated with a particular project or account number by forcing users to dial specified account codes before making outgoing calls. This facilitates call accounting.

Call Detail Recording

Records detailed call information on incoming and outgoing calls for the purpose of call accounting and sends this call information to a call detail recording output device. You can specify the trunk groups and extensions for which you want records to be kept as well as the type of information to be recorded. You can keep track of both internal and external calls. This application contains a wide variety of administrable options and capabilities.

Call Forwarding All Calls

Allows users to forward all their calls to their extension number to another extension, an off-premises number, the attendant group, or a specific attendant. This feature is activated by dialing a dial access code or by pressing a Call Forwarding button and then dialing the designated (forwarded-to) number. When Call Forwarding is activated at a telephone and a call for that telephone is forwarded, the telephone can (if administered to do so) receive a redirection notification signal that a call is being redirected.

Call Management System

This adjunct system provides real-time and historical reports for monitoring Automatic Call Distribution facilities and personnel.

Call Park

Allows users to put a call on hold and then retrieve the call from any other telephone within the system. This is helpful when a user is active on a call and needs to go to another location for information. Call Park also allows users to answer a call from any telephone after being paged by a telephone user or an attendant.

Call Pickup

Allows users to answer calls to other extensions within the user's specified Call Pickup group. When one member of a Call Pickup group is away and receives an incoming call, any member of the Call Pickup group can answer the call. With this feature, a user does not have to leave his or her telephone to answer a call for a nearby telephone. Instead, the user simply lifts the handset and dials an access code or presses a Call Pickup button.

Call Prompting

Allows the system to collect information from the calling party and direct the calls via Call Vectoring. The caller is verbally prompted by the system and enters information in response to the prompts. This information is then used to redirect the call or handle the call in some other way (taking a message, for example). This feature is mostly used to enhance the efficient handling of calls in the Automatic Call Distribution application.

Call Vectoring

Provides processing of incoming and internal calls according to a programmed set of commands. Vector commands may direct calls to on-premise or off-premise destinations, to any hunt group or split, or to a specific call treatment such as an announcement, forced disconnect, forced busy, or delay treatment.

For example, the system can collect digits from the user via Call Prompting and route calls to a destination specified by those digits. There are many different applications of the Call Vectoring feature, however, Call Vectoring is primarily used to handle the call activity of Automatic Call Distribution splits and skills.

Call Waiting Termination

Allows for users of single-line telephones who are on a call to be notified of a second call. This feature enables the second call to wait and sends a distinctive call waiting tone to the user who is being called.

Calling Line Identification Prefix

Allows the DEFINITY System to modify calling party number information for ISDN/PRI calls that come in to the switch on a given trunk group. These calls may terminate locally, or may be tandemed out to other private switches or central offices. This feature only applies to incoming calls, and is administered for and applied to *all* calls on a trunk group. It does not apply to calls originated locally.

Based on the values in the Calling Number - Delete, Insert and Numbering Format fields, DEFINITY will delete up to 15 of the most significant digits from the incoming CPN information. If there is a digit string in the Insert field, DEFINITY appends these numbers to the CPN after deleting the specified number of digits. Only the first 15 digits are passed on when the call is routed.

This feature is a requirement of the Unisource Network, but anyone may use the prefix for call accounting or redirection purposes. By using this feature in conjunction with Call Vectoring, it is possible to accomplish call routing required by Unisource, as well as Unisource-specific error handling. For example, if the Automatic Number Identification is required, a vector step can check whether it is present. If it is identical to the inserted digits, the call may be rejected.

Call-By-Call Service Selection

Enables a single trunk group to be used by a variety of services rather than requiring each trunk group to be dedicated to a specific service. This feature applies to integrated services digital network-private rate interface trunk groups.

CALLVISOR Adjunct/Switch Application Interface

Provides one or more links between the DEFINITY switch and one or more adjuncts. The links are Integrated Services Digital Network Basic Rate Interface links. This feature improves the call handling efficiency of Automatic Call Distribution agents and other users by allowing an adjunct to monitor, initiate, control, and terminate calls on the switch. CALLVISOR Adjunct/Switch Application Interface messages and procedures are based on the International Telephone and Telegraph Consultation Committee Q.932 international standard for supplementary services. This feature supports a wide variety of capabilities.

Centralized Attendant Service

Enables attendant services in a private network to be concentrated at a central location. Each branch in a Centralized Attendant Service has its own listed directory number or other type of access from the public network. Incoming calls to the branch, as well as calls made by users directly to the attendants, are routed to the centralized attendants over release link trunks. This feature is an alternative to Inter-Private Branch Exchange Attendant Calls.

Class of Restriction

Defines many different classes of call origination and termination privileges. Systems may have no restrictions, only a single class of restriction, or may have as many classes of restrictions as necessary to effect the desired restrictions. Many different types of classes of restriction can be assigned to many types of facilities on the switch. For example, a calling party class of restriction could be used to prevent callers from accessing the public network.

Class of Service

Defines whether or not telephone users *can* or *cannot* access the following features and functions: Automatic Callback, Call Forwarding All Calls, Data Privacy, Priority Calling, Off-Hook Alert, Console Permission, or Client Room.

Code Calling Access

Allows attendants, users, and tie trunk users to page with coded chime signals. This feature is helpful for users who are often away from their telephones or at a location where a ringing telephone might be disturbing.

Conference — Attendant

Allows the attendant to set up a conference call for as many as six conferees, including the attendant. Conferences from inside and outside the system can be added to the conference call.

Conference — Terminal

Allows multi-appearance telephone users to set up six-party conference calls without attendant assistance. Single-line telephone users can set up three-party conference calls without attendant assistance.

Constellation Voice/Data Terminal Support

Provides support for integrating telephones with the Constellation Voice/Data Terminal. The Constellation is a voice/data workstation that provides an integrated environment for applications using digital communications protocol based signaling and provides enhanced capability in a telemarketing environment.

Consult

Allows a covering user, after answering a call that has come to them through Call Coverage, to call the called party for private consultation. Consult can be used to let a covering user ask the principal if they want to speak with the calling party.

Coverage Callback

Allows a covering user to leave a message for the called party to call back the person who called.

Coverage Incoming Call Identification

Allows multi-appearance telephones users without a display in a Coverage Answer Group to identify an incoming call to that group.

Customer-Provided Equipment Alarm

Provides you with an indication that a system alarm has occurred and that the system has attempted to contact a service organization. A device that you provide, such a lamp or a bell, is used to indicate the alarm situation. You can administer the level of alarm about which you want to be notified.

Features: D

The following section contains brief descriptions of features from *Data Call Setup* to *Do Not Disturb*.

Data Call Setup

Enables the setting up of data calls using a variety of methods, such as: keyboard dialing, telephone dialing, Hayes command dialing, permanent switched connections, administered connections, automatic calling unit interface, and hot-line dialing. Data Call Setup is provided for both digital call protocol and integrated services digital network basic rate interface telephones.

Data Hot Line

Provides for automatic placement of a data call when the originator goes off hook (usually from a data module). Data Hot Line may be used for security purposes. This feature offers fast and accurate call placement to commonly called data endpoints. Data terminal users who constantly call the same number can use Data Hot Line to automatically place the call when they go off hook.

Data Privacy

Protects analog data calls from being disturbed by any of the system's overriding or ringing features. Data Privacy is activated when the user dials the activation code at the beginning of the call.

Data Restriction

Like Data Privacy, this feature protects analog data calls from being disturbed by any of the system's overriding or ringing features. This feature is administered at the system level to selected analog and multi-appearance telephones and trunk groups.

Data-Only Off-Premises Extensions

Allows users to establish data calls involving equipment that is located remotely from the system site using DATAPHONE digital service or other private line data facilities.

Default Dialing

Provides data terminal users who dial a specific number the majority of the time a very simple method of dialing that number. This feature enhances Data Terminal (Keyboard) Dialing by allowing a data terminal user to place a data call to a preadministered destination in several different ways, depending on the type of data module.

Dial Access to Attendant

Allows telephone users to access an attendant by dialing an attendant access code. Attendants can then extend the call to a trunk or to another telephone.

Dial Plan

The Dial Plan is the system's guide to digit translation. The Dial Plan, or first-digit and second-digit table, established during administration for each system, provides information to the switch on what to do with dialled digits.

Digital Multiplexed Interface

Supports two signaling techniques, Bit Oriented signaling and Message Oriented signaling, for direct connection to host computers.

Digital Services 1 Trunk Service

Provides a 24-channel, 1.544 Mbps rate digital interface for a number of different types of trunks.

Direct Department Calling and Uniform Call Distribution

Enables direct inward access to an answering group other than the attendant even if the system does not have the direct inward dial feature. This feature provides a method of distributing calls to a group of telephones or individual attendants, data modules, data line circuit ports, or modems. Direct Department Calling routes incoming calls in a direct administered sequence. Uniform Call Distribution rings the most idle member of a group, distributing the calls evenly among the group members.

Direct Inward Dialing

Connects calls from the public network directly to the dialed extension number without attendant assistance.

Direct Inward and Outward Dialing — International

Provides a two-way service with both inward and outward dialing features. This feature allows calls from an international public exchange to be made directly to the switch. This feature is a combination of the Direct Inward Dialing feature and the Direct Outward Dialing feature via a common analog or digital trunk and implies a two-way service.

Direct Outward Dialing

Allows users to access the public network without attendant assistance.

Distinctive Ringing

Helps users and attendants distinguish between various types of incoming calls by distinctive ringing patterns that can be administered for internal, external, and priority calls. In addition, there are ringing signals for Manual and Dial Intercom, Manual signaling, and Redirection Notification.

Distributed Communication System Alphanumeric Display for Terminals

Within a distributed communication system, call information is displayed on users' alphanumeric displays. This feature gives the user considerable call handling capabilities when calls are made to and from other distributed communication system nodes.

Distributed Communication System Call Coverage

Provides the additional Distributed Communications System messaging required to allow calls to be covered by coverage points on remote systems, providing there is a Distributed Communications System signaling link (BX.25 or ISDN PRI) for the trunk groups to which the covered calls are routed. Thus, with Distributed Communications System Call Coverage, calls to an extension on one system can be covered by extensions administered as coverage points on remote systems. This is similar to how Call Coverage functions within a single system. It provides transparency across systems for the Call Coverage feature. Distributed Communications System Call Coverage should not be confused with coverage to a remote AUDIX.

Distributed Communication System Attendant Control of Trunk Group Access

Allows an attendant at any node in the distributed communication system to take control of any outgoing trunk group at an adjacent node. This is helpful when an attendant wants to prevent telephone users from calling out on a specific trunk group for any number of reasons, such as reserving a trunk group for incoming calls or for a very important outgoing call.

Distributed Communication System Attendant Direct Trunk Group Selection

Allows attendants at one node to have direct access to an idle outgoing trunk at a different node in the distributed communication system.

Distributed Communication System Attendant Display

Provides attendants with some transparency when displaying call-related information for calls made to or from both local and remote distributed communication system nodes.

Distributed Communication System Automatic Callback

Allows a user at one node to request an automatic callback from a user at another node in the distributed communication system.

Distributed Communication System Automatic Circuit Assurance

Allows a user or attendant at one node to activate or deactivate Automatic Circuit Assurance referral calls for the entire distributed communication system network.

Distributed Communication System Busy Verification of Terminals and Trunks

Allows attendants and multi-appearance telephone users to make test calls to telephones and trunk groups that are located at other nodes within the distributed communication system.

Distributed Communication System Call Forwarding All Calls

Allows users to forward all calls to a selected extension number within the distributed communication system network or to an external number.

Distributed Communication System Distributed Communications System Call Waiting

Enables calls from one node to busy single-line telephones at another node to wait until the called party is available to accept the call.

Distributed Communication System Distinctive Ringing

Activates the alerting or ringing device of a called terminal so that the user is aware of the type of incoming call before answering it. Distinctive Alerting functions in a distributed communication system environment the same as it does within a system.

Distributed Communication System Leave Word Calling

Allows users to leave "call me" messages at other telephones within the distributed communication system network.

Distributed Communication System Multi-Appearance Conference/Transfer

Provides transparency of transferring and conferencing within a distributed communication system network. This feature allows a user to transfer a call within the distributed communication system as he or she would within the system. Conference Calls can be placed and calls can be transferred to users within the distributed communication system by dialing the Uniform Dial Plan extension number.

Distributed Communication System Over Integrated System Digital Network - Private Rate Interface D-Channel

Enhances the distributed communication system feature by allowing access to the public network for distributed communication system feature connectivity between nodes. The Integrated System Digital Network-Private Rate Interface B-channel is used for voice communications, and the D-channel is used to transport distributed communication system control information.

Distributed Communication System Trunk Group Busy/Warning Indication

Provides attendants with a visual indication that the number of busy trunks in a remote group has reached an administered level. A visual indication is also provided when all trunks in a trunk group are busy.

Do Not Disturb

Allows guests, attendants, and authorized front desk users to request that no calls, other than priority calls, be connected to a particular extension until a specified time.

Features: E

The following section provides brief descriptions of features from *Electronics Industry Association Interface* to *Extension Number Portability*.

E1 Trunk Service

Provides a 32-channel, 2.048 Mbps rate digital for a number of different types of trunks.

Electronics Industry Association Interface

Provides an alternative for host connections and analog telephone users who use simple data terminals or personal computers which emulate simple data terminals.

Emergency Access to the Attendant

Provides for emergency calls to be placed to an attendant. These calls can be placed automatically by the system or can be dialed by system users. Emergency access calls can receive priority handling by the attendant.

End-to-End signaling

Enables both dual tone multifrequency (touch tone) telephones and non-dual tone multifrequency telephones to send digits over a trunk after the connection has been made. For example, this feature allows the user of a rotary phone or other non-dual tone multifrequency phone to access equipment, such as AUDIX, that is controlled by dual tone multifrequency signaling. In this case, addressing digits are sent over the trunk as rotary. After addressing is complete and the call is connected, any additional digits are sent as dual tone multifrequency signals.

Enhanced 84xx Display

Allows users to administer the switch to display information and soft key labels using the Katakana alphabet and various European characters on 84xx series display terminals. The system accepts entries as Roman characters preceded by a tilde (~), and maps them to corresponding Katakana or European characters.

Enhanced Abbreviated Dialing

Supplements the standard Abbreviated Dial feature by enabling the use of an Enhanced Number List containing up to 1,000 entries. This list is in addition to the System List.

Enhanced Integrated Channel Service Unit

The Integrated Channel Service Unit is a combination of a Lucent Technologies 120A CSU module and a TN464E, TN767D, or later suffix DS1 circuit pack. It provides the essential functions that have historically been provided by external CSUs. The enhanced functionality provides for the administration and maintenance of the unit by local and remote personnel. It also provides for additional performance measurements of a DS1 facility and for new loopback tests. This feature is only available for use in the USA with 1.544 Mbps DS1 service. It requires a 120A CSU module with the TN767E, TN464F or later suffix DS1 board.

Enhanced Distributed Communication System

Adds features to the existing distributed communication system capabilities. Additional features include exchanging information to provide class of restriction checking between switches in the Enhanced Distributed Communication System network, providing call progress information for the attendant, allowing attendant intrusion between a main and a satellite, and allowing a main switch to provide direct inward dial/central office intercept treatment rather than the satellite switch.

Expected Wait Time

Based on a patented Lucent Technologies algorithm, allows routing decisions to be based on the estimated time a call will be in queue. Instead of calculating wait time based solely on historical data, the algorithm takes into account dynamic call center conditions such as changes in staffing and call traffic. This information can be passed to the Intuity CONVERSANT system to trigger announcements telling the caller how long the wait will probably be.

Expert Agent Selection

Enables certain Expert Agent Selection skill types to be assigned to a call type or a Vector Directory Number. Routing calls via vectoring then allows the system administration to direct calls to agents who have the particular agent skills required to complete the customers' inquiries successfully.

Extended Trunk Access

Provides a mechanism for routing calls that are not defined either in the first or second digit tables or the feature/trunk access code tables. This feature makes use of an Extended Trunk Access routing pattern and/or an Extended Trunk Access node number for determining how to route an unidentified call. The use of this feature is transparent to end users.

Extension Number Portability

Provides the ability to assign any extension to any switch in an Extension Number Portability subnetwork. Within certain limits, this enables an employee who changes location to keep his or her phone number.

Features: F

The following section provides brief descriptions of features from *Facility Busy Indication to Facility* and *Non-Facility Associated signaling*.

Facility Busy Indication

Allows users of multi-appearance telephones to see which lines, trunk groups, terminating extension groups, hunt groups, or paging zones (called resources or facilities) are busy. When the lamp associated with the resource is lit, the resource is busy. When the lamp is not lit, the resource is idle and available.

Facility Restriction Levels and Traveling Class Marks

Provide a method of allowing certain calls to specific users, while denying the same calls to other users. For example, certain users may be allowed to use public trunks to other corporate locations, while other users may be restricted to the less expensive private network lines. This feature provides up to eight levels of restriction for users of the Automatic Alternate Routing and/or Automatic Route Selection features.

Facility Test Calls (with Security Measures)

Allows telephone users to make test calls to access specific trunks, dual tone multifrequency receivers, time slots, and system tones. The user dials an access code and makes the test call to make sure the facility is operating properly. There are security measures to prevent unauthorized use

Facility and Non-Facility Associated Signaling

Provides signaling for integrated services digital network-private rate interface. Facility Associated signaling allows an integrated services digital network-private rate interface digital services 1/european 1 interface D-channel to carry signaling information for only those B-channels located on the same facility (circuit pack) as the D-channel. Non-Facility Associated signaling, on the other hand, allows a D-channel to convey signaling information for B-channels (voice and data channels) on facilities other than the one containing the D-channel. As a result, a D-channel can carry signaling information for numerous B-channels located on different digital services 1/european 1 facilities.

Flexible Billing

Allows the DEFINITY ECS system or an adjunct to change the rate at which an incoming 900-type call is billed. This is done by communicating with the AT&T network through ISDN PRI messages. Rate change requests can be made any-time after the call is answered and before it disconnects. Only a Lucent Technologies authorized representative can turn on Flexible Billing. All change requests are initiated by an Adjunct Processor connected to the DEFINITY ECS. The Adjunct Processor determines when to request a rate change based on information from customer-provided software residing on the processor.

The billing rate can be changed to any of the following:

- New Rate
- Flat Rate (not dependent on length of call)
- Premium Charge (a flat charge in addition to the existing rate)
- Premium Credit (a flat negative charge in addition to the existing rate)
- Free Call

Features: G

This section provides brief descriptions of the *Generalized Route Selection* and *Go to Cover* features.

Generalized Route Selection

Provides voice and data call routing capabilities to select not only the least cost routing, but also optimal routing over the appropriate facilities. This feature is a capability that enhances the current Automatic Alternate Routing and Automatic Route Selection features by providing additional parameters in the routing decision.

Go to Cover

Allows users, when making a call to another internal extension, to send the call directly to the called party's coverage.

Features: H

The following section contains brief descriptions of features from *Hold* to *Hunting*.

Hold

Allows telephone users to disconnect from a call temporarily, use the telephone for other call purposes, and then return to the original call.

Hold — Automatic

Allows attendants and multi-function telephone users to alternate easily between two or more calls. For example, with automatic hold, selection of a second call appearance automatically puts the active call (if any) on hold and makes the second call appearance active. This feature can be activated on a system-wide basis only. When automatic hold is not activated, the depression of the second call appearance would drop the first call.

Hot Line Service

Allows a single-line telephone user, by simply lifting the telephone receiver, to automatically place a call to a preassigned extension number, public or private network telephone number, or feature access code. This feature is helpful in any application where very fast service is required.

Hunting

Checks for the active or idle status of extension numbers in one or more ordered groups. If all members of a group are active, the call can route to another group through Call Coverage or can wait in a queue for an available group member, if a queue is provided. Hunting is accomplished through the ACD, Call Coverage, DDC, and UCD features. The order of hunting is defined under each individual feature.

Hunting is useful whenever a group of voice terminal users receives a high volume of calls. It minimizes call completion time and attendant assistance is not required. Agents should not be used for hunt group calls when they are used for ACD split calls. This is because all ACD calls are answered before hunt group calls. That is, no hunt group calls are answered until all ACD calls are answered. The oldest call waiting termination is only supported for agents who are servicing ACD calls only.

Features: I

The following section provides brief descriptions of features from *Inbound Call Management* to *Intraflow and Interflow*.

Inbound Call Management

Improves the handling of inbound calls in such applications as telemarketing and claims processing. An application on a host computer is integrated switch features to provide enhanced features and improve efficiency. This feature works with CALLVISOR Adjunct/Switch Application Interface to let applications receive information about calling parties, prompted digits, called number, etc.

Individual Attendant Access

Allows users to call a specific attendant console. Each attendant console can be assigned an individual extension number.

Information System Network Interface

Provides an interface between the system and Lucent Technologies Information System Network via a Data Line Port in conjunction with an Asynchronous Data Unit. The Information Service Network is a packet-switched local area network that links mainframe computers, minicomputers, word processors, storage devices, personal computers, printers, and communications processors into a single system.

Integrated Announcements

Digitizes and stores recorded announcements (messages) internally within the switch. Announcements can be recorded and updated from any telephone. Announcement configuration is performed from the Management Terminal. Even a power failure will not affect the integrity of the announcements. Because the announcements are stored digitally, voice quality does not degrade over time. There are no external boxes, messy cabling, or separate power supplies. And there are no tapes to jam or break. The announcements can be used with an almost endless number of applications. Announcements can be made in any language, and the modular announcement circuit packs make the system easily expandable.

Integrated Directory

Allows users with display-equipped telephones to access the system database, use the touch-tone buttons to enter a name, and retrieve an extension number from the system directory.

Integrated Services Digital Network — Basic Rate Interface

Enables connection of the system to equipment or endpoints that supports an Integrated Services Digital Network by using a standard format called the Basic Rate Interface. This feature is a 192-kbps interface that carries two 64-kbps B-channels and one 16-kbps D-channel. Each B-channel supports voice and data, while the D-channel transports data, signaling, and other bits for framing. This feature is only available on DEFINITY switches that support μ law companding.

Integrated Services Digital Network — Primary Rate Interface

Enables connection of the system to an Integrated Services Digital Network by using a standard frame format called the Primary Rate Interface. The standard for this interface consists of layers 1, 2, and 3 of the Open System Interconnect model. In this interface the transmission standard for layer 1 is either Digital Services 1 (T1) or European Conference of Postal and Telecommunications Rate 1 (E1). Digital PT1 (E1) is a standard that carries traffic at a rate of 2.048 Mbps and is used in Europe and elsewhere.

DEFINITY offers several administrable protocols, each of which provides a different set of services that Integrated Services Digital Network-Private Rate Interface allows. For the U.S., users can administer either the Lucent Technologies Switched Network or National Integrated Services Digital Network-2. For other countries DEFINITY provides Global Integrated Services

Digital Network-Private Rate Interface, which includes any combination of services, including Basic Call, DDI Display, and Q-SIG Global Networking.

Inter-Private Branch Exchange Attendant Calls

Allows attendant positions for more than one branch location to be concentrated at a central location. Incoming trunk calls to the branch location, as well as calls directly made by users to the attendant, are routed over tie trunks to the attendants at the main location. Inter-Private Branch Exchange Attendant Calls are incoming tie trunk calls from the branch location to the main location with the attendant group as the destination. This feature is an alternative to Centralized Attendant Service.

Intercept Treatment

Provides an intercept tone or a recorded announcement or routes the call to an attendant for assistance when calls cannot be completed or when use of a feature is denied.

Intercom — Automatic

Allows two users to talk together easily. Calling users press the Automatic Intercom button and lift the handset. The called user receives a unique intercom ring and the intercom lamp, if provided, flashes. With this feature, users who frequently call each other can do so by pressing one button instead of dialing an extension number.

Intercom — Dial

Allows multi-appearance telephone users to easily call others within an administered group. The calling user lifts the handset, presses the Dial Intercom button, and dials the one- or two-digit code assigned to the desired party. The called user's phone rings, and intercom lamp, if provided, flashes. With this feature, a group of users who frequently call each other can do so by pressing one button and dialing a one- or two- digit code instead of dialing an extension number.

Internal Automatic Answer

Allows specific telephones to answer incoming internal calls automatically. This feature is intended for use with telephones that have speakerphones or handsets. With this feature, an Internal Automatic Answer feature button is assigned to the user's telephone. When the feature button is pressed by the user, the feature is activated and calls will automatically be answered when the telephone is idle. Internal and Distributed Communications System calls can be answered using automatic answer, but only attendants can use automatic answer to answer external calls directed to the attendant.

Intraflow and Interflow

Enables Automatic Call Distribution calls to be redirected from one hunt group to another hunt group under busy or unanswered conditions. Intraflow provides redirection of these calls to other hunt groups within the system and may be activated using Call Coverage or Call Forwarding All Calls. Interflow uses the Call Forwarding All Calls feature to redirect Automatic Call Distribution calls to an external location.

Features: L

The following section provides brief descriptions of features from *Last Number Dialed* to *Loudspeaker Paging — Deluxe*

Last Number Dialed

Allows users to automatically redial the last number dialed. The system saves the first 24 digits of the last number dialed, whether the call attempt was manually dialed or dialed using Abbreviated Dialing. When users press the Last Number Dialed button or dials the Last Number dialed feature access code, the call is placed again.

Leave Word Calling

Allows internal system users to leave a short preprogrammed message (usually "Call" with the calling user's name, extension number, and the time of the call) for other internal users. When the message is stored on the switch, the Message lamp on the called telephone automatically lights. This lamp is called an Automatic Message Waiting lamp since the status of the lamp is automatically controlled by the system. Leave Word Calling messages can be retrieved using a telephone display, Voice Message Retrieval, or AUDIX. Voice Message Retrieval is available in U.S. English, British English, or Italian.

List Call Forwarding

Lists all call forwarded stations and the respective forwarding numbers, allowing the system administrator to monitor outgoing calling patterns. This helps detect and prevent toll fraud.

Line Lockout

Removes single-line telephone extension numbers from service when users fail to hang up after receiving dial tone for 10 seconds and then intercept tone for 30 seconds. These intervals are administrable. The out-of-service condition lasts until the telephone user hangs up the phone.

Look-Ahead Interflow

Provides flexible and intelligent Automatic Call Distribution load balancing based on the Call Vectoring feature. Look Ahead Interflow enhances Call Vectoring interflow by ensuring that calls do not interflow to a backup switch that cannot accept the calls. With this feature, the switch receiving the call and attempting to send it to another switch does not relinquish control of the call until it is accepted by the receiving switch. Until the call is accepted, the sending switch retains control of the call and the user is unaware that a Look Ahead Interflow call attempt is being made. If the call is denied, vector processing simply continues at the sending switch.

Loudspeaker Paging Access

Provides attendants and telephone users dial access to voice paging equipment. As many as nine paging zones can be provided by the system and one zone can be provided that activates all zones at the same time. A user can activate this feature by dialing the trunk access code of the desired paging zone, or the access codes can be entered into Abbreviated Dialing Lists. Once the user has activated this feature, the user can speak into the handset and make the announcement.

Loudspeaker Paging Access — Deluxe

Provides attendants and telephones users with integrated dial access to voice paging equipment and Call Park capabilities. When this feature is activated, the call is automatically parked. The Call Park feature does not have to be activated separately.

Features: M

The following section provides brief descriptions of features from *MERLIN/System 25 telephone Support — 731xH Series* to *Music-on-Hold Access*.

MERLIN/System 25 telephone Support — 731xH Series

Enables certain MERLIN/System 25 telephones to be reused with the DEFINITY ECS switch. The terminals that can be reused are the 7309H, 7313H, 7314H, 7315H (with built-in display), 7316H, and 7317H (with built-in display).

Malicious Call Trace

Provides a way for a called user to notify a predefined set of users that the called user may be receiving a malicious call. Any one of the predefined set of users can then retrieve certain information related to the call that will aid in tracking the

source of the call. This feature also provides a method of generating an audio recording of the call. Airlines, utility companies, government offices and major corporations are a few examples of DEFINITY system owners who may experience malicious calls. Access to a feature such as Malicious Call Trace can allow them to deter or respond appropriately to bomb threats, product tampering threats, or other possible malicious calls.

Manual Message Waiting

Allows multi-appearance telephone users, by pressing a designated button on their own terminals, to light the status lamp associated with the manual Message Waiting button at another multi-appearance telephone. This feature can be administered only to pairs of telephones such as a secretary and an executive. The secretary might press the button to signal to the executive that a call needs answering or someone has arrived for an appointment. The executive might use the button to indicate that he or she should not be disturbed.

Manual Originating Line Service

Connects single-line telephone users to the attendant automatically when the user lifts the handset. The attendant number is stored in an Abbreviated Dialing list. When the telephone user lifts the handset, the system automatically routes the call to the attendant using the Hot Line Service feature.

Manual signaling

Allows one user to signal another user. The receiving user hears a two-second ring. The signal is sent each time the button is pressed by the signaling user. The meaning of the signal is prearranged between the sender and the receiver.

Misoperation Handling

Defines the treatment of calls when a misoperation occurs. A misoperation is when calls are left on hold when the controlling station goes on hook.

For example, a misoperation can occur under either of the following conditions:

1. When a voice terminal with a call on hold goes on-hook during a feature operation prior to completion of that operation (in some cases going on-hook completes the operation, as in call transfer). For example, a misoperation occurs when a user places a call on hold, begins to transfer the call, dials an invalid extension number, and then hangs up.
2. When the system enters night service while attendant consoles have calls on hold.

The system administrator can alter the standard Misoperation Handling to ensure that an external caller is not left on hold indefinitely, or dropped by the system after a misoperation with no way to reach someone for help.

Modem Pooling

Enables switched connections between digital data endpoints (data modules) and analog data endpoints and acoustic coupled modems. Data transmission between a digital data endpoint and an analog endpoint requires a conversion resource since the digital communications protocol format used by the data module is not compatible with the modulated signals of an analog modem. The conversion resource translates the digital communications protocol format into modulated signals and vice versa. The Modem Pooling feature provides pools of conversion resources.

Move Agents from Call Management System

Enables a Call Management System user to move agents that are not currently logged into a hunt group from one hunt group to another via the screen on the Call Management System terminal. This feature gives the user of the Call Management System screen some of the same capabilities that the System Manager has with the DEFINITY Management Terminal.

Multi-Appearance Preselection and Preference

Provides multi-appearance telephone users with options for placing or answering calls on selected appearances. Ringing Appearance Preference automatically connects the user to the incoming ringing call when the user picks up the handset. Idle Appearance Preference automatically connects a user to an idle appearance. Preselection allows the user to manually select an appearance. Preselection is used, for example, when the user wants to reenter a held call or activate a feature and can also be used with a feature button. For example, if an Abbreviated Dialing button is pressed, the call appearance is automatically selected and, if the user lifts the handset within five seconds, the call is automatically placed. The Preselection option overrides both preference options.

Multiple Audio/Music Sources

Allows you to create flexible menus of delay announcements. Up to 256 messages or music selections of varying lengths can be played based on the nature of the call, the length of the wait, or service objective. Helps decrease the number of abandoned calls and provides a flexible marketing venue.

Multiple Call Handling

Allows an agent to be interrupted with an additional ACD call, either when he or she requests one, or automatically. It is useful in applications in which it is important for an agent to take another call without dropping the active call.

Multiple Listed Directory Numbers

Allows a publicly published number for each incoming and two-way (incoming side) foreign exchange and local central office trunk group assigned to the system. Also allows a number of direct inward dial numbers to be treated as listed directory numbers. When a listed directory number is called, a trunk group is accessed. The trunk group then routes the call to the incoming destination designated for that trunk group.

Multiple Music-on-Hold

Allows tenants to choose and create their own music-on-hold, including recorded messages, advertising, theme music, and more. Tenants can choose, for example, to create messages in multiple languages for improved customer relations. Tenant Partitioning is a prerequisite.

Music-on-Hold Access

Provides music to a party that is on hold, waiting in a queue, parked, or on a trunk call that is being transferred. The music lets the waiting party know that the connection is still in effect. The system provides automatic access to the music source.

Features: N

This section provides brief descriptions of features from *Names Registration* to *Night Service — Trunk Group*

Names Registration

Automatically sends a guest's name and room extension from the Property Management System to the switch at check-in, and automatically removes this information at check-out. The information provided by the Names Registration feature may be displayed on any attendant console or display-equipped telephone at various hotel locations (for example, Room Service, Security, and so on.)

Network Access — Private

Enables calls to be connected to other switching systems and networks without having to use the public network. Calls can be connected to the following types of networks and switching systems: Common Control Switching Arrangement, Distributed Communications Systems, Electronic Tandem Network, Enhanced Distributed Communications Systems, Enhanced Private Switched Communications Service, Tandem Tie Trunk Network, and (in Italy) Traslatore Giunzione Uscente/Entrante/Interno.

Network Access — Public

Enables calls to be connected to and from the public network. The Automatic Routing System feature can be used to select the most-preferred route for outgoing calls to the public network. Alternatively, trunk access codes can be dialed for manual route selection. Long-distance carrier access codes can be dialed to select particular carriers.

Night Service — Hunt Group

Allows an attendant or a hunt group supervisor to individually assign a hunt group to the night service mode. All calls for the hunt group are then redirected to the hunt group's designated Night Service Extension.

Night Service — Night Console Service

Allows the attendant to direct all calls for the primary and daytime attendant to a night console. To activate and deactivate this feature, the attendant typically pushes the Night button on the principal attendant console. When this feature is activated, Night Service — Night Console Service calls to the attendant group are still handled by an attendant, even though the primary and daytime attendant consoles are out of service. Only one night console is allowed in the system.

Night Service — Night Station Service

Redirects incoming trunk calls to the attendant to designated extension numbers whenever the system is placed in Night Service. The feature is activated when the attendant has pressed the Night button on the principal console and a night console is not assigned or not activated.

Night Service — Trunk Answer From Any Station

Allows telephone users to answer all incoming calls to the attendant when the attendant is not on duty and when other telephones have not been designated to answer these calls. The incoming call activates a gong, bell, or chime, and a telephone user dials an access code to answer the call.

Night Service — Trunk Group

Allows an attendant or a designated telephone user to individually assign a trunk group or all trunk groups to the night service mode. Specific trunk groups individually assigned to trunk group night service are in the Individual Trunk Night Service Mode so that calls coming into this trunk group are redirected to its designated night service extension. Incoming calls on other trunk groups are processed normally.

Features: O

This section contains a brief description of one feature: *Off-Premises Station*.

Off-Premises Station

Allows a telephone located outside the building where the switch is located to be connected to the system. If central office trunks are used, the telephone must be analog and must be registered by the appropriate government agency. This feature is useful whenever it is necessary to have a telephone located away from the main location. The maximum loop distance allowed is 20,000 feet or 6,093.34 meters without repeaters.

Features: P

This section provides brief descriptions of features from *Personal Computer Interface* to *Pull Transfer*.

Personal Computer Interface

Consists of the Personal Computer/Public Branch Exchange Connection, the Personal Computer/Public Branch Exchange Platforms, and the Personal Computer/Information System Digital Network Platform product family. These products are used with the DEFINITY ECS to provide users of IBM compatible PCs fully integrated voice and data workstation capabilities. Personal Computer/Public Branch Exchange Connection is a voice and data call management application. The platforms consist of personal computer interface cards and open voice and data Applications Programming Interfaces. These interfaces allow a variety of applications to operate on the personal computer and communicate with the switch.

Personal Computer/Private Branch Exchange Connection

Brings the telephone and IBM-compatible personal computer into an integrated voice and data workstation. This feature is a personal computer application that runs on the Personal Computer/Private Branch Exchange platform.

Personal Central Office Line

Provides a dedicated trunk for direct access to or from the public network for multi-appearance telephone users. Each Personal Central Office Line can have an appearance at up to 16 multi-appearance phones. Users assigned this feature press the feature button to answer and place calls. An incoming call on this line rings all telephones assigned the feature, and ringing can be either audible or silent, depending on administration.

Personalized Ringing

Allows users of certain telephones to uniquely identify their own calls. Each user can choose one of a number of possible ringing patterns. The eight ringing patterns are tone sequences consisting of different combinations of three tones. With this feature, users working closely in the same area can each specify a different ringing pattern in order to better identify their own calls.

Power Failure Transfer

Provides service to and from the local telephone company central office, including Wide Area Telecommunications System, during a power failure. This feature provides certain telephones with the capability to access the local central office and to answer certain incoming calls during a power failure. These telephones can be used to make or answer important or emergency calls.

Priority Calling

Allows users to ring another telephone with a distinctive signal that tells the called party the incoming call requires immediate attention. The called party can then handle the call accordingly. A user activates priority calling by Dialing a Priority Calling access code or pressing a feature button, followed by the desired extension number. A user can use Priority Calling if they have the required class of service.

Privacy — Attendant Lockout

Prevents an attendant from reentering a multiple-party connection held on the console unless recalled by a telephone user. This feature is administered on a system-wide basis. It is either activated or not activated.

Privacy — Manual Exclusion

Allows multi-appearance telephone users to keep other users with appearances of the same extension number from bridging onto an existing call. Exclusion is activated by pressing the Exclusion button on a per-call basis.

Property Management System Interface

Provides communications link between the system and a Property Management System. The Property Management System allows a customer to control certain features used in both a hospital-type and a hotel/motel-type environment. The communications link allows the Property Management System to interrogate the system and allows information to be passed between the system and the Property Management System.

Pull Transfer

Provides a convenient way to connect a party with someone better qualified to handle the call. Attendant assistance is not required and the call does not have to be redialed. This feature is an enhancement of the standard transfer operation and allows *either* the party who was originally called *or* the party to whom the held call will be transferred to complete the transfer.

Features: Q

This section provides a brief description of two features: *Q-SIG Global Networking* and *Queue Status Indications*.

Q-SIG Global Networking

The QSIG Global Networking Platform provides a private network protocol for the support of QSIG supplementary services. This platform meets requirements for the ISO Private Network Generic Functional Procedures (Standard 11582) for Call-Related supplementary services. (Supplementary services are services provided by the PBX beyond voice or data connectivity and number transport and display. Examples of supplementary services include Name and Number Identification, Call Forwarding (Diversion), and Call Transfer.)

The QSIG Global Networking platform is supported over the ISDN-PRI basic call setup protocol. It supports Call Related supplementary service transport, Abstract Syntax Notation 1 (ASN.1)/Basic Encoding Rules (BER), and Remote Operation Service Element (ROSE) services/protocols.

DEFINITY ECS provides the Name and Number Identification supplementary service as defined by ISO Standards 13864, 13868, and 11572. It provides Call Forwarding (Diversion) as defined by ISO Standards 13872 and 13873 and Call Transfer as defined by ISO Standards 13865 and 13869.

Queue Status Indications

Provides indications of queue status for Automatic Call Distribution calls based on the number of calls in queue and time in queue. These indication are provided via lamps assigned to the terminals or consoles of hunt group agents or supervisors. In addition, an auxiliary warning lamp can be provided to track queue status and display-equipped telephones and consoles can display the time in queue or a hunt group's oldest call and the number of calls in that hunt group's queue.

Features: R

This section provides brief descriptions of features from *R2-Multifrequency Compelled signaling* to *Rotary Dialing*.

R2-Multifrequency Compelled signaling

Is used primarily in national and international voice-switched networks as a robust and flexible signaling scheme for central office, direct inward dial, and tie trunks. This signaling provides a fourth addressing option, complementing the existing rotary, integrated digital services network, and dual tone multifrequency options. It can be used on both incoming and outgoing trunk calls, but only group II signaling protocol is supported on outgoing trunk calls.

Recall signaling

Allows users on an analog telephone to place a call on hold and consult with another party or activate a feature. After consulting with that third party, the user can conference the third party with the original party by another recall signal, or return to the original party by pressing Recall twice or by flashing the switchhook twice.

Recent Change History

Allows the system manager to view or print a history report of the most recent administration and maintenance changes on the switch. This report may be used for diagnostic or information purposes.

Recorded Announcement

Provides a recorded announcement to a variety of types of calls: calls that cannot be completed as dialed, calls that have been in queue for an assigned interval, any calls whose destination is an announcement, or incoming calls to a user.

Recorded Telephone Dictation Access

Allows telephone users, including Remote Access and incoming tie trunk users, to access dictation equipment. The dictation equipment is accessed by Dialing an access code or extension number. The start/stop function can be voice or dial controlled. Other functions such as initial activation and playback are controlled by additional dial codes.

Redirection On No Answer

Redirects an unanswered Automatic Call Distribution hunt group call after an administered number of rings. The call is redirected back to the hunt group after making the agent unavailable and notifying the call center manager. This feature enhances Automatic Call Distribution and is related to the Call Vectoring and Call Prompting features. This feature has a wide variety of applications within Automatic Call Distribution.

Remote Access (with Security Measures)

Permits authorized callers from remote locations to access the system via the public network and then use its features and services. Remote Access users can dial into the system using direct inward dial, central office, foreign exchange, or 800 service trunks. There are a variety of ways of accessing the feature. After access to the Remote Access feature, the user hears a system dial tone, and, for system security, may be required to dial a barrier code. If a valid barrier code is dialed, the user again hears dial tone and can place local or long-distance calls as allowed.

Remote Call Coverage

Provides automatic redirection of certain calls to remote coverage points when the user and any other coverage points are unavailable by enabling a remote coverage point to be added to a user's call coverage path. Remote Call Coverage paths can be any valid dialed number up to 16 digits that begin with Automatic Alternate Routing or Automatic Route Selection.

Report Scheduler and System Printer

Allows the system manager to schedule selected reports to be printed by an asynchronous printer. Reports can be scheduled at 15-minute intervals for any combination of days of the week. A variety of reports showing system activity and status can be printed using the Report Scheduler and the System Printer.

Restriction — Controlled

Allows an attendant or telephone user with console permission to activate and deactivate the following restrictions for an individual telephone or a group of telephones: outward, total, station-to-station, and termination restrictions.

Restriction — Fully Restricted Service

Restricts assigned telephones from having access to public network calls. This feature is controlled by the class of restriction assigned to the calling telephone. Telephones with this class of restriction have access to internal calls only, and users cannot use authorization codes to deactivate this feature. All calls from outside the system to this telephone receive intercept tone or are routed to an attendant.

Restriction — Miscellaneous Terminal

Restricts callers at specified telephones from accessing certain other telephones. This feature is controlled by the class of restriction assigned to the calling telephone and to the telephone being called. Any class of restriction can be administered to allow or deny access to any other class of service. Restricted calls are routed to intercept tone.

Restriction — Miscellaneous Trunk

Restricts users at specified telephones from accessing certain trunk groups, such as Wide Area Telecommunications System. This feature is controlled by the class of restriction assigned to the calling telephone and to the trunk group being accessed. Any class of restriction can be administered to allow or deny access to any other class of restriction. Restricted calls are routed to intercept tone.

Restriction — Toll

Restricts users at specified telephones from placing calls that have been designated as toll calls by system administration. With this feature, a Toll Analysis table can be administered to assign certain dialed digit strings to a "toll list." A call containing one of these digit strings is designated as being a "toll call." When a

user attempts to dial a toll call, he or she may not be able to place the call, depending on his or her assigned class of restriction. If a user is restricted from making an attempted toll call, the user receives intercept tone.

Restriction — Station — Inward

Restricts callers at specified telephones from receiving public network calls or calls from or going through the attendant. This feature is controlled by the class of restriction of the called telephone. Denied calls are routed to intercept tone, a recorded announcement, or the attendant.

Restriction — Station — Manual Terminating Line

Restricts callers at specified telephones from receiving calls other than those from an attendant. This feature is controlled by the class of restriction of the called telephone. All other calls are routed to intercept tone, a recorded announcement, or an attendant.

Restriction — Station — Origination

Restricts callers at specified telephones from originating calls. Users can only receive calls. A user can, however, activate other features by Dialing the assigned feature access code. This feature is controlled by the class of restriction of the calling telephone. If a telephone user attempts to place a call, intercept tone is received.

Restriction — Station — Outward

Restricts callers at specified telephones from placing calls to the public network. Calls can be placed to other telephone users, to the attendant, and over tie trunks. Calls can be extended to this telephone by the attendant or by other telephone users. This feature is controlled by the class of restriction of the calling telephone. If a telephone user attempts to place a call, intercept tone is received.

Restriction — Station — Public

Restricts callers at specific telephones from receiving public network calls. The users can receive network calls going through the attendant and redirected network calls. This feature is controlled by the class of restriction of the called telephone. A denied call is routed to intercept tone, a recorded announcement, or the attendant.

Restriction — Station — Termination

Restricts callers at specified telephones from receiving any calls. The restricted users can, however, originate calls. This feature is controlled by the class of restriction of the calling telephone. A denied call is routed to intercept tone.

Ringback Queuing

Places calls in an ordered queue (first in, first out) when all trunks are busy. The telephone user who are trying to make a call is automatically called back when a trunk becomes available, and hears a distinctive three-burst alerting signal when called back.

Ringer Cutoff

Allows the user of a multi-appearance telephone to turn certain audible ringing signals on and off. Visual alerting is not affected by this feature. When this feature is enabled, only Priority ring, Intercom ring, and Manual signaling ring at the telephone.

Rolling Average Speed of Answer

Allows calls to be routed based on a weighted average of the most recent calls versus the last time interval. Enables administrators to assign a higher handling priority for important calls.

Rotary Dialing

Enables rotary Dialing telephones to be used with the system. DEFINITY ECS software recognizes that a telephone is rotary when the user lifts the handset, and expects to receive dial pulses instead of touch tones.

Features: S

This section provides brief descriptions of features from *Security Violation Notification* to *System Status Report*.

Security Violation Notification

Notifies a designated referral point (attendant console, display equipped telephone, or a referral call with announcements) of a security violation. This feature provides the capacity to disable a valid login ID or remote access following a security violation. This feature also provides an audit trail containing information about each attempt to access the system.

Send All Calls

Allows users to temporarily send all incoming calls directly to coverage. Send All Calls is activated by pressing the feature button or by Dialing an access code. This temporarily direct all incoming calls to coverage regardless of the assigned Call coverage redirection criteria. To deactivate Send All Calls the user presses the button a second time or dials the access code again.

Senderized Operation

Reduces the time necessary to place calls to distant locations equipped to receive dual tone multifrequency (touch-tone) signals and allows end-to-end signaling to remote computer equipment. The number dialed and end-to-end signaling digits from telephones and trunks are detected by the system and regenerated for transmission over outgoing trunks. The distant end associated with the trunk must be equipped to receive touch tone signals.

Service Observing

Allows a specified user, such as a supervisor, to observe a call that involves other users while the call is in progress. While observing a call, the specified user can toggle between a listen-only and a listen/talk connection to the call. This feature is normally used in Automatic Call Distribution applications but can be used in other applications as well.

Single-Digit Dialing and Mixed Station Numbering

Allows hotel staff and guests easy access to internal hotel/motel services and provides the capability to associate room numbers with guest room telephones. The feature provides the following dial plan types: single-digit Dialing, prefixed extensions, and mixed numbering.

Straightforward Outward Completion

Allows an attendant to complete an outgoing trunk call for a telephone user, without requiring the telephone user to hang up.

Subnet Trunking

Provides modification of the dialed number so an Automatic Alternate Routing and Automatic Route Selection call can route over trunk groups that end at systems with different dial plans. This feature provides digit insertion, deletion, pauses, and/or wait for dial tone in digit outputting, as required, to permit calls to route to or through a remote system, over tie trunks to a private network, over

central office trunks to the serving central office. This feature is not required on calls to a party at the local system, but is required on calls routing to or through a remote system, regardless of the call's destination.

Switch Based Bulletin Board

Provides a bulletin board on the system that allows Lucent Technologies technical personnel and your company's personnel to communicate with each other. Any system administration terminal user who has appropriate permissions is able to leave and receive messages on the Switch Based Bulletin Board. This feature facilitates communication between people who are responsible for administering and servicing the system.

System Measurements

Provides reports on items such as trunk group usage, hunt group usage and efficiency, attendant group activity and efficiency, and security violations. There are many reports that can be generated using this feature. All system measurement reports are on-demand reports. None are provided automatically. Reports are available on the Management Terminal or a remote administration terminal and can be printed if a printer is associated with the terminal. The reports can also be scheduled to print at the system printer via the Report Scheduler and System Printer feature.

System Status Report

Allows the system manager or maintenance personnel to view data associated with attendants, major and minor alarms, and traffic measurements. The information is displayed on the management terminal and presents a basic picture of the system's condition.

Features: T

This section provides brief descriptions of features from *Temporary Bridged Appearance* to *Trunk-to-Trunk Transfer*.

Temporary Bridged Appearance

Allows multi-appearance telephone users in a Terminating Extension Group or Personal Central Office Line Group to bridge onto an existing group call, without manually transferring the call. In addition, if a call has been answered using the Call Pickup feature, the originally called party can bridge onto the call. This feature also allows a called party to bridge onto a call that redirects to coverage before the called party can answer it. This feature provides convenience of operation and saves time.

Tenant Partitioning

Allows partitioning of the system in order to lease the system's services and features to tenants. This provides provides attractive new services and revenue for "virtual" landlords. It provides the robust features of a large system at affordable rates to small business tenants. The system supports up to 100 partitions and 27 Attendant Groups. Multiple Attendant Groups can be assigned to each partition. Stations, hunt groups, and other endpoints assigned to a Class of Service can be partitioned. Network routing pattern preferences also support the assigned tenant partitioning.

Terminal Translation (with Security Measures)

Allows personnel administering the system to associate or disassociate a telephone's administration-without-hardware translation to a valid port address by Dialing a special digit sequence from a terminal connected to the port. This feature, and the Administration without Hardware feature, is expected to reduce costs in the initial provisioning of a system and also helps in telephone and data module moves form office to office. A security code is used to prevent unauthorized use of this feature.

Terminating Extension Group

Allows an incoming call to ring (either audible or silent alerting) as many as four telephones an one time. Any user in the group can answer the call. Any telephone can be administered as a group member, however, only a multi-appearance telephone can be assigned a feature button with an associated status lamp. The feature button allows the user to select a Terminating Extension Group call appearance for answering or bridging onto an existing call but not for call origination. For example, a department in a large store might have three telephones. Anyone in the department can answer the call. The salesperson most qualified to answer the call can bridge onto the call.

Time of Day Routing

Provides the most economical routing of Automatic Route Selection and Automatic Alternate Routing calls, based on the time of day and day of the week that each call is made. With this feature, a company can take advantage of lower calling rates during specific times of the day and week. In addition, companies with locations in different time zones may be able to maximize the use of facilities by utilizing those in a location that has a lower rate at different times of the day or week. This feature can also be used to change the patterns during the times an office is closed in order to reduce or eliminate unauthorized calls.

Timed Reminder and Attendant Timers

Automatically alerts the attendant after an administered time interval for the following types of calls: extended calls to be answered or waiting to be connected to a busy single-line telephone, one-party calls placed on hold on the console, and incoming calls answered by a telephone user, but which are unanswered after being transferred. Timed Reminder informs the attendant that a call requires additional attention. After the attendant reconnects to the call, the user can either choose to try another extension number, hang up, or continue to wait. DEFINITY system supports a variety of administrable attendant timers for use in a variety of situations.

Touch-Tone Dialing

Provides quick and easy pushbutton Dialing using Dual-Tone Multifrequency (or Touch-Tone) Dialing. A distinctive tone is generated when each button is pressed. If a distant switching system can accept only dial pulse (rotary Dialing) signals, the system converts the touch-tone signals to the required dial pulses for transmission to the distant end.

Transfer

Allows telephone users to transfer trunk or internal calls to other telephones within the system without attendant assistance. This feature provides a convenient way to connect a party with someone better qualified to handle the call. Single-line telephone users momentarily flash the switchhook or press the Recall button, dial the desired extension, and hang up. Multiappearance telephone users press the Transfer button, dial the desired extension number, and press the Transfer button again.

Transfer — Outgoing Trunk to Outgoing Trunk (with Security Measures)

Allows a user or attendant to initiate two or more outgoing trunk calls and then transfer the trunks together. The transfer operation removes the original user from the connection and conferences the outgoing trunks. This is an optional enhancement to Trunk-to-Trunk Transfer and requires careful administration and use. Distributed Communication System Trunk Turnaround may be an acceptable and safer alternative to this feature.

Trunk Flash

Enables multifunction telephones to access “central office customized service” that are provided by the far-end central office located directly behind the DEFINITY system. These central office services are electronic features, such as confer-

ence and transfer, that are accessed by a sequence of flash signals and Dialing from the DEFINITY telephone on an active trunk call. Some versions and models of DEFINITY support "Digit 1 as Flash" as used in Italy and the United Kingdom.

Trunk Group Busy/Warning Indicators to Attendant

Provides the attendant with a visual indication that the number of busy trunks in a group has reached an administered level. A visual indication is also provided when all trunks in a group are busy. This feature is particularly helpful to show the attendant that the Attendant Control of Trunk Group Access feature needs to be invoked.

Trunk Identification By Attendant

Allows an attendant or display-equipped telephone user to identify a specific trunk being used on a call. This capability is provided by assigning a Trunk ID button to the attendant console or telephone. This feature is particularly helpful for identifying a faulty trunk. That trunk can then be removed from service and the problem quickly corrected.

Trunk-to-Trunk Transfer

Allows the attendant or telephone user to connect an incoming trunk call to an outgoing trunk call. This feature is particularly useful when a caller outside the system calls a user or attendant and requests a transfer to another outside number. For example, a worker, away on business, can call in and have the call transferred elsewhere. The system assures that incoming central office trunks without Disconnect Supervision are not transferred to outgoing trunks or other incoming central office trunks without Disconnect Supervision.

Features: U

This section provides a brief description of one feature: *Uniform Dial Plan*.

Uniform Dial Plan

Provides a common four-or five-digit dial plan that can be shared among a group of systems. Interswitch Dialing and intraswitch Dialing both require four-or five-digit Dialing. The Uniform Dial Plan is used with Extended Tandem Network, Main/Satellite/Tributary, and Distributed Communication System configurations. Additionally, this feature can be used alone to provide uniform four-or five-digit Dialing between two or more private switching systems without any of the configurations listed above.

Features: V

This section provides brief descriptions of features from *Vector Directory Number of Origin Announcement* to *VuStats*.

Vector Directory Number of Origin Announcement

Provides a short voice message when an agent answers a Vector Directory Number call. The message informs the agent of the city of origin of the caller or of the service requested by the caller, based on the Vector Directory Number used to process the call. The message begins as soon as the agent answers the call. While the agent can hear both the message and the caller, the caller is not able to hear the message. After listening to the announcement, but agent can appropriately respond to the caller.

Visually Impaired Attendant Service

Provides voice feedback to a visually impaired attendant in either Italian or British English. Each voice phrase is a sequence of one or more single voiced messages. This feature defines six new attendant buttons to aid visually impaired attendants: a feature activation/deactivation button, console status button, display status button, last operation button, last voiced message button, and direct trunk group selection status button. The visually impaired attendant may use the Inspect mode to locate each button and determine the feature assigned to each without actually executing the feature.

Voice Message Retrieval

Allows telephone users, remote access users, and attendants to retrieve Leave Word Calling and Call Coverage messages in the form of a voice output. Voice choices are UK English, US English, and Italian; these choices depend up on the voice synthesis circuit pack provided. Messages are protected by restricting unauthorized users from retrieving messages. This feature is activated by Dialing a dial access code.

Voice Response Integration

Integrates Call Vectoring with the capabilities of voice response units, particularly Lucent Technologies CONVERSANT Voice Information System. Voice Response Integration enhances the integration of Lucent Technologies DEFINITY call center systems. This feature can execute a voice response unit script while retaining control of the call in DEFINITY vector processing, execute a voice response unit script while the call remains in the hunt group queue and keeps its position in the queue, pool CONVERSANT ports for multiple applications, use a voice response

unit as a flexible external announcement device, pass data between DEFINITY and a voice response unit, and tandem voice response unit data through DEFINITY to an adjunct switch applications interface host.

Voice Terminal Display

Provides multi-appearance telephone users with updated call and message information. This information is displayed on a display-equipped terminal. The information displayed depends upon the display mode selected by the user. Users may select any of the following as the display message language: English, French, Italian, Spanish. In addition, messages can be administered on the system in a fifth language. The language for display messages is selected by each user. This feature provides an instant display of information associated with certain system features, functions, and services. Information that allows personalized call answering is available on many calls. Retrieving stored information, such as messages and directory information, is easy as well as convenient.

Voice Terminal Alerting Options

Provides certain multi-appearance telephone users with different ringing patterns. This feature primarily affects audible ringing for calls directed to telephones that are off hook, or calls directed to idle and active CALLMASTER telephones.

Voice Terminal Flash Timing

Allows users on an analog telephone to place a call on hold and consult with another party or activate a feature. After consulting with that third party, the user can conference the third party with the original party by another recall signal, or return to the original party by pressing Recall twice or by flashing the switchhook twice.

VuStats

Allows users with display-equipped telephones to display a call center's real-time statistics. The display shows the agent, the hunt group or skill, the vector directory number, and trunk group report data without requiring additional Manager or Call Management System terminals. This feature allows agents to watch their progress in a call center, and for supervisors to monitor progress of each of their agents. You can decide the information that should be displayed to meet the needs of your call center workers.

Features: W

This section provides brief descriptions of features from *Wideband Switching* to *World Class Tone Generation*.

Wideband Switching

Provides the ability to dedicate two or more integrated systems digital network B-channels or DS0 endpoints for applications which require large amounts of bandwidth. Certain applications, such as video conferencing and high-speed data transmission, require extra bandwidth and it becomes necessary to put several integrated systems digital network-private rate interface narrowband channels into one "wideband" channel to accommodate the needs of these applications. This feature supports both European and North American standards.

World Class Basic Rate Interface (BRI)

Provides an international BRI platform that offers multiple protocol options to meet specific country and application requirements. It provides access to Video Conferencing, Desktop Video Conferencing, Data Transmission, and other non-voice based applications that use BRI as a communication interface. Voice access is not supported, though voice features are not blocked for World Class BRI terminals.

World Class BRI devices must be administered as the new type "wcbri." Users select a country protocol for each terminal that will use the feature. This selection determines both the codeset modifications required to meet the national standards as well as the terminal initialization procedures if required.

World Class BRI supports the following country protocols:

- Bellcore National ISDN-1 protocol in the United States (TR268)
- National protocols in Australia (AUSTEL TS013, Telecom Australia TPH 1962), Japan (NTT BRI) and Singapore (FETEX 150 TIF 218)
- ETSI NET 3 protocol (ETS 300 102) for use in most of Europe.

It supports multipoint (up to two devices per port) only for the Bellcore National ISDN-1 Country Protocol option.

World Class Tone Detection

Enables the DEFINITY system to identify and handle different types of call progress tones, depending on the system administration. "Tone detect mode 1" designates countries that use the same tone plan as Italy. "Tone detect mode 2" designates countries that use the same tone plan as Australia. "Tone detect mode 3" designates countries that use the same tone plan as the United King-

dom. "Tone detect mode 4" designates countries that use dial tones between 345 Hz and 625 Hz. "Tone detect mode 5" designates countries that use dial tones between 345 Hz and 1190 Hz. The "level of tone detection precise" is used in countries that, except for the continuous dial tone and discontinuous other tone, have tones with characteristics that do not match those expected by the tone detector board's detect mode. The "level of tone detection broadband" is used in countries that have a discontinuous dial tone.

World Class Tone Generation

Allows administrators to specify the base call progress tone set to be generated by the system. Administrator can then customize the set by selecting different values for frequency and cadency for up to 6 individually administrable tones.

System Capacity Limits

B

Overview

This appendix provides information on the overall characteristics and capacities of the DEFINITY systems.

System Hardware and Software Capacity Limits

The maximum parameters for the DEFINITY hardware and software items are listed on the following pages. Unless otherwise noted, these parameters apply to both the Single-Carrier Cabinet and Multi-Carrier Cabinet systems.

⇒ NOTE:

Terminal and digital station capacities are reduced by such administered items as: attendant consoles, number of EAS login IDs, and number of ACD agents.

⇒ NOTE:

Not all maximum capacities listed in Table B-1 can be reached simultaneously with all versions or all configurations of the system.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Abbreviated Dialing (AD)			
AD Lists Per System	400	400/2,400	5,000
AD List Entry Size	24	24	24
AD Entries Per System	2,000	2,000/12,000	100,000
Auto Dialing Button ¹			
Entries per System ¹	7	7	7
Enhanced List (System List)	1	1	1
Maximum Entries	2,000	2,000/10,000	10,000
Group Lists	100	100	1,000
Maximum Entries	100	100	100
Group Lists per Extension	3	3	3
System List	1	1	1
Maximum Entries	100	100	100
Personal Lists	400	400/2,400	5,000
Maximum Entries	100	100	100
Personal Lists per Extension	3	3	3
Applications Adjuncts			
CallVisor ASAI Adjuncts ²	4	4/8	8
Asynchronous Links (RS-232) ³	5	5	10
CDR Output Devices	2	2	2
Journal: System Printer	2:1	2:1	2:1
Property Management Systems	1	1	1
BX.25 Physical Links ⁴	4	4/8	16
Application Processors (such as 3B2-MCS)	1	1	7
AUDIX Adjuncts	1	1	8
CMS Adjuncts	1	1	1
ICM Adjuncts (ISDN Gateway)	1	1	1
BX.25 Processor Channels	64	64	128
Hop Channels	64	64	128

1. No limit on maximum number of auto dial buttons (other than system limit on button capacity).
2. Release 5vs does not support CallVisor ASAI adjuncts.
3. In Release 5si, four NETCON channels plus one direct connect. In Release 5r, 10 system ports through the Packet Data circuit pack.
4. In SCC/ESCC/CSCC, only four BX.25 physical links are supported in the configuration.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Automatic Call Distribution (ACD)			
Announcements per Split	2	2	2
Announcements per System	128	128	256
Splits	24	24/99	600
ACD Members per Split	150	150/200	999
Split Members per System	300	300/1,000	10,000
Logged-In ACD Agents	150	150/500	5,200
Logged-In Splits per Agent ¹			
No CMS	4	4	4
R2 CMS	3	3	3
R3 CMS	3	3	3
R3V2 CMS	4	4	4
R3V4 CMS ²	4	4	4
R3V5 CMS	4	4	4
Queue Slots per Group	200	200	999
Queue Slots per System	200	200/1,500	15,000
ARS/AAR			
AAR/ARS Patterns (Shared)	40	40/254	640
ARS/AAR Analysis Tables	2,000	2,000	2,000
Choices per RHNPA Table	12	12	12
Digit Conversion Entries	400	400	400
AAR/ARS Digit Conversion			
Digits Deleted for ARS/AAR	28	28	28
Digits Inserted for ARS/AAR	18	18	18
AAR/ARS Sub-Net Trunking			
Digits Deleted for ARS/AAR ³	28	28	28
Digits Inserted for ARS/AAR	36	36	36
Entries in each RHNPA Table	1,000	1,000	1,000
FRLs	8	8	8

1. When going from 4 to 3 login maximums, a change to the hunt group form is required. This requires all agents to be logged-out. In one extreme case, this is potentially avoided and R2 & R3 CMS handles the fourth login as UNSTAFFED appropriately.
2. R3V3 CMS was renamed to R3V4 CMS to match the DEFINITY system numbering.
3. Plus up to seven inter-exchange carrier (IXC) digits.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — continued

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
ARS/AAR (Continued)			
Inserted Digit Strings ¹	450	450/1,200	3,000
Patterns for Measurement			
Shared Patterns for Measurement	20	20	25
RHNPA Tables	32	32	32
Routing Plans	8	8	8
ARS Toll Tables	32	32	32
Entries per Toll Table	800	800	800
Trunk Groups in an ARS/AAR Pattern	6	6	16
UDP (Entries)	240	240/10,000	50,000
TOD Charts	8	8	8
Toll Analysis Table Entries	1,000	1,000	1,000
Attendant Service			
Attendant Consoles (day:night) ²	6:1	6:1/15:1	27:1
Attendant Console 100s Groups per Attendant	20	20	20
Attendant Control Restriction Groups	96	96	96
Centralized Attendant Service			
Release Link Trunks at Branch	99	99	255
Release Link Trunk Groups at Branch	1	1	1
Release Link Trunks at Main	100	100/400	4,000
Release Link Trunk Groups at Main ³	32	32/99	666
Other Access Queues			
Maximum Number of Queues	12	12	12
Maximum Number of Queue Slots ⁴	30	80	80
Size Range of Reserved Queue	2-25	2-25/2-75	2-75
Reserved Queue Default Size	5	5	5
Queue Length	30	80	300
Switched Loops per Console	6	6	6

1. Number of available 12 character inserted-digit-strings available for AAR/ARS preferences.
2. For Release 5vs, four is the recommended number of consoles supported due to power limitations. Of these, one may be used as a night console. The software supports 6:1 day/night attendant consoles.
3. This is the same as the number of trunk groups in the system.
4. Referred to as "emergency access queue length" in Release 5si+memory.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Authorization			
Authorization Codes	1,500	1,500/5,000	90,000
Station Security Code Length	8	8	8
Classes of Restriction	96	96	96
Classes of Service	16	16	16
Length of Authorization Code	4-7	4-7	4-7
Length of Barrier Code	4-7	4-7	4-7
Length of Account Codes	1-15	1-15	1-15
Restricted Call List	1	1	1
Remote Access Barrier Codes	10	10	10
CDR Account Code List	1	1	1
Toll Call List	1	1	1
Unrestricted/Allowed Call Lists	10	10	10
Total Call List Entries	1,000	1,000	1,000
Automatic Callback Calls	20	20/240	1,500
Automatic Wakeup			
Simultaneous Display Requests	10	10	30
Wakeup Requests per System	400	400/2,400	15,000
Wakeup Request per Extension	1	1	1
Wakeup Requests per 15-minute Interval	150	150/450	950
Basic CMS			
Measured Agents or Login IDs	75	75/400	2,000
Measured Splits	24	24/99	600
Measured Trunk Groups	32	32	32
Measured VDNs	24	24/99	512
Reporting Periods			
Intervals	25	25	25
Days	7	7	7
Cabinets			
Expansion Port Network			
Multi-Carrier Cabinet ¹	NA	NA/2	43
Single-Carrier Cabinet ¹	NA	NA/8	164

1. Only Expansion Port Networks in Release 5r can be DS1-remote Expansion Port Networks.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Cabinets (Continued)			
Small (Upgrades only) ¹	NA	NA/2	41
Inter-Port Network Connectivity			
Port Networks	1	1/3	44
Maximum Number of Port Networks per Cabinet	1	1	2
Switch Nodes (Simplex)	NA	NA	3
Switch Nodes (Duplex)	NA	NA	6
DS1 Converter Complex (Simplex)	NA	NA	41
DS1 Converter Complex (Duplex)	NA	NA	82
Processor Port Network			
Multi-Carrier Cabinet ²	NA	NA/1	1
Single-Carrier Cabinet or Enhanced Single-Carrier Cabinet	4	4	NA
Compact Single-Carrier Cabinet	1	1/NA	NA
Call Appearances			
Bridged Images per Appearance	7	7	15
Call Appearances per Station ³	54	54	54
Maximum Appearances per Extension	10	10	10
Minimum Appearances per Extension	0	0	0
Total Bridged Appearances	400	400/2,400	25,000
Maximum Simultaneous Off-Hook per Call ⁴	5	5	5
Call Coverage			
Coverage Answer Groups (CAG)	30	30/200	750
Coverage Paths	999	999	9,999
Coverage Paths Including in Call Coverage Report	100	100	100
Coverage Path per Station	4	4	4
Coverage Points in a Path	6	6	6
Remote Coverage Points	999	999	999

1. Small systems refer to the 2-carrier cabinet systems no longer sold to new customers.
2. Multi-Carrier Cabinet includes the Medium Cabinet.
3. The number of call appearances is the sum of primary and bridged appearances; at most 10 can be primary. A maximum of 54 administrable buttons are supported for the 8434D terminal with expansion module — 34 buttons in the basic terminal and 20 more buttons in the expansion module.
4. Does not apply to conferencing.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Call Coverage (Continued)			
Maximum Users per Coverage Path ¹	700	700/3,500	36,065
Members per Coverage Answer Group	8	8	8
Time of Day Coverage Tables	999	999	999
Time of Day Changes per Table	5	5	5
Remote Administration Coverage Paths	2	2	2
Call Detail Recording			
Intra-Switch Call Trackable Extensions	100	100/1,000	5,000
Maximum Number of CDR Records Buffered in Switch	300	300	1,900
Number of Records Buffered for the Primary Output Device to Cause Secondary Device to be Busied Out for 2 Minutes	200	200	1,800
Call Forwarding			
Call Forwarded Digits (off-net)	16	16	16
Call Forwarded Numbers	400	400/2,400	25,000
Call Park			
Attendant Group Common Shared Extension Numbers per System ²	10	10/80	80
Number of Parked Calls	180	180/723	10,604
Call Pickup Groups			
Call Pickup Members per Group	50	50	50
Call Pickup Members per System	400	400/2,400	25,000
Number of Groups	100	100/800	5,000
Call Vectoring			
Maximum Skills a Call Can Simultaneously Queue to	3	3	3
Priority Levels	4	4	4
Recorded Announcements/Analog Sources for Vector Delay	128	128	256
Steps per Vector	32	32	32
Vector Directory Numbers	100	100/512	20,000
Audio Sources for Vector Delay			

1. The maximum number of users per coverage path equals the number of extensions.
2. Shared extensions must be shared among all attendant groups in the system including Tenant Partition scenarios.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5— *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Call Vectoring (Continued)			
CMS Measured VDNs ¹	100	100/512	2,000
Vectors per System	48	48/256	512
# of Collected Digits for Call Prompting or CINFO	16	16	16
Number of Dial-Ahead Digits for Call Prompting	24	24	24
Vector Routing Tables	5	10	100
CallVisor ASAI²			
Active Station Control Associations	250	250/2,000	6,000
Call Controllers per Call	1	1	1
Call Monitors per Call	14	14	14
Station Controllers per Station	2	2	2
Maximum Simultaneous Call Classifications	40	40	400
Number of CallVisor ASAI Links (Open & Proprietary)	4	8	8
Notification Requests (Monitors)	50	50/300	10,000
Simultaneous Active Call Controlled Calls	75	75/300	3,000
Switch to Adjunct Associations (Routing)	127	127	127
Number of Open MultiQuest Billing Requests	25	25/100	1,000
Maximum Calls with Send DTMF Active	16	16	32
Selected Listen - Disconnect Paths	NA	NA/75	300
LAN Gateway Circuit Pack Maximum Links	4	4	4
Conference Parties			
Simultaneous 3-way Conference Calls ³	161	161/483	7,084
Simultaneous 6-way Conference Calls ⁴	80	80/240	3,520
Data Parameters			
Administered Connections	24	24/128	128
Alphanumeric Dialing			
Maximum Entries	50	50/200	1,250
Characters per Entry	22	22	22
PRI Endpoints (PE)	25	25	50
Access Endpoints (Number of Trunks)	100	100/400	4,000

1. Measured limits depend on the CMS release used.
2. Release 5vs does not support CallVisor ASAI.
3. Simultaneous 3-way Conference Call = (483 / 3)* number PNs.
4. Simultaneous 6-way Conference Call = (483 / 6)* number PNs.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Digital Data Endpoints	75	75/800	7,500
Dial Plan			
Direct Inward Dialing Listed Directory Numbers	8	8	20
Expert Agent Selection (EAS) Agent Login IDs ¹	450	450/1,500	10,000
Extensions	700	700/3,500	36,065
Extension Number Portability ²	240	240/10,000	50,000
Feature Dial Access Codes	77	77	77
Number of Digits	1-4	1-4	1-4
Integrated Directory Entries ³	407	407/2,416	25,028
Maximum Extension Size	5	5	5
Minimum Extension Size	1	1	1
Miscellaneous Extensions ⁴	150	150/900	3,317
Names			
Number of Names ⁵	664	664/4,215	36,511
Number of Characters in a Name	27	27	27
Non-DID LDNs	50	50	666
Prefix Extensions	Yes	Yes	Yes
Trunk Dial Access Codes			
Number of Access Codes	65	65/317	884
Number of Digits	1-4	1-4	1-4
Do Not Disturb (DND)			
DND Requests per System	400	400/2,400	25,000
Simultaneous Display Requests	10	10	30

1. Login IDs count against the "Extensions" switch capacity.
2. These are Uniform Dialing Plan (UDP) entries.
3. The Integrated Directory Entries = Stations + Attendant Consoles.
4. Used for PCOL groups, common shared extensions, access endpoints, administered TSCs, code calling IDs, LDNs, hunt groups, announcements, and TEGs (phantom extensions).
5. The Number of Names = number of stations + attendant consoles + trunk groups + digital data endpoints + miscellaneous extensions.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — continued

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Expert Agent Selection (EAS)			
Skill Groups	24	24/99	600
VDN Skill Preferences	3	3	3
Maximum Skills a Call Can Simultaneously Queue to	3	3	3
Maximum Agent Login IDs Administered	450	450/1,500	10,000
Maximum Agent Login IDs Staffed	150	150/500	5,200
Maximum Agent/Skill Pairs Administered	1,800	1,800/6,000	40,000
Maximum Agent/Skill Pairs Staffed	300	300/1,000	10,000
Maximum Skills Per Agent			
No CMS	20	20	20
R3V2 CMS	4	4	4
R3V4 CMS	4	4	4
R3V5 CMS	20	20	20
Maximum Skill Levels	16	16	16
Maximum Agents Logged-In			
When Each Has 20 Skills Assigned	15	15/50	500
When Each Has 4 Skills Assigned	75	75/250	2,500
When Each Has 1 Skill Assigned	150	150/500	5,200
Facility Busy Indicators			
Buttons per Tracked Resource	100	100	500
Number of Indicators (Station and Trunk Groups)	450	450/3,600	10,000
Hunt Groups (Non ACD)			
Announcements per Group	1	1	1
Announcements per System	128	128	256
Groups	24	24/99	600
Group Members per Group	150	150/200	999
Group Members per System	300	300/1,000	10,000
Queue Slots per Group	200	200	999
Queue Slots per System	200	200/1,500	15,000

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Intercom Translation Table (ICOM)			
Automatic/Manual and Dial			
ICOM groups per system	10	10/32	256
Auto/Manual	10	10/32	256
Dial	10	10/32	256
Members per ICOM group			
Auto	32	32	32
Dial	32	32	32
Members per System	320	320/1,024	8,192
Last Number Dialed			
Entries per System ¹	482	482/3,216	32,528
Number of Digits	24	24	24
Leave Word Calling (Switch-Based)			
Messages Stored	650	650/2,000	6,000
Messages per User	125	125	125
Remote Message Waiting Indicators			
Per Extension	80	80	80
Per System	240	240	1,250
Simultaneous Message Retrievers	60	60	400
System-Wide Message Retrievers	10	10	10
Malicious Call Trace			
Maximum Simultaneous Traces	16	16	16
MLDN			
Via Direct Inward Dialing	8	8	20
Via Direct Inward Dialing with Tenant Partition	20	20	100
Via CO	99	99	666
Modem Pool Groups			
Mode 2/Analog			
Group Members per System	64	64/160	2,016
Number of Groups	2	2/5	63
Members per Group	32	32	32

1. The Last Number Dialed Entries = Stations + Digital Data Endpoints + attendant consoles.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Networking			
CAS Nodes	99	99	99
DCS Nodes ¹			
BX.25	20	20	20
ISDN PRI	20	20	20
Hybrid	20	20	20
EN Nodes ²	999	999	999
Paging			
Code Calling IDs	125	125	125
Loudspeaker Zones	9	9	9
Partitions			
Attendant Groups	15	15	27
Extension Partition Groups	8	8	8
Extension Partition	8	8	8
Tenant Partition	20	20	100
Multiple Music On Hold Sources	20	20	100
Personal CO Lines (PCOL)			
PCOL Appearances	4	4	16
PCOL Lines (Trunk Groups)	15	15/200	200
PCOL Trunks Per Trunk Group	1	1	1
Port Circuit Pack Slots³			
Per Expansion Port Network			
Multi-Carrier Cabinet Standard Reliability	NA	NA/99	99
Single-Carrier Cabinet Standard Reliability	NA	NA/71	71
Small Cabinet Standard Reliability (Upgrade only)	NA	NA/39	39

1. The actual software limit is 63, but due to performance considerations the recommended number of DCS Nodes is 20.
2. These are node number addresses.
3. Only port slots are included in this count. For example, there are 100 port slots per MCC EPN cabinet with 99 port slots and one slot dedicated to the Tone/Clock board. Other service circuits may be required that would further reduce the number of port slots available. In Release 5r and Release 5si carriers, the service slot may be equipped with service boards that do not require tip and ring connections.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5— *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Port Circuit Pack Slots (Continued)			
Per Processor Port Network			
Multi-Carrier Cabinet Standard Reliability	NA	NA/89	80
Single-Carrier Cabinet Standard Reliability	NA	NA/64	NA
Enhanced Single-Carrier Cabinet Standard Reliability	70	70	NA
Compact Single-Carrier Cabinet Standard Reliability	10	NA/NA	NA
Recorded Announcements/Audio Sources			
Analog and Auxiliary Trunk Announcements			
Analog and Auxiliary Trunk Queue Slots per Announcement	150	150	1,000
Analog and Auxiliary Trunk Queue Slots per System	150	150	1,000
Trunk Calls Connected per Announcement	50	50/150	1,000
Integrated Announcements			
Integrated Announcement Circuit Packs	1	1/5	10
Channels Connected per Integrated Announcement Circuit Pack	16	16	16
Calls Connected per Integrated Announcement	25	25/50	1,000
Integrated Announcement Recording Time (Minutes:Seconds)			
16 KB Recording	8:32	8:32	8:32
32 KB Recording	4:16	4:16	4:16
64 KB Recording	2:08	2:08	2:08
Integrated Queue Slots per System	25	25/200	4,000
Total Recorded Announcements	128	128	256
System Administration			
Number of Logins	15	15	15
Administrable History File Entries	50	50/500	1,250
Simultaneous Administration Command	1	1	5
Simultaneous Maintenance Command	1	1	5
Simultaneous System Maintenance Sessions	3	5	8
Number of Scheduled Reports	50	50	50
Speech Synthesis Circuit Packs			
Channels per Speech Circuit Pack	4	4	4

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5— *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Terminating Extension Groups (TEG)			
TEGs	32	32	32
Users That May Share a TEG	4	4	4
Time Slots			
Simultaneous Circuit-Switched Calls ¹	180	180/723	7,712
Total Slots	512	512/1,536	22,528
Time Slots for Voice and Data ²	483	483/1,449	21,208
Time Slots per Port Network	512	512	512
Tone Classifiers			
Tone Receivers (General) ³	80	200	840
Call Classifier Circuit Packs	NA	NA	NA
Classifiers / Prompting TTRs	NA	NA	NA
Tone Detector Circuit Packs	NA	NA	NA
General Purpose Tone Detectors	NA	NA	NA
Touch-Tone Receivers	NA	NA	NA
TTR Queue Size	4	4	4
Prompting TTR Queue Size	80	80	80
Trunks			
DS1 Circuit Packs	8	8/30	166
Queue Slots for Trunks	64	64/198	1,332
PRI Interfaces via Processor Interface ⁴	4	4/8	NA
PRI Interfaces via PACCON ⁵ (Packet Controller)	NA	8/30	NA

1. 241 Simultaneous Circuit-Switched Calls per Port Network, except for Release 5si with 180 Simultaneous Circuit Switched Calls and Release 5r with 7,712 (limited by the number of call records supported).
2. 483 time slots for voice and data per port network.
3. G3V4 and Release 5 use TN744 Call Classifier for basic TTR usage as well as call prompting/call classification/MFC. Also, the TN2182 Tone/Clock/Detector is used for multiple tone detection functions. The number of TN748, TN420, or TN744 boards is limited only by the number of available slots. The number of TN2182 boards is limited. There is a single limit on the total number of tone receiver (classifier) ports for the system: TN748/TN420 have 4 ports for TTR use, TN748/TN420 have 2 ports for GPTD use, TN744 has 8 ports for call prompting/call classification/ MFC/TTR/GPTD use, and TN2182 has 8 ports for call prompting/call classification/MFC/ TTR/GPTD use.
4. Only one Processor Interface (PI) circuit pack is supported in Release 5vs and Release 5si configurations, therefore a total of four physical links (used for BX.25 or PRI) are available. PRI interface via the PI is not available in Germany. PRI interface via the Packet Controller is used. PRI is not available on Release 5vs in Germany.
5. PRI interface via the Packet Controller is not available on Release 5vs. Therefore, PRI is not available on Release 5vs in Germany. Other countries must use the PI when they have the Release 5vs configuration.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
Trunks (Continued)			
PRI Interfaces via PKTINT	NA	NA	166
PRI Temporary Signaling Connections (TSCs)			
TSCs in System	164	164/656	4,256
Call Associated TSCs	100	100/400	4,000
Non Call Associated TSCs	64	64/256	256
Administered TSCs	32	32/128	128
Ringback Queue Slots	64	64/198	1,332
Total PRI Interfaces	4	8/30	166
Trunk Groups Hourly Measurements	25	25	75
Trunk Groups in the System	32	32/99	666
Trunk Members in a Trunk Group	99	99	255
Trunks in System (Including Remote Access)	100	100/400	4,000
Measured Trunks in System	100	100/400	4,000
Voice Terminals¹			
Associated Data Modules (such as DTDMs)	75	75/800	7,500
BRI Stations ²	NA	50/1,000	7,000
Digital Stations ³	400	400/2,400	25,000
Display Stations	400	400/2,400	10,000
Stations ⁴	400	400/2,400	25,000
Station Button Capacity (K Units) ⁵	102.8	102.8/700.8	5,260

1. The following items detract from the total number of available "Stations" on a switch:

- Analog Music-On-Hold
- Attendants
- Modem Pool Conversion Resources
- TAASPort
- Stations (Digital, Display, BRI, etc.)
- Analog Announcements
- Analog External Alarm Port
- Agent Login IDs
- ACD Agents

2. All BRI stations can be display stations (Release 5vs does not support BRI).

3. The software limit for digital stations in Release 5vs is 400 stations. Due to power limitations, the recommended limit is 120 digital stations.

4. Including extensions administered without associated hardware (for Release 5si and Release 5r configurations). The Station Capacity for Release 5vs is a software limit. The physical capacity of the Release 5vs (10 port slots) limits its configuration from reaching the software limit.

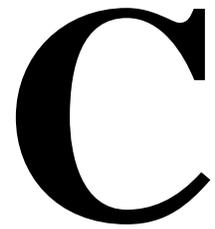
5. Station Button Capacity replaces Maximum Button Modules in pre-R1V5.1 configurations.

Table B-1. Maximum System Parameters for DEFINITY ECS Release 5 — *continued*

ITEM	Release 5vs	Release 5si 8/12 MB	Release 5r
VuStats			
Measured Agents or Login IDs	75	75/400	2,000
Measured Splits	24	24/99	600
Measured Trunk Groups	32	32	32
Measured VDNs	24	24/99	512
Reporting Periods			
Intervals	25	25	25
Days	1	1	1
Display Formats	50	50	50
Simultaneous Updating Displays	100	100	500
DEFINITY Wireless Business System			
Display Terminals (9601)	200	200/250	250
Station Button Capacity (K Units)	68.4	68.4/700.8	5,260
Radio Controller Circuit Packs ¹	8	8/30	30
Wireless Fixed Bases	16	16/60	60
Cell Antenna Units	64	64/240	240
Coverage Area (Million Square Feet)	1	1/3	3

1. For Release 5r, Radio Controller circuit packs cannot be used in DS1 remoted Expansion Port Networks (EPNs).

References



The following is a list of DEFINITY Enterprise Communications Server (ECS) Release 5 documents, including a brief description of each document.

To order these or other DEFINITY documents, contact the Lucent Technologies Publications Center at the address and phone number on the back of this document's title page. A complete list of Business Communications Systems (BCS) documents, including previous issues of the documents listed here, is provided in *BCS Publications Catalog*, 555-000-010.

Basic DEFINITY ECS Documents

The following are basic documents for anyone using DEFINITY ECS.

DEFINITY Enterprise Communications Server Release 5 — Pocket Reference, Issue 1, 555-230-207

A compact reference containing hardware descriptions, system parameters, and listings of features and system configurations.

DEFINITY Enterprise Communications Server Release 5 — Feature Description, Issue 1, 555-230-301

Provides comprehensive technical descriptions of system features and parameters. Includes the applications and benefits, feature interactions, administration requirements, hardware and software requirements, and a brief discussion of data communications and private networking configurations.

DEFINITY Enterprise Communications Server Release 5 — Implementation, Issue 1, 555-230-302

Provides step-by-step procedures for preparing the hardcopy forms that correspond to the screens and are required to implement the features, functions, and services of the system. Includes procedures for completing a communications survey. Includes an initial set of blank forms (555-230-655B, 555-230-653B).

DEFINITY Enterprise Communications Server Release 5 — Implementation Blank Forms, Issue 1, 555-230-303

Provides additional blank hardcopy forms that correspond to the screens that are required to implement the features, functions, and services of the system.

Copies of these forms are automatically included with the *DEFINITY Enterprise Communications Server Release 5 Implementation, Issue 1, 555-230-302*. Use this order number to purchase additional forms.

DEFINITY Enterprise Communications Server Release 5 — System Description and Specifications, Issue 1, 555-230-210

Provides a technical description of the systems and is intended for service personnel, sales personnel, and customers who need a comprehensive overview of the system. Includes descriptions of hardware, software features, technical specifications, environment requirements, maintenance requirements, and illustration of components.

DEFINITY Enterprise Communications Server Release 5 — System Monitoring and Reporting, Issue 3, 555-230-511

Provides detailed descriptions of all the measurement, status, and security reports available in the system and is intended for administrators who validate traffic reports and evaluate system performance. This document was titled *Traffic Reports* for earlier systems. It includes corrective actions for potential problems.

DEFINITY Communications System Generic 1 and Generic 3 — Installation and Test, Issue 5, 555-230-104

Provides descriptions of the procedures for installing and testing the system's common equipment and adjuncts. Includes setup procedures for the system management terminal, power and grounding requirements, and testing steps. Includes complete details on system wiring. Provides both domestic and international information.

DEFINITY Enterprise Communications Server Release 5 — Installation for Single-Carrier Cabinets, Issue 2, 555-230-894

Provides procedures and information for hardware installation and initial testing of single-carrier cabinets. This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Castillian Spanish (SP), and Japanese (JA).

To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

DEFINITY Enterprise Communications Server Release 5 — Installation for Multiple-Carrier Cabinets, 555-230-112

Provides procedures and information for hardware installation and initial testing of multi-carrier cabinets.

DEFINITY Communications System Generic 3 Version 1.1 - Version 4 Upgrades and Additions, Issue 2, 555-230-107

Provides procedures for an installation technician to convert an existing DEFINITY Communications System earlier than Generic 3 Version 4 to Generic 3 Version 4.

DEFINITY Enterprise Communications Server Release 5 — Upgrades and Additions for R5r, Issue 1, 555-230-121

DEFINITY Enterprise Communications Server Release 5 — Upgrades and Additions for R5vs/si, Issue 1, 555-230-120

Provides procedures for an installation technician to convert an existing DEFINITY Communications System Generic 3 Version 4 to DEFINITY ECS.

Included are upgrade considerations, lists of required hardware, and step-by-step upgrade procedures. Also included are procedures to add control carriers, switch node carriers, port carriers, circuit packs, auxiliary cabinets, and other equipment.

DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5r, Issue 5, 555-230-105

DEFINITY Enterprise Communications Server Release 5 — Maintenance for R5vs/si, Issue 9, 555-204-105

Provides detailed descriptions of the procedures for monitoring, testing, and maintaining the systems. Included are maintenance commands, step-by-step trouble-clearing procedures, the procedures for using all tests, and explanations of the system's error codes.

DEFINITY Enterprise Communications Server Release 5 — Overview, Issue 2, 555-230-024

Provides a detailed overview of the system including descriptions of many of the major features, applications, hardware, system capabilities, and the support provided with the system.

DEFINITY Communications System Generic 3 Planning and Configuration, Issue 2, 555-230-601

Provides step-by-step procedures for the account team in determining the customer's equipment and hardware requirements to configure a system according to the customer specifications. Includes detailed requirements and block diagrams. This document reflects Generic 3 Version 2 software, but still contains relevant information.

BCS Products Security Handbook, Issue 5, 555-025-600

Provides information about the risks of telecommunications fraud and measures for addressing those risks and preventing unauthorized use of BCS products. This document is intended for telecommunications managers, console operators, and security organizations within companies.

DEFINITY Communications System and System 75 and System 85 Terminals and Adjuncts Reference, Issue 7, 555-015-201

Provides descriptions of the peripheral equipment that can be used with System 75, System 85, DEFINITY Communications System, and DEFINITY ECS. This document is intended for customers and Lucent Technologies account teams for selecting the correct peripherals to accompany a system.

DEFINITY Communications System Generic 1, Generic 3, and System 75 Voice Terminal Guide Builder, Issue 3, 555-230-755

Provides capability to produce laser-printed documentation for specific voice terminals. The software is supported by a comprehensive user's guide and on-line help. This product requires a 386 PC, minimum of 6MB disk space, minimum of 4MB RAM, a printer supported by Microsoft GDI printer drive, and Microsoft Windows 3.1 or higher. A mouse is recommended.

Call Center

The following list of documents are Call-Center specific.

DEFINITY

DEFINITY Enterprise Communications Server Release 5 — Call Vectoring/EAS Guide, Issue 1, 585-230-521

Provides information on how to write, use, and troubleshoot vectors, which are command sequences that process telephone calls in an Automatic Call Distribution (ACD) environment. It is provided in two parts: tutorial and reference.

The tutorial provides step-by-step procedures for writing and implementing basic call vector scripts.

The reference includes detailed descriptions of the call vectoring features, vector management, vector administration, adjunct routing, troubleshooting, and interactions with management information systems (including the Call Management System).

DEFINITY Enterprise Communications Server Release 5 — Basic Call Management System (BCMS) Operations, Issue 1, 555-230-706

Provides detailed instructions on how to generate reports and manage the system and is intended for telecommunications managers who wish to use Basic Call Management System (BCMS) reports and system managers responsible for maintaining the system.

CentreVu CMS

CentreVu Call Management System Release 3 Version 5 — Administration, Issue 1, 585-215-820

CentreVu Call Management System Release 3 Version 5 — Reports, Issue 1, 585-215-821

CentreVu Call Management System Release 3 Version 5 — Custom Reports, Issue 1, 585-215-822

CentreVu Call Management System Release 3 Version 5 — Upgrades and Migrations, Issue 1, 585-215-826

CentreVu Call Management System Release 3 Version 5 — External Call History Reference, Issue 1, 585-215-824

CentreVu Call Management System Release 3 Version 5 — Forecast, Issue 1, 585-215-825

Networks

The following list of documents are network-specific.

DEFINITY Communications System Generic 3 Wideband Technical Reference, Issue 1, 555-230-230

Provides detailed information regarding the Wideband Switching feature for the system and is intended for users and technical support personnel involved with the installation, administration, and operation of this feature. This feature provides high speed end-to-end connectivity between customer endpoints where dedicated facilities are not economical or appropriate. The primary function is to support high speed video-conferencing and data applications.

DEFINITY Communications System Generic 2.2 and Generic 3 Version 2 DS1/CEPT1/ISDN PRI Reference Manual, Issue 1, 555-025-107

Provides a detailed technical description of digital trunks in the DEFINITY Communications Systems. This includes trunks conforming to the DS1 standard (1.544 Mbps) and the CEPT1 standard and all other methods of signalling, including bit-oriented signalling as well as ISDN-PRI signalling. This document includes background information on these topics, information on how digital trunk capabilities have been designed into the DEFINITY Communications System and information for field personnel and customers on how to provision and administer digital trunk capabilities and features. Provides both domestic and international information.

Application Specific Documents

The following list of documents are application-specific.

DEFINITY Enterprise Communications Server Generic 2 to Release 5 — Transition Reference, Issue 1, 555-230-622

Provides information on the differences in features and administration between the old and new systems when upgrading from a Generic 2 system to DEFINITY ECS.

ASAI

DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Planning Guide, Issue 5, 555-230-222

Provides procedures and directions for the account team and customer personnel for effectively planning and implementing the CallVisor Adjunct/Switch Application Interface (ASAI) PBX-Host environment. The CallVisor ASAI is a communications interface that allows adjunct processors to access switch features and to control switch calls. It is implemented using an Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI). Included are hardware and software requirements.

DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Protocol Reference, Issue 5, 555-230-221

Provides detailed layer 3 protocol information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the library or driver programmer of an adjunct processor to create the library of commands used by the applications programmers. Describes the ISDN message, facility information elements, and information elements.

DEFINITY Enterprise Communications Server Release 5 — CallVisor ASAI Technical Reference, Issue 5, 555-230-220

Provides detailed information regarding the CallVisor Adjunct/Switch Application Interface (ASAI) for the systems and is intended for the application designer responsible for building and/or programming custom applications and features.

DEFINITY Enterprise Communications Server Release 5 — Installation, Administration, and Maintenance of CallVisor ASAI Over the DEFINITY LAN Gateway, Issue 2, 555-230-223

Provides procedures for installation, administration, and maintenance of the CallVisor Adjunct/Switch Application Interface (ASAI) Ethernet application over the DEFINITY LAN Gateway and is intended for system administrators, telecommunications managers, Management Information System (MIS) managers, LAN managers, and Lucent personnel. The ASAI-Ethernet application

provides ASAI functionality using 10Base-T Ethernet rather than BRI as a transport media.

DEFINITY Enterprise Communications Server Release 5 — Overview, Issue 2, 555-230-225

DEFINITY Enterprise Communications Server Release 5 — CallVisor PC ASAI Installation and Reference, Issue 3, 555-246-205

ACD

DEFINITY Enterprise Communications Server Release 5 — Automatic Call Distribution (ACD) Agent Instructions, Issue 5, 555-230-722

Provides information for use by agents after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

DEFINITY Enterprise Communications Server Release 5 — Automatic Call Distribution (ACD) Supervisor Instructions, Issue 4, 555-230-724

Provides information for use by supervisors after they have completed ACD training. Includes descriptions of ACD features and the procedures for using them.

Console Operations

DEFINITY Communications System Generic 1 and Generic 3 Console Operations, Issue 2, 555-230-700

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call-handling procedures, basic system troubleshooting information, and routine maintenance procedures.

DEFINITY Enterprise Communications Server Release 5 — Console Operations Quick Reference, Issue 2, 555-230-890

Provides operating instructions for the attendant console. Included are descriptions of the console control keys and functions, call handling, basic system-troubleshooting information, and routine maintenance procedures. This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Colombian Spanish (SPL), and Japanese (JA).

To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

Hospitality

An Introduction to DEFINITY Communications System Generic 3 Hospitality Services, Issue 1, 555-230-021

Provides an overview of the features available for use by the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Included are brief definitions of many of the system features, descriptions of the hardware, planning considerations, and list of the system capabilities.

DEFINITY Communications System Generic 1 and Generic 3 Hospitality Operations, Issue 2, 555-230-723

Provides step-by-step procedures for using the features available for use by the lodging and health industries to improve their property management and to provide assistance to their employees and clients. Includes detailed descriptions of reports.

References

Abbreviations

A

AA

Archangel

AAC

ATM Access Concentrator

AAR

Automatic Alternate Routing

AC

Alternating Current

ACA

Automatic Circuit Assurance

ACB

Automatic Callback

ACD

Automatic Call Distribution

ACU

Automatic Call Unit

ACW

After Call Work

AD

Abbreviated Dialing

ADAP

AUDIX Data Acquisition Package

ADM

Asynchronous Data Module

ADU

Asynchronous Data Unit

AE

Access Endpoint

AG

ASAI Gateway

AIM

Asynchronous Interface Module

AIOD

Automatic Identification of Outward Dialing

ALBO

Automatic Line Build Out

ALM-ACK

Alarm Acknowledge

AMW

Automatic Message Waiting

AN

Analog

ANI

Automatic Number Identification

AOL

Attendant Offered Load

AP

Applications Processor

APLT

Advanced Private Line Termination

ARS

Automatic Route Selection

ASAI

Adjunct Switch Applications Interface

ASCII

American Standard Code for Information Interchange

ATB

All Trunks Busy

ATD

Attention Dial

ATM

Asynchronous Transfer Mode

AUDIX

Audio Information Exchange

AUX

Auxiliary

AVD

Alternate Voice/Data

AWOH

Administration Without Hardware

AWT

Average Work Time

B

BCC

Bearer Capability Class

Abbreviations

BCMS

Basic Call Management System

BCT

Business Communications Terminal

BER

Bit Error Rate

BHCC

Busy Hour Call Completions

BLF

Busy Lamp Field

BN

Billing Number

BOS

Bit Oriented Signaling

BPN

Billed Party Number

BPS

Bits Per Second

BRI

Basic Rate Interface

BTU

British Thermal Unit

B8ZS

Bipolar Eight Zero Substitution

C

CA-TSC

Call-Associated Temporary Signaling Connection

CACR

Cancellation of Authorization Code Request

CAG

Coverage Answer Group

CAMA

Centralized Automatic Message Accounting

CARR-POW

Carrier Port and Power Unit for AC Powered Systems

CAS

Centralized Attendant Service or Call Accounting System

CBC

Call-By-Call or Coupled Bonding Conductor

CC

Country Code

CCIS

Common Channel Interoffice Signaling

CCITT

Consultative Committee for International Telephone and Telegraph

CCMS

Control Channel Message Set

CCS

Centum (Hundred) Call Seconds

CCSA

Common Control Switching Arrangement

CDM

Channel Division Multiplexing

CDOS

Customer-Dialed and Operator Serviced

CDR

Call Detail Recording

CDRP

Call Detail Record Poller

CDRR

Call Detail Recording and Reporting

CDRU

Call Detail Recording Utilities

CEM

Channel Expansion Multiplexing

CEPT

European Conference of Postal and Telecommunications Rate 1

CI

Clock Input

CISPR

International Special Committee on Radio Interference

cm

Centimeter

CM

Connection Manager

Abbreviations

CMDR

Centralized Message Detail Recording

CMS

Call Management System

CO

Central Office

COR

Class of Restriction

COS

Class of Service

CP

Circuit Pack

CPE

Customer Premises Equipment

CPN

Called-Party Number

CPN/BN

Calling Party Number/Billing Number

CPTR

Call Progress Tone Receiver

CRC

Cyclical Redundancy Checking

CSA

Canadian Safety Association

CSCC

Compact Single Carrier Cabinet

CSCN

Center Stage Control Network

CSD

Customer Service Document

CSM

Centralized System Management

CSS

Center Stage Switch

CSSO

Customer Services Support Organization

CSU

Channel Service Unit

CTS

Clear to Send

CWC

Call Work Codes

D**DAC**

Dial Access Code or Direct Agent Calling

dB

Decibel

dBa

Decibels in reference to Amperes

dBnC

Decibels above reference noise with C filter

DC

Direct Current

DCE

Data Communications Equipment

DCO

Digital Central Office

DCP

Digital Communications Protocol

DCS

Distributed Communications System

DDC

Direct Department Calling

DDD

Direct Distance Dialed

DID

Direct Inward Dialed

DIOD

Direct Inward and Outward Dialing

DIVA

Data In/Voice Answer

DLC

Data Line Circuit

DLDM

Data Line Data Module

DMI

Digital Multiplexed Interface

Abbreviations

DND

Do Not Disturb

DNIS

Dialed Number Identification Service

DOD

Direct Outward Dialing

DOSS

Delivery Operations Support System

DOT

Duplication Option Terminal

DPM

Dial Plan Manager

DPR

Dual Port RAM

DS1

Digital Signal Level 1

DS1C

Digital Signal Level-1 protocol C

DSI

Digital Signal Interface

DSU

Data Service Unit

DTDM

Digital Terminal Data Module

DTE

Data Terminal Equipment

DTGS

Direct Trunk Group Select

DTMF

Dual-Tone Multi-Frequency

DTS

Disk Tape System

DXS

Direct Extension Selection

EAA

Expansion Archangel

EAL

Expansion Archangel Link

EBCDIC

Extended Binary-Coded Decimal Interexchange Code

ECC

Error Correct Code

ECMA

European Computer Manufacturers Association

EFP

Electronic Power Feed

EI

Expansion Interface

EIA

Electronic Industries Association

EMI

Electro-Magnetic Interference

EPN

Expansion Port Network

EPROM

Erasable Programmable Read Only Memory

EPSCS

Enhanced Private Switched Communications Services

ERL

Echo Return Loss

ESF

Extended Superframe Format

ESPA

European Standard Paging Access

ETA

Extended Trunk Access, also Enhanced Terminal Administration

ETN

Electronic Tandem Network

ETSI

European Telecommunications Standards Institute

E

E & M

Ear and Mouth (receive and transmit)

F

FAC

Feature Access Code

FAS

Facility-Associated Signaling

FAT

Facility Access Trunk

FAX

Facsimile

FCC

Federal Communications Commission

FEAC

Forced Entry of Account Codes

FEP

Front End Processor

FIC

Facility Interface Codes

FNPA

Foreign Numbering-Plan Area

FRL

Facilities Restriction Level

FX

Foreign Exchange

G

G3-MA

Generic 3 Management Applications

G3-MT

Generic 3 Management Terminal

G3r

Generic 3, RISC (Reduced Instruction Set Computer)

GM

Group Manager

GPTR

General-Purpose Tone Receiver

GRS

Generalized Route Selection

H

HNPA

Home Numbering Plan Area Code

Hz

Hertz

I

IAS

Inter-PBX Attendant Service

IC

Inter-Cabinet

ICC

Intercarrier Cable

ICD

Inbound Call Director

ICDOS

International Customer Dialed Operator Serviced

ICHT

Incoming Call-Handling Table

ICI

Incoming Call Identifier

ICM

Inbound Call Management

IDDD

International Direct Distance Dialing

IDF

Intermediate Distribution Frame

IE

Information Element

IMT

Intermachine Trunk

in

Inch

INADS

Initialization and Administration System

INS

ISDN Network Service

Abbreviations

INWATS

Inward Wide Area Telephone Service

IO

Information Outlet

ISDN

Integrated Services Digital Network

IS/DTT

Integrated Services/Digital Tie Trunk

ISN

Information Systems Network

ISO

International Standards Organization

ISV

Independent Software Vendor

ITP

Installation Test Procedures

ITU

International Telecommunications Union

IXC

Interexchange Carrier Code

K

kHz

Kilohertz

kbps

Kilobits Per Second

kbyte

Kilobyte

kg

Kilogram

L

LAN

Local Area Network

LAP-D

Link Access Procedure on the D-channel

LAPD

Link Access Procedure Data

LATA

Local Access and Transport Area

lb

Pound

LBO

Line Build Out

LDN

Listed Directory Number

LDS

Long-Distance Service

LEC

Local Exchange Carrier

LED

Light Emitting Diode

LINL

Local Indirect Neighbor Link

LOFC

LSU

Local Storage Unit

LWC

Leave Word Calling

M

MAC

Medium Access

M-Bus

Memory Bus

MA-UII

Message Associated User-to-User Signaling

MADU

Modular Asynchronous Data Unit

MAP

Maintenance Action Process

MAPD

Multi-Application Platform for DEFINITY

Abbreviations

Mbps

Megabits Per Second

MCC

Multi-Carrier Cabinet

MCS

Message Center Service

MCT

Malicious Call Trace

MCU

Multipoint Control Unit

MDF

Main Distribution Frame

MDM

Modular Data Module

MDR

Message Detail Record

MEM

Memory

MET

Multibutton Electronic Telephone

MF

Multi-Frequency

MFB

Multifunction Board

MFC

Multi-Frequency Code

MHz

Megahertz

MIM

Management Information Message

MIPS

Million Instructions Per Second

MIS

Management Information System

MISCID

Miscellaneous Identification

MMCS

Multimedia Call Server

MMCH

Multimedia Call Handling

MMI

Multimedia Interface

MMS

Material Management Services

MO

Maintenance Object

MOS

Message-Oriented Signaling

MPDM

Modular Processor Data Module

MS

Message Server

ms

Millisecond

MS/T

Main Satellite/Tributary

MSA

Message Servicing Adjunct

MSG

Message Service

MSM

Modular System Management

MSS

Mass Storage System

MSSNET

Mass Storage/Network Control

MT

Management Terminal

MTDM

Modular Trunk Data Module

MTP

Maintenance Tape Processor

MTT

Multi-Tasking Terminal

MWL

Message Waiting Lamp

Mbps

Megabits Per Second

Mbyte

Megabytes

Abbreviations

N

NANP

North American Numbering Plan

NAU

Network Access Unit

NCA/TSC

Non-Call Associate/Temporary Signaling Connection

NCOSS

Network Control Operations Support Center

NCSO

National Customer Support Organization

NEC

National Engineering Center

NEMA

National Electrical Manufacturer's Association

NETCON

Network Control Circuit Pack

NFAS

Non-Facility Associated Signaling

NI

Network Interface

NID

Network Inward Dialing

NM

Network Management

NN

National Number

NPA

Numbering Plan Area

NPE

Network Processing Element

NQC

Number of Queued Calls

NSE

Night Service Extension

NSU

Network Sharing Unit

NXX

Public Network Office Code

O

OA

Operator Assisted

OCM

Outbound Call Management

ONS

On-Premises Station

OPS

Off-Premises Station

OPX

Off Premises Extension

OQT

Oldest Queued Time

OSHA

Occupational Safety and Health Act

OSI

Open Systems Interconnect

OSS

Operations Support System

OSSI

Operational Support System Interface

OTDR

Optical Time Domain Reflectometer

OTQ

Outgoing Trunk Queuing

P

PACCON

Packet Control

PAD

Packet Assembly/Disassembly

PBX

Private Branch Exchange

PC

Personal Computer

PCM

Pulse Code Modulation

Abbreviations

PCOL

Personal Central Office Line

PCOLG

Personal Central Office Line Group

PCS

Permanent Switched Calls

PDM

Processor Data Module

PDS

Premises Distribution System

PE

Processing Element

PEC

Price Element Codes

PEI

Processor Element Interchange

PGATE

Packet Gateway

PGN

Partitioned Group Number

PI

Processor Interface

PIB

Processor Interface Board

PIDB

Product Image Database

PKTINT

Packet Interface

PL

Private Line

PLS

Premises Lightwave System

PMS

Property Management System

PN

Port Network

PNA

Private Network Access

POE

Processor Occupancy Evaluation

POP

Point Of Presence

PPM

Parts Per Million, or Periodic Pulse Metering

PPN

Processor Port Network

PRI

Primary Rate Interface

PROCR

Processor

PSC

Premises Service Consultant

PSDN

Packet Switch Public Data Network

PT

Personal Terminal

PTC

Positive Temperature Coefficient

PTT

Postal Telephone and Telegraph

R

RAM

Random Access Memory

RBS

Robbed-Bit Signaling

RC

Radio Controller

RCL

Restricted Call List

REN

Ringer Equivalency Number

RFP

Request For Proposal

RHNPA

Remote Home Numbering Plan Area

RINL

Remote Indirect Neighbor Link

Abbreviations

RISC

Reduced Instruction Set Computer

RLT

Release Link Trunk

RMATS

Remote Maintenance, Administration, and Traffic System

RNX

Route Number Index (Private Network Office Code)

ROM

Read-Only Memory

RPN

Routing Plan Number

RS-232C

Recommended Standard 232C

RS-449

Recommended Standard 449

RSC

Regional Support Center

S

SABM

Set Asynchronous Balance Mode

SAC

Send All Calls

SAKI

Sanity and Control Interface

SAT

System Access Terminal

SCC

Single Carrier Cabinet or Serial Communications Controller

SCD

Switch-Control Driver

SCI

Switch Communications Interface

SCO

System Control Office

SCOTCH

Switch Conferencing for TDM Bus in Concentration Highway

SCSI

Small Computer System Interface

SDDN

Software Defined Data Network

SDI

Switched Digital International

SDLC

Synchronous Data Link Control

SDN

Software Defined Network

SFRL

Single-Frequency Return Loss

SID

Station Identification Number

SIT

Special Information Tones

SMDR

Station Message Detail Recording

SN

Switch Node

SNA

Systems Network Architecture

SNC

Switch Node Clock

SNI

Switch Node Interface

SNMP

Simple Network Management Protocol

SPE

Switch Processing Element

SPID

Service Profile Identifier

SSI

Standard Serial Interface

SSM

Single Site Management

SSV

Station Service

Abbreviations

ST3

Stratum 3 Clock Board

STARLAN

Star-Based Local Area Network

SVN

Security Violation Notification

SXS

Step-by-Step

SYSAM

System Access and Administration

T

TAAS

Trunk Answer from Any Station

TABS

Telemetry Asynchronous Block Serial

TAC

Trunk Access Code

TC

Technical Consultant

TCM

Traveling Class Mark

TDM

Time Division Multiplex(ing)

TDR

Time of Day Routing

TEG

Terminating Extension Group

TEI

Terminal Endpoint Identifier

TOD

Time of Day

TOP

Task Oriented Protocol

TSC

Technical Service Center

TTR

Touch-Tone Receiver

TTT

Terminating Trunk Transmission

TTTN

Tandem Tie Trunk Network

TTY

Teletypewriter

U

UAP

Usage Allocation Plan

UART

Universal Asynchronous Transmitter

UCD

Uniform Call Distribution

UCL

Unrestricted Call List

UDP

Uniform Dial Plan

UL

Underwriter Laboratories

UM

User Manager

UNMA

Unified Network Management Architecture

UNP

Uniform Numbering Plan

UPS

Uninterruptible Power Supply

USOP

User Service Order Profile

UUCP

UNIX-to-UNIX Communications Protocol

UUI

User-to-user information

Abbreviations

V

VAR

Value Added Reseller

VDN

Vector Directory Number

VIS

Voice Information System

VLSI

Very Large Scale Integration

VM

Voltmeter

VNI

Virtual Nodepoint Identifier

W

WATS

Wide Area Telecommunications Service

WCC

World Class Core

WCR

World Class Routing

WCTD

World Class Tone Detection

WFB

Wireless Fixed Base

WSA

Waiting Session Accept

WSS

Wireless Subscriber System

Z

ZCS

Zero Code Suppression

Glossary

Numerics

3B2 Message Server

An AT&T software application that combines voice and data messaging services for voice terminal users whose extensions are connected to a G3 switch.

800 service

A service in the USA, which allows incoming calls from a certain area or areas to an assigned number for a flat-rate charge based on usage.

A

ARS

See Automatic Route Selection on page GL-5.

abandoned call

An incoming call, where the caller hangs up before being answered.

access code

A 1-, 2-, or 3-digit dial code used to activate or cancel a feature, or access an outgoing trunk. The star (*) and pound (#) can be used as the first digit of an access code.

access endpoint

Either a nonsignaling channel on a DS1 interface or a nonsignaling port on an analog tie trunk circuit pack that is assigned a unique extension.

access tie trunk

A trunk that connects a main communications system with a tandem communications system in an electronic tandem network (ETN). An access tie trunk can also be used to connect a system or tandem to a serving office or service node. Also called "access trunk."

ACCUNET

A trademarked name for a family of digital services offered by AT&T in the USA.

ACD

See **Automatic Call Distribution**. ACD also refers to the "Work State" indicating that the agent is on an ACD call.

ACD split (or split)

A group of extensions that are staffed by agents trained to handle a certain type of incoming call. Valid split numbers range from 1~through 99. Each number identifies a unique grouping of ACD agent positions. ACD split is also referred to as an *ACD hunt group* or *hunt group*.

ACD work modes

See **work modes**.

active-notification association

A "link" that is initiated by the adjunct allowing it to receive Event Reports for a specific switch entity, for example, an outgoing call. This association is initiated by the adjunct via the *Event Notification Request* capability.

active-notification call

A call for which Event Reports are being sent over an active-notification association (communication channel) to the adjunct. Sometimes referred to as a monitored call.

active notification domains

Domains are VDNs and ACD split extensions for which Event Notification has been requested.

adjunct-control association

A relationship initiated by an application via the *Third Party Make Call*, the *Third Party Take Control* or *Domain (Station) Control* capabilities to set up calls and control calls already in progress.

adjunct-controlled calls

Include all the calls that can be controlled using an adjunct-control association. These calls must have been originated via the *Third Party Make Call* or *Domain (Station) Control* capabilities or must have been taken control of via the *Third Party Take Control* or *Domain (Station) Control* capabilities.

adjunct-controlled splits

ACD splits administered to be under adjunct control. Agents logged into such splits must do all telephony and ACD login and/or logout and change work mode functions through the adjunct (except for auto-available adjunct controlled splits, whose agents may not be logged in and/or logged out or have their work modes changed).

adjunct-monitored calls

Include all the adjunct-controlled calls and the active-notification calls. In addition it includes calls which provide event reporting over domain-control associations.

application

An application refers to an adjunct entity that requests and receives ASAI services or capabilities. One or more applications can reside on a single adjunct. However, the switch cannot distinguish among several applications residing on the same adjunct and treats the adjunct, and all resident applications, as a single application. The terms application and adjunct are used interchangeably throughout this document.

after call work (ACW) mode

In this mode, agents are unavailable to receive ACD calls. Agents should enter the ACW mode to perform ACD-related activities such as filling out a form after an ACD call. If agents are in the Manual-In mode and disconnect from an ACD call, they automatically enter the ACW mode. Agents who normally use Auto-In mode can enter the ACW state by depressing the ACW button while on a call.

adjunct

A processor that does one or more tasks for another processor and that is optional in the configuration of the other processor.

adjunct-switch application interface (ASAI)

An AT&T recommendation for interfacing adjuncts and communications systems, based on the CCITT Q.932 specification for layer 3.

administer

To access and change parameters associated with the services or features of a system.

Administered Connection (AC)

Administered Connection is a feature that allows the switch to automatically establish and maintain end-to-end connections between access endpoints (trunks) and/or data endpoints (data modules).

administration terminal

A terminal used to administer and maintain a system. See also **terminal**.

Administration Without Hardware (AWOH)

Provides the ability to administer ports without the need for the associated terminals or other hardware to be physically present.

abandoned call

An incoming call, where the caller hangs up before being answered.

agent (or ACD agent)

An answering position who receives calls that are directed to a split. A member of an ACD hunt group (ACD split).

agents in multiple splits

An agent may be logged into more than one split (three maximum). If, while logged into more than one split, the agent (1) answers an ACD call, (2) is in ACW mode for any split, or (3) makes or receives a direct extension call, the switch will not distribute additional ACD calls to that agent.

agent report

Provides historical traffic information for internally measured agents.

American National Standard Code for Information Interchange

See **ASCII**.

analog

The representation of information by means of continuously variable physical quantities such as amplitude, frequency, and phase.

analog data

Data that is transmitted over a digital facility in analog (pulse code modulation) form. The data must pass through a modem either at both ends or at a modem pool at the distant end.

analog telephone

A telephone that receives acoustic voice signals and sends analog electrical signals along the telephone line. Analog telephones are usually served by a single wire pair (tip and ring). The model-2500 telephone set is a typical example of an analog telephone.

analog-to-digital converter (ADC)

A device that converts an analog signal to digital form. See also **digital-to-analog converter**.

angel

A microprocessor located on each port card in a processor port network (PPN). The angel uses the control-channel message set (CCMS) to manage communications between the port card and the archangel on the controlling switch processing element (SPE). The angel also monitors the status of other microprocessors on a port card and maintains error counters and thresholds. See also **archangel**.

answerback code

An assigned number used to respond to a page from a code-calling or loudspeaker-paging system, or to retrieve a parked call.

appearance

A software process that is associated with an extension and whose purpose is to supervise a call. Also called "call appearance," "line appearance," and "occurrence."

applications processor

A minicomputer used with several user-controlled applications such as traffic analysis and electronic documentation.

architecture

The organizational structure of a system, including hardware and/or software.

ASCII (American National Standard Code for Information Interchange)

The standard code, using a coded character set consisting of 7-bit coded characters (eight bits, including parity check), used for information interchange among data processing systems, data communications systems, and associated equipment. The ASCII set consists of control characters and graphic characters.

asynchronous data transmission

A method of transmitting data in which each character is preceded by a start bit and followed by a stop bit, thus permitting data characters to be transmitted at irregular intervals. This type transmission is advantageous when transmission is not regular (characters typed at a keyboard). Also called "asynchronous transmission." See also **synchronous data transmission**.

association

An association is a communication channel between the adjunct and switch for messaging purposes. An active association is one which applies to an existing call on the switch or to an extension on the call.

asynchronous data unit (ADU)

A data communications equipment (DCE) type device that allows direct connection between RS232C equipment and a digital switch.

attendant

A person at a console on a customer's premises who provides personalized service for incoming callers and voice-services users by performing switching and signaling operations. See also **attendant console**.

attendant console

The workstation used by an attendant. The attendant console allows the attendant to originate a call, answer an incoming call, transfer a call to another extension or trunk, put a call on hold, and remove a call from hold. Attendants using the console can also manage and monitor some system operations. Also called "console." See also **attendant**.

Audio Information Exchange (AUDIX)

A fully integrated voice-mail system that can be used with a variety of communications systems to provide call-history data, such as subscriber identification and reason for redirection.

auto-in trunk groups

Those trunk groups where the CO processes all of the digits for the incoming call. Whenever the switch determines that the CO has seized a trunk from an Auto-In trunk group, it automatically (without processing any digits) connects the trunk to the destination. The destination will typically be an ACD split where (if there are no agents available) the call will go into a queue in which the callers wait to be answered in the order in which they arrived.

auto-in work mode

One of four agent work modes. The work mode where an agent indicates, to the system, that the agent is ready to process another call as soon as the current call is completed. Specifically, if an

agent disconnects from an ACD call while in Auto-in Work Mode, then that agent immediately becomes available to receive another ACD call. See **Manual-In Work Mode** for a contrast.

Automatic Call Distribution (ACD) split

Calls of a similar type are distributed among agents.

Automatic Route Selection

The software program that controls call routing over an ETN is called Automatic Alternate Routing (AAR). AAR not only determines the route for a call, but, through the Facilities Restriction Level (FRL) function, defines up to eight levels of calling privileges for users of the ETN. Another function of AAR, Subnet Trunking, can convert an on-network number to a public network or international number. This function is useful when all on-network routes are busy or are not provided.

automatic trunk

A trunk that does not require the sending or receiving of addressing information because the destination is predetermined. A request for service on the trunk, called a “seizure,” is sufficient to route the call. The normal destination of an automatic trunk is the communications-system attendant group. Also called “automatic incoming trunk” and “automatic tie trunk.”

automatic restoration

A service that restores disrupted connections between access endpoints (nonsignaling trunks) and data endpoints (devices that connect the switch to data terminal and/or communications equipment). This restoration is done within seconds of a service disruption so that critical data applications can remain operational.

auxiliary equipment

Equipment used for optional system features, such as Loudspeaker Paging and Music-on-Hold.

auxiliary trunk

A trunk used to connect auxiliary equipment, such as radio-paging equipment, to a communications system.

aux-work mode

In this mode, agents are unavailable to receive ACD calls. Agents should enter aux-work mode when involved in non-ACD activities such as taking a break, going to lunch, or placing an outgoing call.

When agents log in, they are automatically placed in the Aux-Work mode. They can then use the Auto-In or Manual-In feature to make themselves available to answer the first call.

Also, the last available agent in a split cannot enter the aux-work mode if any ACD calls are remaining in the queue. If the last available agent attempts to enter aux-work mode, the following occurs: (1) Calls in the queue are routed to the agent until the queue is empty (2) If the last available agent has an aux-work button, the light next to the button flashes until all calls in the queue are answered. When the last call is answered, the light next to the button goes on steadily, and the agent then enters aux-work mode.

B

bandwidth

The difference, expressed in Hertz, between the defined highest and lowest frequencies in a frequency range.

barrier code

A security code used with the Remote Access feature to prevent unauthorized access to the system.

baud

In telecommunications applications, a unit of transmission speed equal to the number of signal events per second. See also **bit rate** and **bits per second**.

BCC

The Bearer Capability Class (BCC) identifies the type of a call, for example, voice and different types of data. Determination of BCC is based on the call originator's characteristics for non-ISDN endpoints and on the Bearer Capability and Low-Layer Compatibility Information Elements of an ISDN endpoint.

Current BCCs are:

- 0: Voice-grade data and voice
- 1: DMI Mode 1, 56 kbps data transmission
- 2: DMI Mode 2, synchronous/asynchronous data transmission up to 19.2 kbps
- 3: DMI Mode 3, 64 kbps circuit/packet data transmission
- 4: DMI Mode 0, 64 kbps synchronous data
- 5: Temporary Signaling Connection
- 6: Wideband Call, 128 to 1984 kbps synchronous data

bit (binary digit)

One unit of information in binary notation having two possible states or values, 0 or 1.

bits per second (bps)

The number of binary units of information that are transmitted or received per second. See also **baud** and **bit rate**.

bit rate

The speed at which bits are transmitted, usually expressed in bits per second. Also called "data rate." See also **baud** and **bits per second**.

bridge (bridging)

The appearance of a voice terminal's extension at one or more other voice terminals.

BRI

The ISDN Basic Rate Interface specification.

bridged appearance

A call appearance on a voice terminal that matches a call appearance on another voice terminal for the duration of a call.

buffer

(1) In hardware, a circuit or component that isolates one electrical circuit from another. Typically, a buffer holds data from one circuit or process until another circuit or process is ready to accept the data. (2) In software, an area of memory used for temporary storage.

bus

A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

business communications terminal (BCT)

An integrated digital data terminal used for business applications. A BCT can function via a digital terminal data module (DTDM) or a processor data module (PDM) as a special-purpose terminal for services provided by an applications processor (AP) or, as a terminal for data entry and retrieval.

BX.25

An AT&T version of the CCITT X.25 protocol for data communications. BX.25 adds a fourth level to the standard X.25 interface. This uppermost level combines levels 4, 5, and 6 of the International Standards Organization (ISO) reference model.

bypass tie trunks

A one-way, outgoing tie trunk from a tandem switch to a main switch in an electronic tandem network (ETN). Bypass tie trunks, provided in limited quantities, are used as a "last-choice" route when all trunks to another tandem switch are busy. Bypass tie trunks are used only if all applicable intertandem trunks are busy.

byte

A sequence of (usually eight) bits processed together.

C

cabinet

Housing for racks, shelves, or carriers that hold electronic equipment.

cable

The physical connection between two pieces of equipment (em for example, cable from a data terminal to a modem (em) or between a piece of equipment and a termination field (em) for example, circuit pack I/O cables).

cable connector

A cable connector is either a jack (female) or plug (male) on the end of a cable. A cable connector connects wires on a cable to specific leads on telephone or data equipment.

call appearance, attendant console

Six buttons, labeled "a" through "f," and used to originate, receive, and hold calls. Each button has two lights to show the status of the call appearance.

call appearance, voice terminal

A button labeled with an extension number and used to place outgoing calls, receive incoming calls, or hold calls. Two lights next to the button show the status of the call appearance or the status of the call.

call control capabilities

call control capabilities are all the capabilities (*Third Party Selective Hold, Third Party Reconnect, Third Party Merge*) that can be used in either of the Third Party Call Control ASE (cluster) subsets: Call Control and Domain Control.

call detail recording

A switch feature that utilizes software and hardware to record call data (same as CDRU).

call detail recording utility (CDRU)

Applications software that collects, stores, optionally filters, and outputs call detail records for direct or polled output to peripheral devices.

call management system (CMS)

An application, running on an adjunct processor, that collects information from an Automatic Call Distribution (ACD) unit. CMS enables customers to monitor and manage telemarketing centers by generating reports on the status of agents, splits, trunks, trunk groups, vectors, and vector directory numbers (VDNs), and enables customers to partially administer the ACD feature for a communications system.

call reference value (CRV)

An identifier present in ISDN messages that serves to associate a related sequence of messages. In ASAI, the CRVs distinguish between associations.

call vector

A set of up to 15 vector commands to be performed for an incoming or internal call.

callback call

A call that is automatically returned to a voice terminal user who activated the Automatic Callback or Ringback Queuing feature.

call-waiting ringback tone

A low-pitched tone identical to ringback tone except that the tone decreases in the last 0.2~second (in the United States). A call-waiting ringback tone notifies the attendant that the Attendant Call Waiting feature has been activated and that the called user is aware of the waiting call. Tones in international countries may sound different.

call work code

A number, up to 16 digits, entered by Automatic Call Distribution (ACD) agents to record the occurrence of customer-defined events (such as account codes, social security numbers, or phone numbers) on ACD calls.

carrier

An enclosed shelf containing vertical slots that hold circuit packs.

carried load

The amount of traffic actually served by traffic-sensitive facilities during a given interval.

CCS or hundred call seconds

A unit of traffic measure that is used to determine usage. In order to determine usage for a facility, it is scanned every 100 seconds. If the facility is found busy, then it is assumed to have been busy for the entire scan interval. There are 3600 seconds per hour. The Roman numeral for 100 is the capital letter "C." The abbreviation for call seconds is CS. Therefore, 100 call seconds is abbreviated as CCS. If a facility is busy for an entire hour, then it is said to have been busy for 36 CCS. *See also Erlang.*

capability

A capability is either a request or indication of an operation. For example, a *Third Party Make Call* is a request for setting-up a call and an *Event Report* is an indication that an event has occurred.

capability groups

Capability groups are sets of capabilities, provisioned through switch administration, that can be requested by an application. Each capability group may contain capabilities from several capability groups. Capability groups are also referred to, in other documentation, as administration groups or Application Service Elements (ASEs). Capability groups denote association types. For example, *Call Control* is a type of association which allows certain functions (the ones in the capability group) to be performed over this type of association.

cause value

A Cause Value is returned in responses to requests or in event reports when a denial occurs or an unexpected condition is encountered. ASAI cause values fall into two “coding standards”: Coding Standard 0 includes any cause values that are part of AT&T and CCITT ISDN specifications, and, Coding standard 3 includes any other ASAI cause values. This document uses a notation for cause value where the coding standard for the cause is given first, then a slash, then the cause value. For example, CS0/100 is coding standard 0, cause value 100.

CCITT

CCITT (Comite Consultatif International Telephonique et Telegraphique) is now called *International Telecommunications Union* (ITU). See this name for information.

center stage switch (CSS)

The central interface between the processor port network (PPN) and expansion port networks (EPNs) in a CSS-connected system.

central office (CO)

The location housing telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling.

central office (CO) codes

The first three digits of a 7-digit public network telephone number in the USA. CO codes are numbered from 200 through 999.

central office (CO) trunk

A telecommunications channel that provides access from the system to the public network through the local CO.

channel

The term channel is nonspecific and must be taken in context. Channel can refer to a circuit-switched call or a communications path for transmitting voice and/or data.

In wideband, a channel refers to all of the time slots necessary to support a call. For example, an H0-channel uses six 64 kbps time slots. This definition of channel is the same whether the time slots necessary to support the call are contiguous or noncontiguous.

Channel can also refer to a DS0 on a T1 or E1 facility not specifically associated with a logical circuit-switched call. In this context, a channel is analogous to a single trunk.

channel negotiation

Channel negotiation is the process by which the channel offered in the Channel Identification Information Element (CIIE) in the SETUP message is “negotiated” to be another channel acceptable to the switch receiving the SETUP message and ultimately to the switch that sent the SETUP. Negotiation will only be attempted if the CIIE is encoded as *Preferred*. Channel negotiation will not be attempted for wideband calls.

circuit

(1) An arrangement of electrical elements through which electric current flows, providing one or more specific functions. (2) A channel or transmission path between two or more points.

circuit pack

A card on which electrical circuits are printed, and integrated circuit (IC) chips and electrical components are installed. A circuit pack is installed in a switch carrier.

Class of Restriction (COR)

A feature that allows up to 64 classes of call-origination and call-termination restrictions for voice terminals, voice terminal groups, data modules, and trunk groups. See also **Class of Service (COS)**.

Class of Service (COS)

A feature that uses a number (0 through 15) to specify if voice terminal users can activate the Automatic Callback, Call Forwarding (emAll Calls, Data Privacy, or Priority Calling features).

common control switching arrangement (CCSA)

A private telecommunications network using dedicated trunks and a shared switching center for interconnecting company locations.

communications system

The software-controlled processor complex that interprets dialing pulses, tones, and/or keyboard characters and makes the proper interconnections both within the system and external to the system. The communications system itself consists of a digital computer, software, storage device, and carriers with special hardware to perform the actual connections. A communications system provides voice and/or data communications services, including access to public and private networks, for telephones and data terminals on a customer's premises. See also **switch**.

confirmation tone

A tone confirming that a feature activation, deactivation, or cancellation has been accepted.

connectivity

The connection of disparate devices within a single system.

console

See **attendant console**.

contiguous

Contiguous, which is a wideband term, refers to adjacent DS0s within one T1 or E1 facility or adjacent TDM or fiber time slots. Note that the first and last TDM bus, DS0, or fiber time slots are not considered contiguous (no wraparound). For an E1 facility with a %D-channel, DS0s 15 and 17 are considered contiguous.

control cabinet

See **control carrier**.

control carrier

A carrier in a multicarrier cabinet that contains the switch processing element (SPE) circuit packs and, unlike a G3r control carrier, port circuit packs. Also called "control cabinet" in a single-carrier cabinet. See also **switch processing element**.

controlled station

A station that is being monitored and controlled via a domain-control association.

coverage answer group

A group of up to eight voice terminals that ring simultaneously when a call is redirected to it by Call Coverage. Any one of the group can answer the call.

coverage call

A call that is automatically redirected from the called party's extension number to an alternate answering position when certain coverage criteria are met.

coverage path

The order in which calls are redirected to alternate answering positions.

coverage point

An extension or attendant group, vector directory number (VDN), or Automatic Call Distribution (ACD) split designated as an alternate answering position in a coverage path.

covering user

A person at a coverage point who answers a redirected call.

critical reliability system

A system that has the following duplicated items: control carriers, tone-clock circuit packs, expansion interface (EI) circuit packs, and cabling between port networks (PNs) and center stage switch (CSS) in a CSS-connected system. See also **duplicated common control**, **duplicate processor-only system**, and **duplication**.

D

data channel

A communications path between two points used to transmit digital signals.

data communications equipment (DCE)

The equipment (em usually a modem, data module, or packet assembler/disassembler (em on the network side of a communications link that provides the functions to make the binary serial data from the source or transmitter compatible with the communications channel.

data link

The configuration of physical facilities enabling end terminals to communicate directly with each other.

data module

An interconnection device between a basic rate interface (BRI) or digital communications protocol (DCP) interface of the switch and data terminal equipment (DTE) or data communications equipment (DCE).

data path

The end-to-end connection used for a data-communications link. A data path is the combination of all the elements of an interprocessor communication in a distributed communications system (DCS).

data port

A point of access to a computer that uses trunks or lines for transmitting or receiving data.

data rate

See **bit rate**.

data service unit (DSU)

A device designed to transmit digital data on transmission facilities.

data terminal

An input/output (I/O) device that has either switched or direct access to a host computer or to an applications processor (AP).

data terminal equipment (DTE)

Equipment consisting of the endpoints in a connection over a data circuit. For example, in a connection between a data terminal and a host, the terminal, the host, and their associated modems or data modules make up the DTE. DTE usually consists of the following functional units: control logic, buffer store, and one or more input or output devices or computers. DTE can contain error control, synchronization, and telephone-identification capabilities.

D-channel backup

D-channel backup is used with Non-Facility Associated Signaling (NFAS). With D-channel backup, a primary D-channel provides signaling for an NFAS D-channel group (two or more PRIs facilities). A second (redundant) %D-channel, located on a separate PRI facility of the NFAS D-channel group is designated as backup for the D-channel. The failure of the primary D-channel

causes an automatic transfer of call-control signaling to the backup D-channel. When this happens, the backup becomes the primary D-channel, and when the previous primary is returned to service it becomes the backup D-channel.

DCS

See Distributed Communications System on page GL-13.

delay-dial trunk

A trunk that allows dialing directly into a communications system (em that is, the digits are received as they are dialed).

denying a request

Denying a Request is the same as sending a negative acknowledgement (NAK), and is done by sending an Facility Information Element (FIE) with a *return error* component (a cause value is also provided). It should not be confused with the "denial" event report which applies to calls.

designated voice terminal

The specific voice terminal to which calls, originally directed to a certain extension number, are redirected. Commonly used to mean the "forwarded-to" terminal when Call Forwarding All Calls is active.

dial-repeating tie trunk

A tie trunk that transmits called-party addressing information between two communications systems.

digit conversion

A process used to convert specific dialed numbers into other dialed numbers.

digital communications protocol (DCP)

An AT&T proprietary protocol used to transmit both digitized voice and digitized data over the same communications link. A DCP link is made up of two 64-kbps information (I-) channels and one 8-kbps signaling (S-) channel.

digital data endpoints

In G3iV2, digital data endpoints include devices such as the 510D terminal or the 515-type business communications terminal (BCT).

digital multiplexed interface (DMI)

An interface that provides connectivity between a communications system and a host computer or between two communications systems using digital signal level-1 (DS1) 24th-channel signaling. DMI provides 23 64-kbps data channels and 1 common signaling channel over a twisted-pair connection. DMI is offered through two capabilities: bit-oriented signaling (DMI-BOS) and message-oriented signaling (DMI-MOS).

digital signal level 0 (DS0)

A single 64 kbps voice channel. A DS0 is a single 64 kbps channel in a T1 or E1 facility and consists of eight bits in a T1 or E1 frame every 125 micro-seconds.

digital terminal data module (DTDM)

An integrated or adjunct data module that shares with a digital telephone the same physical port for connection to a communications system. The function of a DTDM is similar to that of a processor data module (PDM) and modular processor data module (MPDM) in that it converts RS232C signals to DCP signals.

digital-to-analog converter

A device that converts data in digital form to the corresponding analog signals. See also **analog-to-digital converter**.

digital transmission

A mode of transmission in which the information to be transmitted is first converted to digital form and then transmitted as a serial stream of pulses.

digital trunk

A circuit in that carries digital voice and/or digital data in a telecommunications channel.

dial-repeating trunks

A PBX tie trunk that is capable of handling PBX station signaling information without attendant assistance.

direct agent

A switch feature accessed only via Adjunct Switch Applications Interface (ASAI) which allows a call to be placed in a split queue but routed only to a specific agent in that split. This allows a call to receive normal ACD call treatment (for example, announcements) and to be measured as an ACD call while ensuring that a particular agent answers.

Direct Extension Selection (DXS)

A feature on an attendant console that allows an attendant direct access to voice terminals by pressing a group select button and a DXS button.

Direct Inward Dialing (DID)

A feature that allows an incoming call from the public network (not FX or WATS) to reach a specific telephone without attendant assistance. DID calls to DID-restricted telephone lines are routed to an attendant or recorded announcement, depending on the option selected.

direct inward dialing (DID) trunk

An incoming trunk used for dialing directly from the public network into a communications system without help from the attendant.

disk drive

An electromechanical device that stores data on and retrieves data from one or more disks.

distributed communications system (DCS)

A network configuration linking two or more communications systems in such a way that selected features appear to operate as if the network were one system.

domain

Available domains are VDNs, ACD splits, and stations. The VDN domain is only used for active-notification associations, the station domain is only used for the domain-control associations. The ACD-split domain is for active-notification associations and domain-control associations.

domain-control association

A *Third Party Domain Control Request* capability initiates a unique "CRV/link number" combination, which is referred to as a domain-control association.

domain-controlled split

A split for which *Third Party Domain Control* request has been accepted. A domain-controlled split provides an event report for logout.

domain-controlled station

A station for which a *Third_Party_Domain_Control* request has been accepted. A domain-controlled station provides event reports for calls that are alerting, connected, or held at the station.

domain-controlled station on a call

A station active on a call which provides event reports over one or two domain-control associations.

duplicated common control

Two processors ensuring continuous operation of a communications system. While one processor is on-line, the other functions as a backup. The backup processor goes on-line periodically or when a problem condition occurs.

duplication

The use of redundant components to improve availability. When a duplicated subsystem fails, its backup redundant system automatically takes over.

duplication option

A system option that duplicates the following:

- Control carrier, which contains the switch processing element (SPE)
- Expansion interface (EI) circuit packs in carriers
- Fiber-optic cabling between port networks (PNs)
- Center-stage switch (CSS) in a CSS-connected system

E

E1

A digital transmission standard that carries traffic at the rate of 2.048 Mbps.

The E1 facility is divided into 32 channels (DS0s) of 64 kbps information numbered from 0 to 31. Channel 0 is reserved for framing and synchronization information. When a D-channel is present, it occupies channel 16.

ear and mouth (E&M) signaling

Trunk supervisory signaling, used between two communications systems, whereby signaling information is transferred through two-state voltage conditions (on the E and M leads) for analog applications and through a single bit for digital applications.

electronic tandem network (ETN)

A tandem tie trunk network that has automatic call routing capabilities based on the number dialed and the most preferred route available at the time the call is placed. Each switch in the network is assigned a unique private network office code (RNX), and each voice terminal is assigned a unique extension number.

Electronics Industries Association (EIA)

A trade association of the electronics industry that establishes electrical and functional standards.

emergency transfer

If a major system failure occurs, the automatic transfer within a communications system of a pre-defined set of central office (CO) lines to a group of answering telephones with at least one telephone capable of making outgoing calls. The system operates in this mode until the failure is repaired and the system automatically returns to normal operation. Also called "power-failure transfer."

end-to-end signaling

The transmission of touch-tone signals generated by dialing from a voice terminal user to remote computer equipment. A connection must first be established over an outgoing trunk from the calling party to the computer equipment. Then additional digits can be dialed to transmit information to be processed by the computer equipment.

enhanced private-switched communications service (EPSCS)

An analog private telecommunications network based on the No. 5 Crossbar and 1A ESS that provides advanced voice and data telecommunications services to companies with many locations.

Erlang

A unit of traffic intensity, or load, used to express the amount of traffic it takes to keep one facility busy for one hour. One Erlang is equal to 36 CCS. See also **Hundred Call Seconds**.

expansion archangel (EAA)

A network-control microprocessor located on an expansion interface (EI) port circuit pack in an expansion port network (EPN). The EA provides an interface between the EPN and its controlling switch processing element (SPE).

expansion-archangel link (EAL)

A link-access function on the D-channel (LAPD) logical link that exists between a switch processing element (SPE) and an expansion archangel (EA). The EAL carries control messages from the SPE to the EA and to port circuit packs in an expansion port network (EPN).

expansion control cabinet

See **expansion control carrier**.

expansion control carrier

A carrier in a multicarrier cabinet that contains extra port circuit packs and a maintenance interface. Also called "expansion control cabinet" in a single-carrier cabinet.

expansion interface (EI)

A port circuit pack in a port network (PN) that provides the interface between a PN's time-division multiplex (TDM) bus and packet bus, and a fiber-optic link. The EI carries circuit-switched data, packet-switched data, network control, timing control, and DS1 control. In addition, an EI in an expansion port network (EPN) communicates with the master maintenance circuit pack to provide the EPN's environmental and alarm status to the switch processing element (SPE).

expansion port network (EPN)

A port network (PN) that is connected to the TDM bus and packet bus of a processor port network (PPN). Control is achieved by indirect connection of the EPN to the PPN via a port-network link (PNL). See also **port network**.

extension-in

Extension-In (ExtIn) is the work state agents go into when they answer (receive) a non-ACD call. If the agent is in Manual-In or Auto-In and receives an extension-in call, it is recorded by CMS as an AUX-In call.

extension-out

Extension-Out (ExtOut) is the work state agents go into when they place (originate) a non-ACD call. If the agent is in Manual-In or Auto-In and places an extension-out call, it is recorded by CMS as an AUX-Out call.

external measurements

Refers to those ACD measurements that are made by the External CMS adjunct.

extension number

A 1- to 5-digit number by which calls are routed through a communications system or, with a Uniform Dial Plan (UDP) or main-satellite dialing plan, through a private network. Extension numbers are primarily used for telephones and data terminals but can also be used with specific features.

external call

A connection between a communications system user and a party on the public network or on another communications system in a private network.

F

facility

A general term used for a telecommunications transmission pathway and associated equipment.

facility associated signaling (FAS)

Signaling in which a D-channel carries the signaling only for those channels on the same physical interface.

feature

A specifically defined function or service provided by the system.

feature button

A labeled button on a telephone or attendant console used to access a specific feature.

fiber optics

A technology using materials that transmit ultrawideband electromagnetic light-frequency ranges for high-capacity carrier systems.

fixed

Fixed is a trunk allocation term. In the fixed allocation scheme, the time slots necessary to support a wideband call are contiguous, and the first time slot is constrained to certain starting points.

flexible

Flexible is a trunk allocation term. The flexible allocation scheme allows the time slots of a wideband call to occupy noncontiguous positions within a single T1 or E1 facility.

floating

Floating is a trunk allocation term. In the floating allocation scheme, the time slots necessary to support a wideband call are contiguous, but the position of the first time slot is not fixed.

foreign exchange (FX)

A central office (CO) other than the one providing local access to the public telephone network.

foreign exchange trunk

A telecommunications channel that directly connects the system to a central office (CO) other than its local CO.

foreign numbering-plan area code (FNPAC)

An area code other than the local area code. The FNPAC must be dialed to call outside the local geographical area.

G

Generic 3 Management Applications (G3-MA)

DEFINITY Communications System Generic 3 Management Applications, a PC-based tool which offers the following capabilities: emulation with DEFINITY switches and voice products, data exchange with voice products, flexible report creation, storage of switch changes to be executed later, global changes of switch forms, auditing of switch translations, automatic updates to CAS for Window Call Accounting software and bulk administration of stations.

Generic 3 Management Terminal (G3-MT)

DEFINITY Communications System Generic 3 Management Terminal, a management terminal used for system administration and maintenance in the switch room or optionally at some distance from the switch.

generalized route selection (GRS)

An enhancement to Automatic Alternate Routing/Automatic Route Selection (AAR/ARS) that performs routing based on call attributes, such as Bearer Capability Classes (BCCs), in addition to the address and facilities restriction level (FRL), thus facilitating a Uniform Dial Plan (UDP) that is independent of the type of call being placed.

glare

The simultaneous seizure of a two-way trunk by two communications systems, resulting in a standoff.

grade of service

The number of call attempts that fail to receive service immediately. Grade of service is also expressed as the quantity of all calls that are blocked or delayed.

ground-start trunk

A trunk on which, for outgoing calls, the system transmits a request for services to a distant switching system by grounding the trunk ring lead. To receive the digits of the called number, that system grounds the trunk tip lead. When the system detects this ground, the digits are sent.

H

handshaking logic

A format used to initiate a data connection between two data module devices.

H0

An ISDN information transfer rate for 384 kbps data defined by CCITT and ANSI standards.

H11

An ISDN information transfer rate for 1536 kbps data defined by CCITT and ANSI standards.

H12

An ISDN information transfer rate for 1920 kbps data defined by CCITT and ANSI standards.

Hertz (Hz)

A unit of frequency equal to one cycle per second.

high reliability system

A system having the following: two control carriers, duplicate expansion interface (EI) circuit packs in the PPN (in G3r with CSS), and duplicate switch node clock circuit packs in the switch node (SN) carriers. See also **duplicated common control**, **duplication**, **duplication option**, and **critical reliability system**.

holding time

The total length of time in minutes and seconds that a facility is used during a call.

home numbering-plan area code

The local area code. The area code does not have to be dialed to call numbers within the local geographical area.

hop

Nondirect communication between two switch communications interfaces (SCIs) whereby the SCI message passes automatically without intermediate processing through one or more intermediate SCIs.

host computer

A computer, connected to a network, that processes data from data-entry devices.

hunt group

A group of extensions that are assigned the Station Hunting feature so that a call to a busy extension will reroute to an idle extension in the group.

I

immediate-start tie trunk

A trunk on which, after making a connection with a distant switching system for an outgoing call, the system waits a nominal 65 ms before sending the digits of the called number. This allows time for the distant system to prepare to receive digits. On an incoming call, the system has less than 65 ms to prepare to receive the digits.

information exchange

The exchange of data between users of two different systems, such as the switch and a host computer, over a local area network (LAN).

information systems network (ISN)

A wide area network (WAN) and local area network (LAN) with an open architecture combining host computers, minicomputers, word processors, storage devices, PCs, high-speed printers, and nonintelligent terminals into a single packet-switching system.

inside call

A call placed from one telephone to another within the local communications system.

Integrated Services Digital Network (ISDN)

A public or private network that provides end-to-end digital communications for all services to which users have access by a limited set of standard multipurpose user-network interfaces defined by the CCITT. Through internationally accepted standard interfaces, ISDN provides digital circuit-switched or packet-switched communications within the network and links to other ISDNs to provide national and international digital communications. See also **Integrated Services Digital Network Basic Rate Interface** and **Integrated Services Digital Network Primary Rate Interface**.

Integrated Services Digital Network Basic Rate Interface (ISDN-BRI)

The interface between a communications system and a terminal that includes two 64-kbps B-channels for transmitting voice or data and one 16-kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information — an arrangement called “2B+1D.” ISDN-BRI also includes 48-kbps for transmitting framing and D-channel contention information, for a total interface speed of 192 kbps. ISDN-BRI serves ISDN terminals and digital terminals fitted with ISDN terminal adapters. See also **Integrated Services Digital Network Primary Rate Interface**.

Integrated Services Digital Network Primary Rate Interface (ISDN-PRI)

The interface between multiple communications systems that in North America includes 24 64-kbps channels, corresponding to the North American digital signal level-1 (DS1) standard rate of 1.544 Mbytes per second.

The most common arrangement of channels in ISDN-PRI is 23 64-kbps B-channels for transmitting voice and data and one 64-kbps D-channel for transmitting associated B-channel call control and out-of-band signaling information — an arrangement called “23B+1D,” although with non-facility-associated signaling (NFAS) ISDN-PRI can include 24 B-channels and no D-channel. See also **Integrated Services Digital Network** and **Integrated Services Digital Network Basic Rate Interface**.

intercept tone

An tone that indicates a dialing error or denial of the service requested.

interface

A common boundary between two systems or pieces of equipment.

internal call

A connection between two users within a system.

International Tele-communications Union (ITU)

Formerly known as International Telegraph and Telephone Consultative Committee (CCITT), ITU is an international organization that sets universal standards for data communications, including Integrated Services Digital Network (ISDN). ITU members are from telecommunications companies and organizations around the world. See also **BX.25**.

International Telegraph and Telephone Consultative Committee

See **International Telecommunications Union (ITU)**.

interflow

Allows calls to forward to other splits on the same PBX or a different PBX using the Call Forward All Calls switch feature.

intraflow

Allows calls to be redirected to other splits on the same PBX on a conditional or unconditional basis using call coverage “busy,” “don’t answer,” or “all” criteria.

internal measurements

Refers to those BCMS measurements that are made by the system. ACD measurements that are made external to the system (via External CMS) are referred to as external measurements.

in-use lamp

A red light on a multiappearance voice terminal that is illuminated to show which call appearance will be selected when the handset is lifted or which call appearance is active when a user is off-hook.

ISDN Gateway (IG)

A feature allowing integration of the switch and a host-based telemarketing application via a link to a gateway adjunct. The gateway adjunct is a 3B-based product that notifies the host-based telemarketing application of call events.

ISDN trunk

A trunk administered for use with Integrated Services Digital Network primary rate interface (ISDN-PRI). Also called “ISDN facility.”

ISDN-PRI Terminal Adapter

A terminal adapter acts as interface between endpoint applications and an ISDN PRI facility. ISDN-PRI terminal adapters are currently available from other vendors and are primarily designed for video conferencing applications. Accordingly, currently available terminal adapters adapt the two pairs of video codec data (V.35) and dialing (RS-366) ports to an ISDN PRI facility.

L

light-emitting diode (LED)

A semiconductor device that produces light when voltage is applied. LEDs provide a visual indication of the operational status of hardware components, the results of maintenance tests, and the alarm status of circuit packs, and the activation of telephone features.

lightwave transceiver

Hardware that provides an interface to fiber-optic cable from port circuit packs and digital signal level-1 (DS1) converter circuit packs. Lightwave transceivers convert electrical signals to light signals and vice versa.

line

A transmission path between a communications system or central office (CO) switching system and a voice terminal or other terminal.

line port

The hardware that provides the access point to a communications system for each circuit associated with a telephone and/or data terminal.

link

A transmitter-receiver channel that connects two systems.

link-access procedure on the D-channel (LAPD)

A link-layer protocol on the Integrated Services Digital Network basic rate interface (ISDN-BRI) and primary rate interface (ISDN-PRI) data-link layer (level 2). LAPD provides data transfer between two devices, and error and flow control on multiple logical links. LAPD is used for signaling and low-speed packet data (X.25 and mode 3) on the signaling (D-) channel and for mode-3 data communications on a bearer (B-) channel.

local area network (LAN)

A networking arrangement designed for a limited geographical area. Generally, a LAN is limited in range to a maximum of 6.2 miles and provides high-speed carrier service with low error rates. Common configurations include daisy chain, star (including circuit-switched), ring, and bus.

logical link

The communications path between a processor and a basic rate interface (BRI) terminal.

loop-start trunk

A trunk on which, after establishing a connection with a distant switching system for an outgoing call, the system waits for a signal on the loop formed by the trunk leads before sending the digits of the called number.

M

main-satellite-tributary

A private network configuration that can either stand alone or access an electronic tandem network (ETN). A "main" switch provides interconnection, via tie trunks, with one or more subtending switches, called "satellites"; all attendant positions for the main/satellite configuration; and access to and from the public network. To a user outside the complex, a main/satellite configuration appears as one switch, with one listed directory number (LDN). A "tributary" switch is connected to the main switch via tie trunks, but which has its own attendant positions and LDN.

maintenance

The activities involved in keeping a telecommunications system in proper working condition: the detection and isolation of software and hardware faults, and automatic and manual recovery from these faults.

management terminal

The terminal that is used by the system administrator to administer the switch. The terminal may also be used to access the BCMS feature.

major alarm

An indication of a failure that has caused critical degradation of service and requires immediate attention. Major alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, logged to the alarm log, and reported to a remote maintenance facility, if applicable.

manual-in work mode

In this mode, agents automatically enter the ACW mode when they disconnect from an ACD call. However, in order to become available to receive another ACD call, they must then manually enter the Auto-In or Manual-In mode. See **Auto-In Work Mode** for a contrast.

memory

A device into which information can be copied and held, and from which the information can be obtained at a later time.

message center

An answering service that supplies agents to and stores messages for later retrieval.

message center agent

A member of a message center hunt group who takes and retrieves messages for voice terminal users.

minor alarm

An indication of a failure that could affect customer service. Minor alarms are automatically displayed on LEDs on the attendant console and maintenance or alarming circuit pack, sent to the alarm log, and reported to a remote maintenance facility, if applicable.

modem

A device that converts digital data signals to analog signals for transmission over telephone circuits. The analog signals are converted back to the original digital data signals by another modem at the other end of the circuit.

modem pooling

A capability that provides shared conversion resources (modems and data modules) for cost-effective access to analog facilities by data terminals. When needed, modem pooling inserts a conversion resource into the path of a data call. Modem pooling serves both outgoing and incoming calls.

modular processor data module (MPDM)

A processor data module (PDM) that can be configured to provide several kinds of interfaces (RS232C, RS449, and V.35) to customer-provided data terminal equipment (DTE). See also **processor data module**.

modular trunk data module (MTDM)

A trunk data module (TDM) that can be configured to provide several kinds of interfaces (RS232C, RS449, and V.35) to customer-provided data terminal equipment (DTE).

modulator-demodulator

See **modem**.

multiappearance voice terminal

A terminal equipped with several call appearance buttons for the same extension number, allowing the user to handle more than one call, on that same extension number, at the same time.

multicarrier cabinet

A structure that holds one to five carriers. See also **single-carrier cabinet**.

multifrequency-compelled (MFC), release 2 (R2) signaling

A signal consisting of two frequency components, such that when a signal is transmitted from a switch, another signal acknowledging the transmitted signal is received by the switch. "R2" designates signaling used in the USA and countries outside the USA.

multiplexer

A device used to combine a number of individual channels into a single common bit stream for transmission.

multiplexing

A process whereby a transmission facility is divided into two or more channels, either by splitting the frequency band into a number of narrower bands or by dividing the transmission channel into successive time slots. See also **time-division multiplexing**.

multirate

Multirate refers to the new N x DS0 service (see N x DS0).

N

N x DS0

N x DS0, equivalently referred to as N~x 64-kbps, is an emerging standard for wideband calls separate from H0, H11, and H12 ISDN channels. The emerging N x DS0 ISDN multirate circuit mode bearer service will provide circuit-switched calls with data rate multiples of 64 kbps up to 1536 kbps on a T1 facility or up to 1920 kbps on an E1 facility. In the switch, N x DS0 channels will range up to 1984 kbps using NFAS E1 interfaces.

narrowband

A circuit-switched call at a data rate up to and including 64 kbps. All nonwideband switch calls are considered narrowband.

Non-Facility Associated Signaling (NFAS)

A method that allows multiple T1 and/or E1 facilities to share a single D-channel to form an Integrated Services Digital Network primary rate interface (ISDN PRI). If D-Channel Backup is not used, one facility is configured with a %D-channel, while the other facilities that share the D-channel are configured without D-channels. If D-Channel Backup is used, two facilities are configured to have D-channels (one D-channel on each facility), while the other facilities that share the D-channels are configured without D-channels.

On every facility, all DS0s that are not %D-channels are available as %B-channels. Therefore, a T1 facility without a D-channel has 24~B-channels, and an E1 facility without a %D-channel has 31~B-channels.

network

A series of points, nodes, or stations connected by communications channels.

network-specific facility (NSF)

An information element in an ISDN-PRI message that specifies which public-network service is used. NSF applies only when Call-by-Call Service Selection is used to access a public-network service.

network interface

A common boundary between two systems in an interconnected group of systems.

node

A switching or control point for a network. Nodes are either "tandem" — they receive signals and pass them on — or "terminal" — they originate or terminate a transmission path.

O

offered load

The traffic that would be generated by all the requests for service occurring within a monitored interval, usually one hour.

othersplit

The Work State that indicates the agent is currently active on another split's call, or in ACW for another split.

P

packet

A group of bits (em including a message element, which is the data, and a control information element (IE), which is the header (em used in packet switching and transmitted as a discrete unit. In each packet, the message element and control IE are arranged in a specified format. See also **packet bus** and **packet switching**.

packet bus

A wide-bandwidth bus that transmits packets.

packet switching

A data-transmission technique whereby user information is segmented and routed in discrete data envelopes called "packets," each with its own appended control information, for routing, sequencing, and error checking. Packet switching allows a channel to be occupied only during the transmission of a packet; on completion of the transmission, the channel is made available for the transfer of other packets. See also **BX.25** and **packet**.

paging trunk

A telecommunications channel used to access an amplifier for loudspeaker paging.

party/extension active on call

A party is on the call if it is actually connected to the call (in active talk or in held state). An originator of a call is always a party on the call. Alerting parties, busy parties, and tones are not parties on the call.

PCOL

Personal Central Office Line.

primary extension

The main extension associated with the physical station set.

principal

A station that has its primary extension bridged on one or more other stations.

personal computer (PC)

A personally controllable microcomputer.

pickup group

A group of individuals authorized to answer any call directed to an extension number within the group.

port

A data- or voice-transmission access point on a device that is used for communicating with other devices.

port carrier

A carrier in a multicarrier cabinet or a single-carrier cabinet containing port circuit packs, power units, and service circuits. Also called a "port cabinet" in a single carrier cabinet.

port network (PN)

A cabinet containing a TDM bus and packet bus to which the following components are connected: port circuit packs, one or two tone-clock circuit packs, a maintenance circuit pack, service circuit packs, and (optionally) up to four expansion interface (EI) circuit packs in G3. Each PN is controlled either locally or remotely by a switch processing element (SPE). See also **expansion port network** and **processor port network**.

port-network connectivity

The interconnection of port networks (PNs), regardless of whether the configuration uses direct or switched connectivity.

Primary Rate Interface (PRI)

A standard Integrated Services Digital Network (ISDN) frame format that specifies a protocol used on digital circuits between two communications systems.

In North America, PRI runs at 1.544 Mbps and provides 23 64 kbps B-channels (voice or data) and one 64 kbps D-channel (signaling). In most countries outside of North America, PRI runs at 2.048 Mbps and provides 30 64 kbps B-channels (voice or data) and one 64 kbps D-channel (signaling.) The D-channel of the interface contains multiplexed signaling information for the other channels.

PRI endpoint (PE)

The wideband switching capability introduces PRI Endpoints on switch line-side interfaces. A PRI endpoint consists of one or more contiguous B-channels on a line-side T1 or E1 ISDN PRI facility and has an extension number. Endpoint applications have call control capabilities over PRI endpoints.

principal (user)

A person to whom a telephone is assigned and who has message center coverage.

private network

A network used exclusively for the telecommunications needs of a particular customer.

private network office code (RNX)

The first three digits of a 7-digit private network number. These codes are numbered 220 through 999, excluding any codes that have a 0 or 1 as the second digit.

processor carrier

A phrase used for “control carrier” in G3rV2. See also **control carrier**.

processor data module (PDM)

A device that provides an RS232C data communications equipment (DCE) interface for connecting to data terminals, applications processors (APs), and host computers and provides a digital communications protocol (DCP) interface for connection to a communications system. See also **modular processor data module**.

processor port network (PPN)

A port network (PN) controlled by a switch processing element (SPE) that is directly connected to that PN's time-division multiplex (TDM) bus and local area network (LAN) bus. See also **port network**.

processor port network (PPN) control carrier

A carrier containing the maintenance circuit pack, tone/clock circuit pack, and switch processing element (SPE) circuit packs for a processor port network (PPN) and, optionally, port circuit packs.

Property Management System (PMS)

A stand-alone computer used by lodging and health services organizations use for services such as reservations, housekeeping, and billing.

protocol

A set of conventions or rules governing the format and timing of message exchanges to control data movement and correction of errors.

public network

The network that can be openly accessed by all customers for local or long-distance calling.

pulse-code modulation (PCM)

An extension of pulse-amplitude modulation (PAM) in which carrier-signal pulses modulated by an analog signal, such as speech, are quantized and encoded to a digital, usually binary, format.

Q

quadrant

A quadrant is a group of six contiguous DS0s in fixed locations on an ISDN PRI facility. Note that this term comes from T1 terminology (one-fourth of a T1), but there are five quadrants on an E1 ISDN PRI facility (30B + D).

A quadrant is considered available or idle when all six contiguous DS0s are idle. Otherwise, the quadrant is considered contaminated or partially contaminated. This is a dynamic condition; quadrants become idle and contaminated as calls are placed and dropped. Note that a T1 facility containing the primary or backup D-channel (23B + D) has a maximum of three idle quadrants. The fourth quadrant (DS0s 19-24) never has six contiguous idle DS0s because one is always allocated to the D-channel. On an E1 facility, channel 0 is reserved for framing and synchronization, and channel 16 contains the D-channel when present, but five quadrants are potentially available.

queue

An ordered sequence of calls waiting to be processed.

queuing

The process of holding calls in order of their arrival to await connection to an attendant, to an answering group, or to an idle trunk. Calls are automatically connected in first-in, first-out sequence.

R

R2-MFC signaling

MultiFrequency compelled (MFC) signaling is a form of number signaling similar to Dual-Tone MultiFrequency (DTMF) in that tones convey the dialed number. R2-MFC is a version of MFC recommended by CCITT for signaling between a CO and a PBX over analog or digital CO, DID, or tie trunks.

random access memory (RAM)

A storage arrangement whereby information can be retrieved at a speed independent of the location of the stored information.

read-only memory (ROM)

A storage arrangement primarily for information retrieval applications.

recall dial tone

Tones signaling that the system has completed a function (such as holding a call) and is ready to accept dialing.

redirection criteria

The information administered for each voice terminal's coverage path that determines when an incoming call is redirected to coverage.

redirection on no answer

An optional feature that redirects an unanswered ringing ACD call after an administered number of rings. The call is then redirected back to the agent.

remote home numbering-plan area code (RHNPA)

A foreign numbering-plan area code that is treated as a home area code by the Automatic Route Selection (ARS) feature. Calls can be allowed or denied based on the area code and the dialed central office (CO) code rather than just the area code. If the call is allowed, the ARS pattern used for the call is determined by these six digits.

reorder tone

A tone to signal that at least one of the facilities, such as a trunk or a digit transmitter, needed for the call was not available at the time the call was placed.

report scheduler

Software that is used in conjunction with the system printer for the purpose of scheduling the days of the week and time of day that the desired reports are to be printed.

RS232C

A physical interface specified by the EIA. RS232C transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of up to 50 feet.

ROSE

Remote Operations Service Element is a CCITT and ISO standard that defines a notation and services that support interactions between the various entities that make up a distributed application.

S

sanity and control interface (SAKI)

A custom, very-large-scale-integration (VLSI) microchip located on each port circuit pack. The SAKI provides address recognition, buffering, and synchronization between the angel and the five control time slots that make up the control channel. The SAKI also scans and collects status information for the angel on its port circuit pack and, when polled, transmits this information to the archangel.

simplex system

A system that has no redundant hardware.

simulated bridged appearance

The same as a **temporary bridged appearance**, allows the station user (usually the principal) the ability to bridge onto a call which had been answered by another party on its behalf.

single-carrier cabinet

A combined cabinet and carrier unit that contains one carrier. See also **multicarrier cabinet**.

single-line voice terminal

A voice terminal served by a single-line tip and ring circuit (models 500, 2500, 7101A, 7103A).

small computer system interface (SCSI)

An ANSI bus standard that provides a high-level command interface between host computers and peripheral devices.

software

A set of computer programs that perform one or more tasks.

split

A condition whereby a caller is temporarily separated from a connection with an attendant. A split condition automatically occurs when the attendant, active on a call, presses the start button.

split number

The split's identity to the switch and BCMS.

split report

Provides historical traffic information for internally measured splits.

split (agent) status report

Provides the real-time status and measurement data for internally measured agents and the split to which they are assigned.

staffed

Indicates an agent position is logged-in. A staffed agent will be functioning in one of four work modes: Auto-In, Manual-In, ACW, or AUX-work.

Station Message Detail Recording (SMDR)

An obsolete term now called "CDR" (see call detail recording), which is a switch feature that utilizes software and hardware to record call data.

standard serial interface (SSI)

A communications protocol developed by AT&T Teletype Corporation for use with the 500 business communications terminals (BCTs) and the 400-series printers.

status lamp

A green light that shows the status of a call appearance or a feature button by the state of the light (lit, flashing, fluttering, broken flutter, or unlit).

stroke counts

A method used by Automatic Call Distribution (ACD) agents to record up to nine customer-defined events per call when the Call Management System (CMS) is active.

switch

Any kind of telephone switching system. See also **communications system**.

switchhook

The buttons located under the receiver on a voice terminal.

switch node (SN) carrier

A carrier containing a single switch node, power units, and, optionally, one or two digital signal level-1 (DS1) converter circuit packs. An SN carrier is located in a center stage switch (CSS).

switch node (SN) clock

The circuit pack in a switch node (SN) carrier that provides clock and maintenance alarm functions and environmental monitors for an SN.

switch node interface (SNI)

The basic building block of a switch node. An SNI circuit pack controls the routing of circuit, packet, and control messages.

switch node link (SNL)

The hardware that provides a bridge between two or more switch nodes. The SNL consists of the two switch node interface (SNI) circuit packs residing on the switch nodes and the hardware connecting the SNIs. This hardware can include lightwave transceivers that convert the SNI's electrical signals to light signals, the copper wire that connects the SNIs to the lightwave transceivers, a full-duplex fiber-optic cable, digital signal level-1 (DS1) converter circuit cards and DS1 facilities if a company does not have rights to lay cable, and appropriate connectors.

switch processing element (SPE)

A complex of circuit packs (em processor, memory, disk controller, and bus-interface cards) mounted in a processor-port-network (PPN) control carrier. The SPE serves as the control element for that PPN and, optionally, for one or more expansion port networks (EPNs).

synchronous data transmission

A method of sending data in which discrete signal elements are sent at a fixed and continuous rate and specified times.

system administrator

The person who maintains overall customer responsibility for system administration. Generally, all administration functions are performed from the G3 Management Terminal (G3-MT). The switch requires a special login, referred to as the system administrator login, in order to gain access to the system administration capabilities.

system printer

An optional printer that may be used to print scheduled reports via the report scheduler.

system report

Provides historical traffic information for all internally measured splits.

system status report

Provide real-time status information for internally measured splits.

system manager

A person responsible for specifying and administering features and services for a system.

system reload

A process that allows stored data to be written from a tape into the system memory (normally after a power outage).

T

T1

A digital transmission standard that in North America carries traffic at the digital signal level-1 (DS1) rate of 1.544 Mbps. A T1 facility is divided into 24 channels (DS0s) of 64 kbps information numbered from 1 to 24. These 24 channels, with an overall digital rate of 1.536 Mbps, and an 8 kbps framing and synchronization channel make up the 1.544 Mbps transmission. When a D-channel is present, it occupies channel 24.

T1 facilities are also used in Japan and some Middle-Eastern countries.

TAC

Trunk Access Code.

tandem switch

A switch within an electronic tandem network (ETN) that provides the logic to determine the best route for a network call, possibly modifies the digits outpulsed, and allows or denies certain calls to certain users.

tandem through

The switched connection of an incoming trunk to an outgoing trunk without human intervention.

tandem tie-trunk network

A private network that interconnects several switching systems.

TEG

Terminating Extension Group.

terminal

A device that sends and receives data within a system. See also **administration terminal**.

tie trunk

A telecommunications channel that directly connects two private switching systems.

time-division multiplex (TDM) bus

A bus that is time-shared regularly by preallocating short time slots to each transmitter. In a PBX, all port circuits are connected to the TDM bus, permitting any port to send a signal to any other port.

time-division multiplexing (TDM)

Multiplexing that divides a transmission channel into successive time slots. See also **multiplexing**.

time interval

The period of time, either one hour or one-half hour, that BCMS measurements are collected for a report(s).

time slice

See **time interval**.

time slot

A time slot refers to 64 kbps of digital information structured as eight bits every 125 micro-seconds. In the switch, a time slot refers to either a DS0 on a T1 or E1 facility or a 64 kbps unit on the TDM bus or fiber connection between port networks.

time slot sequence integrity

Time slot sequence integrity means that the "N" octets of a wideband call that are transmitted in one T1 or E1 frame arrive at the output in the same order that they were introduced.

to control

To control means that an application can invoke Third Party Call Control capabilities using either an adjunct-control or a domain-control association.

to monitor

To monitor means that an application can receive *Event_Reports* on either an active-notification, adjunct-control, or a domain-control association.

tone ringer

A device with a speaker, used in electronic voice terminals to alert the user.

trunk

A dedicated telecommunications channel between two communications systems or central offices (COs).

trunk allocation

The manner in which trunks are selected to form wideband channels.

trunk data module

A device that provides the interface for connection between off-premises private-line trunk facilities and a G3V2 switch. The trunk data module provides conversion between the RS232C and the Digital Communications Protocol (DCP), and can connect to direct distance dialing (DDD) modems as the DCP member of a modem pool.

trunk group

Telecommunications channels assigned as a group for certain functions that can be used interchangeably between two communications systems or central offices (COs).

U

uniform dial plan

A feature that allows a unique 4- or 5-digit number assignment for each terminal in a multiswitch configuration such as a distributed communications system (DCS) or main-satellite-tributary system.

V

vector directory number (VDN)

An extension that provides access to the Vectoring feature on the switch. Vectoring allows a customer to specify the treatment of incoming calls based on the dialed number.

vector-controlled split

A hunt group or ACD split administered with the "vector" field enabled. Access to such split is only possible by dialing a VDN extension. Vector-Controlled Splits cannot be Active Notification Domains.

voice terminal

A single-line or multiappearance telephone.

W

wide area tele-communications service (WATS)

A service in the USA that allows calls to a certain area or areas for a flat-rate charge based on expected usage.

wideband

A circuit-switched call at a data rate greater than 64 kbps. A circuit-switched call on a single T1 or E1 facility with a bandwidth between 128 and 1536 (T1) or 1984 (E1) kbps in multiples of 64 kbps. H0, H11, H12, and N x DS0 calls are all wideband.

wideband access endpoint

The wideband switching capability extends Access Endpoints to include wideband access endpoints. A wideband access endpoint consists of one or more contiguous DS0s on a line-side T1 or E1 facility and has an extension number. The Administered Connections feature provides call control for calls originating from wideband access endpoints.

wink-start tie trunk

A trunk with which, after making a connection with a distant switching system for an outgoing call, the system waits for a momentary signal (wink) before sending the digits of the called number. Similarly, on an incoming call, the system sends the wink signal when ready to receive digits.

work modes (or ACD work modes)

A work mode is one of four states (Auto-In, Manual-In, ACW, AUX-work) that an ACD agent enters after logging in. Immediately upon logging in, an agent enters the AUX-work mode. To become available to receive ACD calls, the agent enters either the Auto-In or Manual-In work modes. To do work associated with an ACD call, at the conclusion of the call, an agent would enter the ACW mode. If an agent changes work modes while handling a call, the change becomes effective when the agent finishes the call. The system does not recognize the change until the call is completed.

In order to answer an ACD call, the ACD agent must specify a Work Mode. Generally, two methods are available for indicating Work Modes: (1) by pressing the appropriate button on their voice terminal, and (2) by dialing an access code. The four work modes associated with ACD call handling are Auto-In, Manual-In, ACW, and AUX-work. An agent can change work modes while handling a call, but the system will not recognize the change until the call is completed. It is important that the ACD agents always accurately indicate their correct work mode, otherwise the BCMS measurements will not be accurate.

work state

An ACD agent may be a member of up to three different splits. Each ACD agent continuously exhibits a work state for every split that it is a member of. Valid work states are Avail, Unstaffed, AUX-work, ACW, ACD (answering an ACD call), ExtIn, ExtOut, and OtherSpl. An agent's work state for a particular split may change for a variety of reasons (for example, whenever a call is answered, abandoned, the agent changes work modes, etc.). The BCMS feature monitors the work states and uses this information to provide the BCMS reports.

write operation

The process of putting information onto a storage medium, such as a hard disk.

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